ELEMENTARY SCHOOL ENROLLMENT REDISTRIBUTION

Prepared for Boyertown Area School District

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In the following report, Hanover Research reviews the literature on enrollment redistribution, with a focus on the elementary school level. The report also discusses each practice as it relates to data available from Boyertown Area School District.

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INTRODUCTION

To support Boyertown Area School District (BASD) in its efforts to redistribute enrollment across the district's seven elementary schools, Hanover Research conducted a review of strategies to achieve more balanced enrollment across a school system. Overcrowded schools pose potential learning and safety issues, and under-utilized schools are an inefficient use of district resources. The redistribution strategies highlighted in this report serve to alleviate issues attributable to uneven school enrollment growth patterns.

The following figure summarizes the benefits and drawbacks of the three common approaches to enrollment redistribution described in this report: redistricting, school expansion, and new school construction. The body of this report discusses these strategies in greater detail.

Figure ES.1: Summary of Enrollment Redistribution Strategy Benefits and Drawbacks

APPROACH	DESCRIPTION	BENEFITS	DRAWBACKS
Redistricting	Changing neighborhood school boundaries	▪ Less expensive than new building construction or school additions ▪ Doesn't destabilize special programs ▪ Allows efficient use of space	▪ Gradual implementation process ▪ Disrupts existing school communities ▪ Requires balancing of program equity, demographics, and transportation
School expansion	Renovations and additions to existing schools	▪ Allows modernization and improvements to buildings ▪ Does not affect transportation costs	▪ Students may need to relocate during construction
New school construction	Building additional schools	▪ Most permanent solution to overcrowding	▪ Requires additional land ▪ Requires redistricting

This report comprises two sections:

- **Section I** discusses approaches to enrollment redistribution, including redistricting, school expansion, and new school construction.
- **Section II** reviews the research related to factors that may be impacted by enrollment redistribution, including class size, school size, and transportation.

KEY FINDINGS

- **Many districts consider redistricting as a cost-effective method of rebalancing enrollments within the district.** The literature suggests that redistricting works best when nearby schools are overcrowded or under-enrolled; offer similar programs, services, and feeder patterns; and redistricting does not pose transportation challenges. However, existing school capacities must be sufficient for current and future district enrollments in order for redistricting to be effective without school expansion or new school construction.
- **Districts implement school expansion to increase building capacity without the capital requirements of new building construction.** School renovations can also modernize and improve existing structures to better serve students, teachers, and school staff. Districts consider multiple factors when deciding to renovate or expand existing elementary schools, including but not limited to grade alignment, class size, school safety, and security. Feasibility studies can help districts review the above factors and determine if expansion is a viable option.
- **New school construction is the most permanent, and often most costly, approach to enrollment redistribution.** New school construction requires districts to acquire additional land, hire additional teachers, pay construction costs, and redraw attendance zones to fill the new school. Districts often decide to construct new schools only if projected enrollment increases are consistent over multiple years and the district cannot meet demand through school expansion, redistricting, or program moves.
- **Although BASD's K-5 enrollment is projected to fall from the 2014-2015 school year the 2019-2020 school year, some data suggest that future enrollment changes may occur unevenly throughout the district**. Data from 2011-2012, for example, indicate that some elementary attendance areas are already near or over functional capacity, whereas others are noticeably below capacity. Moreover, 2015 estimates also indicate that several elementary areas, such as Gilbertsville and Washington, are expected to see substantially higher levels of dwelling unit construction (a limited but useful measure for assessing elementary enrollment growth) by 2023.
- **There is considerable research to support the positive impact of small class and school sizes on student outcomes.** Across the reviewed studies, findings suggest small class sizes (below 20 students) and school sizes (below 500 students) have small, positive effects on student achievement. However, researchers note that class size reductions are comparatively costly interventions, given the small impact on achievement. In addition, researchers caution against attributing achievement improvements to school size, as this measure is often a representation of other factors, such as school climate, school composition, curricular and extra-curricular offerings, and teacher-student relationships. There is insufficient research to form conclusions about the impact of transportation times on student outcomes.

SECTION I: ENROLLMENT REDISTRIBUTION

The following section presents three common approaches to enrollment redistribution: redistricting, school expansion, and new school construction. Specifically, Hanover Research reviews how school districts have used each approach to mitigate the challenges of overcrowding and discusses potential costs and benefits to each approach.

METHODOLOGY

To identify common enrollment distribution strategies, Hanover Research first reviews the literature published by districts that experienced redistricting, school expansion, or new school construction in recent years. We synthesize information to highlight commonalities across the profiled districts, including specific examples of notable practices.

In addition, Hanover Research reviews demographic and enrollment data compiled by BASD and discusses the application of various enrollment rebalancing strategies (i.e., redistricting, school expansion, new school construction) within the district's specific context. For each practice, Hanover Research shares key criteria that profiled districts used to guide enrollment redistribution decisions. Overall, the criteria discussed in this section were selected based on three central characteristics:

- **Practicable:** The criteria were used by profiled districts.
- **Measurable:** The criteria are well-defined and measurable.
- **Replicable:** The criteria measure data also published by BASD.

The BASD data referred to in this section are drawn primarily from a 2012 feasibility study and a 2015 demographic analysis.[1]

REDISTRICTING

Redrawing zoning boundaries is a common approach employed by school districts to rebalance enrollments. The following section discusses key components of redistricting, including the decision-making process, key considerations, and implementation.

[1] [1] "Boyertown Area School District-Wide Feasibility Study." EI Associates, August 2012. http://www.boyertownasd.org/cms/lib07/PA01916192/Centricity/Domain/4/2012_District-WideFeasibilityStudy-NoBldgPlans.pdf
[2] "An Updated Analysis of Demographics and Housing and Related Activity and Projects of Public School Enrollments in the Boyertown Area School District 2014-15." Pennsylvania Economy League, February 19, 2015. http://www.boyertownasd.org/cms/lib07/PA01916192/Centricity/Domain/4/PEL%20-%20Boyertown%20Area%20SD%20FINAL%20%20Report%20-%20February%202015.pdf

DECISION-MAKING PROCESS

When considering redistricting, districts take deliberate steps to gather information and soliciting community input. For example, Figure 1.1 presents the process employed at Albemarle County Public School District.

Figure 1.1: Albemarle County Public Schools Redistricting Timeline

DATE	EVENT
April 2, 2015	School Board authorizes the establishment of a Redistricting Advisory Committee, composed of a member of the Long-Range Planning Advisory Committee, an equity and diversity representative, and two representatives from each feeder pattern
April 28, 2015	Redistricting Advisory Committee holds first meeting
May 5, 2015	Redistricting Advisory Committee holds second meeting
May 12, 2015	Redistricting Advisory Committee holds third meeting
May 18, 2015	Redistricting Advisory Committee holds first **community meeting** – presents three options
May 26, 2015	Redistricting Advisory Committee holds fourth meeting
June 2, 2015	Redistricting Advisory Committee holds second **community meeting** – presents two options based on input gathered from first community meeting
June 9, 2015	Redistricting Advisory Committee holds fifth meeting
September 15, 2015	Redistricting Advisory Committee holds sixth meeting
September 22, 2015	Redistricting Advisory Committee holds seventh meeting
September 29, 2015	Redistricting Advisory Committee holds third **community meeting** – presents final option
October 6, 2015	Redistricting Advisory Committee holds eighth meeting – makes recommendation to Superintendent
October 22, 2015	Superintendent makes recommendation to School Board
November 5, 2015	School Board holds **public hearing**
November 12, 2015	School Board votes on recommendation
Spring 2016	Families affected by boundary changes participate in tours, meetings with principals and faculty, and involvement in parent activities at the new school
August, 2016	New attendance zones go into effect

Source: Albemarle Public Schools[2]

When discussing boundary changes, many districts seek to solicit community input. For instance, Fairfax County Public Schools (FCPS) policy requires that the Superintendent meet with the sending and receiving school communities and consult with the School Board prior to adjusting school boundaries.[3] An FCPS evaluation found that communities are generally open to flexible, creative solutions to capacity challenges.[4]

[2] [1]"Albemarle Schools to Present Redistricting Proposals." NBC29 Charlottesville, VA, May 28, 2015. http://www.nbc29.com/story/29063242/albemarle-schools-to-present-redistricting-proposals [2] "Redistricting Advisory Committee." Albemarle Public Schools. https://www2.k12albemarle.org/acps/division/superintendent/redistricting/Pages/Current-Projects.aspx

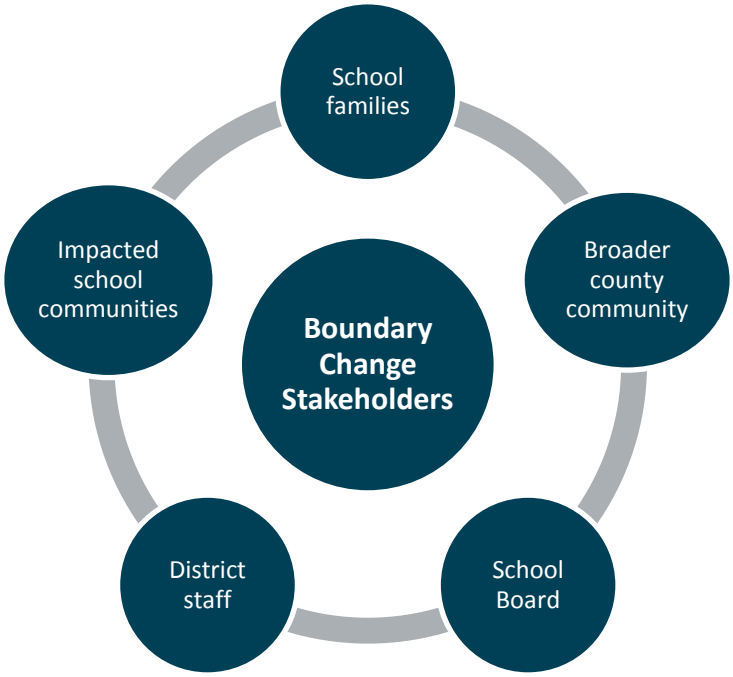
[3] "School Board Policy 8130." Fairfax County Public Schools. http://www.fcps.edu/fts/planning/fairfaxlanier/policy8130.pdf

[4] "Facilities Planning Advisory Council Annual Report Executive Summary." Fairfax County Public Schools, 2015. p. 17. http://www.fcps.edu/fts/planning/fpac/reports/annual/schoolyear2014-15.pdf

To gather diverse stakeholder input, districts often create committees to lead enrollment rebalancing efforts, including redistricting. These committees may include district administrators, school administrators, and parent representatives. At Stafford County Public Schools (SCPS), the redistricting committee included voting members such as the Assistant Superintendent for Operations, a demographic planner, a pupil transportation staff member, and a student services staff member as non-voting committee members.[5]

Similarly, Arlington Public Schools (APS) held a community meeting, conducted a community survey, and held Parent Teacher Association (PTA) meetings to engage the affected communities in a proposed boundary change.[6] Below, Figure 1.2 displays the various stakeholders APS sought to engage in boundary change processes.

Figure 1.2: Boundary Change Stakeholders



Source: Arlington Public Schools[7]

After gathering information and community feedback, district administrators and leaders (e.g., School Board members) evaluate potential boundary change options and reach a final

[5] "Overcrowding Concerns at Widewater and Winding Creek Elementary Schools." Stafford County Public Schools, November 18, 2014. p. 9. http://stafford.schoolfusion.us/modules/groups/homepagefiles/cms/120789/File/Demographic%20Planning/WES%20Redistricting%20Committee%20Presentation%2011-18-14.pdf?sessionid=e482f85b507b4853308989559e701d4a

[6] "Elementary Boundary Process: Framework and Update on Community Process." Arlington Public Schools, October 4, 2012. p. 2. http://www.apsva.us/cms/lib2/VA01000586/Centricity/Domain/110/FrameworkPresentation.pdf

[7] Ibid., p. 12.

decision. At Portland Public Schools' (PPS), for instance, the decision-making process for enrollment balancing is as follows:[8]

- The Enrollment and Transfer Department Director makes a recommendation to the Superintendent;
- The Superintendent makes a final recommendation to the Portland School Board; and
- The Portland School Board makes a final decision.

KEY CONSIDERATIONS

Districts tend to consider boundary changes for the following reasons:[9]

- Relieve facility overcrowding (if school expansion is not possible);
- Avoid underuse of buildings;
- Make effective use of new or existing space;
- Better relate program resources to needs; and/or
- Reduce operating costs.

PPS lists the following benefits and drawbacks of redistricting as an enrollment redistribution measure, presented in Figure 1.3.

Figure 1.3: Benefits and Drawbacks of Redistricting

Advantages	Disadvantages
✓ Doesn't destabilize special programs ✓ Only applies to new students (in most situations) ✓ Predictable set of criteria for decision	× Actual impact can vary from projection × Takes years to implement fully × Historic allegiance to existing boundaries × Requires forum to air biases

Source: Portland Public Schools[10]

Often, the primary factor in the decision-making process is the extent of enrollment imbalances within the district. To assess this, PPS staff members analyze enrollments each year for each school in comparison with the enrollment targets. Schools the staff identify as

[8] "Frequently Asked Questions about PPS District-Wide Boundary Review." Portland Public Schools. http://www.pps.k12.or.us/files/enrollment-transfer/DBRAC-Flowchart-04.pdf

[9] [1] "School Board Policy 8130," Op. cit., p. 2.
[2] "Boundaries." Arlington Public Schools, November 1, 2012. http://www.apsva.us/cms/lib2/VA01000586/Centricity/Shared/school%20board%20policies/30-genadmin/30-2.2-boundaries.pdf

[10] Content taken verbatim from "School Enrollment Change Options." Portland Public Schools. http://www.pps.k12.or.us/files/enrollment-transfer/enrollment_change_options.pdf

either under-enrolled or overcrowded "are prioritized for enrollment balancing actions, including boundary changes, program moves, and school consolidations."[11]

However, districts differ in their thresholds for enrollment imbalances. As one example, schools in PPS with enrollment that is consistently at least 75 students below the target size are likely to receive students from schools with over 100 percent utilization.[12] On the other hand, the FCPS Facilities Planning Advisory Council advises that the district consider boundary changes for schools with less than 95 percent or greater than 110 percent utilization through the next five years.[13] An FCPS evaluation found that creative principals and school administrators can successfully absorb some excess student enrollment (up to about 120 percent capacity) without major impacts on instructional space; however, over-enrollment has more immediate impacts in other areas such as cafeteria capacity, transportation safety, and after-school care.[14]

Regardless of threshold differences, districts typically adhere to specific criteria to determine which situations require boundary changes and publicize those criteria to the larger district community. Publicity is important; an FCPS evaluation, for example, found that the district needs to be transparent and definite about what triggers boundary adjustments and the timing of those adjustments.[15] The FCPS Facilities Planning Advisory Council recommends the following criteria for evaluating boundary changes:[16]

- Any schools with capacity, as identified in the latest Capital Improvement Plan, less than 95 percent or greater than 110 percent utilization through the next five years;
- Any schools that share a border with a school that meets the above criteria;
- Any schools that are planned for renovation;
- Any schools in which the percentage of students who receive free- and reduced-price lunch exceeds 40 percent;
- Any schools for which capacity projects past the next five years exceed 10 percent of projected capacity;
- Any schools that are currently or projected to be more than 100 percent utilization, in which reducing programs (e.g., advanced academic programs, special education support, foreign language immersion, Title 1) would reduce capacity by more than 20 percent;
- Any schools in which the school boundary straddles a geographic or physical boundary;
- Any schools that include an "attendance island" population;

[11] "2013 Enrollment Balancing Priorities." Portland Public Schools, November 13, 2012. p. 1. http://www.pps.k12.or.us/files/enrollment-transfer/2013_Enrollment_Balancing_Priorities.draft_1.pdf
[12] Ibid., p. 2.
[13] "Facilities Planning Advisory Council Annual Report Executive Summary," Op. cit., p. 19.
[14] Ibid., p. 17.
[15] Ibid.
[16] Bulleted text taken verbatim from Ibid., p. 19.

- Any schools that contain a contiguous residential community that is split between two schools;
- Any schools in which students travel on a bus more than 30 minutes on average in each direction;
- Any school in which more than 50 percent of the base population are bused;
- Any school in which students are bused, but there is a school within walking distance (i.e., one mile for elementary school) from their home;
- Any school for which capital improvement is planned, and is adjacent to a school that is greater than 110 percent or less than 85 percent utilization; and
- Any school where the students' lunch hour begins earlier than two hours after the start of school and less than two hours before the school day ends.

According to PPS, boundary changes work best when nearby schools are overcrowded or under-enrolled, and offer similar programs, services, and feeder patterns. Ideally, boundary changes will not cause transportation challenges.[17] PPS policy states, "The Board acknowledges and values neighborhood school stability; however, it also recognizes the need to maintain flexibility to adjust neighborhood school boundaries in response to changes in the broader community."[18] Figure 1.4 displays the factors the board considers when making a decision on which enrollment balancing actions to pursue.

Figure 1.4 PPS School Boundary Change Considerations

Stable Feeder Pattern
▪ Allow as many students as possible to continue together from one school level to the next. ▪ Have each K-5 school preferably feeding one and no more than two middle schools, and each K-8 or middle school preferably feeding one and no more than two high schools.
Diverse Student Body Demographics
▪ Aim to more closely reflect the broad range of language, cultural, and socio-economic backgrounds of the district's student population. ▪ Consider the different learning needs of the student body.
Compact Boundaries
▪ Promote safer routes to schools by limiting the number of natural and human-made physical boundaries students must cross to and from school and considering the availability of sidewalks and bicycle lanes. ▪ Promote a sense of community by keeping neighborhoods together as much as possible. ▪ Minimize transportation times and distances. ▪ Minimize the assignment of students away from schools in close proximity to their residence.
Optimal Use of Existing Facilities
▪ Minimize additional expenses for transportation and modification to facilities.

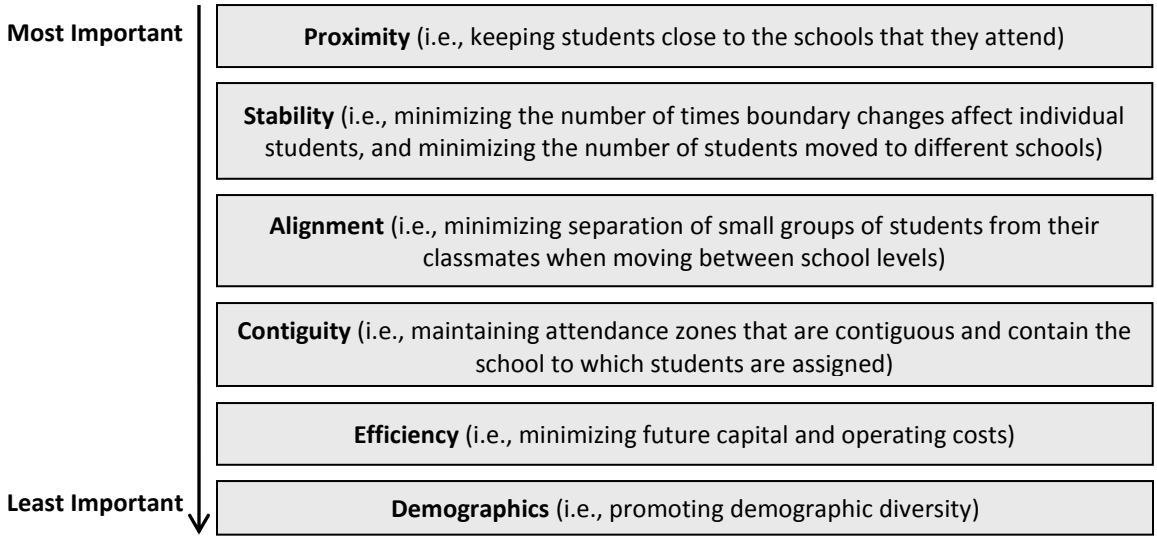
[17] "School Enrollment Change Options," Op. cit.
[18] "Student Assignment to Neighborhood Schools." Portland Public Schools, June 2008. p. 1. http://www.pps.k12.or.us/files/board/4_10_045_P.pdf

Stable Feeder Pattern
▪ Maximize conservation of natural resources such as natural gas, oil, gasoline and electricity. ▪ Ensure that projected student enrollment supports an adequate academic curriculum.
Stable Program and Enrollment in Surrounding Schools
▪ Establish attendance areas that will not necessitate frequent changes. ▪ Consider the potential program and enrollment impact at nearby schools.
Limited Impact on Students
▪ Affect the smallest number of students possible. ▪ Avoid causing students who have continued to reside in a particular geographic area to be affected by a boundary change more than once at a particular school level. ▪ Avoid separating small numbers of students from their classmates when they move to a school at the next level.

Source: Portland Public Schools[19]

APS has similar criteria to PPS in determining situations appropriate for redistricting. Figure 1.5 shows the APS School Board's criteria for boundary decisions, which community members ranked in order of priority as part of the boundary change process.

Figure 1.5: Arlington Public Schools Community-Ranked Criteria for Redistricting



Source: Arlington Public Schools[20]

[19] Content taken verbatim from Ibid., pp. 3–4.

[20] [1]"Arlington Public Schools School Board Meeting and Closed Meeting." Arlington Public Schools, March 21, 2013. p. 7. http://www.arlington.k12.va.us/cms/lib2/VA01000586/Centricity/Domain/176/2012-13/032113mi.pdf
[2] "Progressive Planning Model - Boundary Adjustments Decision Matrix." Arlington Public Schools. http://www.apsva.us/cms/lib2/VA01000586/Centricity/Domain/110/PPM%20Boundary%20Options%20Matrix%20-%20DC%20Edits.doc.

IMPLEMENTATION

Implementing boundary changes can take over a year; furthermore, some districts recommend that this process occur in phases to mitigate community impacts. The implementation process for boundary changes typically takes 10 to 18 months (see Figure 1.1 for an example timeline).[21] During this time, district administrators communicate the change to community members and prepare for the logistical elements of boundary changes, such as transportation and teacher assignments. FCPS policy suggests that boundary changes occur in phases when possible to minimize the impact on students and families. An example of how this occurs in practice is detailed on FCPS' website for a planned boundary change.[22]

Districts may make accommodations for current families to maintain stability. For example, both PPS and FCPS allow students entering final grade levels to remain at their current school.[23] Furthermore, PPS allows all current students and their siblings to continue at their current school through the highest grade, although an exception may be made when the boundary change is occurring to alleviate overcrowding.[24]

APPLICATION TO BASD

As discussed previously in this section, districts often accommodate shifting enrollment patterns by redistricting. In Figure 1.6, Hanover Research applies the decision-making criteria outlined in this section to BASD.

[21] [1] "Oh the Boundaries, They Are a Changin'." Connection Newspaper, February 27, 2007. http://www.connectionnewspapers.com/news/2007/feb/27/oh-the-boundaries-they-are-a-changin/ [2] Manning, R. "Portland Public Schools Consider Boundary Changes." OPB, January 14, 2015. http://www.opb.org/news/article/portland-public-schools-consider-boundary-changes/ [2] "North Arlington School Boundaries Could Change Again." WTOP, November 5, 2014. http://wtop.com/news/2014/11/north-arlington-school-boundaries-could-change-again/ [2] "Albemarle Schools to Present Redistricting Proposals," Op. cit. [2] "Overcrowding Concerns at Widewater and Winding Creek Elementary Schools," Op. cit., p. 20.

[22] "Update on Proposed Boundary Options." Fairfax County Public Schools, July 31, 2015. http://www.fcps.edu/news/boundaries/vienna-freedom-hill.shtml

[23] [1] "Student Assignment to Neighborhood Schools," Op. cit. [2] "School Board Policy 8130," Op. cit.

[24] "Student Assignment to Neighborhood Schools," Op. cit., p. 3.

Figure 1.6: Key Criteria for Redistricting

CONSIDER BOUNDARY CHANGES IF…	RELEVANT BASD METRICS
A school consistently enrolls 75 students below target size (95%, of the school's capacity)[25]	▪ Pine Forge Elementary School was at 79% of building capacity in 2011-12, enrolling 73 students below capacity. ▪ Washington Elementary School was at 87% of building capacity in 2011-12, enrolling 94 students below capacity ▪ Earl Elementary School was at 91% of building capacity in 2011-12; enrolling 30 students below capacity ▪ Boyertown Elementary was at 95% of building capacity in 2011-12, enrolled 32 students below capacity[26]
A school has more than 100% utilization through the next 5 years[27]	▪ Gilbertsville Elementary School was at 112% of building capacity in 2011-12 ▪ New Hanover-Upper Frederick Elementary School was at 106% of building capacity in 2011-12 ▪ Colebrookedale Elementary School was at 105% of building capacity in 2011-12[28]
Nearby schools are overcrowded or under-enrolled; offer similar programs, services, and feeder patterns; and boundary changes would not create transportation issues[29]	BASD may consider which elementary schools are contiguous and feed to the same junior high schools

SCHOOL EXPANSION

School expansions and renovations typically comprise investments in existing buildings. School expansions increase building capacity without the capital requirements of new building construction. School renovations modernize and improve existing structures to better serve students, teachers, and school staff.

Some districts expand their sites as an alternative to redistricting or new school construction. In support of this strategy, a Fairfax news article reports that many elementary schools have more land than is required, and therefore can add capacity through additions.[30] Indian River School District (IRSD) added 44 classrooms to schools across the district to address overcrowding and increasing school enrollments.[31]

[25] "2013 Enrollment Balancing Priorities," Op. cit., p. 2.
[26] "Boyertown Area School District-Wide Feasibility Study," Op. cit., p. 7.
[27] "2013 Enrollment Balancing Priorities," Op. cit., p. 2.
[28] "Boyertown Area School District-Wide Feasibility Study," Op. cit.
[29] "School Enrollment Change Options," Op. cit.
[30] Biele, J. "FCPS: New Elementary Schools Slated for Route 1." Mount Vernon Patch, January 3, 2013. http://patch.com/virginia/mountvernon/fcps-new-elementary-schools-slated-for-route-1
[31] "Planning for Future Growth." Indian River School District. http://www.irsd.net/growth

DECISION-MAKING PROCESS

Districts undergo a multi-step process before deciding to renovate and expand existing schools. Typically, this process begins with a feasibility study. Feasibility studies identify the needs of current buildings, and based on the nature and cost of the identified needs, district leaders may decide to move forward with renovations or expansion. For instance, Shaler Area School District (SASD) considered renovations to all primary school buildings to address facility quality in elementary schools. The district conducted a feasibility study, which determined that facilities "[were] small and restrictive in terms of providing adequate educational programs to meet current standards and requirements for special education, art, music, physical education, and technology."[32]

Once feasibility studies have been conducted, the School Board is typically involved in analyzing results and making a recommendation. SASD's Board heard several presentations from the firm that conducted the feasibility study before deciding to move forward with the renovations.[33] Similarly, Solanco School District's (SSD) Board reviewed the results of the district's feasibility study and recommended renovations to two elementary schools for the following reasons:[34]

- Overwhelming administrative support;
- Most cost-efficient option for transportation;
- Addresses security issues at the two elementary schools;
- Provides more flexibility in student scheduling; and
- The project can occur in phases.

KEY CONSIDERATIONS

Districts consider multiple factors when deciding to renovate or expand existing elementary schools, including but not limited to grade alignment, class size, school safety, and security. According to SASD's feasibility study, the determining factors in the selection of options for school renovations are "educational criteria such as grade alignment, special education programs, and class size philosophy."[35] Echoing this point of view, Puyallup School District (PSD) identified three elementary schools with structures that do not facilitate teacher collaboration or small-group instruction.[36]

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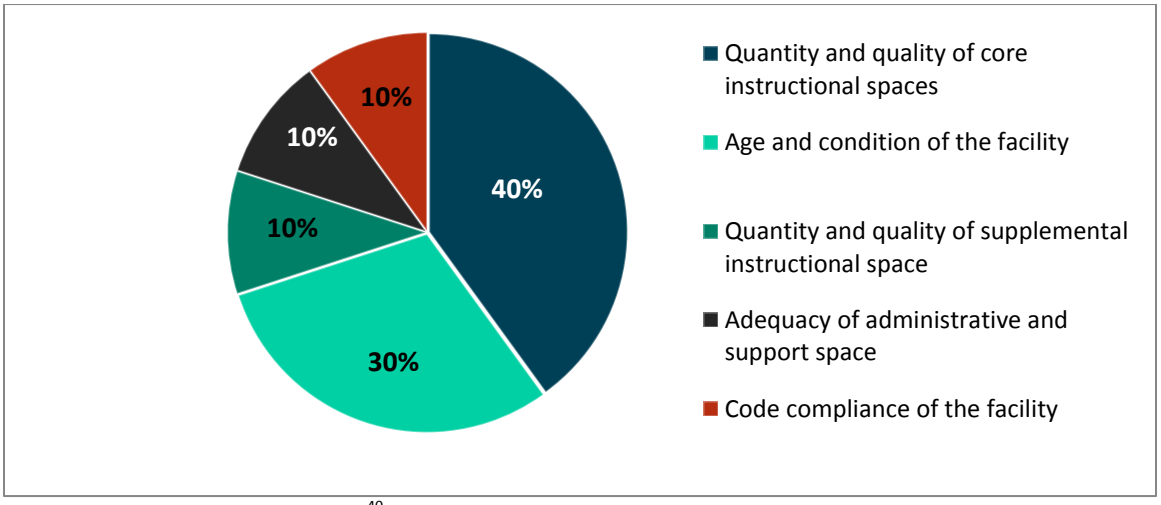
[32] "Facility Study for the Shaler Area School District." HHSDR Architects, August 2014. p. 2. http://www.sasd.k12.pa.us/Downloads/1%20Intro%20Overview.pdf
[33] "Feasibility Study." Shaler Area School District. http://www.sasd.k12.pa.us/FeasibilityStudy.aspx
[34] "Solanco Feasibility Study." Solanco School District, August 2010. http://www.solancosd.org/?page_id=379&doing_wp_cron=1446233164.2406919002532958984375
[35] "Facility Study for the Shaler Area School District," Op. cit., p. 2.
[36] "Bond Proposes Replacing and Expanding Three Schools." Puyallup School District, 2015. http://www.puyallup.k12.wa.us/pages/Puyallup_School_District/News/Bond_proposes_replacing_and_ex

Additional considerations include school safety, security, and non-classroom space (e.g., cafeterias).[37] However, cost also plays an important role. The estimated cost for renovations to SASD's five primary schools serving grades Kindergarten through 3 and one serving Grades 4 through 6 is $48,797,000 over 10 years. The proposed renovations add 13 classrooms across the six schools, as well as several libraries, gyms, and office renovations.[38]

FCPS uses additional criteria to evaluate the necessity of school renovations. FCPS established the criteria listed in Figure 1.7 for building renovations in 2008, after determining that the condition and age of the facility were inadequate indicators. Each FCPS school receives a score and resulting ranking, which enables FCPS to prioritize schools most in need of renovations. If the district identifies a significant capacity shortage that is likely to persist over time at a school, that school is likely to undergo capacity-enhancing renovations.[39]

Figure 1.7: FCPS Building Renovation Criteria



Source: Fairfax County Public Schools[40]

IMPLEMENTATION

School renovations tend to occur in phases, as students and staff must relocate during the time of construction. As an example, SASD's implementation plan calls for six years of renovations, over which five schools will vacate every 14 months.[41]

[37] Ibid.
[38] "Summary of Options." Shaler Area School District, August 27, 2014. p. 3. http://www.sasd.k12.pa.us/Downloads/5%20Option%201-3.pdf
[39] Proposed Capital Improvement Program." Fairfax County Public Schools, December 5, 2014. p. 14. http://www.boarddocs.com/vsba/fairfax/Board.nsf/files/9RS2U3647CAD/$file/Proposed%20CIP%202016-20_Final_Web.pdf
[40] "Proposed Capital Improvement Program." Fairfax County Public Schools, December 5, 2014. p. 24. http://www.boarddocs.com/vsba/fairfax/Board.nsf/files/9RS2U3647CAD/$file/Proposed%20CIP%202016-20_Final_Web.pdf
[41] "Facility Improvement Options." Shaler Area School District, March 27, 2015. pp. 13–14. http://www.sasd.k12.pa.us/Downloads/Facility%20Improv%20Options%205-27-15.pdf

APPLICATION TO BASD

The districts profiled in this report decided to renovate and expand elementary schools to improve facilities and provide additional space for growing elementary enrollments. In Figure 1.8, Hanover Research reviews BASD's data in relation to the decision-making criteria used by the districts profiled in this report.

Figure 1.8: Key Criteria for School Expansion

CONSIDER SCHOOL RENOVATIONS IF…	MEANING FOR BASD
The district identifies a significant capacity shortage at a school that is likely to persist over time[42]	Total K-5 enrollment in BASD is expected to fall in coming years. Actual 2014-2015 K-5 enrollment was 3,173 students, whereas projected enrollment for 2019-2020 is 2,887 students (91.0% of 2014-2015 enrollment).[43] However, enrollment growth and loss trends may not be evenly distributed throughout elementary enrollment areas. Previous data indicate that some elementary attendance areas were already near or over functional capacity in 2011-2012, whereas others were noticeably below capacity.[44] Moreover, some estimates also indicate that several elementary attendance areas, such as Gilbertsville and Washington, are expected to see substantially higher levels of dwelling unit construction (a limited but useful measure for assessing elementary enrollment growth) by 2023.[45]
The elementary school has enough land on which to expand[46]	Based on the feasibility study, each elementary school has a significantly greater number of acres than the current architectural area.[47]
Any of the following are inadequate: ▪ Quantity of core instructional spaces ▪ Quality of core instructional spaces ▪ Quantity of supplemental instructional space ▪ Quality of supplemental instructional space ▪ Administrative and support space ▪ Condition of the facility ▪ Code compliance of the facility[48]	The suggested renovations list code compliance improvements for each BASD elementary school.[49]

[42] "Proposed Capital Improvement Program," Op. cit., p. 7.
[43] "An Updated Analysis of Demographics and Housing and Related Activity and Projects of Public School Enrollments in the Boyertown Area School District 2014-15," Op. cit., pp. 5–21.
[44] "Boyertown Area School District-Wide Feasibility Study," Op. cit., p. 7.
[45] "An Updated Analysis of Demographics and Housing and Related Activity and Projects of Public School Enrollments in the Boyertown Area School District 2014-15," Op. cit., pp. 2–31.
[46] "Facility Study for the Shaler Area School District," Op. cit., p. 2.
[47] See "Boyertown Area School District-Wide Feasibility Study," Op. cit., pp. 92–207.

NEW SCHOOL CONSTRUCTION

Although constructing new schools is typically the most costly option for enrollment redistribution, at times it is necessary to meet enrollment demands. This section reviews the decision-making process, key considerations, and implementation of districts that constructed new elementary schools to increase the district's capacity.

DECISION-MAKING PROCESS

The decision to construct a new elementary school often occurs in conjunction with conversations about school expansion and redistricting. Indeed, new school construction mandates future redistricting to create a population for the new school. Thus, these decisions do not happen in isolation.

In considering the construction of new elementary schools, districts first evaluate the need for additional capacity. For example, the Fairfax County Public Schools (FCPS) School Board approved a new elementary school in an area in which surrounding schools were at 91.4 percent capacity, 99.6 percent capacity, and 112 percent capacity. Without additional construction, these schools were projected to be at 125 percent capacity, 122 percent capacity, and 143 percent capacity within four years.[50] The county passed a referendum of $21,169,348 to fund the construction of a new elementary school and held community meetings to discuss the matter further.[51] The opinions of one affected community are represented in Figure 1.9.

Figure 1.9: Benefits and Drawbacks of New Elementary School

Advantages:	**Disadvantages**:
✓ Provide a new elementary school with 400-700 seats to help ease overcrowding in nearby elementary schools ✓ Alleviate "attendance islands" (areas outside of a school boundary) and build stronger communities ✓ Accommodate future growth in the area ✓ Allow more students to walk and bike to school ✓ Reduce bus transportation time ✓ Offer wrap-around services to families	× Nearby schools will experience significant boundary changes × The school will definitely be a Title 1 school

Source: Stratford Landing Elementary PTA[52]

[48] "Proposed Capital Improvement Program," Op. cit., p. 24.
[49] See "Boyertown Area School District-Wide Feasibility Study," Op. cit., pp. 92–207.
[50] Biele, Op. cit.
[51] "2013 Bond Referendum." Fairfax County Public Schools, November 2013. http://www.fcps.edu/news/bond13.shtml
[52] "Region 3 Facilities Meetings for the Community." Stratford Landing Elementary PTA, February 2015. http://stratfordlanding.my-pta.org/Content/525_1/DocumentStore/0/CIP%20talking%20points%20SLES.pdf

The Shaler Area School District (SASD) buildings and grounds committee echoed these sentiments in their evaluation of the construction of a new elementary school. The committee comprised three School Board members, the District Superintendent, and the buildings and grounds supervisor.[53] The committee evaluated the costs and benefits of renovations to existing elementary schools as well as building new schools, and ultimately decided to move forward with the construction of a new elementary school.[54] SASD followed a multi-step process to reach its decision:[55]

- **Step 1:** Information Gathering
- **Step 2:** Facility Assessments
- **Step 3:** Program Assessments
- **Step 4:** Administration Input
- **Step 5:** Assessments of Facility Conditions
- **Step 6:** Develop Improvement Options
- **Step 7:** Develop Budget
- **Step 8:** Complete Report
- **Step 9:** Community Input
- **Step 10:** Final Plan and Financing Determination
- **Step 11:** Conduct Closing Hearings (if necessary)
- **Step 12:** Closing Determination (if necessary)
- **Step 13:** Select Implementation Plan
- **Step 14:** Complete Designs
- **Step 15:** Complete Construction

Districts may include community members in addition to district staff and School Board members in the decision-making process regarding new school construction. For example, the Superintendent of Arlington Public Schools (APS) created a community working group "to evaluate and analyze site options" for a new elementary school. [56] The working group includes:[57]

- Representatives of all South Arlington elementary school Parent-Teacher Associations;
- Representatives of South Arlington civic associations;
- "At-large" representatives, including students, recent APS graduates, and/or representatives of other community organizations; and
- Representatives from the Advisory Council on School Facilities and Capital Programs.

The APS working group members serve as ambassadors for the elementary school construction project and participate in community outreach and engagement efforts.[58] To

[53] "Buildings and Grounds Committee Meeting Number 111." Shaler Area School District, April 22, 2015. http://www.sasd.k12.pa.us/EventAttachments/Bldgs%20Grounds%20Agenda%204-22-153.pdf
[54] "Feasibility Study," Op. cit.
[55] Bulleted text taken verbatim from "Facility Study Presentation." Shaler Area School District, August 27, 2014. p. 3. http://www.sasd.k12.pa.us/Downloads/Facility%20Study%20part%2013.pdf
[56] "Working Group Process to Site a New Neighborhood Elementary School in South Arlington." Arlington Public Schools, May 2015. http://www.apsva.us/cms/lib2/VA01000586/Centricity/Domain/110/South%20Arlington%20elementary%20Working%20Group%20Charge%20052115.pdf
[57] Bulleted text taken verbatim from Ibid., p. 2.
[58] "Working Group Process to Site a New Neighborhood Elementary School in South Arlington," Op. cit.

solicit input and feedback from community members, the working group maintains a webpage and posts questions for comment. Notably, one question about preferences for the location of the new elementary school received 63 comments.[59]

KEY CONSIDERATIONS

In considering building new schools, district leaders evaluate the full scope of options available to address enrollment imbalances and overcrowding issues. Indeed, FCPS considers new school construction to address capacity deficits "that cannot otherwise be addressed through school boundary changes, program relocations, temporary facilities, or other internal building modifications designed to recapture underutilized or unused capacity."[60] To that end, FCPS only constructs new schools when existing facilities are not able to meet enrollment demands within a community or neighborhood.[61]

In evaluating the costs and benefits of school renovations versus new school construction, SASD compared the factors listed in Figure 1.10. These considerations represent the potential advantages and disadvantages of new school construction, many of which are applicable across districts.

Figure 1.10: Comparison of Renovations to New Building Construction

	ADVANTAGES	DISADVANTAGES
Renovations to existing building	▪ Lower cost ($15.9 million) ▪ Provides more green space ▪ Retains playing fields	▪ Loss of advantages of construction of new building ▪ Basement space for storage only
Construction of new building	▪ Consistent classroom sizes ▪ Allows for grade levels to be grouped together ▪ Separate cafeteria and multi-purpose spaces ▪ Provides more space for art, music, library, and the office ▪ Provides space above ceiling for ducted HVAC system ▪ Provides more parking spaces ▪ Provides better site circulation ▪ Increased security	▪ Higher cost ($23.7 million) ▪ Eliminates playing fields

[59] "South Arlington Working Group." Arlington Public Schools. http://www.apsva.us/Page/30469
[60] "Proposed Capital Improvement Program," Op. cit., p. 7.
[61] "Letter to the Fairfax County Public Schools School Board." Stratford Landing Elementary PTA, March 1, 2015. p. 3. http://stratfordlanding.my-pta.org/Content/525_1/DocumentStore/0/Region%203%20Capital%20Improvement%20Plan%20(CIP)%20Guiding%20Principles%20%20PDF.pdf

Source: Shaler Area School District[62]

Snoqualmie Valley School District (SVSD) decided that constructing a new elementary school was the best option due to a combination of factors: continued enrollment growth in the district, state funding to reduce class size at the elementary level, and state mandated full-day Kindergarten. These factors contributed to a need for additional space that only a new school could meet.[63]

IMPLEMENTATION

Constructing a new school is a time- and resource-intensive process that requires buy-in from multiple stakeholders, particularly when new school construction leads to redistricting. After FCPS School Board members approved the plan for construction of a new elementary school to alleviate overcrowding, the district's assistant superintendent noted that the district might need to undergo boundary changes and program changes in order to accommodate the new school.[64] In recognition of the significant community impact of these changes, FCPS is engaging in multiple community outreach efforts "to help the community to better understand the complexities of facilities decision-making in order to make the most efficient use of limited resources."[65]

Similarly, Bellingham Public Schools (BPS) administrators recognize the need for community outreach in the construction of new schools. According to the Assistant Superintendent of Business and Operations, "Whenever a new school is built, existing attendance boundaries must be revised to relieve existing overcrowding and create the new school's student body."[66] BPS created an Elementary Boundary Advisory Task Force of parents, community members, and staff to review and propose changes to the district's elementary attendance boundaries.[67]

APS is also engaging the community in the selection of the site for the new elementary school. The APS working group conducts research on potential sites for the elementary school, prioritizing sites already owned by APS and the county. The working group evaluates the following factors for each potential site:[68]

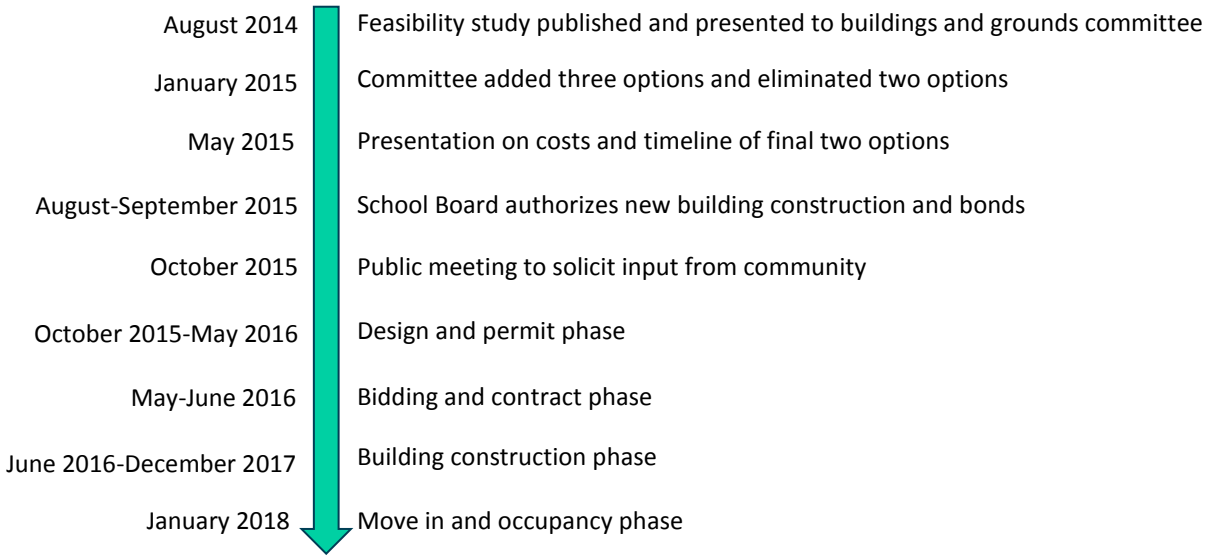
- The effect on overcrowding;
- The extent of anticipated boundary changes and/or program moves;

[62] Contents taken verbatim from "Rogers Primary School." Shaler Area School District, August 13, 2015. p. 9. http://www.sasd.k12.pa.us/Downloads/Rogers%20Primary%20presentation%208-13-15.pdf
[63] "Facility Planning & Construction." Snoqualmie Valley School District, 2015. http://www.svsd410.org/Page/5025
[64] Singh, R. "New Schools, Boundary Changes Possible." Connection Newspaper, January 8, 2015. http://www.connectionnewspapers.com/news/2015/jan/08/new-schools-boundary-changes-possible/
[65] "Facilities Planning Advisory Council Annual Report Executive Summary," Op. cit., p. 3.
[66] "Elementary Boundary Proposals Balance Enrollment, Prepare for Opening of New Schools." Bellingham Public Schools, 2008. http://bellinghamschools.org/news/2007-04/elementary-boundary-proposals-balance-enrollment-prepare-opening-new-schools
[67] Ibid.
[68] "Working Group Process to Site a New Neighborhood Elementary School in South Arlington," Op. cit., p. 2.

- Transportation;
- Cost; and
- Construction completion date.

Community input and site selection are only a few components of the overall timeline for new school construction. As an example, Figure 1.11 displays SASD's timeline for implementation of a new elementary school, which takes place over nearly four years.

Figure 1.11: Shaler Area School District Building Construction Timeline



APPLICATION TO BASD

In Figure 1.12, Hanover Research applies the decision-making criteria used by the districts reviewed in this section considering new school construction to the available data from BASD.

Figure 1.12: Key Criteria for New School Construction

CONSIDER NEW SCHOOL CONSTRUCTION IF…	MEANING FOR BASD
Existing facilities are not able to meet enrollment demands within a neighborhood[69]	Total K-5 enrollment in BASD is expected to fall in coming years. Actual 2014-2015 K-5 enrollment was 3,173 students, whereas projected enrollment for 2019-2020 is 2,887 students (91.0% of 2014-2015 enrollment).[70] However, enrollment growth and loss trends may not be evenly distributed throughout elementary enrollment areas. Previous data indicate that some elementary attendance areas were already near or over functional capacity in 2011-2012, whereas others were noticeably below capacity.[71] Moreover, some estimates also indicate that several elementary attendance areas, such as Gilbertsville and Washington, are expected to see substantially higher levels of dwelling unit construction (a limited but useful measure for assessing elementary enrollment growth) by 2023.[72]
Capacity deficits cannot otherwise be addressed through boundary changes, temporary facilities, or other internal building modifications[73]	▪ Gilbertsville Elementary School was at 112% of building capacity in 2011-12 ▪ New Hanover-Upper Frederick Elementary School was at 106% of building capacity in 2011-12 ▪ Colebrookedale Elementary School was at 105% of building capacity in 2011-12[74]
The cost is not prohibitive[75]	The feasibility study estimates a total project cost of $15,000,000 to build a new elementary school.[76]

[69] "Letter to the Fairfax County Public Schools School Board," Op. cit., p. 3.
[70] "An Updated Analysis of Demographics and Housing and Related Activity and Projects of Public School Enrollments in the Boyertown Area School District 2014-15," Op. cit., pp. 5–21.
[71] "Boyertown Area School District-Wide Feasibility Study," Op. cit., p. 7.
[72] "An Updated Analysis of Demographics and Housing and Related Activity and Projects of Public School Enrollments in the Boyertown Area School District 2014-15," Op. cit., pp. 2–31.
[73] Ibid.
[74] "Boyertown Area School District-Wide Feasibility Study," Op. cit., p. 7.
[75] See, for example "Working Group Process to Site a New Neighborhood Elementary School in South Arlington," Op. cit., p. 2.
[76] "Boyertown Area School District-Wide Feasibility Study," Op. cit., p. 375.

SECTION II: CONSIDERATIONS FOR ENROLLMENT REDISTRIBUTION

The following section reviews the extant research related to factors that may be impacted by enrollment redistribution, including class size, school size, and transportation. Please note that very few studies that examine these features employ rigorous experimental designs, such as random assignment. Therefore, it is difficult to establish a causal relationship between specific factors and student outcomes. However, the information presented here is able to describe the relationship between student outcomes and variables affected by enrollment redistribution – namely, class size, school size, and transportation.

CLASS SIZE

The recent research base suggests that class size does impact student outcomes, though the extent of this impact is under debate. Early research conducted on class size suggested that this factor had little significant impact on student outcomes. However, researchers critique these studies for their small sample size and poor methodological design.[77] More recently, studies identify benefits to small class size, such as improved achievement and high school graduation rates. However, some argue that the extent of this benefit is relatively small, especially given the high costs associated with reducing class size.

Tennessee's class size experiment, Project STAR, provides a valuable means to examine the impact of class size. The study randomly assigned 12,000 incoming Kindergarten students to either small classes (13-17 students) or large classes (22-26 students) for one, two, three, or four years.[78] Evaluations of the program have shown that participation in small classes in Kindergarten through Grade 3 has a positive impact on the following outcomes:[79]

- Reading achievement,
- Mathematics achievement, and
- Likelihood of graduating from high school.

These gains are especially evident for students from low-income homes.[80] Researchers suggest that, in order to realize the full benefits of smaller class sizes, students must spend at least three to four years in this environment.[81]

[77] Biddle, B. and D. Berliner. "What Research Says about Small Classes and Their Effects." WestEd, 2002. pp. 2-3. http://www.wested.org/online_pubs/small_classes.pdf
[78] Finn, J., S. Gerber, and J. Boyd-Zaharias. "Small Classes in the Early Grades, Academic Achievement, and Graduating from High School." Journal of Educational Psychology, 2005. p. 215. http://finance.tc-library.org/Content.asp?abstract=true&uid=1168
[79] Ibid., p. 220.
[80] Ibid.
[81] Ibid., p. 221.

A review of the literature sponsored by The Rockefeller Foundation reveals similar findings, namely that long-term exposure to small classes in the early grades provides advantages for students, and that gains are greater the longer students are exposed to small classes. Furthermore, the paper finds that gains are greater for students "who have traditionally been disadvantaged in education" and in classrooms smaller than 20 students.[82] The review attributes gains to improved teacher-student interactions, improved student conduct, and better classroom environments in small classes.[83]

Several studies find less substantial impacts of class size on student achievement. For example, a 2012 study examining the impact of class size on student achievement finds that a decrease of 10 students per class increases test scores by 0.04 to 0.05 standard deviations of the distribution of test scores. The study examined outcomes for students in Grades 3 and 5 across 460 schools in Minnesota.[84] A paper that professors at the University of Oregon and the University of Michigan presented at a Brookings Institute conference on the effects of school size and class size identified similar findings. The authors analyzed student data from the Early Childhood Longitudinal Study, Kindergarten Cohort of 1998-1999 (ECLS-K). The analysis finds that students in Kindergarten and Grade 1 who study in classes with fewer than 17 students achieve greater gains in literacy and mathematics skills when compared to students in larger classrooms (more than 25 students).[85] However, it should be noted that small class sizes were only marginally more beneficial than medium-size classrooms (between 17 and 25 students).[86]

These minimal gains lead some to identify class size reductions as an inefficient use of school resources. A paper published in the *Journal of Education Finance* assesses the cost-effectiveness of class size reduction in light of Florida's statewide initiative to reduce class sizes. The authors analyzed data from 1,734 elementary schools in Florida and used a multiple regression analysis to determine the effects of various inputs and the relative costs of interventions.[87] The analysis compared the cost of seven interventions required to achieve a two percent increase in student scores on the Florida state standardized test.[88] The analysis reveals that class size reductions (from the mean of 22.9 to the required 20.4) are the least cost-effective means of raising test scores.[89] The authors identify quality of instruction (defined as the percentage of teachers with advanced degrees and the ratio of

[82] Biddle and Berliner, Op. cit., p. 3.
[83] Ibid., p. 15.
[84] "Do Reductions in Class Size Raise Students' Test Scores? Evidence from Population Variation in Minnesota's Elementary Schools." Economics of Education Review, June 2012. http://www.sciencedirect.com/science/article/pii/S0272775712000180
[85] Ready, D. and V. Lee. "Optimal Elementary School Size for Effectiveness and Equity: Disentangling the Effects of Class Size and School Size." Brookings Institution, May 26, 2006. p. 1. http://www.brookings.edu/gs/brown/bpepconference/readylee_paper.pdf
[86] Ibid.
[87] Ilon, L. and A. Normore. "Relative Cost-Effectiveness of School Resources in Improving Achievement." Journal of Education Finance, 2006. p. 238. Accessed via EbscoHost
[88] Ibid., p. 251.
[89] Ibid., p. 249.

teachers to aides) as a more cost-effective intervention.[90] Figure 2.1 lists the interventions considered and their associated costs.

Figure 2.1: Costs of Various Educational Interventions to Achieve a 2% Gain in Standardized Test Scores

Most cost-effective

Least cost-effective

Intervention	Cost Per School
Expenditure per student	-$577*
Percentage of administrators	$16,284
Teachers per aide K-3	$87,435
Percentage of teachers with advanced degrees	$121,050
Teachers' average years of experience	$122,543
Percentage of instructional staff	$124,672
Average class size	$139,359

*Note: Per-student expenditures are highest for the lowest-income schools in Florida, so higher per-student expenditures are associated with lower student achievement.[91]
Source: Journal of Education Finance[92]

SCHOOL SIZE

New school construction and redistricting may reduce the number of students enrolled in certain schools in the district. The research base supports this practice, as the majority of studies on the topic identify a positive relationship between smaller schools and student outcomes. However, it should be noted that school size is often a representation of other factors, such as school climate, school composition, curricular and extra-curricular offerings, and teacher-student relationships, each of which affect student outcomes.[93]

A review of 57 empirical studies published between 1990 and 2009 identifies multiple benefits of smaller schools, especially for students who struggle in school or are from disadvantaged backgrounds. Key findings of the review are:[94]

- Studies consistently found that smaller elementary schools benefit the academic achievement of their students.
- Studies as a whole indicate that school size has a larger impact on the learning of disadvantaged and/or low-SES students than on the learning of advantaged or high-SES students.
- Though only six studies were located for [the] review of school size effects on student engagement, they are of quite good quality and provide entirely consistent evidence in support of the claim that smaller schools are associated with greater student engagement conceived of in several ways.

[90] Ibid., p. 251.
[91] Ibid., p. 250.
[92] Figure content adapted from: Ibid., p. 251.
[93] Stevenson, K. "School Size and Its Relationship to Student Outcomes and School Climate." National Clearinghouse for Educational Facilities, April 2006. p. 3. http://files.eric.ed.gov/fulltext/ED495953.pdf
[94] Bulleted text taken nearly verbatim from: Ibid., pp. 468-475.

The paper recommends that elementary schools with high populations of disadvantaged or struggling students enroll a maximum of 300 students, and that elementary schools with heterogeneous or high-SES populations enroll a maximum of 500 students.[95]

Other studies focusing on elementary school identify positive effects of smaller school sizes on student achievement. The previously referenced Brookings Institute study of ECLS-K data determines that Grade 1 students in small schools (fewer than 275 students) gain more literacy skills than students who attend large schools with enrollments of 800 or more.[96] Furthermore, the study identifies a linear relationship between school size and class size in Kindergarten and Grade 1, so reductions in school size may facilitate implementation of smaller class sizes.[97] However, researchers classify the relationship between elementary school size and student learning as "marginal" and note that the move from large schools to medium-sized schools (401 – 600 students) may offer the same benefits and be less costly than the shift to small schools.[98]

The National Clearinghouse for Educational Studies published a review of the research conducted in South Carolina on the relationship between school size and student academic performance and school climate. Four studies examine the elementary school level and reach similar conclusions regarding the impact of school size on student outcomes. Namely, the studies find negligible relationships between school size, student achievement, and school climate. However, several cite a small positive correlation between larger school enrollment and standardized test scores. Below is a summary of findings from each:

- One study notes a "small but significant" positive relationship between larger enrollment and the frequency a school was recognized for meeting or exceeding expected student performance. However, students receiving free and reduced price lunch experienced the opposite effect, succeeding more in smaller schools.[99]
- A second study finds a similar effect, with larger school size correlating positively with student scores on a statewide standardized exam but no relationship for students receiving free and reduced price lunch.[100]
- A third study of Grade 5 student achievement on the Metropolitan Achievement Test (MAT) does not find a significant relationship between school size and MAT scores in reading or mathematics.[101]
- The fourth study finds few significant relationships between school size and various school climate measures (teacher and student satisfaction with the learning environment, the social and physical school environment, and home-school relations; percentage of students identified as gifted and talented, on academic

[95] Leithwood, K. and D. Jantzi. "A Review of Empirical Evidence About School Size Effects: A Policy Perspective." *Review of Educational Research*, 2009. p. iii. Accessed via ProQuest.
[96] Ready and Lee, Op. cit., p. 1.
[97] Ibid., p. 17.
[98] Ibid., pp. 1, 16, 27.
[99] Stevenson, Op. cit., p. 2.
[100] Ibid.
[101] Ibid., p. 3.

plans, or on academic probation; percentage of pupils suspended, expelled, and retained in a given year; student attendance; percentage of teachers returning from the previous year; and teacher attendance).[102]

Though these findings seemingly contradict those from other studies, the researchers note the difficulty of disentangling the impact of school size from other key variables, such as socio-economic status.[103] Therefore, the results of these correlational studies should be interpreted with caution and do not necessarily supplant findings from studies with more rigorous methodologies.

TRANSPORTATION

Some enrollment redistribution methods, such as redistricting, may result in increased transportation times for students. The research base on transportation and student outcomes is much more limited than research examining the effects of class size or school size, and those studies that do exist are more than 10 years old. One of the first studies of transportation and student achievement was in the context of busing in the 1960s to achieve racial integration in schools. Studies from this era produced conflicting results. For instance, research comparing achievement data for children who were and were not bussed found no statistically significant differences among the groups apart from participation in extracurricular activities.[104] A challenging study published in 1973 found that, controlling for socioeconomic status, each hour of transportation time reduced student achievement scores by up to four points.[105]

Some common theories regarding transportation and student achievement include:[106]

- Increased transportation costs may force school districts to spend less money in other areas, such as instructional materials;
- Students and families who live further away from their schools may be less likely to engage in activities outside of school time; and
- Students with long transportation times may be less likely to take challenging courses if they feel they do not have adequate time to complete the homework.

These theories provide grounds for the argument that increased transportation time may have a negative impact on student academic achievement. However, the limitations of the

[102] Ibid.
[103] Ibid., pp. 2-3.
[104] White, D. "Does Busing Harm Elementary Pupils?" Phi Delta Kappan, 1971. As cited in Spence, B. "Long School Bus Rides: Their Effect on School Budgets, Family Life, and Student Achievement." Rural Education Issue Digest, 2000. http://files.eric.ed.gov/fulltext/ED448955.pdf
[105] Lu, Y.-C. and L. Tweeten. "The Impact of Busing on Student Achievement." Growth and Change, 1973. As cited in Spence, Op. cit.
[106] [1] Irish, L. "Shrinking Budgets Challenge Districts to Spend More in Classroom." Arizona Education News Service, March 11, 2014. http://azednews.com/2014/03/11/5295/ [2] Spence, Op. cit. [2] Fox, M. "Rural School Transportation as a Daily Constraint in Students' Lives." Rural Educator, 1995. http://eric.ed.gov/?id=EJ523557

extant research based – namely, lack of recent research – does not allow for any definitive conclusions in this realm. If this is a key area of interest to BASD, we suggest conducting subsequent primary and secondary research related to best practices in transportation route design and management to gain a fuller picture of enrollment redistribution and transportation.

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