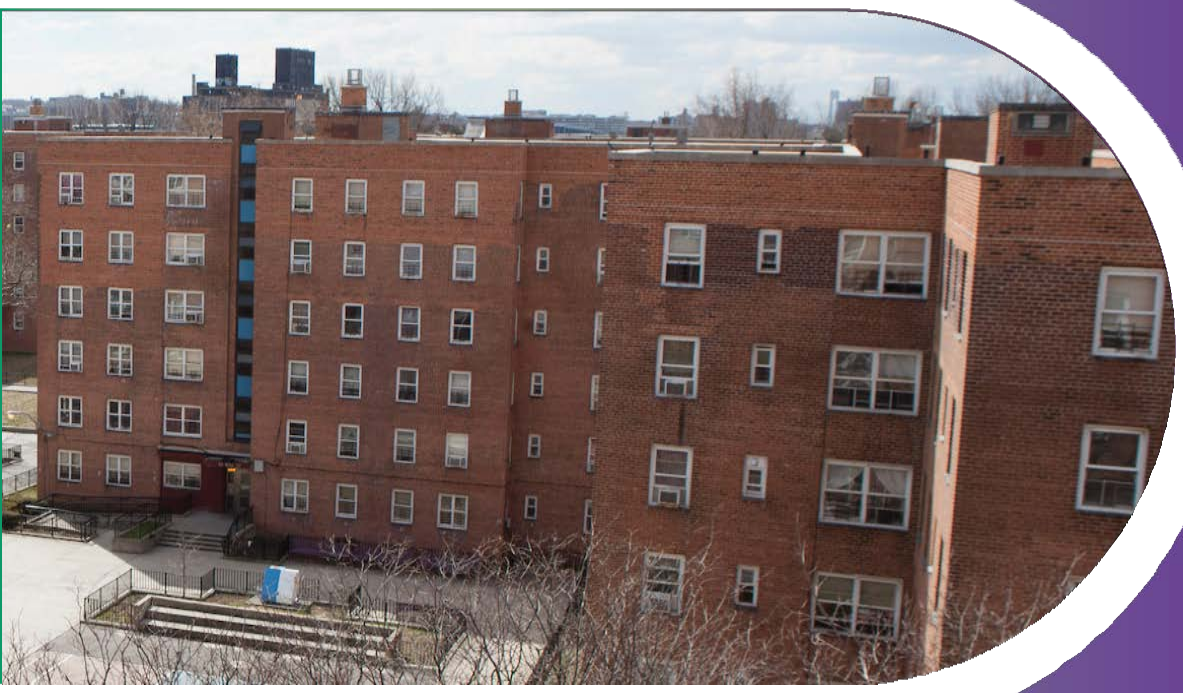
2023 Report on NYCHA's Mold and Leak Response Efforts: Progress, Challenges and Next Steps



NEW YORK CITY HOUSING AUTHORITY

Presented by: NYCHA's Office of Mold Assessment and Remediation

Table of Contents

Executive Summary

The New York City Housing Authority (NYCHA) has made notable progress in addressing the challenges related to mold and leaks, but significant challenges remain. NYCHA, in coordination with community advocates, court-appointed independent experts and Special Master, the U.S. Department of Housing and Urban Development (HUD), and NYCHA's Federal Monitor, has created several new departments and employed effective strategies to reduce its mold and leak work orders (WO or WOs), prevent mold occurrence and recurrence, and improve resident satisfaction. The following illustrates NYCHA's progress and accomplishments from 2018 through the present:

- Since 2019, the number of mold WOs was reduced by over 50% because of NYCHA's efforts to identify and address the root causes of mold. Additionally, prior to the development of Mold Busters, NYCHA's Mold Standard Procedure (Mold SP), the rate of mold recurrence was nearly 40% and was reduced to roughly 14% by early 2023.
    - NYCHA has fostered productive relationships with court-appointed experts, including the Independent Mold Analyst (IMA), Microecologies, Inc., the Independent Data Analyst (IDA), Stout, and the Independent Ombudsperson, César de Castro. The Mold SP was developed in conjunction with the IDA and IMA and incorporates robust inspection and quality assurance (QA) processes.

- NYCHA established the Office of Mold Assessment and Remediation (OMAR) in July 2018 and the Compliance Department (Compliance) in 2019 in response to the 2018 *Baez* Amended Consent Decree[1] and the 2019 HUD Agreement.[2] In partnership with court-appointed experts and NYCHA's Federal Monitor, OMAR has led many initiatives to improve NYCHA's operational response and data/reporting efforts related to mold and leaks.
    - The OMAR team has expanded to 100 active staff, 27 of whom are in the Mold Response Unit (MRU). Compliance now consists of 53 active staff.[3]
    - The Mold HUD Action Plan was issued in March 2020 in partnership with the Federal Monitor. The Action Plan sets a two-year strategy for improving NYCHA's response to mold and leak WOs and includes several of the initiatives highlighted in this document.

- In 2020, NYCHA's MRU began working with the court-mandated Ombudsperson Call Center (OCC) to address mold and leak WOs escalated by residents. Since its launch, the OCC has served over 17,000 residents with mold and leak related WOs. NYCHA also performed resident outreach via an informational campaign and shared information with residents about the OCC on social media. NYCHA has also updated resident-facing documents to include OCC contact information.

[1] Baez Revised Consent Decree: https://www.nrdc.org/sites/default/files/complaint-nycha-20131217.pdf

[2] 2019 HUD Agreement: https://archives.hud.gov/news/2019/HUD-NYCHA-Agreement013119.pdf

[3] OMAR and MRU active headcounts pulled from OMAR org chart as of April 2023. Compliance Department headcount provided by Compliance Deputy Director.

- NYCHA made significant infrastructure investments to improve airflow and ventilation in 51% of its buildings (which have mechanical exhaust ventilation). This initiative replaced or inspected and retained nearly 80% of the roof fan portfolio. Inadequate ventilation in the buildings was one of the most prominent causes of mold growth. This initiative appears to have significantly reduced the incidence of mold growth caused solely by inadequate mechanical ventilation.
    - NYCHA has plans for additional infrastructure investments related to balancing air flows in apartment lines.
    - While NYCHA has made substantial progress addressing ventilation issues, as of April 2023, two of the most common root causes of mold at NYCHA are condensation from uninsulated/poorly insulated cold water supply pipes and leaks from aging plumbing pipes.[4] The resolution of these root causes will require billions of dollars of plumbing renovations.

- NYCHA launched the Mold and Leak Performance Scorecard (Scorecard) in May 2022 and the Enhanced Oversight Program (EOP) in June 2022 to evaluate NYCHA developments in key mold and leak areas. As a result, open mold initial inspections, QA inspections, re-inspections, and cleaning WOs were significantly reduced.

- In 2020, NYCHA began developing a Leak Standard Procedure (Leak SP) for identifying, tracing, and addressing the root causes of leaks. By the end of 2023, NYCHA will implement the Leak SP, which will reduce the number of leaks in buildings and improve repairs. It will also provide additional staff training, improving the efficiency with which the root causes of leaks are identified and remediated.

Although these efforts have optimized NYCHA's ability to address mold and leak issues, the backlog of open WOs continues to grow. As of October 31, 2019[5], NYCHA had 35,718 open parent mold and leak WOs.[6] By January 31, 2023[7], the number of open parent mold and leak WOs had doubled to 71,114.

A significant cause of the backlog is aging infrastructure. The large number of open WOs and the lengthy response times are symptoms of NYCHA's $40 billion[8] capital need comprising mechanical, electrical, architectural, and other repairs, as identified in its 2017 Physical Needs Assessment.[9] NYCHA estimates that its capital need increases by at least $1 billion per year.[10] Because NYCHA lacks these funds, NYCHA conducts local repairs when comprehensive capital projects are needed. As part of its Transformation Plan, NYCHA uses data-driven capital

[4] In April 2023, the Baez Independent Mold Analyst wrote that condensation and leaks are the two most prevalent root causes of mold.
[5] The 22nd quarter of compliance reporting in the *Baez* matter is August 1st through October 31st, 2019.
[6] An initial "parent" WO is a record that is created in NYCHA's asset management database to memorialize a resident-reported complaint or issue identified by NYCHA staff that needs to be addressed. Parent WOs consist of initial inspections for mold and initial complaints for leaks. Subsequent "child" WOs are created by NYCHA staff after initial inspections/complaints to remediate/abate mold and leaks and conduct related repairs. The parent WOs cannot close until all related child WOs necessary to complete the full scope of repairs are closed.
[7] January 31, 2023 is the end of the 35th quarter (Q35) of the compliance reporting for the *Baez* matter.
[8] NYCHA Transformation Plan pg. 16 Current Challenges.
[9] NYCHA Transformation Plan pg. 103 Portfolio Planning – Capital Projects.
[10] The $1 billion capital needs estimate was taken from NYCHA's Blueprint for Change document, pg. 3.

planning and performs capital upgrades that directly impact mold and leaks. Specifically, NYCHA is replacing pipes and sealing building envelopes by constructing new roofs. NYCHA is also transitioning some of its properties to Project-Based Section 8 funding via its Permanent Affordability Commitment Together (PACT) initiative. While remaining permanently affordable and preserving residents' rights, properties that transition to PACT/the federal Rental Assistance Demonstration (RAD) receive comprehensive renovations (attributable to new funding that NYCHA can access), enhanced property management, and expanded on-site social services.

Additionally, the growth of the backlog is partly a result of the work restrictions administered during the COVID-19 pandemic. In March 2020, NYCHA restricted non-essential work to prioritize WOs critical to residents' health and safety. Because of work suspensions, the mold and leak WO backlog increased. Other disruptions related to the pandemic include the transitioning of staff to completely remote work, employee absences due to illness, resident refusal to allow staff into units to perform work, delays in obtaining work materials, and issues obtaining personal protective equipment. The COVID-19 rent eviction moratorium also created a $450 million rent collection shortfall, straining NYCHA's funding and ability to respond to resident needs.

Another challenge that NYCHA is facing is its long mold-related repair times. It took 301 days on average to address mold WOs requiring skilled trades and 38 days[11] to address WOs resolved by development staff. The process of closing mold WOs is lengthy because it includes several steps that may occur over weeks or months. The first step is the initial mold inspection, in which the inspector identifies the root causes of mold, creates remediation and repair WOs, and documents the inspection through photos and entries in a handheld device. NYCHA then remediates the mold and completes repairs that often require ordering specialized materials, supplies, and sequencing multiple skilled trades. Additionally, because it takes time to reschedule work when employees or residents miss appointments, this can further delay the project completion timeline.

As detailed throughout this report, NYCHA has developed comprehensive strategies designed to assess the need for adequate staffing resources for WOs that will be created, the efficient and effective scheduling of those WOs, the SPs necessary to ensure that work is done correctly, and the compliance and oversight functions that provide transparency and accountability across the organization. In doing so, NYCHA has acknowledged that substantial financial investments are needed to maintain its infrastructure and offer its residents safe and sanitary housing. Without this capital investment, NYCHA is at risk of continued expansion of its WO backlog and worsened conditions for its residents.

The historical disinvestment in NYCHA buildings, infrastructure, and staffing, which was further exacerbated by the COVID-19 pandemic, resulted in the backlog of nearly 100,000 mold and leak WOs. NYCHA struggles to address these despite significant capital investment and the strategies it has developed and implemented to ensure prompt response times for future WOs. Funding for local vendor contracts, staffing to increase the management of vendor contracts, and staffing and resources to expand pre-screening and backlog scheduling efforts are just a few of

[11] This metric excludes consideration of the 5% of WOs with the longest time to remediate, per the terms of the *Baez* Revised Consent Degree.

the additional resources discussed in this document that NYCHA needs to overcome its unique challenges linked to the significant WO backlog.

NYCHA is confident that its efforts to address mold and leak issues will continue to be effective with additional funding directed toward capital repair and the WO backlog, the use of innovative strategies, and agency-wide prioritization of mold and leak remediation.

Part 1: Introduction and Background

In February 2023, Congressman Ritchie Torres requested a public report outlining NYCHA's operational challenges and the policies that have improved mold and leak issues at NYCHA. The Special Master in the *Baez* matter asked NYCHA and the court-appointed IDA to address Congressman Torres' request. This document was written by NYCHA in coordination with the court-appointed IDA and IMA. The data presented in this report was either prepared by NYCHA and validated by the IDA, prepared independently by NYCHA and validated by NYCHA, or prepared independently by the IDA and validated by the IDA.

I. External Oversight

Two recent legal agreements, the 2018 *Baez* Consent Decree (between the *Baez* plaintiffs/NYCHA residents and NYCHA) and the 2019 HUD Agreement (between the U.S. Department of Housing and Urban Development, NYCHA, and New York City) have primarily driven NYCHA's response to mold and leaks. In partnership with court-appointed experts and NYCHA's Federal Monitor, OMAR has pioneered many efforts to improve mold and leak data/ reporting and NYCHA's operational response to mold and leaks.

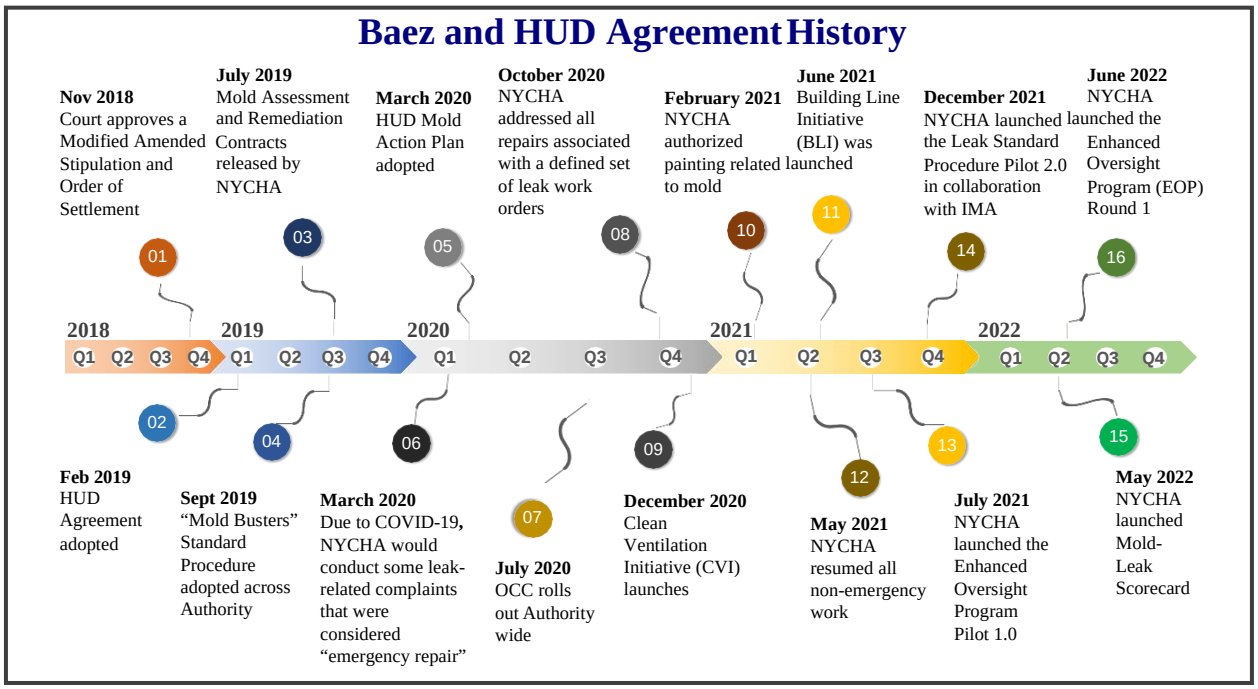
Of particular importance is NYCHA's publication of the Mold HUD Action Plan[12] in March 2020, which is a detailed strategy outlining NYCHA's plan to improve its response to mold and leak WOs. For six months, NYCHA and the Federal Monitor's team collaborated on this plan, creating an internal dashboard to monitor agency progress toward outlined goals. The following lists NYCHA's key commitments in the Mold HUD Action Plan:

- Staffing NYCHA's MRU and launching the OCC NYCHA-wide
- Eliminating specific subsets of aging mold and leak WOs
- Expanding NYCHA's contract capacity to address mold WOs
- Improving and repairing mechanical ventilation
- Developing a new roof fan inspection procedure and a new Leak SP
- Developing an educational campaign on mold

[12] Mold HUD Action Plan.

- Continuing mold training and offering refresher training to previously trained staff
- Increasing staff capacity to respond to leak emergencies

The timeline below outlines other key events instrumental to improving NYCHA's mold and leak response:



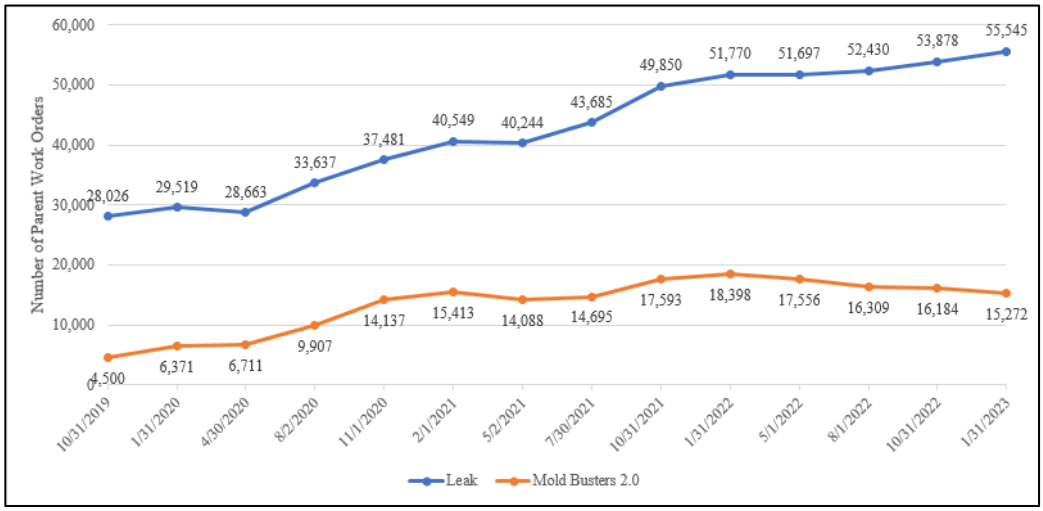
II. Current Mold and Leak Performance

As discussed, NYCHA has made progress through its numerous initiatives, but NYCHA still continues to struggle with addressing mold and leaks in a timely manner due to the lack of capital funding. The COVID-pandemic compounded this issue further, contributing to the growth of the WO backlog. As of January 31, 2023, NYCHA had 71,114 open mold and leak parent WOs, as shown in Chart 1. This is nearly double the 35,718 open mold and leak parent WOs that NYCHA reported on October 31, 2019.[13]

COVID-19-related work restrictions caused mold WOs to remain open due to pending paint work. Additionally, a significant number of NYCHA Painters were performing lead-based paint work during the timeline reflected in Chart 1, diverting resources from mold WOs. In May 2021, NYCHA lifted its COVID-19 suspensions. However, mold WOs continued to grow until January 2022. Furthermore, leak WOs have continued to increase because of aging infrastructure, NYCHA's lack of a Leak SP, and staffing shortages including Plumbers; therefore, the current backlog is comprised of the increasing number of leak WOs.

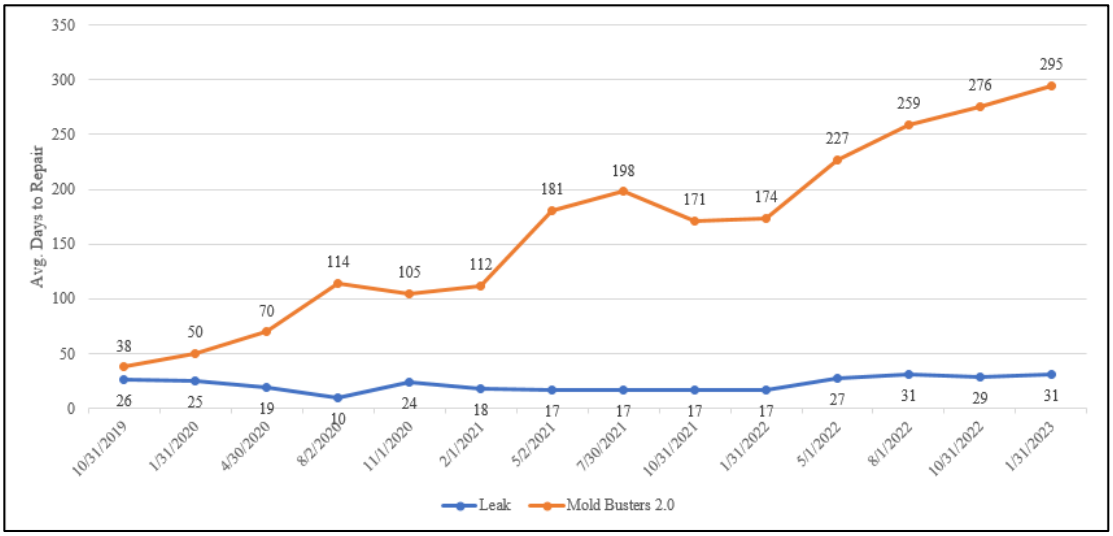
[13] October 31, 2019 is the closing date of the first reporting quarter (August 1 through October 31, 2019) in which NYCHA reported to the *Baez* Plaintiffs on its mold and leak statistics under the oversight of the *Baez* court-appointed data analyst. To ensure the reliability of the data shared in this response and consistency in calculations/ definitions, NYCHA will only share data beginning from this reporting period.

Chart 1: Number of Open Work Orders by Quarter by Type



NYCHA monitors the time it takes to address mold and leak WOs. From October 2019 through January 2023, average days to address mold WOs increased from 38 to 295 days, displayed by Chart 2. The 295 days captures the time from the creation of the WO to the closure of the last repair WO associated with it. It does not capture the additional time that NYCHA spends on QA inspections. During this time, average days to complete leak WOs increased from 26 to 31 days. NYCHA took 136 days on average to address the 21% of leak WOs requiring a skilled trades repair and two-and-a-half days to address leak WOs addressed solely by maintenance.

Chart 2: Average Days to Complete Work Orders by Quarter by Type

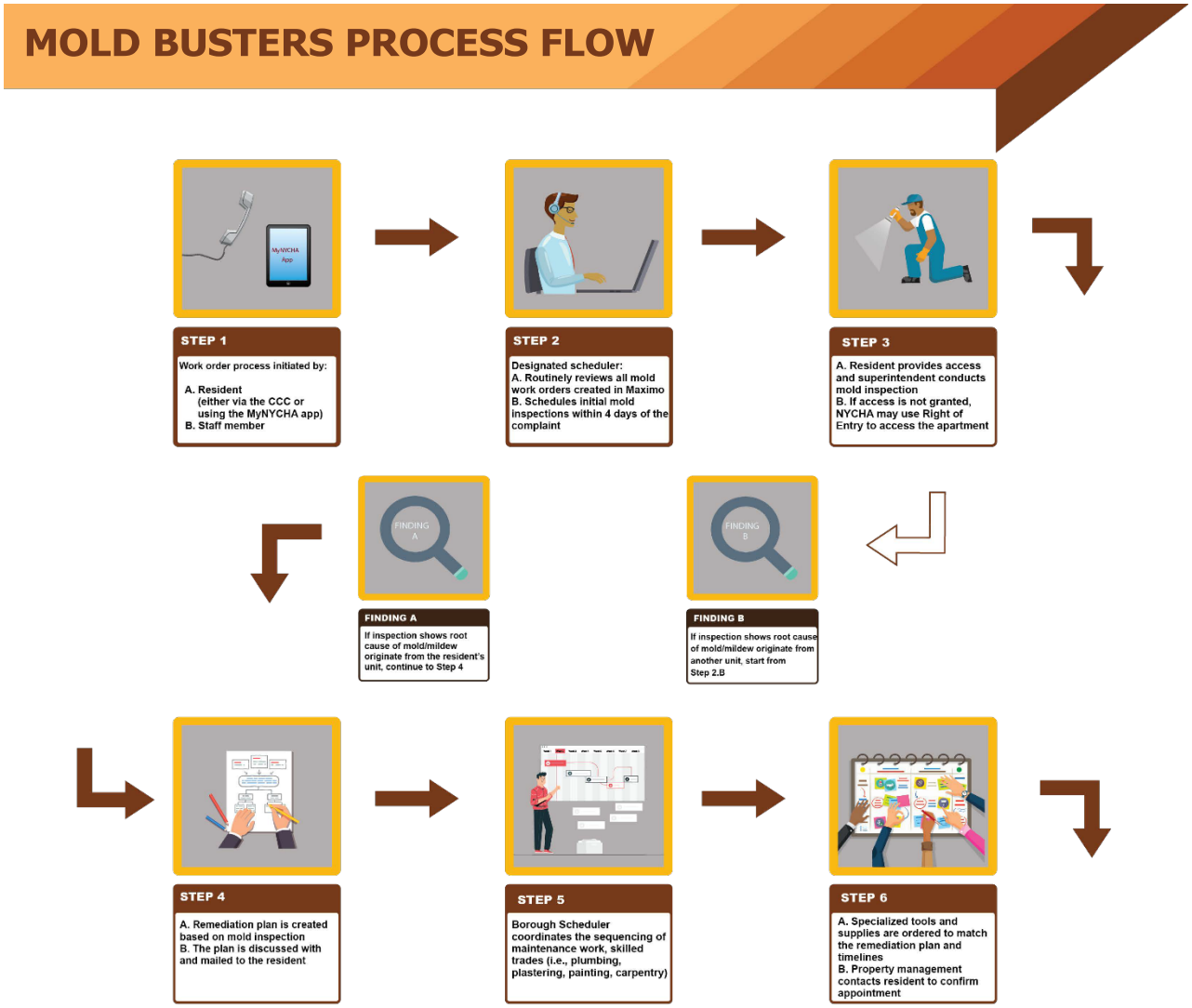


While the time to complete leak WOs remained steady, the time to complete mold WOs increased dramatically because of the complexity of mold repairs, the introduction of the Mold SP, and the prioritization of closing large numbers of older mold WOs. Regarding the

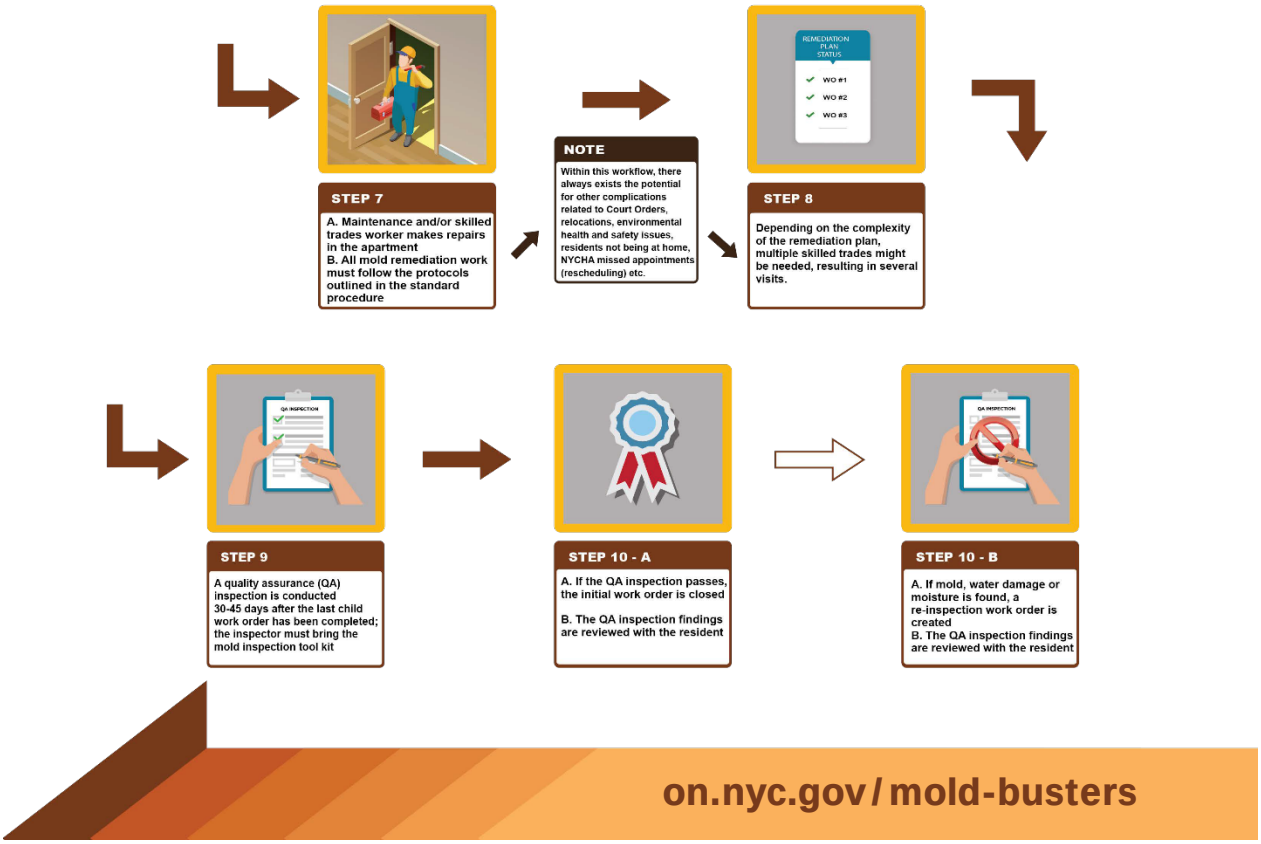
complexity of mold repairs, nearly all mold parent WOs require the work of one or more specialized trades. WOs assigned to Painters, Plumbers, and Carpenters comprise most of the outstanding mold and leak repairs. To expedite skilled trades repairs, NYCHA created 504 new positions in 2021 and 2022 as part of its Work Order Reform (WOR) initiative. Part 3 details these additional staffing needs.

The launch of the Mold SP – which is part of the Mold Busters approach to combating mold – lengthened the time to complete mold WOs by introducing a standardized inspection and repair process that requires staff to spend additional time investigating and thoroughly remediating the root causes of mold. While effective at remediating mold in buildings, this improved process has increased the number of steps required to complete mold WOs.

The graphic below summarizes each of these steps. As stated, a similar SP will be introduced for leak WOs by the end of 2023 and is further described in Part 3.



Graphic is continued on next page.



NYCHA's prioritization of older mold WOs also contributes to the increase in the days to complete mold WOs figure.[14] Specifically, NYCHA closed a subset of aging mold repair WOs during the Mold and Leak Prioritization Initiative (MLP)[15] from February 2021 through February 2022, and continues to prioritize completing aging WOs in communications to Operations staff. This closure of many older WOs increased the average days to complete statistic.

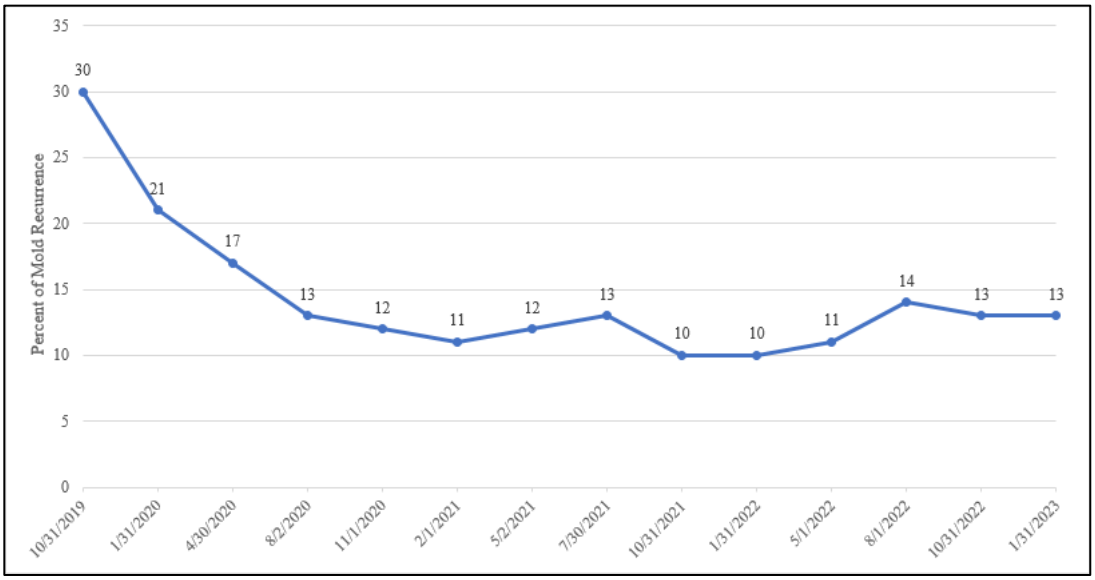
Despite the trends highlighted above, NYCHA is showing progress in several areas. First, declining mold recurrence rates indicate that NYCHA's interventions to address mold's root causes are effective. Second, NYCHA's EOP has increased response times and reduced open mold-related inspections and mold cleaning WOs at select NYCHA developments. Third, the deployment of specialized teams to perform inspection and paint work has been successful, as NYCHA is completing more mold inspection and paint work now than during the previous year (2021-2022), and more WOs are being closed than being created, reducing the backlog of these WOs.

[14] The closure of many aging WOs has the effect of increasing the average days to complete statistic.
[15] Despite its name, the initiative only encompassed mold WOs.

Declining Recurrence Rates

As Chart 3 illustrates, the frequency of mold recurrence declined by 55% (from 30% in October 2019 to 13% in January 2023). NYCHA is confident that the introduction of the Leak SP will further reduce mold recurrence rates.

Chart 3: Combined Recurrence Percentage of Mold Work Orders at Unit and Room Level



Increased Response Times and Decreases in Open Mold Inspections and Mold Cleaning WOs

In addition to NYCHA's progress in reducing mold recurrence, the Scorecard[16] and EOP reduced the time to complete initial mold and QA inspections.[17] Launched in June 2022, NYCHA's EOP has improved performance at struggling consolidations (groups of developments) by addressing challenges related to the growing mold and leak backlog. NYCHA uses its Scorecard to select EOP sites. These efforts are summarized in Part 2. The below work categories, specifically tracked within the Scorecard as priorities, displayed dramatic improvement from March 24, 2022, through January 31, 2023:

- Open mold inspections[18] decreased by 73%, from 2,053 to 522.[19]
- Open mold QA inspections[20] decreased by 66%, from 2,138 to 723. The QA failure rate also decreased significantly across all boroughs.
- Open mold re-inspections[21] decreased by 61%, from 267 to 104.

[16] Launched in May 2022, the Scorecard ranks all NYCHA's consolidations from best to worst performing based on the consolidations' performance across various mold and leak performance metrics.
[17] NYCHA considers a QA inspection to be complete if it has any result: pass or fail. Time to complete for QA inspection is the time between the WO create date and when the QA has any result in Maximo (pass/fail).
[18] There are 522 mold WOs that are pending initial inspection, the step before remediation and repairs.
[19] The time to complete for mold parent inspections and re-inspections is the time between the WO create date and when the parent WO status changes to "COMP."
[20] There are 723 QA WOs that are pending inspection. Note that mold inspection WOs will remain open after a failed QA inspection.
[21] There are 104 re-inspection WOs that are pending inspection, which is the step before additional remediation/ repairs and after a failed QA inspection.

- Open mold cleaning WOs assigned to Caretaker X staff decreased by 90% from 2,174 to 228, and open mold cleaning WOs assigned to Painters decreased by 48% from 6,329 to 3,283. Caretaker Xs clean mold up to 20 square feet. Painters clean mold between 20 and 100 square feet, apply mold-resistant paint, and paint walls/ceilings after mold remediation.

Productivity Progress

Along with reducing the volume of mold, NYCHA is completing mold inspections and mold cleaning WOs faster than they are being created as displayed by the data below. As Chart 4 illustrates, NYCHA completed 58,925 mold inspections and mold cleaning WOs and created 49,705 of these from March 2022 through March 2023.

Chart 4: Created vs. Completed - Mold Inspections and Mold Cleaning WOs, March 2022-2023

Type	Created 3/2022 - 3/2023	Completed/Closed 3/2022 - 3/2023	Difference of Completed/Closed vs. Created
Mold Parent Inspections	16,129	17,921	**1,792**
Mold QA Inspections	17,729	19,406	**1,677**
Mold Re-Inspections	3,560	3,760	**200**
Mold Cleaning by Caretaker X	4,400	6,448	**2,048**
Mold Cleaning by Painters	7,887	11,390	**3,503**
Total	**49,705**	**58,925**	**9,220**

The number of completed aging mold inspections and mold cleaning WOs completed by NYCHA demonstrates an improvement in productivity. NYCHA completed 8,742 more aging mold inspections and cleaning WOs from March 2022 through March 2023 than it completed from March 2021 through March 2022.

Chart 5: Increase in Completed Mold Inspections and Mold Cleaning WOs from March 2021-2022 to March 2022-2023

Type	250+ Days Completed 3/2022 - 3/2023	250+ Days Completed 3/2021 - 3/2022	Difference of Completed 250+ Days 2022-2023 vs. 2021-2022
Mold Parent Inspections	649	88	**561**
Mold QA Inspections	801	151	**650**
Mold Re-Inspections	69	12	**57**
Mold Cleaning by Caretaker X	967	489	**478**
Mold Cleaning by Painters	3,773	1,743	**2,030**
Total	**6,259**	**2,483**	**8,742**

Part 2: NYCHA's Efforts to Improve Mold and Leak Compliance

Since 2018, NYCHA has undertaken various measures to improve its mold and leak response. This section discusses several of its main improvements.

I. Improving Ventilation

Proper building ventilation increases airflow, regulates temperature, provides general indoor air quality improvements, and prevents the development of mold growth on surfaces of rooms that are subject to high levels of moisture. NYCHA's buildings have both natural ventilation via airflow from windows and mechanical exhaust ventilation via mechanical roof fans that pull air through a common ventilation duct running vertically through the building.

The IMA highlighted NYCHA's need to address excessive shower condensation from inadequate exhaust ventilation as a major cause of mold in bathrooms. This issue has been one of the most prevalent root causes of mold growth in NYCHA's buildings with mechanical exhaust ventilation, which represent approximately 51% of the buildings in NYCHA's portfolio.[22] NYCHA's aims to provide rooms served by exhaust ventilation with continuous airflow rates that exceed local code requirements. To implement this, the Mold SP requires airflow rates to be measured when mold inspections take place in rooms with exhaust ventilation. If inadequate ventilation is found, a roof fan inspection WO is created to ensure that the roof fans are operating properly. NYCHA is also carrying out multiple exhaust ventilation improvement projects that reduce mold recurrence and new mold WOs.

OMAR's Roof Fan Replacement Efforts

In August 2020, NYCHA started its roof fan replacement project to prevent mold growth in bathrooms from shower condensation and to improve general indoor air quality in NYCHA units. NYCHA began with the inspection of all roof fans, as these provide mechanical ventilation to units and public corridors. NYCHA contracted three engineering firms to identify recently installed roof fans that meet the modern performance requirements to be retained. Fans deemed inadequate were scheduled to be replaced with new direct-drive, variable speed roof fans.[23] As of May 2022, NYCHA reached its milestone to replace or retain 8,436 roof fans, which represents 80% of NYCHA's roof fan portfolio. Of the 8,436 fans, 6,188 new fans were installed, and 2,248 fans were retained. This was a massive undertaking requiring emergency procurement, engineering work, asbestos removal, and installation.

[22] This number is a tentative estimate and pending the completion of roof fan annotation project.
[23] Some inoperable roof fans (deferred) were not replaced because of planned capital projects involving the roof.

Clean Vent Initiative (CVI)

NYCHA launched its CVI in December 2020 to clean in-unit lateral vents to improve air circulation and air quality in units with mechanical ventilation. As of January 2023, the CVI is 79% complete (vents were cleaned in 68,395 out of 87,268 units). In January 2022, NYCHA started making third attempts to access approximately 30,000 units to clean vents. These units were originally inaccessible because the residents were not home during the first two attempts or because the residents refused cleaning services. NYCHA will continue the third attempt effort for the remaining units, which will be completed in April 2023.

During the peak of this initiative, NYCHA mobilized approximately 25 seasonal staff and promoted resident hiring. Approximately 85% of all hires were NYCHA residents, garnering a higher access rate in comparison to hired vendors. Anecdotally, very positive feedback from residents was received. For a compilation of resident feedback through this program, please see the following: CVI Resident Feedback.[24]

Volume and Fire Damper Replacement

NYCHA is currently engaged with engineers to launch its replacement of approximately 64,500 in-unit and 11,400 public space volume and fire dampers portfolio-wide (within bathroom, kitchen, and common hallway exhaust openings). This vital work will improve the distribution of

[24] Link to resident feedback compilation for printed copy:
https://www.facebook.com/NYCHA/videos/459352502489211/

airflow throughout the building line. When a line is balanced poorly, airflow is distributed unequally, which may result in excessive airflow on upper floors and inadequate airflow on lower floors. Poor distribution of airflow may prevent lower floors from reaching the minimum exhaust volume of 25 cubic feet per minute (CFM) required to adequately prevent mold growth from shower condensation. Based on the most recent bid proposals from vendors, OMAR is estimating the total cost for this project to be approximately $91 million. This project is expected to begin in three NYCHA developments that will serve as a pilot, providing an opportunity to refine the logistics of volume and fire damper replacement across the larger portfolio.

Roof Fan Standard Procedure and Roof Fan Labeling

In July 2021, NYCHA published the Roof Fan Inspections at NYCHA Residential Buildings SP, providing staff guidance to conduct monthly roof fan inspections. In addition to the Roof Fan SP, the Roof Fan Inspections training guide and video were produced to instruct staff on the SP. In May 2022, NYCHA began the roof fan labeling project. This entailed labeling roof fans with unique identifier codes, or "assets", in Maximo (NYCHA's asset management database) to tie performed monthly inspections on staff handhelds to the Maximo assets. As a result of the project, development staff can easily identify each roof fan when conducting monthly roof fan inspections and follow up on corrective maintenance WOs. As of February 2023, 100% of the 8,436 residential roof fan assets identified within OMAR's scope have been labeled. An additional estimated 1,755 roof fans outside of OMAR's original scope were identified at 56 developments. The additional roof fan labeling is expected to conclude in July 2023. Better management, maintenance, and data tracking of NYCHA's roof fans result from releasing a SP, producing a training guide and video, and labeling roof fans.

Roof Fan Replacement Efforts by A&CM

In addition to the exhaust ventilation improvement work performed by OMAR, roof fan replacements are being performed by NYCHA's Asset & Capital Management department (A&CM) as part of the programs outlined in the agency's Capital Plan. The programs that A&CM has conducted to date include the following:

- **East Harlem Rezoning:** NYCHA's East Harlem Rezoning & Energy Performance Contracts (EPC) Ventilation solicitations are in progress. These include site condition surveying and exhaust riser camera scoping, development of a retrofit equipment schedule, riser and branch duct cleaning and sealing, and replacement of existing roof fans. The developments involved are Jefferson, Carver, Wagner I, Wagner II, and Washington, all of which are currently under construction.

- **Weatherization Assistance Program (WAP):** The WAP is a US Department of Energy program administered in New York by NYS Homes and Community Renewal (HCR). The program addresses health and safety issues in NYCHA's eligible stand-alone buildings and one-to-four-story developments through energy-efficiency measures. Measures include sealing cracks and holes to reduce air infiltration, replacing inadequate roof fans and in-unit registers, and cleaning ducts and vents to improve indoor air quality. As part of this program, 383 fans were installed in 27 developments.

Preliminary Impact Analysis of Ventilation Improvement Projects

To assess the impact and effectiveness of ventilation improvement projects on mold reduction, a preliminary assessment was conducted by the IDA. It focused on the impact of NYCHA's roof fan replacements and CVI and indicated that these efforts likely reduced the number of mold WOs created in units with mechanical ventilation. The assessment focused on units with bathrooms with an exhaust fan, mold growth, inadequate ventilation, and no other identified factors like leaks that could cause mold growth. In 2020, there were 6,841 founded mold inspections[25] in bathrooms with mechanical ventilation. Of these inspections, 2,018 (30% of the founded mold inspections in bathrooms with mechanical ventilation) found mold growth from inadequate exhaust ventilation with no other contributing factors.

Over this period, 325 of the 2,192 founded mold inspections of bathrooms with mechanical ventilation were completed. Despite ventilation improvements, mold was found in areas with insufficient ventilation with no other contributing factors. This represents a 72% decline in annualized mold occurrence from 2020. Over the same period, 34% of inspections for mold reported inadequate ventilation, which is a 54% decrease compared to 2020. There was also a 39% decline in mold occurrences in bathrooms with natural ventilation and no other identified contributing factors. Mold will persist even when ventilation has significantly improved without the appropriate remediation of other moisture conditions, since poor ventilation is just one of many root causes of mold, another being leaks. Therefore, the estimated impact of these initiatives may be understated until other root causes are addressed.

II. Performing Complex Mold and Leak Repairs (OMAR)

OMAR's Mold Remediation and Leak Repair Efforts

To respond to residents' mold WOs and perform repairs that resolve difficult root causes, OMAR contracted several licensed vendors to address NYCHA's most challenging mold repairs. These include repairs to units with more than 100 square feet of mold with complex root causes, community center renovation projects, and building line plumbing replacement projects.

Chart 6: OMAR's Breakdown of Completed Repairs – 2020 to Present

Repair Type	Number of Repairs
Complex Mold Repairs[39]	56
Leak Plumbing Repairs	80
Tub Enclosure Replacements[40]	84
Painting	239

[25] This metric include inspection that took ten minutes or more to complete which represent greater confidence in the quality of the inspection results.

Complex Repairs in NYCHA Units

For challenging mold and moisture issues, OMAR utilizes specialized vendors for comprehensive mold remediation projects. OMAR restores apartments to safe and sanitary conditions with full-scale mold remediation and the use of mold-resistant paint and paperless sheetrock. Below are photos of improvements from several complex remediation projects.

Brownsville – 251 Osborn Street:

South Bronx Area (Site 402) – 865 Cauldwell Avenue:

Vladeck Houses – 326 Madison Street:

West Tremont Avenue-Sedgwick Avenue Area – 228 West Tremont Avenue:

Community Center Repairs

OMAR has completed nine complex remediation repairs at several community centers across the five boroughs. Renovating and re-opening these community centers gave access to important youth and senior services and created a safe space for community events. The following three community centers showcase large-scale mold remediation renovations carried out by OMAR:

Chelsea Addition – Chelsea Gymnasium – 441 West 26th Street:

Grant Houses – Medical Center – 3170 Broadway:

Ravenswood Houses – Queens Public Library Branch – 35-21 21st Street:

Building Line Initiative (BLI) Demonstration Project - Red Hook East

The BLI is a comprehensive plumbing and renovation project that aims to address mold and leaks by targeting their underlying root cause(s) and developing a full scope of work for the affected unit line to complete necessary repairs. It was launched in June 2021 at Red Hook East. This demonstration project served as a model for conducting similar complete line-by-line plumbing renovation projects in other developments. NYCHA fully renovated bathrooms and kitchens in affected units by performing mold remediation and demolition of chase walls to insulate domestic hot and cold-water pipes. NYCHA also replaced all vertical waste riser and vent lines, waste branch lines, and domestic water supply branch lines. This work was intended to address any current or near-term plumbing leaks and prevent the development of condensation on cold-water riser and supply branch surfaces that may result in excessive moisture conditions and/or mold growth. To complete the initiative, NYCHA needed to relocate the residents during the work. The completed work received signoffs from NYCHA's QA Unit and NYC's Department of Buildings in December 2022.

Building Line Initiative - Tompkins

On January 8, 2023, NYCHA launched its second BLI project at Tompkins. It involves 15 units and includes mold remediation, kitchen renovations, bathroom renovations (as needed), plumbing upgrades, and electrical upgrades. In February 2023, NYCHA held a kickoff meeting with tenants and started identifying and preparing relocation units. Once the units are available, NYCHA will relocate tenants and continue construction prep work.

III. Addressing Resident Concerns and Improving Communication via Resident Outreach

Establishment of the OCC to Address Resident Concerns

When the *Baez* Revised Consent Decree was approved by the Court, it also included the appointment of César de Castro as the independent Ombudsperson. The Ombudsperson addresses escalated leak, mold, and excessive moisture complaints from residents and Stout Risuis Ross, LLC (the IDA and operator of the Ombudsperson's call center (OCC)). The independent OCC has been available for NYCHA's residents for over three years and has assisted over 17,000 residents with mold and leak-related WOs. The OCC is an objective mechanism for residents to raise concerns, hold NYCHA accountable for completing necessary repairs, and identify and prevent issues from occurring in the future. Complaints can be submitted to the OCC via phone (Monday – Friday, 9am – 5pm) at **1-888-341-7152** with bilingual representatives (and the use of Language Line for other interpretation needs) orthrough a web-form at www.ombnyc.com.

The OCC prioritizes empathetic listening and proactive communication. Most resident-reported complaints to the OCC involve a breakdown in communication between the resident and NYCHA. The OCC has identified a variety of resident communication strategies and best practices that NYCHA has implemented to foster a more customer-centric culture and train staff to better engage with residents.

If NYCHA does not promptly resolve a resident-reported complaint, the Ombudsperson can take certain actions outlined in the *Baez* Revised Consent Decree. To make sure that NYCHA promptly addresses these complaints, interacts with residents, and completes root cause repairs, the OCC has devised supervision tools: automated reporting on activity and communication, tracking scheduled dates or lack thereof, development of response timelines and escalation processes if those are breached, and the facilitation of a weekly or bi-weekly status call to discuss complex resident-reported complaints with various departments within NYCHA.

Residents who reach out to the OCC often live with severe conditions that may negatively impact physical and mental health like ongoing leaks or severe mold that result in deteriorated walls, pest infestations, and unhealthy air quality. Resident-reported complaints often involve broken or missing fixtures such as sinks, cabinets, toilets, showers, or exposed holes in the wall from wall breaks made to attempt leak repairs. Some are forced to relocate while units are in disrepair, as some WOs take months or years to be resolved. See below for examples of the conditions originally reported by residents to the OCC and photos after repairs were completed.

Additionally, NYCHA formed the MRU to address resident-reported complaints to the OCC, as NYCHA is dedicated to the success of OCC operations and assisting in prioritizing WOs that are brought to OCC. To successfully resolve resident-reported complaints to the OCC, the MRU created 30 Resident Community Associate and six supervisor roles to communicate with residents and the appropriate teams within NYCHA. This work by the OCC and MRU made improvements: in December 2021, NYCHA was servicing nearly 2,000 active resident-reported complaints to the OCC. By January 2023, NYCHA was servicing 615 active resident-reported complaints to the OCC, accounting for nearly a 70% decline. The decline in active resident-reported complaints is largely due to NYCHA's increased ability to complete the necessary repair work for OCC cases and the declining rates of newly reported complaints to the OCC.

However, NYCHA must ensure residents are aware of the OCC, as the decrease in new cases may also be attributable to a lack of awareness. The OCC's efforts to proactively contact residents with leaks that have been unresolved for longer than 400 days revealed that over 90% of them were not aware of the OCC. In January 2023, only approximately 4% of residents with open mold or leak WOs had contacted the OCC.

NYCHA supported the OCC with outreach to residents during the initial launch by using robo-calls, distributing an OCC flyer in rent inserts and email, and using the online news site for residents (The NYCHA Journal). NYCHA posted the OCC information on its website, displays the OCC information in the MyNYCHA app, and posts on social media about the OCC regularly. In 2022, as part of an effort to increase awareness, NYCHA provided a budget to the OCC to conduct proactive outreach to residents and other stakeholders. Some examples include targeted outreach to residents with Plumber WOs open for more than 400 days; outreach to residents with indications of severe unresolved leaks which affect several units within a building line; and offering awareness presentations to elected officials, legal service providers, and resident associations.

The increased oversight provided by the OCC and dedicated MRU staff has been extremely effective in holding NYCHA accountable to complete the necessary repair activities, follow SPs, communicate with residents about the repair process and scheduling, and ensure residents' satisfaction. The OCC has also proven to be a reliable mechanism to identify opportunities to refine and transform NYCHA's organizational culture, resident communication, operational processes, and identification of buildings with capital needs that contribute to mold and leak occurrence. The OCC has outlined many of the factors necessary for continued success in its periodic reports, available on its website.[26] Some ongoing operational challenges identified through the OCC include the following:

[26] Please reference the OCC periodic reports for more information regarding these efforts: www.ombnyc.com.

- **Multiple Appointments Required to Complete the Repair Process:** NYCHA's repair process requires separate, sequenced appointments for each step in the process. For example, a single NYCHA staff person cannot typically inspect and repair the leak and plaster and re-paint the wall. It typically requires the resident to be home for three to four separate appointments, which would be completed by three to four separate workers or teams. The MRU's support for resident communication and WO scheduling expedites the completion of these repairs, but more work is needed if staff in charge of scheduling are not responsive, which is a regular complaint from residents who contact the OCC.

- **Scheduling Delays:** Most of the trades are currently being scheduled two to six months in the future due to significant staffing constraints, causing significant delay in resolving resident-reported complaints to the OCC. The MRU is working with the trades to expedite repairs and request skilled trades to schedule work during after-hours using overtime, although this has had limited success.

- **Missed Appointments Worsened by Scheduling Delays:** The MRU is tackling the issue of missed appointments by NYCHA or the resident, which has a significant impact on NYCHA's ability to complete repairs promptly. If an appointment is missed, the wait time for a new date may be another two to six months. To prevent residents from having to wait months because of missed appointments, the MRU is attempting to reduce missed appointments and coordinate with skilled trades to expedite work.

- **Improperly Closing WOs:** The MRU has struggled with Maintenance Workers (or other staff) prematurely closing WOs after no work was done, either because the resident was not home or because the root cause of a leak was not in the unit related to the WO. The MRU must investigate these circumstances to determine why WOs were closed and whether new WOs must be created and scheduled. This issue creates confusion or frustration with residents and should be ameliorated when the Leak SP is implemented by the end of 2023.

Resident Outreach through the Launch of the Mold Busters Campaign

In 2020, NYCHA launched and completed its Mold Busters campaign to inform residents about reducing occurrences of mold in their units. The campaign involved the development of targeted outreach and collateral materials, including short videos and window clings that were shared with locations without mechanical ventilation.

In June and July 2022, the MRU, Operations, and Resident Participation and Civic Engagement Department collaborated with the OCC to assist developments with outdoor blitz events at Howard, Unity Plaza, and Red Hook West. In August 2022, the MRU attended multiple family days at Sumner, Unity, St. Mary's Park, and Wilson. At both the blitzes and family days, MRU representatives engaged residents and provided reading materials about preventing mold in units. OMAR inspectors attended these events to inspect resident units with severe issues.

NYCHA's Resident Participation and Civic Engagement Department has also proactively engaged with residents. In 2021, the Resident Engagement Department conducted outreach to various developments that were engaged in the tenant associations election process.

For an example of a short video from the Mold Busters resident informational campaign, please see the following: What is mold, how to identify it, and why it matters (Video 1 of 4) #MoldBusters - YouTube[27]

IV. Using Data Analysis to Drive Mold and Leak Performance

Mold and Leak Performance Scorecard (Scorecard)

As per its Transformation Plan, NYCHA aims to produce data-driven decisions and actions.[28] To accomplish this for mold and leaks, NYCHA, in partnership with the IDA, developed the Scorecard, an assessment tool that evaluates NYCHA's performance at every level on key performance metrics and equips Operations with actionable data that was once unavailable.[29] It enables NYCHA management to monitor staff productivity and to intervene when troubling performance areas are identified in each location.

In 2019, with the IDA's assessment, NYCHA worked extensively to refine available mold and leak data. Data from Maximo, NYCHA's WO tracking system, was put into a more usable and relevant format called the "Data Cube", which contains mold and leak WOs outlined in the Revised *Baez* Consent Decree. The IDA uses this information to produce data visualizations that NYCHA can view online on the Scorecard; this debuted in April 2022.

The Scorecard currently evaluates mold and leak performance based on 11 key metrics which correlate to the *Baez* compliance requirements. Each metric has a predetermined weight assigned by NYCHA and the IDA. Performance is determined by a ranking system that lists each consolidation's weighted average score from lowest (i.e., the best performing sites) to highest (i.e., the poorest performing sites). The 11 metrics are calculated by consolidation, neighborhood[30], borough, and NYCHA-wide levels and include the following:

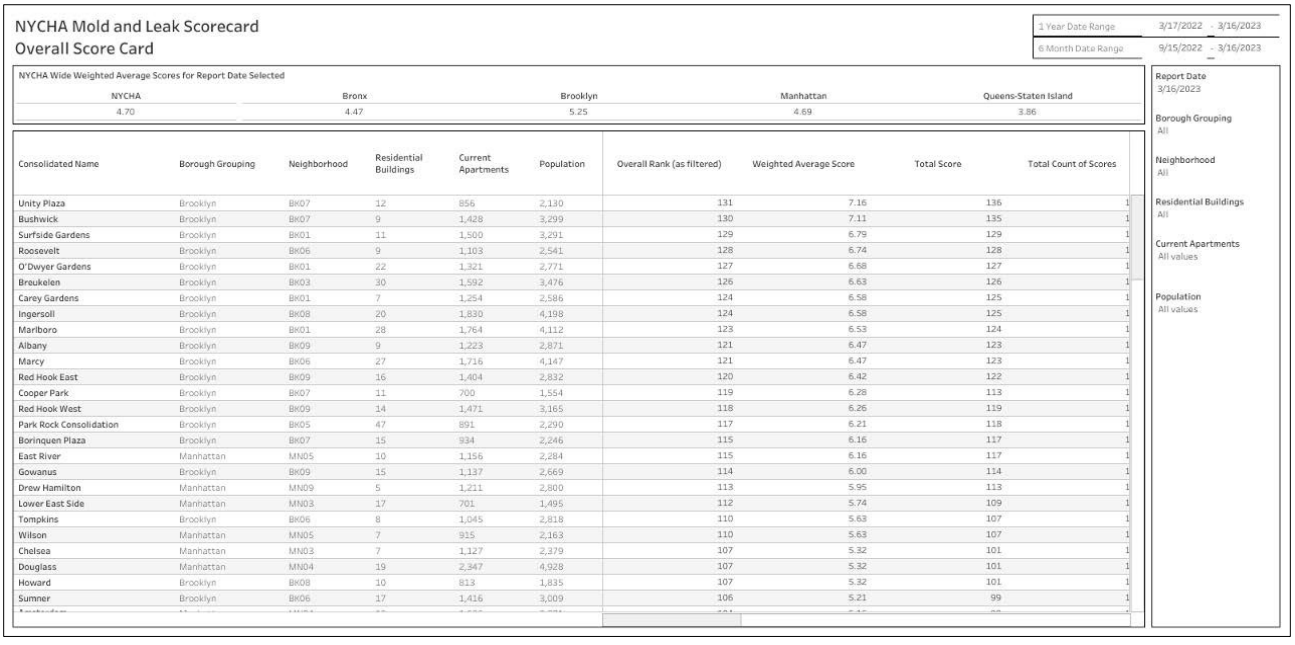
- Median days to complete a mold initial inspection (for completed inspections) or median days a mold inspection has been awaiting completion (for incomplete inspections).
- Percentage of mold and leak skilled trades WOs open for over 100 days.
- Percentage of open mold and leak WOs that have a corresponding future scheduled appointment date.
- Percentage of mold inspections where mold, water damage, or moisture was identified during NYCHA's unit inspection.

[27] Link to video: https://youtu.be/YEIMZOuPKqY
[28] This will be done along with the NYCHA STAT process, in which mold and other pillar areas are reviewed at a high level by Executive staff; there is also a mold/leak dashboard that specifically tracks the agreement metrics.
[29] The Scorecard is accessible through a link on the NYCHA Connect homepage through Data Warehouse. The link is mobile enabled to allow for ease of access. Instructions on how to locate and log onto the Scorecard are emphasized and reinforced in all training sessions.
[30] A neighborhood is a group of consolidations in the same geographic location.

- Percentage of mold QA inspections completed within 45 days of the completion of work.
- Percentage of mold QA inspections that passed.
- Percentage of mold WOs that are a recurrence (from a previous WO).
- Percentage of emergency leaks in which water is removed in 48 hours.
- Median days to complete non-paint repairs or days pending non-paint repairs from the mold WO date.
- Percentage of OCC tickets solved or pending solution within 30 days of create date.
- Percentage of fair, good, or excellent responses to a resident satisfaction survey on NYCHA's handling of mold and leak WOs.

The Scorecard also presents other visualizations that allow users to identify trends and to review/export WOs. Sample views of the Scorecard are highlighted below.

NYCHA Scorecard: Consolidation Scorecard View[31]



NYCHA Mold and Leak Scorecard
Overall Score Card

1 Year Date Range 3/17/2022 - 3/16/2023
6 Month Date Range 9/15/2022 - 3/16/2023

NYCHA Wide Weighted Average Scores for Report Date Selected

NYCHA	Bronx	Brooklyn	Manhattan	Queens-Staten Island
4.70	4.47	5.25	4.69	3.86

Consolidated Name	Borough Grouping	Neighborhood	Residential Buildings	Current Apartments	Population	Overall Rank (as filtered)	Weighted Average Score	Total Score	Total Count of Scores
Unity Plaza	Brooklyn	BK07	12	856	2,130	131	7.16	136	1
Bushwick	Brooklyn	BK07	9	1,428	3,299	130	7.11	135	1
Surfside Gardens	Brooklyn	BK01	11	1,500	3,291	129	6.79	129	1
Roosevelt	Brooklyn	BK06	9	1,103	2,541	128	6.74	128	1
O'Dwyer Gardens	Brooklyn	BK01	22	1,321	2,771	127	6.68	127	1
Breukelen	Brooklyn	BK03	30	1,592	3,476	126	6.63	126	1
Carey Gardens	Brooklyn	BK01	7	1,254	2,586	124	6.58	125	1
Ingersoll	Brooklyn	BK08	20	1,830	4,198	124	6.58	125	1
Marlboro	Brooklyn	BK01	28	1,764	4,112	123	6.53	124	1
Albany	Brooklyn	BK09	9	1,223	2,871	121	6.47	123	1
Marcy	Brooklyn	BK06	27	1,716	4,147	121	6.47	123	1
Red Hook East	Brooklyn	BK09	16	1,404	2,832	120	6.42	122	1
Cooper Park	Brooklyn	BK07	11	700	1,554	119	6.28	113	1
Red Hook West	Brooklyn	BK09	14	1,471	3,165	118	6.26	119	1
Park Rock Consolidation	Brooklyn	BK05	47	891	2,290	117	6.21	118	1
Borinquen Plaza	Brooklyn	BK07	15	934	2,246	115	6.16	117	1
East River	Manhattan	MN05	10	1,156	2,284	115	6.16	117	1
Gowanus	Brooklyn	BK09	15	1,137	2,669	114	6.00	114	1
Drew Hamilton	Manhattan	MN09	5	1,211	2,800	113	5.95	113	1
Lower East Side	Manhattan	MN03	17	701	1,495	112	5.74	109	1
Tompkins	Brooklyn	BK06	8	1,045	2,818	110	5.63	107	1
Wilson	Manhattan	MN05	7	915	2,163	110	5.63	107	1
Chelsea	Manhattan	MN03	7	1,127	2,379	107	5.32	101	1
Douglass	Manhattan	MN04	19	2,347	4,928	107	5.32	101	1
Howard	Brooklyn	BK08	10	813	1,835	107	5.32	101	1
Sumner	Brooklyn	BK06	17	1,416	3,009	106	5.21	99	1

Report Date
3/16/2023

Borough Grouping
All

Neighborhood
All

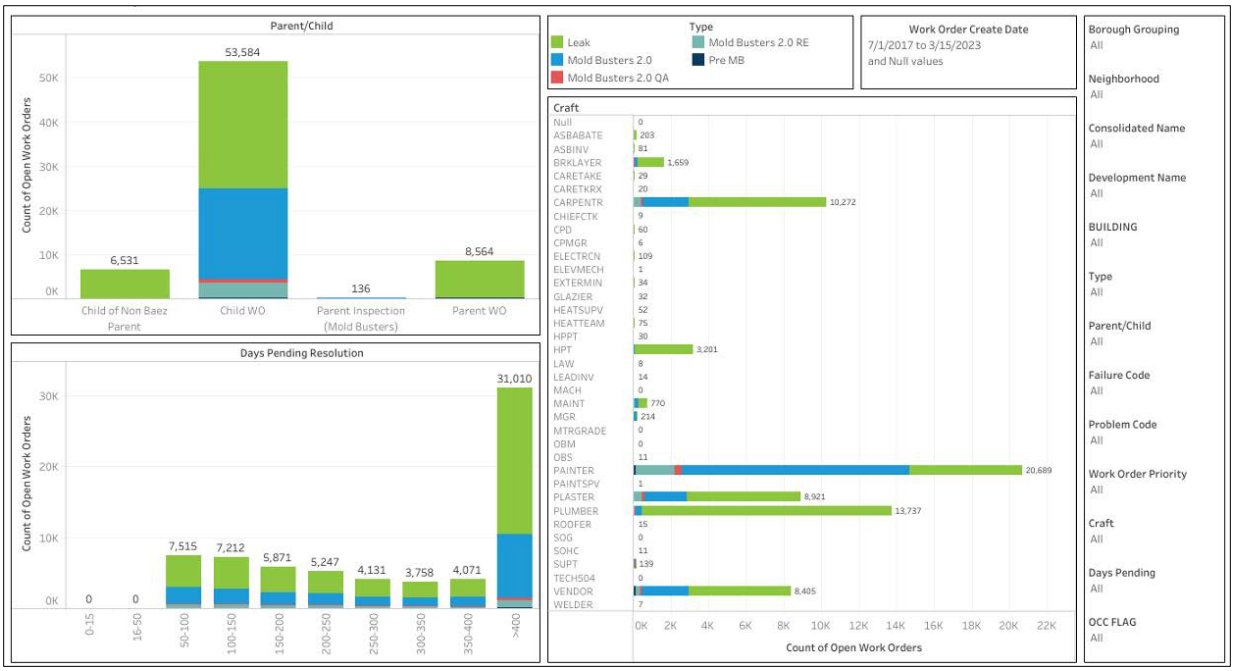
Residential Buildings
All

Current Apartments
All values

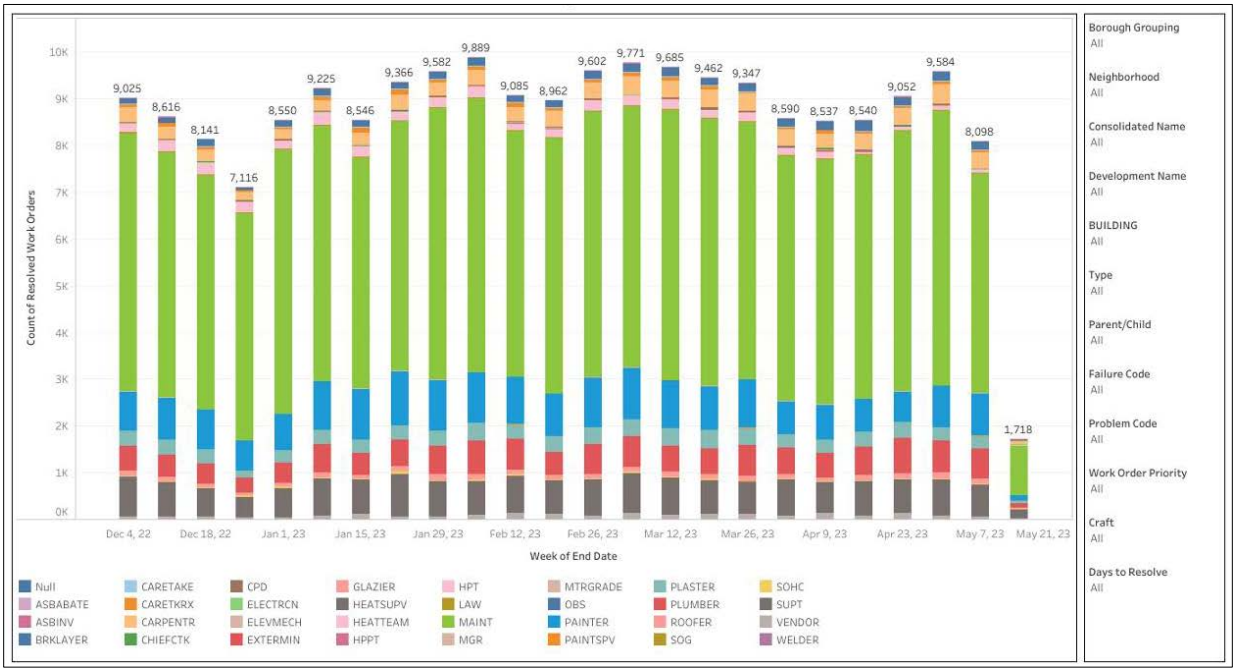
Population
All values

[31] This *Consolidation Scorecard View* displays each consolidation's rank, weighted average score, and individual score for each of the 11 key metrics.

NYCHA Scorecard: Individual Open WOs View[32]



NYCHA Scorecard: WOs Resolved in the Last 24 Weeks by Craft[33]



Since NYCHA Operations adopted the Scorecard, users have expressed positive feedback about its visual presentation of data, transparency of WO trends, and usability. Constructive feedback has been incorporated into the Scorecard, and it has facilitated agency-wide improvements in

[32] The *Individual Open WOs View* displays bar graphs breaking down open WOs by parent and child distribution, WO age distribution, and craft distribution.

[33] The *WOs Resolved in the Last 24 Weeks by Craft View* displays a bar graph breaking down WOs that were resolved in the last 24 weeks by craft.

NYCHA's response to residents' mold and leak WOs since its introduction. From March 24, 2022,[34] to March 27, 2023, NYCHA's overall weighted average score improved from 5.4 to 4.7[35] after a decrease in median day to inspect from 25 days to nine days, an increase in the percentage of 45-day QA compliance from 67% to 87%, and an increase in the percentage of open WOs with a scheduled date in the future from 8% to 21%. This can also be attributed to the 75% decline in open mold initial, QA, and re-inspections, a 93% decline in open mold cleaning WOs assigned to Caretaker Xs, and a 61% decline in open mold cleaning WOs assigned to Painters.[36] While there were improvements, NYCHA observed negative trends, such as a decrease in the percentage of founded mold inspections from 78% to 70%, an increase in mold recurrence on unit and room level from 9% to 12%, and an increase in the median days to complete non-paint repairs from 184 days to 234 days (which could be attributed to an aging backlog of non-paint repair WOs).[37] See Charts 7 and 8 for summaries of NYCHA's progress in key metrics and priority WOs.

Chart 7: Key Scorecard Metrics - NYCHA

Scorecard Metrics	Report Date 3/24/22	Report Date 3/27/23	Change (% or points)[38]
Weighted Average Score	5.4	4.7	**-0.7**
1: Median Days to Inspect or Pending Inspection	25	9	**-63%**
2: % of Skilled Trades WOs Over 100 Days	n/a	71%	**-4**
3: % of Open WOs with a Scheduled Date in the Future	8%	21%	**13**
4: % of Founded Mold Busters 2.0 Inspections	78%	70%	**-8**
5: % of Mold Busters 2.0 QA Inspections 45-Day Compliant	67%	87%	**20**
6: % Mold Busters 2.0 QA Inspections Passed	78%	83%	**5**
7: % Mold Recurrence	9%	12%	**3**
8: % of 48-Hour-Compliant Emergency Leaks	78%	76%	**-2**
9: Median Days to Complete Non-Paint Repairs or Days Pending Non-Paint Repairs from Create Date	184	234	**27%**
10: % of OCC Tickets Solved or Pending Solution within 30 Days of Create Date	16%	20%	**4**
11: % Fair, Good, or Excellent Resident Satisfaction	71%	76%	**5**

[34] The Scorecard was introduced in Q32. The earliest report is dated March 24, 2022.
[35] The data in this report is written in whole numbers, but for the Weighed Average Score, one decimal place is written to display the changes in value.
[36] See *Operation Mold Clean Up* section for more details.
[37] While more WOs are being scheduled and addressed, these WOs are largely newly created. This results in the older WOs getting older, which causes the median days to complete non-paint repairs to increase.
[38] This column tracks the change between the earliest report date March 24, 2022, against the last report date March 27, 2023.

Chart 8: Priority Work Orders - NYCHA[39]

Priority Work Orders	Report Date 3/24/22	Report Date 3/9/23	Change (Number)	Change (%)
Open Initial Mold Inspections	2,053	372	-1,682	-82%
Open Mold QAs	2,138	681	-1,457	-68%
Open Mold Re-inspections	267	61	-206	-77%
Open Mold Cleaning WOs (Craft Caretaker X)	2,174	159	-2,015	-93%
Open Mold Cleaning WOs (Craft Painter)	6,327	2,485	-3,842	-61%
Open Mold-Resistant Paint WOs (MRPAINT)	7,400	4,412	-2,987	-40%
Open Tub Enclosure Replacement WOs	5,853	6,748	898	15%
Grand Total	**26,212**	**14,918**	**-11,291**	**-43%**

Since the introduction of the Scorecard, Bronx's performance has been outstanding. The borough's weighted average score improved dramatically from 5.7 to 4.5, representing the greatest progress of all boroughs. This change is reflected in improvements in key metrics, including a decrease in the median days to inspect from 26 days to two days, an increase in the percentage of 45-day QA compliance from 59% to 99%, and an increase in the percentage of open WOs with a scheduled date in the future from 7% to 18%. Bronx's improvement in performance can also be attributed to borough management holding staff meetings that focus solely on mold and leak WOs, using the Scorecard during staff meetings, encouraging individual staff use of the Scorecard, prioritizing filling vacant positions, utilizing strategic overtime, increasing resident communication, and excelling in mold remediation.

Queens/Staten Island improved its performance significantly, decreasing its weighted average score from 4.6 to 4.0. This score stands as the best overall mold and leak performance of any borough. Queens/Staten Island's performance can be attributed to improvements in key metrics such as the median days to inspect, which decreased from 15 days to five days; a decrease in the percentage of skilled trades WOs over 100 days from 72% to 66%; and an increase in the percentage of open WOs with a scheduled date in the future from 19% to 33%. Queens/Staten Island's improvement in performance can also be attributed to borough management closely monitoring inspection WO completion, monitoring Neighborhood and Borough Planner performance to ensure that WOs are being scheduled in a timely fashion, utilization of the Scorecard during staff meetings, and encouraging individual staff utilization of the Scorecard.

Manhattan's performance was mostly stagnant, but from November 2022 through March 2023, the borough had been able to make a positive shift, improving its weighted average score from 5.3 to 4.7. Manhattan's median days to inspect improved from 19 days to six days, the percentage of 45-day QA compliance improved from 79% to 91%, and the percentage of open WOs with a scheduled date in the future increased from 4% to 19%. Manhattan was the last

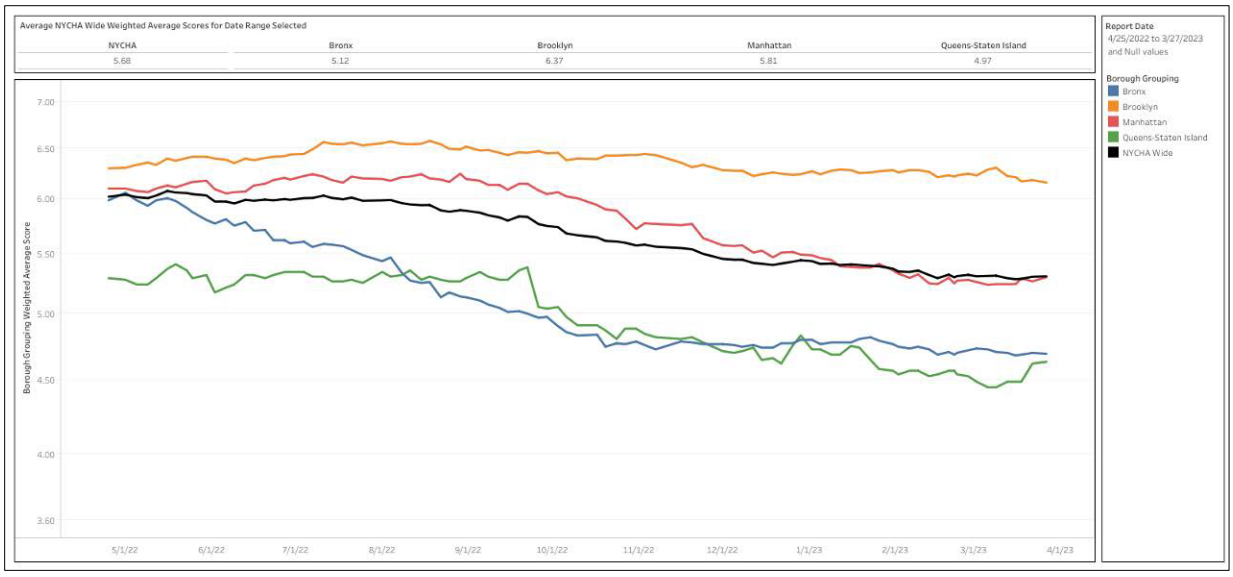
[39] It should be noted that this chart only captures the number of WOs open on the selected report dates. There are WOs that are opened and completed during the duration of the selected report dates that are not accounted for. As such, the number of WOs addressed may be greater than is reflected in the chart.

borough to transition to the Neighborhood Model in October 2022, which could have contributed to the delay in improvement from the use of the Scorecard. (The Neighborhood Model is described in detail in Part 2, Section VII.) Manhattan's improvement in performance can also be attributed to borough management and staff's use of the Scorecard during weekly meetings, reiterating the importance of updating and closing WOs in Maximo appropriately, and monitoring productivity reports.

Brooklyn's progress was largely stagnant but took a positive turn in the beginning of 2023. During this time, Brooklyn's weighted average score decreased from 5.6 to 5.2. The borough's median days to inspect improved from 33 days to 19 days, the percentage of 45-day QA compliance improved from 56% to 77%, and the percentage of WOs with a scheduled date in the future increased from 7% to 19%. This positive change in recent months can be attributed to new leadership and heightened focus by the Executive Department in addition to the Neighborhood Model taking root. New borough leadership has been communicating clear goals and expectations to Neighborhood Administrators, prioritizing filling vacant positions, conducting blitzes, utilizing the Scorecard during staff meetings, encouraging individual staff to use the Scorecard, and reiterating the importance of updating and closing WOs in Maximo. NYCHA's Healthy Homes Department has been working closely with the borough to develop strategies to improve mold and leak response and compliance and will continue to do so.

Chart 9 outlines each borough's performance from March 24, 2022, through March 27, 2023.

Chart 9: Overall Score Trend[40]



[40] This chart and view display the overall score trend and weighed average score from a selected date range, which in this case is March 24, 2022, to March 27, 2023. The weighted average score of a date range will differ from the weighted average score of a select date. The borough weighted average scores displayed in this view are different from the borough weighted average scores mentioned in this section.

Charts 10 and 11 outline the highest and lowest performing consolidations as of March 2023.

Chart 10: The 10 Highest Performing Consolidations on the Scorecard

Ten Highest Performing Consolidations
1. Taylor St – Wythe Ave (BK)
2. South Beach (Q/SI)
3. Gun Hill (BX)
4. Vandalia Avenue (BK)
5. Woodson (Q/SI)
6. Stapleton (Q/SI)
7. Todt Hill (Q/SI)
8. Langston Hughes Apartments (BK)
9. Mariner's Harbor (Q/SI)
10. Parkside (BX)

Chart 11: The 10 Lowest Performing Consolidations on the Scorecard

Ten Lowest Performing Consolidations
131. Unity Plaza (BK)
130. Bushwick (BK)
129. Surfside Gardens (BK)
128. Breukelen (BK)
127. O'Dwyer Gardens (BK)
126. Carey Gardens (BK)
125. Ingersoll (BK)
124. Albany (BK)
123. Borinquen Plaza (BK)
122. Roosevelt (BK)

Enhanced Oversight Program (EOP)

To improve compliance metrics related to existing WOs at high-risk consolidations, OMAR, in partnership with the IDA, the OCC, and the IMA, engages lower performing consolidations as part of the EOP. The EOP establishes overall performance milestones consistent with *Baez* requirements and identifies site-specific roadblocks that hinder performance (i.e., staffing shortages, lack of managerial oversight, access issues to occupied units, scheduling disruptions, procurement delays, material shortages, or the need for training). OMAR works with consolidations to address roadblocks by engaging Operations leadership to develop strategic response plans and allocating internal specialized teams to address priority work backlogs.

OMAR, along with the IDA, OCC and IMA, works with consolidations by having weekly check-ins to review progress, prioritize tasks, discuss priority OCC resident-reported complaints, and develop strategies to tackle the root causes of mold and leaks and WO backlogs. The strategies discussed at check-ins improve consolidations' performance on the Scorecard when implemented.

Since July 2022, the EOP has completed two rounds and commenced a third. Chart 12 illustrates the EOP's positive impact across Round I and II developments and lists the developments in ongoing Round III.[41] It is noted that participating sites significantly improved during the EOP period as lower numbers indicate higher ranking. There is only one site located in Brooklyn, Red Hook East, that did not undergo enough significant change during its time in EOP Round II. Consequently, OMAR decided to include it in Round III.

[41] Round III sites do not have weighted average scores or ranks since this round is ongoing.

Chart 12: EOP Rounds

Round	Consolidation	Metric	Prior to EOP	End of EOP	Change
EOP Round I Start Data Date[42]: 6/13/22 End Data Date: 9/22/22	Astoria (Q/SI)	Rank	72	35	**-37**
		Weighted Average Score	5.3	4.5	**-0.8**
	Saint Mary's Park (BX)	Rank	111	78	**-33**
		Weighted Average Score	6.5	5	**-1.5**
	Wilson (MN)	Rank	129	117	**-12**
		Weighted Average Score	7.4	6.7	**-0.7**
	Red Hook West (BK)	Rank	131	121	**-10**
		Weighted Average Score	7.7	6.8	**-0.9**
	Sumner (BK)	Rank	132	126	**-6**
		Weighted Average Score	7.7	7.0	**-0.7**
	Unity (BK)	Rank	125	124	**-1**
		Weighted Average Score	7.1	6.8	**-0.3**
EOP Round II Start Data Date: 9/15/22 End Data Date[43]: 12/29/22; 1/23/23	Queensbridge North (Q/SI)	Rank	111	85	**-26**
		Weighted Average Score	6.6	5.0	**-1.6**
	Jefferson (MN)	Rank	130	106	**-24**
		Weighted Average Score	7.2	5.6	**-1.6**
	O'Dwyer Gardens (BK)	Rank	132	117	**-15**
		Weighted Average Score	7.5	6.6	**-0.9**
	Red Hook East (BK)	Rank	120	N/A	N/A
EOP Round III Start Data Date: 1/16/23 End Data Date: N/A[44]		Weighted Average Score	6.8	N/A	N/A
	Park Rock Consolidation (BK)	Rank	129	N/A	N/A
		Weighted Average Score	7.0	N/A	N/A
	Bushwick (BK)	Rank	126	N/A	N/A
		Weighted Average Score	6.9	N/A	N/A
	East River (MN)	Rank	120	N/A	N/A
		Weighted Average Score	6.6	N/A	N/A

Some consolidations made sustainable changes and remained in good standing on the Scorecard because of the strides made by OMAR, the Environmental Health and Safety Department (EHS), and Compliance. Two consolidations that made enduring improvements since participating in the EOP are Astoria and Queensbridge North:

Astoria: As of February 27, 2023, Astoria's rank is 43 after entering EOP at rank 72 (out of 132). Astoria was chosen to be part of EOP Round I because of its high backlog of tub enclosure replacement WOs and large number of skilled trades WOs over 100 days. Its response time to emergency leaks lagged compared to other Q/SI consolidations, which tend to perform well on

[42] The start data date is the date the consolidations were selected to be an EOP site based on the Scorecard data. The start data date differs from the start date of the EOP Round.
[43] EOP Round II consolidations had various end dates and thus the end data dates are not the same for all consolidations. Queensbridge North's EOP Round II end data date is December 29, 2022. Jefferson and O'Dwyer Gardens' EOP Round II end data date was January 23, 2023.
[44] EOP Round III is expected to conclude in May 2023.

the Scorecard. With the assistance of the Mold Cleaning Initiative (MCI) team and vendors, Astoria was able to halve its number of mold cleaning WOs from 67 to 30, reduce its tub enclosure replacement WOs from 91 to 54, and reduce its median days to inspect from 11 to six. On September 29, 2022, it became the fifth best consolidation (out of 132) in the performance metric of open WOs with a scheduled date in the future and the eighth best consolidation (out of 132) in the performance metric of decline in skilled trades WOs over 100 days.

Queensbridge North: This consolidation's rank is 36 as of February 27, 2023, after entering the EOP at rank 111 (out of 132). The changes that were made at Queensbridge North were sustainable. It completed the program on December 29, 2022, at a higher (worse) rank of 85, and since December 2022, the site has continued to display lower rankings. OMAR, in partnership with the consolidation, identified and accomplished the following goals for Queensbridge North: reduction of the aging backlog of all open WOs, improvement of the percentage of WOs with a scheduled date in the future, and the reduction of priority mold-related work (mold cleaning, mold-resistant painting, and other skilled trades WOs). On December 29, 2022, Queensbridge North was able to reduce its median days to inspect by 78%, reduce its open mold removal WOs assigned to the craft of Painter by 64%, and increase its mold QA inspections completed within 45 days by 17 percentage points. The consolidation was ranked the fourth best consolidation in NYCHA regarding open WOs with a scheduled date in the future at the end of EOP Round II.

Some EOP sites struggle to maintain performance improvements after the sites finish participating in the EOP. For example, Unity Plaza, which participated in EOP Round I, was able to increase its rank from 125 to 122during its time in the program, but as of February 27, 2023, its rank is 131 (out of 131).[45] Another consolidation that regressed is O'Dwyer Gardens, which secured the rank of 117 after entering Round II at rank 132, which made it the lowest performing consolidation before EOP intervention.

NYCHA has discovered that some developments contain buildings with materials that are not conducive to removing mold. Unity Plaza contains sheetrock, which means that the mold remediation process is more involved because of sheetrock's porous nature; out of 258 developments, 66 contain sheetrock (26% of developments). Due to the complicated nature of its mold and leak problems, Unity Plaza struggles with a continuously increasing open WO backlog. Unity Plaza is ranked the worst performing consolidation as of February 27, 2023. This site also tends to have more unfounded mold inspections and longer response times for emergency leaks. The progress that Unity Plaza made during its time in the EOP was only temporary. Likewise, multiple vacancies in critical positions such as Superintendent and Assistant Superintendent at O'Dwyer Gardens contributed to its inability to sustain EOP successes, which is further explained in Part 3, Section III.

Lessons Learned & Recommendations

With the conclusion of the first two EOP rounds, OMAR has learned the following lessons regarding common obstacles that impede progress at EOP sites:

- **Contract Issues:** Some consolidations underperform because of contract issues, such as Brownsville. Brownsville's paint WO backlog continued to grow in 2021 because of a

[45] As of January 2023, there are 131 consolidations, but during Round I and Round II, there were 132 consolidations. One consolidation transitioned to private management through the RAD/PACT program.

lack of vendor contracts. OMAR and Compliance escalated this issue to NYCHA Procurement, and, by end of October 2021, Procurement awarded two contracts totaling approximately $1 million for Brownsville to address this required work.

- **Lack of Substantial Progress:** OMAR will revisit consolidations that do not display substantial progress and include them in subsequent EOP rounds. Major improvements across sites include reductions in days to inspect/pending inspection, increasing percentages of WOs with scheduled dates in the future, and reductions in priority WOs, including mold removal WOs[46] and tub enclosure replacement WOs.

- **Lack of Training:** Some staff require training or re-training. For example, there was a backlog of Mold Busters and QA inspections at Wagner Houses because only one member of the Wagner Houses management team had received Mold Busters training.

- **Scheduling:** More WOs must be scheduled and attempted, especially the oldest WOs. Of the scheduled and attempted WOs, there are occasional unit access issues. OMAR will continue to work with the WOR team to deem the Neighborhood Planner the primary point of contact for mold-related skilled trades repairs and to incorporate the *Repairs-to-Schedule Slip (RTS)* in the mold inspection process.[47] Neighborhood Planners and Administrators will continue to prioritize both aging and newly created WOs.

- **Staffing:** At Jefferson, the lack of a Property Maintenance Superintendent and late onboarding of a Neighborhood Planner affected mold inspection completion and scheduling skilled trades work. At Red Hook East, vacancies in Maintenance Worker positions increased the backlog of corrective maintenance work and delayed response time for emergency leaks. Timely escalation to Operations leadership as well as the implementation of backup plans like using floating resources, weekend blitzes targeting the highest need crafts, and WO pre-screening will help mitigate these issues.

V. Reducing Backlogs of Priority Mold and Leak Work Orders

OMAR's Mold Inspection Initiative

As of January 2022, OMAR has been using the Scorecard to determine which developments have the highest mold inspection backlog and deploying the Superintendents on its team to help those developments. This includes conducting initial mold inspection, QA, and reinspection of WOs. While EOP sites are currently prioritized, OMAR continuously monitors NYCHA-wide trends and, when needed, dispatches inspectors to the consolidations with the highest open mold inspection WO counts. As of March 28, 2023, OMAR staff completed 1,771 mold inspections, including initial inspections, QA inspections, and re-inspections across 24 consolidations. Additional details about this effort are provided in Chart 13.

[46] Mold removal WOs assigned to Painters.
[47] The *RTS* is a physical form that NYCHA residents receive which indicates the work that needs to be done within their units and gives them the option to contact a Neighborhood Planner to schedule skilled trades workers to repair these issues.

Chart 13: OMAR Mold Inspection Initiative

Borough	Number of Consolidations	Total Inspections Completed[48]
Bronx	3	79
Brooklyn	16	1,424
Manhattan	151	151
Queens	117	117
Total	**24**	**1,771**

Operation Mold Clean Up

On May 3, 2022, NYCHA launched an authority-wide initiative, Operation Mold Clean Up, to reduce the backlog of open Caretaker X and Painter mold removal WOs and outstanding mold-resistant paint WOs. Addressing these WOs would directly impact the health and safety of its residents. Phase I occurred from May 2022 through July 2022 and focused on closing 13,002 WOs identified for this initiative. Phase II occurred from August 2022 to November 2022 and aimed to close the remaining open WOs identified for Phase I as well as 6,631 newly created WOs. Phase III occurred from December 2022 through March 2023 and closed the remaining open WOs identified in Phase I and Phase II as well as 3,830 newly created WOs. There were 3,092 newly created WOs for Phase IV, which commenced in April 2023.

Overall, Operation Mold Clean Up significantly reduced the backlog of mold removal WOs. By March 27, 2023, NYCHA completed 100% of the Caretaker X mold cleaning WOs, 87% of the Painter mold cleaning WOs, and 75% of the Painter mold-resistant paint WOs identified as part of this initiative.

Chart 14: Operation Mold Clean Up Overview for Phase I, II, and III

WO Type	Starting Number of WO[49]	Number of Open WO as of 3/27	Number of Closed WO as of 3/27	Percentage of Closed WO as of 3/27
Caretaker X Mold Cleaning	2,661	6	2,655	100%
Painter Mold Cleaning	9,819	1,318	8,501	87%
Painter Mold-Resistant Paint	10,983	2,758	8,225	75%
Grand Total	**23,463**	**4,082**	**19,381**	**83%**

OMAR's Mold Cleaning Initiative (Includes EOP and Non-EOP Sites)

In May 2022, to further support the "Operation Mold Clean Up" effort to reduce the backlog of mold removal WOs, OMAR mobilized seasonal staff to do mold clean-up for circumstances involving up to 50 square feet. Another smaller team was mobilized for circumstances involving

[48] Total Inspections completed include the initial mold inspection, QA, and reinspection WOs.
[49] May 2, 2022 - Phase I - 13,002, August 1, 2022 - Phase II - 6,631, December 5, 2022 - Phase III - 3,830

In May 2022, to further support Operation Mold Clean Up's effort to reduce the backlog of mold removal WOs, OMAR mobilized seasonal staff to clean mold for circumstances involving up to 50 square feet. Another smaller team was mobilized for circumstances involving larger square footage (50 to 99 square feet). OMAR implemented this initiative at 25 developments, including EOP sites with the largest backlogs of mold removal WOs. OMAR is allocating 20 technicians and two supervisors to staff this team. The seasonal staff aids the development team by performing mold removal, vent cleaning, and caulking tasks when such deficiencies are identified during the visit.

When attempting to clean mold, OMAR staff make at least two attempts to access each unit. From May 2022 through February 2023, OMAR staff visited 28 consolidations and closed 2,294 mold cleaning WOs. A large portion of WOs that OMAR found completed were completed by staff who did not record completed mold cleaning repairs in NYCHA's WO tracking system, Maximo, and therefore these WOs remained open although work was done.[50]

OMAR Staff Performing Mold Cleaning

VI. Improving Training

Mold Busters Training Launch and Continued Application of Lessons Learned

Beginning in 2019, NYCHA's subject matter experts and training department created a class to train Property Management staff on the new Mold Busters process. NYCHA rolled out Mold Busters from January 2019 through September 2019 city-wide. The Mold Busters process utilizes inspection tools to identify the underlying causes of mold and moisture, using handheld

[50] Upon OMAR staff's arrival, 32% (727) of the 2,294 WOs were already completed by Caretaker Xs and Painters. A large portion of the 727 WOs that OMAR found completed were done by staff who did not record their completed mold cleaning repairs in NYCHA's WO tracking system, Maximo, and therefore these WOs remained open although work was done. Data Pull Date: February 1, 2023. Data pulled from Q35 Leak, Mold, and Excess Moisture Remediation Compliance Report.

devices to record inspection results, and it remediates those causes to prevent recurrence. The new tools introduced during the Mold Busters process include moisture meters (to detect surface level moisture), anemometers (which measure ventilation), hygrometers (which measure relative humidity), and borescopes (which allow the user to view inside wall cavities).

NYCHA engaged a training vendor, Environmental Education Associates (EEA), to train NYCHA staff city-wide on the new Mold Busters process. The program includes a one-day remediation class to teach the guidelines and requirements to safely and effectively clean mold, a two-day building science class, and a three-day mold inspection class. The hands-on training also includes virtual reality technology from training partner NextWave Safety Solutions, in which trainees practice remediating mold in a virtual unit. Trainees ae taught to use smartphones to document mold inspection findings and choose the appropriate remediation methods.

The initial Mold Busters training program (which trained 2,870 staff) was put on hold due to COVID-19 until the EEA could deliver a virtual training. Mold Busters training re-commenced in September 2020 to train new hires and newly promoted staff. As of February 1, 2023, 4,818 additional employees have received Mold Busters training since its resumption.

Chart 15: Mold Busters Training Summary

Mold Courses	Employees Trained 9/2020 to 2/2023	Employees Pending Training As of 2/2023
Remediation Methods	1,070	186
Inspection	196	20
Building Science – Inspector	183	37
Building Science - Maintenance Workers	429	129
Mold Refresher Inspector	430	106
Mold Remediation Refresher	2,510	1,435
Total	**4,818**	**1,913**

NYCHA also offers Mold Busters Refresher training, which consists of two four-hour virtual courses. This training is for staff who already took the original Mold Busters training in 2019.

VII. Improving Policies and Procedures

Mold SP Assessments and Enhancements

NYCHA continues to update the Mold SP to improve its overall response for mold WOs by:

- Recognizing a broader range of mold's root causes during the mold inspection process so that the correct root causes are addressed, reducing instances of recurrence.[51]

[51] Related IT enhancement for new root causes was introduced in December 2021.

- Introducing new mold-resistant materials that staff can use in mold-remediation efforts when there are supply chain shortages impacting existing approved materials, leading to a quicker remediation response.
- Expanding the list of titles permitted to perform mold inspections, facilitating faster initial responses to resident WOs.

Leak SP Development

As part of its efforts to reduce new leak WOs and recurring issues by appropriately identifying and addressing the root causes of leaks, NYCHA launched its Leak SP pilot in September 2020 at three Brooklyn consolidations (Brevoort, Low, and Roosevelt). The pilot introduced a standardized, improved, and comprehensive leak inspection and repair process to help trace the source of leaks, document the root cause(s) of conditions, and ensure that repair WOs are created for all impacted units. NYCHA provided extensive training to staff, is currently monitoring the progress of the pilot, and periodically makes operational and procedural adjustments to the process. NYCHA expects to begin implementing the finalized Leak SP by the end of 2023. More information regarding the difficulties caused by NYCHA's absence of a Leak SP as well as the progress and results of the pilot are provided in Part 3, Section VII.

Organizational Change – Neighborhood Model

NYCHA implemented significant procedural and structural changes to increase operating efficiencies through the introduction of the Neighborhood Model in 2021 through 2022. The Neighborhood Model is a borough-based vertical organizational structure that reorganizes Property Management under four geographic regions and is further divided into neighborhood groupings. Neighborhood Administrators oversee these groupings, are required to make routine visits to the properties under their purview, and are entrusted with significant decision-making authority. Some skilled trades staff, which were previously borough based, were moved to the neighborhood level. This model allows for a more effective, localized service by moving more resources closer to the point of delivery.

Skilled Trades Oversight for Data Entry

Furthermore, NYCHA has made efforts to ensure that skilled trades workers are utilizing handheld devices when completing WOs. When a WO is completed, it must be closed in Maximo by the worker using a handheld device. If this does not occur, it appears that the completed WO is still open. This negatively impacts staff productivity and leads to staff coming back to apartment when work is no longer needed. There is a consistent finding that 30% of open mold and leak WOs[52], especially older ones, are complete but have not been closed in Maximo due to lack of handheld access or training. By requiring skilled trades workers to use handhelds to close the completed WOs, the number of closed WOs interpreted as open will be reduced over time. The WOR team is currently monitoring the use of handhelds among skilled trades staff (particularly staff closing less than 80% of their WOs on handhelds) and is working with the IT team to resolve any handheld access or utilization issues.

[52] Based on outbound calling conducted by the IDA and OCC, findings from EOP pre-screening efforts, and observations from pre-screening prior to PACT transitions by NYCHA Compliance.

Part 3: Persistent Challenges and Recommendations

As discussed in Parts 1 and 2 above, many measures have been taken to prevent the WO backlog from growing and mold from emerging or recurring. Despite previous and current efforts, NYCHA still faces challenges with regard to the growing WO backlog and mold and leak remediation.

I. Lack of Capital Funding to Address Aging Plumbing Infrastructure

Description of Challenges:

Aging infrastructure is a major factor that impacts mold and excessive moisture problems in NYCHA's consolidations. As discussed in Part 2, aging roof fans were a significant contributor to exhaust ventilation inadequacies that have historically been the most prevalent root cause of mold growth in buildings with mechanical exhaust ventilation[53], and major improvements have been made in addressing this. Other underlying causes of mold WOs include leaks from outdated plumbing pipes and condensation buildup on cold water supply pipes with broken, degraded, or absent insulation. These circumstances are expected to worsen over time. HUD has determined the following anticipated end-of-service life ranges for plumbing pipes in its *Residential Rehabilitation Inspection Guide*[54] prepared by the National Institute of Building Sciences:

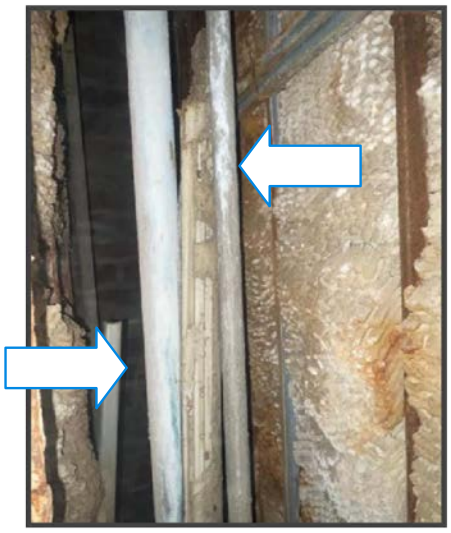
Chart 16: Type of Plumbing Pipe and Expected End-of-Service Life Range

Type of Plumbing Pipe	Primary Use in NYCHA	Expected End of Service Life Range
Cast iron waste piping	Waste risers and branches	75 to 100 years
Red brass piping	Domestic water risers and branches	70 or more years
Copper piping	Domestic water risers and branches	50 or more years
Galvanized steel piping	Waste branches	20 to 50 years

There are numerous site-specific factors that may impact pipe life expectancy, though many buildings likely contain one or more types of plumbing pipe(s) that are either within or beyond expected end-of-service life range. In many cases, pipes can remain in good condition despite being near or beyond expected end-of-service life range. Thus, examining the pipes is a critical step in planning for upgrades. Beginning in June 2022, the IMA began the ongoing Wall Cavity Plumbing Assessment Project to provide field data on the condition of plumbing pipes within wall cavities. This determines if leak WO data in the Scoring Model/Prioritization Framework (developed by the IDA) can be used as a valid and reliable tool to help NYCHA manage scarce resources and prioritize plumbing replacement projects where the greatest needs exist.[55] With the use of the Scoring Model data visualization tool, buildings and stair halls are categorized based on the severity of their leak issues, identifying locations for plumbing renovation projects.

[53] Microecologies, Inc. Wall Cavity Plumbing Assessment Project Summary February 20, 2023.
[54] Link to guide for printed copy: https://www.huduser.gov/portal/Publications/PDF/rehabinspect.pdf.
[55] Microecologies, Inc. Wall Cavity Plumbing Assessment Project Summary February 20, 2023.

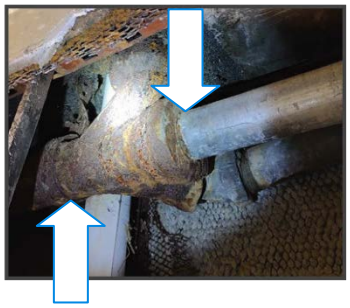
The findings from the first 21 assessments of this Project (conducted in seven EOP developments) indicate that the domestic water risers (composed of copper/brass) were in good to fair condition. However, in the two units assessed at Queensbridge North[56], the domestic water risers (and all other pipes within the wall cavity) appear to be approaching the end-of-service life and may be subject to failure in the near term. Further invasive inspection work is necessary to evaluate the interior condition of various types of plumbing pipes and assess the correlation between exterior and interior appearances. During the invasive inspection work at Howard Houses, significant sediment/debris accumulation was observed on the interior of the waste branch line (>90% obstructed), which can be expected to substantially impede water flow and may have other considerations with respect to pipe health over time (e.g., residents using corrosive drainpipe cleaning products). Other observations from the first 21 assessments include evidence of kitchen waste riser leaks in multiple units at Saint Mary's Park and previous waste riser repairs in two units at the development, suggesting that in some instances, local plumbing repairs of waste risers can be effective in situations in which the problem areas can be isolated. In the two units in which previous waste riser repairs were observed, the affected sections had been cut/spliced with new sections of cast iron and without hub fittings. These repairs appear to have been made from the adjacent bedrooms that adjoin the kitchens and could be completed without the need for resident relocation.



Domestic water risers at Queensbridge North diplaying possible chemical reaction or de-zincification of the brass, suggesting that the pipes are at the end of their service life and may be subject to failure in the near term

Waste riser at Howard considered to be in poor condition based on exterior physical appearance (excessive exterior corrosion)

[56] Queensbridge North is the oldest development (completed in 1940) included in these first 21 assessments and its construction preceded the other six initial developments by 15 to 33 years.



Typical conditions on waste branch lines where moderate to excessive surface corrosion is present on the cast iron (left) and threaded sections of galvanized (right)

Interior surface of waste branch line (cast iron section) at Howard with significant sediment/debris accumulation

In five of the six lines with the highest scores, active leaks from above, damaged/leaking pipes within the chase wall, or evidence of significant plumbing issues were identified. This supports the approach of using data as the first step in identifying lines in which current plumbing problems are likely to exist. However, poor plumbing conditions were identified in lines with low scores and in buildings in the lowest prioritization category, indicating that modifications to the Score Model/Prioritization Framework criteria are needed to align the data even more closely with physical conditions in the field.

During the 21 Wall Cavity Plumbing Assessments, widespread pipe insulation deficiencies were observed. There is significant potential for condensation formation (sweating) on inadequately insulated cold water pipes within wall cavities during the summer months. This is a significant root cause of wet, water damaged, or moldy conditions on plumbing chase walls. In 19 of the 21 initial assessments, the domestic water branch lines appear to have never been insulated. However, in 13 of the 21 initial assessments, insulation deficiencies were observed in the domestic water risers where the insulation had either been removed during prior plumbing repairs or had deteriorated or became damaged over time. The importance of addressing wall cavity condensation related to mold growth is well recognized. However, there are some major practicality issues associated with conducting pipe insulation/re-insulation work that have been identified: extensive wall removal and rebuild work, toilet/sink removal and replacement, asbestos abatement, and resident relocation in a high percentage of projects. In many cases, it has been discovered that there are obstructions within wall cavities (including metal framing, wall surfaces, or other pipes) that prevent complete insulation of all pipe surfaces.

Related Recommendation(s):

Replacement of plumbing pipes would require billions of dollars in capital funding that has not been allotted to NYCHA. The refined Scoring Model/Prioritization Framework is expected to be a useful tool in identifying buildings and lines where the greatest needs exist, which, in conjunction with in-depth physical assessments of plumbing conditions, can help to prioritize future BLIs and, perhaps, more comprehensive projects as funding opportunities becomes available. There is also a need for the development and funding of alternative solutions to address wall cavity condensation-related mold growth, which requires further consideration/discussion and will probably require the implementation of multiple interventions. This is because insulation/re-insulation of cold-water plumbing pipes is limited.

The IMA and IDA recently refined the Scoring Model/Prioritization Framework, taking building age into account when calculating the scoring criteria. The next step for the Wall Cavity Plumbing Assessment includes verification of the revised Scoring Model/Prioritization Framework in additional developments on a prospective basis and on a retrospective basis by re-evaluating the alignment between the data and physical findings in previously conducted assessments. Procedures also must be developed for conducting more in-depth assessments of priority buildings/lines identified by the scoring tool. This will verify the need for comprehensive plumbing renovation work and define the scope of the plumbing replacement work, as not all pipes may require replacement.

II. Difficulty Addressing Mold and Leak Work Order Backlog

Description of Challenge:

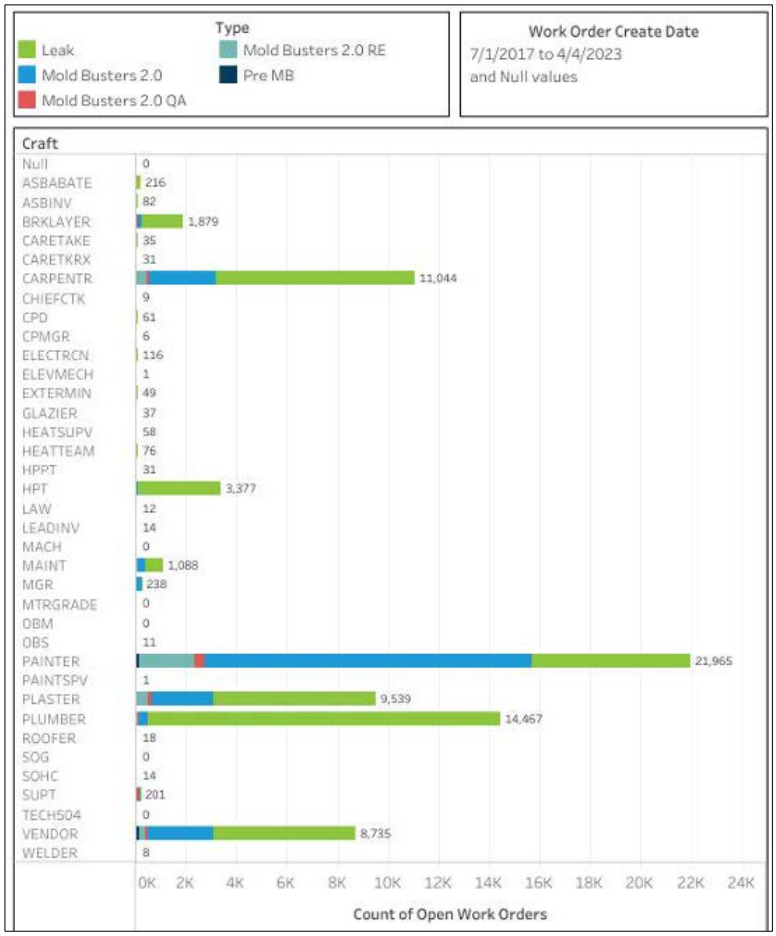
NYCHA's growing mold and leak WO backlog is one of its most outstanding challenges. As of April 2023, NYCHA had 68,214 open parent mold and leak WOs: 53,733 (79%) were attributed to leaks, and 14,508 (21%) were attributed to mold. The current number of open parent mold and leak WOs is nearly double pre-pandemic levels. As of January 31, 2020 (pre-pandemic), NYCHA reported 38,100 open parent mold and leak WOs: 29,519 (77%) were attributed to leaks, and 8,581 (23%) were attributed to mold. Of open pre-pandemic WOs, 33,166 (87%) were already aged past the required compliance timeline of seven to 15 days (depending on complexity) to complete repairs.

A high volume of incoming WOs, vacancies in key positions, complexity of required repairs, coordination challenges between crafts, scheduling delays, and resident communication barriers contribute to NYCHA's large aging WO population and difficulty with addressing newly created WOs. The COVID-19 pandemic amplified these challenges by triggering staffing disruptions, limiting the work that NYCHA staff could complete, and creating unit access issues due to health concerns.

As discussed, NYCHA restricted the completion of non-emergency work[57] and the suspended work compounded the existing backlog because of the COVID-19 pandemic.
While mold remediation was permitted during the pandemic, paint work related to mold was suspended as of April 3, 2020. Scheduled repairs for non-emergency work, annual inspections, and other skilled trades and maintenance work were also suspended. As a result of these policies, the number of open parent and child WOs climbed to 47,024 by October 26, 2020. Authorized work expanded in 2020 and 2021, permitting vendors to complete mold-related paint WOs, permitting repairs associated with a (limited) category of emergency leaks, and authorizing staff to perform painting and other non-emergency remediation work. All other suspensions were lifted on May 3, 2021, over one year after the initial work suspension policy was enacted. By May 2021, NYCHA accumulated a backlog of 54,772 open mold and leak parent WOs, with 49% of them open for more than 200 days.[58]

[57] As a result, the number of mold inspections (parent WOs) completed per week decreased from 728 for a week beginning on February 23, 2020, to 84 for a week beginning on April 5, 2020.
[58] This data includes 40,250 leak and 14,522 mold parent WOs.

Chart 17: Individual Open WOs by Craft – All Open WOs



As of April 3, 2023, NYCHA has 90,589 open mold and leak WOs.[59] Paint WOs associated with mold and leaks (which were suspended for the longest period compared to the other WO categories shown), still represent the highest need with 25,995 open WOs. Additionally, as of April 2023, NYCHA possesses 17,331 open plumbing WOs, 12,729 open Carpentry WOs, and 11,082 open Plastering WOs that are pending resolution.

Breaking Down the Backlog:

Painters

Painters are responsible for cleaning mold in units where the mold growth is identified to be between 20 and 99 square feet[60], applying mold-resistant paint, and painting walls and ceilings after mold and leak-related repairs are completed.

On the borough-based skilled trades level, NYCHA currently has 167 Painter positions filled (137 Painters and 30 Supervisor Painters) and 37 vacant Painter positions. NYCHA also has $107,885,555 in combined contract capacity, with $64,095,558 encumbered and $43,789,996

[59] This data includes both parent and child WOs.
[60] In the developments that have lead based paint, NYCHA Painters are responsible for cleaning mold between ten and 99 square feet.

remaining to perform painting work. The following section provides a breakdown of mold-and-leak-related WOs assigned to Painters.

Breakdown of Open Paint WOs

As of April 3, 2023, Painters are responsible for 25,995 open WOs pertaining to mold and leak repairs, and 13,139 (50%) of those are over 250 days old. Chart 18 provides a breakdown of open painting WOs by borough and work type.

Chart 18: Paint WOs by Borough

Borough	Open WO (Leak)	Open WO (Mold)	Total Open WOs
Bronx	1,546 (6%)	4,403 (17%)	5,949
Brooklyn	1,825 (7%)	6,172 (24%)	7,997
Manhattan	3,099 (12%)	7,024 (27%)	10,123
Queens/Staten Island	646 (2%)	1,280 (5%)	1,926
Total	**7,116 (27%)**	**18,879 (73%)**	**25,995**

Mold-related WOs comprise 73% of the open mold and leak painting backlog. The top three work categories across these open WOs: (1) painting the walls in residential units after mold remediation is completed – 7,361 (28%) WOs; (2) applying mold-resistant paint to ceilings as part of mold remediation – 4,110 (16%) WOs; (3) cleaning mold off the walls and ceilings in residential units as part of mold remediation – 2,222 (9%) WOs. Chart 19 lists the five consolidations that have the most open painting WOs associated with mold and leak repairs.

Chart 19: Paint WOs by Consolidation – Top 5

Consolidation	Borough	Number of Open WOs	Average Days Pending Repair
Wagner	MN	883	425
Ingersoll	BK	676	370
Washington	MN	521	332
Sheepshead Bay	BK	516	576
St. Nicolas	MN	446	384

On average, Painters resolve 950 WOs per week, and an average of 705 new WOs are created per week, indicating a positive ratio regarding completed versus created work. Approximately, this represents six to seven WOs completed by a Painter per week[61]. For painting WOs completed within the last six months, 73% were closed with work done, 15% were closed as previously corrected, 7% were cancelled, and 2% were sequenced to another trade or vendor to complete the work.

[61] Six to seven WOs resolved by a Painter per week is calculated by dividing 950 (count of WOs resolved per week by Painters) by 137 (count of borough-based active Painters).

Action Plan to Address Mold and Leak Painter Backlog

The largest backlog of Painter mold and leak WOs is attributed to the follow-up painting after mold and leak-related remediation is completed, applying mold-resistant paint to protect surfaces after mold remediation, and mold cleaning. While painting represents the highest need authority-wide, the number of open WOs for a specific craft does not accurately represent the number of unique units pending painting work. Of 25,995 open painting WOs, only 15,787 (61%) are located within unique residential units. Additionally, 5,854 units have more than one open painting WO (28 units currently have ten or more open paint WOs) because mold-related WOs are excluded from Maximo duplication rules and could also be created on the surface (e.g., ceiling or walls) or room (e.g., bathroom, bedroom, kitchen, etc.) level, which slightly distorts the assessment of the true need for Painters.[62]

NYCHA recognizes the high need in this area and understands that it may take years to eliminate the painting backlog. To address this, NYCHA launched Operation Mold Clean Up in May 2022 to ensure that each neighborhood prioritizes mold cleaning and mold-resident painting WOs. The progress made by each borough and neighborhood is tracked by OMAR and is reported back to the Borough Vice Presidents and Operations Leadership, as noted in Part 2. NYCHA also established specialized teams to temporarily assist consolidations with the highest mold cleaning and mold-resistant paint backlog. As a result, NYCHA has achieved a 75.2% and 61.3% reduction in the mold cleaning and mold-resistant paint backlog, respectively, and continues to prioritize this work as part of the Phase IV Operation Mold Clean Up. Over the last six months, Painters on average have been able to complete 245 more WOs per week than created.

NYCHA is revising the Mold SP and exploring opportunities to streamline duplication rules for mold to minimize instances in which one apartment or room within an apartment might have multiple open WOs for the same work.[63] This will enable a more accurate representation of an actual painting backlog, alleviate confusion around scheduling for both Neighborhood Planners and residents, and enable NYCHA to assign scarce skilled trades resources more efficiently. Furthermore, NYCHA is working to incorporate Neighborhood Planner information into the mold forms given to residents as a primary point of contact to schedule skilled trades repairs.[64]

Plumbers

Plumbers are responsible for repairing and replacing leaking pipes, clearing clogged pipes and drains, and repairing leaking radiators and toilets. Challenges presented by NYCHA's aging plumbing infrastructure (e.g., some of the branch lines and waste risers are nearing the end of their lifecycle) and the complexity of plumbing repairs can make it difficult for Plumbers to address the root cause(s) of leaks via localized repairs. Often, when responding to repair requests, Plumbers learn about the materials and supplies needed only upon arrival to the location, complicating the ability to plan for the repair and possibly requiring a follow-up visit if supplies are not readily available. NYCHA has also been facing material shortages to perform plumbing work (e.g., pipes, starter fittings, stacks, and couplings). Additionally, plumbing work often requires coordination with multiple residential units to trace the source of the leak and/or

[62] As part of the data review, NYCHA identified 28 apartments which has over ten open painting WOs each.

[63] Presently, if an apartment or room within apartment has an open painting WO, Maximo will allow to create another painting WO for each impacted surface as part of the mold repair.

[64] Presently, Mold Inspection Receipt and Mold Inspection Review Notice don't include the contact number of NP.

assess the conditions of plumbing pipes when making a repair, which complicates the scheduling of Plumber WOs and may require several follow-up visits until access is gained.

On the borough-based skilled trades level, NYCHA currently has 233 Plumber positions filled (118 Plumbers, 99 Plumber's Helpers and 16 Supervisor Plumbers) and 24 Plumber positions vacant (2 Plumbers and 22 Plumber's Helpers). NYCHA also has $80.7 million in total combined contract capacity, with $22.1 million encumbered and $58.6 million remaining to perform plumbing work.[65]

Breakdown of Open Plumbing WOs

As of April 3, 2023, Plumbers are responsible for 17,331 open WOs pertaining to mold and leak repairs, and 9,920 (57%) of those are over 250 days old. Chart 20 provides a breakdown of open plumbing WOs by borough and work type.

Chart 20: Plumbing WOs by Borough

Borough	Open WOs (Leak)	Open WOs (Mold)	Total Open WOs
Bronx	4,544 (26%)	169 (1%)	4,713
Brooklyn	6,053 (35%)	270 (2%)	6,323
Manhattan	4,537 (26%)	115 (1%)	4,652
Queens/Staten Island	1,608 (9%)	35 (0%)	1,643
Total	**16,742 (97%)**	**589 (3%)**	**17,331**

Leak-related plumbing WOs represent the highest need across NYCHA and account for 97% of the open backlog. The top three types of open plumbing-related WOs are (1) pipe requiring repair – 8,449 (49%) WOs; (2) pipe leaking and requiring repair – 1,499 (9%) WOs; (3) active leak from above WO – 691 (4%) WOs. Chart 21 lists the five consolidations with the most open plumbing WOs associated with mold and leak repairs.

Chart 21: Plumbing WOs by Consolidation – Top 5

Consolidation	Borough	Number of Open WOs	Average Days Pending Repair
Castle Hill	BX	532	400
Park Rock Consolidation	BK	427	432
Union Avenue Consolidated	BX	377	515
Douglass	MN	338	381
Sumner	BK	287	409

[65] The plumbing contract estimate excludes any contracts managed by the Heating Management Services and other contracts pertaining to heating or gas-related work.

On average, Plumbers resolve 496 WOs per week, and an average of 494 new WOs are created per week. Approximately, this represents 4 WOs completed by a Plumbing team per week[66]. For plumbing WOs completed within the last six months, 57% were closed with work done, 18% were cancelled, 17% were closed as previously corrected, and 1% was sequenced to another trade to complete work.

Action Plan to Address the Mold and Leak Plumber Backlog

Plumbing WOs represent the second highest need in NYCHA based on the count of open WOs (after painting WOs). In the past, NYCHA has had difficulty with tackling the plumbing backlog due to aging infrastructure and complex nature of some repairs. The number of open WOs for leak repairs grew every month since COVID-19 restrictions were lifted. Based on the last six-month average, Plumbers have a slightly positive ratio (+2) regarding completed versus created work; however, to make a more positive shift, additional intervention is needed.

To address the backlog of open plumbing WOs for leak and mold-related repairs, NYCHA is launching a targeted backlog prioritization project in 2023. Deemed Operation Dry Out, this Authority-wide effort will tackle select plumbing and tub enclosure WOs that are 250 days old or more. NYCHA engaged the IDA to identify 6,235 plumbing and 3,502 tub enclosure WOs: these WOs are likely to cause damage to building materials, penetrate to other units, and/or lead to mold growth, and they will be prioritized as part of this effort. This effort will also focus on completing additional restoration work for other trades to complete the repair after the source of the leak has been abated. NYCHA estimates that it will cost approximately $15.5 million in labor and materials to complete this work, including the estimated cost of labor and materials to repair leaks, as well as follow-up plastering and painting repairs. NYCHA kicked off this initiative in spring 2023, even though NYCHA has not yet received external funding for this effort. NYCHA set a deadline for the end of 2023 to substantially reduce this backlog.

As mentioned in the previous section, NYCHA worked with the IDA from 2022 through 2023 to use statistical data/tools to conduct on-site comprehensive assessment of plumbing infrastructure as part of the Wall Cavity Plumbing Assessment Project. The findings will help NYCHA evaluate the efficiency of the Scoring Model/Prioritization Framework to identify lines with the most severe plumbing issues and prioritize these locations for capital and/or building line modernization work. In 2022 through 2023, NYCHA completed its first building line project at Red Hook East, and another building line replacement project will occur at Tompkins in 2023 through 2024.

Carpenters

Carpenters perform various critical tasks to address mold and leak WOs, such as installing new tub enclosures when existing tub enclosures have cracks or are separating off the walls, leading to conditions that allow the water to penetrate through the walls into the other unit(s) and/or mold growth. Carpenters also install new sheetrock, when the walls are damaged by mold or wet conditions and replace cabinets.

[66] Four to five WOs resolved by a Plumbing team per week is calculated by dividing 496 (count of WOs resolved per week by Plumbers) by 118 (count of borough-based active Plumbers). Plumbers are generally paired up with Plumber's Helpers in teams.

The work of Carpenters is heavily driven by the availability of materials. For example, there are only five manufacturers from which NYCHA orders kitchen cabinets. NYCHA can experience extensive delays in receiving supplies after an order is placed due to the manufacturers' shortages. Tub surround replacement requires purchasing new enclosures and epoxies to install the enclosures. Delays in procuring materials, whether from supply chain issues or from lack of internal coordination on purchasing, cause delays in addressing carpentry WOs. Tub enclosure and cabinet replacement often require plastering before tubs and cabinets can be re-installed. This requires coordination between multiple skilled trades and adds more time to complete the repair. Furthermore, when replacing sheetrock, Carpenters may discover that the root cause of the mold or leak has not been fully remediated or that a more extensive repair may be required.

On the borough-based skilled trades level, NYCHA currently has 251 Carpenter positions filled (232 Carpenters and 19 Supervisor Carpenters) and 13 vacant Carpenter positions. NYCHA also has $1,478,400 in total combined contract capacity ($0 has been encumbered). The following section provides a breakdown of open carpentry WOs for mold and leak conditions.

Breakdown of Open Carpenter WOs

As of April 3, 2023, Carpenters are responsible for 12,729 open WOs pertaining to mold and leak repairs, and 6,711 (53%) of those are over 250 days old. Chart 22 provides a breakdown of open carpentry WOs by borough and work type.

Chart 22: Carpenter WOs by Borough

Borough	Open WOs (Leak)	Open WOs (Mold)	Total Open WOs
Bronx	2,396 (19%)	902 (7%)	3,298
Brooklyn	2,667 (21%)	1,476 (12%)	4,143
Manhattan	3,418 (27%)	1,091 (9%)	4,509
Queens/Staten Island	595 (5%)	184 (1%)	779
Total	**9,076 (71%)**	**3,653 (29%)**	**12,729**

Most open carpentry WOs are attributed to leak-related repairs. Manhattan has the most open WOs. The top three types of open carpentry WOs are (1) tub enclosure replacement – 6,395 (50%) WOs; (2) kitchen cabinet replacement – 783 (6%) WOs; and (3) sheetrock removal and replacement – 667 (5%) WOs. Chart 23 lists the five consolidations with the most open carpentry WOs associated with mold and leak repairs.

Chart 23: Carpenter WOs by Consolidation – Top 5

Consolidation	Borough	Number of Open WOs	Average Days Pending Repair
Wagner	MN	342	373
Morris	BX	333	471
Patterson	BX	315	341
Grant	MN	306	327
Washington	MN	295	374

On average, Carpenters resolve 279 WOs per week, and an average of 298 new WOs are created. This means that, on average, Carpenters have a negative ratio regarding completed versus created work. Approximately, this represents one to two WOs completed by a Carpenter per week.[67] For WOs completed by Carpenters within the last six months, 69% were closed with work done, 12% were closed as previously corrected, 9% were cancelled, and 4% were sequenced to another trade to complete work.

Action Plan to Address Carpenter Backlog

The largest backlog (50%) of open Carpenter WOs is attributed to tub enclosure replacement. This is problematic, because out of all Carpenter-related repairs, tub enclosure replacement is essential for preventing leaks and mold in residents' bathrooms. If a tub enclosure is damaged, missing, or loose, water from the shower will impact the surrounding walls and may even leak into the wall cavity, affecting apartments on lower floors. Thus, tub enclosures are a top priority repair for NYCHA to provide residents with decent, safe, and sanitary bathrooms.

Tub enclosures are, however, a more targetable WO type for a successful backlog reduction project. Tub enclosures require more readily available materials than custom projects, such as NYCHA cabinets. This should increase NYCHA's ability to drive down the number of tub enclosure WOs comprehensively and consistently.

To address the growing carpentry WO backlog, NYCHA will be prioritizing any tub enclosure Carpenter-related work under Operation Dry Out. As part of this initiative, NYCHA, in partnership with IDA, expects to address 3,502 tub enclosure-related WOs that are 250 days old or older – of those, 3,343 (95%) are assigned to Carpenters. NYCHA estimates that it will cost about $17 million in labor and materials to complete this work, including properly installing tub enclosures, plastering where needed, and painting the residents' entire bathroom to provide more water-tight and mold-resistant bathrooms.

NYCHA recognizes that the current rate of created versus resolved Carpenter WOs represents a significant challenge for borough-based skilled trades to address the backlog. To improve this rate, NYCHA will ensure that Carpenter positions get filled expeditiously. Additionally, consolidations should ensure that there is a budget for skilled trades and contracts in place to tackle the highest-need backlog. Thus, as part of Operation Dry Out, Neighborhood Administrators will work with Operations leadership and skilled trades administrators to develop a plan to utilize vendors or a combination of local skilled trades and vendor resources to address the tub enclosure backlog.

Another challenge will be coordinating with Plasterers, who also perform essential work for properly installing tub enclosures. However, with proper sequencing and coordination, NYCHA anticipates that it can resolve this issue and tackle this major category of the existing backlog in a reasonable amount of time.

Plasterers

Plasterers are responsible for plastering walls and ceilings after mold and leak-related remediation and repair is completed and assist with installation of new sheetrock and tub

[67] One to two WOs resolved by a Carpenter per week is calculated by dividing 279 (count of WOs resolved per week by Carpenters) by 232 (count of borough-based active Carpenters).

enclosures. NYCHA has, for some time, struggled to recruit qualified staff into the Plasterer title due to an industry-wide shortage of individuals with the skillset to work on the three-coat system (scratch, brown, finish). Scheduling of plastering work must often be coordinated between multiple trades. For example, Maintenance Workers and Carpenters are responsible for cabinet and vanity removal before Plasterers can begin work. Plastering work is also labor intensive; each repair can take days to complete. Plastering work requires rubber repair paste and proper dust control measures, making this process more complex. Furthermore, delays may occur because Plasterers and Painters must stop working if they observe that the root cause of leak, mold, or excessive moisture conditions has not been fully and properly abated and must schedule another follow-up visit to complete their work.

On the borough-based skilled trades level, NYCHA currently has 491 Plasterer positions filled (228 Plasterers, 29 Supervisor Plasterers and 234 Caretaker Ps) and 27 vacant Plasterer positions (17 Plasterers and 11 Caretaker Ps). Additionally, plastering could be covered under a General Services contract; however, vendors often lack skilled Plasterers that address the significant plastering repairs often needed in the apartments.[68] The following section provides a breakdown of plastering WOs for mold and leak conditions.

Breakdown of Open Plastering WOs

As of April 3, 2023, Plasterers are responsible for 11,082 open WOs pertaining to mold and leak repairs: 5,664 (51%) of those are over 250 days old. Chart 24 provides a breakdown of open plastering WOs by borough and work type.

Chart 24: Plastering WOs by Borough

Borough	Open WOs (Leak)	Open WOs (Mold)	Total Open WOs
Bronx	2,239 (20%)	1,330 (12%)	3,298
Brooklyn	1,715 (15%)	1,043 (9%)	4,143
Manhattan	2,606 (24%)	990 (9%)	4,509
Queens/Staten Island	852 (8%)	307 (3%)	779
Total	**7,412 (67%)**	**3,670 (33%)**	**11,082**

Manhattan has the most open plastering WOs, as documented in the chart above. The top three types of open WOs are (1) wall plastering – 4,095 (37%) WOs; (2) surface plastering before painting can be completed – 1,821 (16%) WOs; (3) ceiling plastering – 1,128 (10%) WOs. Chart 25 lists the five consolidations with the most open plastering WOs associated with mold and leak repairs.

[68] Determining the dollar value of NYCHA's Plastering contract is difficult to estimate as it is a part of the General Services contract, which includes multiple other skilled trades. Due to the time sensitive nature of this report, NYCHA has decided not to perform this complex calculation at this time.

Chart 25: Plasterer WOs by Consolidation – Top 5

Consolidation	Borough	Number of Open WOs	Average Days Pending Repair
Wagner	MN	304	259
Morris	BX	286	464
Grant	MN	279	356
Jefferson	MN	214	397
Mitchel	BX	214	403

On average, Plasterers resolve 297 WOs per week, with an average of 285 new plastering WOs created per week. Approximately, this represents one tot wo WOs resolved by a Plastering team per week.[69] For plastering WOs completed within the last six months, 73% were closed with work done, 9% were closed as previously corrected, 8% were cancelled, and 2% were sequenced to another trade to complete.

Action Plan to Address Plastering Backlog

Presently, Plasterers have a slightly positive ratio regarding completed versus created work, as indicated above (+12). However, to increase the number of qualified Plasterers in the agency and make a positive shift in addressing the current plastering backlog, NYCHA is considering implementing a "Plastering School" for a current population of Plasterer Helpers that previously took a plastering test and failed by a small margin. This population could become qualified enough to advance to the Plasterer after receiving individualized training and mentorship in which they would receive feedback to focus on areas for improvement over a six-month period. At the end of the six-month period, participants would be tested, and, upon receiving a passing score, would become eligible for promotion to Plasterer.

The Challenges of Vendor Management

NYCHA could utilize vendors to repair or replace damaged pipes and other plumbing work, perform apartment-wide painting, replace floor tiles, and perform other repairs when needed. However, the current process of procuring and administrating vendor contracts is labor intensive and involves multiple steps for staff to move the contract from initiation to completion. Operations relies on key departments within NYCHA to secure usable large-scale contracts. First, the administrating department undergoes the lengthy process of writing the scope of work and developing independent cost estimates before submitting the request for the bid to NYCHA's Procurement Department (Procurement). In conjunction with the administering department, Procurement identifies the type of contract and defines the terms of the contract. Procurement then prepares and publishes the solicitation for vendors to submit bids. To determine the lowest responsive and responsible bidder, Procurement conducts the bid evaluation process after bid closure by reviewing bidders' basic qualifications/experience satisfaction and overall bid compliance. Depending on the procurement type, the evaluation will be based on the

[69] One to two WOs resolved by a Plastering team per week is calculated by dividing 297 (count of WOs resolved per week by Plasterers) by 228 (count of borough-based active Plasterers). Plasterers are generally paired up with Caretaker Ps in teams.

lowest cost (Sealed Bid) or a weighted evaluation (Request for Proposal) which are scored through a committee. Upon selection of the winning bidder, Procurement will initiate an award to the lowest responsive bidder interfacing the various required stakeholders to obtain approvals. The necessary stakeholder approvals are determined by the pending contract award amount. After all necessary approvals are obtained, Procurement finalizes the award and registers the contract in NYCHA's Oracle system, after which the contract is active for use by the requesting administrating department. Operations lacks the resources for proper procurement planning and contract monitoring to ensure that contract requests are submitted to maintain the continuity of cyclical services.

Non-competitive proposals bypass the regular procurement process to expedite the onboarding of a vendor, and it is important to note that circumstances exist in which these may be used. Although these circumstances do not apply to the majority of NYCHA's vendor work categories, non-competitive proposals are used when an item or service is only available from a single source or from a single qualified provider as well as in public emergencies, for express approvals, for inadequate competition, and in exigency conditions.

Although managing operational responsibilities and providing administrative oversight of contracts is important, Property Maintenance Superintendents (or their designees) often lack the bandwidth to do so. Oversight of contractors requires dedicated staff and inspectors that NYCHA must acquire to oversee each step of the contracted work. Instead, NYCHA attempts to rely on overtaxed development staff to play a role in the lengthy procurement and vendor oversight process. The development supervisory staff must liaise with administrative departments to ensure that funds are available and that the project code is registered, and to upload all required documents to create associated releases prior to commencement of any work. As the work begins, development supervisory staff must facilitate work and oversee that it is being complete. Upon completion of repairs, the Property Maintenance Superintendent (or designee) must perform a QA inspection of completed work and sign a statement of services to substantiate work completion in accordance with contract specifications and NYCHA standards. The development staff is also responsible for manually tracking each vendor WO in Maximo and closing the WOs in accordance with NYCHA requirements to ensure the accuracy of reporting. These steps are very challenging to development staff, who often lack training and time to properly coordinate and oversee the vendor-performed repairs.

Operations also may opt to utilize the micro or small purchase procurement method at the NYCHA development level if there isn't an active contract in place. Micro purchases (less than $10k) are discretionary and require only one bid. Small purchases ($10k to $25k for goods, $10k to $50k for construction, and $10k to $250k for other services) require three bids. NYCHA has also adopted a "S3BC & M/WBE First policy", which ensures that Section 3 Business Concerns (S3BC) and Minority/Women Business Enterprise (M/WBE) vendors receive first and second priority, respectively, when soliciting vendors for micro and small purchases. Non-S3BC and non-M/WBE vendors will only be solicited for micro and small contracting opportunities if neither S3BC nor M/WBE vendors are available.

Finally, coverage for vacant skilled trades positions is often covered by vendor contracts. The biggest obstacle when utilizing contracts to fill vacancies in skilled trades positions is lack of contract funds to hire the number of contractual staff needed to address open WO backlogs.

Specifically, some sites that utilized contracts to address open paint WOs for mold and moveouts reported that several weeks of coverage would cost tens of thousands of dollars.

Breakdown of Open Vendor WOs

As of April 3, 2023, NYCHA had 9,193 open vendor WOs associated with mold and leak repairs: of those, 6,031 (66%) WOs were over 250 days old. Chart 26 provides a breakdown of open vendor WOs by borough and work type.

Chart 26: Vendor WOs by Borough

Borough	Open WOs (Leak)	Open WOs (Mold)	Total Open WOs
Bronx	1,527 (17%)	928 (10%)	2,455
Brooklyn	2,243 (24%)	963 (10%)	3,206
Manhattan	1,597 (17%)	1,058 (12%)	2,655
Queens/Staten Island	659 (7%)	218 (2%)	877
Total	**6,026 (66%)**	**3,167 (34%)**	**9,193**

NYCHA could utilize vendors to complete a variety of work. The top three types of open vendor WOs are: (1) painting – 2,970 (32%) WOs; (2) pipe replacement – 1,040 (11%) WOs; (3) floor tile replacement – 546 (6%) WOs. Chart 27 lists the five consolidations with the most open vendor WOs for mold and leak repairs.

Chart 27: Vendor WOs by Consolidation – Top 5

Consolidation	Borough	Number of Open WOs	Average Days Pending Repair
Ingersoll	BK	371	600
South Jamaica	Q/SI	237	472
Jefferson	MN	209	397
Castle Hill	BX	203	558
Washington	MN	200	343

Due to the complexities associated with vendor repairs, some consolidations have the highest average days pending repair associated with vendor work and the lowest productivity rates. Based on the six-month average, NYCHA vendors on average address 71 WO per week, with an average of 115 new WOs created (-44). For vendor WOs completed within the last six months, 42% were cancelled, 31% were closed with work done, and 21% were closed as previously completed.

Action Plan to Address Mold and Leak Vendor Backlog

Vendor WOs demonstrate the lowest productivity as compared to skilled trades and other crafts: over 60% of vendor WOs are closed with no work completed. Additionally, vendor WOs tend to have highest average days pending repair. Depending on available funding, NYCHA may offer administrative support to its staff to manage vendor contracts to increase the efficiency of the use

of vendor contracts. Administrative support will include help with the procurement process, resident communication, scheduling, and closing of WOs in Maximo. By putting these extra resources in place, Operations staff will be better able to use the vendor option and increase productivity. NYCHA is implementing a new agency-wide contract management strategy to determine its contract administration staff needs and a process for hiring, training and providing ongoing support to onboarded staff.

III. Vacancies and Turnover in Critical Positions

Description of Challenge:

NYCHA experiences high personnel turnover rates that result in frequent vacancies in its Superintendent (40% turnover in 2022), Assistant Superintendent (38% turnover in 2022), and Assistant Housing Manager (38% turnover in 2022) titles.[70] The turnover rates that are associated with Superintendents, Assistant Superintendents, and Housing Managers are notably higher than the 26% overall turnover rate characteristic of all NYCHA front-line and skilled trades titles (which itself is high).[71] Extended leaves due to personal issues and injuries experienced by staff in the aforementioned positions add to NYCHA's WO backlog.

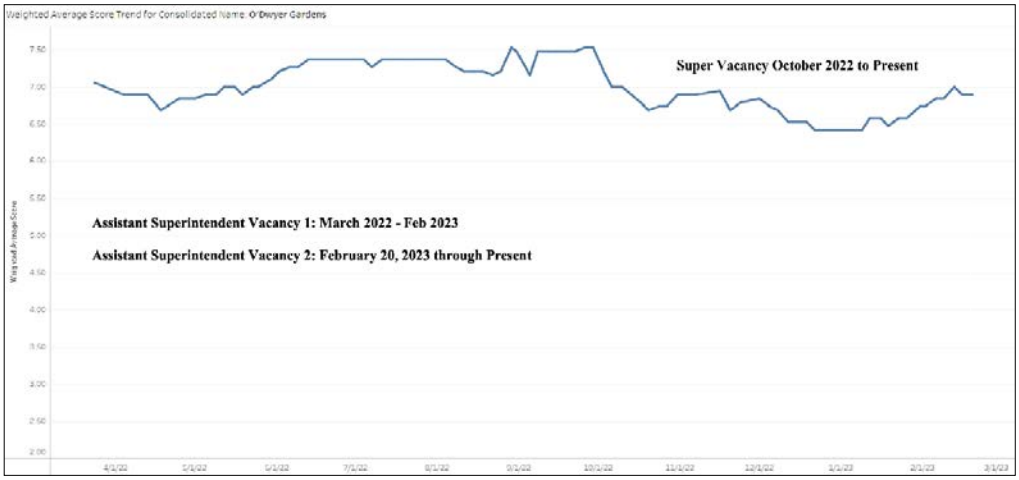
Through the EOP, OMAR observed that vacancies in critical front-line Operations positions (i.e., Superintendent, Assistant Superintendent, Maintenance Worker), impacted NYCHA's ability to address mold and leak WOs. In addition to performing mold initial inspections and QA inspections, Superintendents and Assistant Superintendents ensure that skilled trades WOs are scheduled and completed in a timely manner by following up with Neighborhood and Borough Planners. Superintendents and Assistant Superintendents also ensure the completion of WOs assigned to Maintenance Workers and Caretaker X staff and direct their staff to post right-to-access 48-hour notices to obtain unit access to complete WOs. Therefore, the absence of a Superintendent or Assistant Superintendent not only impacts the number of mold inspections completed in a timely manner (as they typically perform these inspections) but also hinders a consolidation's ability to address mold and leak WOs.

At O'Dwyer Gardens, a Round II EOP site, two Assistant Superintendent positions and one Superintendent position were vacant from March 2022 through March 2023. The Assistant Superintendent vacancy occurred from March 2022 through February 2023. Once the vacancy was filled, the other Assistant Superintendent vacancy occurred in February 2023 and remains vacant as of March 2023. The Superintendent was on leave from October 2022 through February 2023, and he then vacated his position. As of March 2023, the vacancy remains.[72] O'Dwyer demonstrates how sustained improvements are difficult when key vacancies exist in critical field positions even after EOP intervention. Chart 28 illustrates an overall increase in O'Dwyer's

[70] Turnover rates were provided by NYCHA Human Resources for the 2022 calendar year on February 22, 2023. NYCHA calculates turnover by dividing the number of individuals in the position that changed titles (but remained with NYCHA) plus the number of individuals in the position that separated from NYCHA by the total actual head count associated with the position at the end of 2022.
[71] NYCHA HR attributed 76% of the 2022 attrition in the Super, Assistant Super, Housing Manager and Assistant Housing Manager positions to title changes (i.e., promotions and demotions). Concerning promotions, the creation of 30 neighborhoods (occurring in 2022 as part of the Neighborhood Model's roll-out), each with a new position created for a Neighborhood Administrator and Planner, resulted in significant internal movement upward in NYCHA's title structure in 2022.
[72] The two Assistant Superintendent and Superintendent vacancy periods were provided by NYCHA Operations.

average weighted score from March 2022 (7.05 score) to March 2023 (7.21 score).[73] A positive decline in O'Dwyer's average weight score occurred during the consolidation's participation in Round II of the EOP from October 2022 through December 2022 (a sign of improving performance). However, after EOP intervention ended in January 2023, O'Dwyer's average weighted score began to increase (a sign of declining performance).

Chart 28: Weighted Average Score Trend for O'Dwyer Gardens



Mold inspections completed and average days to inspect fluctuated significantly in comparison to NYCHA-wide trends, while average days to inspect remained high at O'Dwyer Gardens. Charts 29 and 30 juxtapose NYCHA's steady inspection trends (capturing the performance of all consolidations citywide) with O'Dwyer's fluctuating trend. Chart 30 also displays the many weeks in which no mold inspections were performed, likely due to ongoing staff vacancies — there was a spike in mold inspections performed during the EOP period.

[73] A consolidation's average score is calculated based on its performance in areas such as median days to inspect/pending a mold inspection, percentage of skilled trades WOs over 100 days, WOs with a scheduled date in the future, percentage of passed QAs, and median days to complete non-paint repairs/days pending non-paint repairs.

Chart 29: NYCHA Mold Inspections and Average Days to Inspect

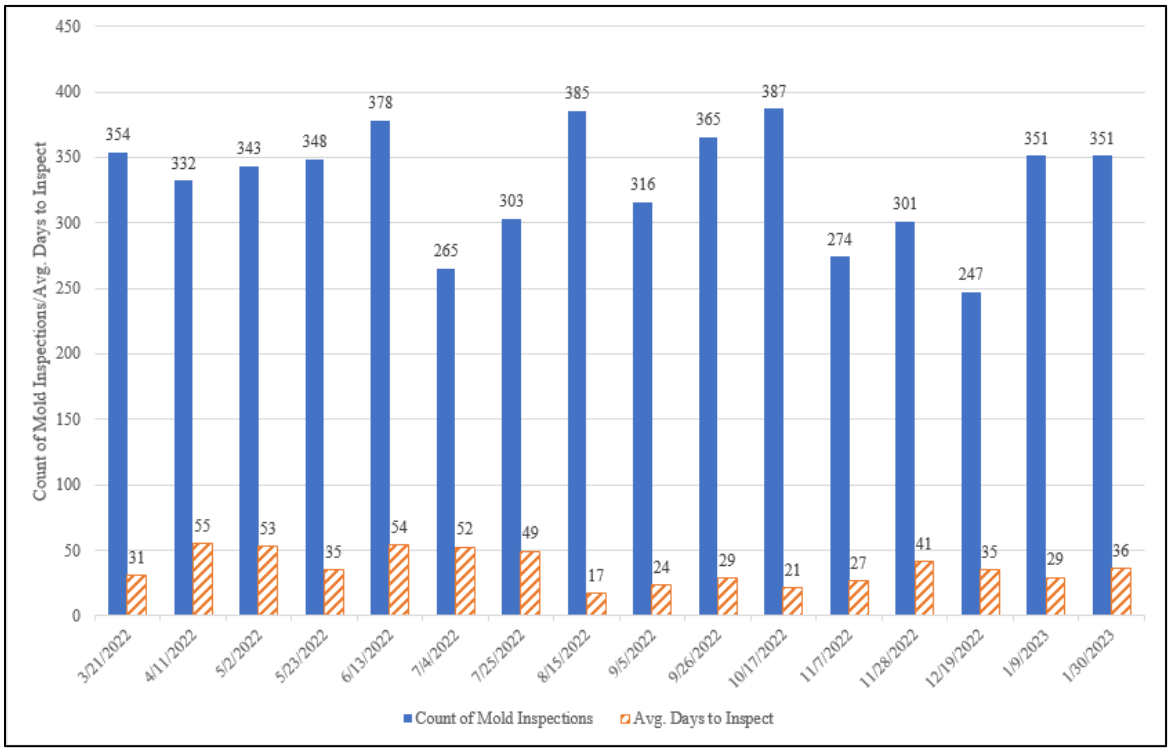
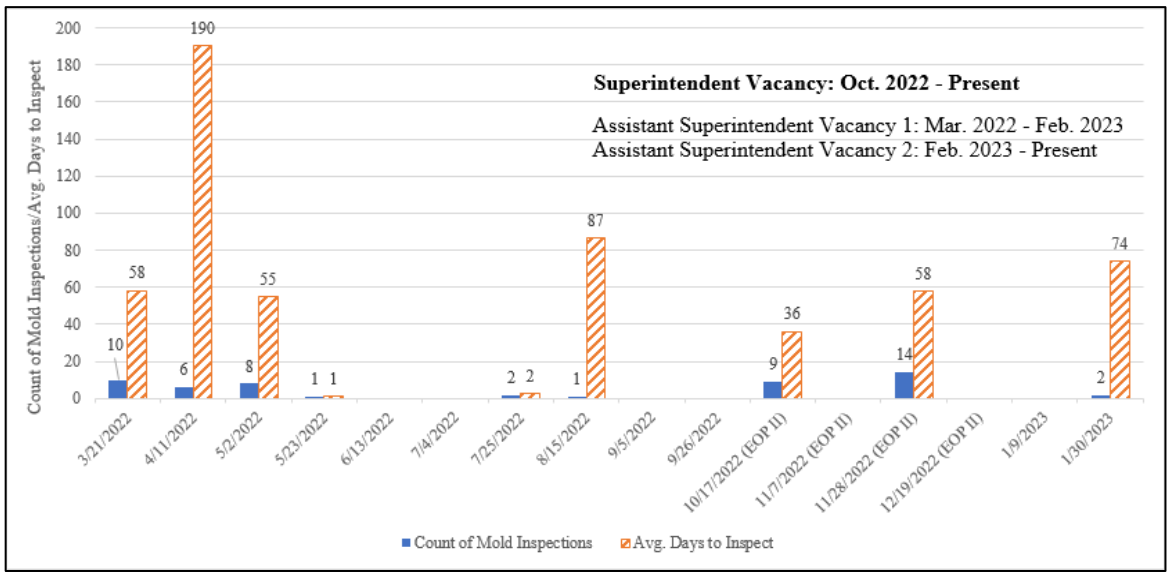


Chart 30: O'Dwyer Mold Inspections and Average Days to Inspect



NYCHA also experiences hiring and staff retention difficulty due to the civil service rules. These rules require that all City employees (except for those in labor class titles, non-competitive titles, and exempt titles) take and pass an examination to be hired and retained. Provisional (or temporary) appointments can be made for titles for which there currently does not exist a civil service list and when approved by the Department of Citywide Administrative Services. When appointed provisionally, employees still must pass examinations or risk being terminated if a list is established in their title. After taking and passing an examination, it generally takes nine to 12 months for a list to be established from which agencies can hire. This combination of factors

leaves NYCHA with a small number of qualified and hirable applicants for its Superintendent[74], Assistant Superintendent[75], Painter, Plumber, Carpenter, and Plasterer[76] vacancies.

Related Recommendation(s):

NYCHA will consider working towards creating an emergency coverage plan within each borough for critical positions, such as Superintendents, Assistant Superintendents, Neighborhood Administrators, Neighborhood Planners, and Property Managers, and for skilled trades positions, such as Painters, Plasterers, Plumbers, and Carpenters.

In the past, some boroughs have used "floaters," or NYCHA employees trained to temporarily fill vacancies that cannot be filled by contractors. Currently, no NYCHA borough offices are using floaters; however, Neighborhood Administrators in Manhattan reported that floaters were extremely helpful even though the number of floaters was not sufficient. Operations staff representing multiple boroughs support the idea of implementing floaters to reduce the WO backlog. If there are vacancies in Superintendent, Assistant Superintendent, and Property Manager positions, floaters could assist. The positions of Neighborhood Administrator and Neighborhood Planner, though, may be too nuanced for floaters. For these nuanced critical positions, NYCHA staff from other units without vacancies would be asked to provide coverage. As discussed, coverage for vacant skilled trades positions may be (and often are) covered by vendor contracts despite being time-consuming and costly. Using vendors for assisting NYCHA's mold and lead WO reduction efforts is a complicated but accomplishable endeavor.

IV. Staffing Needs

In 2021 through 2022, NYCHA increased headcount by 504 positions as part of its Transformation Plan/WOR initiative. The new staff address all WOs (not only mold and leak WOs). While there was an increase of 504 positions, NYCHA requires additional staff to address its projected annual demand of work. In August 2022, the WOR team conducted an analysis to estimate the staff (supervisors, skilled trades, and Maintenance Workers) required to meet the annual demand for the 2023 fiscal year. While NYCHA places a greater emphasis on enhancing employee productivity and efficiency, the analysis used current productivity targets to determine the number of staff members that were required. The analysis determined the number of additional skilled trades and Maintenance Workers required to meet this demand, the number of additional supervisors required to manage the additional skilled trades workers, and the estimated additional cost in salary, overtime, and fringe benefits that implementing the proposal

[74] To become a NYCHA Superintendent, one must already hold the civil service title of Assistant Superintendent, served under this title for one year, and pass a resume screening performed by NYCHA HR. Superintendents are not provisional and must have passed and scored well on the Superintendent civil service exam. Superintendents who miss the exam must wait until an exam is administered, which occurs every few years.
[75] To become a NYCHA Assistant Superintendent, one must pass the initial NYCHA HR resume screening. Assistant Superintendents may be provisional, but if an exam is offered, Assistant Superintendents must take the exam and perform well to retain their position.
[76] Skilled trades titles (Painters, Plumbers, Carpenters, and Plasterers) can be filled by temporary or provisional staff. All candidates must pass the initial HR resume screening. If there is no civil service list, skilled trades workers may work provisionally, but if a list is created, those who work provisionally must pass an exam and score well to retain their position.

would incur. It should be noted that NYCHA's WO backlog was not taken into consideration for this analysis.

WOR's staffing analysis estimated that to address its annual volume of all incoming WOs (not only mold and leaks), NYCHA needs an additional 14 skilled trades supervisors, 57 skilled trades workers, and 34 Maintenance Workers beyond the headcount funded in its 2022 budget. Given that mold and leak WOs amount to approximately 28% of the overall projected annual need, an increase of four skilled trades supervisors, 16 skilled trade workers, and ten Maintenance Workers is estimated to be needed specifically for mold and leaks. Due to budget constraints, the staffing proposal was not funded for the 2023 fiscal year.

V. Resolving Scheduling Issues

Description of Challenge:

With the implementation of the Neighborhood Model and WOR as defined in the NYCHA Transformation Plan, NYCHA has made tremendous advancements in enhancing and modernizing the mold repair scheduling process. Prior to the Neighborhood Model and WOR, skilled trades workers and Planners were at the borough level. Each borough had several Borough Planners responsible for scheduling select skilled trades. Due to the emphasis on craft-specific Service Level Agreements, WOs were established and scheduled only after the preceding step was finished, making it difficult and time-consuming for staff and residents to perform complex repairs that required the coordination of multiple skilled trades. WOs were also often scheduled without resident input regarding their availability.

With the introduction of the Neighborhood Model and WOR, Planners and skilled trades workers were decentralized, and instead, concentrated at the neighborhood level. The Planner and the required skilled trades are now situated closely to their respective job sites. Time previously spent traveling around the borough or between boroughs is reinvested into the developments. With a consistent on-site presence, residents and staff can form relationships that promote accountability. Staff members can improve service quality over time by gaining specialized knowledge of the problems that arise in the buildings they support. All necessary WOs for a resident's request are made simultaneously on-site during the first maintenance visit or inspection. Residents are then provided a "Repairs to Schedule" slip which details all repairs needed as well as the Neighborhood Planner's phone number. Residents can then call to schedule WOs assigned to skilled trades.

Currently, residents are provided this slip for all WOs responded to by Maintenance Workers, except for Mold Busters WOs (see below for recommendations related to Mold Busters WOs); residents may only call in to schedule skilled trades WOs assigned to the following titles: Bricklayers, Carpenters, Roofers, Electricians, Glaziers, Plumbers, Painters, Plasterers, and Exterminators. Residents may not call to schedule WOs assigned to Property Management staff (i.e., Superintendents or Maintenance Workers).

In summary, the decentralization of scheduling that occurred with the introduction of the Neighborhood Model optimizes scheduling, communication, and problem solving associated with complex WOs that require sequencing several skilled trades. Despite the operational changes implemented thus far, there are still improvements to be made. For example, only 19% (18,435 out of 94,853) of all open mold and leak WOs related to *Baez* have a scheduled date in

the future as of February 20, 2023. However, this is an improvement from March 24, 2022, when only 7% (7,426 out of 100,983) of WOs had a scheduled date in the future.

As a result of more WOs being scheduled, NYCHA's scheduling delays and staffing constraints have become more visible. Specifically, nearly 90% of open mold and leak WOs are assigned to a skilled trades craft. Of these WOs, 72% are over 100 days old. Of the skilled trades WOs with a scheduled date in the future, 21% (3,594 of 17,007) are scheduled more than three months in the future due to lack of available appointments. The median number of days from the WO create date to the scheduled date in the future is 246 days. Because 12% (10,237 of 83,004) of skilled trades WOs have a scheduled date in the past, these skilled trades WOs will need to be rescheduled.

Related Recommendation(s):

NYCHA is currently modifying the Mold Busters SP to include the "Repairs to Schedule" slip to address these scheduling challenges (providing residents with a contact number to initiate the scheduling of their skilled trades WOs) and make it possible for mold WOs to be booked as effectively and easily as leak and other WOs.

Additionally, NYCHA recommends sending subject matter experts (i.e., skilled trades supervisors) to pre-screen aging skilled trades WOs. For some WOs, the physical work was completed at the designated location, but the WOs were not closed in Maximo. Pre-screening WOs allows subject matter experts to identify what has been completed and close the appropriate WOs before scheduling, maximizing skilled trades worker availability. Moreover, pre-screening WOs allows high severity cases and units to be given priority once reported to the Planner. To assist with pre-screening efforts, NYCHA is currently in the process of designing a tool to log pre-screening dates as "last verified date." NYCHA and the IDA estimate that approximately 32% (or 21,409) of the 67,137 open work orders assigned to the painter, plumber, carpenter and plasterer crafts may not require work, as identified in Part 3, Section II.

NYCHA will continue to monitor the outcomes of the Neighborhood Model and WOR and make improvements as needed. NYCHA will encourage schedulers to allocate a pre-determined percentage of available appointments for new, emergency, and the oldest WOs to reduce the aging skilled trades WOs.

VI. Maintaining Compliance with the Mold Standard Procedure

Description of Challenge:

The Mold SP establishes responsive measures to mold and its root causes in NYCHA public housing locations. It also creates protocols to protect the health of residents and staff when staff remediate mold and identify and correct its root causes. Compliance, EHS, the QA Department, and OMAR monitor mold and leak WO data to identify and correct cases of non-compliance with NYCHA's Mold SP. NYCHA has noted that failure to perform the following tasks are some of the most common instances of non-compliance with the Mold SP:

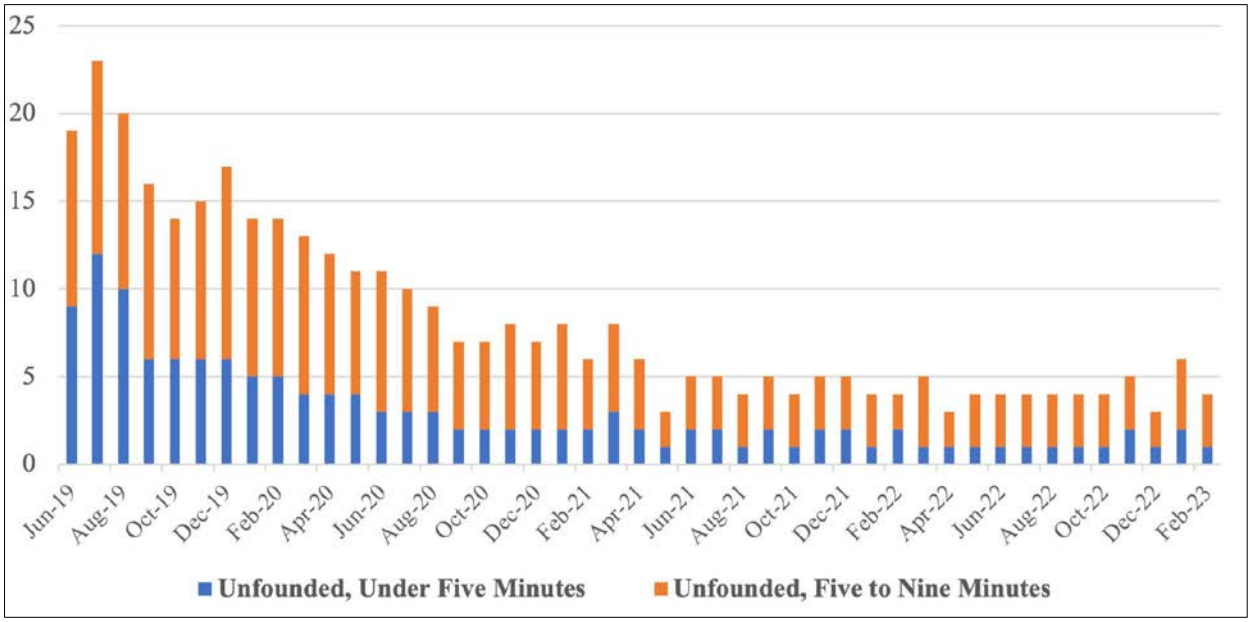
- Uploading appropriate photographs that depict the presence of mold and/or water damage
- Selecting the appropriate root cause in the WO to properly repair damage

- Utilizing tools such as hygrometers, anemometers, and moisture meters
- Entering moisture readings, humidity readings, and CFM measurements

Compliance also closely monitors two other common instances of non-compliance: the percentage of unfounded WOs and the time it takes for staff to complete mold inspections. Specifically, a higher percentage of unfounded mold inspections from one inspector arouses suspicion that the inspector may not be performing the mold inspection correctly and is failing to report observed mold, moisture, and/or water damage, which leads to close monitoring by Compliance. Chart 31 displays the percent of unfounded WOs from June 1, 2019, through February 28, 2023. Throughout this period, the percent of WOs that were deemed unfounded decreased. The percent of unfounded WOs decreased sharply since 2020 and has not exceeded 6% since April 2021. Although this is a positive trend, the presence of these unfounded WOs indicates that staff may be reporting that some WOs are improperly categorized as unfounded when the reported mold conditions exist and need to be remediated.

Additionally, when employees are not spending the minimum estimated required time of ten minutes per inspection, Compliance may investigate if the employee is completing mold inspections correctly. Due to the number of questions that the inspector is prompted to answer during the standardized mold inspection questionnaire, a properly performed mold inspection typically takes more than ten minutes. NYCHA continues to strive to reduce the percentage of mold inspections completed in ten minutes or less.

Chart 31: Percent of Unfounded Mold Busters 2.0 Parent WOs[77]



[77] Note that 10+ minute unfounded inspections are excluded from this chart.

Related Recommendation(s):

Compliance will continue to reinforce proper identification of the root causes of mold during mold inspections, proper use of tools during inspections, taking the appropriate length of time to perform a thorough mold inspection, and indicating the presence of mold or moisture/water damage by recommending that Operations does the following:

- Issue memos to individual staff
- Work with staff to provide guidance and expectations on work related to mold and leaks
- Offer retraining through the Mold Busters training program or OMAR

Compliance bases these recommendations on the findings of its investigation team as well as investigations conducted by the MRU, OCC, EHS, IMA, and the Federal Monitor. Additionally, OMAR works with Compliance based on IMA inspection findings to assess the appropriate next steps (i.e., additional field training, root cause training, and huddle or class training facilitated by the OMAR team as well as the creation of additional WOs if the IMA identifies any issues during inspections).[78] These IMA inspections and proactive investigations are essential for maintaining staff accountability.

Compliance reviews these inspections and make accountability recommendations to the respective Neighborhood Administrators (Operations staff) to issue verbal warnings. The Compliance Inquiry Review & Assessment Unit (CIRA) follows up on prior recommendations until the recommendations are closed out by Operations Borough Management. CIRA also makes recommendations for formal discipline if there is evidence of significant or willful deviations from the Mold SP. If Compliance recommends disciplinary actions such as suspension or demotion, the final disciplinary action must be decided by the Chief Operating Officer (COO) or the Borough VP. If the COO or the Borough VP agrees with the recommendation, Compliance works with the Law Department to bring disciplinary charges under the NYCHA administrative hearing process. Finally, residents now have several channels for escalating mold WOs: Compliance (online portal), the Federal Monitor, and the OCC.

VII. Lack of Leak Standard Procedure

Description of Challenge:

As discussed in Part 2, NYCHA does not have an SP for tracing leaks, documenting leaks' root cause(s), and generating repair WOs based on site-specific information collected by inspectors. Because of the lack of a Leak SP for standardized inspection, NYCHA is unable to fully connect all required leak repairs to underlying root cause(s) and record them in its system, Maximo (root causes are not currently enabled within leak WOs). Additionally, NYCHA is unable to properly document the findings of vertical building line inspections within NYCHA systems or connect leak WOs to the main root causes found in another area (i.e., a unit on a floor above). For example, NYCHA's current procedure prevents staff from easily viewing the three individual

[78] OMAR and IMA conduct 250 QA inspections per year as part of the requirements of the *Baez* Revised Consent Decree. NYCHA checks which sites have high failure rates of inspections through the EOP, described in Part 2. OMAR schedules appointments with the residents whose mold inspections were conducted in their units by Property Management. The goal is to ensure that the development maintenance supervisors have the necessary knowledge to enable them to conduct a valid mold and root cause assessment in response to a parent mold WO.

leak WOs for units 1A, 2A, and 3A in the event of a severe leak in a building in which three separate residents each filed a WO due to flooding. WOR is currently preparing guidance for Maintenance Workers to properly generate child WOs for leaks in adjacent/above units. This will streamline the process for repairing leaks within the units and may reduce leak recurrence, since staff will now be able to view all leak repairs simultaneously and more easily determine the root cause of leaks.

Furthermore, NYCHA has many "Failure Class" and "Problem Code"[79] combinations that may refer to the same issue and lead to the creation of multiple WOs to address the same root cause (i.e., FAÇADE – BRICKWORKDML and LEAK FROM ABOVE – CONSTANT LEAKING). Because these WO classifications are not standardized, or not uniformly documented within Maximo, NYCHA's WO data regarding leaks may be unreliable when used for analyses. As a result, NYCHA has difficulty understanding data collected on the scope and complexity of certain leak repairs.

Related Recommendation(s):

NYCHA developed the Leak SP and launched a pilot project to evaluate the efficiency and effectiveness of procedural and IT enhancements to address the issues described above. NYCHA engaged the IMA and IDA to design a leak inspection workflow and pilot evaluation. The following three consolidations in Brooklyn were selected to participate in the pilot: Brevoort, Low, and Roosevelt. The first phase of the pilot was launched in September 2020, followed by the second phase (Leak SP Pilot 2.0) launched in December 2021, which is ongoing.

As of February 2023, pilot sites generated 7,412 parent leak inspection WOs. Of those, 6,612 (89%) WOs were closed, and 577 (8%) remain open. The leak inspection process introduced by the pilot is designed to mimic the Mold Busters process, meaning that the initial parent leak inspection WO will remain open until all subsequent repairs created via child WOs are addressed. This change will increase the average time to complete leak-related repairs but will enable NYCHA to ensure that all repairs are completed in all impacted units before the parent leak WO is closed and work documented as completed.

The Leak SP Pilot 2.0 introduced the following enhancements to NYCHA's leak response at the pilot locations:

- A new intake script introduced to improve leak WO classification upon resident's submission of a complaint via the MyNYCHA App or phone call to Customer Contact Center (CCC) representatives via Siebel software. This enhancement aims to improve the accuracy of residents' submitted complaints and ensure that works get prioritized based on the assigned "Failure Class" and "Problem Code."
- Leak inspection workflow to enable staff to improve in the following areas:
    - Document flooding condition and/or standing water in unit during inspection and create a follow-up repair (if needed) to measure NYCHA's response in

[79] Descriptive issue code used at NYCHA to document the scope of repairs when a resident submits a complaint or NYCHA staff creates a WO. For example, NYCHA will create a WO to document brickwork repair, utilizing FAÇADE (Failure Class) and BRICKWORKDML (Problem Code) combination.

addressing emergency leaks as outlined in Revised Consent Decree and HUD Agreement.[80]
    - Inspect for mold, water damage, or elevated moisture utilizing a moisture meter during leak inspection to ensure that the root cause(s) of the condition is identified and documented against the WO.
    - Create leak inspection WO for additional unit(s) if the root cause(s) is identified in another unit to ensure that repair WOs are created for all impacted units.
- Updated guidance on performing wall breaks, pipe insulation, and fire-stopping installation, developed in partnership with the IMA.
- New tools to assist staff with performing wall breaks, pipe insulation, and fire-stopping installation work as recommended by the IMA.

Additionally, NYCHA is collaborating with the IDA to ensure that information about the OCC is shared with the leak pilot sites so residents can report leak-related WOs as needed. As NYCHA continues to learn from the pilot, additional procedural and operational adjustments will be made before the Leak SP's full-scale launch by the end of 2023.

VIII. Improving Neighborhood and Consolidation Managerial Buy-In

Description of Challenge:

Managerial buy-in regarding mold and leak monitoring and performance is occasionally a shortcoming within neighborhoods. This may prevent mold and leaks from receiving required treatment.

As per the NYCHA Transformation Plan, NYCHA has committed to become more data-centric when designing and implementing an organizational structure and business processes with clear management structures so individuals can be measured against concrete goals. It has been a priority and a challenge to change NYCHA's culture to adopt this approach. With this data-centric approach, NYCHA aims to improve and increase staff accountability, transparency, and proactive measures. The most comprehensive and user-friendly data tool to monitor and assess mold and leak performance is the Scorecard. Currently there are 564 authorized Scorecard users, of which 486 users are in Operations. As of February 27, 2023, 90% (27 out of 30) of Neighborhood Administrators and 86% (24 out of 28) of Neighborhood Planners have accessed the platform in the last 30 days. Users are encouraged to utilize and review the Scorecard at least once per week. As of February 27, 2023, 43% (13 out of 30) of Neighborhood Administrators and 57% (16 out of 28) of Neighborhood Planners have accessed the platform in the last seven days. Mold and leak performance cannot be monitored and acted upon if key managerial staff are not utilizing the Scorecard.

In addition to lack of performance monitoring via the Scorecard, complete investment in mold and leaks may be lacking amongst key managerial staff due to competition with other HUD Agreement pillars and priorities, such as pests, lead, and asbestos. Additional routine and urgent

[80] NYCHA makes a best effort to address flooding condition within 24 hours and to remove any standing water within 48 hours.

tasks that fall under the purview of Operations include fires, rent collection, unit move-outs, ground maintenance, high-profile media cases, court cases, Public Housing Assessment System inspections, intergovernmental inquiries, and a variety of resident-reported complaints that may divert attention. This divided attention may prevent mold and leak WOs from being prioritized and addressed in a timely manner.

Managerial buy-in and investment may also wane with staffing shortages. Staffing shortages can lead to backlogs of mold and leak WOs, which can be difficult to eliminate or reduce significantly, even after a vacant position is filled. This may overwhelm key managerial staff, leading to the prioritization of other HUD pillars or tasks.

Related Recommendation(s):

NYCHA continually monitors Scorecard usage, training attendance, and consolidations' mold and leak compliance and performance to promote managerial buy-in and investment. It also emphasizes the significance of mold and leak prioritization and aids consolidations as necessary. The frequency of Scorecard trainings has been increased to at least two training sessions per month. The first training session assists users with logging into the Scorecard for the first time, resolving common IT issues, and other concerns. The second training session instructs users to navigate the Scorecard, understand data, and create mold and leak WO management strategies. To ensure that new users receive training and that users who have accessed the Scorecard in the past can receive a refresher training, all users with access to the Scorecard are invited to the second session of training every month. Key staff members such as Community Administrators and Neighborhood Planners may receive one-on-one training as needed or upon request to review the performance of their neighborhoods. The importance of timely action and the impact mold and leaks have on residents' health and quality of life are emphasized in all trainings.

Scorecard access and usage is now being monitored on a weekly basis by the COO's office to ensure that key Operations staff are reviewing their neighborhood's performance. Staff are aware that their usage is being monitored, and since becoming aware, there has been an increased interest in mold and leak WO management and requests for additional Scorecard trainings. Several key managerial staff in Operations have begun using and reviewing the Scorecard in weekly internal meetings with their staff, which is an encouraged positive trend.

Additionally, the EOP must continue to monitor consolidations with the lowest mold and leak performance and assist them in working towards WO reduction. Increasing managerial buy-in for mold and leak performance is an ongoing effort. It's NYCHA's priority, and the effectiveness of strategies to improve managerial buy-in will be monitored and adjusted going forward.

Part 4: Conclusion and Needs

Mold and leaks are persistent challenges at NYCHA, and their prevention and resolution are agency priorities. In recent years, NYCHA has made critical investments to address mold and leaks. Additionally, NYCHA's Transformation Plan introduced organizational and operational changes to improve customer service and responsiveness at each consolidation, improving the quality of life for residents.

NYCHA is already observing the positive impact of all these efforts through its Scorecard tool (as detailed in the Scorecard section) and the reduction in mold recurrence rates by 17 percentage points since October 2019. Additionally, Stout's analysis of NYCHA's mold and leak WO data indicates that the roof fan replacement and CVI projects may have contributed to a 72%[81] decline in identified mold in which there was inadequate ventilation.

Despite these efforts, NYCHA recognizes the immense amount of work required to ensure that all residents have access to healthy living conditions. NYCHA is committed to improving the Mold Busters process, developing the Leak SP, introducing/continuing operational strategies to improve responsiveness to WOs, and advocating for infrastructure investments. There is a direct connection between aging infrastructure in need of urgent repair and the presence of mold and leaks. Immediate infrastructure investment projects, including enhancing ventilation, decreasing the tub enclosure and plumbing WO backlogs, and replacing pipes in entire building lines, will have the greatest impact. Each of these project categories and associated funding requests are described in detail below.

Ventilation Projects

NYCHA is planning to begin its citywide volume and fire damper replacement project. As discussed earlier, damper replacement and balancing would enable adequate airflow inside and outside of the units and prevent fires from spreading across units. There are approximately 64,500 in-unit dampers and 11,402 hallway (public space) dampers that require replacement. Based on bid proposals from vendors, OMAR estimates that each damper replacement costs $1,200. NYCHA’s total need for the volume and fire damper replacement project is $91 million (75,902 dampers replaced at $1,200 per damper). NYCHA currently possesses $25 million of the $91 million needed and is requesting an additional $66 million to fund this unmet need. Funding needs may change, as NYCHA is still in the design and negotiations phase of the damper project.

Addressing the General Backlog of Mold and Leak WOs

Infrastructure disinvestments, staffing limitations, and work restrictions during the COVID-19 pandemic, resulted in a backlog of almost 100,000 mold and leak WOs. To address this backlog, NYCHA requires funding for local vendor contracts, staffing/resources for the management of vendor contracts, and the expansion of pre-screening and backlog scheduling efforts.

Addressing Tub Enclosures, Plumbing, and Other Root Cause Repair Backlogs

As discussed in Part 3, there is a large aging backlog of tub enclosure and plumbing work that NYCHA must address. As of March 2023, there are 3,930 open tub enclosure replacement WOs older than 250 days (costing $4,326 per repair) and 5,245 plumbing WOs older than 250 days (costing $2,897 per repair) that will be prioritized by NYCHA beginning in April 2023. NYCHA is requesting $32 million to address its tub enclosure ($17 million) and plumbing ($15 million) backlog. This need was also shared with the New York Governor’s Office for consideration.

[81] The 72% is the percent change between 2,018 founded mold inspections in units with mechanical ventilation in 2020 and 557 (325 over a seven-month period annualized), founded mold inspections where inadequate ventilation was also detected in 2022. This data was provided by the *Baez* Independent Data Analyst on March 29, 2023.

Building Line Initiative (BLI)

The BLI comprehensive plumbing and renovation projects are considered some of NYCHA's most important initiatives, as they address mold and leaks by targeting underlying root cause(s). These initiatives require gut-rehabs of entire building lines and the replacement of deteriorating plumbing systems. Because the BLI process is so intensive, the average per-unit cost of performing a gut-rehab is approximately $160,000.[82] NYCHA requires $34 million in funding for 13 building lines (212 units) across nine developments that NYCHA aims to target via new BLI projects. Additionally, NYCHA applied for a $1.25 million grant award from the Dormitory Authority of the State of New York for a building line project at Hammel. NYCHA also applied for a $5 million HUD Lead and Mold Abatement Grant, which was denied. However, if provided with additional funds, NYCHA will invest in even more BLI projects.

Chart 32 summarizes NYCHA's recommended investments to address mold and leaks and the funding needed.

Chart 32: Recommended Actions and Related Funding Needs to Address Mold and Leaks

Recommended Actions	Project Start Year	Funding Need
Volume and fire damper replacements	2023	$66 million
Tub enclosure and plumbing backlog reduction effort	2023	$32 million
Building Line Initiative projects	2024	$34 million
Backlog reduction funding	2023	TBD
	Total	$132 million plus any additional backlog reduction funds

In conclusion, NYCHA continues to work with numerous partners, including community advocates, the Special Master, the independent court-appointed Mold and Data Analysts, the Ombudsperson/OCC, and the Federal Monitor's team, to facilitate lasting improvements. Although NYCHA's past and ongoing initiatives have displayed promising results, major capital investments are urgently needed to protect the health and safety of its residents.

[82] Cost includes electrical and plumbing basement work, but does not include administrative oversight cost, relocation costs, or uncollected rent while repairs are taking place.

Glossary

Term	Definition
Assistant Resident Buildings Superintendent	Development staff responsible for supervising the operation and maintenance of properties or, in the central or borough offices, supervising skilled and semi-skilled employees executing major repair programs. Assistant Superintendents report to Superintendents and are responsible for overseeing Maintenance Workers and janitorial or ground operations.
Blitz	A specialized team or individual is sent to quickly address a group of WOs.
Building Line Initiative (BLI)	A comprehensive plumbing replacement and renovation project that aims to address mold and/or leaks by targeting their underlying root cause(s) and developing a full scope of work for the affected unit line to complete all necessary repairs.
Capital Repair	A repair requiring a total system upgrade, including an improvement that replaces a system, major component, or structural part of the property (this increases the value of the asset and extends its useful life). Major repairs that do not constitute capital improvements include but are not limited to replacing or repairing portions of roofs, insulating or replacing pipes, replacing sheetrock, and replacing or repairing roof fans.
Caretaker X	Development staff assigned to do mold cleaning work (among other responsibilities). Caretaker Xs clean mold growth with surface areas of up to 20 square feet.
Child Work Orders (WOs)	WOs created by staff after initial inspections/complaints to remediate/abate mold and leaks and conduct related repairs.
Clean Vent Initiative (CVI)	Specialized effort launched in December 2020 to clean in-unit vents to improve air circulation and air quality in units with mechanical ventilation.
Consolidation	A group of developments managed by one Property Management office.
Craft	Type of worker (i.e., Maintenance Worker, Painter) assigned to complete a WO.
Development	A group of apartment buildings in the same geographic area that were built and leased by NYCHA. Developments are subsets of consolidations.
Enhanced Oversight Program (EOP)	A three-to-six-month long program within NYCHA led by OMAR to improve mold and leak compliance at the consolidation level. The EOP establishes overall performance milestones consistent with Baez court-ordered requirements and identifies site-specific roadblocks hindering performance (i.e., staffing shortages, access issues, scheduling disruptions, procurement delays, and/or need for additional training). The EOP also provides coaching/resources to help sites overcome identified roadblocks.
Exhaust Ventilation	System that removes air from a building through a fan and a single exhaust point.
Fire Damper	Fire dampers (or shutters) prevent the spread of fire and smoke through heating, ventilation, and AC ducts by closing automatically upon the detection of heat.

Term	Definition
Healthy Homes Department (HHD)	NYCHA Department established to effectuate change in response to a legal agreement between NYCHA and HUD. The HHD makes sustainable changes within NYCHA developments by eliminating mold, lead, leaks, and asbestos.
HEPA Vacuum	A vacuum utilizing a high-efficiency particulate air (HEPA) filter that is at least 99.9% efficient in removing microscopic particles.
Independent Data Analyst (IDA)	Individual or advisory firm selected by the Special Master with the input of the Baez parties retained by the Special Master and qualified in forensic data analysis. The IDA also operates the OCC and collaborates with the Mold Response Unit to facilitate the resolution of cases brought to the OCC's attention by residents.
Independent Mold Analyst (IMA)	An individual or advisory firm selected by the Special Master with the input of the Baez parties, is retained by the Special Master, has a Mold Assessors License from the New York State Department of Labor, and is either (1) certified as an industrial hygienist by the American Industrial Hygiene Association or (2) certified by the American Council for Accredited Certification (ACAC) as an Indoor Environmental Consultant, an Indoor Environmentalist, a Microbial Consultant, a Microbial Investigator, a Moisture Control Consultant, or a Moisture Control Investigator.
Lateral Ventilation Duct	A duct that allows one mechanical ventilation unit (i.e., a roof fan) to simultaneously distribute air to adjoining unit(s).
Maximo Asset Management System	A database designed to support the tracking and documentation of WOs throughout their lifecycles.
Mechanical Ventilation	A mechanical system, as opposed to natural ventilation (i.e., opening a window or door), which facilitates the movement of stale indoor air outside and fresh outdoor air inside. Mechanical ventilation systems involve a fan and, in some cases, also Energy Recovery Ventilators or Heat Recovery Ventilators. Exhaust ventilation, defined above, is one type of mechanical ventilation. Other categories of mechanical ventilation include supply, balanced, and energy recovery.
Mold and Leak Performance Scorecard (Scorecard)	An assessment tool that scores and compares the performance of each consolidation, neighborhood, and borough on key mold and leak performance metrics.
Mold Action Plan	A two-phase plan written by NYCHA and the HUD Monitor team in response to the HUD Agreement to improve mold and leak compliance. NYCHA committed to completing its phase one obligations by January 31, 2021. A second set of obligations must be completed by January 31, 2024. A plan to address these obligations (pertaining to reducing mold recurrences) will be included in a forthcoming Action Plan.
Mold Initial Inspections/Mold Parent Inspection	The first step in a mold WO. During the initial inspection, staff identify the root cause of the reported mold, moisture, and/or water damage and create corresponding repair WOs.
Mold Response Unit	OMAR staff who provide case management support to the OCC by liaising between the OCC and residents, development, and skilled trades to resolve WOs escalated to the OCC.
Mold Standard Procedure (Mold SP)	An instructional document that describes how staff should perform mold inspections, remediation work, and repairs.

Term	Definition
Natural Ventilation	Within NYCHA, this term refers to windows that allow airflow into apartments.
Neighborhood	A group of consolidations in the same geographic location.
Neighborhood Model	Organizational structure implemented to improve oversight and increase managerial attention on developments by creating smaller property management portfolios. NYCHA uses this model to address challenges arising from the large scale of its operations.
NYCHA Transformation Plan	Organizational/operational changes to improve customer service and responsiveness at developments, ensure that large projects are completed in a timely manner, promote staff accountability, enable better property management, and ensure that limited funding is used effectively.
Ombudsperson Call Center (OCC)	An independent court-appointed call center, as described in the Baez et. al. v. NYCHA Modified Amended Stipulation and Order of Settlement (United States District Court, Southern District of New York), established to resolve resident mold and leak WOs escalated from the CCC. These WOs are routed to MRU staff, who engage NYCHA's court-appointed experts, Operations staff, and residents to resolve complaints.
Parent Work Order (WO)	A record created in NYCHA's asset management database to memorialize a resident-reported complaint or issue identified by NYCHA staff that requires action by NYCHA. Parent WOs consist of initial inspections for mold and initial complaints for leaks.
Quality Assurance (QA) Inspections	An inspection in which a NYCHA inspector verifies that no mold, moisture, or water damage remains (at the location of the initial complaint) and that all remediation and repair work was completed.
Root Cause	The fundamental reason for an occurrence of mold, water damage, or moisture (i.e., source of water or excessive moisture, or the lack of ventilation). Identifying and correcting root causes are essential to prevent mold and moisture issues from recurring.
Service Level Agreement (SLA)	Target repair timeframe generally applied to a specific WO category.
Simple Repairs	Repairs that can be completed by a Caretaker or a Maintenance Worker.
Special Master	An individual who was appointed by the U.S. Attorney's Office for the Southern District of New York to investigate NYCHA's failure to comply with the Baez Revised Consent Decree and to make recommendations to the Court to bring NYCHA into compliance.
Superintendent	Development staff responsible for supervising the operation and maintenance of NYCHA properties, implementing established procedures, and establishing work schedules.
Unfounded	A term used to characterize certain mold WOs for which staff conducted an initial mold inspection but did not identify mold, moisture, or water damage during the inspection.
Volume Damper	A manually operated damper that allows the control of airflow into a heating, ventilation, and air conditioning (HVAC) unit.
Work Order Reform (WOR)	Program at NYCHA implemented in 2021 - 2022 to make NYCHA's repair processes more efficient.