

EXECUTIVE SUMMARY FACILITIES ASSESSMENT & SCHOOL FACILITY PLANNING



July 27, 2018

**Detroit Public Schools
Community District**
3011 West Grant Blvd.
Detroit, Michigan 48202





INTRODUCTION

OHM Advisors, in partnership with ALPHA Facilities Solutions and Centric Design Studio, was retained by the Detroit Public Schools Community District (DPSCD), to work in conjunction with various DPSCD departments and facilities, to support the District's vision of ensuring the children of Detroit are granted the best possible learning environment to thrive academically.

The goal of this project was to

1. Assess the current state of the nearly 12.2 million square feet of school facility portfolio for condition, investment dollar needs, as well as a straight forward comparison of needs in order to make them continue to operate as intended
2. Develop a Facility Condition Index based reporting of the findings, along with a reporting of needs, projected out ten years into the future
3. Provide an assessment of the District's parking lots and grounds for potential hazards and investment needs
4. Evaluate the state of the facilities in relation to school capacities in an effort to provide insights on investment priorities
5. Present the results of findings to key District stakeholders

This project resulted in the development of several reports, including

- Facility assessment reports for each of the schools identified in the project portfolio (including a summary of their condition state as well as potential investment needs)
- Playground assessment reports for each of the schools in the project portfolio, that included such facilities
- A spreadsheet based database containing the data behind the findings

The intent of this executive summary is to summarize key takeaways from this project and the resulting details contained in the above-stated reports and data.



FACILITY CONDITION ASSESSMENT

Appendix A to this executive summary contains an executive level detail on the overall findings and investment needs for the project facility portfolio, which is broken down further into elementary, middle, and high school groupings. This section summarizes overall findings applicable for the facility portfolio as a whole.

Overall, the following observations have been made on the facilities:

1. *Overall Condition State of the Facilities*
Many facilities in the DPSCD were generally found to be in fair to poor condition. The common age of many systems exceeded their expected useful life; however, some renovations have taken place since the original construction of the buildings.
2. *Site Elements*
Significant amount of deterioration has been observed on the asphalt paving surrounding the facilities. The state of the concrete varies widely.
3. *Structural State of Facilities*
Evidence of structural issues were observed at Edward 'Duke' Ellington at Beckham Academy, Moses Field Center, Mumford High School/Mumford Academy and Palmer Park Preparatory Academy. An engineering study is recommended to evaluate the issues further.
4. *Roofing System*
The roofing system was observed to be in fair condition overall. However, many of the systems have exceeded their useful life and are showing signs of deterioration, damage, and wear, which causes damage to the spaces below.
5. *Exterior Finishes*
Brick veneers and doors were observed to be in good condition. However, windows and seals were found to be in poor state and in need of attention.
6. *Interior Finishes*
In general, interior finishes were in fair to poor condition. Paint, floors, and casework were observed to be in good condition and ceilings, fixed seating, as well as toilet rooms were found to be in poor condition. Some floor tiles, ceiling tiles, tile adhesives, drywall, duct wrap, ceiling textures sprays, pipe wrap and boiler insulation installed prior to the 1990s may contain asbestos.
7. *Heating, Ventilation, and Air Conditioning (HVAC)*
These systems, although well maintained and still operational, have exceeded their statistical service lives and may not be the most efficient heating and cooling units.
8. *Electrical System*
It was observed that these systems were either recently upgraded or original to the building.
9. *LAN System*
Although most of the school facilities include updated communications and security systems, many lack the modern network capacity and infrastructure to support the internet, WI-FI and technological advances in the education industry.
10. *Elevators Freight*
Elevators appear to be used as passenger elevators and many regular elevators appear to either not be used or out of service.



11. Accessibility & Compliance with the Americans with Disabilities Act (ADA)

A number of deficiencies were noted. In a majority of the schools, there is insufficient striping and signage to define accessible auto and van parking. Throughout the District, additional ramps and curb cuts should be added to the site elements to provide adequate access to the facility for students and teachers. Most entrances/exits and associated paths of travel are ADA compliant with minor deficiencies observed. Exterior doors should be modified to improve accessibility with proper locksets, widths, and automatic openers. Multi-story facilities that do not have an elevator or working ADA compliant elevator are required to be modified with the addition of an ADA compliant elevator. One of the most significant ADA deficiencies observed were in the existing toilet rooms. Existing toilet rooms should be modified to ensure adequate turning space is available; accessible hardware, fixtures, audible and visual alarms are present; and proper signage is posted indicating ADA compliance. In most of the older schools, current drinking fountains should either be modified or replaced to ensure they meet compliance standards in height, access, and operability.

PLAYGROUNDS CONDITION ASSESSMENT

Playgrounds were visually inspected using a process referencing the Consumer Product Safety Commission's Handbook on Public Playground Safety and the U.S. Access Board Summary of Accessibility Guidelines for Play Area. The inspections were categorized into

- General
- Surfacing
- Maintenance and General Hazards
- Ancillary / Playground Equipment Specific
- General Accessibility Considerations

In general, it was observed that the following school playgrounds were in poor condition:

- Wayne Elementary
- Neinas Elementary
- Detroit Lions Alternative
- Davison Elementary
- West Side Alternative for Girls

Furthermore, approximately 91% of the playgrounds were found to be in good to fair condition, with approximately 8% needing immediate attention.



Playground / Field Visual Inspection Checklist

Name of Center: _____ Date & Time Completed: _____
Completed by: _____ Approved By: _____
NOTE: Document findings with pictures as applicable

Category	YES	NO	Rating of Condition: 1 – 4 1=Excellent; 2=Good; 3=Fair; 4=Poor	Comments
General Inspection				
G-1: Playground area free of visible litter, debris, and/or tripping hazards				
G-2: Fencing around playground does not appear to have gaps or holes				
G-3: Locks at fence gates appear to not be damaged				
G-4: Visible water ponding / apparent drainage issues in playground area				



FACILITY CONIDTION INDEX (FCI) RATING

Facility Condition Index (FCI) is a benchmarking process by which to quantify a facility's physical condition at a specific point in time. The FCI is calculated using the ratio between the expired system replacement costs (costs associated with systems that are beyond average service life) and the current replacement value (CRV) of the building. Expired system replacement costs consist of work that is necessary to restore the facility to a condition equivalent to its original (like new) state.

Facility Condition Index (FCI)	Qualitative Rating	General Description
0 - 10	Good	Facility new or well maintained (very good condition)
11 - 20	Fair	Facility is satisfactorily maintained (good condition)
21 - 30	Poor	Facility is under maintained (fair condition)
31 - 60	Unsatisfactory	Facility should be considered for significant renovation or possible replacement (poor condition - facility is still safe but more cost effective to Replace than to maintain)

Even though there are no industry established standards for how to contextualize FCI values, the project team, along with DPSCD staff input, established that FCI values of 20 and below would constitute fair condition. FCI values higher than 60 would suggest that the investments needed are more than 60% of the total replacement value of the facility.

Figure 1a below shows the variation of FCI in the DPSCD project portfolio. Figure 1b, on the other hand, provides an example of the variation of FCI values for the elementary school asset portfolio.

Figure 1a: Variation of FCI across School Facilities Portfolio

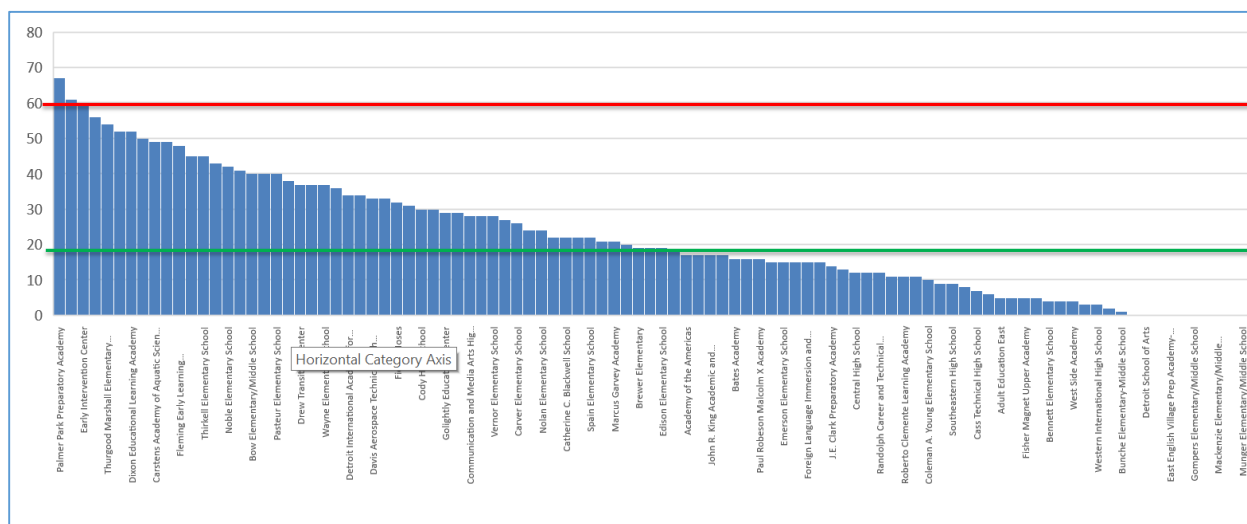
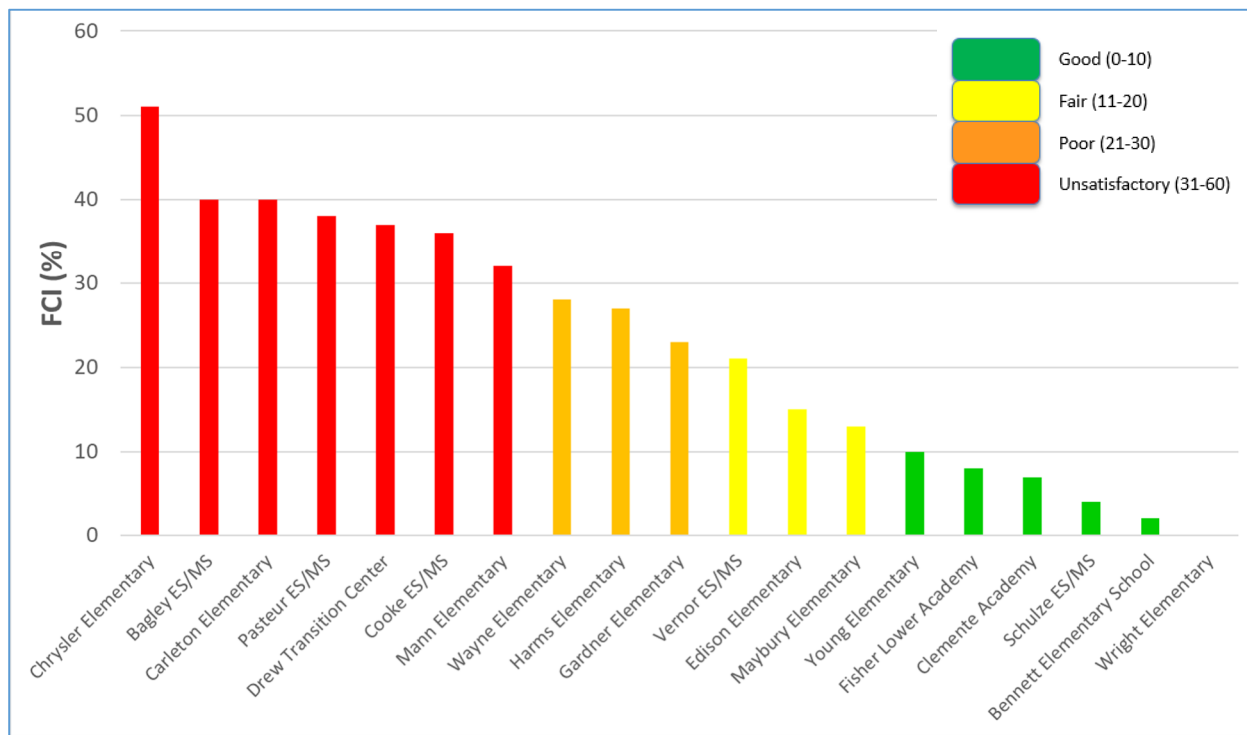




Figure 1b: Variation of FCI for Elementary Schools



CAPACITY INDEX (CI) APPROXIMATION

Upon obtaining school enrollment approximations from the DPSCD, our team compared facility space against available spacing standards in an effort to determine what we referred to as a

School District Area Per Student Analysis Prepared by David Losinski OHM Advisors 3/7/2018				Capacity Index Legend 0%-20% Good 20%-40% Fair > 40% Poor < 0% Unsatisfactory				
School	Grade Levels	Floor Area	Students	Area/Student	Standard	Totals/Std	Difference	Capacity %
Academy of XYZ	1P-8	97,929 SF	921	106.33 SF		118,247 SF	(20,318) SF	-20.7%
	1P-5		605		116.58	70,531 SF		
	6-8		316		151.00	47,716 SF		
School Facility 01	1P-8	43,343 SF	253	171.32 SF		33,419 SF	9,924 SF	22.9%
	1P-5		184		125.00	23,000 SF		
	6-8		69		151.00	10,419 SF		
Schol Facility 02	1P-6	54,317 SF	416	130.57 SF		53,222 SF	1,095 SF	2.0%
	1P-5		369		125.00	46,125 SF		
	6		47		151.00	7,097 SF		

Capacity Index. In essence, this index is a ratio between available per student capacity and capacity anticipated as per guideline standards.

Overall, on average, the school facilities appear to show an approximately 65% utilization (as compared with planning level facility space capacity benchmarks).



BENCHMARKING

In an effort contextualize the state of the DPSCD facilities with school assets in other parts of the country, two sets of comparisons were performed, as illustrated in Figure 2a and 2b. Figure 2a compares the average FCI values of the DPSCD facilities against the national database that our team (ALPHA) has been compiling for similar size and make up of school districts in the country that our team has performed assessments for. Figure 2b, on the other hand, represents a qualitative comparison of the DPSCD data against data published by the Institute of Education Science (2013) on the condition of our country's public school facilities.

Overall, it can be observed that, even though, comparatively speaking, the DPSCD facilities are in fair condition, there is a higher portfolio of school facilities in the unsatisfactory category, i.e. FCI index values greater than 30.

Figure 2a: FCI Benchmarking Against Facilities with Similar Makeup to the DPSCD

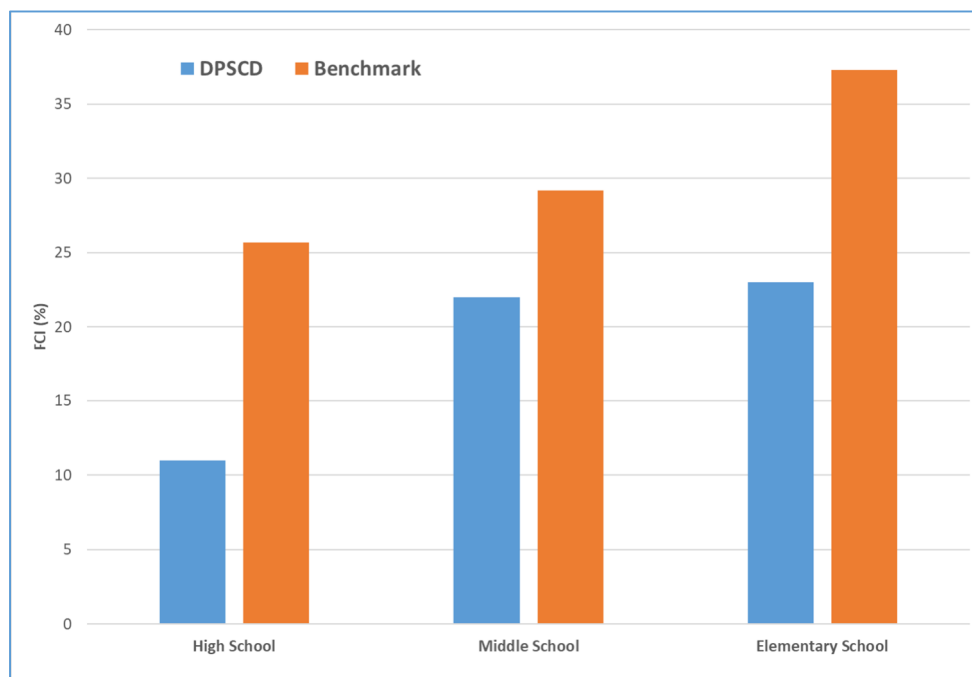
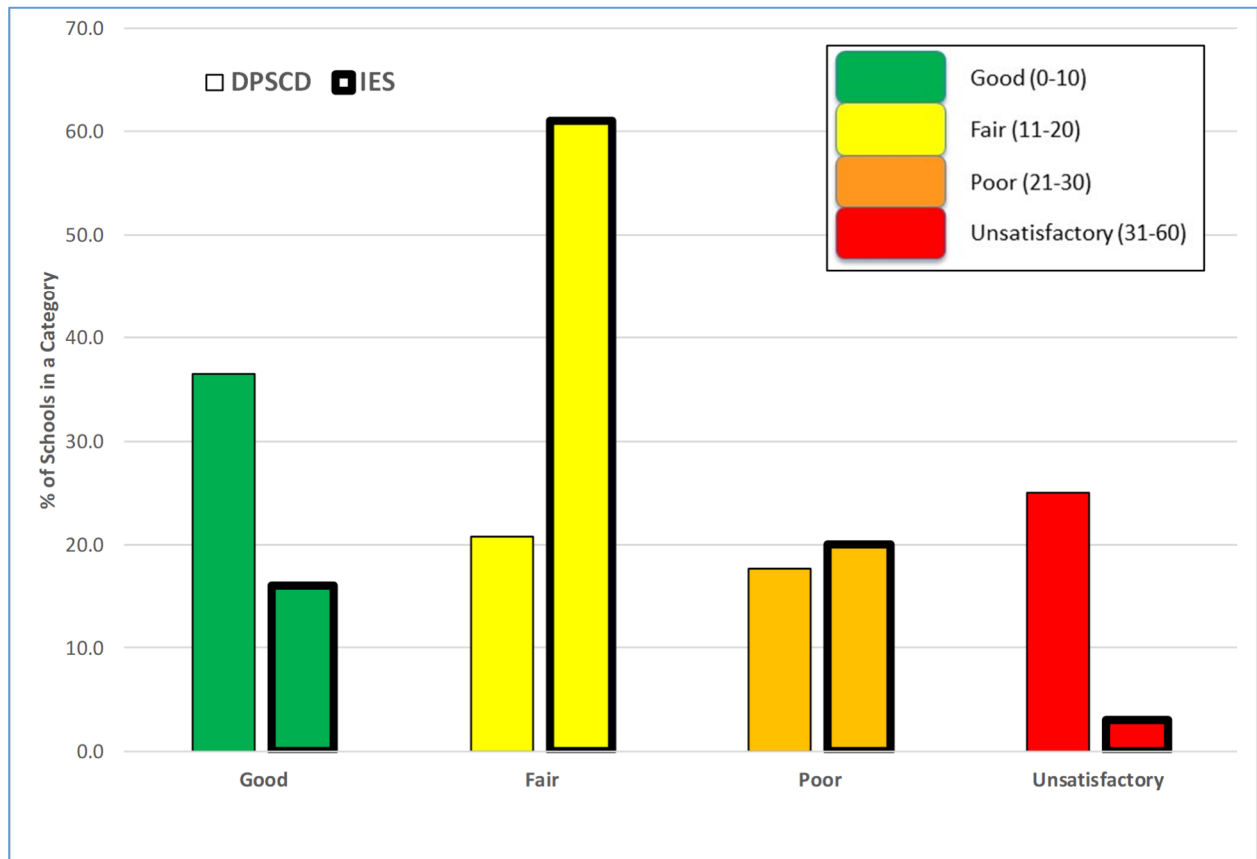




Figure 2b: FCI Benchmarking Against Institute of Education Science Data (Published 2013)

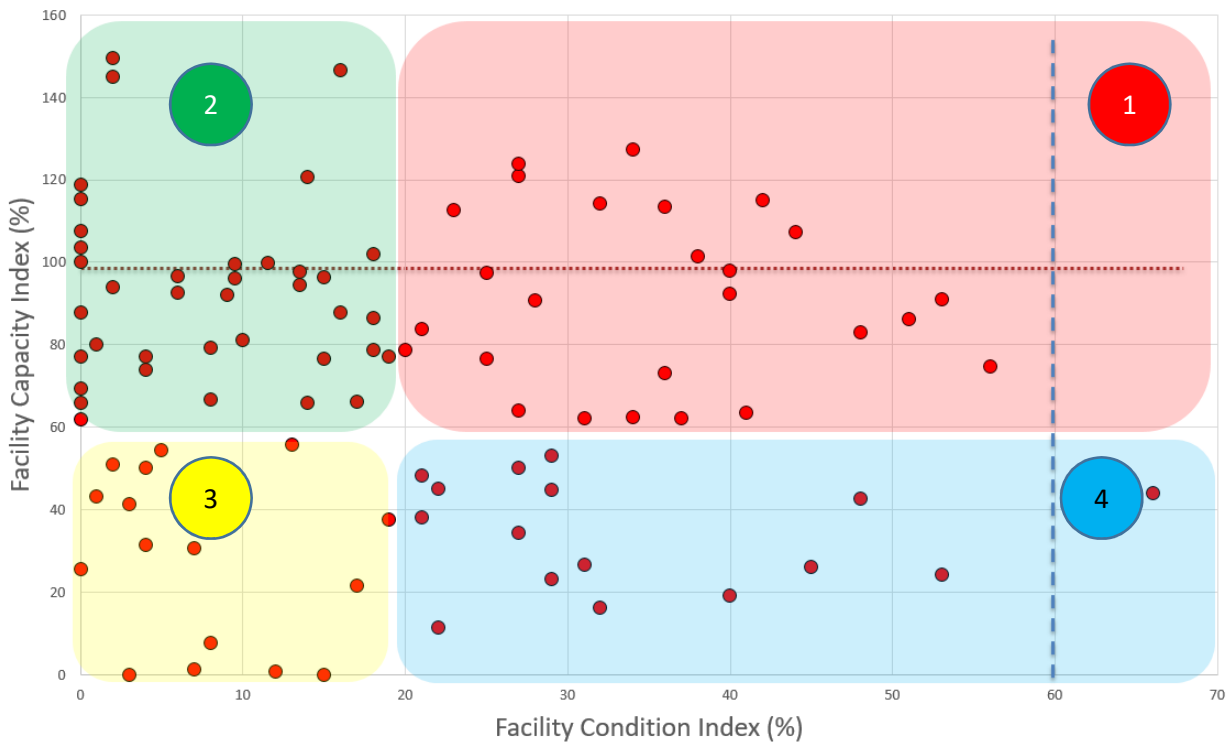


Our team combined the FCI and CI indices into a portfolio risk matrix for further benchmarking and evaluation. The results of this evaluation are shown in Figure 3. In this figure, the benchmark classifications have been identified as follows:

- 1 High Utilization / High Facility Failure Risk
- 2 High Utilization / Lower Facility Failure Risk
- 3 Lower Utilization / Lower Facility Failure Risk
- 4 Potentially Underutilized Facility with High Failure Risk



Figure 3: Condition vs Capacity Risk Matrix Based Benchmarking



As can be observed in Figure 3, a number of facilities are potentially over their facility capacity along with a number of underutilized facilities with large investment needs (as compared to their current day replacement values).



CURRENT AND FORECAST INVESTMENT PROJECTIONS

Our team performed a 5 year as well as 10 year forecasting of anticipated needs. Table 1 below summarizes our findings. As can be seen, the anticipated current needs are approximately \$0.5 billion and likely to grow three fold in the next ten years, to nearly \$1.5 billion, if no action is taken.

Table 1: Anticipated Current and Forecast Investment Needs Approximations

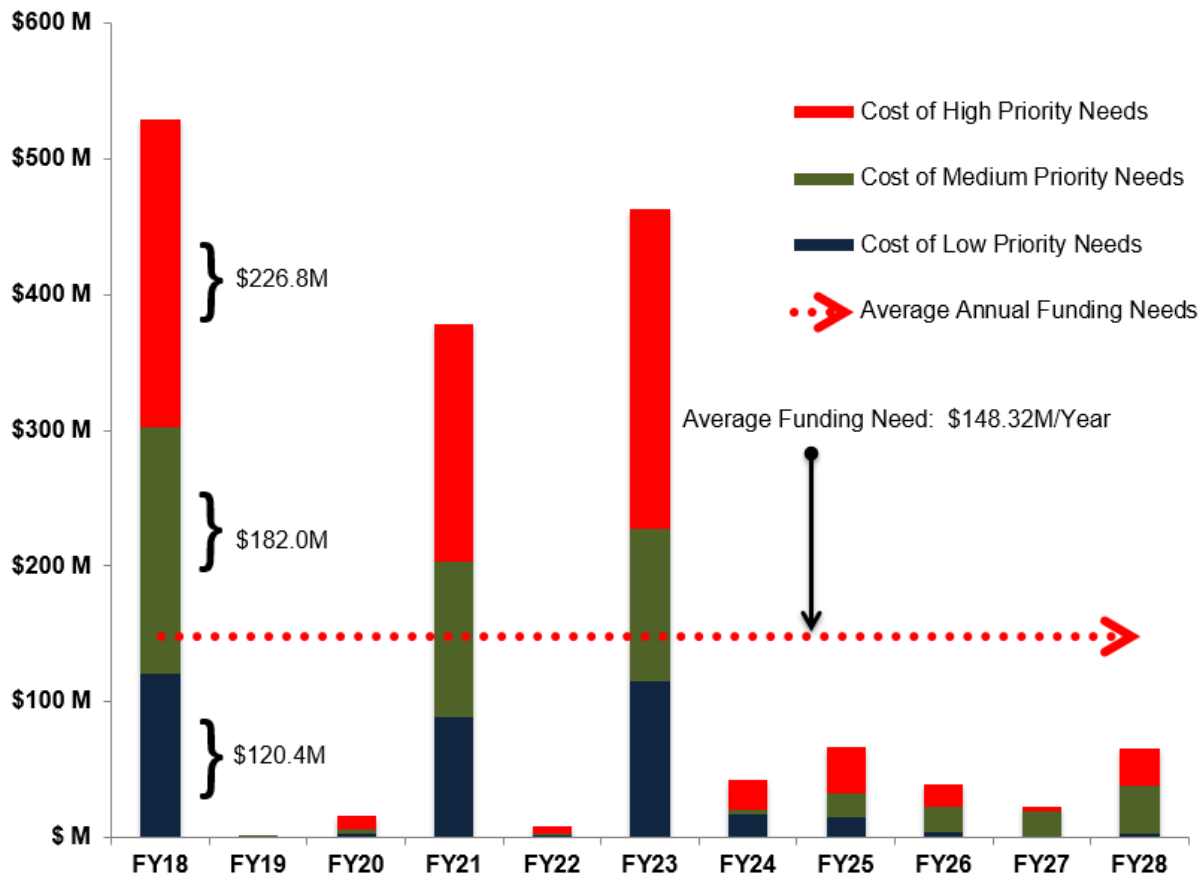
Group	Area (SF)	Total Needs 2018	Current Replacement Value	2018 FCI %	Total Needs 2023	Forecast Replacement Value	2023 FCI %
Elementary School	2,377,329	\$103,447,778	\$461,039,809	22	\$269,570,215	\$534,471,502	50
High School	5,775,496	\$179,545,074	\$1,432,940,809	13	\$598,309,905	\$1,661,171,126	36
Middle School	4,394,119	\$189,174,302	\$1,011,208,357	19	\$529,902,076	\$1,172,267,628	45
SUBTOTAL	12,546,944	\$472,167,154	\$2,905,188,975	16	\$1,397,782,195	\$3,367,910,256	42
Site and Infrastructure (excluded from FCI calculations)		\$36,127,751			\$83,547,840		
Abbreviated Accessibility		\$13,957,907			\$16,181,041		
Portables		\$4,391,845			\$5,091,352		
TOTALS	12,546,944	\$526,644,657	\$2,905,188,975		\$1,502,602,428	\$3,367,910,256	

Figure 4 illustrates these investment needs, spread across a ten year planning horizon, also categorized by priority investment assets. At the onset of this project, our team, along with the DPSCD key staff categorized assets into investment priorities, the details of which can be found in Appendix A of this executive summary. In essence, high priority assets (major building systems) included heating and cooling systems, security and communication systems etc. Medium priority assets (site and support building systems) included windows, exterior doors, etc. Finally, lower priority asset categories (Equipment, finishes, and foundations), on the other hand, encompassed lockers, wall finishes, partitions, etc.

High	Medium	Low
<ul style="list-style-type: none"> Elevators and Lifts Energy Supply Heating generating systems Cooling generating systems Sprinklers Standpipes Electrical Service/Distribution Lighting Branch Wiring Communications Security System Local Area Network (LAN) Public Address/Intercom Emergency Lights Plumbing Fixtures 	<ul style="list-style-type: none"> Exterior Walls Exterior Windows Exterior Doors Roof Coverings Roof Openings Interior Doors Domestic Water Distribution Sanitary Waste Rain Water Drainage Terminal and Package Units 	<ul style="list-style-type: none"> Standard Foundation Slab on Grade Basement Excavation Basement Walls Floor Construction Roof Construction Partitions Casework Fixed Seating Interior Wall/Partitions Lockers Stair Construction Wall Finishes Floor Finishes Ceiling Finishes



Figure 4: Forecast of Anticipated Investment Needs across Priority Asset Categories





APPENDIX A:

FACILITY CONDITION ASSESSMENT – Overall Executive Summary Report

Facility Condition Assessment

Executive Summary Report

Detroit Public Schools Community District

May 31, 2018



in partnership with

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**FACILITY CONDITION ASSESSMENT
DETROIT PUBLIC SCHOOLS COMMUNITY DISTRICT**

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EXECUTIVE SUMMARY

Introduction

The Detroit Public Schools Community District (DPSCD) entered into a contract with OHM Advisors in partnership with ALPHA Facilities Solutions, LLC (ALPHA) to conduct a facility-to-facility assessment and inspection of the school district's facilities to determine current condition of the school facilities as it regards to code compliance; deferred maintenance; potential hazards; and compliance with depreciate/replacement schedules for roofs/windows, heating and cooling systems, fires systems, and Americans with Disabilities Act (ADA) compliance and design. This project was completed by a team consisting of engineers, architects, and construction professionals. Data collected during the facility condition assessment phase of the project was recorded in Asset Planning and Performance Software (APPS), in order to estimate current and future funding requirements for facility sustainment. This predictive approach to asset management is known as capital planning, and is used to anticipate funding and maintenance needs many years into the future.

The scope of work included the following:

1. Facilities Evaluation

- a. Meet with District key personnel and compile information received pertaining to issues related to the preservation of the facility.
- b. Collect data from the facility maintenance staff to determine areas needing attention based on deferred maintenance, remaining useful life, and safety.
- c. Evaluate the existing construction, structural and mechanical/electrical systems with an analysis which require short and long-term attention.
- d. Review buildings for conformance with fire safety regulation compliance issues and offer solution improvements.
- e. Evaluate all major building systems and rate them based on overall integrity, probable useful life and need of replacement. Systems and equipment shall be rated using evaluation criteria that includes present overall condition, age effectiveness, efficiency, safety, code compliance as per year constructed, spare capacity, and design deficiencies.
- f. Develop capital budgets for each school building. These budgets must be reported in a manner, so the decision makers can prioritize and phase required work plans. Present draft reports to the Superintendent or his designee and submit a final Multi-Year Facility Planning Report that details building design and usage. This report will take into account changes in area demographics and will promote the best opportunity for learning on a school by school basis.

2. Facilities Condition Assessment

- a. Assessment of Current School Building based on FCI
 - i. Major systems.
 - ii. Classroom design and configuration including common areas.
 - iii. Cost Analysis of remaining useful life.
- b. Cost analysis should include detailed breakdown of investment needed to bring the buildings to ideal functionality.
- c. Comprehensive report presented based on facility by facility study of the physical condition, cost of repairs, and code compliance, along with prioritization. Any scheduled

replacement of large cost items including roofs, HVAC systems, etc. of the next 10-years should be part of this as well.

Finally, the team of OHM and ALPHA would like to take this opportunity to thank Dr. Nikolai Vitti and his team at the Detroit Public Schools Community District for allowing OHM and ALPHA to help the District achieve its goals. We would like to extend a special thank you to Felicia Venable, Sr. Executive Director for Facilities Maintenance & Auxiliary Services; School Nutrition and Student Transportation, for investing a substantial amount of her valuable time working with us on this project. Her knowledge of the DPSCD facilities and staff is superb, and her contribution was invaluable.

Facility Condition Assessment Approach

Asset Planning and Performance Software (APPS) was used to document facility conditions, to determine current requirements, and to forecast future requirements for facilities within the DPSCD. Parametric cost models contained within APPS were assigned to most buildings and new cost models were developed in instances where an appropriate cost model did not exist. New cost models, developed by the ALPHA team, are also contained within APPS. System and component life cycles used within the cost models were based on average service life as shown in the Preventive Maintenance Guidebook: Best Practices to Maintain Efficient and Sustainable Buildings published by Building Owners and Managers Association (BOMA), International. When life cycle information is not provided by BOMA, we used our experience and professional judgment to suggest appropriate average service life for those components and systems. Unit costs, which are used to calculate renewal requirements, were also built into the cost models. Life cycles and unit costs have been adjusted on a location-specific basis as appropriate or as requested by DPSCD personnel.

Although there are many factors that are important to obtain a successful outcome for a facility condition assessment, three provide the foundation for establishing a reliable cost model for each building. Those three factors are related to the following basic building information:

- Gross area
- Date built
- Building/location name

The gross area of a building, also known as gross square footage (GSF), is one of the basic building blocks for determining current replacement value (CRV) and generating system renewal costs, which are major components of a parametric-based effort. The date built for each facility provides the basis for establishing life cycles for many, and in some cases, all major building systems. Finally, although not critical to the outcome of the project, agreeing upon a building/location naming convention that is meaningful to all stakeholders enhances the usefulness and readability of the facility condition assessment report. Please note that the estimated GSF's for each building was provided by the DPSCD. If a GSF was not provided, the ALPHA team derived an estimation based off a combination of sources to include DPSCD records, satellite imagery, and professional judgment. It should be noted that some building names may have changed at the direction of the School District from what was indicated in documentation initially provided. Locations, names, dates built, and GSF data contained in this report are as shown in the Asset Planning and Performance Software account.

In order to determine basic building information, the ALPHA team met with designated DPSCD personnel to discuss school district-specific information such as building construction/renovation programs and building naming conventions. Scaled floor and site plans were generally not available, so square footages associated with additions and site features were obtained from a combination of sources to include DPSCD records, satellite imagery, and professional judgment.

It is worth noting that, although most concealed systems may appear to be functional at the time of assessment, the risk of failure increases with time when they have exceeded the average service life as predicted by BOMA. Consequently, this effort assumes that replacement of concealed systems that have exceeded the average service life as predicted by BOMA is appropriate. Based on the availability of resources and the tolerance for risk or potential out-of-service conditions, the DPSCD may elect to defer immediate replacement of concealed systems that have exceeded average service life as appropriate.

Building condition requirements and site infrastructure requirements are documented within the Asset Planning and Performance Software and based on estimated quantities, RS Means, and client supplied data when available.

Prioritization of Needs

All needs contained within APPS have been assigned a default priority based on importance to mission performance. Therefore, systems whose failure might render a building not suitable for occupancy have been ranked with a higher priority than those systems that have minimal or no impact on a facility's suitability for occupancy. For example, replacement of an HVAC system might take priority over replacement of flooring. The priority for a specific need can be changed if required and priorities can be further refined if desired by assignment of scores of one through 99. Although additional priorities are available within APPS, priorities used for this project are:

- High
- Medium
- Low

Needs contained within APPS have been ranked in terms of urgency in order to aid in the prioritization for allocation of funds. The priorities of applicable systems for this project were as follows:

High

- Communications and Security - Central Clock
- Communications and Security - LAN
- Communications and Security - Public Add Intercom
- Communications and Security - Security System
- Conveying Systems - Chair Lifts
- Conveying Systems - Elevators
- Fire Protection - Activation Devices
- Fire Protection - Notification Device Ctrl Panel
- Fire Protection - Sprinklers and Standpipe
- Fire Protection - Wiring
- Heat Generating System
- Lighting - Branch Wiring
- Lighting - Light Fixtures
- Sanitary Waste
- Cooling Generating Systems
- Distribution Systems
- Electrical Service/Distribution
- Energy Supply
- Other Electrical Systems - Emergency Power
- Plumbing Fixtures

Medium

- Fixed Furnishings - Fixed Seating
- Institutional Equipment - Kitchen Equipment
- Roof Coverings - Built-up
- Roof Coverings - Composition Shingles
- Roof Coverings - Metal
- Interior Doors
- Parking
- Parking Lots
- Paths of Travel
- Pedestrian Paving
- Portable
- Rain Water Drainage
- Ramps

- Roof Coverings - Modified Bitumen
- Roof Coverings - Single - Ply
- Access to Goods and Services
- Access to Goods and Services
- Additional Access
- Domestic Water Distribution
- Elevators/Lifts
- Entrances/Exit
- Exterior Doors
- Exterior Walls
- Exterior Walls - Finishes
- Exterior Windows
- Fixed Furnishings - Fixed Seating
- Guestrooms
- Roadways
- Roof Coverings - Built-up
- Roof Coverings - Composition Shingles
- Roof Coverings - Modified Bitumen
- Roof Coverings - Single - Ply
- Roof Openings
- Special Construction
- Terminal and Packaged Units
- Toilet Rooms

Low

- Fittings - Casework
- Fittings - Lockers
- Fittings - Toilet Partitions
- Ceiling Finishes
- Basement Excavation
- Basement Walls
- Floor Construction
- Floor Finishes
- Wall Finishes
- Partitions
- Roof Construction
- Slab on Grade
- Standard Foundations
- Stair Construction

Building Performance Metrics

As part of the FCA process, a FCI was calculated for each facility. The FCI is used to quantify a facility's physical condition at a specific point in time and is calculated using the expired system replacement costs (costs associated with systems that are beyond average service life) and the current replacement value (CRV) of the building. Expired system replacement costs consist of work that is necessary to restore the facility to a condition equivalent to its original (like new) state.

The FCI can be helpful in several ways to include:

- Comparing the condition of one facility to a group of facilities.
- Tracking trends (the extent of improvement or deterioration over time).
- Prioritizing capital improvement projects.
- Making renovation versus replacement decisions.

The FCI is calculated as shown in the example below.

Example 1: Total expired system replacement costs (Requirements) = \$3,000,000

Current Replacement Value (CRV) = \$10,000,000

$$FCI = \frac{\$3,000,000}{\$10,000,000} = .30$$



It is important to note there is no recognized standard for what constitutes an acceptable or unacceptable FCI. Based on discussion with the Detroit Public School Community District, the following building condition were defined in terms of the FCI as follows:

1. Good - 0% to 10%,
2. Fair - 11% to 20%,
3. Poor - 21% to 30%, and
4. Unsatisfactory - greater than 30%

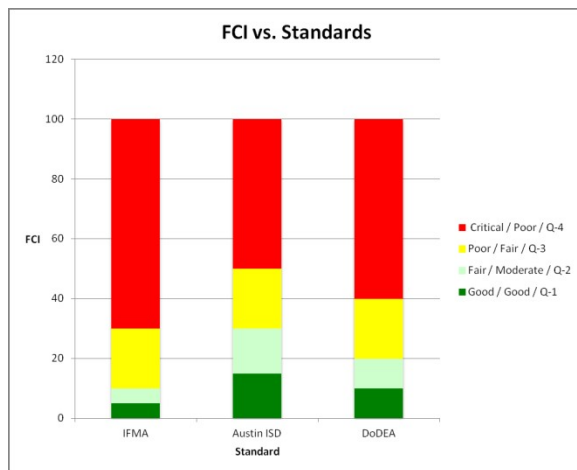


Figure 1. FCI Standards

The Renovate Versus Replacement Question

A question that often arises is at what point does it make sense to replace a facility rather than to renovate it? Again, there is no industry standard, but conventional thinking is that replacement of a facility should be seriously considered when the FCI rises above 60%. However, the FCI is not the only consideration when making renovation versus replacement decisions. One consideration that should be taken into account is whether a facility is functionally adequate for the intended use. Another consideration revolves around the magnitude of needed renovations. For example, when cost of renovation reaches or exceeds 50% of the replacement cost of the facility, requirements to meet Americans with

Disabilities Act (ADA), Life Safety and possibly other codes may be triggered. When the requirement to meet current building codes or civil rights statutes, such as those mentioned above are triggered, additional costs will be incurred. Although it is not possible to predict what the additional costs will be until project requirements are identified and cost estimates are prepared, it has been our experience that additional cost can be expected to range from 5% to 20% depending upon the age of the facility.

Categorization of Costs

At this point, it is appropriate to review the different types of costs associated with facility renovation and construction and how they apply to this project. According to the American Institute of Architects (AIA), facility capital costs are normally subdivided into three major categories - site costs, hard costs, and soft costs. Site costs are normally associated with the owner's initial land acquisition and development costs for a project and are not a consideration in the context of this project. Hard costs are associated with direct construction costs while soft costs can be defined as any indirect costs incurred in addition to the direct construction costs. Soft costs include a variety of costs such as design fees, legal fees, taxes, insurance, owner's administration costs, and financing costs.

It is important to remember that cost models are intended to produce rough order of magnitude (ROM) costs for purposes of developing a baseline from which to establish an FCI for each facility and to facilitate capital planning. It is not unusual for those new to the parametric cost estimating/life cycle analysis process to have expectations that are not completely in alignment with what the process is intended to yield. For example, the parametric cost estimating/life cycle analysis process generates ROM budgeting-level costs while costs that are more detailed are derived during formal preliminary design and final design cost estimating processes.

As a point of interest, *APPA: Leadership in Educational Facilities* published a paper citing research conducted by the *Building Research Board of the National Research Council* indicating, “Underfunding of maintenance and repair is a widespread and persistent problem.” The council concluded, “That an appropriate total budget allocation for routine maintenance and capital renewal is in the range of two to four percent of the aggregate current replacement value (CRV) of those facilities (excluding major infrastructure). When a backlog of deferred maintenance has been allowed to accumulate, spending must exceed this minimum level until the backlog has been eliminated.

Facility Condition Assessment

Facility-related data contained in this report was developed at the building level, which in turn, was rolled up at the campus level. Likewise, site infrastructure requirements were rolled up at the campus level. All data was then rolled up to provide an aggregate view of District facilities. Data within this report has been grouped as follows:

- High School
- Middle School
- Elementary School

This report includes the following content, which is found at campus and/or Executive Summary levels:

- Facility Description: Summary of Findings
- Current Needs (2018)
- Forecasted Needs (2023)
- Current and Forecasted Needs: Summarized by Reporting Period
- Current and Forecasted Needs: Summarized by System
- Need Priorities (High - Medium - Low)

Appendix B - Supplemental Information provides additional information the reader may find useful.

Site and Infrastructure Condition Assessment

A site infrastructure assessment was included in the scope of work for this project. The site infrastructure assessment is a visual evaluation of the site systems. The teams walked each site to determine the general condition of the systems and categorized them as follows:

- Good condition
- In need of repair
- In need of replacement

Estimated quantities were calculated by digitizing marked-up Satellite imagery. Satellite images were used in lieu of site plans.

The site assessment was performed and the subsequent results grouped by location. Findings for each location were divided as follows:

- Parking Lots
- Pedestrian Pavements
- Roadways

Please note that not all locations have all of the various infrastructure systems present.

We determined unit pricing for the various deficiency requirements by referencing 2017 RS Means Building Construction Cost Data and Assembly Cost Data when available; industry sources were used as a supplemental source for unit pricing when needed.

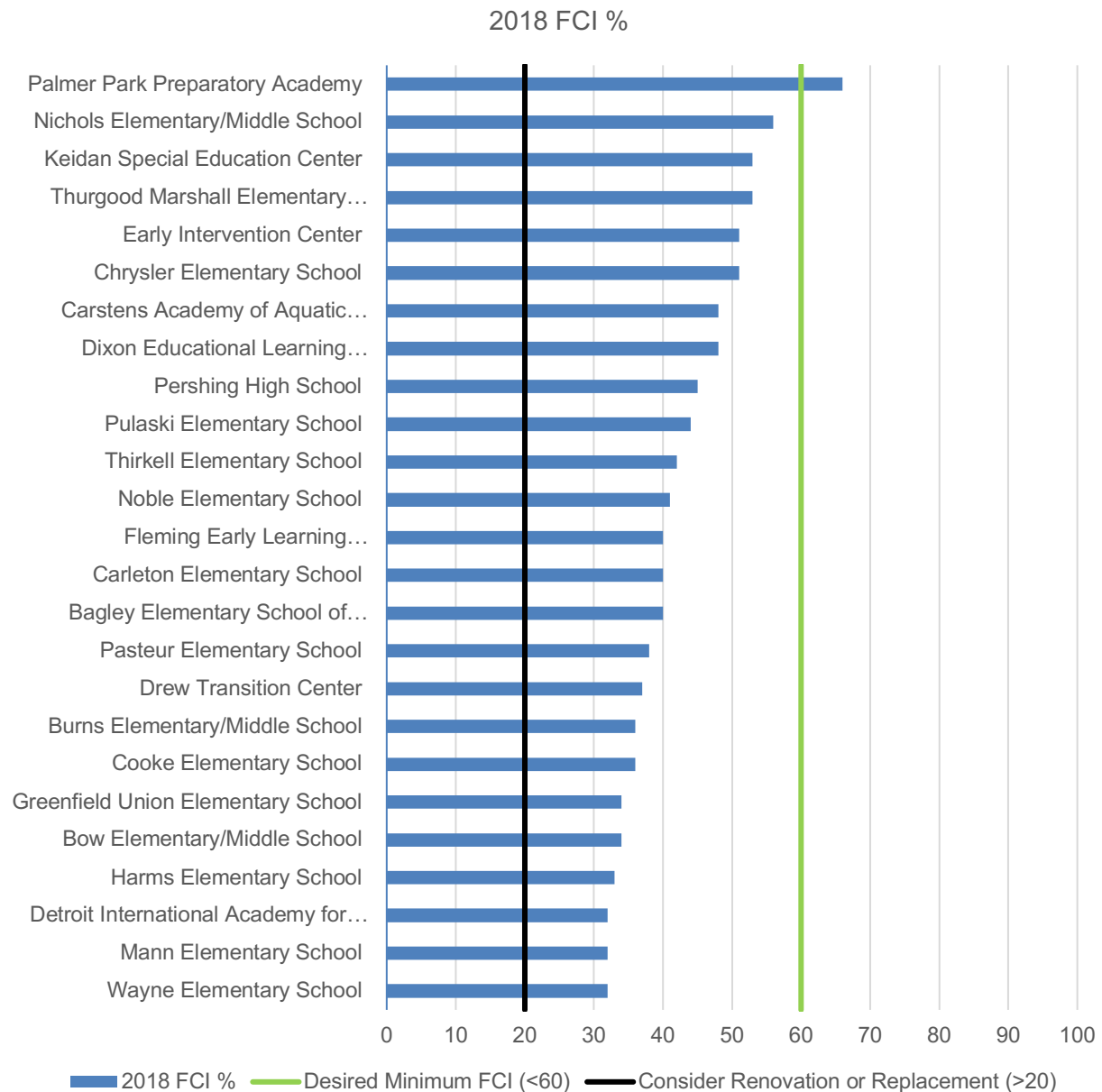
Overview of Findings

1. A majority of the facilities in the DPSCD were generally in fair to poor condition. The common age of many systems exceeded their expected useful life; however, some renovations have taken place since the original construction of the buildings. In some cases, additional testing such as infrared electrical testing and water quality testing could add useful life to existing systems. If the service life of a system is (or has been) extended, a reassessment is recommended in three to five years to properly anticipate capital replacement of those systems.
2. A number of the buildings assessed were constructed prior to 1985. It is recommended that any building constructed before 1985, have water quality test performed on a regular basis. Buildings constructed prior to 1985 may contain lead-based solder used for pipe joint union.
3. Evidence of structural issues were observed at Edward 'Duke' Ellington at Beckham Academy, Moses Field Center, Mumford High School/Mumford Academy and Palmer Park Preparatory Academy. An engineering study is recommended to evaluate the issues further.
4. Due to their historical nature, some of the buildings throughout the district may need refurbishment of the building envelope elements that are compliant with the State Historical Preservation Office.
5. Roofing systems in the DPSCD were in fair condition. Many of the systems have exceeded their useful life and are showing signs of deterioration, damage and wear. These issues are causing damage to the spaces below. An effective roof maintenance plan may assure the useful life of roofs that have not reached the end of their life cycle.
6. Interior finishes throughout the DPSCD were in fair to poor condition. Some floor tiles, ceiling tiles, tile adhesives, drywall, duct wrap, ceiling textures sprays, pipe wrap insulation and boiler insulation that contain asbestos were commonly used from approximately the 1940's to the 1990's. It is recommended an Asbestos Hazard Emergency Response Act (AHERA) survey be performed before performing any demolition in the buildings constructed before 1990.
7. Many of the heating, ventilation and air conditioning (HVAC) systems have exceeded their statistical service lives. Although they have been well maintained and are still operational, these older HVAC systems may not be the most efficient way to heat and cool buildings.
8. HVAC controls throughout the DPSCD appeared to be problematic. Most of the schools are running off older heat generating systems where energy management systems have not been integrated or are not functioning properly. These conditions can diminish the efficiency of the building.
9. It was observed that concealed systems such as water distribution or exhaust fans were overlooked until a malfunction occurs. Residues can build up and cause the systems to slow down. The breaking down of the motor components may be a gradual process and not noticeable until failure occurs. Gradual buildup of a residue can result in serious illness and even liability issues.
10. Some of the electrical service and distribution systems have exceeded their useful lives. It is recommended that an infrared testing be performed on these systems prior to extending their life cycles or continued use to determine additional deficiencies in their respective systems.
11. Some of the buildings do not have emergency lighting systems installed or the system has exceeded its useful life. This issue is a life safety concern and a preventative maintenance plan should be implemented to check exit and emergency backup lighting.

12. Although most of the schools have updated their communications and security systems, many schools lack the modern network capacity and infrastructure to support internet, WI-FI and technological advances in the education industry.
13. Fire alarm systems were observed to have valid current inspections. However; the majority of systems are past their useful life. In addition, many of the school facilities did not have a sprinkler system throughout the building. When the requirement to meet current building codes are triggered, additional cost will be incurred. Addition costs were added to all buildings without a fire sprinkler system, to account for the installation of a fire suppression system.
14. Asphalt parking lot and roadway pavements were generally in poor condition. Most of the asphalt has worn, cracked, or had structural failure. Parking spots are faded throughout the DPSCD. For areas that have structural failure, a sub-base replacement is recommended. For all other problematic areas, an extensive seal coating program will renew and extend the useful life of the pavements and will reduce the necessity of reconstruction. The concrete pedestrian paving in and around the campuses were generally in good to fair condition.
15. The schools that are less than 20 years of age are in jeopardy of system failures due to sub-system component issues that have not been repaired or replaced due to a lack of funding or resources.
16. In regard to the American's with Disability Act compliance, there were a number of deficiencies noted throughout the District. In a majority of the schools, there is insufficient striping and signage to define accessible auto and van parking. Throughout the District, additional ramps and curb cuts should be added to the site elements to provide adequate access to the facility for students and teachers. Most entrances/exits and associated paths of travel are ADA compliant with minor deficiencies observed. Exterior doors should be modified to improve accessibility with proper locksets, widths, and automatic openers. Multi-story facilities that do not have an elevator or working ADA compliant elevator are required to be modified with the addition of an ADA compliant elevator. One of the most significant ADA deficiencies observe were in the existing toilet rooms. Existing toilet rooms should be modified to ensure adequate turning space is available; accessible hardware, fixtures, audible and visual alarms are present; and proper signage is posted indicating ADA compliance. In most of the older schools, current drinking fountains should either be modified or replaced to ensure they meet compliance standards in height, access, and operability.

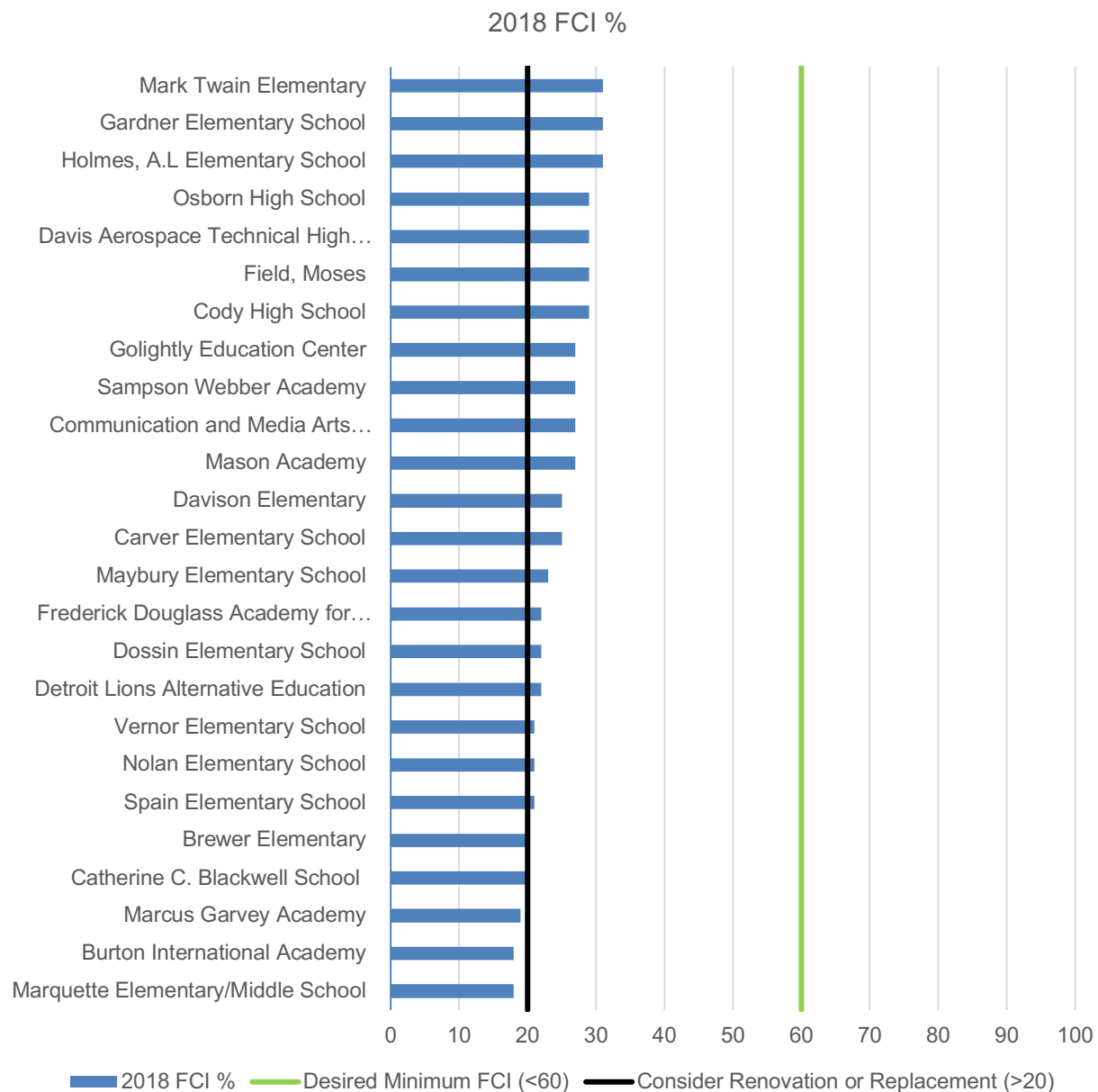
The information shown in the figure below shows the current (2018) FCI for all School District facilities in order of "worst first". The farthest right point on the blue bar for each building indicates the current FCI.

Figure 2. Current Facility Condition: Detroit Public Schools Community District



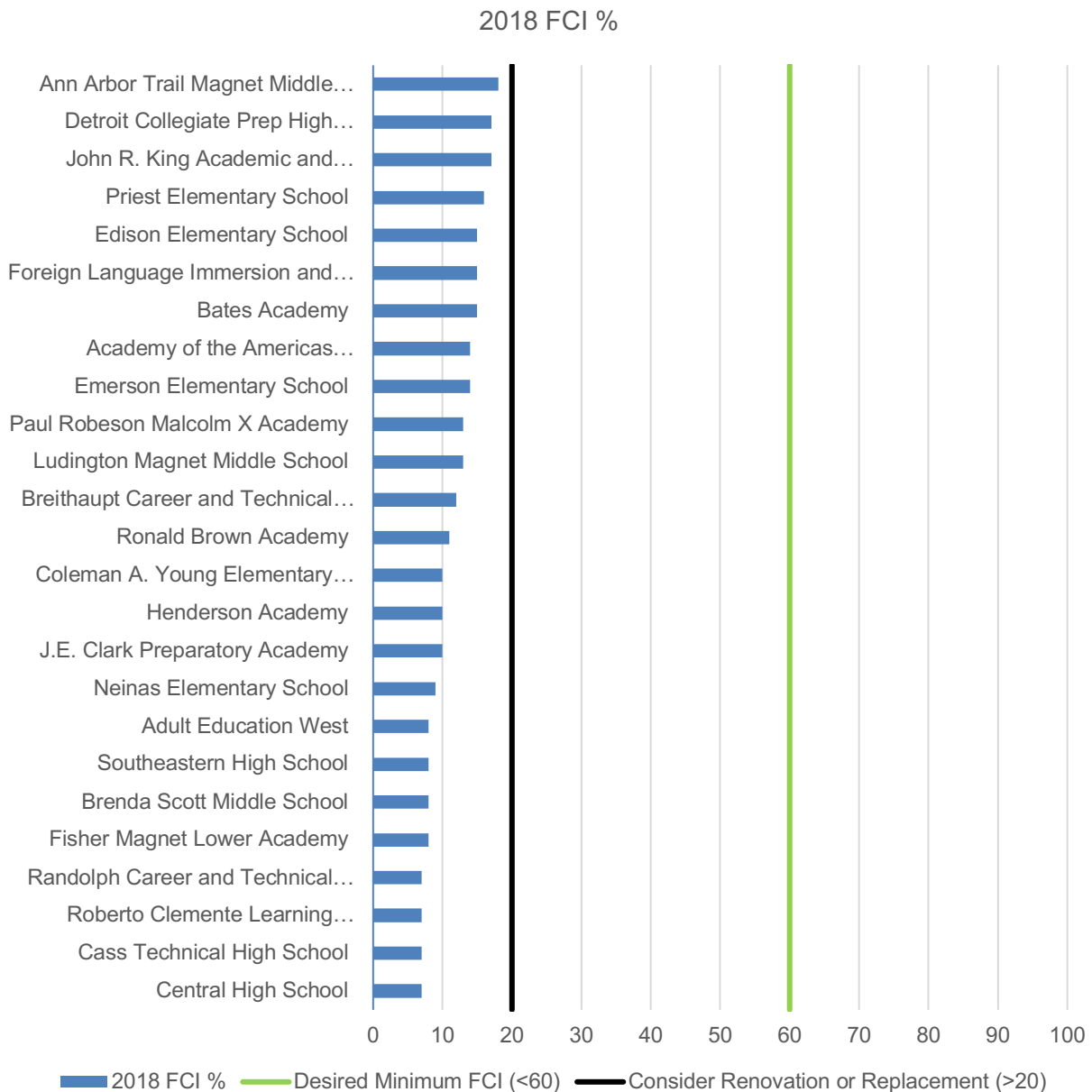
The information shown in the figure below shows the current (2018) FCI for all School District facilities in order of "worst first". The farthest right point on the blue bar for each building indicates the current FCI.

Figure 3. Current Facility Condition: Detroit Public Schools Community District



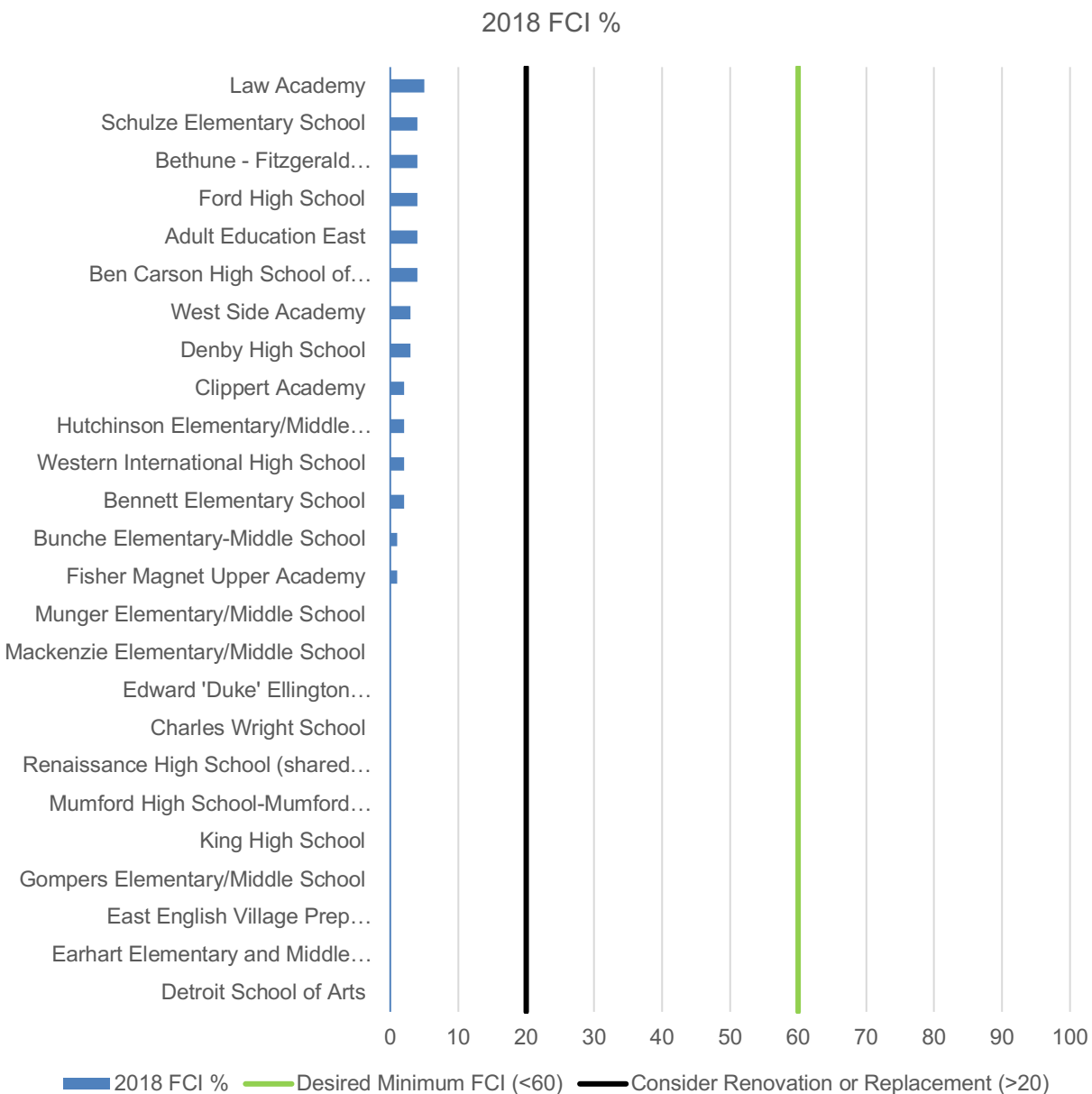
The information shown in the figure below shows the current (2018) FCI for all School District facilities in order of "worst first". The farthest right point on the blue bar for each building indicates the current FCI.

Figure 4. Current Facility Condition: Detroit Public Schools Community District



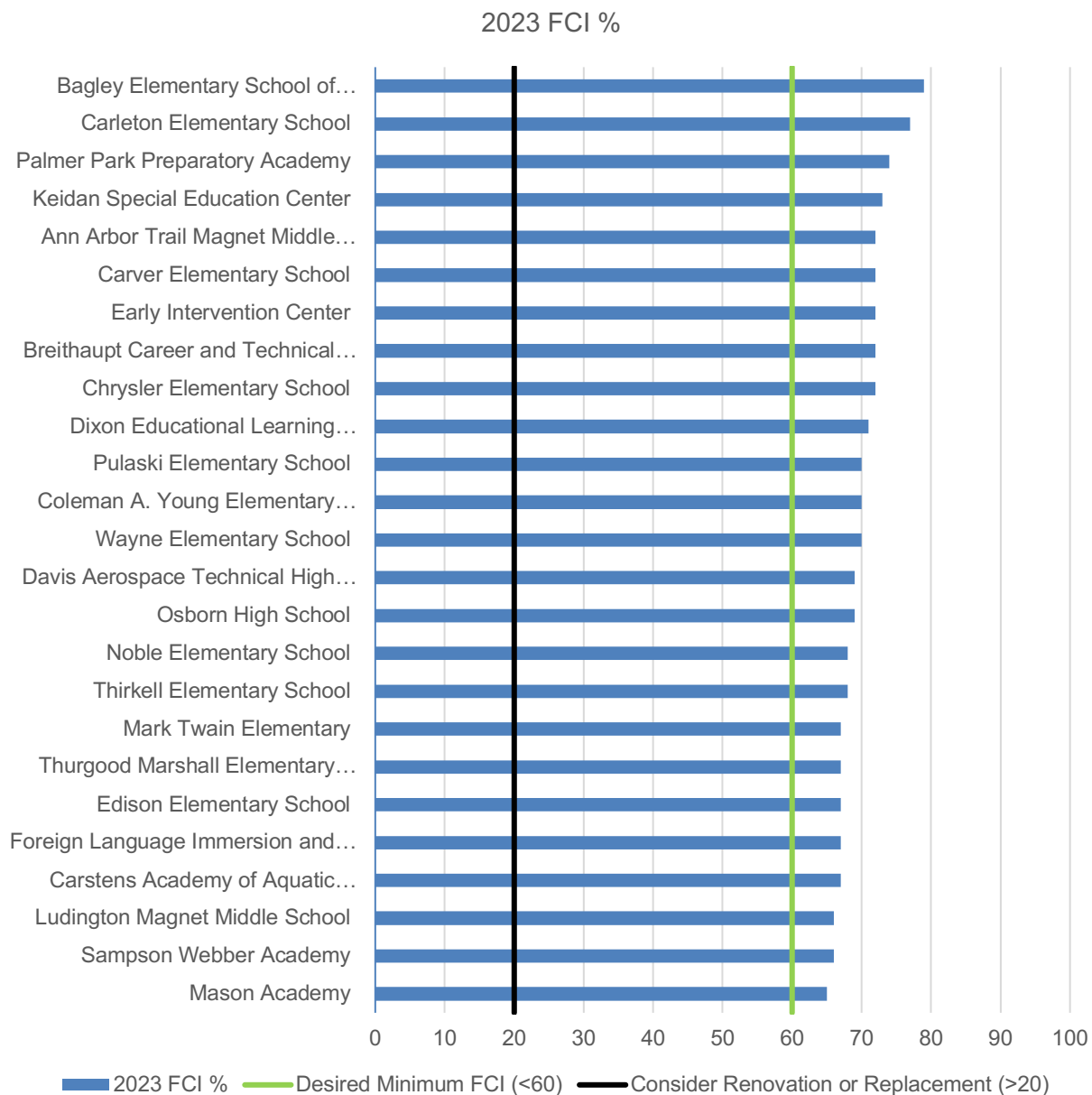
The information shown in the figure below shows the current (2018) FCI for all School District facilities in order of "worst first". The farthest right point on the blue bar for each building indicates the current FCI.

Figure 5. Current Facility Condition: Detroit Public Schools Community District



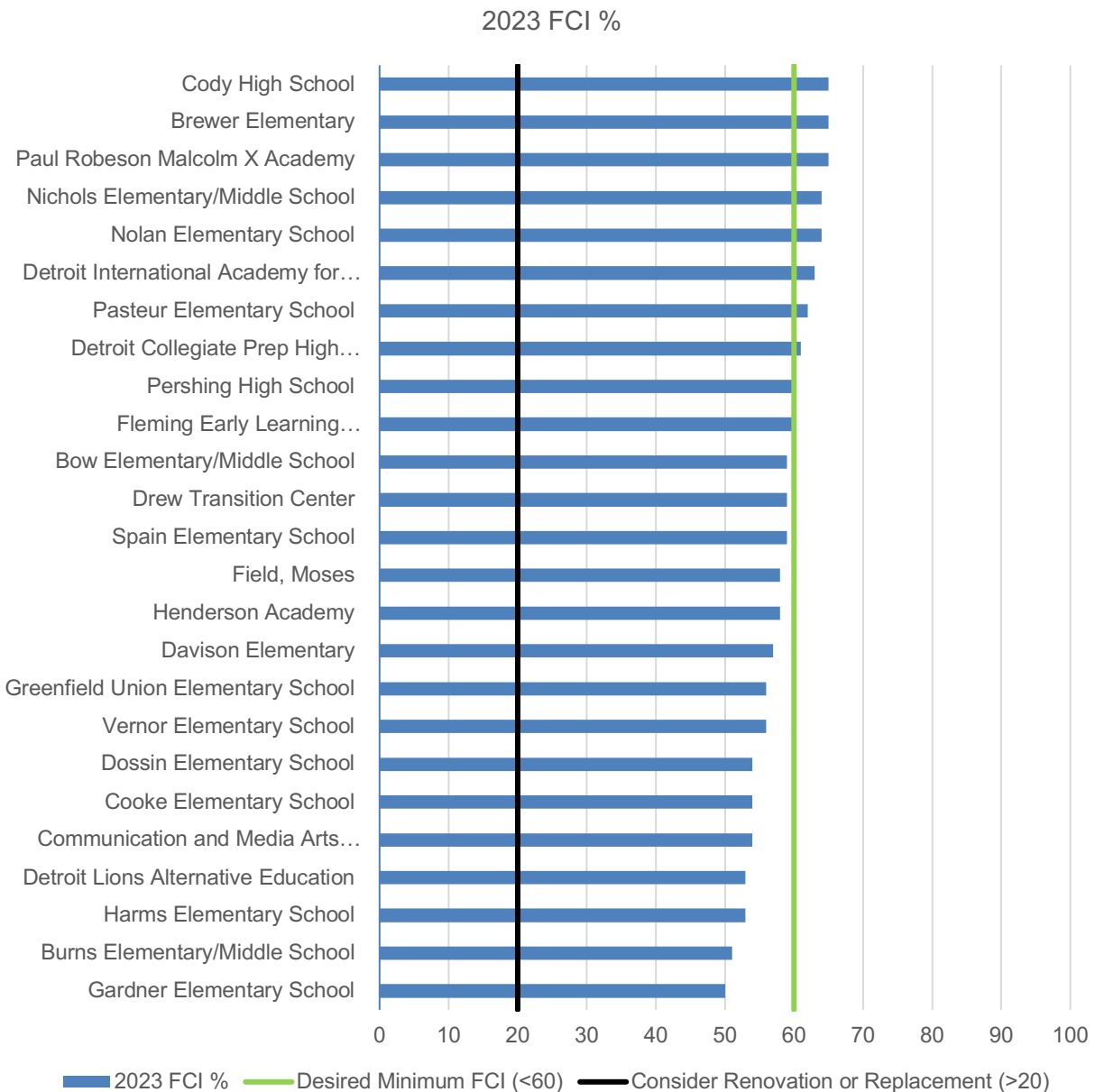
The information shown in the figure below shows the forecast (2023) FCI for all School District facilities in order of "worst first". The farthest right point on the blue bar for each building indicates the forecast FCI.

Figure 6. Forecast Facility Condition: Detroit Public Schools Community District



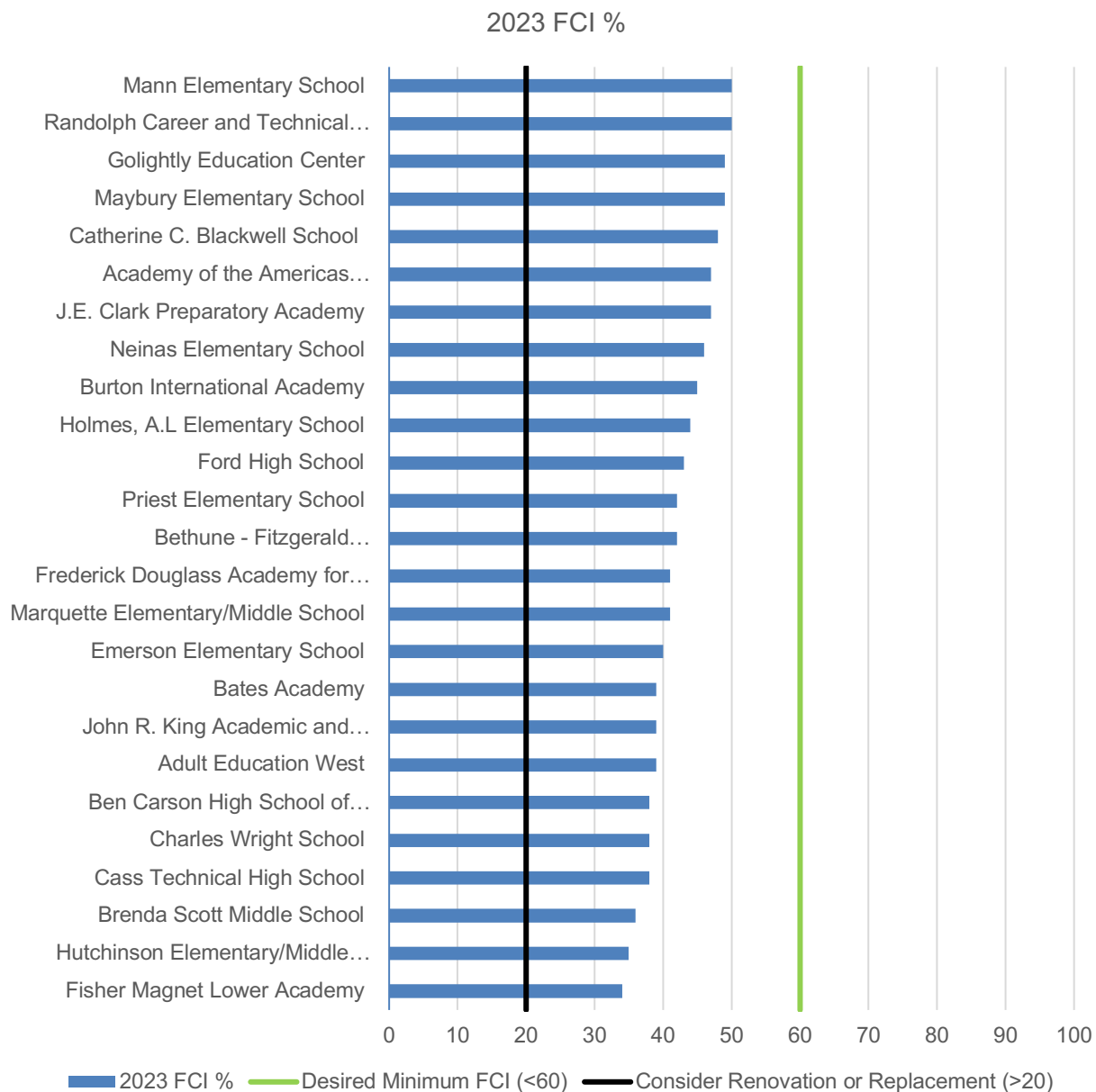
The information shown in the figure below shows the forecast (2023) FCI for all School District facilities in order of "worst first". The farthest right point on the blue bar for each building indicates the forecast FCI.

Figure 7. Forecast Facility Condition: Detroit Public Schools Community District



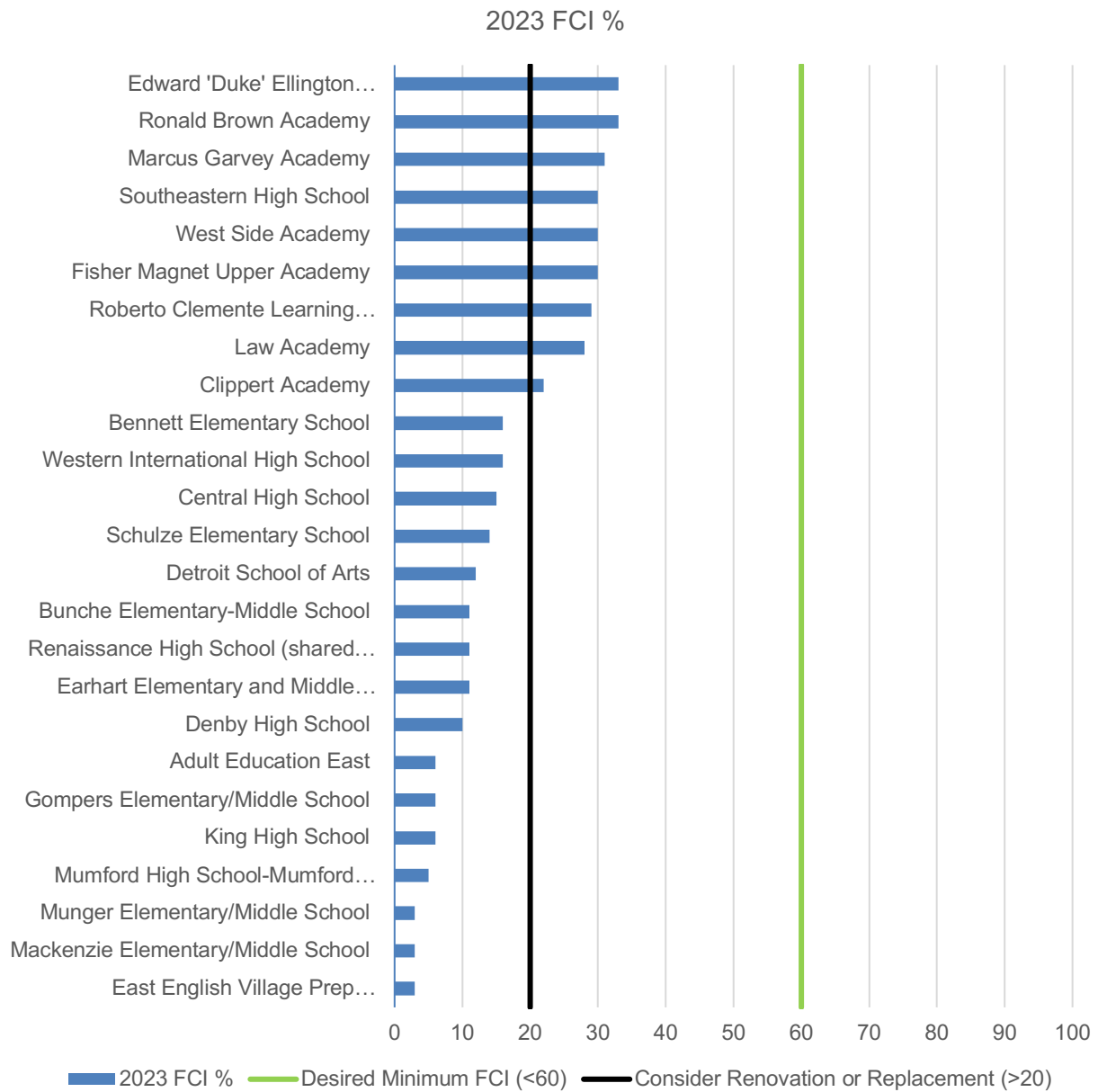
The information shown in the figure below shows the forecast (2023) FCI for all School District facilities in order of "worst first". The farthest right point on the blue bar for each building indicates the forecast FCI.

Figure 8. Forecast Facility Condition: Detroit Public Schools Community District



The information shown in the figure below shows the forecast (2023) FCI for all School District facilities in order of "worst first". The farthest right point on the blue bar for each building indicates the forecast FCI.

Figure 9. Forecast Facility Condition: Detroit Public Schools Community District



The following table summarizes findings by group. Please note the column labeled "Total Needs 2023" assumes no additional capital renewal funding is provided. A comprehensive list of expired systems and those expected to expire between now and the Year 2028 is shown in the Current and Forecasted Needs: Summarized by System - Detroit Public Schools Community District Table.

Table 1. Facility Description: Summary of Findings: Detroit Public Schools Community District

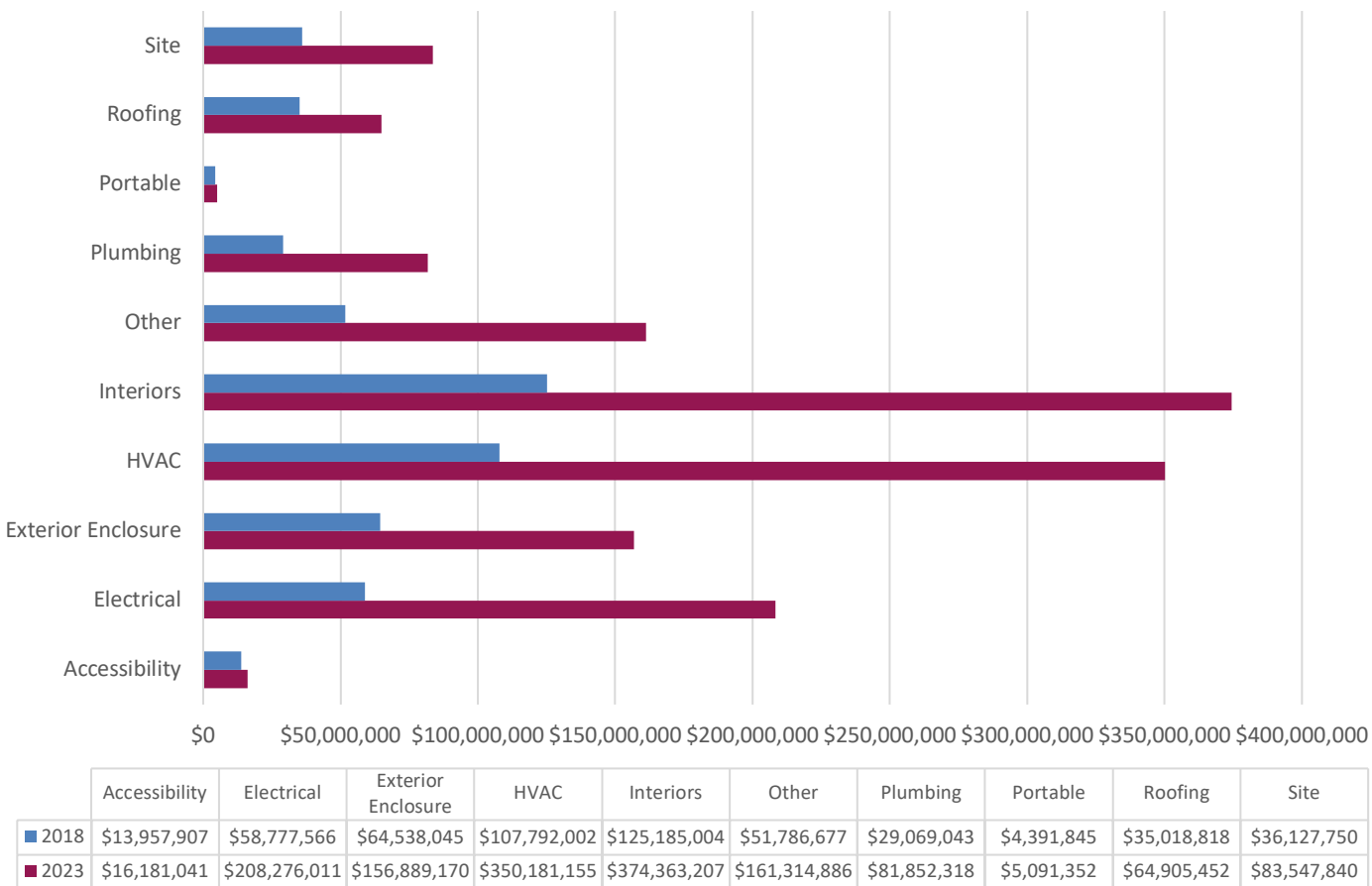
Group	Area (SF)	Total Needs 2018	Current Replacement Value	2018 FCI %	Total Needs 2023	Forecast Replacement Value	2023 FCI %
Elementary School	2,377,329	\$103,447,778	\$461,039,809	22	\$269,570,215	\$534,471,502	50
High School	5,775,496	\$179,545,074	\$1,432,940,809	13	\$598,309,905	\$1,661,171,126	36
Middle School	4,394,119	\$189,174,302	\$1,011,208,357	19	\$529,902,076	\$1,172,267,628	45
SUBTOTAL	12,546,944	\$472,167,154	\$2,905,188,975	16	\$1,397,782,195	\$3,367,910,256	42
Site and Infrastructure (excluded from FCI calculations)		\$36,127,751			\$83,547,840		
Abbreviated Accessibility		\$13,957,907			\$16,181,041		
Portables		\$4,391,845			\$5,091,352		
TOTALS	12,546,944	\$526,644,657	\$2,905,188,975		\$1,502,602,428	\$3,367,910,256	

Note: The average FCI for the Detroit Public Schools Community District facilities assessed is 16 while the average FCI in 5 years is estimated to be 41 assuming current sustainment levels.

The Figure below shows the current and forecasted needs respectively for all facilities. Needs are grouped as follows:

- Site
- Roofing
- Portable
- Plumbing
- Other
- Interiors
- HVAC
- Exterior Enclosure
- Electrical
- Accessibility

Figure 10. Comparison of 2018 Current Needs vs. 2023 Forecasted Needs by System Group: Detroit Public Schools Community District



The following Figures show the current and forecasted needs respectively for all School District facilities grouped by location.

Figure 11. Comparison of 2018 Current Needs vs. 2023 Forecasted Needs by Group: Detroit Public Schools Community District

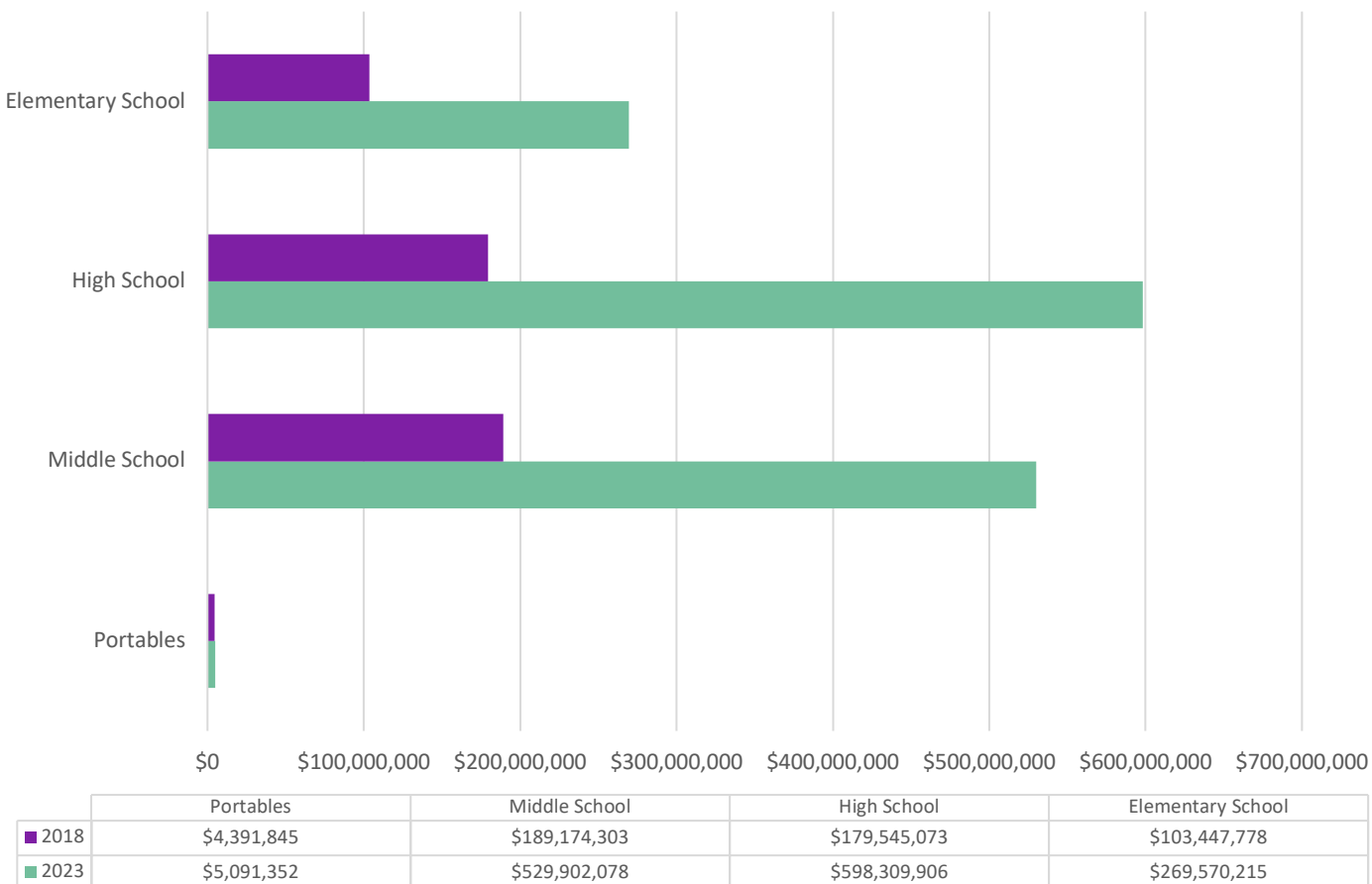
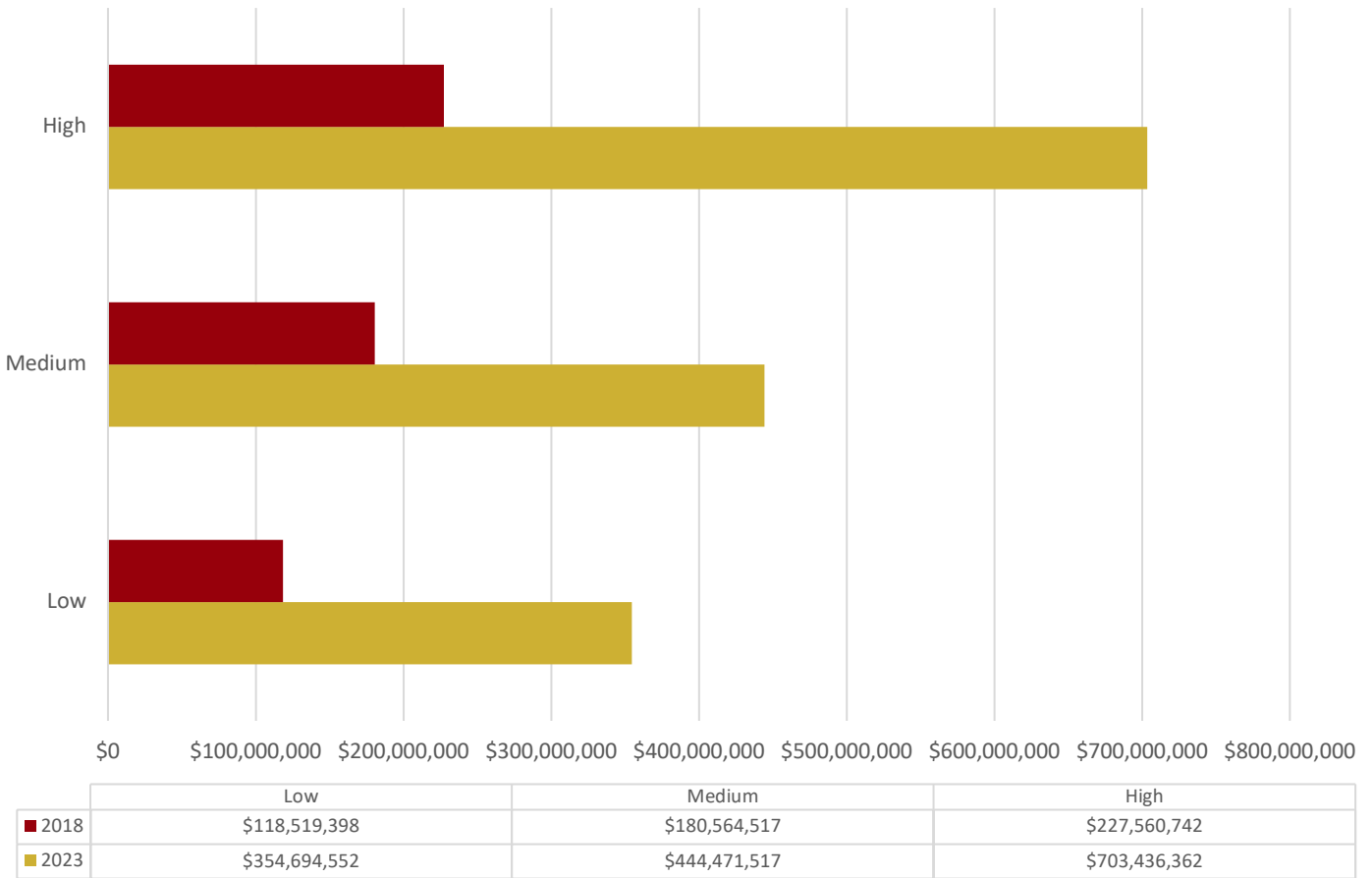


Figure 12. Comparison of 2018 Current Needs vs. 2023 Forecasted Needs by Priority: Detroit Public Schools Community District



Note: Forecasted Needs (2023) include Current Needs (2018)

Figure 13. Current and Forecasted Needs: Summarized by Reporting Period (Current +10 Years): Detroit Public Schools Community District

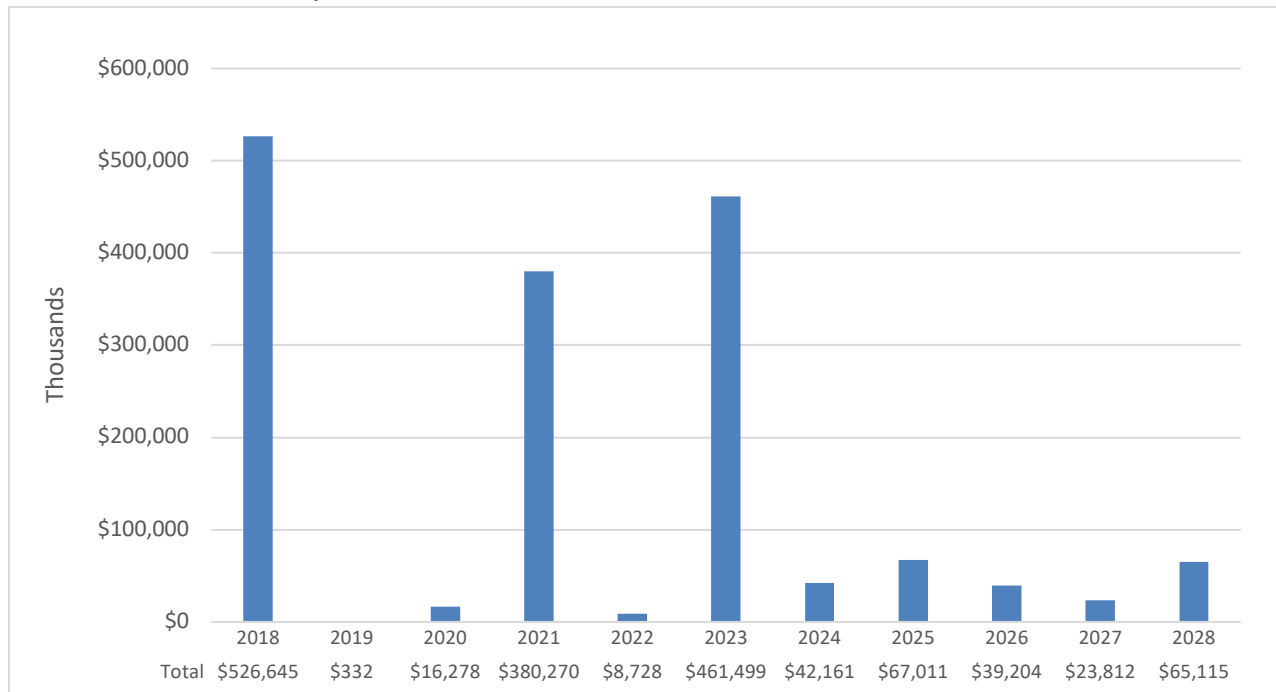


Table 2. Current and Forecasted Needs Summarized by System (Current + 5 years): Detroit Public Schools Community District

System	2018	2019	2020	2021	2022	2023
Cumulative Needs by Year	\$526,644,657	\$542,775,745	\$575,336,591	\$972,866,266	\$1,010,780,378	\$1,502,602,432
Needs by Year	\$526,644,657	\$331,748	\$16,277,573	\$380,269,578	\$8,728,124	\$461,498,642
EXTERIOR ENCLOSURE	\$64,538,045	\$0	\$112,585	\$34,605,423	\$61,562	\$45,172,562
Exterior Walls	\$6,308,239	\$0	\$0	\$4,129,325	\$0	\$19,375,622
Exterior Walls - Finishes	\$1,319,562	\$0	\$38,783	\$1,514,130	\$61,562	\$5,268,455
Exterior Windows	\$55,253,478	\$0	\$0	\$24,993,855	\$0	\$18,088,031
Exterior Doors	\$1,656,766	\$0	\$73,802	\$3,968,113	\$0	\$2,440,454
ROOFING	\$35,018,818	\$0	\$888,024	\$11,942,579	\$345,871	\$10,312,548
Roof Coverings - Built-up	\$17,353,409	\$0	\$468,258	\$6,515,616	\$0	\$2,635,321
Roof Coverings - Composition Shingles	\$3,683,026	\$0	\$0	\$875,379	\$0	\$1,568,941
Roof Coverings - Metal	\$685,204	\$0	\$0	\$0	\$0	\$0
Roof Coverings - Modified Bitumen	\$5,178,306	\$0	\$419,766	\$2,727,279	\$345,871	\$5,495,513
Roof Coverings - Single - Ply	\$7,448,172	\$0	\$0	\$1,366,707	\$0	\$0
Roof Openings	\$670,700	\$0	\$0	\$457,599	\$0	\$612,773
INTERIOR CONSTRUCTION	\$38,562,156	\$122,678	\$1,186,853	\$22,938,188	\$893,051	\$34,181,523
Interior Doors	\$6,665,606	\$97,138	\$0	\$5,785,146	\$0	\$5,694,599
Fittings - Casework	\$9,070,472	\$0	\$0	\$4,225,583	\$39,266	\$5,924,693
Fittings - Lockers	\$21,104,603	\$0	\$1,175,449	\$9,656,397	\$339,076	\$18,450,839
Fittings - Toilet Partitions	\$1,721,475	\$25,540	\$11,405	\$3,271,062	\$514,709	\$4,111,392
INTERIOR FINISHES	\$86,622,848	\$209,070	\$1,927,034	\$75,306,698	\$1,298,984	\$84,796,144
Wall Finishes	\$14,999,680	\$0	\$1,300,183	\$24,178,746	\$0	\$36,291,211
Floor Finishes	\$38,711,685	\$209,070	\$626,851	\$31,069,634	\$126,460	\$37,393,446
Ceiling Finishes	\$32,911,483	\$0	\$0	\$20,058,317	\$1,172,523	\$11,111,488
CONVEYING	\$758,045	\$0	\$0	\$316,891	\$0	\$756,426
Conveying Systems - Chair Lifts	\$33,045	\$0	\$0	\$0	\$0	\$0
Conveying Systems - Elevators	\$725,000	\$0	\$0	\$316,891	\$0	\$756,426
PLUMBING	\$29,069,043	\$0	\$0	\$19,838,589	\$0	\$27,106,570
Plumbing Fixtures	\$14,849,939	\$0	\$0	\$15,150,310	\$0	\$19,788,391
Domestic Water Distribution	\$5,977,448	\$0	\$0	\$1,932,585	\$0	\$3,435,600
Sanitary Waste	\$5,833,050	\$0	\$0	\$1,938,045	\$0	\$2,294,597
Rain Water Drainage	\$2,408,606	\$0	\$0	\$817,650	\$0	\$1,587,983
HVAC	\$107,792,002	\$0	\$0	\$108,724,653	\$3,214,825	\$106,563,429
Energy Supply	\$10,580,765	\$0	\$0	\$3,432,706	\$0	\$22,881,659
Heat Generating System	\$42,838,841	\$0	\$0	\$44,743,840	\$0	\$41,566,596
Cooling Generating Systems	\$11,713,443	\$0	\$0	\$8,293,448	\$1,027,703	\$12,126,754
Distribution Systems	\$32,289,440	\$0	\$0	\$34,120,156	\$0	\$23,496,735
Terminal and Packaged Units	\$10,369,513	\$0	\$0	\$18,134,503	\$2,187,122	\$6,491,686
FIRE PROTECTION	\$33,572,692	\$0	\$145,132	\$6,718,428	\$305,690	\$19,882,160

System	2018	2019	2020	2021	2022	2023
Fire Protection - Activation Devices	\$2,498,842	\$0	\$0	\$2,374,848	\$53,959	\$3,540,890
Fire Protection - Notification Device Ctrl Panel	\$1,779,361	\$0	\$0	\$1,272,451	\$43,300	\$3,177,907
Fire Protection - Sprinklers and Standpipe	\$15,439,554	\$0	\$0	\$1,087,265	\$167,872	\$7,235,755
Fire Protection - Wiring	\$13,854,936	\$0	\$145,132	\$1,983,864	\$40,558	\$5,927,608
ELECTRICAL	\$58,777,566	\$0	\$9,721,887	\$41,129,941	\$2,608,142	\$83,192,193
Electrical Service/Distribution	\$955,839	\$0	\$247,683	\$1,569,638	\$157,150	\$1,938,833
Lighting - Branch Wiring	\$42,895,876	\$0	\$543,518	\$6,318,598	\$0	\$16,300,162
Lighting - Light Fixtures	\$7,387,150	\$0	\$8,047,936	\$27,931,722	\$583,557	\$38,111,128
Communications and Security - Central Clock	\$1,857,873	\$0	\$0	\$715,919	\$58,869	\$1,731,733
Communications and Security - LAN	\$628,215	\$0	\$0	\$70,279	\$119,505	\$10,913,446
Communications and Security - Public Add Intercom	\$1,935,151	\$0	\$332,941	\$2,458,607	\$115,414	\$4,251,617
Communications and Security - Security System	\$1,227,228	\$0	\$302,760	\$1,917,775	\$1,573,648	\$8,826,393
Other Electrical Systems - Emergency Power	\$1,890,235	\$0	\$247,049	\$147,402	\$0	\$1,118,882
EQUIPMENT	\$9,469,050	\$0	\$2,129,293	\$19,840,724	\$0	\$41,374,147
Institutional Equipment - Kitchen Equipment	\$9,469,050	\$0	\$2,129,293	\$19,840,724	\$0	\$41,374,147
FIXED FURNISHINGS	\$805,074	\$0	\$166,765	\$673,203	\$0	\$822,177
Fixed Furnishings - Fixed Seating	\$805,074	\$0	\$166,765	\$673,203	\$0	\$822,177
SPECIAL CONSTRUCTION	\$7,181,816	\$0	\$0	\$3,226,948	\$0	\$2,812,145
Special Construction	\$7,181,816	\$0	\$0	\$3,226,948	\$0	\$2,812,145
SITEWORK	\$36,127,750	\$0	\$0	\$35,007,313	\$0	\$4,526,617
Roadways	\$24,725,538	\$0	\$0	\$23,611,761	\$0	\$3,298,859
Pedestrian Paving	\$2,185,612	\$0	\$0	\$2,694,641	\$0	\$1,227,758
Parking Lots	\$9,216,601	\$0	\$0	\$8,700,911	\$0	\$0
PORTABLE	\$4,391,845	\$0	\$0	\$0	\$0	\$0
Portable	\$4,391,845	\$0	\$0	\$0	\$0	\$0
ACCESSIBILITY	\$13,957,907	\$0	\$0	\$0	\$0	\$0
Parking	\$690,857	\$0	\$0	\$0	\$0	\$0
Ramps	\$173,377	\$0	\$0	\$0	\$0	\$0
Entrances/Exit	\$128,130	\$0	\$0	\$0	\$0	\$0
Paths of Travel	\$12,395	\$0	\$0	\$0	\$0	\$0
Elevators/Lifts	\$11,144,571	\$0	\$0	\$0	\$0	\$0
Toilet Rooms	\$1,008,516	\$0	\$0	\$0	\$0	\$0
Guestrooms	\$5,857	\$0	\$0	\$0	\$0	\$0
Access to Goods and Services	\$42,291	\$0	\$0	\$0	\$0	\$0
Additional Access	\$751,913	\$0	\$0	\$0	\$0	\$0

Table 3. Current and Forecasted Needs Summarized by System (Years 6 - 10): Detroit Public Schools Community District

System	2024	2025	2026	2027	2028
Cumulative Needs by Year	\$1,589,841,712	\$1,704,547,555	\$1,794,888,299	\$1,872,547,342	\$1,993,838,416
Needs by Year	\$42,161,208	\$67,010,592	\$39,204,318	\$23,812,393	\$65,114,655
EXTERIOR ENCLOSURE	\$603,711	\$3,356,822	\$2,521,273	\$1,308,188	\$19,651,291
Exterior Walls	\$0	\$2,384,683	\$0	\$0	\$13,256,160
Exterior Walls - Finishes	\$603,711	\$275,972	\$266,877	\$0	\$53,664
Exterior Windows	\$0	\$535,289	\$1,823,368	\$634,827	\$5,427,737
Exterior Doors	\$0	\$160,878	\$431,027	\$673,361	\$913,731
ROOFING	\$2,467,293	\$4,541,076	\$1,747,799	\$2,784,492	\$3,700,007
Roof Coverings - Built-up	\$0	\$1,473,642	\$736,233	\$2,569,132	\$1,451,935
Roof Coverings - Composition Shingles	\$0	\$219,468	\$0	\$0	\$0
Roof Coverings - Metal	\$0	\$0	\$0	\$0	\$0
Roof Coverings - Modified Bitumen	\$2,467,293	\$2,789,699	\$943,810	\$70,351	\$2,095,665
Roof Coverings - Single - Ply	\$0	\$0	\$0	\$0	\$0
Roof Openings	\$0	\$58,267	\$67,757	\$145,009	\$152,407
INTERIOR CONSTRUCTION	\$6,953,844	\$7,273,136	\$2,669,761	\$1,288,811	\$2,128,434
Interior Doors	\$0	\$401,659	\$1,096,629	\$1,288,811	\$1,205,612
Fittings - Casework	\$0	\$0	\$932,779	\$0	\$262,182
Fittings - Lockers	\$6,028,532	\$5,821,734	\$640,353	\$0	\$184,827
Fittings - Toilet Partitions	\$925,312	\$1,049,743	\$0	\$0	\$475,812
INTERIOR FINISHES	\$10,138,533	\$8,453,473	\$2,901,073	\$72,681	\$1,852,998
Wall Finishes	\$0	\$2,227,074	\$0	\$0	\$338,478
Floor Finishes	\$7,589,504	\$0	\$2,459,757	\$0	\$827,261
Ceiling Finishes	\$2,549,029	\$6,226,399	\$441,315	\$72,681	\$687,259
CONVEYING	\$0	\$0	\$10,465	\$0	\$97,434
Conveying Systems - Chair Lifts	\$0	\$0	\$10,465	\$0	\$0
Conveying Systems - Elevators	\$0	\$0	\$0	\$0	\$97,434
PLUMBING	\$0	\$38,953	\$521,453	\$0	\$1,071,809
Plumbing Fixtures	\$0	\$0	\$521,453	\$0	\$683,117
Domestic Water Distribution	\$0	\$0	\$0	\$0	\$143,118
Sanitary Waste	\$0	\$0	\$0	\$0	\$128,806
Rain Water Drainage	\$0	\$38,953	\$0	\$0	\$116,768
HVAC	\$196,407	\$10,009,298	\$14,586,012	\$1,195,997	\$15,065,003
Energy Supply	\$0	\$1,122,867	\$0	\$0	\$2,744,444
Heat Generating System	\$0	\$1,272,365	\$1,358,018	\$0	\$5,716,078
Cooling Generating Systems	\$0	\$0	\$7,329,491	\$1,191,390	\$2,072,262
Distribution Systems	\$0	\$0	\$0	\$0	\$1,927,412
Terminal and Packaged Units	\$196,407	\$7,614,066	\$5,898,503	\$4,607	\$2,604,808
FIRE PROTECTION	\$4,977,783	\$6,988,385	\$191,674	\$19,783	\$1,314,509
Fire Protection - Activation Devices	\$871,515	\$1,165,566	\$8,978	\$10,975	\$133,587
Fire Protection - Notification Device Ctrl Panel	\$699,364	\$1,179,551	\$138,692	\$8,807	\$218,813
Fire Protection - Sprinklers and Standpipe	\$2,556,278	\$2,587,099	\$24,164	\$0	\$359,530

System	2024	2025	2026	2027	2028
Fire Protection - Wiring	\$850,627	\$2,056,169	\$19,841	\$0	\$602,578
ELECTRICAL	\$16,823,637	\$16,852,980	\$1,133,729	\$2,313,535	\$9,296,917
Electrical Service/Distribution	\$0	\$0	\$184,513	\$0	\$60,440
Lighting - Branch Wiring	\$3,179,759	\$0	\$0	\$0	\$5,091,511
Lighting - Light Fixtures	\$9,425,270	\$10,502,250	\$96,876	\$118,425	\$2,892,273
Communications and Security - Central Clock	\$272,697	\$647,261	\$4,877	\$5,962	\$0
Communications and Security - LAN	\$2,329,398	\$2,638,350	\$414,235	\$1,805,718	\$102,643
Communications and Security - Public Add Intercom	\$968,350	\$1,589,009	\$9,976	\$12,195	\$182,768
Communications and Security - Security System	\$648,163	\$1,003,272	\$0	\$0	\$967,282
Other Electrical Systems - Emergency Power	\$0	\$472,839	\$423,252	\$371,235	\$0
EQUIPMENT	\$0	\$9,139,048	\$12,338,977	\$14,491,833	\$10,936,253
Institutional Equipment - Kitchen Equipment	\$0	\$9,139,048	\$12,338,977	\$14,491,833	\$10,936,253
FIXED FURNISHINGS	\$0	\$357,420	\$582,100	\$337,073	\$0
Fixed Furnishings - Fixed Seating	\$0	\$357,420	\$582,100	\$337,073	\$0
SPECIAL CONSTRUCTION	\$0	\$0	\$0	\$0	\$0
Special Construction	\$0	\$0	\$0	\$0	\$0
SITEWORK	\$0	\$0	\$0	\$0	\$0
Roadways	\$0	\$0	\$0	\$0	\$0
Pedestrian Paving	\$0	\$0	\$0	\$0	\$0
Parking Lots	\$0	\$0	\$0	\$0	\$0
PORTABLE	\$0	\$0	\$0	\$0	\$0
Portable	\$0	\$0	\$0	\$0	\$0
ACCESSIBILITY	\$0	\$0	\$0	\$0	\$0
Parking	\$0	\$0	\$0	\$0	\$0
Ramps	\$0	\$0	\$0	\$0	\$0
Entrances/Exit	\$0	\$0	\$0	\$0	\$0
Paths of Travel	\$0	\$0	\$0	\$0	\$0
Elevators/Lifts	\$0	\$0	\$0	\$0	\$0
Toilet Rooms	\$0	\$0	\$0	\$0	\$0
Guestrooms	\$0	\$0	\$0	\$0	\$0
Access to Goods and Services	\$0	\$0	\$0	\$0	\$0
Additional Access	\$0	\$0	\$0	\$0	\$0

The following table provides an overall summary of findings for the portfolio or buildings included in this project.

Table 4. Facility Description: Summary of Findings: Detroit Public Schools Community District

Campus Name	Age (Years)	Area (SF)	Total Building Needs 2018	Current Replacement Value (\$)	2018 FCI %	Total Building Needs 2023	Forecast Replacement Value (\$)	2023 FCI %
Academy of the Americas Elementary/Middle School	100	97,929	\$3,242,379	22,759,414	14	\$12,318,269	26,384,398	47
Adult Education Center-East	90	69,950	\$528,123	15,566,425	3	\$1,110,950	18,045,753	6
Adult Education Center-West	79	48,742	\$946,448	11,163,133	8	\$5,023,113	12,941,130	39
Ann Arbor Trail Magnet Middle School	10-72	44,863	\$1,665,617	8,828,969	19	\$7,758,989	10,235,195	76
Bagley Elementary School of Journalism and Technology	88	65,022	\$4,678,008	11,744,599	40	\$10,811,889	13,615,209	79
Bates Academy	52	128,190	\$4,380,413	29,786,549	15	\$13,600,544	34,530,774	39
Ben Carson High School of Science and Medicine	38	92,464	\$822,698	21,777,268	4	\$9,673,328	25,245,822	38
Bennett Elementary School	107	67,144	\$247,845	12,153,903	2	\$2,564,577	14,089,705	18
Bethune-Fitzgerald Elementary/Middle School	93	179,354	\$1,838,693	41,585,979	4	\$20,018,557	48,209,547	42
Bow Elementary/Middle School	69	59,100	\$3,714,066	11,033,334	34	\$7,591,456	12,790,658	59
Breithaupt Career and Technical Center	37	150,361	\$3,751,507	31,468,678	12	\$26,263,882	36,480,822	72
Brenda Scott Middle School	15	147,620	\$2,562,499	31,933,541	8	\$13,250,679	37,019,727	36
Brewer Academy	18-90	54,287	\$1,759,893	10,725,318	16	\$7,812,947	12,433,583	63
Bunche Elementary/Middle School	96	113,400	\$377,170	26,649,820	1	\$3,465,751	30,894,445	11
Burns Elementary/Middle School	95	65,370	\$4,425,415	12,286,157	36	\$7,315,435	14,243,024	51
Burton International Academy	56	114,200	\$3,307,089	28,822,653	11	\$14,925,713	33,413,354	45
Carleton Elementary School	15-73	56,234	\$4,421,920	11,027,493	40	\$9,808,945	12,783,887	77
Carstens Academy of Aquatic Science at Remus	41	128,000	\$12,872,800	26,765,300	48	\$20,835,610	31,028,318	67
Carver Elementary School	65	67,102	\$3,355,436	13,353,663	25	\$11,206,795	15,480,556	72
Cass Technical High School	14	402,484	\$7,453,501	105,593,743	7	\$46,217,478	122,412,088	38
Catherine C. Blackwell Institute	69	57,044	\$2,562,378	13,136,757	20	\$7,290,974	15,229,101	48
Central High School	94	229,545	\$3,637,544	52,853,226	7	\$8,909,836	61,271,375	15
Charles Wright Academy of Arts and Science	16	94,991	\$11,874	19,298,678	0	\$8,527,877	22,372,458	38

Campus Name	Age (Years)	Area (SF)	Total Building Needs 2018	Current Replacement Value (\$)	2018 FCI %	Total Building Needs 2023	Forecast Replacement Value (\$)	2023 FCI %
Chrysler Elementary School	56	23,066	\$2,286,449	4,482,880	51	\$3,727,801	5,196,887	72
Clippert Academy	113	45,818	\$163,879	8,769,140	2	\$2,286,116	10,165,837	22
Cody High School	71	360,956	\$25,500,188	89,359,479	29	\$66,982,205	103,592,127	65
Coleman A. Young Elementary School	36	67,800	\$1,387,612	13,564,700	10	\$11,004,660	15,725,205	70
Communication and Media Arts High School	60	79,450	\$5,127,802	19,093,821	27	\$11,993,825	22,134,972	54
Cooke Elementary School	93	45,184	\$2,987,961	8,339,837	36	\$5,240,094	9,668,157	54
Davis Aerospace Technical High School at Golightly	36	132,668	\$9,704,498	33,855,215	29	\$27,260,028	39,247,473	69
Davison Elementary/Middle School	91-102	110,388	\$6,346,692	24,895,883	25	\$16,491,263	28,861,152	57
Denby High School	89	214,802	\$1,330,418	52,224,063	3	\$6,296,758	60,542,003	10
Detroit Collegiate Preparatory High School	48	388,059	\$15,350,644	91,300,320	17	\$64,209,739	105,842,094	61
Detroit International Academy for Young Women	104	304,087	\$24,092,987	75,299,315	32	\$55,341,999	87,292,544	63
Detroit Lions Alternative Education	55	32,241	\$1,429,405	6,555,804	22	\$4,057,415	7,599,974	53
Detroit School of Arts	14	305,634	\$0	77,077,607	0	\$10,678,125	89,354,071	12
Dixon Educational Learning Academy	55	93,258	\$9,395,277	19,595,837	48	\$16,128,626	22,716,946	71
Dossin Elementary School	18-69	52,260	\$1,831,609	9,918,509	18	\$6,007,937	11,498,270	52
Drew Transition Center	48	139,000	\$12,207,944	32,977,324	37	\$22,633,909	38,229,756	59
Earhart Elementary/Middle School	7	104,450	\$0	26,990,732	0	\$3,431,280	31,289,655	11
Early Intervention Center	48	61,152	\$6,341,121	12,416,648	51	\$10,396,614	14,394,299	72
East English Village Preparatory Academy	6	238,440	\$0	60,984,979	0	\$1,924,556	70,698,304	3
Edison Elementary School	97	44,263	\$1,214,466	8,154,904	15	\$6,311,877	9,453,769	67
Edward 'Duke' Ellington Conservatory of Music and Art	17	86,000	\$40,883	21,867,138	0	\$8,389,708	25,350,006	33
Emerson Elementary/Middle School	13-71	126,805	\$3,381,606	24,377,701	14	\$11,400,860	28,260,437	40
Moses Field Center	54	53,742	\$3,268,588	10,909,626	30	\$8,085,048	12,647,247	64
Fisher Magnet Lower Academy	16	95,098	\$1,476,396	19,320,335	8	\$7,680,331	22,397,564	34
Fisher Magnet Upper Academy	15	147,620	\$368,865	34,515,937	1	\$11,932,823	40,013,430	30
Fleming Early Learning Neighborhood Center	68	62,548	\$4,966,233	12,329,775	40	\$8,540,713	14,293,588	60

Campus Name	Age (Years)	Area (SF)	Total Building Needs 2018	Current Replacement Value (\$)	2018 FCI %	Total Building Needs 2023	Forecast Replacement Value (\$)	2023 FCI %
Ford High School	62	270,218	\$2,787,583	70,569,742	4	\$34,954,298	81,809,672	43
Foreign Language Immersion and Cultural Studies School	68	131,103	\$5,032,716	33,915,101	15	\$26,187,922	39,316,897	67
Frederick Douglass Academy for Young Men	15-53	236,067	\$13,133,746	59,016,318	22	\$28,260,468	68,416,087	41
Gardner Elementary School	15-93	35,634	\$1,465,430	6,459,084	23	\$3,309,049	7,487,849	44
Golightly Education Center	16-99	107,134	\$5,435,324	19,893,075	27	\$11,305,945	23,061,526	49
Gompers Elementary/Middle School	7	87,748	\$0	23,075,125	0	\$1,674,631	26,750,394	6
Greenfield Union Elementary School	16-104	75,285	\$4,888,395	14,385,749	34	\$9,349,051	16,677,026	56
Harms Elementary School	15-103	55,497	\$2,836,693	10,037,120	28	\$5,730,162	11,635,773	49
Henderson Academy	55	109,000	\$2,618,725	25,864,338	10	\$17,441,276	29,983,856	58
A.L. Holmes Academy of Blended Learning	103	102,217	\$7,520,999	24,460,528	31	\$12,514,671	28,356,456	44
Hutchinson Elementary/Middle School at Howe	16	98,174	\$515,659	24,166,854	2	\$9,896,114	28,016,007	35
J.E. Clark Preparatory Academy	93	61,202	\$1,443,679	14,647,169	10	\$7,925,990	16,980,083	47
John R. King Academic and Performing Arts Academy	95	187,551	\$6,867,654	41,560,988	17	\$18,820,249	48,180,575	39
Keidan Special Education Center	11-55	77,550	\$7,916,713	14,994,340	53	\$12,733,445	17,382,549	73
King High School	7	306,444	\$0	84,804,866	0	\$5,848,346	98,312,083	6
Law Academy	17	125,995	\$1,560,763	30,943,236	5	\$10,059,523	35,871,692	28
Ludington Magnet Middle and Honors School	55	95,591	\$2,437,212	19,076,379	13	\$14,652,391	22,114,752	66
Mackenzie Elementary/Middle School	6	111,774	\$64,270	28,559,501	0	\$976,684	33,108,289	3
Mann Elementary School	74	44,909	\$3,282,006	10,260,584	32	\$5,919,757	11,894,829	50
Marcus Garvey Academy	6-56	135,600	\$6,161,709	32,273,900	19	\$11,754,046	37,414,295	31
Mark Twain School for Scholars	93	120,132	\$6,563,000	21,010,380	31	\$16,386,546	24,356,788	67
Marquette Elementary/Middle School	16-69	92,618	\$3,424,514	18,921,889	18	\$8,988,559	21,935,655	41
Mason Academy	54	96,304	\$5,845,292	21,785,197	27	\$16,506,378	25,255,014	65
Maybury Elementary School	15-109	56,597	\$1,890,044	10,331,870	18	\$5,631,123	11,977,469	47
Mumford High School/Mumford Academy	6	240,273	\$0	59,350,104	0	\$3,544,450	68,803,036	5

Campus Name	Age (Years)	Area (SF)	Total Building Needs 2018	Current Replacement Value (\$)	2018 FCI %	Total Building Needs 2023	Forecast Replacement Value (\$)	2023 FCI %
Munger Elementary/Middle School	6	115,691	\$66,522	29,507,183	0	\$1,010,911	34,206,912	3
Neinas Elementary School	102	60,365	\$977,385	11,914,542	8	\$5,536,172	13,812,220	40
Nichols Elementary/Middle School	108	51,904	\$5,605,762	10,077,810	56	\$7,487,825	11,682,944	64
Noble Elementary School	98	143,605	\$14,279,004	34,953,457	41	\$27,706,235	40,520,637	68
Nolan Elementary School	92	112,432	\$5,749,070	27,402,489	21	\$20,308,035	31,766,995	64
Osborn High School	62	201,884	\$13,993,463	50,327,736	28	\$39,327,249	58,343,640	67
Palmer Park Preparatory Academy	89	165,500	\$25,455,650	38,718,753	66	\$33,403,897	44,885,646	74
Pasteur Elementary School	88	56,541	\$4,231,528	11,254,486	38	\$8,035,511	13,047,034	62
Paul Robeson Malcolm X Academy	88	54,427	\$1,714,178	12,984,241	13	\$9,709,814	15,052,294	65
Pershing High School	89	249,694	\$28,041,977	62,027,827	45	\$43,027,450	71,907,252	60
Priest Elementary/Middle School	15-95	117,502	\$4,613,758	28,424,400	16	\$13,839,521	32,951,670	42
Pulaski Elementary/Middle School	76	60,966	\$5,116,953	11,598,019	44	\$9,444,121	13,445,283	70
Randolph Career and Technical Center	36	122,883	\$2,036,170	27,552,211	7	\$15,855,427	31,940,564	50
Renaissance High School	13	295,523	\$0	75,897,194	0	\$9,793,853	87,985,649	11
Roberto Clemente Learning Academy	17	94,088	\$1,444,604	20,016,804	7	\$7,573,402	23,204,962	33
Ronald Brown Academy	17-91	121,992	\$3,396,752	30,799,275	11	\$11,629,089	35,704,801	33
Sampson Webber Academy	54	145,118	\$9,600,826	35,171,162	27	\$26,980,974	40,773,016	66
Schulze Elementary School	16	94,991	\$860,737	19,271,368	4	\$3,017,167	22,340,798	14
Southeastern High School	104	378,761	\$8,363,595	99,015,038	8	\$34,743,609	114,785,566	30
Spain Elementary/Middle School	51-106	141,738	\$7,440,324	36,232,031	21	\$24,601,315	42,002,854	59
Thirkell Elementary School	104	68,701	\$5,890,252	13,911,094	42	\$10,960,708	16,126,770	68
Thurgood Marshall Elementary/Middle School	98	90,905	\$11,133,931	21,103,600	53	\$16,355,831	24,464,857	67
Vernor Elementary School	73	44,608	\$1,897,792	8,886,471	21	\$5,746,596	10,301,856	56
Wayne Elementary School	18-89	47,066	\$2,537,595	8,934,686	28	\$7,032,531	10,357,692	68
West Side Academy	55	74,557	\$464,023	17,420,796	3	\$6,001,666	20,195,477	30
Western International High School	82	312,500	\$798,338	71,930,806	1	\$13,544,308	83,387,519	16
TOTALS		12,432,744	\$472,167,154	2,909,983,614		\$1,397,782,199	3,373,468,560	

The following table illustrates the current estimated needs by campus.

Table 5. Summary of Current Deficiencies: Detroit Public Schools Community District

Name	Year Built	Age (Years)	Building System	Site	Abbreviated Accessibility	Portables	Current Estimated Needs
Academy of the Americas Elementary/Middle School	1918	100	\$3,242,379	\$233,555	\$306,118	\$0	\$3,782,052
Adult Education Center-East	1928	90	\$528,123	\$110,139	\$9,578	\$0	\$647,839
Adult Education Center-West	1939	79	\$946,448	\$0	\$7,082	\$0	\$953,530
Ann Arbor Trail Magnet Middle School	1946	72	\$1,665,617	\$0	\$294,239	\$0	\$1,959,856
Bagley Elementary School of Journalism and Technology	1930	88	\$4,678,008	\$355,064	\$268,529	\$0	\$5,301,601
Bates Academy	1966	52	\$4,380,413	\$221,829	\$50,771	\$0	\$4,653,012
Ben Carson High School of Science and Medicine	1980	38	\$822,698	\$880,652	\$8,891	\$0	\$1,712,241
Bennett Elementary School	1911	107	\$247,845	\$21,718	\$247,423	\$0	\$516,986
Bethune-Fitzgerald Elementary/Middle School	1925	93	\$1,838,693	\$108,588	\$34,207	\$0	\$1,981,487
Bow Elementary/Middle School	1949	69	\$3,714,066	\$375,884	\$312,172	\$0	\$4,402,122
Breithaupt Career and Technical Center	1981	37	\$3,751,507	\$391,156	\$26,626	\$0	\$4,169,288
Brenda Scott Middle School	2003	15	\$2,562,499	\$2,321,813	\$1,705	\$0	\$4,886,016
Brewer Academy	1928	90	\$1,759,893	\$0	\$257,714	\$546,695	\$2,564,302
Bunche Elementary/Middle School	1922	96	\$377,170	\$655,433	\$18,000	\$0	\$1,050,602
Burns Elementary/Middle School	1923	95	\$4,425,415	\$93,075	\$340,763	\$0	\$4,859,253
Burton International Academy	1962	56	\$3,307,089	\$0	\$250,131	\$0	\$3,557,220
Carleton Elementary School	1945	73	\$4,421,920	\$0	\$272,548	\$0	\$4,694,469
Carstens Academy of Aquatic Science at Remus	1977	41	\$12,872,800	\$0	\$274,024	\$0	\$13,146,824
Carver Elementary School	1953	65	\$3,355,436	\$100,213	\$26,572	\$0	\$3,482,221
Cass Technical High School	2004	14	\$7,453,501	\$0	\$5,489	\$0	\$7,458,990
Catherine C. Blackwell Institute	1949	69	\$2,562,378	\$77,563	\$289,901	\$0	\$2,929,842
Central High School	1924	94	\$3,637,544	\$2,332,649	\$119,657	\$0	\$6,089,850
Charles Wright Academy of Arts and Science	2002	16	\$11,874	\$0	\$4,307	\$0	\$16,181
Chrysler Elementary School	1962	56	\$2,286,449	\$33,731	\$15,351	\$0	\$2,335,531
Clippert Academy	1905	113	\$163,879	\$58,787	\$253,889	\$0	\$476,556
Cody High School	1947	71	\$25,500,188	\$1,195,848	\$13,553	\$0	\$26,709,589
Coleman A. Young Elementary School	1982	36	\$1,387,612	\$0	\$15,124	\$0	\$1,402,736
Communication and Media Arts High School	1958	60	\$5,127,802	\$0	\$289,745	\$0	\$5,417,547
Cooke Elementary School	1925	93	\$2,987,961	\$209,238	\$252,552	\$0	\$3,449,751
Davis Aerospace Technical High School at Golightly	1982	36	\$9,704,498	\$1,570,000	\$20,719	\$0	\$11,295,217
Davison Elementary/Middle School	1916	102	\$6,346,692	\$64,232	\$335,712	\$0	\$6,746,636
Denby High School	1929	89	\$1,330,418	\$434,350	\$9,681	\$0	\$1,774,449
Detroit Collegiate Preparatory High School	1970	48	\$15,350,644	\$337,103	\$39,268	\$0	\$15,727,014

Name	Year Built	Age (Years)	Building System	Site	Abbreviated Accessibility	Portables	Current Estimated Needs
Detroit International Academy for Young Women	1914	104	\$24,092,987	\$1,195,883	\$56,169	\$0	\$25,345,039
Detroit Lions Alternative Education	1963	55	\$1,429,405	\$0	\$36,187	\$0	\$1,465,592
Detroit School of Arts	2004	14	\$0	\$0	\$5,580	\$0	\$5,580
Dixon Educational Learning Academy	1963	55	\$9,395,277	\$683,957	\$38,565	\$0	\$10,117,799
Dossin Elementary School	1949	69	\$1,831,609	\$0	\$272,498	\$464,280	\$2,568,388
Drew Transition Center	1970	48	\$12,207,944	\$83,577	\$14,451	\$0	\$12,305,972
Earhart Elementary/Middle School	2011	7	\$0	\$0	\$4,223	\$0	\$4,223
Early Intervention Center	1970	48	\$6,341,121	\$1,136,501	\$9,236	\$0	\$7,486,858
East English Village Preparatory Academy	2012	6	\$0	\$0	\$7,934	\$0	\$7,934
Edison Elementary School	1921	97	\$1,214,466	\$72,909	\$287,487	\$0	\$1,574,861
Edward 'Duke' Ellington Conservatory of Music and Art	2001	17	\$40,883	\$0	\$9,426	\$0	\$50,308
Emerson Elementary/Middle School	1947	71	\$3,381,606	\$0	\$282,932	\$0	\$3,664,538
Moses Field Center	1964	54	\$3,268,588	\$234,158	\$25,919	\$0	\$3,528,666
Fisher Magnet Lower Academy	2002	16	\$1,476,396	\$1,372,070	\$13,894	\$0	\$2,862,361
Fisher Magnet Upper Academy	2003	15	\$368,865	\$1,484,583	\$12,733	\$0	\$1,866,181
Fleming Early Learning Neighborhood Center	1950	68	\$4,966,233	\$918,635	\$18,799	\$0	\$5,903,668
Ford High School	1956	62	\$2,787,583	\$0	\$13,106	\$0	\$2,800,689
Foreign Language Immersion and Cultural Studies School	1950	68	\$5,032,716	\$193,906	\$7,961	\$0	\$5,234,583
Frederick Douglass Academy for Young Men	1965	53	\$13,133,746	\$720,992	\$290,581	\$0	\$14,145,319
Gardner Elementary School	1925	93	\$1,465,430	\$167,801	\$328,102	\$795,000	\$2,756,333
Golightly Education Center	1919	99	\$5,435,324	\$94,626	\$249,320	\$0	\$5,779,270
Gompers Elementary/Middle School	2011	7	\$0	\$0	\$11,174	\$0	\$11,174
Greenfield Union Elementary School	1914	104	\$4,888,395	\$117,866	\$327,005	\$0	\$5,333,266
Harms Elementary School	1915	103	\$2,836,693	\$173,054	\$261,995	\$912,660	\$4,184,402
Henderson Academy	1963	55	\$2,618,725	\$243,401	\$40,300	\$0	\$2,902,427
A.L. Holmes Academy of Blended Learning	1915	103	\$7,520,999	\$159,886	\$295,161	\$0	\$7,976,046
Hutchinson Elementary/Middle School at Howe	2002	16	\$515,659	\$0	\$76,498	\$0	\$592,157
J.E. Clark Preparatory Academy	1925	93	\$1,443,679	\$273,813	\$266,598	\$0	\$1,984,089
John R. King Academic and Performing Arts Academy	1923	95	\$6,867,654	\$0	\$35,077	\$0	\$6,902,731
Keidan Special Education Center	1963	55	\$7,916,713	\$173,740	\$252,896	\$0	\$8,343,349
King High School	2011	7	\$0	\$0	\$3,879	\$0	\$3,879
Law Academy	2001	17	\$1,560,763	\$0	\$33,065	\$0	\$1,593,828
Ludington Magnet Middle and Honors School	1963	55	\$2,437,212	\$803,688	\$73,617	\$0	\$3,314,517
Mackenzie Elementary/Middle School	2012	6	\$64,270	\$0	\$8,278	\$0	\$72,548
Mann Elementary School	1944	74	\$3,282,006	\$373,724	\$290,204	\$0	\$3,945,934

Name	Year Built	Age (Years)	Building System	Site	Abbreviated Accessibility	Portables	Current Estimated Needs
Marcus Garvey Academy	1962	56	\$6,161,709	\$139,613	\$268,406	\$0	\$6,569,728
Mark Twain School for Scholars	1925	93	\$6,563,000	\$603,325	\$12,696	\$0	\$7,179,021
Marquette Elementary/Middle School	1949	69	\$3,424,514	\$0	\$286,203	\$0	\$3,710,717
Mason Academy	1964	54	\$5,845,292	\$1,955,575	\$14,250	\$0	\$7,815,117
Maybury Elementary School	1909	109	\$1,890,044	\$52,743	\$289,793	\$1,204,160	\$3,436,739
Mumford High School/Mumford Academy	2012	6	\$0	\$0	\$0	\$0	\$0
Munger Elementary/Middle School	2012	6	\$66,522	\$0	\$6,955	\$0	\$73,477
Neinas Elementary School	1916	102	\$977,385	\$40,838	\$262,605	\$0	\$1,280,827
Nichols Elementary/Middle School	1910	108	\$5,605,762	\$268,866	\$278,101	\$0	\$6,152,729
Noble Elementary School	1920	98	\$14,279,004	\$111,690	\$121,799	\$0	\$14,512,493
Nolan Elementary School	1926	92	\$5,749,070	\$224,750	\$20,409	\$0	\$5,994,229
Osborn High School	1956	62	\$13,993,463	\$288,533	\$25,835	\$0	\$14,307,831
Palmer Park Preparatory Academy	1929	89	\$25,455,650	\$149,731	\$265,976	\$0	\$25,871,357
Pasteur Elementary School	1930	88	\$4,231,528	\$67,538	\$247,442	\$0	\$4,546,509
Paul Robeson Malcolm X Academy	1930	88	\$1,714,178	\$90,334	\$253,783	\$0	\$2,058,295
Pershing High School	1929	89	\$28,041,977	\$2,136,709	\$54,394	\$0	\$30,233,080
Priest Elementary/Middle School	1923	95	\$4,613,758	\$235,500	\$306,725	\$0	\$5,155,983
Pulaski Elementary/Middle School	1942	76	\$5,116,953	\$465,375	\$269,696	\$0	\$5,852,023
Randolph Career and Technical Center	1982	36	\$2,036,170	\$1,289,553	\$78,637	\$0	\$3,404,360
Renaissance High School	2005	13	\$0	\$0	\$17,586	\$0	\$17,586
Roberto Clemente Learning Academy	2001	17	\$1,444,604	\$673,138	\$6,062	\$0	\$2,123,804
Ronald Brown Academy	1927	91	\$3,396,752	\$1,050,566	\$250,111	\$0	\$4,697,429
Sampson Webber Academy	1964	54	\$9,600,826	\$291,547	\$284,109	\$0	\$10,176,482
Schulze Elementary School	2002	16	\$860,737	\$1,340,381	\$8,416	\$0	\$2,209,535
Southeastern High School	1914	104	\$8,363,595	\$617,250	\$11,172	\$0	\$8,992,016
Spain Elementary/Middle School	1912	106	\$7,440,324	\$0	\$550,647	\$0	\$7,990,971
Thirkell Elementary School	1914	104	\$5,890,252	\$108,588	\$278,333	\$0	\$6,277,173
Thurgood Marshall Elementary/Middle School	1920	98	\$11,133,931	\$100,831	\$261,299	\$0	\$11,496,061
Vernor Elementary School	1945	73	\$1,897,792	\$340,913	\$293,311	\$0	\$2,532,015
Wayne Elementary School	1929	89	\$2,537,595	\$454,550	\$293,285	\$469,050	\$3,754,481
West Side Academy	1963	55	\$464,023	\$69,806	\$1,705	\$0	\$535,534
Western International High School	1936	82	\$798,338	\$490,625	\$5,277	\$0	\$1,294,239
						Total Estimated Needs	\$526,644,657

Note: Please note that requirements are based on visual observations and interviews with School District personnel.

HIGH SCHOOLS
FACILITY CONDITION INFORMATION

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High Schools

The project included facilities at 25 locations totaling approximately 5,775,496 square feet. The table below contains location-specific information regarding current and forecast Facility Condition Indices. A comprehensive list of expired systems and those expected to expire between now and the year 2028 is shown in the Forecasted Needs Summarized by System: High School Table.

Table 6. Facility Description: Summary of Findings: High Schools

Name	Area (SF)	Total Needs 2018	Current Replacement Value (\$)	2018 FCI %	Total Needs 2023	Forecast Replacement Value (\$)	2023 FCI %
Adult Education Center-West	48,742	\$946,448	11,163,133	8	\$5,023,113	12,941,130	39
Ben Carson High School of Science and Medicine	92,464	\$822,698	21,777,268	4	\$9,673,328	25,245,822	38
Breithaupt Career and Technical Center	150,361	\$3,751,507	31,468,678	12	\$26,263,882	36,480,822	72
Cass Technical High School	402,484	\$7,453,501	105,593,743	7	\$46,217,478	122,412,088	38
Central High School	229,545	\$3,637,544	52,853,226	7	\$8,909,836	61,271,375	15
Cody High School	360,956	\$25,500,188	89,359,479	29	\$66,982,205	103,592,127	65
Communication and Media Arts High School	79,450	\$5,127,802	19,093,821	27	\$11,993,825	22,134,972	54
Davis Aerospace Technical High School at Golightly	132,668	\$9,704,498	33,855,215	29	\$27,260,028	39,247,473	69
Denby High School	214,802	\$1,330,418	52,224,063	3	\$6,296,758	60,542,003	10
Detroit Collegiate Preparatory High School	388,059	\$15,350,644	91,300,320	17	\$64,209,739	105,842,094	61
Detroit International Academy for Young Women	304,087	\$24,092,987	75,299,315	32	\$55,341,999	87,292,544	63
Detroit School of Arts	305,634	\$0	77,077,607	0	\$10,678,125	89,354,071	12
Drew Transition Center	139,000	\$12,207,944	32,977,324	37	\$22,633,909	38,229,756	59
East English Village Preparatory Academy	238,440	\$0	60,984,979	0	\$1,924,556	70,698,304	3
Ford High School	270,218	\$2,787,583	70,569,742	4	\$34,954,298	81,809,672	43
Frederick Douglass Academy for Young Men	236,067	\$13,133,746	59,016,318	22	\$28,260,468	68,416,087	41
King High School	306,444	\$0	84,804,866	0	\$5,848,346	98,312,083	6
Mumford High School/Mumford Academy	240,273	\$0	59,350,104	0	\$3,544,450	68,803,036	5
Osborn High School	201,884	\$13,993,463	50,327,736	28	\$39,327,249	58,343,640	67
Pershing High School	249,694	\$28,041,977	62,027,827	45	\$43,027,450	71,907,252	60
Randolph Career and Technical Center	122,883	\$2,036,170	27,552,211	7	\$15,855,427	31,940,564	50
Renaissance High School	295,523	\$0	75,897,194	0	\$9,793,853	87,985,649	11
Southeastern High School	378,761	\$8,363,595	99,015,038	8	\$34,743,609	114,785,566	30
West Side Academy	74,557	\$464,023	17,420,796	3	\$6,001,666	20,195,477	30
Western International High School	312,500	\$798,338	71,930,806	1	\$13,544,308	83,387,519	16
SUBTOTAL	5,775,496	\$179,545,074	\$1,432,940,807	13	\$598,309,906	\$1,661,171,127	36
Site and Infrastructure (excluded from FCI calculations)		\$14,034,685			\$36,327,962		
Abbreviated Accessibility		\$1,127,018			\$1,306,522		
Portables		\$0			\$0		
TOTALS	5,775,496	\$194,706,777	\$1,432,940,809		\$635,944,389	\$1,661,171,127	

Note: The average FCI for the High School facilities assessed is 8 while the average FCI in 5 years is estimated to be 39 assuming current sustainment levels.

Figures below show the current and forecasted needs respectively for all High School locations grouped by system.

Figure 14. Comparison of 2018 Current Needs vs. 2023 Forecasted Needs by System Group: High School

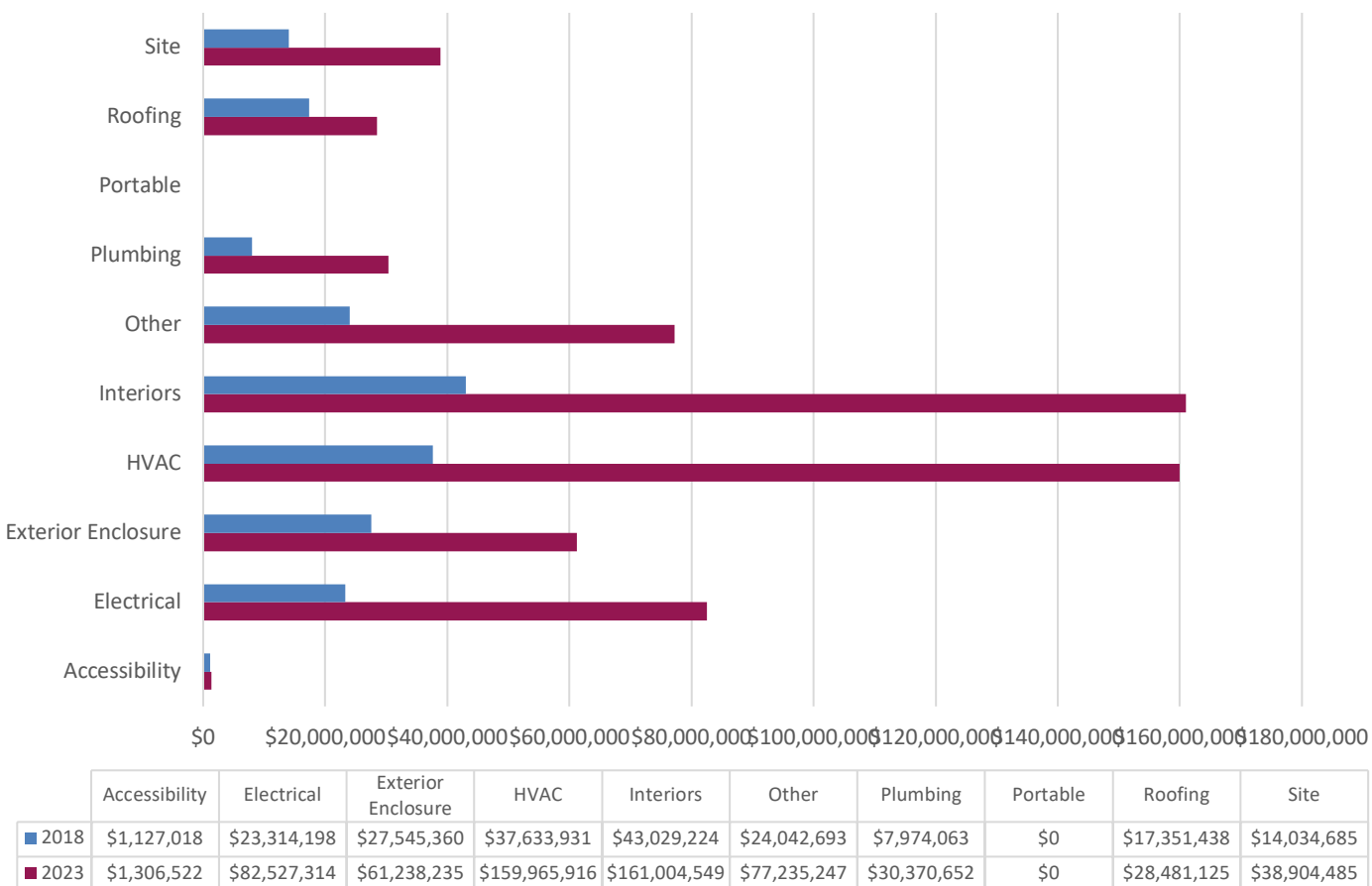
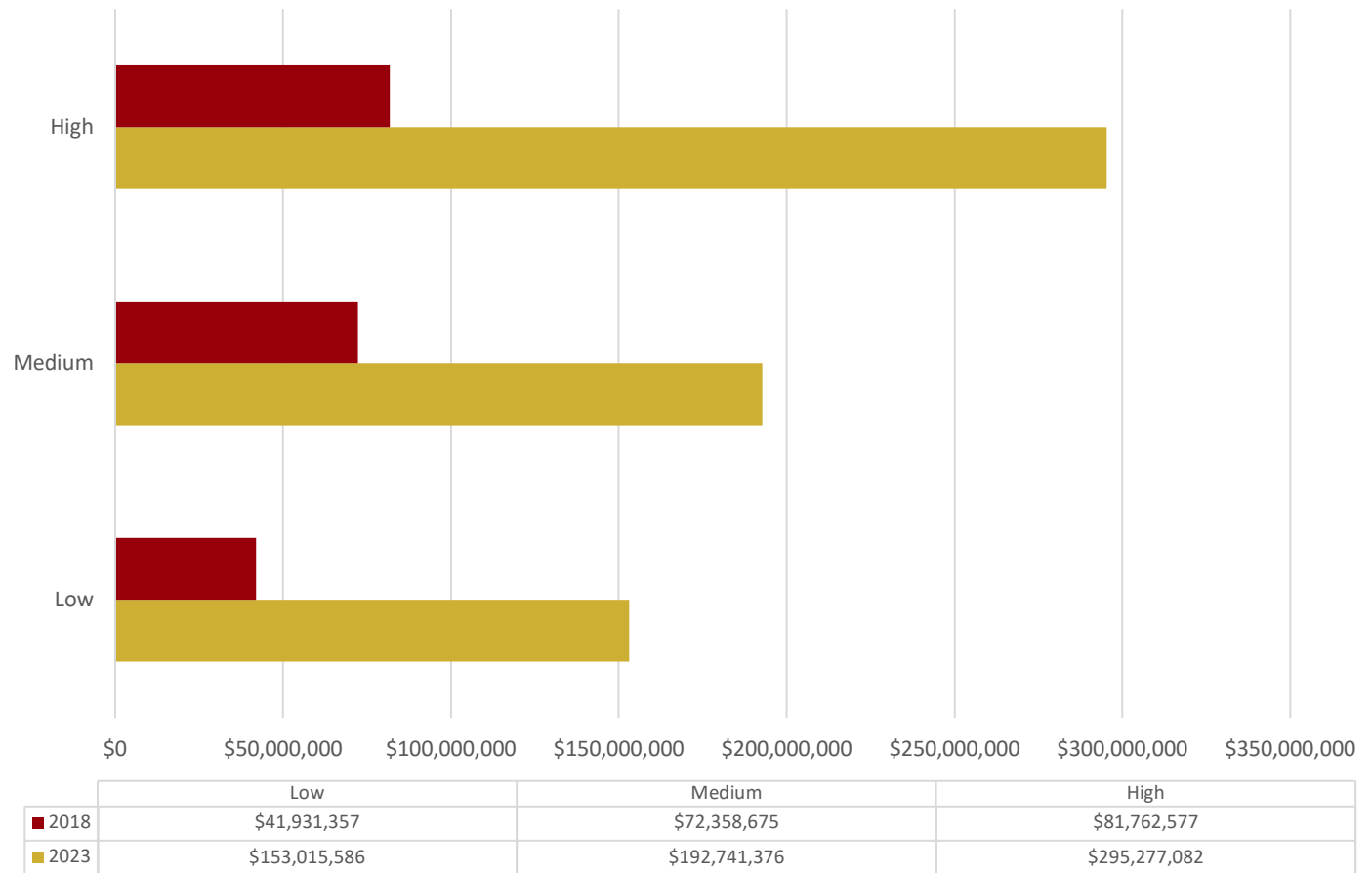


Figure 15. Comparison of 2018 Current Needs vs. 2023 Forecasted Needs by Priority: High School



Renewal Forecast

The renewal forecast below, for high school locations, shows the current backlog and projected facility sustainment requirements over the next 10 years. Please note, the renewal forecast does not include potential costs associated with asbestos abatement; seismic evaluation; seismic retrofitting; hazardous material inspection, evaluation, and mitigation; and National Fire Protection Association (NFPA) 101 and ADA upgrades. The renewal forecast is shown in the following figures:

Figure 16. Current and Forecasted Needs: Summarized by Reporting Period (Current +10 Years): High School

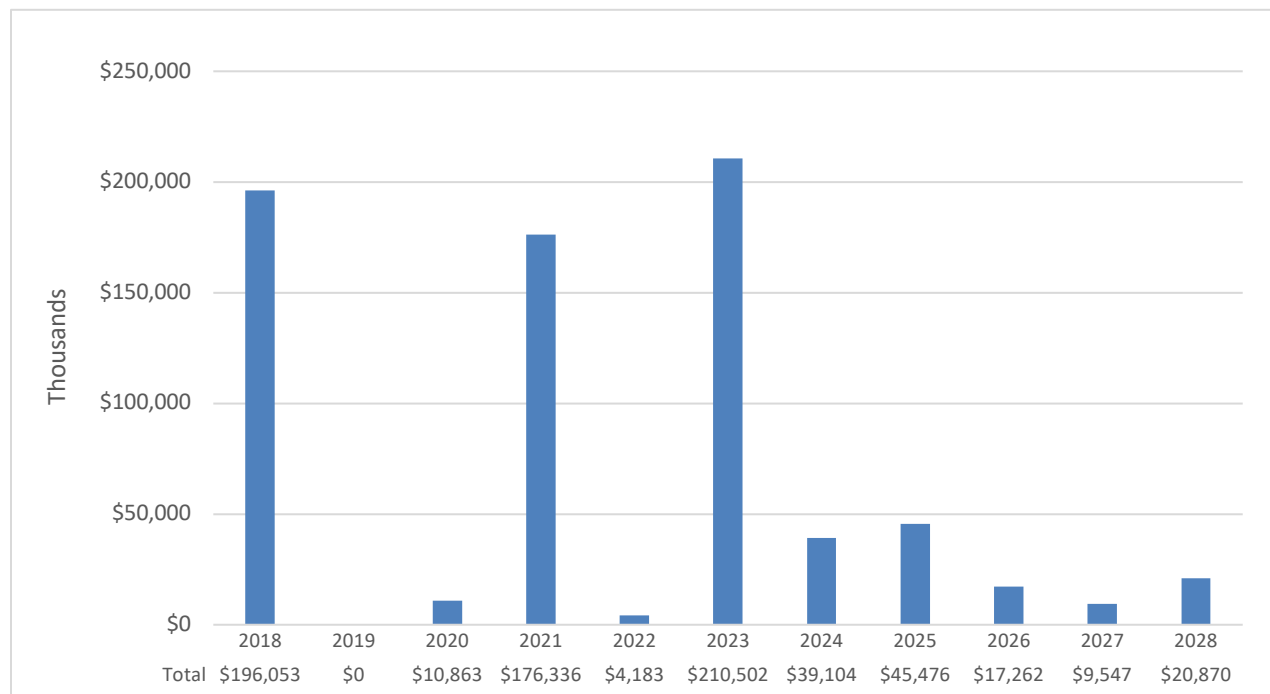


Table 7. Current and Forecasted Needs Summarized by System (Current + 5 years): High School

System	2018	2019	2020	2021	2022	2023
Cumulative Needs by Year	\$196,052,609	\$201,934,187	\$218,855,667	\$401,756,875	\$417,992,669	\$641,034,045
Needs by Year	\$196,052,609	\$0	\$10,863,454	\$176,335,538	\$4,183,088	\$210,501,596
EXTERIOR ENCLOSURE	\$27,545,360	\$0	\$0	\$7,942,483	\$0	\$20,879,433
Exterior Walls	\$0	\$0	\$0	\$0	\$0	\$9,689,943
Exterior Walls - Finishes	\$396,498	\$0	\$0	\$525,117	\$0	\$3,173,563
Exterior Windows	\$26,485,099	\$0	\$0	\$5,926,308	\$0	\$7,206,424
Exterior Doors	\$663,764	\$0	\$0	\$1,491,058	\$0	\$809,502
ROOFING	\$17,351,438	\$0	\$0	\$5,252,211	\$345,871	\$2,437,736
Roof Coverings - Built-up	\$6,639,402	\$0	\$0	\$3,859,129	\$0	\$1,977,535
Roof Coverings - Composition Shingles	\$2,479,923	\$0	\$0	\$0	\$0	\$84,482
Roof Coverings - Modified Bitumen	\$306,549	\$0	\$0	\$1,141,616	\$345,871	\$0
Roof Coverings - Single - Ply	\$7,852,066	\$0	\$0	\$0	\$0	\$0
Roof Openings	\$73,499	\$0	\$0	\$251,466	\$0	\$375,719
INTERIOR CONSTRUCTION	\$10,550,908	\$0	\$11,405	\$9,375,080	\$396,366	\$20,355,566
Interior Doors	\$1,097,867	\$0	\$0	\$2,869,138	\$0	\$3,672,365
Fittings - Casework	\$3,470,211	\$0	\$0	\$1,344,623	\$0	\$4,021,773
Fittings - Lockers	\$5,825,492	\$0	\$0	\$3,554,919	\$339,076	\$10,772,010
Fittings - Toilet Partitions	\$157,337	\$0	\$11,405	\$1,606,400	\$57,290	\$1,889,419
INTERIOR FINISHES	\$32,478,316	\$0	\$0	\$30,234,550	\$357,329	\$47,955,695
Wall Finishes	\$5,360,979	\$0	\$0	\$7,244,320	\$0	\$22,956,436
Floor Finishes	\$14,746,794	\$0	\$0	\$10,798,083	\$0	\$24,508,026
Ceiling Finishes	\$12,370,544	\$0	\$0	\$12,192,148	\$357,329	\$491,234
CONVEYING	\$225,761	\$0	\$0	\$158,445	\$0	\$336,189
Conveying Systems - Chair Lifts	\$8,261	\$0	\$0	\$0	\$0	\$0
Conveying Systems - Elevators	\$217,500	\$0	\$0	\$158,445	\$0	\$336,189
PLUMBING	\$7,974,063	\$0	\$0	\$8,605,900	\$0	\$11,996,528
Plumbing Fixtures	\$1,847,321	\$0	\$0	\$6,630,538	\$0	\$8,868,271
Domestic Water Distribution	\$2,735,246	\$0	\$0	\$773,198	\$0	\$1,551,968
Sanitary Waste	\$2,567,238	\$0	\$0	\$1,111,134	\$0	\$851,296
Rain Water Drainage	\$824,258	\$0	\$0	\$91,030	\$0	\$724,993
HVAC	\$37,633,931	\$0	\$0	\$59,846,157	\$687,478	\$52,138,986
Energy Supply	\$2,183,504	\$0	\$0	\$1,286,555	\$0	\$9,813,985
Heat Generating System	\$14,704,277	\$0	\$0	\$20,150,610	\$0	\$23,643,489
Cooling Generating Systems	\$5,144,149	\$0	\$0	\$4,341,530	\$0	\$7,949,120
Distribution Systems	\$11,286,281	\$0	\$0	\$18,803,749	\$0	\$9,425,865
Terminal and Packaged Units	\$4,315,721	\$0	\$0	\$15,263,713	\$687,478	\$1,306,526
FIRE PROTECTION	\$13,438,882	\$0	\$0	\$3,351,649	\$265,132	\$4,016,109
Fire Protection - Activation Devices	\$409,270	\$0	\$0	\$1,552,311	\$53,959	\$961,899
Fire Protection - Notification Device Ctrl Panel	\$643,724	\$0	\$0	\$890,496	\$43,300	\$648,397

System	2018	2019	2020	2021	2022	2023
Fire Protection - Sprinklers and Standpipe	\$6,049,811	\$0	\$0	\$0	\$167,872	\$1,064,719
Fire Protection - Wiring	\$6,336,076	\$0	\$0	\$908,842	\$0	\$1,341,093
ELECTRICAL	\$23,314,198	\$0	\$8,572,970	\$16,907,620	\$2,130,914	\$25,999,717
Electrical Service/Distribution	\$248,214	\$0	\$247,683	\$698,828	\$157,150	\$385,985
Lighting - Branch Wiring	\$19,431,094	\$0	\$0	\$524,894	\$0	\$5,236,955
Lighting - Light Fixtures	\$533,725	\$0	\$8,047,936	\$12,930,654	\$583,557	\$12,676,318
Communications and Security - Central Clock	\$706,767	\$0	\$0	\$292,006	\$0	\$592,598
Communications and Security - LAN	\$0	\$0	\$0	\$0	\$60,621	\$2,060,390
Communications and Security - Public Add Intercom	\$710,459	\$0	\$58,174	\$1,391,187	\$59,954	\$1,169,010
Communications and Security - Security System	\$653,072	\$0	\$0	\$1,070,051	\$1,269,632	\$3,217,780
Other Electrical Systems - Emergency Power	\$1,030,868	\$0	\$219,176	\$0	\$0	\$660,681
EQUIPMENT	\$3,910,077	\$0	\$2,112,315	\$10,124,470	\$0	\$21,499,090
Institutional Equipment - Kitchen Equipment	\$3,910,077	\$0	\$2,112,315	\$10,124,470	\$0	\$21,499,090
FIXED FURNISHINGS	\$193,176	\$0	\$166,765	\$380,378	\$0	\$638,063
Fixed Furnishings - Fixed Seating	\$193,176	\$0	\$166,765	\$380,378	\$0	\$638,063
SPECIAL CONSTRUCTION	\$6,274,797	\$0	\$0	\$3,226,948	\$0	\$1,818,307
Special Construction	\$6,274,797	\$0	\$0	\$3,226,948	\$0	\$1,818,307
SITEWORK	\$14,034,685	\$0	\$0	\$20,929,647	\$0	\$430,177
Roadways	\$9,470,044	\$0	\$0	\$16,783,747	\$0	\$238,883
Pedestrian Paving	\$1,063,470	\$0	\$0	\$513,316	\$0	\$191,294
Parking Lots	\$3,501,171	\$0	\$0	\$3,632,584	\$0	\$0
ACCESSIBILITY	\$1,127,018	\$0	\$0	\$0	\$0	\$0
Parking	\$95,492	\$0	\$0	\$0	\$0	\$0
Ramps	\$2,737	\$0	\$0	\$0	\$0	\$0
Entrances/Exit	\$12,506	\$0	\$0	\$0	\$0	\$0
Elevators/Lifts	\$630,358	\$0	\$0	\$0	\$0	\$0
Toilet Rooms	\$220,036	\$0	\$0	\$0	\$0	\$0
Access to Goods and Services	\$5,494	\$0	\$0	\$0	\$0	\$0
Additional Access	\$160,395	\$0	\$0	\$0	\$0	\$0

Table 8. Current and Forecasted Needs Summarized by System (Years 6 - 10): High School

System	2024	2025	2026	2027	2028
Cumulative Needs by Year	\$699,369,226	\$765,826,402	\$806,063,225	\$839,792,221	\$885,855,689
Needs by Year	\$39,104,160	\$45,476,099	\$17,262,031	\$9,547,099	\$20,869,701
EXTERIOR ENCLOSURE	\$400,126	\$0	\$0	\$58,615	\$5,790,708
Exterior Walls	\$0	\$0	\$0	\$0	\$0
Exterior Walls - Finishes	\$400,126	\$0	\$0	\$0	\$0
Exterior Windows	\$0	\$0	\$0	\$0	\$5,427,737
Exterior Doors	\$0	\$0	\$0	\$58,615	\$362,971
ROOFING	\$2,467,293	\$3,722,855	\$0	\$16,140	\$2,198,850
Roof Coverings - Built-up	\$0	\$1,039,897	\$0	\$0	\$102,044
Roof Coverings - Composition Shingles	\$0	\$0	\$0	\$0	\$0
Roof Coverings - Modified Bitumen	\$2,467,293	\$2,682,958	\$0	\$0	\$2,095,665
Roof Coverings - Single - Ply	\$0	\$0	\$0	\$0	\$0
Roof Openings	\$0	\$0	\$0	\$16,140	\$1,141
INTERIOR CONSTRUCTION	\$6,953,844	\$6,856,844	\$1,573,132	\$129,740	\$146,733
Interior Doors	\$0	\$317,374	\$0	\$129,740	\$146,733
Fittings - Casework	\$0	\$0	\$932,779	\$0	\$0
Fittings - Lockers	\$6,028,532	\$5,673,726	\$640,353	\$0	\$0
Fittings - Toilet Partitions	\$925,312	\$865,744	\$0	\$0	\$0
INTERIOR FINISHES	\$7,579,182	\$6,249,100	\$1,030,750	\$0	\$0
Wall Finishes	\$0	\$1,919,229	\$0	\$0	\$0
Floor Finishes	\$5,030,154	\$0	\$1,030,750	\$0	\$0
Ceiling Finishes	\$2,549,029	\$4,329,870	\$0	\$0	\$0
CONVEYING	\$0	\$0	\$0	\$0	\$97,434
Conveying Systems - Chair Lifts	\$0	\$0	\$0	\$0	\$0
Conveying Systems - Elevators	\$0	\$0	\$0	\$0	\$97,434
PLUMBING	\$0	\$0	\$0	\$0	\$0
Plumbing Fixtures	\$0	\$0	\$0	\$0	\$0
Domestic Water Distribution	\$0	\$0	\$0	\$0	\$0
Sanitary Waste	\$0	\$0	\$0	\$0	\$0
Rain Water Drainage	\$0	\$0	\$0	\$0	\$0
HVAC	\$196,407	\$6,972,714	\$5,898,503	\$0	\$0
Energy Supply	\$0	\$0	\$0	\$0	\$0
Heat Generating System	\$0	\$1,272,365	\$0	\$0	\$0
Cooling Generating Systems	\$0	\$0	\$0	\$0	\$0
Distribution Systems	\$0	\$0	\$0	\$0	\$0
Terminal and Packaged Units	\$196,407	\$5,700,349	\$5,898,503	\$0	\$0
FIRE PROTECTION	\$4,977,783	\$6,244,325	\$0	\$0	\$0
Fire Protection - Activation Devices	\$871,515	\$1,015,867	\$0	\$0	\$0
Fire Protection - Notification Device Ctrl Panel	\$699,364	\$958,207	\$0	\$0	\$0
Fire Protection - Sprinklers and Standpipe	\$2,556,278	\$2,382,363	\$0	\$0	\$0
Fire Protection - Wiring	\$850,627	\$1,887,888	\$0	\$0	\$0
ELECTRICAL	\$16,529,525	\$11,500,390	\$283,256	\$359,152	\$2,618,776

System	2024	2025	2026	2027	2028
Electrical Service/Distribution	\$0	\$0	\$0	\$0	\$0
Lighting - Branch Wiring	\$3,179,759	\$0	\$0	\$0	\$1,991,426
Lighting - Light Fixtures	\$9,425,270	\$7,071,153	\$0	\$0	\$0
Communications and Security - Central Clock	\$272,697	\$496,681	\$0	\$0	\$0
Communications and Security - LAN	\$2,329,398	\$2,079,348	\$0	\$0	\$0
Communications and Security - Public Add Intercom	\$968,350	\$1,015,939	\$0	\$0	\$0
Communications and Security - Security System	\$354,050	\$682,785	\$0	\$0	\$627,350
Other Electrical Systems - Emergency Power	\$0	\$154,483	\$283,256	\$359,152	\$0
EQUIPMENT	\$0	\$3,579,322	\$7,897,394	\$8,710,185	\$10,017,201
Institutional Equipment - Kitchen Equipment	\$0	\$3,579,322	\$7,897,394	\$8,710,185	\$10,017,201
FIXED FURNISHINGS	\$0	\$350,550	\$578,997	\$273,268	\$0
Fixed Furnishings - Fixed Seating	\$0	\$350,550	\$578,997	\$273,268	\$0
SPECIAL CONSTRUCTION	\$0	\$0	\$0	\$0	\$0
Special Construction	\$0	\$0	\$0	\$0	\$0
SITEWORK	\$0	\$0	\$0	\$0	\$0
Roadways	\$0	\$0	\$0	\$0	\$0
Pedestrian Paving	\$0	\$0	\$0	\$0	\$0
Parking Lots	\$0	\$0	\$0	\$0	\$0
ACCESSIBILITY	\$0	\$0	\$0	\$0	\$0
Parking	\$0	\$0	\$0	\$0	\$0
Ramps	\$0	\$0	\$0	\$0	\$0
Entrances/Exit	\$0	\$0	\$0	\$0	\$0
Elevators/Lifts	\$0	\$0	\$0	\$0	\$0
Toilet Rooms	\$0	\$0	\$0	\$0	\$0
Access to Goods and Services	\$0	\$0	\$0	\$0	\$0
Additional Access	\$0	\$0	\$0	\$0	\$0

MIDDLE SCHOOLS
FACILITY CONDITION INFORMATION

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Middle Schools

The project included facilities at 42 middle school (to include elementary/middle school) locations, totaling approximately 4,394,119 square feet. The table below contains location-specific information regarding current and forecast Facility Condition Indices. A comprehensive list of expired systems and those expected to expire between now and the year 2028 is shown in the Forecasted Needs Summarized by System: Middle School Table.

Table 9. Facility Description: Summary of Findings: Middle Schools

Name	Area (SF)	Total Needs 2018	Current Replacement Value (\$)	2018 FCI %	Total Needs 2023	Forecast Replacement Value (\$)	2023 FCI %
Academy of the Americas Elementary/Middle School	97,929	\$3,242,379	22,759,414	14	\$12,318,269	26,384,398	47
Ann Arbor Trail Magnet Middle School	44,863	\$1,665,617	8,828,969	19	\$7,758,989	10,235,195	76
Bates Academy	128,190	\$4,380,413	29,786,549	15	\$13,600,544	34,530,774	39
Bethune-Fitzgerald Elementary/Middle School	179,354	\$1,838,693	41,585,979	4	\$20,018,557	48,209,547	42
Bow Elementary/Middle School	59,100	\$3,714,066	11,033,334	34	\$7,591,456	12,790,658	59
Brenda Scott Middle School	147,620	\$2,562,499	31,933,541	8	\$13,250,679	37,019,727	36
Bunche Elementary/Middle School	113,400	\$377,170	26,649,820	1	\$3,465,751	30,894,445	11
Burns Elementary/Middle School	65,370	\$4,425,415	12,286,157	36	\$7,315,435	14,243,024	51
Catherine C. Blackwell Institute	57,044	\$2,562,378	13,136,757	20	\$7,290,974	15,229,101	48
Davison Elementary/Middle School	110,388	\$6,346,692	24,895,883	25	\$16,491,263	28,861,152	57
Detroit Lions Alternative Education	32,241	\$1,429,405	6,555,804	22	\$4,057,415	7,599,974	53
Dixon Educational Learning Academy	93,258	\$9,395,277	19,595,837	48	\$16,128,626	22,716,946	71
Dossin Elementary School	52,260	\$1,831,609	9,918,509	18	\$6,007,937	11,498,270	52
Earhart Elementary/Middle School	104,450	\$0	26,990,732	0	\$3,431,280	31,289,655	11
Emerson Elementary/Middle School	126,805	\$3,381,606	24,377,701	14	\$11,400,860	28,260,437	40
Moses Field Center	53,742	\$3,268,588	10,909,626	30	\$8,085,048	12,647,247	64
Fisher Magnet Upper Academy	147,620	\$368,865	34,515,937	1	\$11,932,823	40,013,430	30
Foreign Language Immersion and Cultural Studies School	131,103	\$5,032,716	33,915,101	15	\$26,187,922	39,316,897	67
Gompers Elementary/Middle School	87,748	\$0	23,075,125	0	\$1,674,631	26,750,394	6
Henderson Academy	109,000	\$2,618,725	25,864,338	10	\$17,441,276	29,983,856	58
A.L. Holmes Academy of Blended Learning	102,217	\$7,520,999	24,460,528	31	\$12,514,671	28,356,456	44
Hutchinson Elementary/Middle School at Howe	98,174	\$515,659	24,166,854	2	\$9,896,114	28,016,007	35
J.E. Clark Preparatory Academy	61,202	\$1,443,679	14,647,169	10	\$7,925,990	16,980,083	47
John R. King Academic and Performing Arts Academy	187,551	\$6,867,654	41,560,988	17	\$18,820,249	48,180,575	39
Law Academy	125,995	\$1,560,763	30,943,236	5	\$10,059,523	35,871,692	28
Ludington Magnet Middle and Honors School	95,591	\$2,437,212	19,076,379	13	\$14,652,391	22,114,752	66
Mackenzie Elementary/Middle School	111,774	\$64,270	28,559,501	0	\$976,684	33,108,289	3

Name	Area (SF)	Total Needs 2018	Current Replacement Value (\$)	2018 FCI %	Total Needs 2023	Forecast Replacement Value (\$)	2023 FCI %
Marcus Garvey Academy	135,600	\$6,161,709	32,273,900	19	\$11,754,046	37,414,295	31
Mark Twain School for Scholars	120,132	\$6,563,000	21,010,380	31	\$16,386,546	24,356,788	67
Marquette Elementary/Middle School	92,618	\$3,424,514	18,921,889	18	\$8,988,559	21,935,655	41
Munger Elementary/Middle School	115,691	\$66,522	29,507,183	0	\$1,010,911	34,206,912	3
Nichols Elementary/Middle School	51,904	\$5,605,762	10,077,810	56	\$7,487,825	11,682,944	64
Noble Elementary School	143,605	\$14,279,004	34,953,457	41	\$27,706,235	40,520,637	68
Nolan Elementary School	112,432	\$5,749,070	27,402,489	21	\$20,308,035	31,766,995	64
Palmer Park Preparatory Academy	165,500	\$25,455,650	38,718,753	66	\$33,403,897	44,885,646	74
Paul Robeson Malcolm X Academy	54,427	\$1,714,178	12,984,241	13	\$9,709,814	15,052,294	65
Priest Elementary/Middle School	117,502	\$4,613,758	28,424,400	16	\$13,839,521	32,951,670	42
Pulaski Elementary/Middle School	60,966	\$5,116,953	11,598,019	44	\$9,444,121	13,445,283	70
Ronald Brown Academy	121,992	\$3,396,752	30,799,275	11	\$11,629,089	35,704,801	33
Sampson Webber Academy	145,118	\$9,600,826	35,171,162	27	\$26,980,974	40,773,016	66
Spain Elementary/Middle School	141,738	\$7,440,324	36,232,031	21	\$24,601,315	42,002,854	59
Thurgood Marshall Elementary/Middle School	90,905	\$11,133,931	21,103,600	53	\$16,355,831	24,464,857	67
SUBTOTAL	4,394,119	\$189,174,302	\$1,011,208,357	19	\$529,902,076	\$1,172,267,628	45
Site and Infrastructure (excluded from FCI calculations)		\$11,961,489			\$25,897,755		
Abbreviated Accessibility		\$6,941,287			\$8,046,855		
Portables		\$464,280			\$538,228		
TOTALS	4,394,119	\$208,514,358	\$1,011,208,357		\$564,384,914	\$1,172,267,628	

Note: The average FCI for the Middle School facilities assessed is 14 while the average FCI in 5 years is estimated to be 47 assuming current sustainment levels.

Figures below show the current and forecasted needs respectively for all Middle School locations grouped by system.

Figure 17. Comparison of 2018 Current Needs vs. 2023 Forecasted Needs by System Group: Middle School

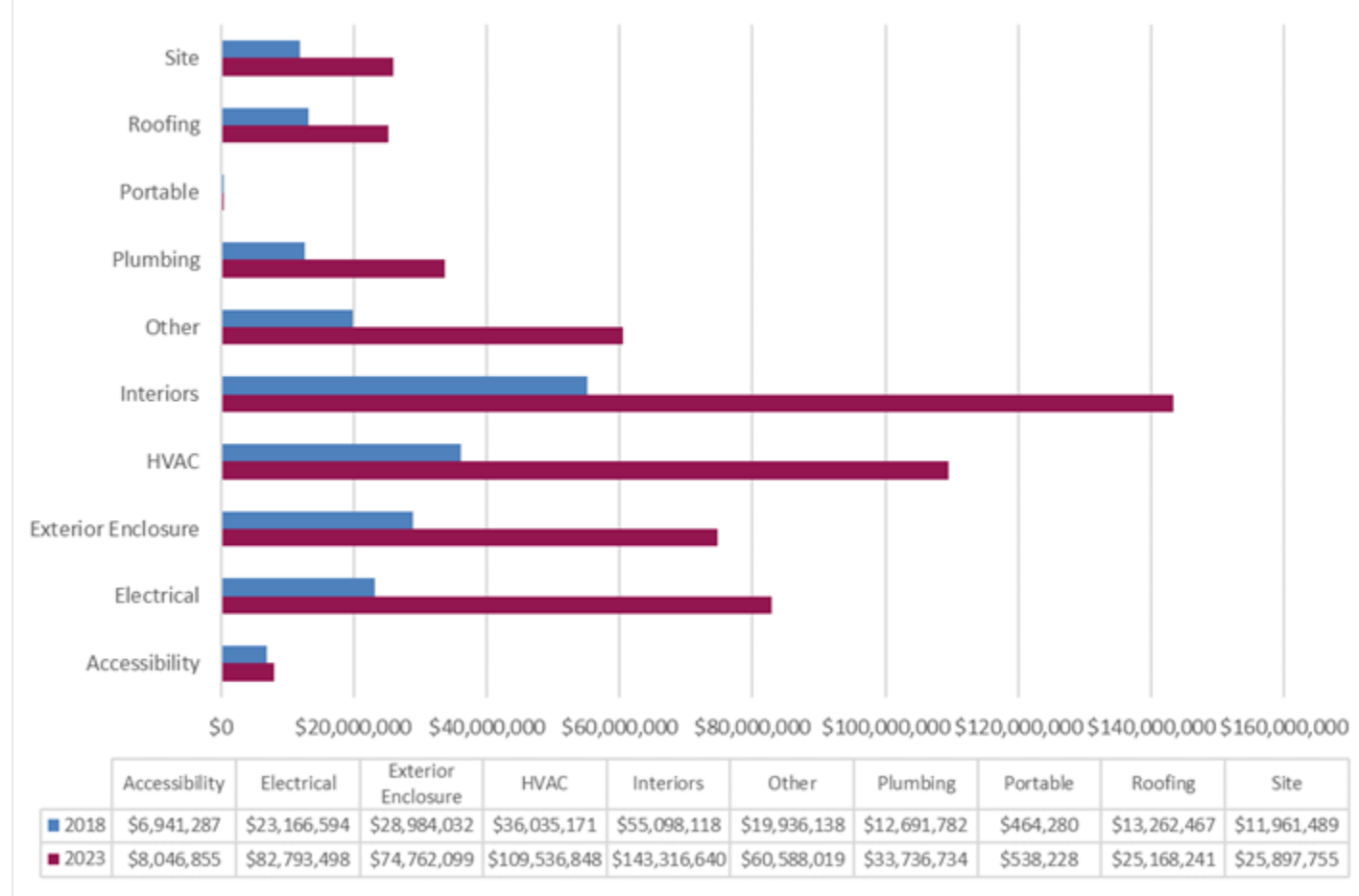
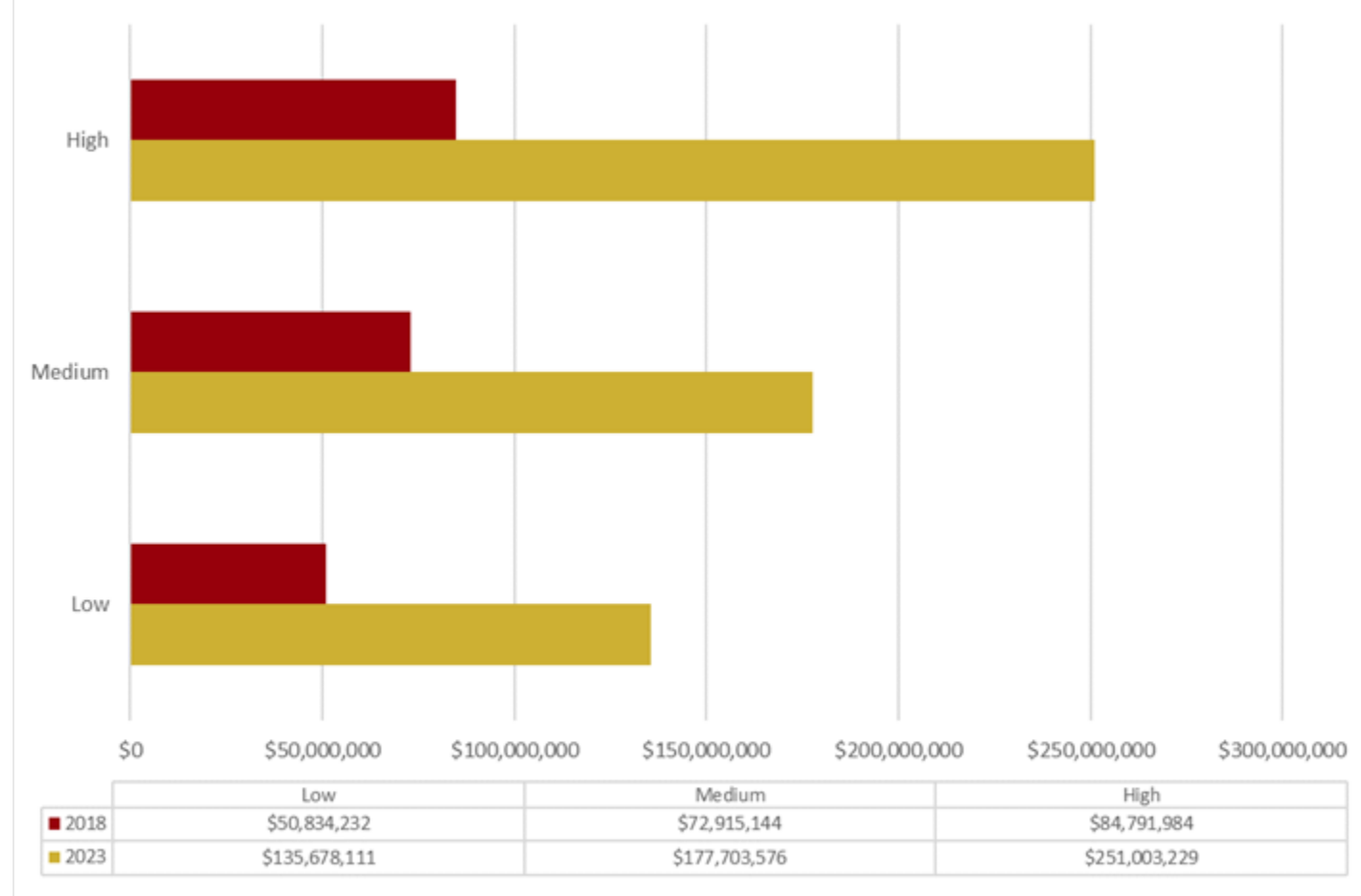


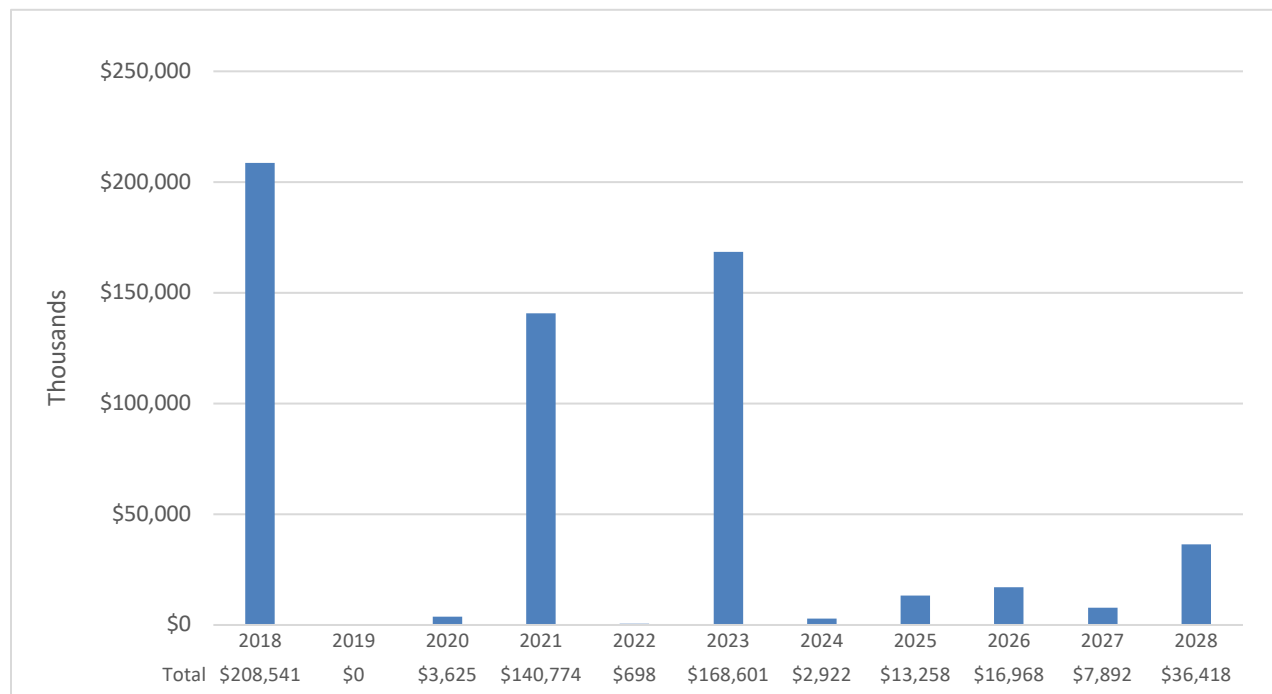
Figure 18. Comparison of 2018 Current Needs vs. 2023 Forecasted Needs by Priority: Middle School



Renewal Forecast

The renewal forecast below, for middle school (to include elementary/middle school) locations, shows the current backlog and projected facility sustainment requirements over the next 10 years. Please note the renewal forecast does not include potential costs associated with asbestos abatement, seismic evaluation; seismic retrofitting; hazardous material inspection, evaluation, and mitigation; and NFPA 101 and ADA upgrades. The renewal forecast is shown in the following figures:

Figure 19. Current and Forecasted Needs: Summarized by Reporting Period (Current +10 Years): Middle School



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Table 10. Current and Forecasted Needs Summarized by System (Current + 5 years): Middle School

System	2018	2019	2020	2021	2022	2023
Cumulative Needs by Year	\$208,541,360	\$214,797,600	\$224,866,122	\$372,386,148	\$384,256,072	\$564,384,916
Needs by Year	\$208,541,360	\$0	\$3,624,594	\$140,774,042	\$698,340	\$168,601,161
EXTERIOR ENCLOSURE	\$28,984,032	\$0	\$0	\$20,330,168	\$61,562	\$19,529,979
Exterior Walls	\$5,666,339	\$0	\$0	\$2,329,051	\$0	\$8,036,767
Exterior Walls - Finishes	\$760,792	\$0	\$0	\$585,273	\$61,562	\$1,198,875
Exterior Windows	\$21,930,902	\$0	\$0	\$15,737,267	\$0	\$9,327,921
Exterior Doors	\$625,999	\$0	\$0	\$1,678,578	\$0	\$966,415
ROOFING	\$13,262,467	\$0	\$759,491	\$4,106,585	\$0	\$4,606,813
Roof Coverings - Built-up	\$8,403,385	\$0	\$339,726	\$1,469,147	\$0	\$690,277
Roof Coverings - Composition Shingles	\$716,768	\$0	\$0	\$444,507	\$0	\$1,458,317
Roof Coverings - Modified Bitumen	\$3,704,894	\$0	\$419,766	\$677,912	\$0	\$2,319,343
Roof Coverings - Single - Ply	\$0	\$0	\$0	\$1,366,707	\$0	\$0
Roof Openings	\$437,420	\$0	\$0	\$148,312	\$0	\$138,877
INTERIOR CONSTRUCTION	\$22,106,548	\$0	\$1,095,311	\$8,935,456	\$118,783	\$10,429,849
Interior Doors	\$4,263,886	\$0	\$0	\$1,083,942	\$0	\$1,545,563
Fittings - Casework	\$3,928,400	\$0	\$0	\$2,177,180	\$0	\$1,019,376
Fittings - Lockers	\$12,941,020	\$0	\$1,095,311	\$4,588,774	\$0	\$6,517,035
Fittings - Toilet Partitions	\$973,242	\$0	\$0	\$1,085,560	\$118,783	\$1,347,874
INTERIOR FINISHES	\$32,991,570	\$0	\$1,300,183	\$28,246,404	\$126,460	\$26,696,514
Wall Finishes	\$5,314,953	\$0	\$1,300,183	\$11,381,470	\$0	\$9,162,807
Floor Finishes	\$15,082,839	\$0	\$0	\$12,855,281	\$126,460	\$9,747,599
Ceiling Finishes	\$12,593,778	\$0	\$0	\$4,009,653	\$0	\$7,786,108
CONVEYING	\$298,261	\$0	\$0	\$79,223	\$0	\$252,142
Conveying Systems - Chair Lifts	\$8,261	\$0	\$0	\$0	\$0	\$0
Conveying Systems - Elevators	\$290,000	\$0	\$0	\$79,223	\$0	\$252,142
PLUMBING	\$12,691,782	\$0	\$0	\$9,100,160	\$0	\$9,369,119
Plumbing Fixtures	\$7,460,943	\$0	\$0	\$6,953,549	\$0	\$6,374,898
Domestic Water Distribution	\$2,140,831	\$0	\$0	\$911,714	\$0	\$1,511,554
Sanitary Waste	\$2,223,624	\$0	\$0	\$771,068	\$0	\$1,068,726
Rain Water Drainage	\$866,385	\$0	\$0	\$463,829	\$0	\$413,941
HVAC	\$36,035,171	\$0	\$0	\$31,018,051	\$46,961	\$34,806,789
Energy Supply	\$3,630,122	\$0	\$0	\$0	\$0	\$8,022,018
Heat Generating System	\$15,987,052	\$0	\$0	\$16,466,984	\$0	\$14,750,462
Cooling Generating Systems	\$2,676,140	\$0	\$0	\$2,189,800	\$0	\$1,898,727
Distribution Systems	\$12,194,863	\$0	\$0	\$12,083,908	\$0	\$8,880,036
Terminal and Packaged Units	\$1,546,994	\$0	\$0	\$277,360	\$46,961	\$1,255,546
FIRE PROTECTION	\$13,466,560	\$0	\$0	\$1,949,585	\$40,558	\$8,443,066
Fire Protection - Activation Devices	\$1,489,659	\$0	\$0	\$600,229	\$0	\$1,280,870
Fire Protection - Notification Device Ctrl Panel	\$841,775	\$0	\$0	\$181,371	\$0	\$1,527,449

System	2018	2019	2020	2021	2022	2023
Fire Protection - Sprinklers and Standpipe	\$6,174,931	\$0	\$0	\$391,258	\$0	\$3,262,044
Fire Protection - Wiring	\$4,960,195	\$0	\$0	\$776,728	\$40,558	\$2,372,704
ELECTRICAL	\$23,166,594	\$0	\$452,630	\$18,073,357	\$304,016	\$35,955,303
Electrical Service/Distribution	\$327,467	\$0	\$0	\$793,965	\$0	\$1,252,021
Lighting - Branch Wiring	\$14,551,859	\$0	\$0	\$3,671,044	\$0	\$7,611,021
Lighting - Light Fixtures	\$4,999,477	\$0	\$0	\$11,690,935	\$0	\$15,208,708
Communications and Security - Central Clock	\$741,827	\$0	\$0	\$332,046	\$0	\$596,365
Communications and Security - LAN	\$542,768	\$0	\$0	\$0	\$0	\$6,305,087
Communications and Security - Public Add Intercom	\$832,067	\$0	\$121,997	\$872,619	\$0	\$1,519,018
Communications and Security - Security System	\$417,872	\$0	\$302,760	\$639,161	\$304,016	\$3,114,562
Other Electrical Systems - Emergency Power	\$753,258	\$0	\$27,873	\$73,588	\$0	\$348,521
EQUIPMENT	\$4,838,205	\$0	\$16,978	\$9,630,101	\$0	\$15,103,572
Institutional Equipment - Kitchen Equipment	\$4,838,205	\$0	\$16,978	\$9,630,101	\$0	\$15,103,572
FIXED FURNISHINGS	\$426,094	\$0	\$0	\$98,602	\$0	\$150,081
Fixed Furnishings - Fixed Seating	\$426,094	\$0	\$0	\$98,602	\$0	\$150,081
SPECIAL CONSTRUCTION	\$907,019	\$0	\$0	\$0	\$0	\$993,839
Special Construction	\$907,019	\$0	\$0	\$0	\$0	\$993,839
SITEWORK	\$11,961,489	\$0	\$0	\$9,206,351	\$0	\$2,264,094
Roadways	\$7,436,894	\$0	\$0	\$6,155,720	\$0	\$1,478,799
Pedestrian Paving	\$844,405	\$0	\$0	\$1,348,757	\$0	\$785,295
Parking Lots	\$3,680,190	\$0	\$0	\$1,701,873	\$0	\$0
PORTABLE	\$464,280	\$0	\$0	\$0	\$0	\$0
Portable	\$464,280	\$0	\$0	\$0	\$0	\$0
ACCESSIBILITY	\$6,941,287	\$0	\$0	\$0	\$0	\$0
Parking	\$411,440	\$0	\$0	\$0	\$0	\$0
Ramps	\$134,099	\$0	\$0	\$0	\$0	\$0
Entrances/Exit	\$70,565	\$0	\$0	\$0	\$0	\$0
Paths of Travel	\$6,921	\$0	\$0	\$0	\$0	\$0
Elevators/Lifts	\$5,433,233	\$0	\$0	\$0	\$0	\$0
Toilet Rooms	\$449,677	\$0	\$0	\$0	\$0	\$0
Guestrooms	\$2,929	\$0	\$0	\$0	\$0	\$0
Access to Goods and Services	\$19,797	\$0	\$0	\$0	\$0	\$0
Additional Access	\$412,627	\$0	\$0	\$0	\$0	\$0

Table 11. Current and Forecasted Needs Sum

System	2024	2025	2026	2027	2028
Cumulative Needs by Year	\$584,238,820	\$615,023,959	\$650,442,689	\$677,847,595	\$734,601,282
Needs by Year	\$2,922,357	\$13,257,974	\$16,968,011	\$7,891,625	\$36,418,260
EXTERIOR ENCLOSURE	\$203,585	\$1,865,053	\$518,726	\$55,654	\$12,721,561
Exterior Walls	\$0	\$1,038,813	\$0	\$0	\$12,269,187
Exterior Walls - Finishes	\$203,585	\$194,193	\$182,645	\$0	\$53,664
Exterior Windows	\$0	\$535,289	\$0	\$0	\$0
Exterior Doors	\$0	\$96,758	\$336,081	\$55,654	\$398,710
ROOFING	\$0	\$0	\$1,107,325	\$33,465	\$1,482,882
Roof Coverings - Built-up	\$0	\$0	\$210,590	\$0	\$1,349,892
Roof Coverings - Composition Shingles	\$0	\$0	\$0	\$0	\$0
Roof Coverings - Modified Bitumen	\$0	\$0	\$886,260	\$0	\$0
Roof Coverings - Single - Ply	\$0	\$0	\$0	\$0	\$0
Roof Openings	\$0	\$0	\$10,474	\$33,465	\$132,990
INTERIOR CONSTRUCTION	\$0	\$207,775	\$636,178	\$392,185	\$1,970,130
Interior Doors	\$0	\$0	\$636,178	\$392,185	\$1,047,308
Fittings - Casework	\$0	\$0	\$0	\$0	\$262,182
Fittings - Lockers	\$0	\$84,353	\$0	\$0	\$184,827
Fittings - Toilet Partitions	\$0	\$123,422	\$0	\$0	\$475,812
INTERIOR FINISHES	\$2,559,351	\$1,189,325	\$1,810,867	\$0	\$338,478
Wall Finishes	\$0	\$307,845	\$0	\$0	\$338,478
Floor Finishes	\$2,559,351	\$0	\$1,429,008	\$0	\$0
Ceiling Finishes	\$0	\$881,480	\$381,859	\$0	\$0
CONVEYING	\$0	\$0	\$10,465	\$0	\$0
Conveying Systems - Chair Lifts	\$0	\$0	\$10,465	\$0	\$0
Conveying Systems - Elevators	\$0	\$0	\$0	\$0	\$0
PLUMBING	\$0	\$38,953	\$521,453	\$0	\$1,004,831
Plumbing Fixtures	\$0	\$0	\$521,453	\$0	\$683,117
Domestic Water Distribution	\$0	\$0	\$0	\$0	\$143,118
Sanitary Waste	\$0	\$0	\$0	\$0	\$128,806
Rain Water Drainage	\$0	\$38,953	\$0	\$0	\$49,791
HVAC	\$0	\$1,122,867	\$7,541,817	\$0	\$11,584,328
Energy Supply	\$0	\$1,122,867	\$0	\$0	\$2,744,444
Heat Generating System	\$0	\$0	\$1,358,018	\$0	\$5,716,078
Cooling Generating Systems	\$0	\$0	\$6,183,798	\$0	\$1,196,395
Distribution Systems	\$0	\$0	\$0	\$0	\$1,927,412
Terminal and Packaged Units	\$0	\$0	\$0	\$0	\$0
FIRE PROTECTION	\$0	\$324,482	\$51,985	\$0	\$1,314,509
Fire Protection - Activation Devices	\$0	\$56,898	\$0	\$0	\$133,587
Fire Protection - Notification Device Ctrl Panel	\$0	\$114,452	\$51,985	\$0	\$218,813
Fire Protection - Sprinklers and Standpipe	\$0	\$153,132	\$0	\$0	\$359,530
Fire Protection - Wiring	\$0	\$0	\$0	\$0	\$602,578
ELECTRICAL	\$159,422	\$4,599,299	\$324,508	\$1,564,868	\$5,082,489

System	2024	2025	2026	2027	2028
Electrical Service/Distribution	\$0	\$0	\$184,513	\$0	\$60,440
Lighting - Branch Wiring	\$0	\$0	\$0	\$0	\$3,100,086
Lighting - Light Fixtures	\$0	\$2,814,344	\$0	\$0	\$1,500,779
Communications and Security - Central Clock	\$0	\$141,534	\$0	\$0	\$0
Communications and Security - LAN	\$0	\$494,903	\$0	\$1,552,786	\$0
Communications and Security - Public Add Intercom	\$0	\$509,676	\$0	\$0	\$81,253
Communications and Security - Security System	\$159,422	\$320,487	\$0	\$0	\$339,932
Other Electrical Systems - Emergency Power	\$0	\$318,356	\$139,996	\$12,083	\$0
EQUIPMENT	\$0	\$3,903,350	\$4,441,583	\$5,781,648	\$919,052
Institutional Equipment - Kitchen Equipment	\$0	\$3,903,350	\$4,441,583	\$5,781,648	\$919,052
FIXED FURNISHINGS	\$0	\$6,870	\$3,104	\$63,805	\$0
Fixed Furnishings - Fixed Seating	\$0	\$6,870	\$3,104	\$63,805	\$0
SPECIAL CONSTRUCTION	\$0	\$0	\$0	\$0	\$0
Special Construction	\$0	\$0	\$0	\$0	\$0
SITEWORK	\$0	\$0	\$0	\$0	\$0
Roadways	\$0	\$0	\$0	\$0	\$0
Pedestrian Paving	\$0	\$0	\$0	\$0	\$0
Parking Lots	\$0	\$0	\$0	\$0	\$0
PORTABLE	\$0	\$0	\$0	\$0	\$0
Portable	\$0	\$0	\$0	\$0	\$0
ACCESSIBILITY	\$0	\$0	\$0	\$0	\$0
Parking	\$0	\$0	\$0	\$0	\$0
Ramps	\$0	\$0	\$0	\$0	\$0
Entrances/Exit	\$0	\$0	\$0	\$0	\$0
Paths of Travel	\$0	\$0	\$0	\$0	\$0
Elevators/Lifts	\$0	\$0	\$0	\$0	\$0
Toilet Rooms	\$0	\$0	\$0	\$0	\$0
Guestrooms	\$0	\$0	\$0	\$0	\$0
Access to Goods and Services	\$0	\$0	\$0	\$0	\$0
Additional Access	\$0	\$0	\$0	\$0	\$0

marized by System (Years 6 - 10): Middle School

ELEMENTARY SCHOOLS
FACILITY CONDITION INFORMATION

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Elementary Schools

The project included facilities at 33 locations totaling approximately 2,377,329 square feet. The table below contains location-specific information regarding current and forecast Facility Condition Indices. A comprehensive list of expired systems and those expected to expire between now and the year 2028 is shown in the Forecasted Needs Summarized by System: Elementary Schools Table.

Table 12. Facility Description: Summary of Findings: Elementary Schools

Name	Area (SF)	Total Needs 2018	Current Replacement Value (\$)	2018 FCI %	Total Needs 2023	Forecast Replacement Value (\$)	2023 FCI %
Adult Education Center-East	69,950	\$528,123	15,566,425	3	\$1,110,950	18,045,753	6
Bagley Elementary School of Journalism and Technology	65,022	\$4,678,008	11,744,599	40	\$10,811,889	13,615,209	79
Bennett Elementary School	67,144	\$247,845	12,153,903	2	\$2,564,577	14,089,705	18
Brewer Elementary School	54,287	\$1,759,893	10,725,318	16	\$7,812,947	12,433,583	63
Burton International Academy	114,200	\$3,307,089	28,822,653	11	\$14,925,713	33,413,354	45
Carleton Elementary School	56,234	\$4,421,920	11,027,493	40	\$9,808,945	12,783,887	77
Carstens Academy of Aquatic Science at Remus	128,000	\$12,872,800	26,765,300	48	\$20,835,610	31,028,318	67
Carver Elementary School	67,102	\$3,355,436	13,353,663	25	\$11,206,795	15,480,556	72
Charles Wright Academy of Arts and Science	94,991	\$11,874	19,298,678	0	\$8,527,877	22,372,458	38
Chrysler Elementary School	23,066	\$2,286,449	4,482,880	51	\$3,727,801	5,196,887	72
Clippert Academy	45,818	\$163,879	8,769,140	2	\$2,286,116	10,165,837	22
Coleman A. Young Elementary School	67,800	\$1,387,612	13,564,700	10	\$11,004,660	15,725,205	70
Cooke Elementary School	45,184	\$2,987,961	8,339,837	36	\$5,240,094	9,668,157	54
Early Intervention Center	61,152	\$6,341,121	12,416,648	51	\$10,396,614	14,394,299	72
Edison Elementary School	44,263	\$1,214,466	8,154,904	15	\$6,311,877	9,453,769	67
Edward 'Duke' Ellington Conservatory of Music and Art	86,000	\$40,883	21,867,138	0	\$8,389,708	25,350,006	33
Fisher Magnet Lower Academy	95,098	\$1,476,396	19,320,335	8	\$7,680,331	22,397,564	34
Fleming Early Learning Neighborhood Center	62,548	\$4,966,233	12,329,775	40	\$8,540,713	14,293,588	60
Gardner Elementary School	35,634	\$1,465,430	6,459,084	23	\$3,309,049	7,487,849	44
Golightly Education Center	107,134	\$5,435,324	19,893,075	27	\$11,305,945	23,061,526	49
Greenfield Union Elementary School	75,285	\$4,888,395	14,385,749	34	\$9,349,051	16,677,026	56
Harms Elementary School	55,497	\$2,836,693	10,037,120	28	\$5,730,162	11,635,773	49
Keidan Special Education Center	77,550	\$7,916,713	14,994,340	53	\$12,733,445	17,382,549	73
Mann Elementary School	44,909	\$3,282,006	10,260,584	32	\$5,919,757	11,894,829	50
Mason Academy	96,304	\$5,845,292	21,785,197	27	\$16,506,378	25,255,014	65
Maybury Elementary School	56,597	\$1,890,044	10,331,870	18	\$5,631,123	11,977,469	47
Neinas Elementary School	60,365	\$977,385	11,914,542	8	\$5,536,172	13,812,220	40
Pasteur Elementary School	56,541	\$4,231,528	11,254,486	38	\$8,035,511	13,047,034	62
Roberto Clemente Learning Academy	94,088	\$1,444,604	20,016,804	7	\$7,573,402	23,204,962	33
Schulze Elementary School	94,991	\$860,737	19,271,368	4	\$3,017,167	22,340,798	14
Thirkell Elementary School	68,701	\$5,890,252	13,911,094	42	\$10,960,708	16,126,770	68
Vernor Elementary School	44,608	\$1,897,792	8,886,471	21	\$5,746,596	10,301,856	56

Name	Area (SF)	Total Needs 2018	Current Replacement Value (\$)	2018 FCI %	Total Needs 2023	Forecast Replacement Value (\$)	2023 FCI %
Wayne Elementary School	47,066	\$2,537,595	8,934,636	28	\$7,032,531	10,357,692	68
SUBTOTAL	2,263,129	\$103,447,778	\$461,039,809	23	\$269,570,214	\$534,471,502	50
Site and Infrastructure (excluded from FCI calculations)		\$10,131,577			\$21,322,123		
Abbreviated Accessibility		\$5,889,602			\$6,827,664		
Portables		\$3,927,565			\$4,553,124		
TOTALS	2,377,329	\$123,396,522	\$461,039,809		\$302,273,125	\$534,471,502	

Note: The average FCI for the Elementary School facilities assessed is 3 while the average FCI in 5 years is estimated to be 6 assuming current sustainment levels.

Figures below show the current and forecasted needs respectively for all elementary school locations grouped by system.

Figure 20. Comparison of 2018 Current Needs vs. 2023 Forecasted Needs by System Group: Elementary School

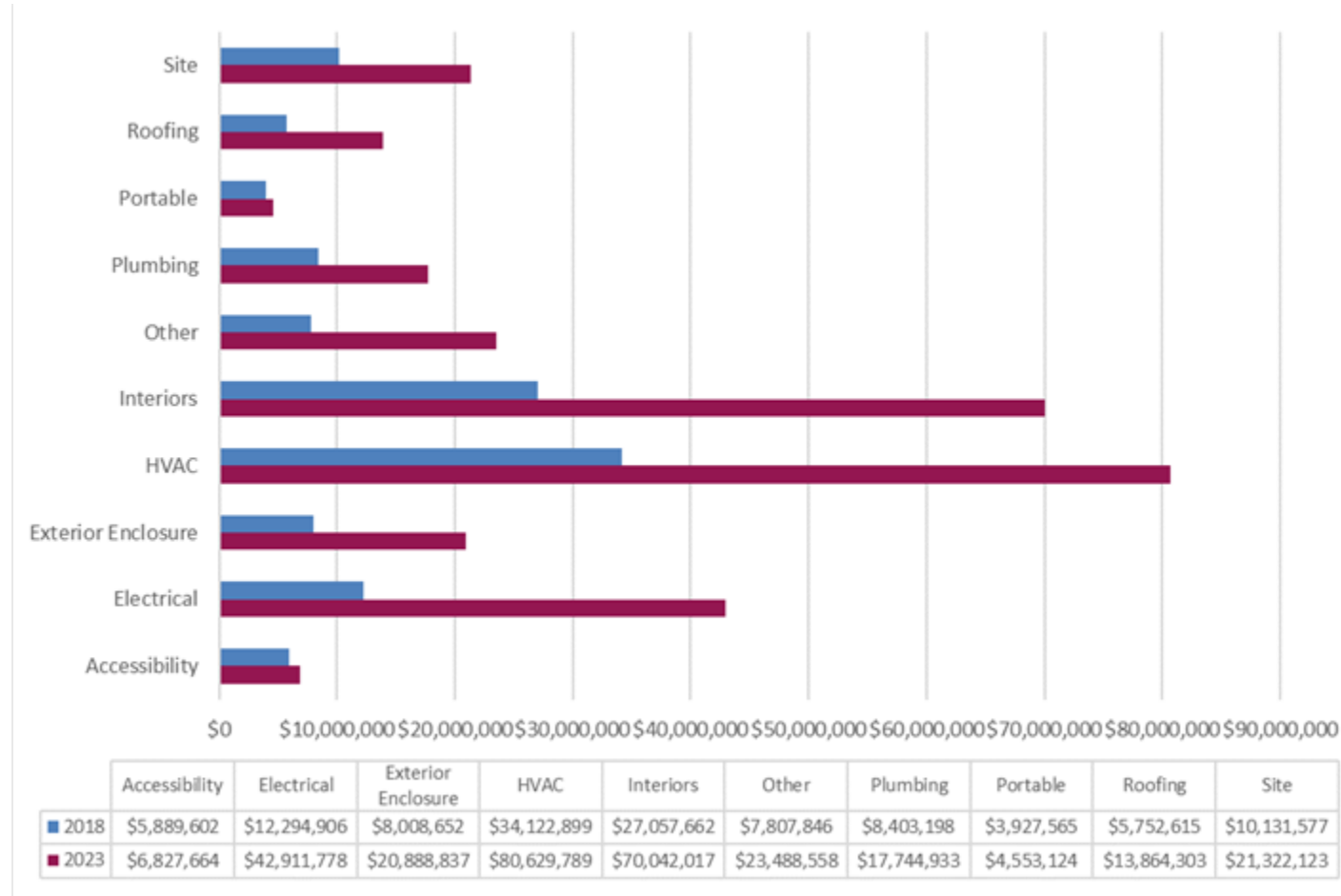
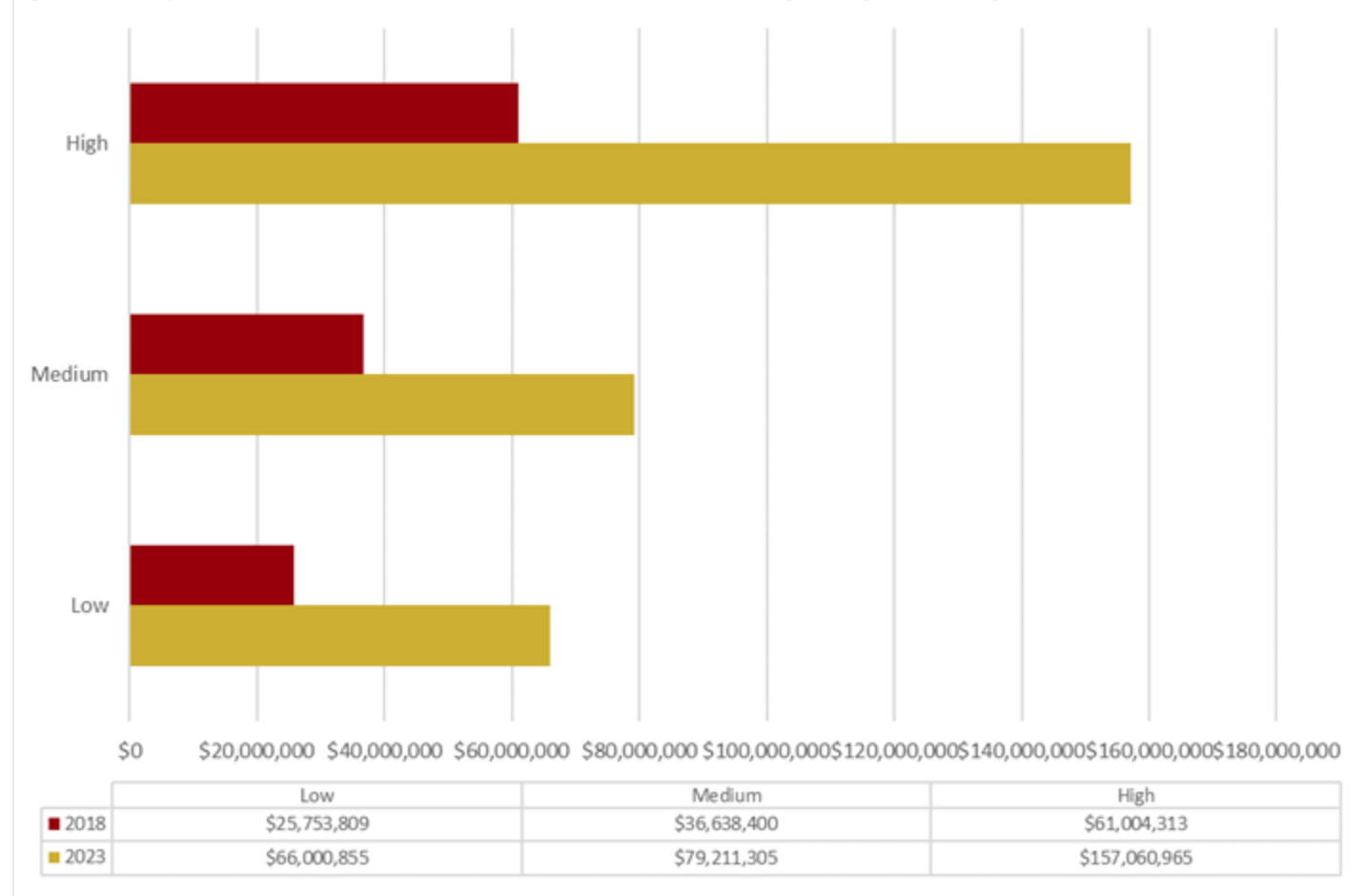


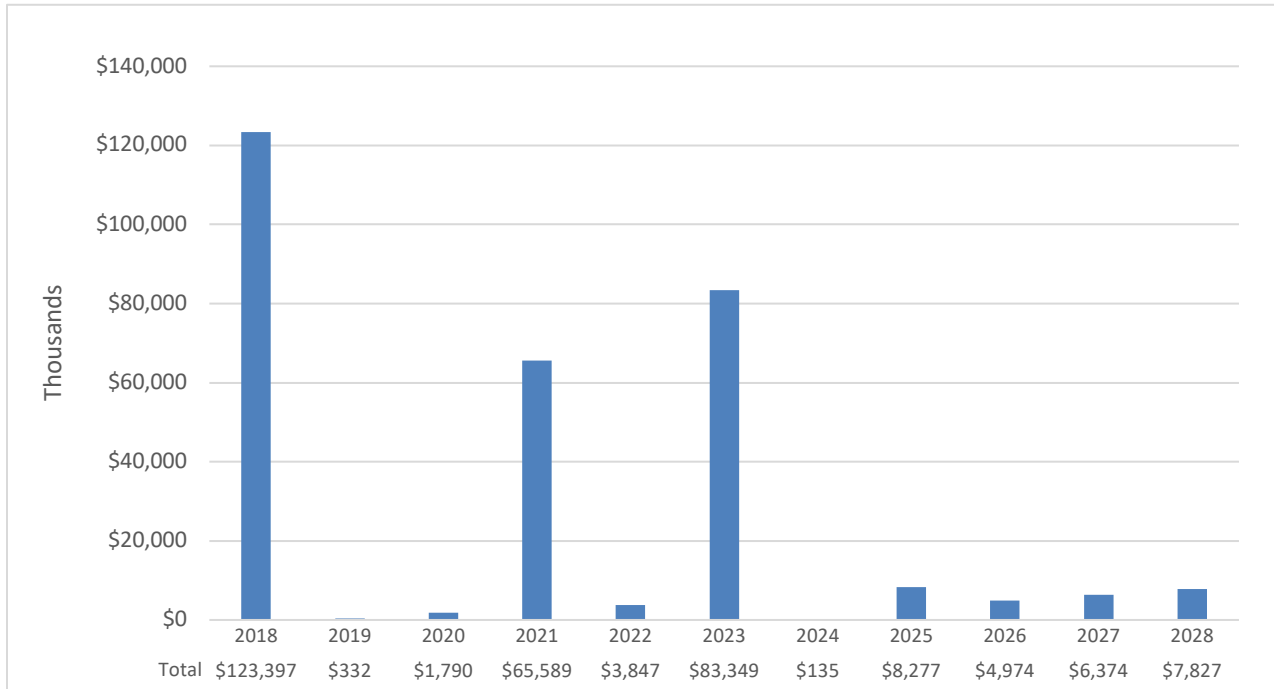
Figure 21. Comparison of 2018 Current Needs vs. 2023 Forecasted Needs by Priority: Elementary School



Renewal Forecast

The renewal forecast below for Elementary School locations shows the current backlog and projected facility sustainment requirements over the next 20 years. Please note the renewal forecast does not include potential costs associated with asbestos abatement, seismic evaluation; seismic retrofitting; hazardous material inspection, evaluation, and mitigation; and NFPA 101 and ADA upgrades. The renewal forecast is shown in the following figures:

Figure 223. Current and Forecasted Needs: Summarized by Reporting Period (Current +10 Years): Elementary School



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Table 13. Current and Forecasted Needs Summarized by System (Current + 5 years): Elementary School

System	2018	2019	2020	2021	2022	2023
Cumulative Needs by Year	\$123,396,522	\$127,430,166	\$133,042,596	\$202,622,491	\$212,547,862	\$302,273,125
Needs by Year	\$123,396,522	\$331,748	\$1,789,525	\$65,588,617	\$3,846,696	\$83,348,827
EXTERIOR ENCLOSURE	\$8,008,652	\$0	\$112,585	\$6,332,772	\$0	\$4,763,150
Exterior Walls	\$641,900	\$0	\$0	\$1,800,275	\$0	\$1,648,912
Exterior Walls - Finishes	\$162,272	\$0	\$38,783	\$403,740	\$0	\$896,017
Exterior Windows	\$6,837,477	\$0	\$0	\$3,330,281	\$0	\$1,553,686
Exterior Doors	\$367,003	\$0	\$73,802	\$798,478	\$0	\$664,536
ROOFING	\$5,752,615	\$0	\$128,532	\$2,583,783	\$0	\$4,313,860
Roof Coverings - Built-up	\$2,310,623	\$0	\$128,532	\$1,187,340	\$0	\$1,013,370
Roof Coverings - Composition Shingles	\$1,430,143	\$0	\$0	\$430,872	\$0	\$26,142
Roof Coverings - Metal	\$685,204	\$0	\$0	\$0	\$0	\$0
Roof Coverings - Modified Bitumen	\$1,166,863	\$0	\$0	\$907,750	\$0	\$3,176,170
Roof Coverings - Single - Ply	\$0	\$0	\$0	\$0	\$0	\$0
Roof Openings	\$159,782	\$0	\$0	\$57,821	\$0	\$98,178
INTERIOR CONSTRUCTION	\$5,904,700	\$122,678	\$80,137	\$4,627,652	\$377,903	\$3,396,108
Interior Doors	\$1,303,853	\$97,138	\$0	\$1,832,066	\$0	\$476,670
Fittings - Casework	\$1,671,860	\$0	\$0	\$703,780	\$39,266	\$883,544
Fittings - Lockers	\$2,338,091	\$0	\$80,137	\$1,512,704	\$0	\$1,161,794
Fittings - Toilet Partitions	\$590,897	\$25,540	\$0	\$579,102	\$338,637	\$874,100
INTERIOR FINISHES	\$21,152,962	\$209,070	\$626,851	\$16,825,744	\$815,195	\$10,143,935
Wall Finishes	\$4,323,748	\$0	\$0	\$5,552,957	\$0	\$4,171,968
Floor Finishes	\$8,882,053	\$209,070	\$626,851	\$7,416,271	\$0	\$3,137,820
Ceiling Finishes	\$7,947,162	\$0	\$0	\$3,856,516	\$815,195	\$2,834,146
CONVEYING	\$234,023	\$0	\$0	\$79,223	\$0	\$168,095
Conveying Systems - Chair Lifts	\$16,523	\$0	\$0	\$0	\$0	\$0
Conveying Systems - Elevators	\$217,500	\$0	\$0	\$79,223	\$0	\$168,095
PLUMBING	\$8,403,198	\$0	\$0	\$2,132,529	\$0	\$5,740,923
Plumbing Fixtures	\$5,541,675	\$0	\$0	\$1,566,223	\$0	\$4,545,222
Domestic Water Distribution	\$1,101,371	\$0	\$0	\$247,672	\$0	\$372,078
Sanitary Waste	\$1,042,188	\$0	\$0	\$55,843	\$0	\$374,576
Rain Water Drainage	\$717,963	\$0	\$0	\$262,791	\$0	\$449,049
HVAC	\$34,122,899	\$0	\$0	\$17,860,446	\$2,480,386	\$19,569,052
Energy Supply	\$4,767,139	\$0	\$0	\$2,146,151	\$0	\$5,045,655
Heat Generating System	\$12,147,512	\$0	\$0	\$8,126,247	\$0	\$3,172,645
Cooling Generating Systems	\$3,893,154	\$0	\$0	\$1,762,118	\$1,027,703	\$2,278,907
Distribution Systems	\$8,808,296	\$0	\$0	\$3,232,500	\$0	\$5,190,833
Terminal and Packaged Units	\$4,506,797	\$0	\$0	\$2,593,430	\$1,452,683	\$3,881,012
FIRE PROTECTION	\$6,667,251	\$0	\$145,132	\$1,417,194	\$0	\$7,419,924
Fire Protection - Activation Devices	\$599,913	\$0	\$0	\$222,308	\$0	\$1,298,121
Fire Protection - Notification Device Ctrl Panel	\$293,862	\$0	\$0	\$200,584	\$0	\$999,000

System	2018	2019	2020	2021	2022	2023
Fire Protection - Sprinklers and Standpipe	\$3,214,812	\$0	\$0	\$696,008	\$0	\$2,908,992
Fire Protection - Wiring	\$2,558,664	\$0	\$145,132	\$298,294	\$0	\$2,213,811
ELECTRICAL	\$12,294,906	\$0	\$696,287	\$6,148,963	\$173,213	\$21,195,917
Electrical Service/Distribution	\$380,158	\$0	\$0	\$76,845	\$0	\$300,826
Lighting - Branch Wiring	\$8,912,924	\$0	\$543,518	\$2,122,661	\$0	\$3,452,186
Lighting - Light Fixtures	\$1,853,948	\$0	\$0	\$3,310,133	\$0	\$10,184,847
Communications and Security - Central Clock	\$409,278	\$0	\$0	\$91,867	\$58,869	\$542,769
Communications and Security - LAN	\$85,448	\$0	\$0	\$70,279	\$58,885	\$2,547,969
Communications and Security - Public Add Intercom	\$392,625	\$0	\$152,770	\$194,801	\$55,459	\$1,563,589
Communications and Security - Security System	\$156,285	\$0	\$0	\$208,563	\$0	\$2,494,051
Other Electrical Systems - Emergency Power	\$104,240	\$0	\$0	\$73,815	\$0	\$109,680
EQUIPMENT	\$720,769	\$0	\$0	\$86,153	\$0	\$4,771,484
Institutional Equipment - Kitchen Equipment	\$720,769	\$0	\$0	\$86,153	\$0	\$4,771,484
FIXED FURNISHINGS	\$185,804	\$0	\$0	\$194,223	\$0	\$34,033
Fixed Furnishings - Fixed Seating	\$185,804	\$0	\$0	\$194,223	\$0	\$34,033
SITEWORK	\$10,131,577	\$0	\$0	\$7,299,936	\$0	\$1,832,346
Roadways	\$7,818,600	\$0	\$0	\$3,100,913	\$0	\$1,581,177
Pedestrian Paving	\$277,737	\$0	\$0	\$832,568	\$0	\$251,169
Parking Lots	\$2,035,240	\$0	\$0	\$3,366,454	\$0	\$0
PORTABLE	\$3,927,565	\$0	\$0	\$0	\$0	\$0
Portable	\$3,927,565	\$0	\$0	\$0	\$0	\$0
ACCESSIBILITY	\$5,889,602	\$0	\$0	\$0	\$0	\$0
Parking	\$183,925	\$0	\$0	\$0	\$0	\$0
Ramps	\$36,541	\$0	\$0	\$0	\$0	\$0
Entrances/Exit	\$45,059	\$0	\$0	\$0	\$0	\$0
Paths of Travel	\$5,474	\$0	\$0	\$0	\$0	\$0
Elevators/Lifts	\$5,080,981	\$0	\$0	\$0	\$0	\$0
Toilet Rooms	\$338,802	\$0	\$0	\$0	\$0	\$0
Guestrooms	\$2,929	\$0	\$0	\$0	\$0	\$0
Access to Goods and Services	\$17,001	\$0	\$0	\$0	\$0	\$0
Additional Access	\$178,891	\$0	\$0	\$0	\$0	\$0

Table 14. Current and Forecasted Needs Summarized by System (Years 6 - 10): Elementary School

System	2024	2025	2026	2027	2028
Cumulative Needs by Year	\$311,476,010	\$329,096,808	\$343,943,988	\$360,635,977	\$379,281,749
Needs by Year	\$134,691	\$8,276,518	\$4,974,275	\$6,373,668	\$7,826,694
EXTERIOR ENCLOSURE	\$0	\$1,491,769	\$2,002,546	\$1,193,920	\$1,139,022
Exterior Walls	\$0	\$1,345,870	\$0	\$0	\$986,972
Exterior Walls - Finishes	\$0	\$81,779	\$84,232	\$0	\$0
Exterior Windows	\$0	\$0	\$1,823,368	\$634,827	\$0
Exterior Doors	\$0	\$64,120	\$94,946	\$559,093	\$152,050
ROOFING	\$0	\$818,221	\$640,475	\$2,734,887	\$18,276
Roof Coverings - Built-up	\$0	\$433,744	\$525,643	\$2,569,132	\$0
Roof Coverings - Composition Shingles	\$0	\$219,468	\$0	\$0	\$0
Roof Coverings - Metal	\$0	\$0	\$0	\$0	\$0
Roof Coverings - Modified Bitumen	\$0	\$106,742	\$57,549	\$70,351	\$0
Roof Coverings - Single - Ply	\$0	\$0	\$0	\$0	\$0
Roof Openings	\$0	\$58,267	\$57,282	\$95,404	\$18,276
INTERIOR CONSTRUCTION	\$0	\$208,517	\$460,452	\$766,886	\$11,571
Interior Doors	\$0	\$84,285	\$460,452	\$766,886	\$11,571
Fittings - Casework	\$0	\$0	\$0	\$0	\$0
Fittings - Lockers	\$0	\$63,656	\$0	\$0	\$0
Fittings - Toilet Partitions	\$0	\$60,577	\$0	\$0	\$0
INTERIOR FINISHES	\$0	\$1,015,049	\$59,456	\$72,681	\$1,514,521
Wall Finishes	\$0	\$0	\$0	\$0	\$0
Floor Finishes	\$0	\$0	\$0	\$0	\$827,261
Ceiling Finishes	\$0	\$1,015,049	\$59,456	\$72,681	\$687,259
CONVEYING	\$0	\$0	\$0	\$0	\$0
Conveying Systems - Chair Lifts	\$0	\$0	\$0	\$0	\$0
Conveying Systems - Elevators	\$0	\$0	\$0	\$0	\$0
PLUMBING	\$0	\$0	\$0	\$0	\$66,977
Plumbing Fixtures	\$0	\$0	\$0	\$0	\$0
Domestic Water Distribution	\$0	\$0	\$0	\$0	\$0
Sanitary Waste	\$0	\$0	\$0	\$0	\$0
Rain Water Drainage	\$0	\$0	\$0	\$0	\$66,977
HVAC	\$0	\$1,913,717	\$1,145,693	\$1,195,997	\$3,480,675
Energy Supply	\$0	\$0	\$0	\$0	\$0
Heat Generating System	\$0	\$0	\$0	\$0	\$0
Cooling Generating Systems	\$0	\$0	\$1,145,693	\$1,191,390	\$875,867
Distribution Systems	\$0	\$0	\$0	\$0	\$0
Terminal and Packaged Units	\$0	\$1,913,717	\$0	\$4,607	\$2,604,808
FIRE PROTECTION	\$0	\$419,578	\$139,689	\$19,783	\$0
Fire Protection - Activation Devices	\$0	\$92,802	\$8,978	\$10,975	\$0
Fire Protection - Notification Device Ctrl Panel	\$0	\$106,892	\$86,706	\$8,807	\$0
Fire Protection - Sprinklers and Standpipe	\$0	\$51,603	\$24,164	\$0	\$0
Fire Protection - Wiring	\$0	\$168,281	\$19,841	\$0	\$0

APPENDICES

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APPENDICES

Appendix A -Typical System Life Cycles, Inflation Rates, and Soft Costs

System and component life cycles used in the cost models for this project were based on average service life as shown in the *Preventive Maintenance Guidebook: Best Practices to Maintain Efficient and Sustainable Buildings* published by Building Owners and Managers Association (BOMA) International. When life cycle information is not provided by BOMA, life cycles have been assigned using ALPHA's professional judgment.

Table 1. Typical Life Cycles

System	Lifecycle (Years)	System	Lifecycle (Years)
Roofing		Plumbing	
Built-up	15-25	Plumbing Fixtures	30
Composition Shingle	20	Domestic Water Distribution	30
Metal Panels	25	Sanitary Waste	30
Modified Bitumen	20	HVAC	
Standing Seam Metal	35	Cooling Generating	25
Building Exterior		Controls	20
Exterior Doors ¹	15-25	Distribution	30
Exterior Walls (Finishes) ¹	10-30	Heat Generating	30
Exterior Windows	30	Terminal and Package Units	15-25
Interior Finishes		Electrical	
Interior Doors ¹	25	Branch Wiring	30
Ceiling (Acoustical Tile and Grids)	20	Lighting	20
Ceiling (Painted) ¹	10	Service and Distribution	40
Walls	5	Other Electrical Systems	15
Floors	12-30	Equipment	
Built-in Equip/Specialties		Institutional Equipment	25
Built-in Equip/Specialties ¹	20	Other Equipment	15-25
Conveying Systems		Fire Protection	
Elevators	35	Fire Sprinklers and Standpipe (Piping and Risers)	25-40
Chair Lifts	15	Fire Alarm and Detection	10-30
		Fire Detection (Activation Devices)	20
		Fire Detection (Notification Devices and Control Panels)	20

¹BOMA Life cycle information not available

Table 2. Inflation Rates

Year	Inflation Rate
2018	1
2019	1.03
2020	1.03
2021	1.03
2022	1.03
2023	1.03
2024	1.03
2025	1.03
2026	1.03
2027	1.03
2028	1.03

Table 3. Soft Costs

Soft Cost Type	Name	Soft Cost Value
Client	All Soft Costs	\$1.25

Appendix B - Supplemental Information

Capital Planning v. Budgeting

While traditional budgets may be perceived as reacting to short-term needs based on the historical performance of facilities and systems, a capital plan anticipates both short- and long-term degradation by employing a facility condition assessment and predictive cost modeling.

- **Budgeting:** Traditional, cost-based, budgeting practices describe a system by which a prior period's budget is adjusted to provide for the fluctuating cost of maintaining facilities. Traditional budgeting issues may include: 1) anticipated needs; 2) organizational growth; 3) the acquisition of new assets; 4) operations and maintenance; 5) deferred maintenance; 6) insurance.
- **Capital Planning:** Capital planning differs from budgeting in that it considers a broader range of financial considerations over an extended timeline so as to more effectively predict and manage the fiscal needs of a real estate portfolio. Financial considerations may include the cost of capital, depreciation, organizational risk and return on investment (ROI). Similar in concept to the accounting principle of anticipating the capital depreciation of plant value, a capital renewal plan anticipates and attempts to counteract the ongoing deterioration of facility systems and components in order to extend a facility's life and value.

Facility Condition Index

A Facility Condition Index is considered to be a key building performance metric. As part of the FCA process, a facility condition index (FCI) is calculated for each facility. The FCI is used to quantify a facility's physical condition at a specific point in time and is calculated using the expired system replacement costs (costs associated with systems that are beyond average service life) and the current replacement value (CRV) of the building. Expired system replacement costs consist of work that is necessary to restore the facility to a condition equivalent to its original (like new) state.

Example: Total expired system replacement costs (Requirements) = \$3,000,000

Current Replacement Value (CRV) = \$10,000,000

$$FCI = \frac{\$3,000,000}{\$10,000,000} = .30$$



Present Value and Nominal Value

In the calculation of FCI sums, monetary values can be discounted to incorporate the time value of money, or be expressed in constant terms, ignoring the effects of inflation and interest. Because the cost of capital can vary significantly according to time, portfolio types, and project programs, all monetary terms in this report are expressed as nominal values.

- **Nominal Value:** Expresses monetary values, without adjusting for inflation or interest (also known as face value or par value).
- **Present Value:** The current worth of a future sum of money or stream of cash flows given a specified rate of return. Future cash flows can be discounted at a client specified discount rate to reflect the owner's internal cost of capital.

Hard and Soft Costs

Unless otherwise stated, the costs indicated in this report represent hard costs only. Because soft costs vary regionally and periodically, provisions for soft cost expenses should be considered in addition to the hard costs indicated. For the purpose of this report, Hard and Soft costs are defined as follows:

- **Hard costs:** Direct costs incurred in relation to a specific construction project. Hard cost may include labor, materials, equipment, etc.
- **Soft cost:** Indirect costs incurred in addition to the direct construction cost. Soft costs may include professional services, financing, taxes, etc.

Building Systems

A building system describes a mechanism, or group of mechanisms that perform a given role to maintain the functionality of a facility. Examples of building systems may include roofing, plumbing or heating, ventilation and air conditioning (HVAC) systems.

Per the Unifomat classification standard, building systems have been grouped as follows:

- Foundations
- Superstructure
- Exterior Enclosure
- Roofing
- Interior Construction
- Interior Finishes
- Conveying Systems
- Plumbing
- HVAC
- Fire Protection
- Electrical

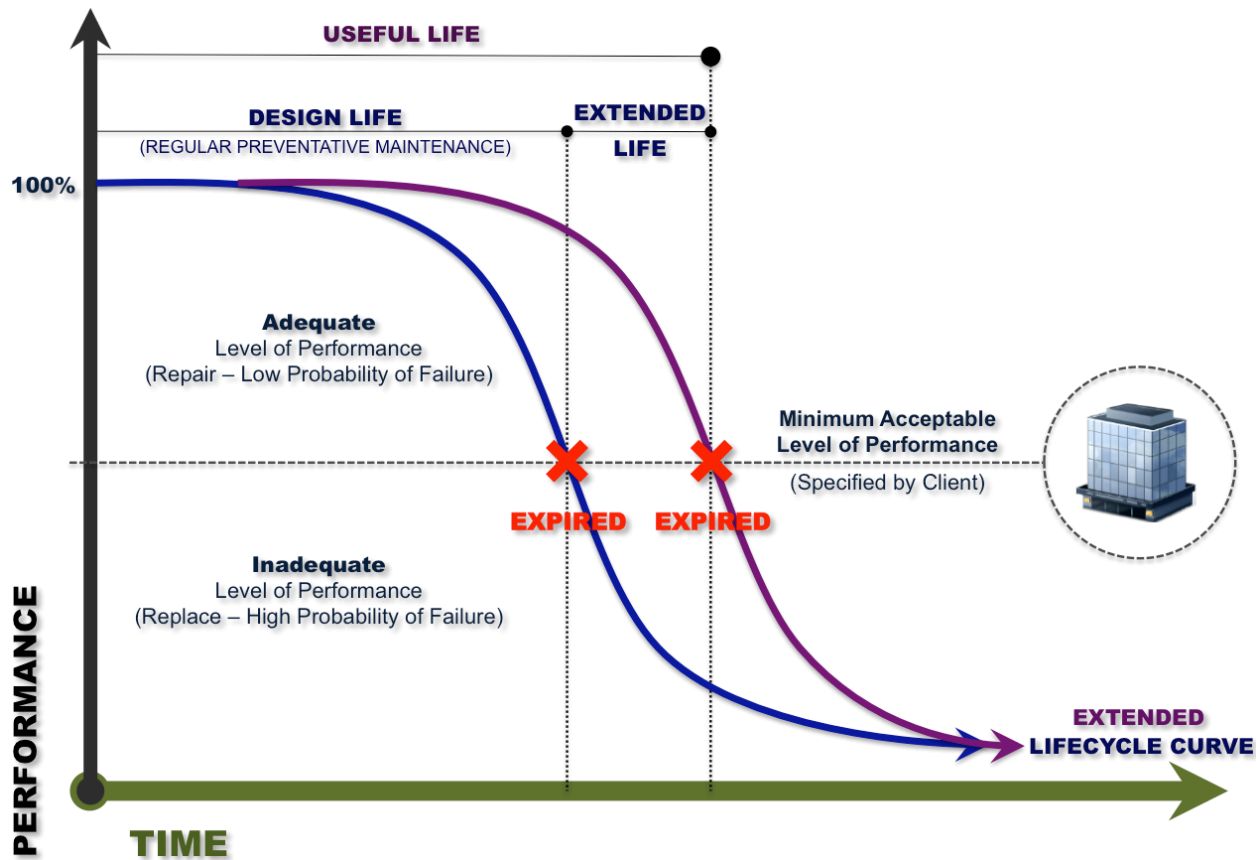
System States

The design life of a building system or component describes the duration for which a system is expected to perform within normal operational parameters. The design life may be shortened for a variety of reasons including, neglect or inadequate maintenance or extended as a result of robust preventative / predictive maintenance. This extended or shortened design life is defined as a system's useful life, and quantifies the duration for which a system, or component, operates within a minimally accepted level of performance.

As illustrated in the figure below, a facility condition analysis will make an appraisal of systems and components and recommend one of a series of actions necessary to ensure the continued functionality of a facility:

- **Missing:** A system or component may be deemed missing if the element absent, but is required for the operation of a facility (Example: ADA requirements for accessible ramps).
- **Extended:** The life cycle of a system or component may be extended beyond its anticipated design life, if the element is deemed to be performing adequately.
- **Expired:** A system or component may be recommended for replacement (at any time) if the element is deemed to be performing inadequately.

Figure 1. System or Component Life Cycle Curve



System Actions

A deficiency describes a condition in which there exists the need to repair an item that is damaged, missing, inadequate or insufficient for an intended purpose. Deficiencies are typically associated with underperforming systems or components, and describe activities that are required to extend their useful life.

- **Repair:** Describes a condition in which it is recommended that the building system or component be serviced to provide additional useful life. Repairs are curative in nature, while maintenance by contrast is preventative.
- **Replace:** Describes a condition in which it is recommended that the building system or component be removed and replaced with a new system or component. Replacement needs may vary according to building type, region, use, and maintenance management.

Multiple building systems are considered “non-renewable” because the replacement of those systems would typically be so costly as to require the replacement of the entire facility (Example: Foundations). Accordingly, there are no deficiencies or costs associated to non-renewable system.

Additionally, per client preferences, many aspects of the built environment may not be part of the scope of a facility condition analysis.

Cost Models

Cost estimation models are parametric equations used to predict the costs or the life cycle of a building system or component. The projections of the cost models are factored into capital plans, budgeting tools and other financial planning mechanisms. The rough order of magnitude cost estimates contained in this report are based on the cost models available within the client's database platform.

It is important to note that there are a variety of cost model equations employed in the building industry and it is not uncommon for prices derived from the client's database platform to vary from external references. If required, adjustments can typically be made to the facility condition data in order to facilitate comparison with external cost models, better reflect local conditions or perform sensitivity analyses.

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Appendix C - Glossary

ACBM: Asbestos-containing Building Material

ADA: Americans with Disabilities Act

AHERA: Asbestos Hazard Emergency Response Act

ALPHA: ALPHA Facilities Solutions, LLC

Alterations: Work performed to change the interior arrangements or other physical characteristics of an existing facility or fixed equipment so that it can be used more effectively for its current designated purpose or adapted to a new use.

ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers

ASTM: American Society for Testing and Materials

BOMA: Building Owners and Managers Association

Budgeting: A system by which a prior period's estimate of income and expenditure is adjusted to account for operational realities in order to provide for the cost of maintaining facilities. Traditional budgeting issues may include anticipated needs, organizational growth, the acquisition of new assets, operations and maintenance, deferred maintenance and insurance.

Building: An enclosed and roofed structure that can be traversed without exiting to the exterior.

Building Addition: An area, space or component of a building added to the existing structure, after the original building's year built date.

Capital Renewal: The planned replacement of building subsystems such as roofs, electrical systems, HVAC systems, and plumbing systems that have reached the end of their useful lives. Without significant reinvestment in building subsystems, older facilities will fall into a state of deteriorating condition and functionality, and the repair and maintenance costs will increase (International Facilities Management Association).

Calculated Next Renewal: The year a system or element would be expected to expire, based solely on the date it was installed and the expected service life of the system.

Condition: Condition refers to the state of physical fitness or readiness of a facility, system or systemic element for its intended use.

Cost Model: Parametric equations used to quantify the condition of building systems and estimate the cost necessary to sustain a facility over a given set of reporting periods. These estimated costs can be presented over a timeline to represent a capital renewal schedule.

Current Replacement Value (CRV): CRV is a standard industry cost estimate of materials, supplies and labor required to replace facility at existing size and functional capability. Please note that the terms Plant Replacement Value and Current Replacement Value have the same meaning in the context of determining Facility Condition Index.

Deficiency: A deficiency describes a condition in which there exists the need to repair a building system or component that is damaged, missing, inadequate or insufficient for an intended purpose.

Element: Elements are the major components that comprise building systems.

Facility: A facility refers to site(s), building(s), or building addition(s) or combinations thereof that provide a particular service or support of an educational purpose.

Facility Condition Assessment (FCA): The process of performing a physical evaluation of the condition of a facility and its systems. The findings of this analysis may be used in conjunction with cost models to estimate the current and future funding streams necessary to maintain a real estate portfolio.

Facility Condition Index (FCI): FCI is an industry-standard measurement of a facility's condition that is the ratio of the cost to correct a facility's deficiencies to the Current Replacement Value of the facilities – the higher the FCI, the poorer the condition of the facility. After an FCI is established for all buildings within a portfolio, a building's condition can be ranked relative to other buildings. The FCI may also represent the condition of a portfolio based on the cumulative FCIs of the portfolio's facilities.

Gross Square Feet (GSF): The size of the enclosed floor space of a building in square feet, measured to the outside face of the enclosing walls.

Hard Costs: Direct costs incurred in relation to a specific construction project. Hard costs may include labor, materials, equipment, etc.

Heating, Ventilation and Air Conditioning (HVAC): A term used to describe building systems responsible for maintaining the temperature, humidity and air quality control.

IFMA: International Facilities Management Association.

Indoor Air Quality (IAQ): A metric used to quantify the air quality within and around buildings and structures, especially as it relates to the health and comfort of building occupants.

Install Year: The year a building or system was built or the most recent major renovation date (where a minimum of 70% of the system's Current Replacement Value (CRV) was replaced).

Inflation: The trend of increasing prices from one year to the next, representing the rate at which the real value of an investment is eroded and the loss in spending power over time.

Interest: The charge for the privilege of borrowing money, typically expressed as an annual percentage rate and commonly calculated using simple or compound interest calculation.

Life Cycle: The period of time that a building, system or element can be expected to adequately serve its intended function.

Maintenance: Work necessary to realize the originally anticipated life of a fixed asset, including buildings, fixed equipment and infrastructure. Maintenance is preventative, whereas repairs are curative.

Mechanical, Electrical and Plumbing (MEP): A term used to describe building systems related to the provision of HVAC, electric and plumbing services to a facility.

Needs: In the context of this report, needs are the backlog of capital renewal requirements.

Next Renewal: The assessor adjusted expected useful life of a system or element as a result of on-site inspection.

Nominal Value: A value expressed in monetary terms for a specific year or years, without adjusting for inflation – also known as face value or par value.

Operations: Activities related to normal performance of the functions for which a building is used (e.g., utilities, janitorial services, waste treatment).

O&M: Operations and Maintenance.

Parametric Cost Modeling: Parametric statistics is a branch of statistics that assumes that the data has come from a type of probability distribution and makes inferences about the parameters of the distribution.

Plant Replacement Value (PRV): PRV represents the cost to design and construct a notional facility to current standards to replace an existing facility at the same location. Please note that the terms Plant Replacement Value (PRV) and Current Replacement Value (CRV) have the same meaning in the context of determining Facility Condition Index (FCI).

Present Value (PV): The current worth of a future sum of money or stream of cash flows given a specified rate of return. Future cash flows are discounted at a client specified discount rate.

Real Interest Rate: A net interest rate adjusted to remove the effects of inflation. It is the amount by which the nominal interest rate is higher than the inflation rate.

Repairs: Work to restore damaged or worn-out facilities to normal operating condition. Repairs are curative, whereas maintenance is preventative.

Replacements: An exchange of one fixed asset for another that has the same capacity to perform the same function. In contrast to repair, replacement generally involves a complete identifiable item of reinvestment (e.g., a major building component or subsystem).

Return on Investment (ROI): ROI is a financial indicator used to evaluate the performance of an investment and as a means to compare benefit.

Rough Order of Magnitude (ROM): ROM cost estimates are the most basic of cost estimate classifications.

RS Means: An independent third-party provider of building industry construction cost data.

Site: A facility's grounds and its utilities, roadways, landscaping, fencing and other typical land improvements needed to support the facility.

Soft Costs: Indirect costs incurred in addition to the direct construction cost. Soft costs may include professional services, financing, taxes, etc.

System: System refers to building and related site work elements as described by ASTM Uniformat II, Classification for Building Elements (E1557-97), a format for classifying major facility elements common to most buildings. Elements usually perform a given function, regardless of the design specification, construction method or materials used. See also, "Uniformat II".

Uniformat II: Uniformat II (commonly referred to simply as Uniformat), is ASTM Uniformat II, Classification for Building Elements (E1557-97) – A methodology for classifying major facility components common to most buildings.

Year Built: The year that a building or addition was originally built, based on substantial completion or occupancy.



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