Equity and Adequacy of Colorado School Funding

Technical Appendix

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Contents

Exhibits

Appendix A. Public Engagement Survey

Survey Instrument

The AIR public engagement survey was offered in English and Spanish. Below we provide the content of the English version of the survey.

Colorado Public Engagement Survey

Please indicate the language you prefer for taking the survey. Por favor, marque el idioma en que quisiera responder a la encuesta.

Response options: English, Español

If you agree to participate in this survey, please select "Yes" and click Next. If you do not agree to participate in this survey, please select "No" and click Next.

Response options: Yes, No

Question: How would you rate the quality of education in your local public schools for the following groups of students? **Response options:** very poor, poor, neither poor nor good, good, very good, don't know
All students
"At-risk" (low-income) students
Students with disabilities (e.g., learning disabilities, physical or cognitive disabilities)
Gifted and talented students
English language learners
Students experiencing homeless
Students in foster care
Immigrant students (students who have come from outside the country)
Newcomer students (students who have been in the US for less than a year)
Migrant students (students who move within or across states most often due to their family's labor situation)

Question: Do you think the current level of funding for your local public schools is more than enough, just enough, or not enough to meet the educational needs of the following groups of students? **Response Options:** not enough, just enough, more than enough, don't know
All students
"At-risk" (low-income) students
Students with disabilities (e.g., learning disabilities, physical or cognitive disabilities)
Gifted and talented students
English language learners
Students experiencing homeless
Students in foster care
Immigrant students (students who have come from outside the country)
Newcomer students (students who have been in the US for less than a year)
Migrant students (students who move within or across states most often due to their family's labor situation)

Question: How important is it that the funding formula the state uses to allocate dollars to public school districts does the following? **Response Options:** not important, slightly important, moderately important, important, very important
Provides adequate funding to enable all students to meet state outcome goals.
Distributes funding so that students in districts and schools serving higher-need populations are provided an equal opportunity to meet state outcome goals.
Provides districts and schools spending flexibility so that they can decide locally how to best use funds.
Is adaptable, so that it can be adjusted over time to meet changing student needs or different outcome goals.
Is transparent and easy to explain and understand.
Is predictable and stable from year to year to allow for long-term planning.
Is developed with input from the public (e.g., families, community members, educators).

Question: How important are the following outcomes for students in your local public schools? **Response Options:** not important, slightly important, moderately important, important, very important
Academic achievement in core subjects (i.e., English language arts, mathematics, science, social studies)
High school graduation
College/career readiness (e.g., ability to succeed in college education or in a career following high school completion)
Proficiency in two or more languages
Development of personal skills (i.e., self-awareness, initiative, flexibility, resilience, financial management)
Development of civic/interpersonal skills (i.e., teamwork, cultural awareness, civic engagement, communication, appreciation of diversity, kindness/empathy for others)
Development of professional skills (i.e., time/task management, career awareness, leadership)
Development of entrepreneurial skills (i.e., critical thinking, creativity, analysis, informed risk-taking)

Question: How would you describe your local public schools' performance in helping students succeed in the following outcomes? **Response options:** very poor, poor, neither poor nor good, good, very good, don't know
Academic achievement in core subjects (i.e., English language arts, mathematics, science, social studies)
High school graduation
College/career readiness (e.g., ability to succeed in college education or in a career following high school completion)
Proficiency in two or more languages
Development of personal skills (i.e., self-awareness, initiative, flexibility, resilience, financial management)
Development of civic/interpersonal skills (i.e., teamwork, cultural awareness, civic engagement, communication, appreciation of diversity, kindness/empathy for others)
Development of professional skills (i.e., time/task management, career awareness, leadership)
Development of entrepreneurial skills (i.e., critical thinking, creativity, analysis, informed risk-taking)

Question: To what extent do you agree with the following statements? **Response Options:** strongly disagree, disagree, neither disagree or agree, agree, strongly agree
Colorado public school teachers are well-paid.
Class sizes in core instructional classes (i.e., English language arts, mathematics, science, social studies) are too large.
Colorado public schools provide enough staff and services to attend to the needs of students from low-income families, English language learners, and students with a disability.
Colorado public schools have enough staff devoted to student mental health and wellness.
Instructional methods and programming provided in Colorado public schools adequately supports the social emotional learning of students.
Colorado public schools provide students sufficient access to the arts (e.g., music, theater, dance, visual arts).
Colorado public schools provide students sufficient extracurricular opportunities.
Colorado public schools offer students sufficient after-school and extended-year opportunities.
Colorado public schools provide programming and services that encourage family and community involvement in supporting students.

Question: In what region(s) of the state have you resided within the last 10 years? (Choose all that apply)

Response options:

- Metro Area
- North Central
- Northeast
- Northwest
- Pikes Peak
- Southeast
- Southwest
- West Central

Question: What is your age?
Response options: Under 18, 18-24, 25-34, 35-44, 45-54, 55-64, 65 and over, prefer not to say

Question: How do you identify your gender?
Response options: female, male, non-binary, prefer not to say, other (please specify)

Question: What is your racial or ethnic background?

Response options:

American Indian or Alaska Native
Asian
Black or African American
Hispanic or Latino
White
Native Hawaiian or Other Pacific Islander
Two or more races
Non-white
I prefer not to say

Question: What is your role? (Choose all that apply)

Response options:

Current Colorado public school student
Former Colorado public school student
Parent
Guardian
Family member
Teacher
Principal
Other school employee
Superintendent
District finance/ business officer
Other school or district administrator
School board member
Colorado Department of Education employee
State or municipal employee
Interested citizen
Community member
Business leader
Community leader
State elected or appointed governmental representative
Official representative of professional group
Other (please specify)

If you had a particular school district in mind while filling out this survey, please select the district from the list below.

Survey Administration

To ensure the greatest opportunity to expand the number of Coloradans sharing their perspectives on public school priorities and public school funding in the state, AIR sought to partner with a variety of entities throughout the state. These entities were invited to encourage their various networks, colleagues, members, and communities to participate in the Colorado Public Engagement survey. The Colorado Department of Education (CDE) played a vital role in identifying these organizations. CDE also supported dissemination of correspondence and announcements from August through October of 2024. These organizations include public school districts, Board of Cooperative Educational Services (BOCES), colleges and universities with teacher preparation programs, and statewide organizations working in K-12 education (e.g., Colorado PTA, American Federation of Teachers – Colorado, Colorado Association of School Boards, Colorado Latino Leadership Advocacy & Research Organization). (See **Error! R eference source not found.**.) AIR contacted these organizations through e-mail, provided a link to the survey, and provided instructions on how to inform all relevant stakeholders about their opportunity to have their voices heard with regards to K-12 school finance in Colorado. AIR also provided a link to the survey on the project website, described in greater detail in Appendix B Townhall Meetings. The organizations then provided the link to the survey to all interested and relevant parties. AIR followed up with these organizations on a weekly basis by e-mail to ensure that they were able to contact the relevant stakeholders concerning completion of the survey. Overall, AIR received 2,079 survey responses, 2,049 responses to the survey in English, and 30 responses to the survey in Spanish. (See Exhibit A-1.)

Exhibit A–1. Preferred Language of Survey Respondents for Taking the Survey

Language	Count	% of Total (*n* = 2,079)
English	2049	98.6%
Spanish	30	1.4%

Exhibit A–2. Organizations Partnering in Outreach

Colorado Organizations
All School Districts
All BOCES
ACL Boulder
Adams State University School of Education
American Federation of Teachers - Colorado
ARC Adams
Arc of Arapahoe & DouglasArc of Arapahoe & Douglas

Colorado Organizations
Black Child Development Institute - Denver
Boulder Valley Community Partners
Boulder Valley Education Association
Children's Voices
Colorado Advisory Council for Homeless Youth
Colorado Association for Bilingual Education
Colorado Association for Gifted & Talented
Colorado Association of School Boards
Colorado Association of School Business Officials
Colorado Association of School Executives
Colorado BOCES Association
Colorado Charter School Institute
Colorado Children's Campaign
Colorado Coalition for Retirement Security (CCRS)
Colorado Coalition for the Homeless
Colorado College Education
Colorado Concern
Colorado Council of Churches
Colorado Department of Higher Education
Colorado Education Association
Colorado Education Initiative
Colorado General Assembly
Colorado Health Foundation
Colorado Immigrant Rights Coalition
Colorado Jobs with Justice
Colorado Kids/ Colorado Children's Campaign
Colorado Latino Leadership Advocacy & Research Organization
Colorado League of Charter Schools
Colorado Mesa University Center for Teacher Education
Colorado Parent Advocacy Network
Colorado PTA
Colorado Rural Schools Alliance
Colorado School Finance Project
Colorado School Public Relations Association
Colorado Springs Education Association
Colorado State Foster Parent Association
Colorado State University- Pueblo School of Education

Colorado Organizations
Colorado State University School of Education
Colorado Succeeds
Colorado Youth Congress
Colorin Colorado
Community Foundation Boulder County
Edgewater Collective
Education Foundation of Eagle County (EFEC)
Every Child Reading
Executives Partnering to Invest in Children
Family Leadership Training Institute
Fort Lewis College School of Education
Great Education Colorado
Great Education Colorado
I2I
Lyra Colorado
Metropolitan State University of Denver School of Education
PEBC
Ready Colorado
Regis University Division of Education
Relay Graduate School of Education
Rocky Mountain NAACP CO-MT-WY State Conference
Stand
Teach for America
Teach Plus
The Arc Colorado
Transform Education Now
University of Colorado- Boulder School of Education
University of Colorado- Colorado Springs School of Education
University of Colorado- Denver School of Education & Human Development
University of Denver Morgridge College of Education
University of Northern Colorado College of Education and Behavioral Sciences
Western Colorado University Education Department
YAASPA

Survey Sample

Two-thousand, forty-nine (2,049) people responded to the Colorado Public Engagement Survey. Approximately four-fifths of survey respondents identify as white (80.3%), just over four-fifths identify as female (83.1%), and more than two-thirds of respondents are between the ages of 35 and 55 (69.9%). Also, the most common roles represented in our survey sample are parents (67.8%) and teachers (37.2%). Lastly, while all regions are represented, over three-quarters of respondents have lived in either one or both of two regions in the past ten years: slightly less than half of respondents have lived in the Metro Area region (45.4%) and under a third have lived in the Pikes Pike region (30.8%). (See additional details below.)

Exhibit A–3. Survey Sample, by Race, Gender, Age, Role, and Region

Race	% of Total (*n* = 1,249)
White	80.3%
Hispanic or Latino	11.6%
Two or More Races	4.6%
Black or African American	1.6%
American Indian or Alaska Native	1.0%
Asian	0.6%
Native Hawaiian or Other Pacific Islander	0.2%

Gender	% of Total (*n* = 1,313)
Female	83.1%
Male	16.6%
Non-Binary	0.3%

Age Group	% of Total (*n* = 1,337)
Under 18	0.4%
18-24	0.6%
25-34	9.5%
35-44	33.7%
45-54	36.2%
55-64	15.9%
65 or over	3.7%

Role	% of Total (*n* = 1,373)
Parent	67.8%
Teacher	37.2%
Community Member	30.3%
Former Student	24.2%
Interested Citizen	22.5%
Other School Employee	16.4%
Family Member	9.7%
Community Leader	6.7%
Other School/District Administrator	6.2%
Other	4.2%
Principal	3.7%
Guardian	3.6%
Business Leader	2.7%
Current Student	2.4%
School Board Member	2.0%
Superintendent	1.7%
School Finance/Business Official	1.7%
Professional Group Representative	1.6%
State or Municipal Employee	1.2%
CDE Employee	0.4%
Elected Official	0.3%

Region	% of Total (*n* = 1,372)
Metro Area	45.4%
Pikes Peak	30.8%
Southeast	9.6%
North Central	7.8%
Northwest	7.0%
Southwest	5.3%
West Central	4.6%
Northeast	2.6%

Additional Survey Results

Overall Results

Exhibit A–4. Survey Results for the Question: *How would you rate the quality of education in your local public schools for the following groups of students?*

	n	Very Poor	Poor	Neither	Good	Very Good	# of Don't Know Responses
All students	1436	2.3%	9.6%	14.5%	50.7%	22.9%	12
"At-risk" (low-income) students	1332	7.8%	23.8%	18.0%	36.2%	14.2%	119
Students with disabilities	1309	9.0%	23.4%	20.0%	33.4%	14.3%	146
Gifted and talented students	1337	7.5%	22.2%	22.1%	32.5%	15.7%	114
English language learners	1255	7.8%	21.0%	23.8%	34.1%	13.3%	191
Students experiencing homelessness	1039	10.4%	21.9%	28.5%	30.0%	9.2%	404
Students in foster care	1011	8.2%	19.2%	29.3%	34.0%	9.2%	431
Immigrant students	1090	10.3%	23.8%	26.8%	26.9%	12.3%	358
Newcomer students	1098	10.1%	23.4%	26.9%	27.4%	12.1%	349
Migrant students	1032	9.2%	25.8%	28.0%	26.5%	10.6%	415

Exhibit A–5. Survey Results for the Question: *Do you think the current level of funding for your local public schools is more than enough, just enough, or not enough to meet the educational needs of the following groups of students?*

	n	Not Enough	Just Enough	More than Enough	# of Don't Know Responses
All students	1419	79.8%	16.2%	4.0%	31
"At-risk" (low-income) students	1351	85.5%	9.6%	4.9%	97
Students with disabilities	1351	84.8%	10.0%	5.2%	97
Gifted and talented students	1347	77.9%	16.4%	5.8%	104
English language learners	1297	79.1%	14.1%	6.8%	148
Students experiencing homelessness	1185	84.3%	11.7%	4.0%	258
Students in foster care	1169	82.1%	13.9%	4.0%	273
Immigrant students	1198	81.8%	9.9%	8.3%	248
Newcomer students	1202	80.6%	11.4%	8.0%	244
Migrant students	1170	81.2%	11.0%	7.8%	271

Exhibit A–6. Survey Results for the Question: *How important is it that the funding formula the state uses to allocate dollars to public school districts does the following?*

	n	Not Important	Slightly Important	Moderately Important	Important	Very Important
Provides adequate funding to enable all students to meet state outcome goals.	1456	1.30%	3.23%	7.49%	22.12%	65.87%
Distributes funding so that students in districts and schools serving higher-need populations are provided an equal opportunity to meet state outcome goals.	1447	2.42%	4.22%	9.19%	22.87%	61.30%
Provides districts and schools spending flexibility so that they can decide locally how funding is best used.	1448	2.21%	3.87%	14.78%	28.45%	50.69%
Is adaptable, so that it can be adjusted over time to meet changing student needs or different outcome goals.	1453	1.17%	2.68%	7.91%	29.59%	58.64%
Is transparent and easy to explain and understand.	1455	0.62%	1.72%	7.01%	22.61%	68.04%
Is predictable and stable from year to year to allow for long-term planning.	1455	0.76%	2.13%	9.14%	25.64%	62.34%
Is developed with input from the public.	1454	1.03%	4.20%	13.41%	25.72%	55.64%

Exhibit A–7. Survey Results for the Question: *How important are the following outcomes for students in your local public schools?*

	n	Not Important	Slightly Important	Moderately Important	Important	Very Important
Academic Achievement	1454	0.28%	1.38%	5.85%	27.92%	64.58%
High School Graduation	1457	0.27%	0.62%	3.50%	21.35%	74.26%
College/Career Readiness	1454	0.34%	1.38%	7.36%	26.20%	64.72%
Proficiency in Two or More Languages	1455	15.60%	24.47%	30.79%	18.14%	11.00%
Development of Personal Skills	1453	1.31%	4.20%	11.29%	28.70%	54.51%
Development of Civic/Interpersonal Skills	1457	3.43%	5.15%	10.23%	29.51%	51.68%
Development of Professional Skills	1454	0.89%	3.58%	9.90%	35.42%	50.21%
Development of Entrepreneurial Skills	1454	1.51%	4.47%	15.13%	31.64%	47.25%

Exhibit A–8. Survey Results for the Question: How would you describe your local public schools' performance in helping students succeed in the following outcomes?

	n	Very Poor	Poor	Neither	Good	Very Good
Academic Achievement	1450	3.86%	12.07%	19.38%	50.76%	13.93%
High School Graduation	1441	1.67%	5.62%	18.95%	53.57%	20.19%
College/Career Readiness	1437	3.90%	11.69%	29.02%	43.28%	12.11%
Proficiency in Two or More Languages	1438	16.27%	28.51%	38.39%	13.56%	3.27%
Development of Personal Skills	1441	5.97%	23.46%	35.67%	29.84%	5.07%
Development of Civic/Interpersonal Skills	1437	5.43%	21.50%	33.19%	32.92%	6.96%
Development of Professional Skills	1441	5.97%	22.07%	37.75%	29.08%	5.14%
Development of Entrepreneurial Skills	1437	7.38%	23.17%	37.86%	26.72%	4.87%

Exhibit A–9. Survey Results for the Question: *To what extent do you agree with the following statements?*

	n	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
Colorado public school teachers are well-paid.	1456	51.10%	31.18%	8.93%	6.94%	1.85%
Class sizes in core instructional classes are too large.	1457	2.75%	9.06%	17.16%	34.66%	36.38%
Colorado public schools provide enough staff and services to attend to the needs of students from low-income families, English language learners, and students with a disability.	1448	43.30%	34.81%	13.19%	6.28%	2.42%
Colorado public schools have enough staff devoted to student mental health and wellness.	1453	41.09%	31.25%	14.25%	9.98%	3.44%
Instructional methods and programming provided in Colorado public schools adequately supports the social emotional learning of students.	1447	17.48%	30.89%	30.34%	19.00%	2.28%
Colorado public schools provide students sufficient access to the arts.	1453	21.13%	29.39%	20.85%	25.33%	3.30%
Colorado public schools provide students sufficient extracurricular opportunities.	1450	11.10%	20.21%	22.55%	38.90%	7.24%
Colorado public schools offer students sufficient after-school and extended-year opportunities.	1451	13.30%	26.88%	31.15%	24.47%	4.20%
Colorado public schools provide programming and services that encourage family and community involvement in supporting students.	1453	11.15%	23.74%	34.62%	26.98%	3.51%

Survey Respondents

Exhibit A–10. Survey Results for the Question: *What is your primary role related to Colorado Public Schools? (Select all that apply.)*

Role	% of Total (*n* = 1373)
Parent	67.81%
Teacher	37.22%
Community Member	30.30%
Former Student	24.18%
Interested Citizen	22.51%
Other School Employee	16.39%
Family Member	9.69%
Community Leader	6.70%
Other School/District Administrator	6.19%
Other	4.22%
Principal	3.71%
Guardian	3.57%
Business Leader	2.69%
Current Student	2.40%
School Board Member	1.97%
Superintendent	1.68%
School Finance/Business Official	1.68%
Professional Group Representative	1.60%
State or Municipal Employee	1.17%
CDE Employee	0.36%
Elected Official	0.29%

Exhibit A–11. Survey Results for the Question: *Have you ever worked in Colorado's K-12 public school system?*

	% of Total (*n* = 1359)
Yes	70.86%
No	27.15%
No, but I have worked in another state's K-12 public school system.	1.55%
No, but I have worked in K-12 private education in Colorado or elsewhere.	0.44%

Exhibit A–12. Survey Results for the Question: *What is your age?*

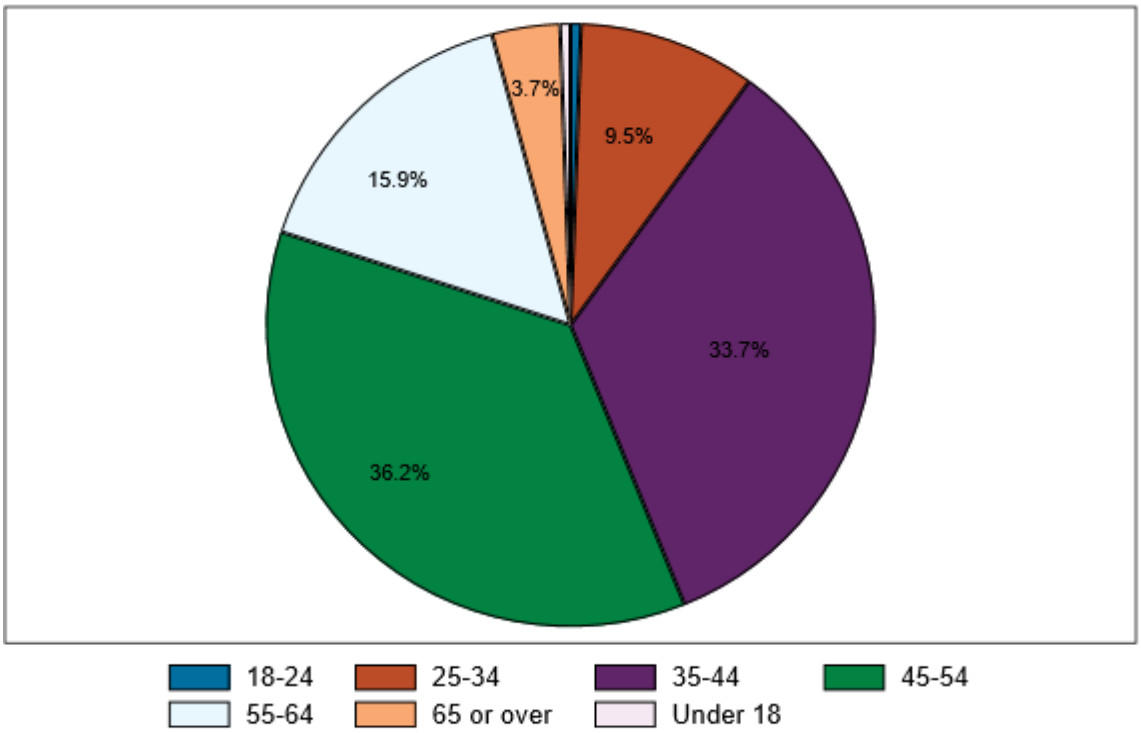


Exhibit A–13. Survey Results for the Question: *How do you identify your gender?*

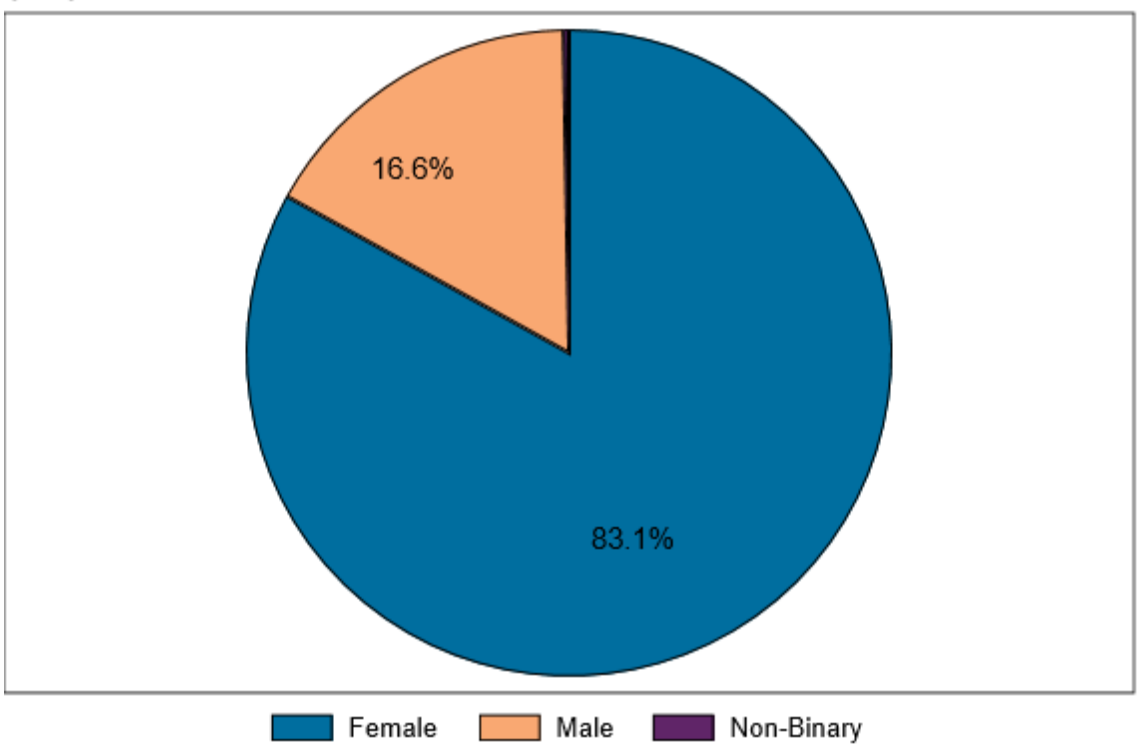


Exhibit A–14. Survey Results for the Question: *What is your racial or ethnic background?*

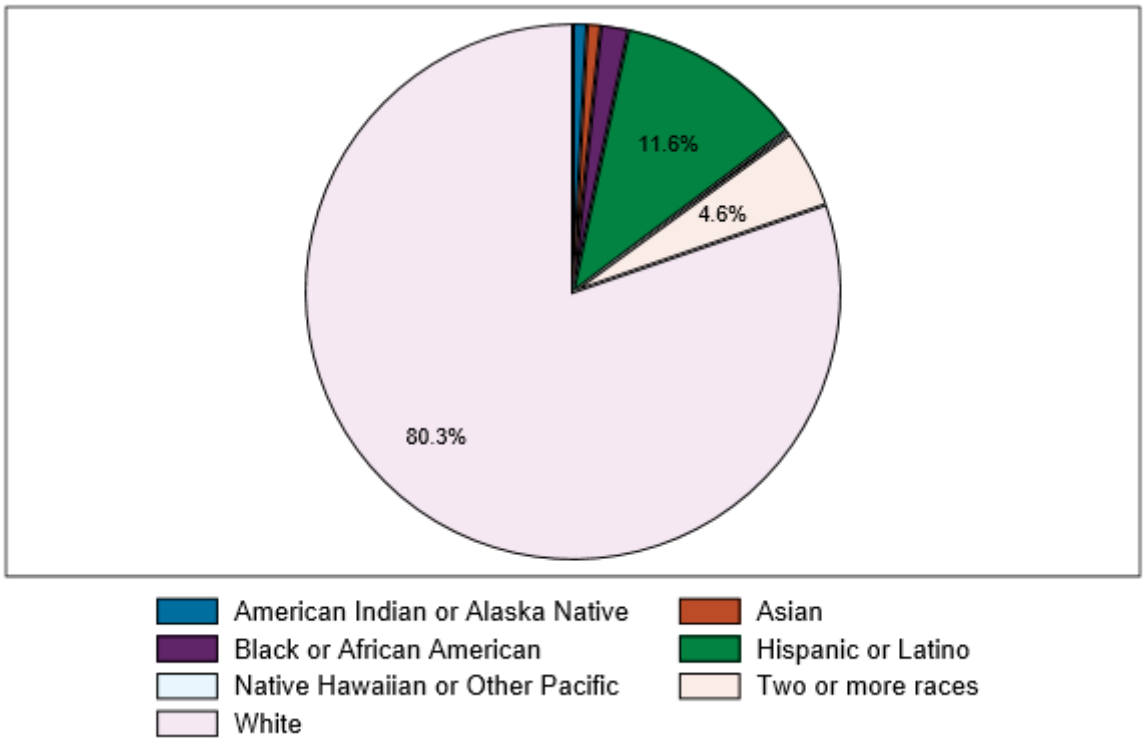


Exhibit A–15. Survey Results for the Question: *If you had a particular school district in mind while filling out this survey, please select the district from the list below.*

District	% of Total (*n* = 1192)
Jefferson County R-1	18.30%
Pueblo City 60	16.69%
Pueblo County 70	11.38%
Boulder Valley Re 2	10.37%
Widefield 3	7.25%
Littleton 6	3.46%
Adams 12 Five Star Schools	3.29%
Denver County 1	2.95%
Thompson R2-J	2.61%
School District 27J	2.28%
Douglas County Re 1	1.94%
Telluride R-1	1.85%
Eagle County RE 50	1.69%
Greeley 6	1.52%
Colorado Springs 11	1.26%

District	% of Total (*n* = 1192)
Mesa County Valley 51	1.10%
Buena Vista R-31	0.93%
Delta County 50(J)	0.67%
Poudre R-1	0.59%
Cherry Creek 5	0.59%
Lewis-Palmer 38	0.51%
Adams-Arapahoe 28J	0.51%
Creede School District	0.34%
Summit RE-1	0.34%
District 49	0.34%
West Grand 1-JT	0.34%
Cheraw 31	0.25%
Garfield Re-2	0.25%
Fowler R-4J	0.25%
Canon City RE-1	0.25%
St Vrain Valley RE1J	0.25%
Elizabeth School District	0.25%
Englewood 1	0.25%
Academy 20	0.25%
Steamboat Springs RE-2	0.17%
East Otero R-1	0.17%
Wiggins RE-50(J)	0.17%
De Beque 49JT	0.17%
Sierra Grande R-30	0.17%
Gunnison Watershed RE1J	0.17%
Akron R-1	0.17%
Hinsdale County RE 1	0.17%
McClave Re-2	0.17%
East Grand 2	0.17%
Weld Re-8 Schools	0.08%
Idalia RJ-3	0.08%
Cheyenne County Re-5	0.08%
Lake County R-1	0.08%
Fountain 8	0.08%
Lamar Re-2	0.08%
Wiley RE-13 Jt	0.08%
Center 26 JT	0.08%

District	% of Total (*n* = 1192)
Yuma 1	0.08%
Limon RE-4J	0.08%
Ignacio 11 JT	0.08%
Aspen 1	0.08%
Weld County RE-1	0.08%
Hanover 28	0.08%
Fremont RE-2	0.08%
Durango 9-R	0.08%
Kit Carson R-1	0.08%
Montezuma-Cortez RE-1	0.08%
Sheridan 2	0.08%
Montrose County RE-1J	0.08%
Ellicott 22	0.08%
Ouray R-1	0.08%
Strasburg 31J	0.08%
Plateau Valley 50	0.08%
Fort Morgan Re-3	0.08%
Adams County 14	0.08%
Valley RE-1	0.08%
Garfield 16	0.08%
Weld RE-4	0.08%
Arriba-Flagler C-20	0.08%
Buffalo RE-4J	0.08%
Ridgway R-2	0.08%
Centennial R-1	0.08%
Roaring Fork RE-1	0.08%
Woodlin R-104	0.08%
Sanford 6J	0.08%
Sargent RE-33J	0.08%
Huerfano Re-1	0.08%

Results by Race, Educator Status, and Parent Status

Results by Race

For this analysis we compare the results for white and non-white respondents. For the reporting of the following results by race, results of those who responded with "I prefer not to say" are excluded from the analysis.

Exhibit A–16. Survey Results by Race for the Question: *How would you rate the quality of education in your local public schools for the following groups of students?*

	n	Very Poor	Poor	Neither	Good	Very Good
All Students						
White	984	1.83%	7.93%	12.80%	53.15%	24.29%
Non-White	240	2.92%	9.58%	17.50%	50.42%	19.58%
At Risk (Low-Income) Students						
White	909	7.15%	22.88%	17.49%	37.18%	15.29%
Non-White	225	8.44%	26.67%	20.00%	34.22%	10.67%
Students with Disabilities						
White	893	8.17%	22.84%	19.60%	34.71%	14.67%
Non-White	218	11.01%	27.98%	17.89%	28.90%	14.22%
Gifted and Talented Students						
White	926	7.02%	22.35%	22.03%	32.18%	16.41%
Non-White	215	6.51%	22.79%	21.86%	35.81%	13.02%
English Language Learners						
White	858	6.53%	22.61%	23.19%	34.50%	13.17%
Non-White	212	9.91%	16.04%	25.47%	34.91%	13.68%
Students Experiencing Homelessness						
White	726	9.09%	21.63%	28.10%	31.54%	9.64%
Non-White	174	11.49%	25.29%	32.18%	24.14%	6.90%
Students in Foster Care						
White*	705	7.09%	19.15%	27.09%	36.17%	10.50%
Non-White	166	9.04%	19.88%	37.95%	25.90%	7.23%
Immigrant Students						
White	751	9.59%	24.90%	26.10%	27.70%	11.72%
Non-White	188	12.23%	23.94%	28.72%	23.40%	11.70%
Newcomer Students						
White	753	9.56%	25.37%	24.83%	28.42%	11.82%
Non-White	190	11.58%	21.05%	32.11%	23.68%	11.58%
Migrant Students						
White	712	8.43%	27.25%	27.25%	26.54%	10.53%
Non-White	176	10.80%	25.00%	31.25%	24.43%	8.52%

Note. Tests for statistical significance were conducted using Pearson's chi-sq. ***$p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Exhibit A–17. Survey Results by Race for the Question: *Do you think the current level of funding for your local public schools is more than enough, just enough, or not enough to meet the educational needs of the following groups of students?*

	n	Not Enough	Just Enough	More than Enough
All Students				
White*	975	82.15%	15.28%	2.56%
Non-White	233	75.11%	20.60%	4.29%
At Risk (Low-Income) Students				
White	930	87.53%	8.92%	3.55%
Non-White	227	85.46%	9.69%	4.85%
Students with Disabilities				
White	937	86.55%	9.39%	4.06%
Non-White	220	83.64%	12.73%	3.64%
Gifted and Talented Students				
White	934	80.62%	14.99%	4.39%
Non-White	219	74.43%	19.18%	6.39%
English Language Learners				
White*	893	82.98%	12.32%	4.70%
Non-White	217	75.12%	19.82%	5.07%
Students Experiencing Homelessness				
White	832	87.02%	10.10%	2.88%
Non-White	192	85.42%	10.94%	3.65%
Students in Foster Care				
White	820	85.12%	12.32%	2.56%
Non-White	191	80.63%	15.18%	4.19%
Immigrant Students				
White	833	86.31%	8.16%	5.52%
Non-White	202	79.70%	11.88%	8.42%
Newcomer Students				
White	833	84.99%	9.48%	5.52%
Non-White	202	79.21%	13.37%	7.43%
Migrant Students				
White	813	85.61%	8.98%	5.41%
Non-White	198	79.29%	13.13%	7.58%

Note. Tests for statistical significance were conducted using Pearson's chi-sq. ***$p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Exhibit A–18. Survey Results by Race for the Question: *How important is it that the funding formula the state uses to allocate dollars to public school districts does the following?*

	n	Not Important	Slightly Important	Moderately Important	Important	Very Important
Provides adequate funding to enable all students to meet state outcome goals.						
White	997	1.20%	2.61%	7.42%	20.66%	68.10%
Non-White	244	0.82%	4.10%	8.20%	23.36%	63.52%
Distributes funding so that students in districts and schools serving higher-need populations are provided an equal opportunity to meet state outcome goals.						
White	992	1.92%	3.33%	8.87%	23.39%	62.50%
Non-White	243	1.65%	3.70%	9.05%	20.99%	64.61%
Provides districts and schools spending flexibility so that they can decide locally how funding is best used.						
White	992	1.81%	4.03%	15.83%	27.82%	50.50%
Non-White	244	1.64%	2.46%	12.30%	31.15%	52.46%
Is adaptable, so that it can be adjusted over time to meet changing student needs or different outcome goals.						
White*	994	0.80%	2.72%	7.34%	29.38%	59.76%
Non-White	245	0.82%	1.63%	8.57%	27.76%	61.22%
Is transparent and easy to explain and understand.						
White	997	0.60%	2.01%	8.02%	22.17%	67.20%
Non-White	245	0.00%	1.22%	5.71%	27.35%	65.71%
Is predictable and stable from year to year to allow for long-term planning.						
White	997	0.70%	2.31%	9.03%	25.48%	62.49%
Non-White	244	0.41%	1.64%	10.25%	25.00%	62.70%
Is developed with input from the public						
White*	996	0.90%	4.82%	14.76%	26.51%	53.01%
Non-White	245	0.82%	2.86%	10.20%	24.08%	62.04%

Note. Tests for statistical significance were conducted using Pearson's chi-sq. ***$p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Exhibit A–19. Survey Results by Race for the Question: *How important are the following outcomes for students in your local public schools?*

	n	Not Important	Slightly Important	Moderately Important	Important	Very Important
Academic Achievement						
White*	997	0.40%	1.20%	4.91%	29.19%	64.29%
Non-White	244	0.00%	1.23%	9.84%	25.82%	63.11%
High School Graduation						
White**	998	0.40%	0.60%	2.30%	22.14%	74.55%
Non-White	245	0.00%	0.82%	6.53%	18.37%	74.29%
College/Career Readiness						
White	996	0.50%	1.31%	6.02%	27.01%	65.16%
Non-White	244	0.00%	1.64%	9.84%	24.18%	64.34%
Proficiency in Two or More Languages						
White***	997	14.84%	26.38%	33.40%	16.95%	8.43%
Non-White	245	14.69%	20.00%	20.41%	24.08%	20.82%
Development of Personal Skills						
White	998	0.90%	3.61%	11.12%	31.36%	53.01%
Non-White	242	1.24%	4.55%	10.33%	22.31%	61.57%
Development of Civic/Interpersonal Skills						
White**	999	2.50%	3.70%	10.01%	33.13%	50.65%
Non-White	244	3.69%	5.33%	8.61%	21.72%	60.66%
Development of Professional Skills						
White**	996	0.70%	3.01%	10.14%	37.75%	48.39%
Non-White	244	0.82%	5.74%	8.61%	25.82%	59.02%
Development of Entrepreneurial Skills						
White*	998	1.30%	3.81%	15.53%	34.37%	44.99%
Non-White	243	1.65%	5.35%	11.93%	25.93%	55.14%

Note. Tests for statistical significance were conducted using Pearson's chi-sq. ***$p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Exhibit A–20. Survey Results by Race for the Question: *How would you describe your local public schools' performance in helping students succeed in the following outcomes?*

	n	Very Poor	Poor	Neither	Good	Very Good
Academic Achievement						
White	995	3.02%	11.26%	18.49%	52.26%	14.97%
Non-White	245	4.08%	12.65%	20.41%	49.39%	13.47%
High School Graduation						
White	990	1.01%	5.15%	17.37%	54.65%	21.82%
Non-White	245	2.04%	6.12%	22.45%	50.20%	19.18%
College/Career Readiness						
White*	983	3.05%	11.09%	26.75%	46.29%	12.82%
Non-White	244	2.87%	13.93%	35.25%	36.48%	11.48%
Proficiency in Two or More Languages						
White	985	15.33%	29.85%	38.48%	13.30%	3.05%
Non-White	245	19.18%	24.08%	36.33%	15.10%	5.31%
Development of Personal Skills						
White	989	5.26%	23.05%	35.69%	31.65%	4.35%
Non-White	243	4.94%	24.28%	36.21%	27.16%	7.41%
Development of Civic/Interpersonal Skills						
White*	987	5.27%	20.87%	32.32%	35.76%	5.78%
Non-White	243	4.12%	23.05%	34.98%	27.98%	9.88%
Development of Professional Skills						
White	989	5.06%	21.33%	37.41%	31.24%	4.95%
Non-White	244	4.51%	22.54%	41.80%	25.00%	6.15%
Development of Entrepreneurial Skills						
White	986	6.80%	21.60%	38.44%	28.60%	4.56%
Non-White	243	6.17%	27.16%	35.80%	25.10%	5.76%

Note. Tests for statistical significance were conducted using Pearson's chi-sq. ***$p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Exhibit A–21. Survey Results by Race for the Question: *To what extent do you agree with the following statements?*

	n	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
Colorado public school teachers are well-paid.						
White***	997	54.86%	30.79%	7.02%	6.22%	1.10%
Non-White	244	42.62%	33.20%	14.75%	5.33%	4.10%
Class sizes in core instructional classes are too large.						
White	998	2.71%	8.72%	16.63%	34.27%	37.68%
Non-White	245	3.27%	7.35%	19.18%	37.55%	32.65%
Colorado public schools provide enough staff and services to attend to the needs of students from low-income families, English language learners, and students with a disability.						
White	992	45.36%	35.18%	12.40%	5.24%	1.81%
Non-White	243	40.74%	36.21%	13.99%	6.17%	2.88%
Colorado public schools have enough staff devoted to student mental health and wellness.						
White	998	42.99%	31.46%	13.93%	9.12%	2.51%
Non-White	243	39.92%	32.51%	16.46%	9.05%	2.06%
Instructional methods and programming provided in Colorado public schools adequately supports the social emotional learning of students.						
White	998	17.54%	31.06%	30.36%	19.44%	1.60%
Non-White	238	19.33%	32.77%	29.83%	15.55%	2.52%
Colorado public schools provide students sufficient access to the arts.						
White	996	20.78%	29.52%	20.88%	25.50%	3.31%
Non-White	243	24.69%	33.33%	18.93%	20.58%	2.47%
Colorado public schools provide students sufficient extracurricular opportunities.						
White**	996	9.44%	20.28%	22.59%	40.06%	7.63%
Non-White	242	17.36%	23.97%	21.49%	30.99%	6.20%
Colorado public schools offer students sufficient after-school and extended-year opportunities.						
White	998	13.03%	27.56%	30.16%	24.75%	4.51%
Non-White	242	16.53%	25.62%	35.12%	20.25%	2.48%
Colorado public schools provide programming and services that encourage family and community involvement in supporting students.						
White	999	9.51%	24.72%	35.54%	26.93%	3.30%
Non-White	242	15.29%	23.14%	31.82%	26.03%	3.72%

Note. Tests for statistical significance were conducted using Pearson's chi-sq. ***$p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Results by Educator Status

For this analysis we compare the results for educators and non-educators, where educators are defined as teachers, principals, and other school professionals.

Exhibit A–22. Survey Results by Educator Status for the Question: How would you rate the quality of education in your local public schools for the following groups of students?

	n	Very Poor	Poor	Neither	Good	Very Good
All Students						
Educators**	733	1.09%	9.00%	12.41%	53.89%	23.60%
Non-Educators	609	3.61%	9.36%	16.58%	48.60%	21.84%
At Risk (Low-Income) Students						
Educators**	725	6.34%	24.97%	15.03%	38.62%	15.03%
Non-Educators	518	9.65%	22.01%	21.62%	33.40%	13.32%
Students with Disabilities						
Educators	724	8.15%	22.79%	18.23%	37.02%	13.81%
Non-Educators	499	10.62%	23.65%	21.44%	29.66%	14.63%
Gifted and Talented Students						
Educators	715	6.43%	22.38%	22.66%	33.29%	15.24%
Non-Educators	540	8.52%	22.59%	21.11%	31.67%	16.11%
English Language Learners						
Educators	703	7.40%	22.48%	22.62%	35.99%	11.52%
Non-Educators	470	7.66%	19.36%	25.11%	32.34%	15.53%
Students Experiencing Homelessness						
Educators	630	8.25%	21.75%	27.94%	33.17%	8.89%
Non-Educators	348	13.51%	21.84%	30.17%	25.00%	9.48%
Students in Foster Care						
Educators***	613	6.69%	17.62%	27.41%	39.15%	9.14%
Non-Educators	339	10.91%	21.24%	31.86%	25.66%	10.32%
Immigrant Students						
Educators	641	10.14%	23.87%	26.37%	28.86%	10.76%
Non-Educators	384	10.68%	23.44%	27.34%	23.96%	14.58%
Newcomer Students						
Educators**	638	9.40%	25.39%	25.39%	30.25%	9.56%
Non-Educators	389	11.57%	20.82%	28.53%	23.14%	15.94%
Migrant Students						
Educators	609	8.54%	25.94%	27.59%	29.06%	8.87%
Non-Educators	357	10.08%	26.33%	28.85%	21.85%	12.89%

Note. Tests for statistical significance were conducted using Pearson's chi-sq. ***$p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Exhibit A–23. Survey Results by Educator Status for the Question: *Do you think the current level of funding for your local public schools is more than enough, just enough, or not enough to meet the educational needs of the following groups of students?*

	n	Not Enough	Just Enough	More than Enough
All Students				
Educators**	733	81.04%	16.78%	2.18%
Non-Educators	594	78.28%	15.66%	6.06%
At Risk (Low-Income) Students				
Educators**	731	88.10%	8.89%	3.01%
Non-Educators	541	82.44%	10.54%	7.02%
Students with Disabilities				
Educators	729	85.73%	10.15%	4.12%
Non-Educators	539	83.49%	10.20%	6.31%
Gifted and Talented Students				
Educators	715	78.60%	16.78%	4.62%
Non-Educators	551	77.13%	15.79%	7.08%
English Language Learners				
Educators**	713	81.91%	13.60%	4.49%
Non-Educators	507	75.94%	14.60%	9.47%
Students Experiencing Homelessness				
Educators**	664	85.54%	12.05%	2.41%
Non-Educators	453	83.44%	10.15%	6.40%
Students in Foster Care				
Educators**	656	83.38%	14.48%	2.13%
Non-Educators	444	81.08%	12.61%	6.31%
Immigrant Students				
Educators**	670	84.33%	9.70%	5.97%
Non-Educators	459	79.52%	9.15%	11.33%
Newcomer Students				
Educators**	668	83.38%	10.93%	5.69%
Non-Educators	462	78.35%	10.39%	11.26%
Migrant Students				
Educators	655	83.66%	11.30%	5.04%
Non-Educators	449	78.40%	10.02%	11.58%

Note. Tests for statistical significance were conducted using Pearson's chi-sq. ***$p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Exhibit A–24. Survey Results by Educator Status for the Question: *How important is it that the funding formula the state uses to allocate dollars to public school districts does the following?*

	n	Not Important	Slightly Important	Moderately Important	Important	Very Important
Provides adequate funding to enable all students to meet state outcome goals.						
Educators	746	0.80%	2.28%	7.10%	23.46%	66.35%
Non-Educators	618	1.94%	3.72%	8.41%	20.39%	65.53%
Distributes funding so that students in districts and schools serving higher-need populations are provided an equal opportunity to meet state outcome goals.						
Educators***	744	1.21%	3.09%	7.12%	24.33%	64.25%
Non-Educators	612	4.08%	5.07%	11.27%	21.24%	58.33%
Provides districts and schools spending flexibility so that they can decide locally how funding is best used.						
Educators	745	1.61%	3.22%	14.63%	30.07%	50.47%
Non-Educators	614	2.61%	4.72%	16.29%	26.38%	50.00%
Is adaptable, so that it can be adjusted over time to meet changing student needs or different outcome goals.						
Educators*	746	0.80%	2.01%	6.84%	31.37%	58.98%
Non-Educators	616	1.79%	3.57%	8.93%	27.11%	58.60%
Is transparent and easy to explain and understand.						
Educators	746	0.54%	1.21%	7.24%	23.59%	67.43%
Non-Educators	619	0.81%	2.58%	7.43%	21.97%	67.21%
Is predictable and stable from year to year to allow for long-term planning.						
Educators	745	0.40%	2.15%	8.86%	24.16%	64.43%
Non-Educators	618	1.29%	2.27%	10.03%	26.86%	59.55%
Is developed with input from the public						
Educators*	747	0.67%	5.62%	13.25%	27.58%	52.88%
Non-Educators	617	1.46%	2.92%	13.94%	24.15%	57.54%

Note. Tests for statistical significance were conducted using Pearson's chi-sq. ***$p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Exhibit A–25. Survey Results by Educator Status for the Question: *How important are the following outcomes for students in your local public schools?*

	n	Not Important	Slightly Important	Moderately Important	Important	Very Important
Academic Achievement						
Educators***	746	0.27%	1.74%	6.03%	32.57%	59.38%
Non-Educators	616	0.32%	0.81%	5.03%	23.05%	70.78%
High School Graduation						
Educators**	746	0.54%	0.67%	2.95%	24.93%	70.91%
Non-Educators	618	0.00%	0.49%	3.72%	17.48%	78.32%
College/Career Readiness						
Educators*	745	0.40%	1.34%	7.79%	29.80%	60.67%
Non-Educators	617	0.32%	1.13%	6.81%	23.18%	68.56%
Proficiency in Two or More Languages						
Educators***	746	16.89%	28.02%	30.56%	16.76%	7.77%
Non-Educators	616	14.45%	21.27%	30.52%	19.97%	13.80%
Development of Personal Skills						
Educators	746	1.74%	4.29%	10.99%	30.83%	52.14%
Non-Educators	615	0.81%	4.07%	11.38%	27.15%	56.59%
Development of Civic/Interpersonal Skills						
Educators**	746	2.41%	4.29%	9.38%	34.05%	49.87%
Non-Educators	618	4.53%	6.31%	10.84%	24.92%	53.40%
Development of Professional Skills						
Educators*	745	1.21%	4.16%	9.53%	38.26%	46.85%
Non-Educators	616	0.49%	2.92%	10.88%	32.31%	53.41%
Development of Entrepreneurial Skills						
Educators	745	1.74%	4.97%	16.38%	31.81%	45.10%
Non-Educators	616	1.30%	3.73%	13.64%	32.14%	49.19%

Note: Tests for statistical significance were conducted using Pearson's chi-sq. ***$p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Exhibit A–26. Survey Results by Educator Status for the Question: *How would you describe your local public schools' performance in helping students succeed in the following outcomes?*

	n	Very Poor	Poor	Neither	Good	Very Good
Academic Achievement						
Educators**	742	2.29%	12.80%	18.33%	53.37%	13.21%
Non-Educators	617	5.51%	11.02%	20.58%	47.65%	15.24%
High School Graduation						
Educators***	741	0.81%	5.80%	18.08%	58.57%	16.73%
Non-Educators	610	2.46%	5.57%	19.84%	46.89%	25.25%
College/Career Readiness						
Educators**	739	2.30%	12.04%	28.42%	46.55%	10.69%
Non-Educators	607	5.77%	10.54%	29.16%	40.53%	14.00%
Proficiency in Two or More Languages						
Educators*	740	16.08%	31.22%	38.38%	11.35%	2.97%
Non-Educators	608	16.78%	25.49%	38.16%	15.79%	3.78%
Development of Personal Skills						
Educators	741	5.13%	25.10%	36.57%	28.61%	4.59%
Non-Educators	610	6.89%	21.31%	34.75%	32.13%	4.92%
Development of Civic/Interpersonal Skills						
Educators	738	5.01%	23.58%	32.25%	33.60%	5.56%
Non-Educators	609	5.91%	18.88%	34.15%	33.17%	7.88%
Development of Professional Skills						
Educators	742	5.12%	22.37%	38.68%	28.84%	4.99%
Non-Educators	609	6.08%	21.51%	37.44%	29.89%	5.09%
Development of Entrepreneurial Skills						
Educators*	739	5.95%	24.90%	39.51%	25.03%	4.60%
Non-Educators	609	8.54%	20.53%	36.12%	29.72%	5.09%

Note. Tests for statistical significance were conducted using Pearson's chi-sq. ***$p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Exhibit A–27. Survey Results by Educator Status for the Question: *To what extent do you agree with the following statements?*

	n	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
Colorado public school teachers are well-paid.						
Educators***	745	57.99%	28.32%	7.92%	4.56%	1.21%
Non-Educators	619	44.43%	34.09%	9.85%	8.72%	2.91%
Class sizes in core instructional classes are too large.						
Educators***	746	3.22%	7.10%	14.75%	33.38%	41.55%
Non-Educators	620	2.58%	10.97%	20.81%	35.65%	30.00%
Colorado public schools provide enough staff and services to attend to the needs of students from low-income families, English language learners, and students with a disability.						
Educators***	744	51.48%	34.41%	7.66%	5.11%	1.34%
Non-Educators	613	34.42%	34.58%	20.07%	7.18%	3.75%
Colorado public schools have enough staff devoted to student mental health and wellness.						
Educators***	746	45.58%	33.24%	10.32%	8.45%	2.41%
Non-Educators	616	36.69%	28.08%	19.16%	11.20%	4.87%
Instructional methods and programming provided in Colorado public schools adequately supports the social emotional learning of students.						
Educators	745	18.66%	33.02%	28.46%	17.58%	2.28%
Non-Educators	613	16.97%	28.55%	31.65%	20.39%	2.45%
Colorado public schools provide students sufficient access to the arts.						
Educators**	747	23.03%	31.99%	19.54%	22.76%	2.68%
Non-Educators	615	18.86%	26.67%	22.60%	27.48%	4.39%
Colorado public schools provide students sufficient extracurricular opportunities.						
Educators	746	10.05%	21.98%	21.18%	39.28%	7.51%
Non-Educators	614	11.89%	18.08%	24.59%	38.27%	7.17%
Colorado public schools offer students sufficient after-school and extended-year opportunities.						
Educators	746	13.40%	27.08%	29.76%	26.41%	3.35%
Non-Educators	614	13.03%	25.57%	34.04%	21.82%	5.54%
Colorado public schools provide programming and services that encourage family and community involvement in supporting students.						
Educators**	745	11.68%	26.04%	36.64%	22.42%	3.22%
Non-Educators	617	10.05%	21.39%	33.23%	31.28%	4.05%

Note. Tests for statistical significance were conducted using Pearson's chi-sq. ***$p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Results by Parent Status[1]

For this analysis we compare the results for parents and non-parents, where for parents we included those who indicated they were parents or guardians.

Exhibit A–28. Survey Results by Parent Status for the Question: *How would you rate the quality of education in your local public schools for the following groups of students?*

	n	Very Poor	Poor	Neither	Good	Very Good
All Students						
Parents*	926	2.48%	8.96%	14.58%	53.46%	20.52%
Non-Parents	416	1.68%	9.62%	13.70%	47.12%	27.88%
At Risk (Low-Income) Students						
Parents	831	7.34%	23.71%	18.77%	37.06%	13.12%
Non-Parents	412	8.50%	23.79%	15.78%	35.19%	16.75%
Students with Disabilities						
Parents	812	9.61%	24.01%	19.21%	33.50%	13.67%
Non-Parents	411	8.27%	21.41%	20.19%	35.04%	15.09%
Gifted and Talented Students						
Parents*	852	8.69%	22.07%	22.42%	32.75%	14.08%
Non-Parents	403	4.47%	23.33%	21.09%	32.26%	18.86%
English Language Learners						
Parents	769	7.02%	20.68%	23.67%	35.24%	13.39%
Non-Parents	404	8.42%	22.28%	23.51%	33.17%	12.62%
Students Experiencing Homelessness						
Parents	618	10.68%	21.20%	29.29%	31.07%	7.77%
Non-Parents	360	9.17%	22.78%	27.78%	28.89%	11.39%
Students in Foster Care						
Parents	606	8.25%	18.98%	29.37%	34.98%	8.42%
Non-Parents	346	8.09%	18.79%	28.32%	33.24%	11.56%
Immigrant Students						
Parents	652	9.36%	23.31%	26.99%	27.61%	12.73%
Non-Parents	373	12.06%	24.40%	26.27%	26.01%	11.26%
Newcomer Students						
Parents	651	9.83%	22.12%	27.34%	28.42%	12.29%
Non-Parents	376	10.90%	26.33%	25.27%	26.06%	11.44%
Migrant Students						
Parents	612	9.15%	24.84%	28.76%	25.98%	11.27%
Non-Parents	354	9.04%	28.25%	26.84%	27.12%	8.76%

Note. Tests for statistical significance were conducted using Pearson's chi-sq. ***$p < 0.001$ ** $p < 0.01$ * $p < 0.05$

[1] The Parents subgroup includes parents and guardians. Responses left blank across all roles are excluded.

Exhibit A–29. Survey Results by Parent Status for the Question: *Do you think the current level of funding for your local public schools is more than enough, just enough, or not enough to meet the educational needs of the following groups of students?*

	n	Not Enough	Just Enough	More than Enough
All Students				
Parents	908	78.96%	16.52%	4.52%
Non-Parents	419	81.62%	15.75%	2.63%
At Risk (Low-Income) Students				
Parents	855	84.91%	9.47%	5.61%
Non-Parents	417	87.29%	9.83%	2.88%
Students with Disabilities				
Parents	852	84.15%	10.21%	5.63%
Non-Parents	416	86.06%	10.10%	3.85%
Gifted and Talented Students				
Parents	855	78.25%	15.20%	6.55%
Non-Parents	411	77.37%	18.73%	3.89%
English Language Learners				
Parents	805	78.14%	14.29%	7.58%
Non-Parents	415	81.93%	13.49%	4.58%
Students Experiencing Homelessness				
Parents	735	84.08%	11.16%	4.76%
Non-Parents	382	85.86%	11.52%	2.62%
Students in Foster Care				
Parents	724	81.63%	13.81%	4.56%
Non-Parents	376	84.04%	13.56%	2.39%
Immigrant Students				
Parents	742	80.86%	9.97%	9.16%
Non-Parents	387	85.27%	8.53%	6.20%
Newcomer Students				
Parents	742	79.38%	11.59%	9.03%
Non-Parents	388	85.05%	9.02%	5.93%
Migrant Students				
Parents**	728	80.36%	10.16%	9.48%
Non-Parents	376	83.78%	11.97%	4.26%

Note. Tests for statistical significance were conducted using Pearson's chi-sq. ***$p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Exhibit A–30. Survey Results by Parent Status for the Question: *How important is it that the funding formula the state uses to allocate dollars to public school districts does the following?*

	n	Not Important	Slightly Important	Moderately Important	Important	Very Important
Provides adequate funding to enable all students to meet state outcome goals.						
Parents	935	1.50%	3.21%	8.13%	22.25%	64.92%
Non-Parents	429	0.93%	2.33%	6.76%	21.68%	68.30%
Distributes funding so that students in districts and schools serving higher-need populations are provided an equal opportunity to meet state outcome goals.						
Parents**	928	3.13%	4.31%	10.34%	23.60%	58.62%
Non-Parents	428	1.17%	3.27%	6.07%	21.50%	67.99%
Provides districts and schools spending flexibility so that they can decide locally how funding is best used.						
Parents	930	2.26%	4.52%	15.91%	28.39%	48.92%
Non-Parents	429	1.63%	2.56%	14.22%	28.44%	53.15%
Is adaptable, so that it can be adjusted over time to meet changing student needs or different outcome goals.						
Parents	933	1.39%	2.47%	7.82%	30.12%	58.20%
Non-Parents	429	0.93%	3.26%	7.69%	27.97%	60.14%
Is transparent and easy to explain and understand.						
Parents	936	0.64%	1.82%	7.48%	22.76%	67.31%
Non-Parents	429	0.70%	1.86%	6.99%	23.08%	67.37%
Is predictable and stable from year to year to allow for long-term planning.						
Parents	935	0.75%	2.14%	10.59%	25.99%	60.53%
Non-Parents	428	0.93%	2.34%	6.78%	24.07%	65.89%
Is developed with input from the public						
Parents	936	1.07%	4.81%	13.89%	25.64%	54.59%
Non-Parents	428	0.93%	3.50%	12.85%	26.87%	55.84%

Note. Tests for statistical significance were conducted using Pearson's chi-sq. ***$p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Exhibit A–31. Survey Results by Parent Status for the Question: *How important are the following outcomes for students in your local public schools?*

	n	Not Important	Slightly Important	Moderately Important	Important	Very Important
Academic Achievement						
Parents	932	0.21%	0.86%	5.69%	27.25%	65.99%
Non-Parents	430	0.47%	2.33%	5.35%	30.47%	61.40%
High School Graduation						
Parents	935	0.11%	0.43%	3.53%	21.18%	74.76%
Non-Parents	429	0.70%	0.93%	2.80%	22.38%	73.19%
College/Career Readiness						
Parents	934	0.32%	1.18%	7.39%	24.63%	66.49%
Non-Parents	428	0.47%	1.40%	7.24%	31.54%	59.35%
Proficiency in Two or More Languages						
Parents	933	15.97%	24.54%	30.44%	18.54%	10.50%
Non-Parents	429	15.38%	25.87%	30.77%	17.48%	10.49%
Development of Personal Skills						
Parents	931	1.40%	4.73%	10.10%	27.82%	55.96%
Non-Parents	430	1.16%	3.02%	13.49%	32.09%	50.23%
Development of Civic/Interpersonal Skills						
Parents	934	3.43%	6.10%	10.06%	29.44%	50.96%
Non-Parents	430	3.26%	3.26%	10.00%	30.93%	52.56%
Development of Professional Skills						
Parents	931	0.75%	3.87%	10.20%	34.37%	50.81%
Non-Parents	430	1.16%	3.02%	10.00%	38.14%	47.67%
Development of Entrepreneurial Skills						
Parents	933	1.61%	4.61%	14.58%	31.94%	47.27%
Non-Parents	428	1.40%	3.97%	16.36%	32.01%	46.26%

Note. Tests for statistical significance were conducted using Pearson's chi-sq. ***$p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Exhibit A–32. Survey Results by Parent Status for the Question: *How would you describe your local public schools' performance in helping students succeed in the following outcomes?*

	n	Very Poor	Poor	Neither	Good	Very Good
Academic Achievement						
Parents	932	4.40%	10.94%	19.42%	51.50%	13.73%
Non-Parents	427	2.34%	14.29%	19.20%	49.18%	14.99%
High School Graduation						
Parents	925	2.05%	5.51%	18.70%	52.65%	21.08%
Non-Parents	426	0.47%	6.10%	19.25%	54.69%	19.48%
College/Career Readiness						
Parents	921	4.23%	11.40%	29.42%	42.67%	12.27%
Non-Parents	425	3.06%	11.29%	27.29%	46.35%	12.00%
Proficiency in Two or More Languages						
Parents	922	16.81%	27.77%	38.18%	13.56%	3.69%
Non-Parents	426	15.49%	30.52%	38.50%	12.91%	2.58%
Development of Personal Skills						
Parents	925	6.38%	23.68%	35.57%	29.62%	4.76%
Non-Parents	426	4.93%	22.77%	36.15%	31.46%	4.69%
Development of Civic/Interpersonal Skills						
Parents	923	5.63%	21.13%	34.24%	32.07%	6.93%
Non-Parents	424	4.95%	22.17%	30.66%	36.32%	5.90%
Development of Professional Skills						
Parents	924	5.63%	21.97%	39.07%	28.25%	5.09%
Non-Parents	427	5.39%	22.01%	36.07%	31.62%	4.92%
Development of Entrepreneurial Skills						
Parents	924	7.79%	22.08%	37.34%	27.71%	5.09%
Non-Parents	424	5.66%	24.76%	39.39%	25.94%	4.25%

Note. Tests for statistical significance were conducted using Pearson's chi-sq. ***$p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Exhibit A–33. Survey Results by Parent Status for the Question: *To what extent do you agree with the following statements?*

	n	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
Colorado public school teachers are well-paid.						
White***	997	54.86%	30.79%	7.02%	6.22%	1.10%
Non-White	244	42.62%	33.20%	14.75%	5.33%	4.10%
Class sizes in core instructional classes are too large.						
White	998	2.71%	8.72%	16.63%	34.27%	37.68%
Non-White	245	3.27%	7.35%	19.18%	37.55%	32.65%
Colorado public schools provide enough staff and services to attend to the needs of students from low-income families, English language learners, and students with a disability.						
White	992	45.36%	35.18%	12.40%	5.24%	1.81%
Non-White	243	40.74%	36.21%	13.99%	6.17%	2.88%
Colorado public schools have enough staff devoted to student mental health and wellness.						
White	998	42.99%	31.46%	13.93%	9.12%	2.51%
Non-White	243	39.92%	32.51%	16.46%	9.05%	2.06%
Instructional methods and programming provided in Colorado public schools adequately supports the social emotional learning of students.						
White	998	17.54%	31.06%	30.36%	19.44%	1.60%
Non-White	238	19.33%	32.77%	29.83%	15.55%	2.52%
Colorado public schools provide students sufficient access to the arts.						
White	996	20.78%	29.52%	20.88%	25.50%	3.31%
Non-White	243	24.69%	33.33%	18.93%	20.58%	2.47%
Colorado public schools provide students sufficient extracurricular opportunities.						
White**	996	9.44%	20.28%	22.59%	40.06%	7.63%
Non-White	242	17.36%	23.97%	21.49%	30.99%	6.20%
Colorado public schools offer students sufficient after-school and extended-year opportunities.						
White	998	13.03%	27.56%	30.16%	24.75%	4.51%
Non-White	242	16.53%	25.62%	35.12%	20.25%	2.48%
Colorado public schools provide programming and services that encourage family and community involvement in supporting students.						
White	999	9.51%	24.72%	35.54%	26.93%	3.30%
Non-White	242	15.29%	23.14%	31.82%	26.03%	3.72%

Note. Tests for statistical significance were conducted using Pearson's chi-sq. ***$p < 0.001$ ** $p < 0.01$ * $p < 0.05$

Appendix B. Public Engagement Townhall Meetings

Outreach and Administration

The AIR research sought to make key constituencies aware of the financial adequacy study and provide an opportunity for public discourse. One approach was to hold a series of ten virtual townhall meetings: eight organized by CDE region (Metro Area, North Central, Northeast, Northwest, Pikes Peak, Southeast, Southwest, West Central) and two open to all members of the public.

To provide information about the study, and access to opportunities to participate, the AIR team developed and hosted a project website. The website, launched in early August, incorporated details about public engagement, including the calendar of townhall meetings and links to register for these meetings.

Townhall meetings were publicized through communications with leadership at Boards of Cooperative Educational Services (BOCES) and school districts, as well as community and business organizations. AIR also publicized the townhall meetings with organizations representing diverse constituents (e.g., local chapters of the NAACP and organizations that represent Colorado's Hispanic/Latino communities) to ensure that a diverse audience was aware of and had the opportunity to participate in the meetings. Additionally, AIR worked with CDE and key organizations (i.e., Colorado School Finance Project) to identify additional concerned entities to advertise townhall meetings.

Townhall meetings took place between August 27th and September 27th, 2024. Meetings were hosted on a web-based platform (Zoom) with functionality allowing for polling participants, a format for questions and responses, and, for those that were not as comfortable speaking, a method for providing comments in writing.

Methodology

Virtual town hall meetings were recorded and transcribed, and AIR researchers took thorough notes. AIR researchers coded the transcribed recordings and notes and synthesized main themes derived from public feedback and identified meaningful quotes that represented the views of townhall attendees. The input collected in these townhall meetings have helped AIR examine the strengths and weaknesses of the current formula from the public's perspective.

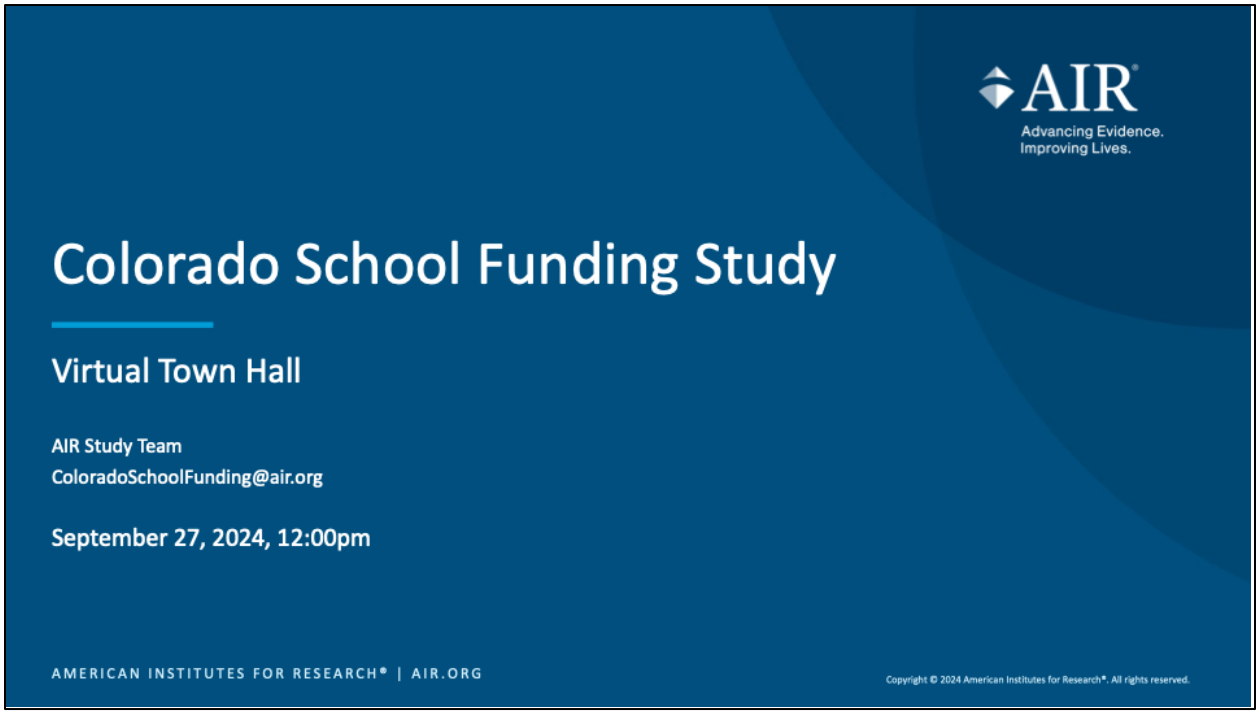
The townhall meetings served to provide insight into the survey responses and offered citizens a voice in explaining educational concerns and goals.

Townhall Meetings

All townhall meetings followed a similar format. The meetings were scheduled for 75 minutes. The first 20 minutes included a welcome from CDE; an interactive presentation in which Dr. Jessie Levin, Principal Investigator of the project, provided an overview of the purpose of the cost study; context for the project, including an overview of the current school finance system; and a description of the study plans. Following this presentation, and a short question and answer period, the AIR team facilitated an interactive conversation to garner input on Colorado's current school funding environment and solicit views on participants' hopes for system improvements. Participants were asked a set of predetermined questions about the current formula and Task Force recommendations. Questions posed to participants aimed to solicit a variety of perspectives across different regions and roles/responsibilities. In the final portion of the meeting, participants will be invited to voice concerns and share ideas. (See **Error! Reference source not found.** for the PowerPoint presentation that includes information on AIR's Colorado school funding study and questions guiding the discussion.)

Materials

Exhibit B–1. Townhall Meeting Presentation Material



Virtual Meeting/Conference Recording Notice

The American Institutes for Research® (AIR®) allows for the recording of audio, visuals, and other information shared during business-related meetings. By joining a meeting, you automatically consent to such recordings. If you prefer, you may participate via audio only and should disable your video camera. Video or audio recordings of any AIR session shall not be transmitted to any third party without AIR's permission. Additionally, AIR does not permit external artificial intelligence bots to record or transcribe AIR meetings or webinars unless requested as a reasonable accommodation.

AIR Inclusive Meeting Guidelines

Hosting and Participating in Meetings

ENGAGE EVERYONE

BE HEARD AND SEEN

ACKNOWLEDGE SPEAKER

MAXIMIZE MICROPHONES

MINIMIZE NOISE

MAXIMIZE VISUAL DISPLAYS

These guidelines are intended to improve the meeting experience for virtual participants, as well as people with hearing loss, visual impairment, and those for whom English is an additional language. Developed by the Access AIR and AIR CREW Employee Resource Groups With Support From the AIR Diversity and Inclusion Office.

Agenda

1. Welcome
2. Background
3. Colorado School Funding Study
4. Discussion

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Meet the Team

Colorado Department of Education

Jennifer Okes

Chief District Operations Officer

American Institutes for Research

Jesse Levin

Principal Investigator

Drew Atchison

Project Director

Stephanie Levin

Senior Researcher

Ajay Srikanth

Researcher

Arun Kolar

Researcher

Brad Salvato

Research Assistant

AIR

Welcome

Senate Bill 23-287 requires the Colorado Department of Education (CDE) to contract with two independent entities to conduct a study and publish a report on the components and costs necessary to adequately provide Colorado students a free and uniform public education.

COLORADO
Department of Education

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Outcome Focused Financial Adequacy Study

Overview by Study Principal Investigator, Jesse Levin, PhD

Key Goals of State Funding Formulas

- **Adequate** – Provide sufficient resources for all students to meet the state's educational goals
- **Equitable** - Account for differences in the costs of providing an equal educational opportunity across schools/districts and the students they serve
  - Provide more resources to schools/districts that need more
- **Wealth Neutral** - Account for differences in ability to raise local revenue (mostly via property taxes)
  - Achieving adequate funding levels should not depend on the property wealth of the community

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Key Study Questions

- **Equity and Wealth Neutrality**
  - How is existing school funding/spending distributed with respect to student needs and other characteristics that affect cost (e.g., district or school size)?
  - To what extent are school funding levels dependent on local revenue capacity?
- **Adequacy**
  - Are current funding/spending levels sufficient to meet the state's educational goals?
  - How should funding be distributed across districts to provide equal educational opportunity?

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Overview of Main Data Collection/Analysis Activities

Policy/ Document Scan	Funding Formula Comparative Analysis
Extant/ Administrative Data	Student Outcomes, Equity, Cost-Function Adequacy
Primary Data Collection	Perceptions of Current System

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Types of Adequacy Analysis

- **Cost-Function**
  - Use existing data on student outcomes and education spending to determine the appropriate level of spending to meet specified outcomes for schools with differing student learning in different locations.

- **Professional Judgement**
  - Expert educators specify resources necessary to meet outcome goals for hypothetical schools that vary with respect to student need and context (school size, locale, etc.)
  - Determine the cost of those resources how they vary with respect to student need and school context.

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Adequacy Analysis – Cost Function

- Cost function analysis is a statistical method that estimates
  - the cost of providing and equal opportunity for all students to achieve at a common level on a host of educational outcomes
  - how *adequate* cost varies according to student needs and school/district characteristics

- Measures the relationship between educational spending per pupil and the following: student outcomes/needs, school and district size, remoteness, and regional differences in resource price levels.

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Adequacy Analysis – Cost Function

- Estimated cost function can be used to predict how much spending is needed to support an equal opportunity for all students to reach a specific performance level.
  - Costs for different types of students learning in different school/district environments that inform funding policy.
  - Use to develop cost projections for individual districts.
  - Aggregate district cost projections to calculate overall statewide cost to inform state funding allocation.

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Project Timeline

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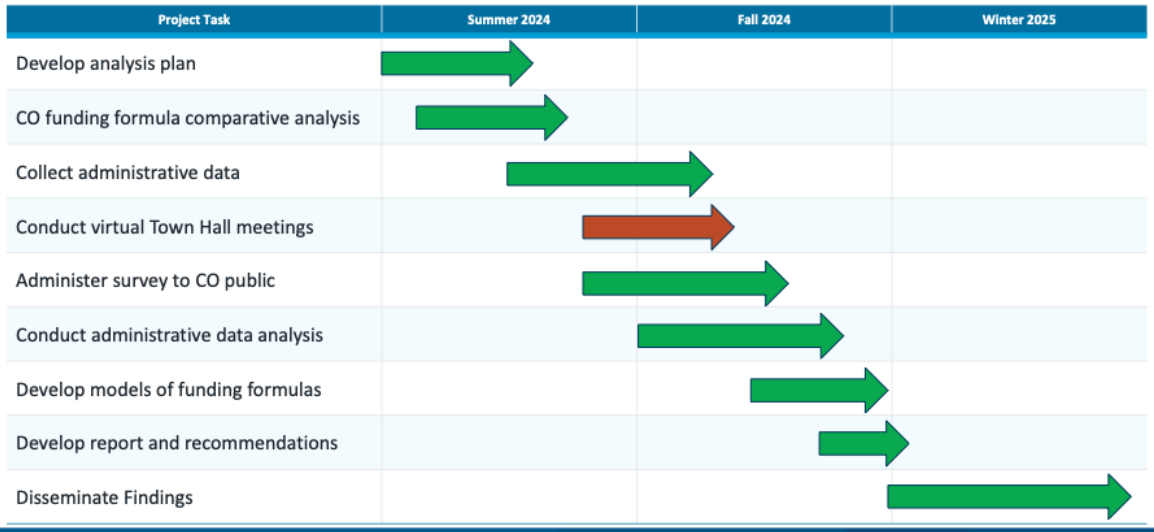
Project Timeline



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What to Expect in the Report

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What to Expect in the Report

- Comparison of Colorado's new (adopted) and former school funding system
- Strengths and weaknesses of Colorado's current system
  - Is there evidence of unequal opportunity?
  - Is the current distribution of funding/spending equitable to students and taxpayers?
  - Is the current system adequate?
- Modeling an equitable and adequate system
  - What would an equitable and adequate funding system look like?
- Recommendations for achieving an equitable and adequate system

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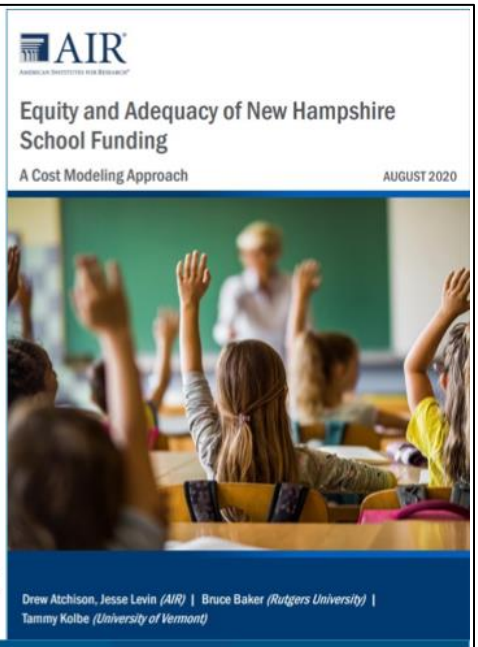
Reports from Other States

- Delaware – Cost-Function and Professional Judgement Study
  - https://education.delaware.gov/wp-content/uploads/2023/12/23-22933_1_Delaware_Full_Report-FMT-ed103023-Version-2.pdf
- New Hampshire – Cost-Function Study
  - https://carsey.unh.edu/sites/default/files/media/2020/09/20-12685_nh_final_report_v10.pdf
- Vermont – Cost-Function Study
  - https://ljfo.vermont.gov/assets/Subjects/Education-Finance-Studies/1b00803525/edu-pupil-weighting-factors-report-act173-sec11-011820.pdf
- California – Professional Judgment Study
  - https://gettingdowntofacts.com/sites/default/files/GDTFII_Report_Levin.pdf



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Questions

What brings you here?

How many of you know about the new funding formula?

Please raise your hand and unmute yourself or provide your response in the chat.

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Questions

What is the most important function of Colorado's public schools?

- ❑ Education
- ❑ Social Development
- ❑ Civic Engagement
- ❑ Economic Contribution
- ❑ Equity and Opportunity
- ❑ Innovation and Cultural Transmission

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Questions:

Do you think your local public school's funding is

- ❑ Too low?
- ❑ Too high?
- ❑ At the right level?

What would you do with additional school funds?

Please raise your hand and unmute yourself or provide your response in the chat.

AIR

Questions

How would you rate the performance of your local public schools?

What does your local public school do really well?

What are the most significant issues affecting your local public schools?

Please raise your hand and unmute yourself or provide your response in the chat.

AIR

Questions

How would you reallocate or use additional funds to improve school performance and student outcomes?

Please raise your hand and unmute yourself or provide your response in the chat.

Questions

Are there additional issues related to school funding or outcomes for students that you would like to discuss?

Please raise your hand and unmute yourself or provide your response in the chat.

If you have more to share…

Please find us at our website:
www.air.org/project/Colorado-financial-adequacy-study

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THANK YOU!!!

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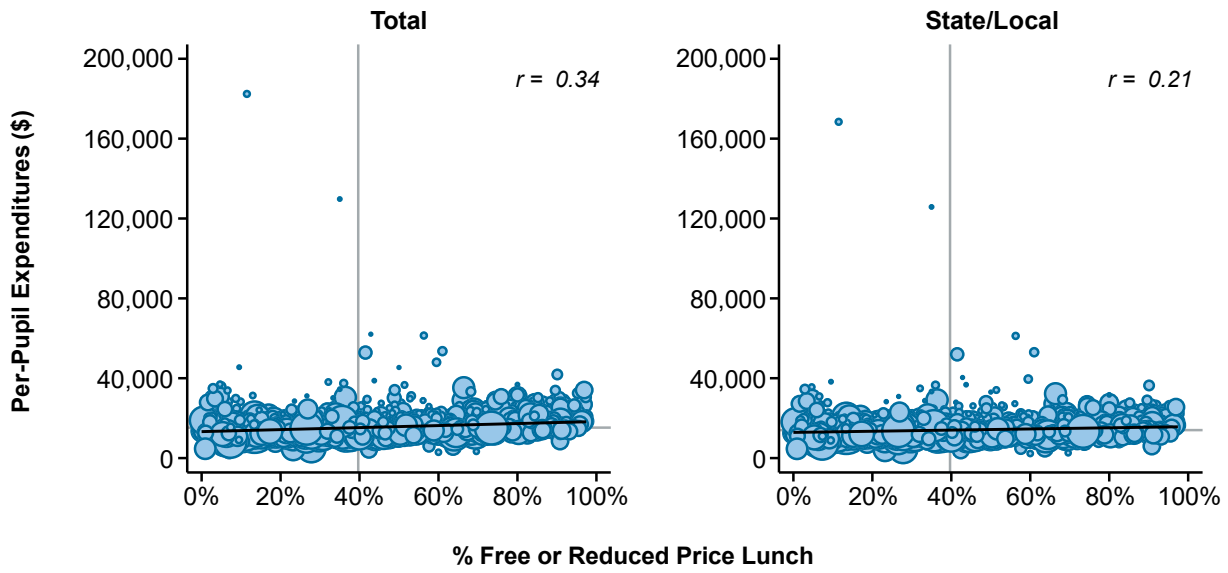
Appendix C. Equity of the Distribution of Funding

Additional Exhibits

Exhibit C–1. Non-Restricted Relationship Between Current Per-Pupil Spending and Percentage of School's Free or Reduced-Price Lunch Students (2022–23)



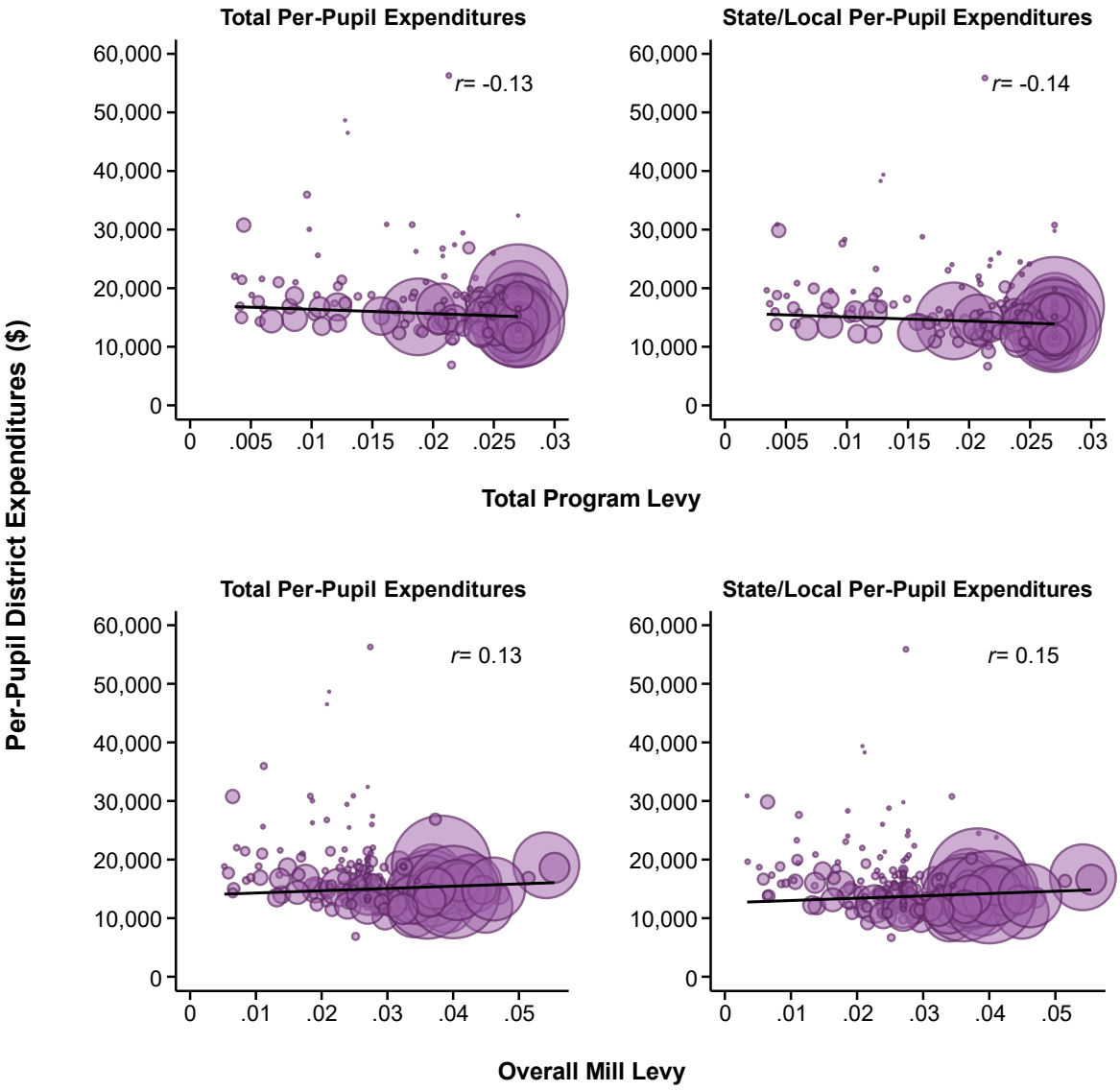
Note. Each dot in the scatters represents a school. The size of the dots are weighted by enrollment. The horizontal gray lines show the overall average per-pupil expenditure, and the vertical gray lines show the overall average percentage of students who are eligible for free or reduced price lunch. The black sloped line is the line of best fit. The correlation coefficient is denoted by r.

Exhibit C–2. Regression Results Showing Teacher Equity and School Characteristics

	Model 1 Average Teacher Salary	Model 2 Student-To-Teacher Ratio	Model 3 Average Teacher Experience
Student needs			
FRL proportion	0.833*	1.117*	0.782*
Students with disabilities proportion	3.324*	0.291*	2.792*
English learner proportion	1.052	0.770*	0.720*
School Year			
2017–18	1.027*	1.041	1.043*
2018–19	1.021*	1.029	1.036*
2019–20	1.015*	1.026	1.025*
2020–21	1.009*	0.990	1.014*
2021–22	1.001	0.992	0.999
Proportions of enrollment by grade			
Grades K to 5	0.937*	0.994	0.929*
Grades 6 to 8	0.935*	1.017	0.877*
CWIFT geographic cost index	2.866*	0.788	0.596*
School and district size (scale)			
School < 200	0.885*	0.759*	0.965
School 200 to < 400	0.964*	0.838*	0.968
School 400 to < 800	0.977	0.912*	0.960
District < 2,000	0.905*	0.925	1.067*
Locale			
Suburb	0.976*	1.042*	0.912*
Town	0.932*	0.992	0.859*
Rural	0.923*	0.945*	0.877*
Constant	26527.0*	28.68*	20.02*
Number of school *X* year observations	9714	9714	9714
Number of unique schools	1675	1675	1675
Pseudo R^2	0.389	0.0420	0.0256

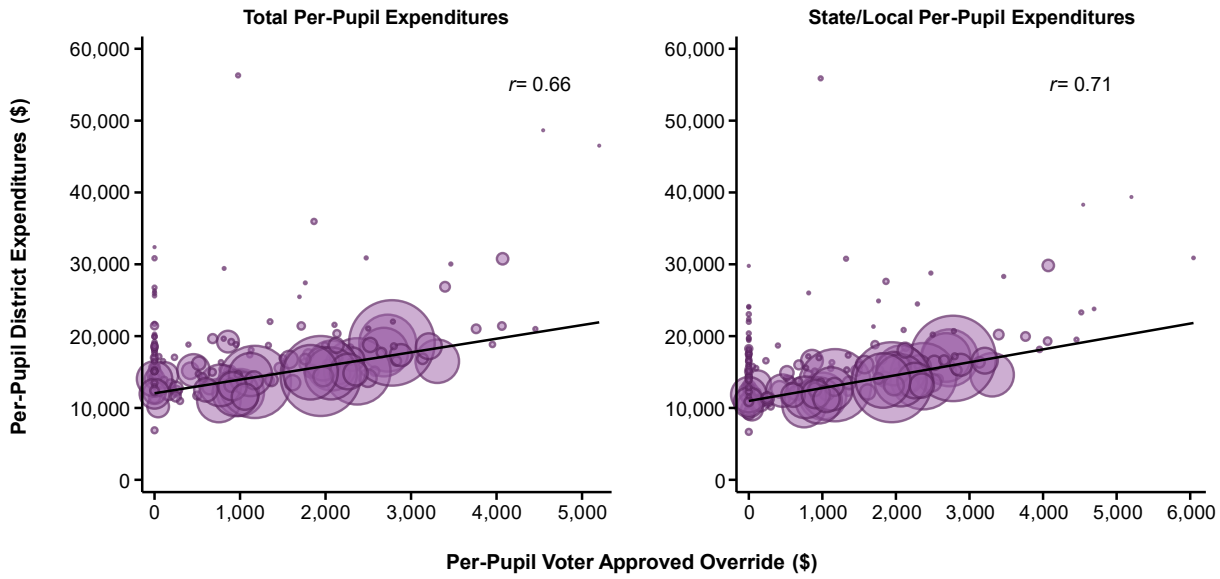
Note. CWIFT = Comparable Wage Index for Teachers. * $p < .05$.

Exhibit C–3. Non-Restricted Relationship Between Total and State/Local Per-Pupil Expenditures and Mill Levy Tax Rates



Note. Each dot in the scatterplot represents a district. The size of the dots is weighted by district enrolment. The black line is the line of best fit. The correlation coefficient is denoted by *r*.

Exhibit C–4. Non-Restricted Relationship Between Per-Pupil District Expenditures and Per-Pupil Voter Approved Override

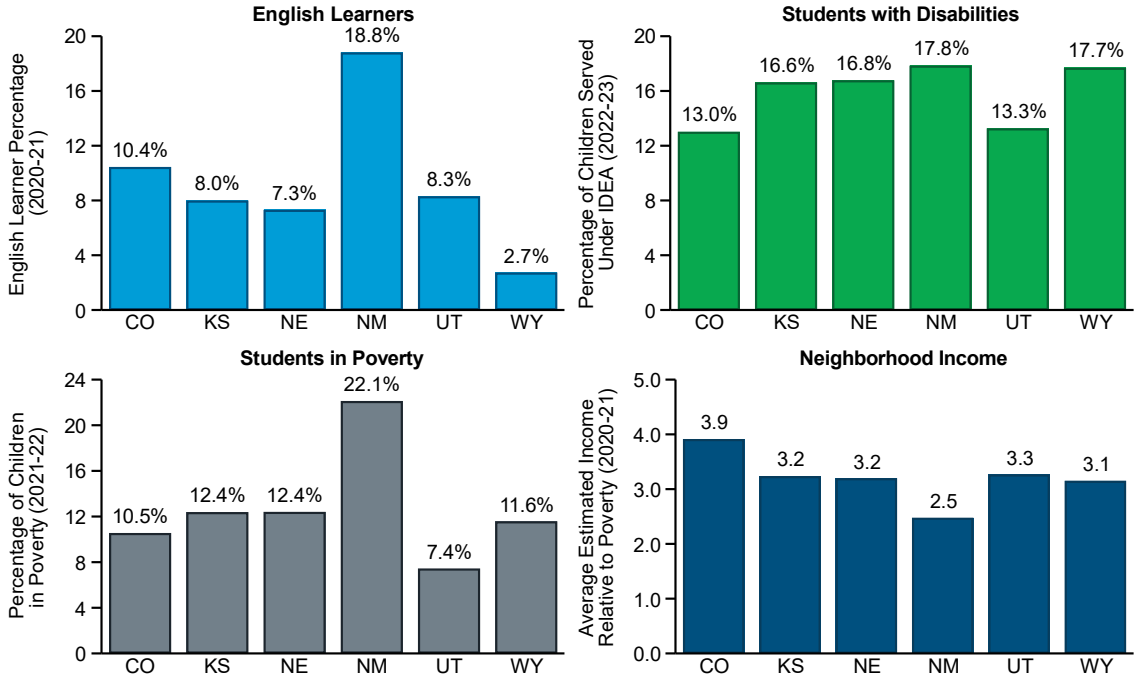


Note. Each dot in the scatterplot represents a district. The size of the dots is weighted by district enrolment. The black line is the line of best fit. The correlation coefficient is denoted by *r*.

Appendix D. Student Outcomes

Additional Exhibits

Exhibit D–1. Statewide Measures of Student Need and Neighborhood Income



Note. For poverty, district level estimates were aggregated at the state level weighting by district enrollment. Neighborhood income is calculated using neighborhood income estimates relative to the federal poverty threshold, aggregated within each state weighting by school enrollment, and divided by 100 to report average income relative to the federal poverty line.

Source. Percentages of EL students and students with disabilities: Digest of Education Statistics (Office of Planning, Evaluation, and Policy Development, 2024). Percentage of children living in poverty: SAIPE (United States Census Bureau, 2021). Neighborhood income: School-level Education Demographic and Geographic Estimates (EDGE; NCES, n.d.).

Exhibit D–2. Correlations Between Student Need Variables (2017–18 through 2022–23)

	FRL	SWD	EL	Homeless	Gifted	Immigrant
FRL %	1.00					
SWD %	0.43	1.00				
ELL %	0.72	0.21	1.00			
Homeless %	0.49	0.28	0.30	1.00		
Gifted %	-0.39	-0.33	-0.29	-0.20	1.00	
Immigrant %	0.45	0.08	0.65	0.19	-0.17	1.00

Note. FRL = free or reduced-price lunch eligible, SWD = students with disabilities, ELL = English language learner

Appendix E. Adequacy Estimates Based on Education Cost Modeling

Technical Details

Issues in Cost Modeling

The goal of education cost modeling, whether for evaluating equal educational opportunities or producing adequacy cost estimates, is to empirically establish reasonable guideposts for how funding should be distributed in school finance systems. Historically, funding levels for state school finance systems have been determined more by political will and economic capacity than by empirical measures of the true cost of producing educational outcomes. In this limited approach, the budget constraint—or total available revenue—and total student enrollment have been the key determinants of the foundation level or basic allotment. To some degree, this will always be true. State and local governments will always have some limit on the amount of revenues they can collect and distribute for public schools. Producing reasonable estimates of the cost of desired outcomes may help justify increasing the state's overall education budget (which likely will require increased tax revenue) or redistributing education revenue by revealing the misalignment between costs and actual spending levels.

Reasonable estimates of cost may assist legislators in setting spending levels consistent with calls to meet the state's goals for student outcomes. These estimates also may assist courts in determining whether current funding levels and distributions (or the minimum educational achievement goals, for that matter) are unreasonable, insufficient, or otherwise substantially misaligned with constitutional or other legal requirements.

Estimating Cost Models

In recent peer-reviewed literature, the dominant modeling approach includes that:

- the dependent measure is a measure of current operating expenditures per pupil,
- student outcome measures are treated as endogenous and are instrumented using measures of competitive context within which local public school districts operate, and
- attempts are made to control for inefficiencies in spending by including measures of variations in fiscal capacity, local public monitoring, and preferences for spending.

This approach is largely the product of years of peer reviews of the cost function estimation published by Duncombe, Yinger, and colleagues (see Duncombe 2002; Duncombe, Lukemeyer

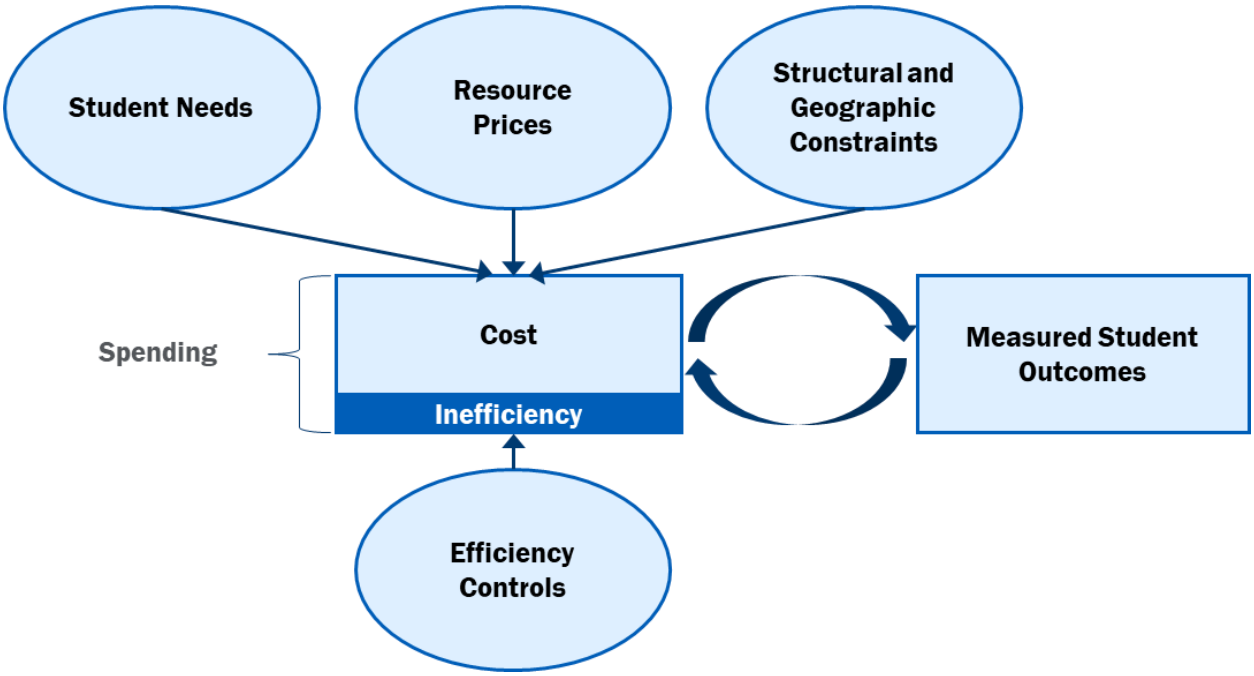
& Yinger, 2003; Duncombe & Yinger 1999, 2004, 2011).[2] Here, we provide the rationale for this approach.

Exhibit E-1 provides an overview of these three items. Our goal is to elicit from district spending data the cost of achieving specific outcome levels. We created a model that predicts spending levels from educational outcomes and other factors, rather than predicting outcomes from spending levels. As such, we take statistical steps to correct for the fact that spending is influenced by outcomes and simultaneously that outcomes are affected by spending: the circular/feedback loop relationship in the figure. More spending can lead to better student outcomes because increased funding can be used to reduce class sizes, recruit better qualified personnel, provide support services, and so on.

However, higher outcomes in a community may drive increased spending; for example, higher student outcomes may make school districts more attractive, thus increasing property values which results in more revenue raised locally at a given tax rate. In this case, there is no clear causal direction because the two factors affect each other simultaneously. The relevant statistical approach to isolate the effect of outcomes on spending—which is distinct from the effect of spending on outcomes—is to use a two-stage model, in which we use exogenous (i.e., outside the loop) measures of each district's competitive context to correct for endogeneity (i.e., inside the loop feedback) in the outcome measure.

[2] The dominant modeling approach in recent peer-reviewed literature is one in which: (a) the dependent measure is a measure of current operating expenditures per pupil; (b) the potential simultaneous determination of the dependent spending measure and the assumed independent measure of student outcomes (i.e., endogeneity) requires a statistical approach called an instrumental variables technique, where the exogenous portion of the student outcomes variable is isolated using measures of the competitive context within which local public school districts operate; and (c) attempts are made to control for inefficiencies in the spending measure (spending that does not affect the outcomes included in the model) by including measures of variations in fiscal capacity and local monitoring of public spending. This approach is largely the product of years of peer-reviewed cost function estimation by William Duncombe, John Yinger, and colleagues of the Maxwell School at Syracuse University (Duncombe, 2002; Duncombe et al., 2003; Duncombe & Yinger, 2004, 2011).

Exhibit E–1. Education Cost Model Components



Note. Student needs usually include measures of economic disadvantage, students who are ELs, and students with disabilities. Resource prices refer to the exogenously determined geographic variation in the price of resources (e.g., teacher salaries). Structural and geographic constraints often include the size of districts or schools (i.e., economies of scale) and population density (e.g., to measure rurality). Efficiency controls often include measures of fiscal capacity, degree of competition (e.g., from neighboring districts), and public monitoring of public spending.

In general, the main (second stage) equation of the education cost function is one in which a measure of current operating expenditures is expressed as a function of the outcomes achieved at those expenditure levels, the students served by districts or schools, a measure of variation in competitive wages (*Input Prices*) for teachers, structural characteristics of the district or schools such as grade ranges served, the size of the district or schools (perhaps coupled with other location factors such as population density or remoteness), and any factors that might produce inefficiencies in the spending measure. The equation may be expressed as follows:

$$Spending_{ij} = f(Outcomes^{*}_{ij} + Students_{ij} + Input\ Prices_{ij} + Structure_{ij} + Scale_{ij} + Inefficiency_{ij})$$

where *Spending* is a measure of current per-pupil operating expenses*; Outcomes* are the outcome measure(s) of interest*,* with the asterisk denoting that outcomes are endogenous; *Students* is a matrix of student need and demographic characteristics; *Input Prices* is a measure of geographic variation in the prices of key inputs to schooling such as teacher wages; *Structure* is a matrix of district structural characteristics such as grade ranges served; *Scale* is a measure

of economies of scale usually expressed in terms of student enrollments, and in some cases also population density; *Inefficiency* is a matrix of variables intended to account for differences in spending across districts that are unrelated to the measured outcomes (described below); and, the subscripts *i* and *j* denote the district or school and the year, respectively.[3]

Relative Efficiency

Another issue is that not all district spending may be efficient, meaning that not all spending directly contributes to the measured outcomes included in the model. In any given district or school, only some portion of current spending contributes directly to the measured student outcomes used in the model, given the students served and the structure, size, and location of the district. The objective of the cost function is to identify the levels of spending associated with achieving specific outcome levels under different circumstances and across varied student populations, holding factors associated with inefficiency constant.

In the modeling approach used here, we include measures that the research literature identifies as predictors of differences in district spending that are not directly associated with outcomes (i.e., inefficiencies). These include measures influencing local public monitoring of public expenditures and preferences for high spending. Specifically, we include the Herfindahl index, which is a measure of labor market concentration, under the assumption that schools in areas with more schooling options will have increased monitoring and accountability over their educational spending. We also included a measure of median housing value, under the assumption that areas with higher housing values will have increased capacity and preference for spending. Lastly, we included a charter school indicator variable as a measure of efficiency under the assumption that charter schools may experience different market pressure and spending oversight compared with non-charter schools.

It is important to understand that, in statistical terms, correcting for inefficiency in a cost model is an omitted variables bias problem. That is, we want to identify factors that explain differences in spending that are neither associated with legitimate cost differences nor with differences in outcomes, such that we can set those factors to a constant level when projecting cost estimates. In the case of the Herfindahl index and housing value, we set these variables to the state average in the 2022–23 school year. In the case of the charter school indicator, we set this to zero such that all cost predications are at the level of non-charter schools.

[3] We prefer to use a relatively simple cost model that is easy to interpret and is easily translatable to policy. Additional quadratic (squared) terms or other interactions were explored to check for nonlinear relationships or whether certain relationships varied in conjunction with the level of another cost factor. For example, we examined whether there were differences in cost associated with concentrations of FRL, ELL, and SWDs using quadratic terms and if the cost of serving SWDs varied by FRL rate and by school size using interaction terms. None of the quadratic terms and interactions proved to be statistically significant.

However, there will always remain some variation in spending in relation to outcomes that are either random, such as an unexplained variation in either the spending or outcome measures, or nonrandom but not captured by the measures available that were included in the model.

Limitation of the Cost Model Estimates

There is a limitation of the cost model estimates. Specifically, they provide guidance regarding the general levels of funding increases that would be required to produce measured outcomes at a certain level, assuming districts can absorb the additional resources without efficiency loss; that is, assuming that efficiency of outcome production remains constant. This is not always the case: districts may use additional revenues for all types of programs or services. This additional spending may be inefficient only in the sense that it does not contribute to improving the educational outcomes we measure. That is not to say this spending does not help districts achieve other goals important to the community or society in general. For example, spending on sports programs may be desirable but does not necessarily increase statewide accountability test scores. Cost models, therefore, are limited by the outcome measures employed within them.

Despite this limitation, cost model estimates can still provide useful, meaningful information to guide the formulation of more rational, equitable, and adequate state school finance systems.

More Detail and Consideration

Here we provide a reporting of technical details from our models and some insights on the decision process involved in selecting a final model. Cost model estimation, including model selection for policy guidance, is a lengthy iterative process that involves balancing technical and statistical concerns with practical concerns regarding usefulness for guiding policy. It is rare to find an ideal cost model that both yields perfect statistical diagnostic features and reasonable findings and projections to guide policy. This is partly why we use both regional- and state-specific models: (a) to better understand the patterns of variation in needs and costs across districts and schools, (b) as possible measures for evaluating costs across districts and schools, and (c) as potential measures to translate cost models into actionable policy.

Steps in Identifying a Model

Through our iterative approach, we tried multiple cost function models. Ultimately, we settled on a model in which:

- The main regression model describing spending yields estimated coefficients on the major cost factors that are both in the expected direction and of reasonable magnitude.
- The collection of instruments selected are sufficiently valid; that is it can predict a significant share of variation in the potentially endogenous outcome measure as indicated

by Partial F > 10. At the same time, the model does not overidentify; that is, it does not belong in the main equation describing spending as indicated by Hansen J ($p > 0.10$).

- Some additional variation in spending is captured by one or more measures related to fiscal capacity, local public monitoring, and/or competition density; that is, it includes indirect inefficiency controls.

Instruments and Efficiency Controls

To identify those factors that are exogenous—outside the control of the observed district or school—and can statistically influence outcomes of the observed district (i.e., are "valid") but, at the same time, are measures that should be excluded from the main cost model (e.g., second stage regression) involves both conceptual and statistical considerations. Conceptually, a long line of similar studies by Duncombe and Yinger (2004, 2011) and Baker (2011) have used measures of the characteristics of surrounding districts, including demographic, economic, and even outcome characteristics of those districts. The idea is that the outcomes of neighboring districts may place competitive pressure on the observed district. These "over the fence" comparisons may influence outcomes beyond other discrete measures of the district itself that are included in the main model. Our regional model uses the median household income and a measures of student test scores for all other districts in the same regional labor market; this is a geographic delineation from the extended National Center for Education Statistics Comparable Wage Index produced by Dr. Lori Taylor.[4] Our Colorado-specific model uses the student assessment outcomes from the 10 nearest schools and the Hispanic student percentage in the 10 nearest schools as well as the percentage of the population within the given zip code who are 0 to 4 years old.

In the additional exhibits section of this appendix, we present the second stage—main—model results for our Colorado-specific model and regional model. Per our earlier discussion, the vast majority of coefficients across the models are statistically significant and in the expected direction, though there are a handful of results that differ between the two models. Both models find each student-need factor to be a significant driver of higher costs to achieve common outcome goals. Both models find that higher outcome goals cost more than lower ones. And both models find that smaller school districts or schools face higher per-pupil costs. The models differ somewhat in their findings regarding costs by grade-range distribution, the cost of sparsity of population, and geographic price differences.

Importantly, though not vitally, both models perform well on traditional statistical tests, including selection of instruments. Instruments in each case explain significant variance in the endogenous outcome measure (i.e., as indicated by Partial F statistics > 10), and neither model suffers from overidentification (i.e., Hansen J *p*-values >.05). Each model also includes at least one efficiency measure that is statistically significant.

[4] See *Extending the NCES CWI*, https://bush.tamu.edu/research/taylor-cwi/.

Additional Exhibits

Colorado Specific Model

Exhibit E–2. Regression Models Comparing OLS and IV Regression Models

Variable	OLS Estimate	IV estimate
Student Outcomes	0.0239***	0.244***
Free-and-Reduced Lunch proportion	0.111***	0.585***
Students with disabilities proportion	0.0626	0.826***
English learner proportion	0.338***	0.511***
Black student enrollment share	0.506***	0.500***
Percentage of students in middle school grades	0.0542***	0.0579***
Percentage of students in high school grades	0.0960***	0.194***
School Enrollment:		
<300	0.270***	0.230***
300 to <450	0.149***	0.116***
450 to <600	0.106***	0.0698***
600 to <800	0.047***	0.0387*
Log population density of people from age 5 to 17 ln(people aged 5 to 17 per square mile in zip code tabulation area)	0.000155	-0.0044
Charter School Institute	-0.0293	0.0336
Comparable Wage Index for Teachers (CWIFT)	0.369***	0.352**
Herfindahl Index (sum of squared school shares of enrollment within the labor market)	0.421***	0.367***
Log median housing value (by zip code)	0.0602***	0.0217
Year:		
2019	0.0738***	0.0741***
2020	0.126***	0.122***
2021	0.163***	0.161***
2022	0.262***	0.275***
2023	0.352***	0.336***
Constant	**8.138*** **	**8.344*** **
Number of school-by-year observations	9654	9654
Number of unique schools	1701	1701
R^2	0.533	0.356
F Test of Excluded Instruments		16.84

Variable	OLS Estimate	IV estimate
Hansen's J Statistic		3.075
Hansen's J p-value		0.2149

Note. Regression coefficients are based on log per-pupil expenditure as the dependent variable. Note. Excluded instruments: 10 nearest neighboring schools' assessment outcomes, 3 nearest neighboring schools' Hispanic student percentage, and percentage of population in zip code tabulation area aged 0 to 4. The reference enrollment category is schools with more than 800 students. Grade level proportion coefficients are interpreted relative to enrollment in elementary grades. To predict school-level costs, the outcome factor score, Herfindahl Index, and log median housing value in zip code tabulation area are set at the state average (0 for the outcome index, 0.03 for the Herfindahl Index, and 13.03 for log median housing value in zip code tabulation area). Data are from the Colorado Department of Education, U.S. Department of Education, and the U.S. Census Bureau. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Exhibit E–3. Descriptive Statistics/Means and Standard Deviations (2017–18 through 2022–23)

Variable	Mean	Standard Deviation
Enrollment Data		
FRL Rate	0.40	0.27
ELL Rate	0.13	0.16
SWD Rate	0.12	0.04
Migrant Rate	0.004	0.01
Immigrant Rate	0.01	0.02
Homeless Rate	0.02	0.02
Gifted Rate	0.08	0.07
Female Rate	0.49	0.03
Rate of Black students	0.05	0.07
Rate of Hispanic Students	0.34	0.24
Proportion of Students Enrolled in Middle School	0.23	0.37
Proportion of Students Enrolled in High School	0.29	0.44
Total School Enrollment	833	627
Total District Enrollment	37,802	29,744
Student Outcome Data		
Outcome Score	0.05	0.88
Graduation Rate	0.89	0.10
Dropout Rate	0.01	0.01
Truancy Rate	0.03	0.03
Chronic Absenteeism Rate	0.08	0.04
Math Assessment Score	733	17
ELA Assessment Score	742	16
SAT Total Score	948	96
SAT Math Score	466	46
SAT Writing Score	482	47
Geographic-based Data		
CWIFT	0.18	0.07
Population density of people aged 5 to 17 per square mile in Zip Code Tabulation Area	408	384
Fiscal Data		

Variable	Mean	Standard Deviation
PPE from all sources	$12,569.49	3247.50
PPE from state and local sources	$11,638.13	2842.04
Efficiency Variables		
Median Housing Value	$486,764.80	170094.6
Herfindahl Index	0.03	0.06
Instruments		
Proportion of population aged 0 to 4 in Zip Code Tabulation Area	0.06	0.01
Weighted Average proportion of Hispanic students in the 3 nearest neighboring schools	0.34	0.21
Weighted average of the standardized assessment scores of the 10 nearest neighboring schools	0.10	0.68
School Staffing Data (only for the 2022-23 Academic Year)		
Average Teacher Salary	$69,739.50	13814.89
Average Principal Salary	$111,294.40	18228.18
Average Paraprofessional Salary	$30,073.19	6161.21
Average Teacher Experience (years)	10.01	3.50
Average Principal Experience (years)	12.88	6.56
Full-time Equivalent Teachers	46.5	31.0
Full-time Equivalent Paraprofessionals	13.78	9.06
Student to Teacher (FTE) Ratio	17.43 (17.4:1)	7.05
Student to Paraprofessional (FTE) Ratio	77.65 (77.7:1)	77.64

Exhibit E–4. Descriptive Statistics/Means by FRL Quintiles

Variables	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
FRL Proportion	0.17	0.33	0.44	0.54	0.68
SWD Proportion	0.11	0.12	0.14	0.13	0.13
ELL Proportion	0.05	0.1	0.11	0.1	0.28
Middle School Enrollment Proportion	0.23	0.22	0.22	0.22	0.22
High School Enrollment Proportion	0.33	0.33	0.31	0.30	0.30
Total Enrollment (# of students)	32,435	39,651	20,298	11,052	49,012
Proportion of Enrollment <300	0.07	0.12	0.13	0.24	0.14
Proportion of Enrollment from 300 to <450	0.22	0.17	0.27	0.31	0.23
Proportion of Enrollment from 450 to <600	0.15	0.16	0.19	0.23	0.23
Proportion of Enrollment from 600 to <800	0.15	0.14	0.11	0.05	0.10
Proportion of Enrollment >800	0.40	0.41	0.30	0.17	0.30
CWIFT	0.18	0.19	0.13	0.10	0.20

Exhibit E–5. Descriptive Statistics/Means by SWD Quintiles

Variables	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
SWD Proportion	0.09	0.11	0.13	0.14	0.17
FRL Proportion	0.25	0.37	0.38	0.57	0.5
ELL Proportion	0.08	0.11	0.14	0.17	0.10
Middle School Enrollment Proportion	0.23	0.22	0.22	0.22	0.22
High School Enrollment Proportion	0.31	0.36	0.32	0.30	0.29
Total Enrollment (# of students)	19,582	13,887	52,595	18,590	3,714
Proportion of Enrollment <300	0.10	0.18	0.09	0.16	0.29
Proportion of Enrollment from 300 to <450	0.22	0.19	0.21	0.25	0.26
Proportion of Enrollment from 450 to <600	0.14	0.19	0.18	0.19	0.24
Proportion of Enrollment from 600 to <800	0.13	0.17	0.13	0.08	0.08
Proportion of Enrollment >800	0.41	0.18	0.38	0.32	0.13
CWIFT	0.13	0.15	0.21	0.14	0.10

Exhibit E–6. Descriptive Statistics/Means by ELL Quintiles

Variables	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
ELL Proportion	0.02	0.04	0.1	0.25	0.41
FRL Proportion	0.25	0.31	0.35	0.57	0.72
SWD Proportion	0.11	0.13	0.12	0.13	0.13
Middle School Enrollment Proportion	0.23	0.22	0.22	0.22	0.23
High School Enrollment Proportion	0.31	0.34	0.32	0.31	0.28
Total Enrollment (# of students)	12,029	29,209	40,967	47,490	29,735
Proportion of Enrollment <300	0.16	0.12	0.11	0.12	0.18
Proportion of Enrollment from 300 to <450	0.22	0.21	0.20	0.27	0.14
Proportion of Enrollment from 450 to <600	0.15	0.17	0.18	0.22	0.18
Proportion of Enrollment from 600 to <800	0.13	0.14	0.12	0.11	0.11
Proportion of Enrollment >800	0.34	0.36	0.39	0.28	0.38
CWIFT	0.11	0.15	0.19	0.20	0.19

Regional Model

Exhibit E–7. Data Elements Included in the Regional and Colorado Models

Measure category	Measure	Regional	Colorado
Outcomes	Standardized assessments (Grades 3–8, mathematics and reading)	✓	✓
	Graduation rates		✓
	Absence rates		✓
	Truancy rates		✓
	Dropout rates		✓
	SAT and PSAT Math and Reading scores		✓
Student needs	Census poverty rate	✓	
	Low-income rate based on direct certification		✓
	English learner rate	✓	✓
	Special education rate	✓	✓
	Black student enrollment share	✓	✓
Scale	Small district size	✓	
	Small school size		✓
	Population density (age 5 to 17 only for Colorado)	✓	✓
	Percentage of students in middle school grades	✓	✓
	Percentage of students in high school grades	✓	✓
Price of inputs (geographic cost)	Comparable Wage Index for Teachers (CWIFT)		✓
	NCES Education Comparable Wage Index (ECWI)	✓	
Efficiency controls	Herfindahl Index (sum of squared district shares of enrollment within the labor market)	✓	✓
	Percentage of population between 5 and 17 years old	✓	
	Ratio of median household income to labor market neighbors	✓	
	Percentage of Revenue from State and Federal Sources	✓	
	Log median housing value		✓
Instruments	Neighboring district outcomes	✓	
	Neighboring district median household income	✓	

Measure category	Measure	Regional	Colorado
	Percentage of population age 0 to 4 years old		✓
	Labor market neighbors' assessment outcomes (schools' 10 nearest neighbors)		✓
	Labor market neighbors' percentage of Hispanic students (schools' 10 nearest neighbors)		✓

Exhibit E–8. Regional Cost Function Model Second Stage Estimates

Variable	IV estimate
Student outcome index	0.948***
Census poverty	1.206***
Students with disabilities proportion	3.013***
English learner proportion	1.717***
Black student enrollment share	1.383***
Percent of students enrolled in preK	-0.0430
Percentage of students in middle school grades	-0.0146
Percentage of students in high school grades	0.200
District Enrollment:	
<=100	0.412***
101 to 300	0.305***
301 to 600	0.204***
601 to 1200	0.121***
1201 to 1500	0.0822**
1501 to 2000	0.0678**
Population Density:	
<5	0.378***
5 to <15	0.284***
15 to <50	0.181***
50 to <200	0.0662
Percent of population 5 to 17	-0.615***
Herfindahl Index	1.913
Percent of revenue from state and federal sources	-0.0352
Median household income	-0.143
Year:	
2015	0.0521***
2016	0.0735***
2017	0.103***
2018	0.145***
2019	0.218***
2020	0.248***
2021	0.282***
Constant	**8.513***

Variable	IV estimate
Number of district-by-year observations	11,536
Number of unique districts	1,449
R^2	0.224
F Test of Excluded Instruments	16.53
Hansen's J Statistic	0.659
Hansen's J p-value	0.417

* $p < .1$, ** $p < .05$, *** $p < .01$

Exhibit E–9. Regional Cost Function Model First Stage Estimates

Variable	IV estimate
Neighboring district student outcomes	0.223***
Neighboring district median household income ($1,000s)	0.0801***
Census poverty	-0.422*
Students with disabilities proportion	-1.204***
English learner proportion	-1.069***
Black student enrollment share	-0.693***
Percent of students enrolled in preK	-0.221
Percentage of students in middle school grades	0.154
Percentage of students in high school grades	-0.0635
District Enrollment:	
<=100	-0.119*
101 to 300	-0.0806***
301 to 600	-0.0583**
601 to 1200	-0.0384*
1201 to 1500	-0.0425
1501 to 2000	-0.0206
Population Density:	
<5	0.0159
5 to <15	0.0113
15 to <50	0.0110
50 to <200	0.0302
Percent of population 5 to 17	0.0571
Herfindahl Index	-0.460
Percent of revenue from state and federal sources	-0.239***
Median household income	0.422***
Year:	
2015	-0.00832
2016	-0.00607
2017	-0.00837
2018	-0.0126

Variable	IV estimate
2019	-0.0167
2020	0.00570
2021	0.0435
Constant	0.0782
Number of district-by-year observations	11536
Number of unique districts	1449
R^2	0.717
F Test of Excluded Instruments	16.53

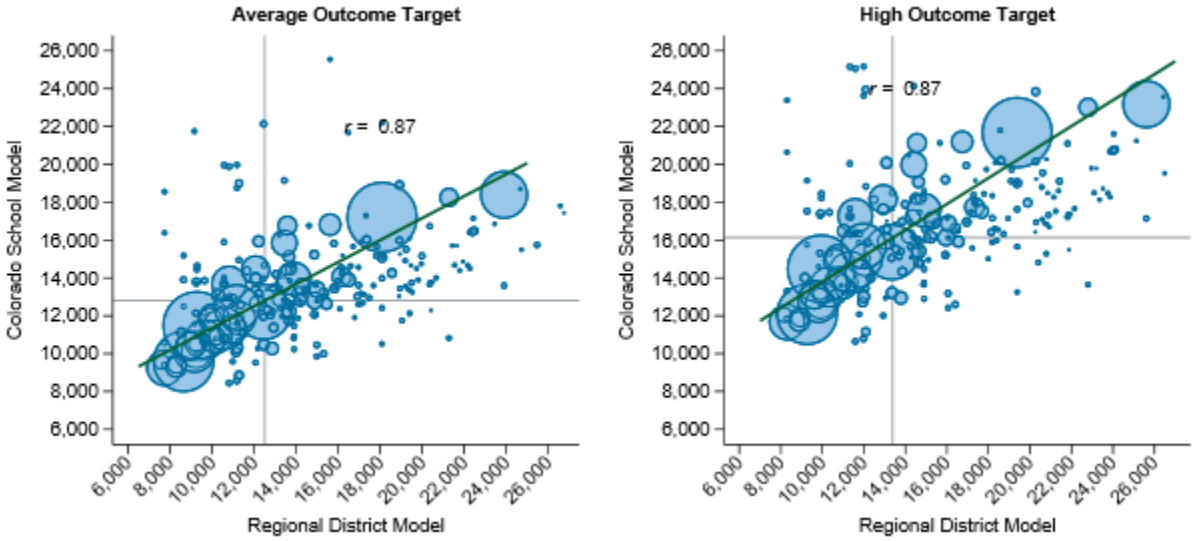
* $p < .1$, ** $p < .05$, *** $p < .01$

Exhibit E–10. Summary of Relationship Between Cost Factors and Costs in the Colorado and Regional Cost Models

Cost factor characteristic	Colorado model	Regional model
Student outcomes	↑	↑
Low income (or Census Poverty)	↑	↑
Special education	↑	↑
English learners	↑	↑
Small schools or districts	↑	↑
Sparsely populated areas	↔	↑
Upper-grade levels	↑	↔
Geographic price differences (CWIFT/NCES CWI)	↑	↔

Note. Arrows represent the relationship of the given cost factor characteristic with costs. Arrows pointing up (↑) represent a statistically significant increase in cost with an increase in the given characteristic. Double-headed horizontal arrows (↔) represent no significant relationship. Arrows pointing down (↓) represent a statistically significant decrease in cost with an increase in the given characteristic. Calculations for the Colorado model based on data from the Colorado Department of Education and calculations for the regional model based on data from the U.S. Department of Education and the U.S. Census Bureau.

Exhibit E–11. Comparing Costs in the Colorado and Regional Cost Models for Meeting Average and High Outcome Targets (2020–21)



Note. The high outcome target for the regional model is set at the outcome of Wyoming, which somewhat outperforms Colorado on the outcome index used in the regional cost model. The outcome target for the Colorado school model is set at an outcome factor score of 1, which generally aligns with the state's educational goals, as described in the Student Outcome chapter of the main report.

Exhibit E–12. Descriptive Data on Schools in Cost Function Sample by School Enrollment Level and Locale (N = 1701)

School Enrollment		Locale			
Enrollment Level (by # of students)	**Descriptive Data**	**City** (*n* = 606)	**Suburb** (*n* = 495)	**Town** (*n* = 180)	**Rural** (*n* = 420)
<300 (*n* = 529)	# of schools	128	74	57	270
	% of schools at enrollment level in locale	24.20%	13.99%	10.78%	51.04%
	% of schools in locale at enrollment level	21.12%	14.95%	31.67%	64.29%
300 to <450 (*n* = 454)	# of schools	187	140	67	60
	% of schools at enrollment level in locale	41.19%	30.84%	14.76%	13.22%
	% of schools in locale at enrollment level	30.86%	28.28%	37.22%	14.29%
450 to <600 (*n* = 323)	# of schools	142	114	30	37
	% of schools at enrollment level in locale	43.96%	35.29%	9.29%	11.46%
	% of schools in locale at enrollment level	23.43%	23.03%	16.67%	8.81%
600 to <800 (*n* = 161)	# of schools	52	73	10	26
	% of schools at enrollment level in locale	32.30%	45.34%	6.21%	16.15%
	% of schools in locale at enrollment level	8.58%	14.75%	5.56%	6.19%
800+ (*n* = 234)	# of schools	97	94	16	27
	% of schools at enrollment level in locale	41.45%	40.17%	6.84%	11.54%
	% of schools in locale at enrollment level	16.01%	18.99%	8.89%	6.43%

Appendix F. Efficiency and Resource Use

Additional Exhibits

Exhibit F–1. Regressing the Funding Gap on the Outcome Gap to Create the Efficiency Index

Variable	OLS estimate
Funding Gap	0.00000319
Funding Gap x Funding Gap	-1.39e-09***
Free-and-Reduced Lunch proportion	-2.163***
Students with disabilities proportion	-3.175***
English learner proportion	-0.634***
Percentage of students in middle school grades	-0.0143
Percentage of students in high school grades	-0.425***
School Enrollment:	
<300	0.163***
300 to <450	0.136***
450 to <600	0.147***
600 to <800	0.0290
Comparable Wage Index for Teachers (CWIFT)	0.923***
Year:	
2019	0.00204
2020	0.0229
2021	0.0147
2022	-0.0525***
2023	0.0783***
Year x Funding Gap:	
2019 x Funding Gap	0.00000214
2020 x Funding Gap	0.0000116*
2021 x Funding Gap	0.0000172***
2022 x Funding Gap	0.0000228***
2023 x Funding Gap	0.0000175***
Constant	1.219***
Number of school-by-year observations	9654
Number of unique schools	1701
R^2	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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