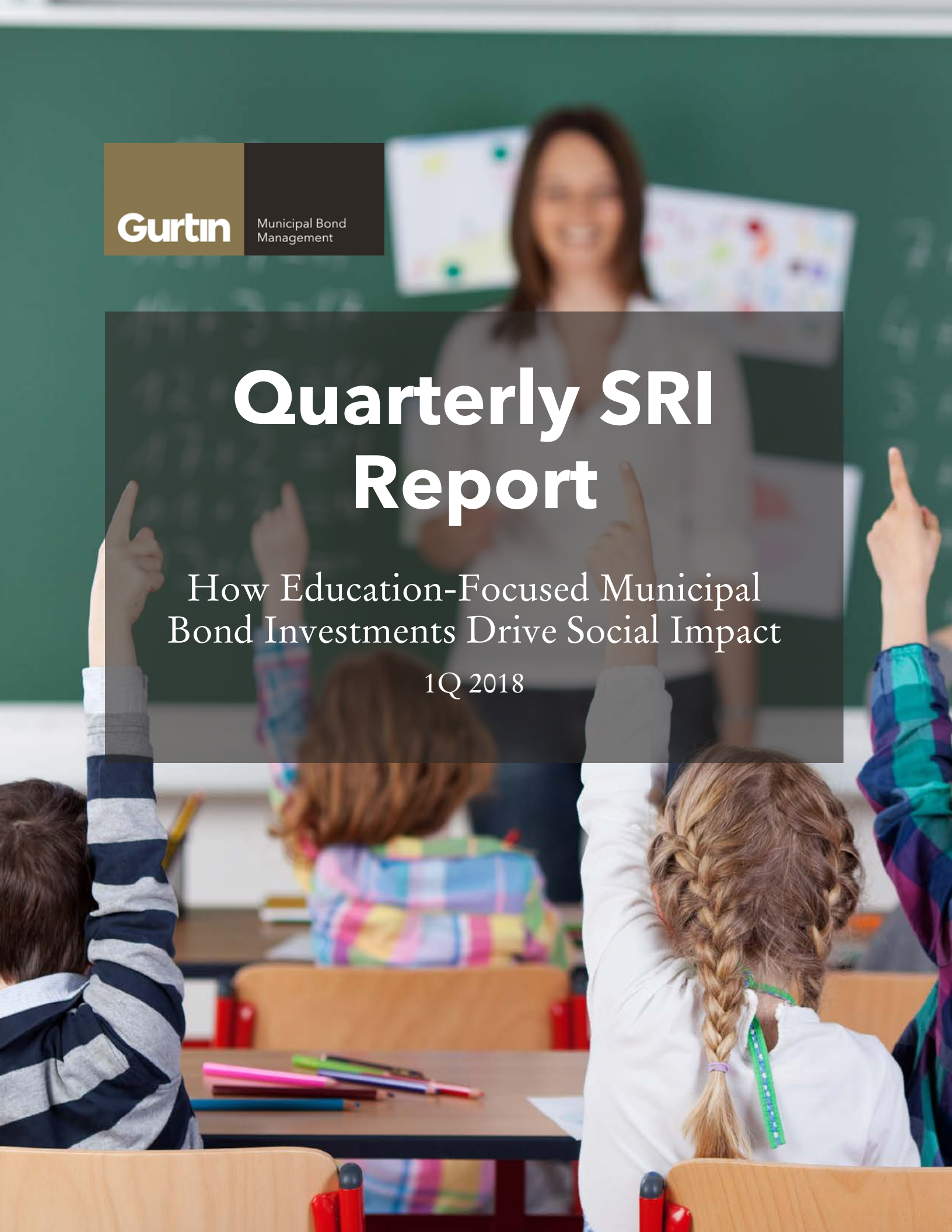

Gurtin Municipal Bond Management

Quarterly SRI Report

How Education-Focused Municipal Bond Investments Drive Social Impact

1Q 2018

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Executive Summary

The availability of municipal bonds to help fund the improvement of school facilities through either new construction or repairs is paramount to educational obligors' ability to meet the high costs associated with building or maintaining education infrastructure.

Furthermore, academic research has shown that improved school facilities correlate with better student achievement, independent of student socioeconomic status.

Despite research that demonstrates the value of investing in school facilities, state and local governments continue to underinvest in school districts' capital needs. Additionally, school facilities in already underserved communities are often the most impacted by this underfunding.

At Gurtin Municipal Bond Management (Gurtin), we aim to do our part in supporting education investment, both by our support of employees' pursuit of continuing or higher education opportunities and by the creation of our education-themed Municipal Social Advancement strategy, one of three areas of focus that investors in this strategy can choose. (The other two areas of focus under this strategy are the environment and communities.)

Through their municipal allocation under this strategy, which helps direct capital toward educational obligors, investors have an opportunity to support education projects throughout the United States.

In this, our inaugural quarterly article focusing on socially responsible investing (SRI), we explain how municipal bond investments in education can positively affect social outcomes.

Why Schools Issue Municipal Bonds

Before exploring why educational obligors issue municipal bonds, it is important to note that there are more than 100,000 K-12 public school facilities in the United States alone. In addition, K-12 public school facilities are the second-largest public infrastructure investment after transportation.[1]

School districts and other educational organizations issue bonds in the municipal bond market for a variety of purposes, typically to finance a new school building, to make significant repairs and improvements to existing buildings, or to refinance prior debt.

Educational obligors rely on the municipal bond market because, in many cases, it is the most affordable way to finance new school construction or major facility repairs. In essence, issuing bonds allows governing bodies to match the financing liability with the financed asset. (Given that new or improved school facilities tend to last upwards of decades, it makes sense to distribute the financing liability across decades as well). If not for their ability and willingness to borrow in the municipal bond market, school districts would

[1] Filardo, Mary. (2017). *State of Our Schools: America's K-12 Facilities*. Center for Green Schools. http://centerforgreenschools.org/state-our-schools

be limited to financing projects with only the use of current revenue and cash on hand or more standard bank mortgage loans, which as shown in Figure 1 below, could be cost prohibitive.

Figure 1: New School Construction Costs by School Type

	Number of Students	Building Cost ($MM)
Elementary Schools	624	$16.3
Middle Schools	612	$26.5
High Schools	1,000	$45.0

Source: School Planning & Management's 20th Annual School Construction Report. Data reflects national median.

Impact of *Improved* School Facilities on Educational Outcomes

Research points to correlations between improved school facilities and better student achievement. A report entitled, "A Decade of U.S. Public School Construction," summarizes the importance of school quality well:

> "Recent research has confirmed what many educators have held as common sense — the quality of a school facility has an impact on students' experiences and ultimately on their educational achievement. … When school facilities are clean, in good repair, and designed to support high academic standards, there will be higher student achievement, independent of student socioeconomic status."

Source: Growth and Disparity: A Decade of U.S. Public School Construction. 21st Century School Fund.

In fact, a previous literature review conducted by the 21st Century School Fund found that all but one study discovered a positive correlation between student achievement and school facility conditions.[2]

Impact of *Deteriorating* School Facilities on Educational Outcomes

While the aforementioned studies point to a relationship between improved school facilities and better educational outcomes, there is also additional research that points to a correlation between inadequate learning environments and poor student performance.

In particular, the Center for Innovative School Facilities identified three specific components of school facilities that have measureable impacts on student performance: lighting, air quality, and noise pollution.[3]

Lighting

The quality and quantity of light that students receive can affect students' achievement, health, and behavior.

[2] Filardo, Mary, Vincent, Jeffrey, Sung, Ping, and Stein, Travis. (2006). *Growth and Disparity: A Decade of U.S. Public School Construction*. https://eric.ed.gov/?id=ED498100

[3] Hatfield, Molly. (2011). *School Facilities and Student Achievement.* Center for Innovative School Facilities. https://www.osba.org/-/media/Files/Resources/Improving-Education/CISF-Policy-Brief.pdf?la=en

For example, Heschong (2002) found that students in elementary school classrooms with the most daylight showed a 21-percent improvement in learning rates compared to students in classrooms with the least amount of daylight.[4]

In addition, Nicklas and Baily (1997) found similar results, noting that students who attend day-lit schools outperform students in non-day-lit schools by 5 percent to 14 percent.[5]

Air Quality and Thermal Comfort
Airborne pollution and thermal discomfort have well-documented negative effects on concentration and attendance.

In fact, the U.S. Environmental Protection Agency, or EPA, (2013) found that asthma is a leading cause of absenteeism, accounting for nearly 13 million missed school days per year; furthermore, poorly maintained educational facilities can serve as environmental triggers for asthmatic students.[6]

Studies have also found that the optimal temperature range for learning seems to be between 68 and 74 degrees Fahrenheit. In one study, male undergraduates performed significantly worse as temperatures became more extreme in either direction.[7]

Noise
Noise pollution from facility equipment, poor acoustics, adjacent classrooms, and nearby facilities can negatively affect student performance and fulfilment.

For instance, Evans (2006) found that noise exposure affects teachers as well as students: fatigue, irritation, and lost teaching time (from noisy interruptions) are common complaints from teachers in loud classrooms.[8]

Furthermore, several studies have found that poor school acoustics lead to problems with long-term memory, reading ability, teacher effectiveness, and student attitudes.[9]

[4] Heschong Mahone Group. (2002). *Re-Analysis Report: Daylighting in Schools, Additional Analysis.* https://www.pge.com/includes/docs/pdfs/shared/edusafety/training/pec/daylight/DL_Schools_Re-analysis.pdf

[5] Nicklas, M. and G. Bailey. (1997) *Analysis of the Performance of Students in Daylit Schools*. Proc. of the 1997 Annual Conference, ASES.

[6] United States Environmental Protection Agency. (2010) *Managing Asthma in the School Environment*. https://www.epa.gov/sites/production/files/2013-08/documents/managing_asthma.pdf

[7] Cheryan, Sapna, Sianna A. Ziegler, Victoria C. Plau, and Andrew N. Meltzoff. (2014) *Designing Classrooms to Maximize Student Achievement*. Policy Insights from the Behavioral and Brain Sciences. Vol. 1(1) 4-12. http://journals.sagepub.com/doi/pdf/10.1177/2372732214548677

[8] Evans GW. (2006). *Child Development and the Physical Environment.* Annual Review of Psychology. 57:423-51

[9] See, for examples: Crandell CC, Smaldino JJ. (2000). *Classroom Acoustics for Children With Normal Hearing and With Hearing Impairment.* Language, Speech, and Hearing Services In Schools. 31:362-370.; Hygge S, Evans GW, Bullinger M. (2002). *A Prospective Study of Some Effects of Aircraft Noise on Cognitive Performance in Schoolchildren*. American Psychological Society. 13(5):469-474.; Klatte M, Hellbrück J, Seidel J, Leistner P. (2010) *Effects of Classroom Acoustics on Performance and Well-Being in Elementary School Children: A field study*. Environment and Behavior. 42(5):659 -692.; Stansfeld SA, Matheson MP. (2003). *Noise Pollution: Non-auditory effects on health*. British Medical Bulletin. 68(1):243-257.; Stansfeld SA, Berglund B, Clark C, et al. (2005). *Aircraft and Road Traffic Noise and Children's Cognition and Health: A cross-national study*. Lancet. 365:1942-1949.

Inadequate conditions in the classroom have also been linked to increased teacher turnover and negative health impacts for both students and staff within the buildings.[10]

Is the U.S. Sufficiently Investing in School Facilities?

Unfortunately, in spite of what we believe are the benefits of improved school facilities (via either repairs or new school construction), state and local governments appear to be underinvesting in school facilities. In their 2017 infrastructure report card, the American Society of Civil Engineers (ASCE) found that 24 percent of public school buildings were in fair or poor condition, and 53 percent needed improvements to be classified as in "good" condition.[11]

Despite these needs, according to the 2016 State of Our Schools: America's K–12 Facilities report, the U.S. faces a projected national aggregated annual shortfall of $46 billion in school facilities funding for K-12 facilities (based on historic annual spending and recommendations by the Center for Green Schools).[12] While financing arrangements can vary by state, 12 states provide no support for K-12 construction, requiring educational obligors to finance any needed construction themselves.[13]

A 2016 report by the Center for Green Schools further demonstrates this lack of sufficient funding for school facilities.[14] In the report, the Center for Green Schools established spending standards for educational facilities. The center calculated these standards by first approximating a facility's lifespan as well as the cost of building a new facility, also known as the current replacement value (CRV). Based on these calculations, the center defined the standard required maintenance and operations (M&O) costs as 3 percent annually of the CRV. [15]

In addition, capital construction in the form of capital renewals alterations, and deferred maintenance is added to the total standard required M&O costs.[16]

Reflecting these maintenance and capital construction standards, Figure 2 below shows the Center for Green Schools' findings that states and K-12 educational obligors in only seven states are adequately funding school maintenance and operation and capital construction investments while states and K-12 educational obligors in 43 states are funding less than

[10] Baker, Lindsay, and Bernstein, Harvey. (2012). *The Impact of School Buildings on Student Health and Performance*. McGraw-Hill Research Foundation and The Center for Green Schools. http://www.centerforgreenschools.org/sites/default/files/resource-files/McGrawHill_ImpactOnHealth.pdf.

[11] American Society of Civil Engineers. (2017) *2017 Infrastructure Report Card*. https://www.infrastructurereportcard.org/wp-content/uploads/2017/01/Schools-Final.pdf

[12] Althen, Aline. (2016) *Infographic: 2016 State of Our Schools: America's K-12 Facilities*. Center for Green Schools. http://centerforgreenschools.org/infographic-2016-state-our-schools-americas-k-12-facilities

[13] Ibid.

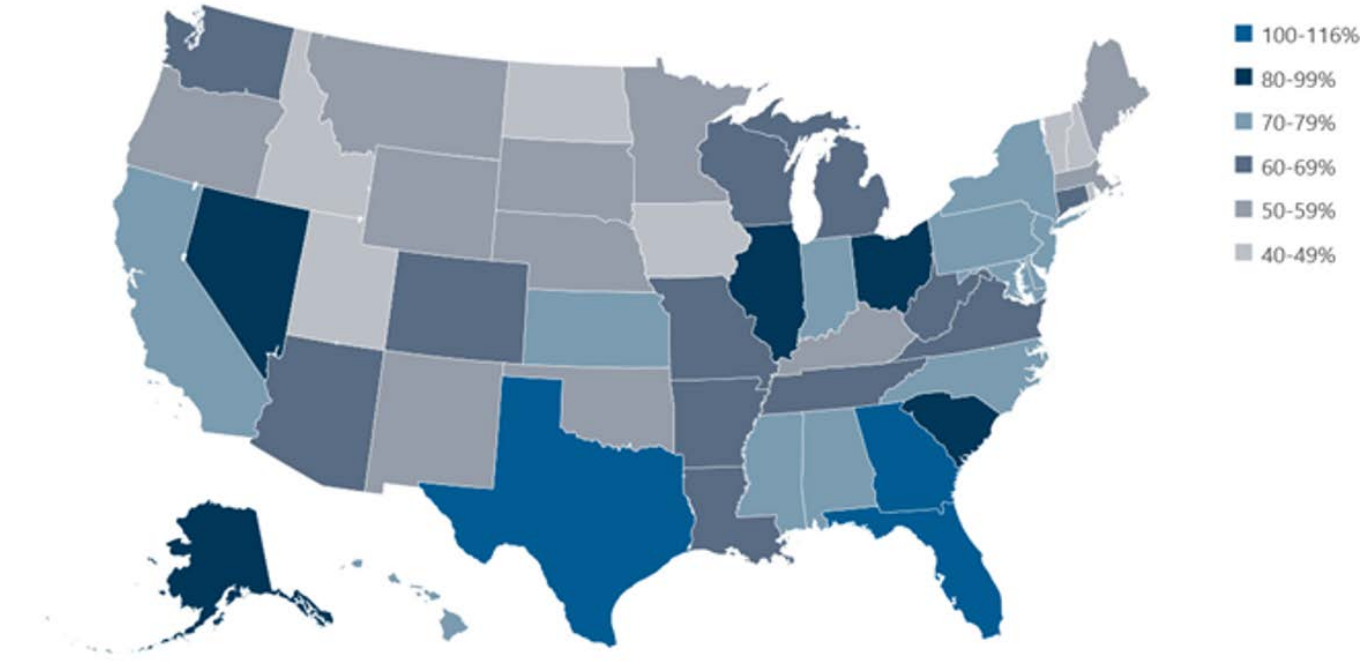
[14] Filardo, Mary. (2017). *State of Our Schools: America's K-12 Facilities*. Center for Green Schools. http://centerforgreenschools.org/state-our-schools

[15] Ibid.

[16] Ibid.

80 percent of the required M&O and capital construction investment.[17]

Figure 2: Percentage of Maintenance & Capital Construction Standards That States Met in FY 2015



Source: Center for Green Schools

[17] Ibid.

Furthermore, not all school districts invest in the repair of existing facilities and construction of new facilities at the same rate or to the same degree: While public school districts collectively spent $52 billion on capital construction and renovations in fiscal year 2015,[18] representing an average of just $1.07 per U.S. elementary-secondary student, previous research has found that the most impoverished districts typically spend the least amount per student while the wealthiest districts spend the most amount per student.[19]

Reports also showed that minorities and impoverished students were more likely to attend school facilities in the worst conditions.[20]

This underfunding was one impetus behind Gurtin's creation of the education area of focus of our Municipal Social Advancement strategy, through which investors can help direct capital toward educational obligors.

Gurtin Investments in Education Bonds

Through the education area of focus of our Social Advancement strategy, we invest in education bonds that fund projects in K-12 schools, community colleges, and higher-education facilities. The following are two examples of the obligor-securities that we believe our municipal allocations help improve.

Case Study No. 1: El Centro Elementary School District, California

El Centro Elementary School District, Calif., serves nearly 4,900 students in grades pre-kindergarten through eighth grade in Imperial County, about 30 miles north of the California-Mexico border.

We purchased a portion of the District's Election of 2016, Series A bonds for portfolios managed under our Social Advancement strategy. The bonds were issued to fund the first phase of a variety of capital projects intended to modernize and improve classroom facilities across the District's nine elementary schools and two middle schools.

The District planned to replace inadequate temporary classrooms with permanent ones, modernize outdated classrooms and other school facilities, improve student access to computers and technology, and construct additional school facilities to alleviate overcrowding.

The community in which the District — and the beneficiary of these bond proceeds — exists has a high 28-percent poverty rate, and an estimated 30 percent of parents with students in the District work in agricultural-related jobs. In the 2016-2017 school year, 55 percent of the District's students were considered low-income, English learners, and/or foster youth.[21]

[18] U.S. Census Bureau. (2017). *2015 Annual Survey of School System Finances.* https://www.census.gov/content/dam/Census/library/publications/2017/econ/g15-aspef.pdf.

[19] Filardo, Mary, Vincent, Jeffrey, Sung, Ping, and Stein, Travis. (2006). *Growth and Disparity: A Decade of U.S. Public School Construction*. https://eric.ed.gov/?id=ED498100

[20] Ibid.

[21] Official Statement. El Centro Elementary School District. General Obligation Bonds, Election of 2016, Series A.

Case Study No. 2: Del Mar College, Texas
Del Mar College in Corpus Christi, Texas, served more than 12,000 students in 2016-2017, an 8 percent increase from the prior year. The College's students primarily come from Corpus Christi and the surrounding areas.

We purchased a portion of the Community College's Series 2017 bonds that were issued to fund the first phase of the development of the new south campus.

Del Mar decided to add a new campus in the south part of Corpus Christi to give greater access to classes to an underserved part of its community as well as to expand some of its programs that were reaching capacity for enrollment at existing facilities. The south campus will house in-demand programs in the science, technology, engineering, and mathematics (STEM) fields — such as in engineering and biotechnology — as well as house architecture and a new culinary-arts facility that would replace outdated, 50-year old culinary-arts facilities.

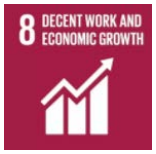
About one-third of students are non-traditional students, 25 years old or older, and nearly 60 percent of full-time beginning students receive Pell grants, which are generally granted to students from low-income families as defined by the federal government.[22]

Supporting the United Nations' Sustainable Development Goals

On September 25, 2015, the United Nations formally adopted 17 sustainable development goals (SDGs), as a call to action for all member nations to work together to achieve global goals — such as ending poverty, protecting the planet, and ensuring prosperity for all — by 2030. We aim to support the goals through our Municipal Social Advancement strategy, as well as through our practices as a company, and have identified the goals that our educational investments support (as shown in Figure 3).

Figure 3: SDGs We Support through Our Education Area of Focus

Goal 4: Ensure inclusive and quality education for all and promote lifelong learning.



Goal 8: Promote inclusive and sustainable economic growth, employment and decent work for all.

Goal 17: Revitalize the global partnership for sustainable development.

Source: http://www.un.org/sustainabledevelopment/sustainable-development-goals/

Helping to Advance Positive Outcomes, Without Compromising Performance

At Gurtin, we believe that investors do not need to sacrifice performance when targeting bonds that fund projects with an educational, environmental, or community-related purpose. In order to maintain performance, we evaluate all bonds that we consider for our Municipal Social Advancement strategy for interest rate risk and to ensure they meet our rigorous credit

[22] Official Statement. Del Mar College District. Limited Tax Bonds, Series 2017.

thresholds, which encapsulates an assessment of material environmental, social, and governance (ESG) risks. Given the material nature of the ESG risks, we believe it is crucial to incorporate them into the credit analysis process not just for our Social Advancement strategy, but also for *all* our municipal strategies.

Our Social Advancement strategy then takes it one step further to look at the projects funded by bond proceeds. Through this strategy, our credit research team thoughtfully analyzes and filters bond purposes, to find bonds that fund meaningful projects that could lead to positive outcomes for communities, education, and the environment. In this way, we aim to ensure that thematic investments achieve their dual purposes of achieving competitive risk-adjusted returns while helping to make a real-life social impact.

Please feel free to contact us at research@gurtin.com for additional information about the information presented in this article.

To learn more about the performance history of municipal bonds managed under our Social Advancement strategy — or to enroll in the strategy — please contact us by calling (858) 436-2200 or by emailing ESG@gurtin.com.

Check out our Twitter @followGurtin and LinkedIn for news, information, and market updates.

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