High Quality Schools

FALL 2020

Heat Map

HIGH QUALITY SCHOOLS HEAT MAP ANALYSIS

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HIGH QUALITY SCHOOL MAP

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This report is meant to accompany an interactive map.

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Contents

Executive Summary

The Colorado high-quality Schools Map seeks to answer a simple question: Who has access to the top[1] public schools in Colorado? Importantly, this map gauges *practical* access to the top schools by accounting for things like driving time and the number of seats actually available in the school relative to the local population. Based on this data, every Colorado zip code was assigned a score on a scale of 1-5, with "5" representing excellent access to the top quality schools and "1" representing poor access to the top quality schools. **This map was designed with the lived experiences of families in mind**.

The COVID-19 virus has wreaked havoc on school systems and put many students at a permanent disadvantage. This phenomenon, known as the COVID slide, will mean access to top schools is even more paramount as kids return to the classroom. The value of a school that can help a child catch up has never been higher.

This report is meant to highlight key trends and considerations from the accompanying interactive map. **The findings in this report illuminate stark inequities throughout our state when it comes to access to quality schools**. To no great surprise, zip codes with the best access to quality schools are often more affluent. **Families living in high-income zip codes are seven times as likely to have excellent access to a top high school than families living in low-income zip codes.** Elementary school students living in affluent zips are four times more likely to have excellent access. Sometimes zip codes that are only a few miles apart have dramatically different opportunities to access a top school. This follows a broader trend of so-called "super zips" where power and influence cluster together and become increasingly isolated from nearby communities.

But the map also clearly shows that demographics are not destiny. While many rural or low-income areas have poor access to top schools, there are positive outliers. For example, Sangre de Cristo Elementary School in south central Colorado boasts high levels of academic achievement and growth. The school is located in a remote area and serves a high population of children eligible for free or reduced-price lunch (FRL), a measure of poverty. This report shares several inspiring stories of schools beating the odds.

Another finding is that Colorado's charter schools play a significant role in expanding access to top schools for historically underserved communities. In Denver, for instance, charter schools are overrepresented in the district's top schools at all levels. At the high school level, 67 percent of the top schools in Denver are charter schools, even though charter schools only comprise 36 percent of the district's high schools. Nearly 7,000 of the seats in top schools in Denver, across all levels, are at charter schools. Even with these charter school seats, there are not nearly enough seats at high-quality schools to serve the large population of students. But without charter schools, thousands of students would be shut out of the state's top schools.

The map and accompanying report show which zip codes have the best access to the state's top-quality schools. **Colorado has a long way to go to ensure equal access to these great schools**. We hope that this map can provide useful data to families so they can make informed decisions and become advocates for better schools.

Methodology

At the most basic level, the High-Quality Schools Map shows how well each zip code in Colorado can access Colorado's top public schools based on the number of available seats and drive time.

This project considers access to "high-quality" schools in terms of both the availability of seats at high-quality schools and the driving time to the nearest high-quality school. High-quality schools are defined as the top 20 percent of schools within each school level (elementary, middle and high) using the Colorado Department of Education's school performance framework. While other aspects, such as school culture, contribute to the quality of a school, student academic performance is a key measure. The statewide performance framework provides a common baseline that allows for comparisons among schools regarding academic performance. The overall "percent of points earned" on the 2019 School Performance Framework was used to identify the high-quality schools.

Access is considered in terms of both the availability of seats at high-quality schools and the driving time to the nearest high-quality school. The "Access Score" is measured using two factors: 1) the ratio between student-aged children in the zip code and the number of seats available in high-quality schools; and 2) the actual driving time to the nearest high-quality school from the center of the zip code.

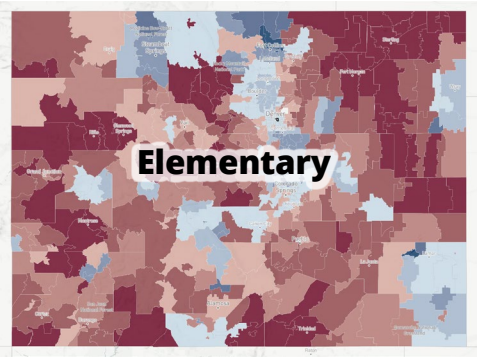
The first factor is determined by identifying intersecting school district and zip code geographies. For each school district, the following calculations were made: 1) the number of students enrolled at high-quality schools within the district; and 2) the estimated number of relevant student-aged children residing in the district. This is done separately for each level: elementary, middle, and high school so that the calculation for high-quality elementary schools uses the number of students enrolled only at high-quality elementary schools and an estimate of the total number of children living in that area. For each zip code, the total high-quality school enrollment of all intersecting school districts is divided by the estimated count of students that are age-eligible for those school districts.

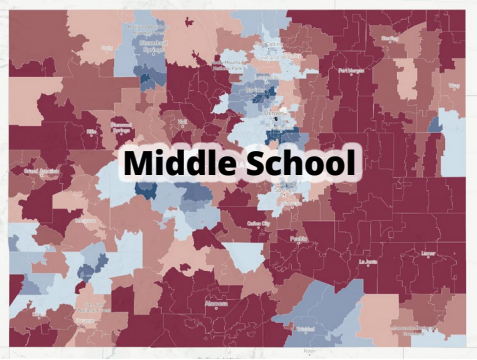
This approach allowed for the most precise accounting of student enrollment at high-quality schools compared with overall student enrollment within a district. Because the scores are averaged across each school district, it does not fully account for differences that might occur within districts, particularly within large school districts. In Denver Public Schools (DPS), for example, some neighborhoods have better access to high-quality schools than others, but all zip codes that are entirely in the boundaries of DPS are assigned the same score for "high-quality school enrollment" under this methodology. Thus, while the map reveals striking inequities between neighborhoods, the reality may be even more disparate for some families.

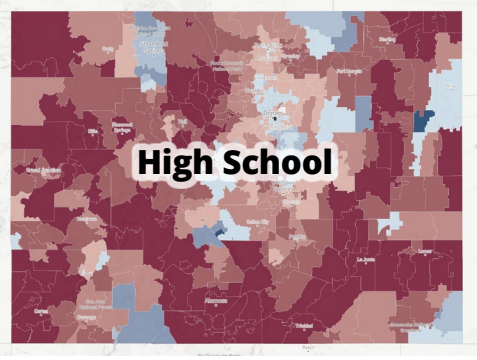
In creating the composite index score (the Access Score), the first factor (high-quality school enrollment) was weighted at 60 percent and the second factor (driving time) was weighted at 40 percent. This weighting acknowledges that driving distances are inherently tied to geographic setting and allows for zip codes to achieve an overall higher access score by having a high-quality school nearby that has sufficient capacity to serve students in the surrounding area.

Demographic Impact on Access

In this section, we consider how access to high-quality schools is affected by income levels and geographic setting. As these data are explored, it is important to note that driving times are typically higher for middle and high schools, since traditionally these schools are bigger and serve a wider geographic boundary. In Figures 1 and 3 below, we would expect to see lower access scores overall for middle and high schools when compared to elementary schools.







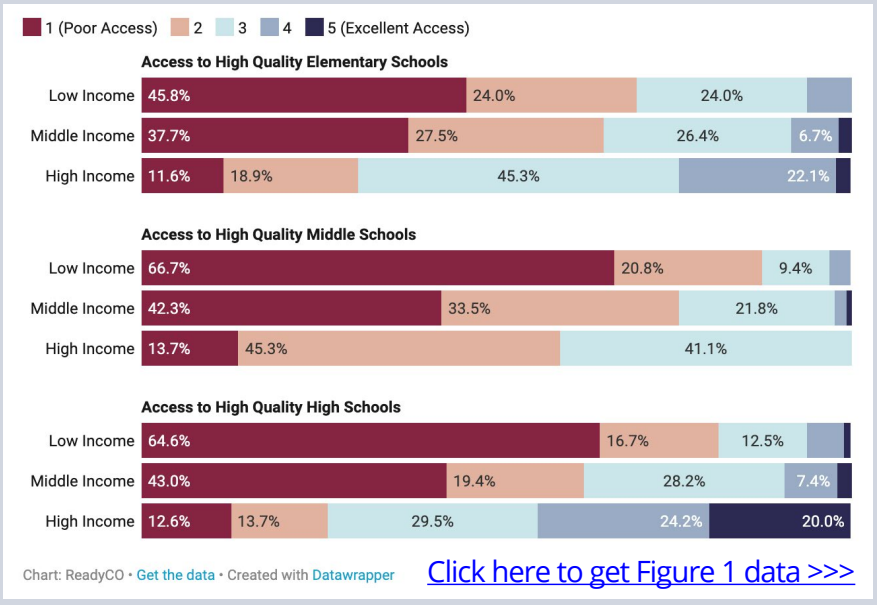
Access and Affluence

Research has found that student educational outcomes are correlated, in part, to family background, including income and other factors such as parental educational attainment. In this section, we look at the relationship between the access scores of zip codes to the median household income of the same zip code.[2] The key takeaway here is that more affluent families have better access to the state's top schools, which may not be surprising in a school system that assigns students to schools based on residence.

Figure 1 provides a visual representation of the distribution of access scores (on a scale of 1 to 5) by income level (low, middle, and high) for each school level (elementary, middle, and high).

FIGURE 1: Access Score Distribution by Median Household Income

Percent of zip codes earning Access Scores (1 to 5) by the median household income of each zip code for elementary, middle and high school levels.



Click here to get Figure 1 data >>>

Note: low-income corresponds with the bottom quintile of household income in Colorado. High-income corresponds with the top quintile and middle income with the second, third and fourth quintiles (i.e. middle 60%). This methodology is derived from the Brookings Institution.[3]

Key Findings:

Elementary schools. Seventy percent of low-income areas and 65 percent of middle-income areas have poor access (scores of 1 or 2) to top elementary schools compared with 30.5 percent of high-income areas. Twenty four percent of high-income areas

have excellent access (scores of 4 or 5), compared with only 6 percent of low-income areas. This means that **families living in high-income zip codes are four times as likely to have excellent access to a top elementary school than families living in low-income zip codes**.

Middle schools. The large majority of zip codes, across all income levels, have poor access to high-quality middle schools (earning a score of 1 or 2). None of the high-income zip codes and only three percent of low- and middle-income zip codes have an access score of 4 or 5 for middle schools. A staggering 87.5 percent of low-income areas and 76 percent of middle-income areas have poor access to quality middle schools. The share of high-income zip codes with poor access to top schools is at its highest at the middle school level (59 percent), compared to 26 percent at the high school level and 30.5 percent at the elementary level.

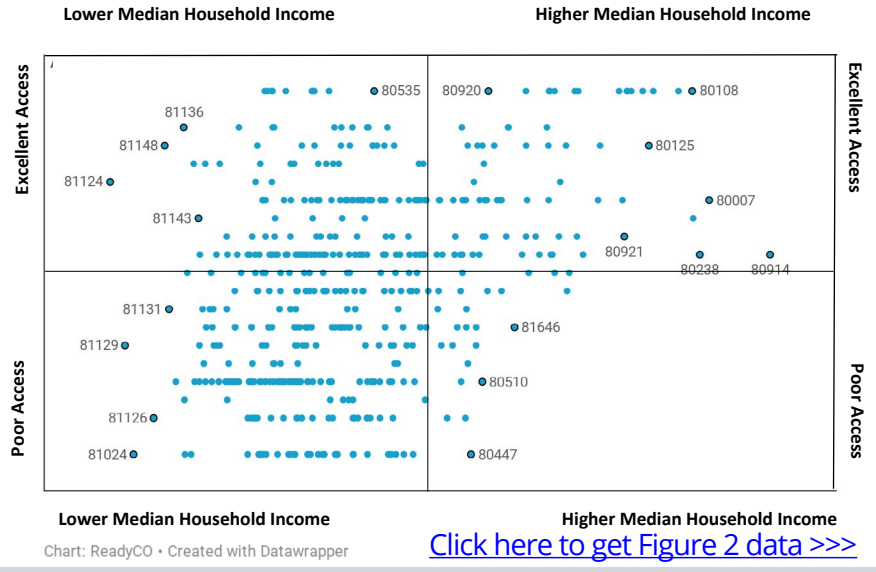
Research studies across the country have found that achievement dips at the middle school level for students that make a school transition in 6th or 7th grade to a stand-alone middle school (usually serving grades 6-8) as compared to students who attend K-8 schools and stay in the same school for the middle grades.[4] This report reflects that trend, with K-8 schools making the "top schools" list at more than twice the rate as stand-alone middle schools. K-8 schools tend to be smaller than stand-alone middle schools. Because the access score index includes a measure of available seats at quality schools, having more K-8 schools on the list than 6-8 schools means fewer quality seats available to families. In 2018-19, Colorado's K-8 schools had an average of 139 students attending grades 6-8, compared to 559 students attending the same grades in stand-alone middle schools. This phenomenon helps explain why middle school access scores are low across the board.

Families living in high-income zip codes are seven times as likely to have excellent access to a top high school than families living in low-income zip codes.

High schools. The most pronounced stratification by income occurs at the high school level. Families living in high-income zip codes are seven times as likely to have excellent access to a top high school than families living in low-income zip codes. Forty four percent of high-income zip codes have excellent access to high-quality high schools (score of 4 or 5), while only 10 percent of middle income and just 6 percent of low-income zip codes have such access. About 81 percent of low-income areas have poor access to top high schools (score of 1 or 2) compared to 62 percent of middle income areas and 26 percent of high-income areas.

Figure 2 displays the elementary school access scores by median household income for every zip code in Colorado. While

FIGURE 2: Zip Code Access Scores by Median Household Income, Elementary Level



Click here to get Figure 2 data >>>

there is a correlation between income levels and better access, there are still many instances of zip codes having excellent access with low to medium household incomes as evidenced by the dots in the upper left quadrant. While there are trends between income and access, the data shows that schools can succeed in both low and high-income areas. **Put simply, demographics do not have to determine destiny for a school or the students attending it.**

Access and Geographic Setting

This section investigates the link between access and geographic setting. Because the Access Score includes a value for driving time, it is expected that more remote areas of the state will often have lower access scores. This reflects the reality for some rural families: longer driving times to access a quality school. Notably, the map measures actual drive time in the car rather than distance, because it is typically slower to drive one mile through downtown Denver than to drive a mile-long stretch of highway between two small towns on the eastern plains. To account for these differences, driving time is weighted at 40 percent compared to the 60 percent weight given to the share of seats at high-quality schools available in a district. Despite these challenges, several remote areas of the state still receive high access scores.

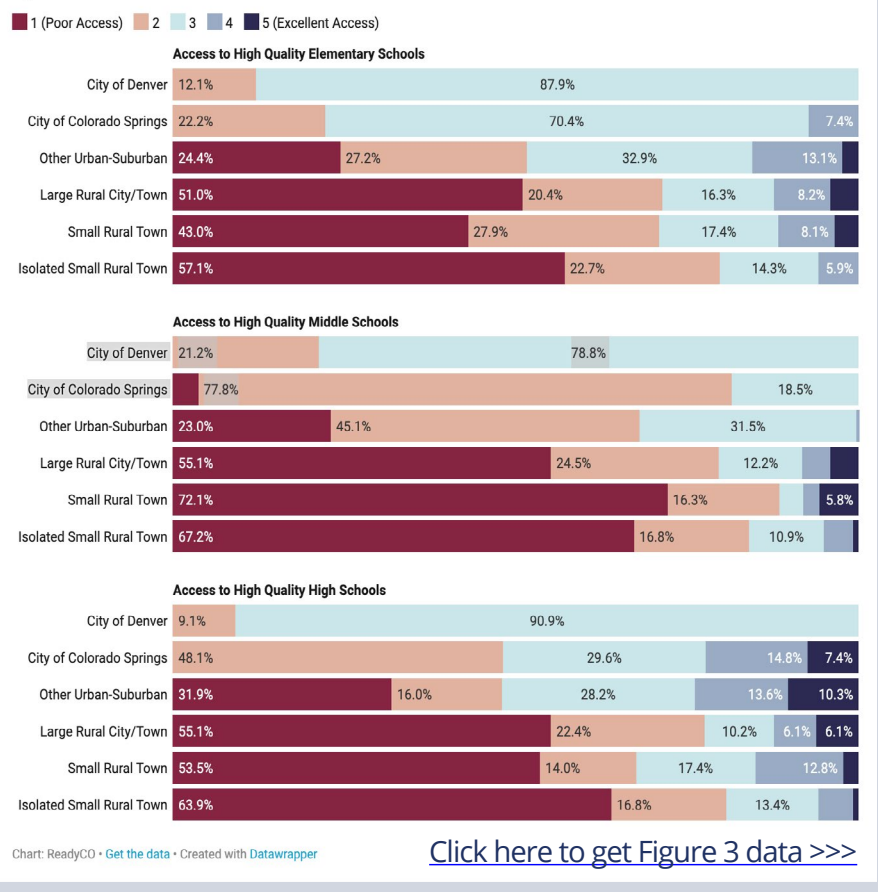
The geographic categories used in Figure 3 include two categories for the zip codes located within the boundaries of Denver and Colorado Springs. The other four categories are derived from the Rural-Urban Commuting Area Codes (RUCA) database, which provides for a granular analysis of rural areas across the state.[5] Table 1 displays the number of zip codes in each category and Figure 3 takes a closer look at the relationship between geographic setting and access.

TABLE 1: Number of Zip Codes in each Geographic Setting

Geographic Setting	Number of Zip codes
City of Denver	33
City of Colorado Springs	27
Other Urban-Suburban	213
Large Urban City/Town	49
Small Rural Town	86
Isolated Small Rural Town	119

FIGURE 3: Access Score Distribution by Geographic Setting

Percent of zip codes earning Access Scores (1 to 5) by the geographic setting of each zip code for elementary, middle and high school levels



Click here to get Figure 3 data >>>

Key Findings:

While the correlation between access and geography is not as strong as between access and affluence, there is still an apparent relationship. Overall, rural areas are more likely to have poor access to high-quality schools when compared to Denver or Colorado Springs. But interestingly, areas outside of Colorado Springs and Denver are more likely to have "excellent" access to top schools. In other words, families living in Denver and Colorado Springs have moderate access in most areas, whereas rural and suburban areas are more likely to have *either* excellent or poor access to top schools. These divergent outcomes are likely a reflection of Colorado's diverse geography.

Elementary Schools. Denver and Colorado Springs have moderate access to high-quality elementary schools with the vast majority of zip codes earning a score of 3. The picture is more mixed for urban-suburban and rural areas. Just over 70 percent of zip codes in large rural cities or towns or small rural towns have poor access to the top elementary schools (score of 1 or 2). Isolated small rural towns have the worst access with 80 percent of zip codes earning a score of 1 or 2 and over half of zip codes (57 percent) earning the bottom score of 1. Families in isolated small rural towns are over 6 times as likely to have poor access to a high-quality elementary school as families living in more populated areas like Denver.

Families in isolated small rural towns are 10 times as likely to have poor access to a high-quality high school as families living in Denver.

Middle Schools. Access is relatively poor across all settings for middle schools, with the exception of Denver which has moderately good access to high-quality middle schools (half of which are charter schools). In Colorado Springs, 82 percent of zip codes have poor access to a top middle school (access score of 1 or 2). This is similar to the proportion of rural zip codes with poor access, but for Colorado Springs most zip codes have a score of 2, while the majority of rural areas see scores of 1. Urban-Suburban areas fare slightly better with 68 percent of zip codes having poor access to quality middle schools. None of the zip codes in Denver or Colorado Springs and only one urban-suburban zip code earned an excellent access score (4 or 5). Rural areas, however, are more likely to have pockets of excellent access with 17 zip codes earning a score of 4 or 5 (collectively within large rural cities/ towns, small rural towns, and isolated small rural towns).

High Schools. Colorado Springs and other urban-suburban areas have the highest share of zip codes with excellent access to top high schools (22 percent and 24 percent, respectively). Small rural towns have the next highest share with 15 percent of zip codes earning a score of 4 or 5. Rural areas are more likely to also have very low access scores, though. While Denver zip codes fall predominantly in the moderate access range (score of 3), over 50 percent of rural areas earned a score of 1 with the rest of the zip codes earning scores of 2 or higher. Families in isolated small rural towns are 10 times as likely to have poor access to a high-quality high school as families living in Denver.

Charter School Impact on Access

Charter schools are tuition-free public schools that operate under a contract for performance (a charter) with a local school district or the state. The schools are governed by local nonprofit boards of community members and have more flexibility in their operations. Because of this increased flexibility, charter schools often provide unique learning models that are not available in traditional schools.

Charter schools are not typically bound by geographic restrictions, meaning that any kid who wants to attend can apply. Thus, the primary barriers to attending a charter school are the school's capacity and transportation. This enrollment model creates an opportunity for parents to choose a top-rated school

If Colorado's current charter schools did not exist, access to quality schools would go down across the state. Specifically, access scores would go down an average of 14% for all school levels (-0.7 points on a scale of 1 to 5) if charters were removed. Removing charter schools would negatively affect access for 18 percent of zip codes at the elementary school level, 43 percent of zip codes at the middle school level, and 26 percent of zip codes at the high school level. Figure 4 displays what the average change in access scores would be by school level if charter schools were excluded.

If Colorado's current charter schools did not exist, access to quality schools would go down across the state.

Percent of Zip Codes that Would Have Worse Access Without Charter Schools

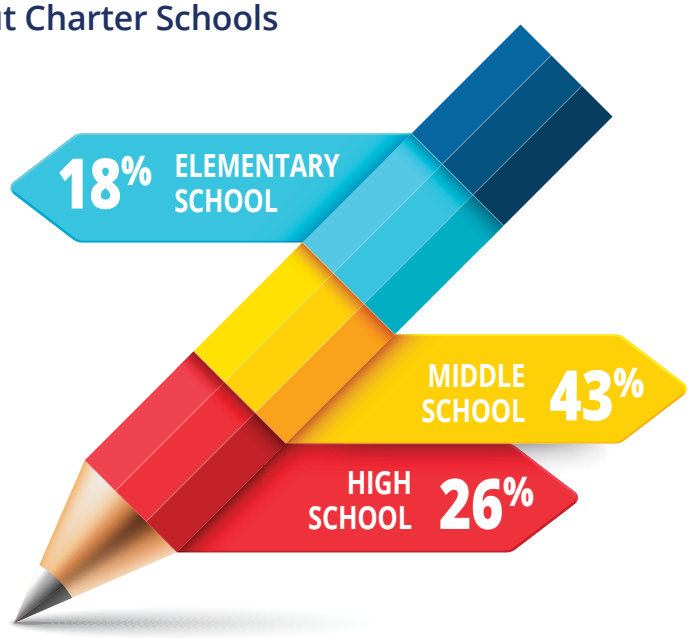
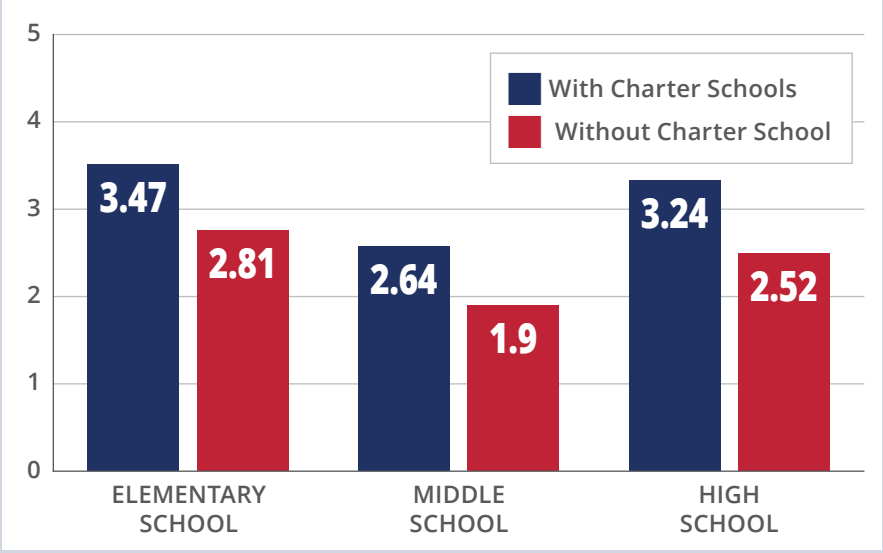


FIGURE 4: Average Access Scores with and without Charter Schools

Impact of excluding charter schools on statewide access scores, by school level



Within Denver Public Schools specifically, getting rid of charter schools would significantly reduce the number of available seats at high-quality schools. Hypothetically, if charter schools closed and the top 20 percent of schools were recalculated, Denver would lose a net[6] of 8 high-quality charter schools and 2,845 high-quality seats. **Put simply, without charter schools nearly 3,000 DPS students would lose the opportunity to attend a top school.**

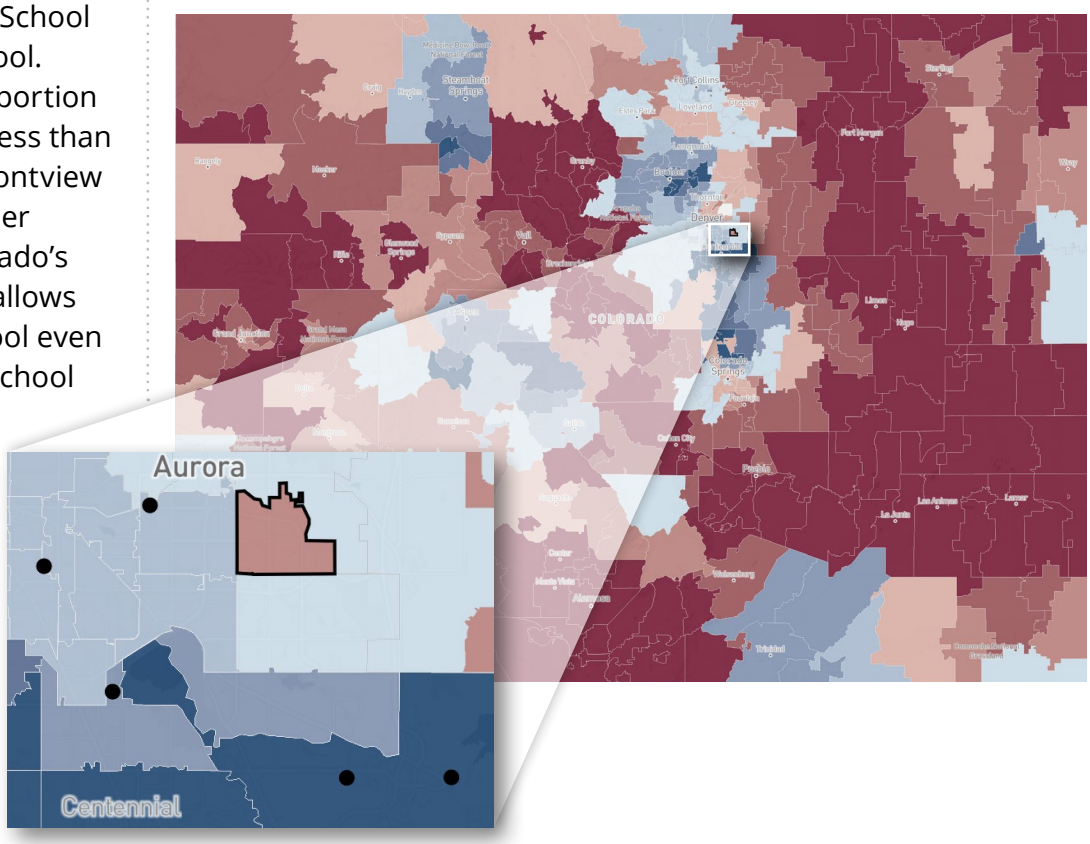
An example of a rural charter school that has increased access is located in zip code 81632 in Edwards. The school, called Eagle County Charter School, was established over 25 years ago by a group of local parents, educators and community members seeking to create a different educational experience. Students at the K-8 charter school have seen consistently strong outcomes, and the state department of education has given the school the "John Irwin School of Excellence Award" on numerous occasions.[7] Students in zip code 81632 are less than 10 minutes from Eagle County Charter School. The next closest high-quality elementary school is a 21 minute drive, and the next closest high-quality middle school is a 65 minute drive.

Charter schools have a positive impact in the most remote corners of the state. Zip code 81411 in Paradox earns a high access score of 4 at the high school level because of Paradox Valley Charter School. Without that high-performing charter school being in operation, zip code 81411 would earn the lowest access score (1) at all levels. Students in this zip code are less than 30 minutes from Paradox Valley Charter School, whereas the next closest high-quality schools are more than an 80-minute drive for elementary and middle school students and a 51-minute drive for high school students. More details about Paradox Valley Charter Schools can be found in the "Case Study" section below, which highlights exceptional outliers that are opening up access for families.

Open Enrollment Impact on Access

In zip code 80017, served by Aurora Public Schools, families are in a desert of quality high schools. The access score for high schools is only 2, while the surrounding zip codes have scores of 3 to 5. In the same city, but in a different school district, access to high-quality schools is entirely different. Just south of zip code 80017, is Cherry Creek School District. Students living in the southern area of 80017 would be less than 20 minutes away by car from Grandview High School or Cherry Creek High School. Students in the northern portion of the zip code would be less than 20 minutes from DSST: Montview High School in DPS, another high-quality option. Colorado's open enrollment system allows families to enroll in a school even if it is located in another school district, provided there is space at that school. For families in 80017, that may be an appealing option if they are looking for a high-performing high school.

Of course, ideally students have high-quality options in their own neighborhood that meet their community's needs. Laudably, Aurora Public Schools recently authorized a new charter high school to open in 80017 with the goal of providing a high-quality and culturally responsive option for families nearby. Empower Community High School was created by a diverse group of students, families, educators, and community members looking for an innovative model focused on "authentic education that is led by students, guided by educators, and co-created with community."[8] Districts across the state should continue to support efforts by families and community members to co-design creative learning environments. Without these efforts, many communities will be deprived of access to high-quality education options.



Case Studies

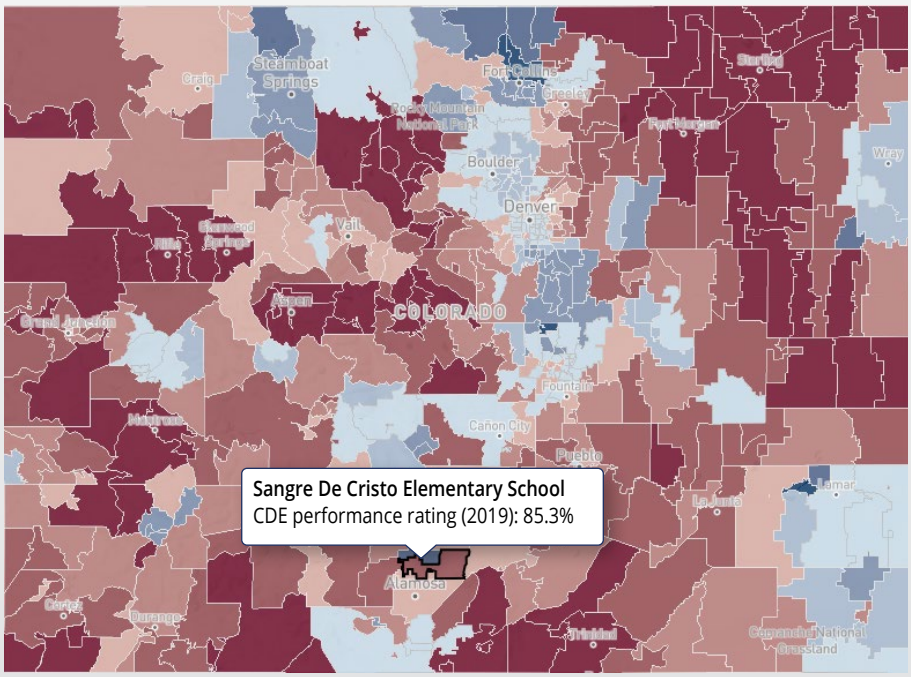
While demographic characteristics, school model type, and geographic setting can impact access to high-quality schools, those factors are not full determinants of school quality. There is wide variation within each geography and among different levels of affluence.

In other words, **demographics do not have to equal destiny.** There are examples of high-performing schools located in zip codes with a lower median income, and wealthier areas can be home to mediocre and low-performing schools. Rural areas are home to high-quality schools just as urban and suburban areas are. Further, with open enrollment and school choice, schools are enrolling students from many zip codes, not just the immediate surrounding area. This section highlights schools and districts that are seeing extraordinary outcomes in a variety of settings, serving low-income and diverse populations.

SANGRE DE CRISTO ELEMENTARY

Serving Zip Codes: 81136, 81146, 81144, 81101, 81125

This small elementary school in south central Colorado is an outlier. It is located in a remote, low-income area and saw high levels of academic achievement and growth in 2019. Over half of the school's children are eligible for free or reduced-price lunch (FRL) and 27 percent identify as Hispanic or Latino. In 2019, **Sangre de Cristo Elementary School** received the 2019 Governor's Distinguished Improvement Award for exceptional student growth.



Sangre de Cristo Elementary School

Demographic Data

- 30% Students of Color
- 50% Low-income students
- Median household income for surrounding zip codes ranges from $27,000 to $50,900

2019 Academic Peformance

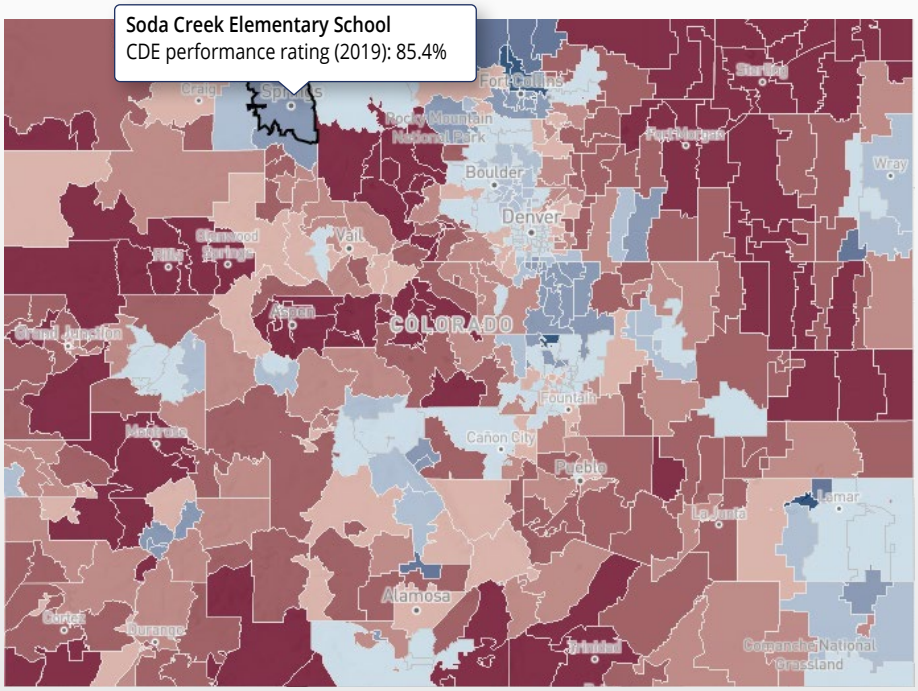
- Overall Percent of Points Earned: 85.3%
- Hispanic students scored in the 82nd percentile on state tests for English language arts; 71st percentile for math
- Median growth percentile for low-income students was 63 for English language arts; 74.5 for math
- Growth for low-income students was the same as growth for all students

Case Studies *(continued)*

Steamboat Springs School District serves approximately 2,600 students in the city of Steamboat Springs and its surrounding rural areas. All five of the district's traditional schools are high-quality as defined by this project (top 20 percent of schools statewide in their respective grade spans). These schools are: Soda Creek Elementary, Strawberry Park Elementary, Steamboat Springs Middle School, Steamboat Springs High School, and North Routt Community Charter School (K-8). North Routt Community Charter School serves a rural area north of Steamboat Springs and provides its families with access to a high-quality education focused on expeditionary learning. Strawberry Park Elementary was one of three finalists for the prestigious Succeeds Prize in 2017, which recognizes the very best schools in Colorado.

STEAMBOAT SPRINGS SCHOOL DISTRICT

Serving Zip Codes: 80477, 80487, 80488, 80428, 81653



Steamboat Springs School District

Demographic Data

- 20% Students of Color
- 14% Low-income students
- Rural district serving approximately 2,600 students over 1,015 square miles

2019 Academic Peformance

- Overall Percent of Points Earned: 78% (Accredited with Distinction)
- "Exceeds" rating on elementary English language arts and math achievement (93rd and 90th percentile, respectively)
- All 5 traditional schools (4 district-run and 1 charter) were in the top 20% of Colorado's schools in 2019

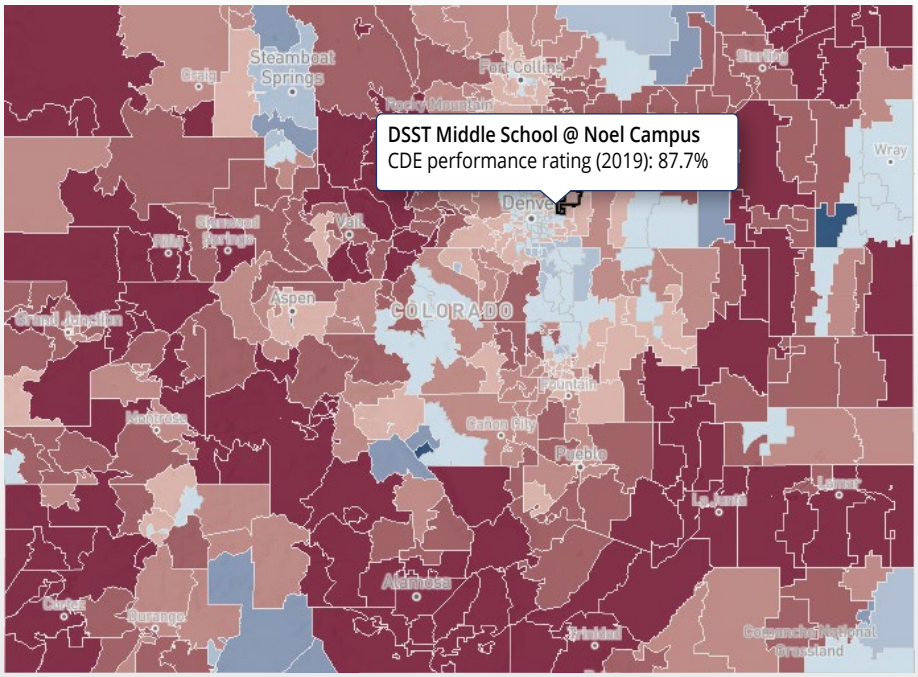
Case Studies *(continued)*

DSST Middle School at Noel Campus is a charter school that serves primarily low-income students of color. Newly opened in 2018-19, DSST Middle School at Noel Campus is located in far northeast Denver serving the Montbello and Green Valley Ranch area. In their first year of operation, 6th graders earned an "Exceeds" expectations rating on academic growth, and the school ranked #1 across all 213 elementary, middle and high schools in DPS. As an open enrollment school, DSST Middle School at Noel Campus has opened opportunities for families to access a high-quality middle school.

While DSST Middle School at Noel Campus is seeing exceptional outcomes, the Access Score for the zip code it is located in (80239) earns a score of 2.8 on the 1 to 5 scale. The reason the access score is lower is because the share of students enrolled at high-quality middle schools is quite low within Denver Public Schools (DPS). There are currently only enough seats at high-quality schools to serve 25 percent of middle school students living within DPS boundaries. Without DSST Middle School at Noel Campus, the Access Score would drop even lower from 2.8 to 1.8 for students living in the Montbello neighborhood.

DSST MIDDLE SCHOOL - AT NOEL CAMPUS

Serving Zip Codes: 80239, 80022



DSST Middle School at Noel Campus

Demographic Data

- 94% Students of Color
- 80% Low-income students
- Median household income for surrounding zip codes ranges from $58,200 to $64,200

2019 Academic Peformance

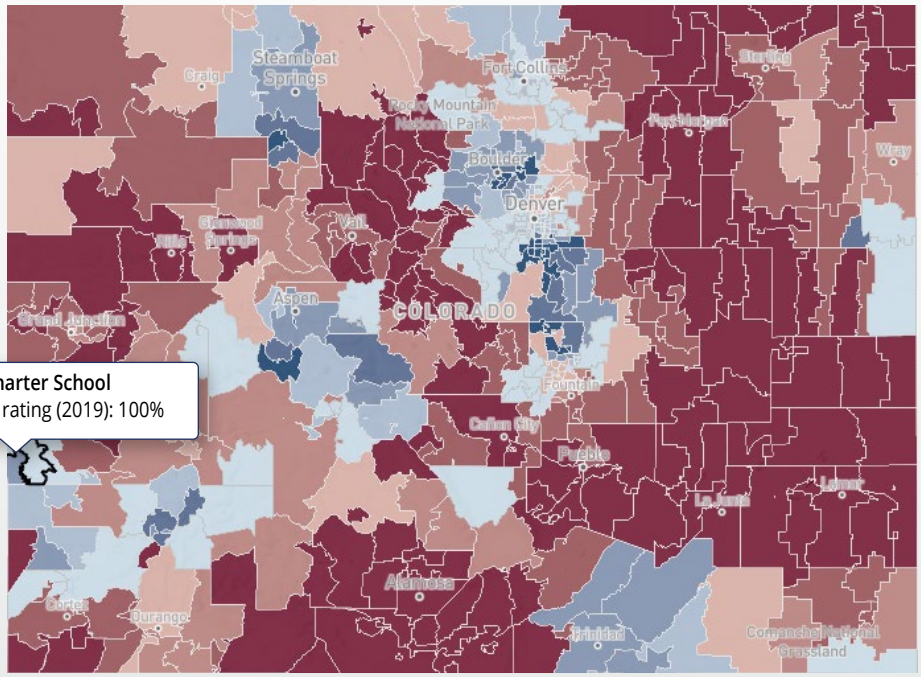
- Overall Percent of Points Earned: 87.7%
- Students of color scored in the 79th percentile on state tests for English language arts; 77th percentile for math
- Students of color, low-income students and English language learners all earned an "Exceeds" rating on growth for both English language arts and math

Case Studies *(continued)*

Paradox Valley Charter School is a small rural school in western Colorado serving students in preschool through 12th grade. The school is in the top 20% at all three grade span levels: elementary, middle and high. The charter school is authorized by West End RE-1 School District, which spans over 1,000 square miles and operates one elementary school (preK-6th) and one secondary school (7th-12th). Paradox Valley Charter School provides an important additional option for families living in the West End region.

PARADOX VALLEY CHARTER SCHOOL

Serving Zip Codes: 80239, 80022



Paradox Valley Charter School

Demographic Data

- 61% Low-income students
- Isolated, small rural town

2019 Academic Peformance

- Overall Percent of Points Earned: 87.9%
- Students exceed expectations in academic growth and meet expectations in academic achievement
- Received the Governors' Distinguished Improvement Award in 2019

Conclusion

This map highlights some incredible successes: schools that are delivering an excellent education to the neediest communities. But it also shows that **access to a quality school is too often tied to affluence and geography**. Colorado can and should do better to break the link between school quality and demographics. Thankfully, the courageous educators profiled in this report are showing us the way to do just that.

So what can we do about the flaws in our current system? The solution seems simple - focus less on boundaries, borders, and exclusion. Instead focus on openness, fairness, and equity. **The current dominant model in schooling—automatic assignment to a zoned boundary school—is unfortunately a model for exclusion and inequality.** This is obvious to every parent, whether it is a wealthy family paying a premium for a home with a guaranteed seat in a top public school or the family without means that drives 40 minutes each way to get their child to a better school. That's because the boundary model of schooling is purposefully designed to exclude certain children.

We should do more to support and encourage school operators who want to shake up the status quo.

Colorado should find ways to expand community-driven, choice-focused education models that respond to the unique needs of individual students. Colorado's charter schools and innovation schools are a great way to expand quality choices, but local school districts also have great authority in Colorado to innovate, change, and adapt. We should do more to support and encourage school operators who want to shake up the status quo.

As indicated above, the COVID-19 virus has created a new challenge for the education community. Limited access to in-person learning has put many students at a permanent disadvantage. The marked dip in student growth and achievement, known as the COVID slide, serves to further illuminate the urgent need for access to top schools. Now more than ever, families are searching for the school that best meets the individual needs of their child.

COVID has presented enormous short-term challenges for parents and educators alike, but it has also highlighted the drastic differences in access that families have to a quality education. When widespread in-person learning begins again, we should not simply go back to the way things were. Instead, we should aim to expand options to ensure every kid has access to a school that can help them thrive.

Appendix A: Detailed Methodology

High-quality schools are defined as the top 20 percent of schools within each school level (elementary, middle and high) using the Colorado Department of Education's school performance framework (SPF). Specifically, the overall percent of points earned on the 2019 SPF was used to identify the high-quality schools. The elementary and middle school SPF ratings are derived from student performance on English and mathematics assessments. The state measures both academic achievement (performance relative to the grade level benchmarks) and academic growth (the amount of learning that occurred during the school year relative to peers who began the school year at the same level). The high school SPF ratings include measures of postsecondary and workforce readiness in addition to academic achievement and growth.

While most of the schools in the top 20 percent have sub-indicator ratings of "Meets" expectations on academic achievement and growth and, for high schools, postsecondary and workforce readiness, some schools do have ratings of "Approaching" expectations. In other words, at most of the top schools a majority of students are on grade level for reading, writing and math. But in some instances students may be achieving at high levels earning the school an "Exceeds" expectations rating on achievement, but the students are growing at a rate slower than their peers who started the school year at the same level, earning the school an "Approaching" rating for academic growth.

The "Access Score" is measured using two factors:

1) the share of relevant student-aged children enrolled at a high-quality school; and

2) the driving time to the nearest high-quality school.

The first factor is determined by identifying intersecting school district and zip code geographies. For each school district, the following calculations were made: 1) the number of students enrolled at high-quality schools within the district; and 2) the estimated number of relevant student-aged children residing in the district. This is done separately for each level: elementary, middle, and high so that the calculation for high-quality elementary schools uses the number of students enrolled only at high-quality elementary schools and the number of children in a school district between the ages of 5 and 9. For each zip code, the total high-quality school enrollment of all intersecting school districts is divided by the estimated count of students that are age-eligible for those school districts.

Student enrollment data were obtained from the US Department of Education, National Center for Education Statistics, Common Core of Data (CCD) for the 2016-17 school year. Student-aged

population data were obtained from the US Department of Education, National Center for Education Statistics, Education Demographic and Geographic Estimates (EDGE) for the 2016-17 school year.

For the second factor, school addresses were retrieved from the US Department of Education, National center for Education Statistics, Common Core of Data (CCD). The Google Maps Distance API was used to calculate the driving time from the centroid of each zip code to nearby high-quality schools.

Each factor was individually scored on a scale of 1 to 5 as follows:

High Quality School Enrollment Proportion	Points
.70+	5
.50 to .69	4
.30 to .49	3
.15 to .29	2
Less than .15	1

Driving Time	Points
0 to 10 minutes	5
11 min. to 20 min.	4
21 min. to 45 min.	3
46 min. to 60 min.	2
61 min. +	1

The factor scores were then combined to create the composite index score, with the first factor (high-quality school enrollment) weighted at 60 percent and the second factor (driving time) weighted at 40 percent. This weighting acknowledges that driving distances are inherently tied to geographic setting and allows for zip codes to achieve an overall higher access score by having a high-quality school nearby that has sufficient capacity to serve students in the surrounding area.

Endnotes

[1] As used in this report, the terms "top schools" or "high-quality schools" refer to schools that rank in the top 20% of Colorado's official state public school ratings. To learn more about these state ratings, visit https://www.cde.state.co.us/accountability/performanceframeworks.

[2] Median Household Income, U.S. Census Bureau, 2014-2018 American Community Survey 5-Year Estimates.

[3] *There are many definitions of "middle class"—here's ours*, Richard V. Reeves and Katherine Guyot, Brookings Institution (2018) *available at* www.brookings.edu/blog/up-front/2018/09/04/there-are-many-definitions-of-middle-class-heres-ours/

[4] *The Middle School Plunge*, Martin R. West and Guido Schwerdt, EducationNext Vol. 12, No. 2 (2012) *available at* https://www.educationnext.org/the-middle-school-plunge/.

[5] Rural-Urban Commuting Area Codes or "RUCAs" are a Census tract-based classification scheme that combines Bureau of Census Urbanized Area and Urban Cluster definitions with work commuting information to classify all of the nation's Census tracts according to their rural and urban status. More information can be found at: https://www.ers.usda.gov/data-products/rural-urban-commuting-area-codes/.

[6] In this hypothetical, seven traditional schools in Denver would jump into the top 20%, but the district would lose 15 charter schools in the top 20%.

[7] According to the Colorado Department of Education, the award is given to schools that earn an Exceeds Expectations rating on the Academic Achievement indicator of the School Performance Framework reflecting exceptional performance in Math, English Language Arts, and Science. https://www.cde.state.co.us/cdeawards/johnirwin

[8] "Our Mission," Empower Community High School, *available at* https://empowerhighschool.org/mission.

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Ready Colorado is a nonprofit working to improve education in Colorado. We promote all forms of school choice and advocate for a more student- and family-oriented education system.

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