



# Maintenance Gap Assessment Report

## Durham Public Schools



**Submission Date:** 12/10/2021



## BACKGROUND

Durham Public Schools (DPS) has implemented a series of measures to improve indoor air quality across all school facilities. Part of this initiative includes enhancing and expanding the current preventive maintenance program. Preventive maintenance lengthens asset life, reduces energy consumption, lowers the risk of unexpected equipment failures and reduces overall maintenance costs.

The DPS maintenance team works extremely hard to keep all schools operating and functional. However, as deferred maintenance levels increase, this team is required to spend more time on emergency repairs than on preventive maintenance. In order to meet the recommended maintenance levels for DPS school facilities, DPS must begin to close the staffing and funding gaps for maintenance that are identified in this report.

## RECOMMENDED PREVENTIVE MAINTENANCE PRACTICES

Our recommendations for HVAC preventive maintenance are broken down into two options: "Best in Class" and "Best Practice". Best in Class refers to the industry gold standard, while Best Practice reflects the best practices for K-12 school maintenance programs. We recommend instituting a preventive maintenance program that strives to meet the Best Practice benchmark.

The table below identifies the recommended cadence of maintenance activities per type of maintenance. For any maintenance that is recommended less than annually, we recommend breaking this down into sections per year. For example, half of the minor equipment might be maintained in Year 1, while the other half is maintained in Year 2.

Maintenance Type	Best in Class	Best Practice
MERV 13 filter changes	Quarterly	Twice a Year
AHU preventative maintenance	Quarterly	Twice a Year
Coil sanitization	Every Three Years	Every Five Years
Chiller maintenance	Twice a Year	Twice a Year
Boiler maintenance	Twice a Year	Annually
Cooling tower maintenance	Twice a Year	Annually
Minor equipment maintenance	Annually	Every Two Years
Controls service	Annually	Annually

## MAINTENANCE GAP ASSESSMENT – LABOR HOURS

Today, DPS's seven HVAC technicians are able to spend at most 10-20% of their time on preventive maintenance activities. This team spends the majority of their time addressing emergency repairs, comfort concerns and other immediate requirements. It is difficult for this team to perform preventive maintenance due to staffing levels, high levels of deferred maintenance and a consistent volume of emergency repairs. In order to meet the Best in Class or Best Practice maintenance levels, DPS will need to hire additional technicians or supplement them with specialized service contracts.

The table below lays out the estimated amount of labor hours required to perform the Best in Class and Best Practice maintenance programs. This is then compared to the estimated amount of time spent today by the DPS team on preventive maintenance in order to identify the gap of how many people (internal or external) who should be **exclusively dedicated** to preventive maintenance.

Description	Best in Class	Best Practice
Recommended PM Hours	16,000	10,000
Estimated Current PM Hours	2,450	2,450
Gap in PM Hours	13,550	7,550
FTE (1750 Hrs)	8	4



## **MAINTENANCE GAP ASSESSMENT – COST**

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The cost to implement a high-quality maintenance program depends on several factors, including the quantity and schedule of service agreements, the number of new in-house staff and the volume of repairs identified & fixed. As the district begins to “catch up” on deferred maintenance, the volume of repairs and their associated costs will decrease.

We recommend that DPS increase the maintenance budget for additional staff, service agreements and maintenance repairs by **at least \$5 million**. The table below shows an estimated range of costs for both preventive maintenance activities and the repairs that are identified through a robust maintenance program.

Description	Range (\$MM)
Preventive Maintenance	\$1.5M - \$2.5M
Maintenance Repairs	\$2.5M - \$5M
Total	\$4.5M - \$7.5M

## **RECOMMENDATIONS**

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We have recommendations

1. Increase funding for maintenance **by at least \$5 million** to increase staffing, fund maintenance repairs and deploy strategic service agreements for specialized services.
2. Contract for specialized services, including:
  - a. Chiller maintenance – annual shutdown and one running inspection
  - b. Boiler maintenance – annual tune-up
  - c. Cooling tower maintenance – annual inspection
  - d. Controls service – annual maintenance and software upgrade program
  - e. Coil sanitization – a rolling program that cleans all units over 3-5 years
3. Contract for scheduled high-volume, commodity-based maintenance activities, including:
  - a. Filter changes – a high-volume activity that places significant demand on in-house staff
  - b. Coil cleaning – a high-volume activity that places significant demand on in-house staff
4. Implement a controls monitoring program that automatically identifies critical alarms through the building automation system and reduces demand on the DPS maintenance team by addressing certain controls issues remotely.
5. Determine skills gaps within existing team and backfill with additional staff.
  - a. This could include additional HVAC technicians or controls technicians, or other skilled trades that are not addressed in this analysis, such as electricians, carpenters or generalists.
6. Fund a robust training program to help maintenance staff grow skills and build cross-functional in-house capacity.
7. Explore potential partnerships with private-sector companies to provide workforce development opportunities to DPS students who then work on maintenance activities within DPS schools.

