

U.S. Merchant Marine Academy: Actions Needed to Sustain Progress on Facility and Infrastructure Improvements

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Report to Congressional Committees
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Why This Matters

The U.S. Merchant Marine Academy (Academy) is the nation's only federal service academy dedicated to training licensed mariners to support domestic and international trade and the transport needs of the U.S. military. Academy graduates can serve as licensed officers on commercial vessels or in the military. The Academy is operated by the Maritime Administration, which is part of the Department of Transportation (DOT). The Academy's campus, in Kings Point, New York, consists of 82 acres on Long Island Sound, with 17 acres of outdoor athletic facilities and 45 buildings totaling almost 900,000 gross square feet (see fig.1).

Figure 1: U.S. Merchant Marine Academy Campus in Kings Point, New York



Source: U.S. Merchant Marine Academy (photo). | GAO-24-106875

Note: This photo shows Crowninshield Pier, the smaller pier on the lower-right, which was demolished in September 2023.

The Maritime Administration and the Academy face long-standing challenges improving the condition of the facilities and infrastructure on campus. The James M. Inhofe National Defense Authorization Act for Fiscal Year 2023 includes a provision for GAO to review capital improvement efforts at the Academy. (Pub. L. No. 117-263, § 3516, 136 Stat. 2395, 3073 (2022)). This report examines progress addressing the Academy's facility and infrastructure issues.

Key Takeaways

- Since 2022, DOT has made several changes to the management of facilities and infrastructure at the Academy that have contributed to recent progress in addressing campus needs, including:
 - DOT and the Maritime Administration established two oversight bodies to review and approve capital projects and help ensure that those projects address the campus's needs;
 - DOT detailed a senior executive to temporarily serve as the lead official for facility and infrastructure improvements on campus; and
 - The Academy combined its maintenance and capital planning departments to improve communication and coordination on facility and infrastructure improvements.
- Since 2022, the Academy completed three capital improvement projects, including renovating an athletic field, and has work underway on four others. The Maritime Administration and the Academy have also begun developing a long-range master plan for the campus, which they plan to complete by December 2024.
- However, we found the progress made thus far is fragile because (1) DOT and the Maritime Administration have not established continuous leadership at the Academy to manage facilities and infrastructure improvements, and (2) the Academy and the Maritime Administration have not conducted strategic workforce planning to determine the needed skills and capabilities for the Academy's newly organized Office of Facilities and Infrastructure.
- We also found that the Academy does not have policies establishing how it estimates costs for capital improvements and that the procedures it used to estimate costs for two new projects do not reflect cost estimating best practices.
- We recommend that the Maritime Administration ensures that the Academy (1) maintain continuous leadership for the Academy's Office of Facilities and Infrastructure, including establishing a dedicated leadership and implementation team to continue improvements, (2) conduct strategic workforce planning to determine the needed resources for the Office of Facilities and Infrastructure, and (3) develop and implement policies and procedures for cost estimation that align with cost estimating best practices.

What is the state of the U.S. Merchant Marine Academy's campus and its effect on the Academy's mission?

Numerous reports have been issued since 2010 documenting poor and deteriorating conditions on the U.S. Merchant Marine Academy's campus. The problems cited include inadequate and outdated facilities that have been poorly maintained. These facilities exhibit crumbling facades, leaking pipes, and water damage. We observed many of these problems and others during our October 2023 site visit to the campus. Figure 2 depicts examples of decayed and water damaged facilities we saw in several areas of the campus.

Figure 2: Examples of Decaying Building Facade and Water Damage at U.S. Merchant Marine Academy Campus, October 2023



Decaying facade on Wiley Hall administration building.

Mildew and decaying facade of outdoor pool bathroom facility.

Source: GAO (photos). | GAO-24-106875

Past reports have warned that the poor campus conditions could impact the Academy's ability to carry out its mission to train U.S. Merchant Marine officers.¹ In November 2021, in response to a statutory requirement, the National Academy of Public Administration (NAPA) issued a report that identified a wide range of facility and infrastructure problems on the campus.² The report cited these problems as the cause of safety concerns, distractions in the learning environment, and a deterrent to would-be applicants. NAPA's report concluded that substantial investment in and attention to campus conditions was needed to address risks to the health and safety of the campus community. The report recommended changes to oversight and management of facilities and infrastructure at the Academy to help address the problems.

What changes have DOT and the Academy made to how they manage facilities and infrastructure?

Since NAPA's 2021 report, DOT, the Maritime Administration, and the Academy have made several changes to how they oversee and manage campus improvements, including new oversight bodies, leadership, and approaches to project management.

New oversight bodies. In 2022, the Maritime Administration and DOT created two oversight bodies to sequentially review and approve the Academy's investment proposals. According to the Academy's fiscal year 2023 capital planning report, these bodies are meant to ensure that "taxpayer funds are properly managed and yield completed projects that address the [Academy's] most urgent needs."³

- The Maritime Administration created the MMARINER (Merchant Marine Academy Requirements for Infrastructure Needs) Council. This council is the Maritime Administration's investment decision-making body responsible for reviewing, approving, and overseeing capital investments at the Academy larger than \$1 million.⁴ It is also responsible for reviewing and approving certain Academy capital planning and budget documents prior to department-level review. The council is chaired by the Maritime Administrator and includes other senior Maritime Administration officials and the Academy's Superintendent. Generally, the MMARINER Council meets monthly, but its charter also allows for ad hoc meetings. The Academy's fiscal year 2022 capital planning report notes that prior to the council's creation, the Maritime

Administration's review of even the largest capital investments at the Academy was ad hoc and did not consistently include senior leaders involved in supporting the investments. The report concluded that the "lack of oversight" prior to the creation of this council likely contributed to the past challenges with the capital and maintenance efforts at the Academy.

- To ensure effective oversight of the Maritime Administration—including the MMARINER Council—and of the Academy's capital improvement and maintenance efforts, DOT created the OMMACC (Office of the Secretary of Transportation Merchant Marine Academy Capital Council). The OMMACC is responsible for reviewing and approving proposals and recommendations presented by the MMARINER Council. It can send proposals back to the MMARINER Council for changes. The OMMACC also makes final approvals for the Academy's investment decisions. It is chaired by DOT's Assistant Chief Financial Officer, and its members include the Assistant Secretary for Administration and other senior DOT officials.

According to a senior Academy official, these bodies were created in part to address prior communication lapses between DOT and the Academy regarding recent campus improvement efforts. For example, the official told us that the Maritime Administration was not included in an effort led by the Academy to develop a real property master plan in 2020. As a result, the Maritime Administration did not have visibility into the investment recommendations in that plan to support its implementation.

These oversight bodies have provided DOT and the Maritime Administration with greater visibility over capital improvements on campus. For example, in October 2023, both councils discussed one of the Academy's two near-term priorities—replacement of the campus stormwater management system. According to the meeting minutes, before voting to approve the project, members discussed how realistic the project's timeline was, the expected congressional funding, and the development of an environmental analysis needed for the project to proceed. According to senior Academy officials, the Academy would like DOT to raise its \$1 million review threshold as the Academy demonstrates progress handling capital improvement projects.

New senior executive position and office for facilities and infrastructure management. In November 2022, DOT detailed a senior executive from the Federal Aviation Administration (FAA) to serve as the Academy's lead official for facilities and infrastructure through November 2024. The executive combined the Academy's formerly separate capital planning and maintenance departments into a single department. According to the executive, combining these departments is intended to improve communication and coordination between capital improvement and maintenance staff. The executive noted that this was important because maintenance staff have more direct visibility of facility conditions and can help inform capital planning decisions.

The Maritime Administration and the Academy intend to formalize the organizational structure of the office by amending the Maritime Administration order that governs the Academy's organization, responsibilities, and authority.⁵ The Maritime Administration and the Academy had planned to finalize the new organizational structure by early 2023, but as of May 2024 had yet to do so. According to Maritime Administration and Academy officials, the final organizational structure has been delayed because the Academy decided to include it as part of a campuswide organizational restructuring that they plan to complete by August 2024.

Use of external facility and infrastructures expertise. To supplement the Academy’s capabilities, the Maritime Administration and the Academy have used external entities, such as the General Services Administration and DOT’s Volpe Center, to assist with some capital projects. For example, the Academy used the General Services Administration to prepare a structural assessment of several facilities in 2021 and, in 2022, to help restart and oversee delayed construction activities at Samuels Hall, an ongoing renovation project. The Academy used the Volpe Center to design and support construction on another ongoing project, a gate access controls upgrade.

Campuswide maintenance contract. To strengthen maintenance capacity on campus, the Maritime Administration awarded a maintenance service contract for the Academy in December 2022. The value of the contract is up to \$42 million over 5 years. The contract allows the Academy to issue task orders for services to supplement the campus’s maintenance staff in performing tasks, such as repairing equipment and developing a preventative maintenance program.

Use of a design-build approach for new projects. To manage new projects more efficiently, the Academy has largely moved from a two-phase approach to contracting to use of a single design-build contract, when possible. Under the two-phase approach, the Academy awarded a design contract and then a construction contract for each capital project. Under the design-build approach, it will now award one contract to design and build a project. The change to a design-build approach will allow construction to begin immediately after design because it eliminates the lead time needed to acquire a separate construction contract. This change is also intended to reduce the number of change orders for a project, as well as related cost overruns. Specifically, Academy officials told us that starting construction immediately after design can reduce opportunities for design changes, which has been a problem in the past, such as with Samuels Hall, as discussed later in this report.

What progress has the Academy made on campus improvements?

As of May 2024, the Academy had completed three of the seven capital improvement projects in its fiscal year 2023 Capital Improvement Plan annual report and has work underway on the four other projects.⁶ The completed projects are smaller projects, such as improvements to the breakwater at the Academy’s Mallery Pier. The Academy faces significant work to complete two large building renovations with planned completion dates of 2025 and 2026. See Table 1.

Table 1: Status of U.S. Merchant Marine Academy Capital Improvement Projects, as of May 2024

| Completed Projects and Description | Completed Date | Total Cost (In Millions) |
|---|---------------------------|------------------------------|
| Mallery Pier Breakwater Upgrade: This project added panels along the Mallery Pier to diffuse wave energy and provide better protection for vessels in the basin. | September 2023 | \$2.3 |
| Lower Roosevelt Field Renovation: This project updated athletic fields with new outdoor lighting and artificial turf surfaces for baseball, soccer, and lacrosse. | October 2023 | \$9 |
| Crowninshield Pier Demolition: This project included the demolition of a deteriorating pier that was a risk to safe navigation and the marine environment. It also included the installation of a temporary wave screen to mitigate wave damage from the Long Island Sound. | December 2023 | \$3.4 |
| Ongoing Projects and Description | Estimated Completion Date | Estimated Cost (In Millions) |
| Samuels Hall Renovation: This project is designed to house a simulator facility where midshipmen can practice ship handling. Samuels Hall also houses the campus main data center, which is still in operation as the building is being renovated. The project underwent several changes since 2016 during its design phase. Following the award of a | July 2025 | \$50 |

construction contract in 2020, concerns over how to protect the data center caused work to pause in 2021. Work restarted in December 2022. The Academy anticipates that the project will be largely completed by July 2025 for the 2025-2026 academic year.

| | | |
|---|------------------------|-------|
| Fulton/Gibbs Complex Renovation: This project updates classrooms and laboratories and improves lighting, eyewash stations, and ventilation to comply with current standards. It is also designed to resolve facility deficiencies identified in a 2017 accreditation review and prepare for the Academy's fiscal year 2024 review. The facility complex has remained open through the renovations, which began in September 2023. | July 2026 | \$21 |
| Gate Access Controls Upgrade (Phase I and II): This project will bring the gate security into compliance with federal standards. The first phase includes a new guard booth, gates, and security cameras. Phase II includes the pedestrian access control and vehicle barriers. | Phase I: February 2024 | \$3 |
| | Phase II: Summer 2025 | \$3 |
| Fiber Optic Network Upgrade (Phase I and II): This project increases the fiber optic network capacity to carry the broadband traffic required for academic instruction and 24/7 live security feeds. The first phase includes replacement and expansion of the existing fiber optic network. The second phase includes the relocation and replacement of hardware in each building that is attached to the fiber optic ring. The cost and scope of the second phase is still being evaluated. | Phase I: August 2024 | \$2.5 |
| | Phase II: TBD | TBD |

Source: GAO summary of U.S. Merchant Marine Academy information. | GAO-24-106875

The Academy's ongoing projects include the renovation of Samuels Hall, an academic building. This project has experienced multiple redesigns since 2016 and other issues that have delayed completion of the project. Following the design changes, a construction contract for Samuels Hall was awarded in 2020. However, the Academy issued a stop work order in 2021 due to concerns about the main data center, which is in Samuels Hall, being in the middle of an active construction zone. According to Academy officials, steps were taken to address concerns about the potential for damage from construction-related vibrations and water intrusion to the main data center, which is to remain operational during the renovation (see fig. 3). The Academy reported the stop work order was fully lifted in December 2022. According to Academy officials, Samuels Hall is scheduled to open to students in July 2025 for the 2025-2026 academic year.

Figure 3: Samuels Hall Renovation Project, Which Includes the U.S. Merchant Marine Academy's Main Data Center, October 2023



Source: GAO (photo). | GAO-24-106875

What factors affect the pace of campus improvements?

Academy officials said that several factors affect the pace of progress on capital projects and maintenance improvements.

Site-Specific Factors. Factors affecting the pace of improvements include:

- no swing space to continue campus operations while buildings are being renovated;
- limited areas for contractors to stage materials and equipment needed to perform construction work, especially when the campus is active (11 months of the year); and
- incomplete information regarding the location of utility infrastructure, such as underground natural gas lines.

Academy officials told us that not having swing space on campus means that building renovations, like at the Fulton-Gibbs Complex, need to happen while students are using other parts of the building. Officials added that the limited space between buildings and the need for access pathways for students and faculty also limit the amount of space that contractors can use for construction equipment and materials. Regarding incomplete information on utility infrastructure, the officials said that parts of the stormwater drainage system predate the opening of campus in 1943, and no records are available for those sections. In other cases, the officials said that maps of underground gas lines are inaccurate and construction progress is delayed when workers discover these lines. During one of our interviews with Academy officials, they ended the meeting early upon learning that a contractor had hit an unmapped gas line while conducting excavation work at the Samuels Hall construction site.

Maintenance Challenges. The Academy also faces challenges getting some maintenance work done through the new campuswide maintenance contract. In

particular, Academy officials told us the Academy's original task order under the contract was too specific and led to some work not being included, such as repairs to heating and air conditioning systems. Officials added that one factor contributing to these challenges is that the Academy does not have historical maintenance data or an up-to-date inventory of campus equipment to estimate costs of repairs or preventative maintenance. The officials said they are working to address these issues by implementing a maintenance management system to collect data on Academy assets to inform future maintenance. The Academy is also re-drafting the task order for maintenance to be more comprehensive and include some of the needed work not included in the original task order.

Does the Academy have the leadership and workforce needed to sustain campus improvements?

We found that DOT and the Academy have not established continuous leadership or strategic workforce planning necessary to sustain improvements to campus conditions. Our prior work has noted that when making changes like those underway at the Academy, having a designated leader and implementation team and conducting strategic workforce planning improves the likelihood of success.⁷ In addition, our work on asset management has found that organizational leadership's clear articulation and support for asset management and the provision of necessary resources are key for effective asset management.⁸

Continuous leadership. Our past work has shown that designating a leader or leaders and having a team with sufficient capacity dedicated to implement changes improves the likelihood of the success of those changes.⁹ The senior executive leading the Office of Facilities and Infrastructure is on a 2-year detail from the FAA that ends in November 2024. However, as of May 2024, DOT has yet to finalize a job announcement for a permanent replacement. While the office currently has 15 maintenance staff and six capital planning staff, DOT has not staffed the office with a deputy or a full team to support the executive with improvements to campus conditions. Specifically, the senior executive told us that the office would need a scheduler to help manage concurrent projects along with additional project management support. The executive stated that if her detail ended tomorrow, continuing the progress the Academy has made on its facilities and infrastructure would be challenging.

Academy officials told us they have faced challenges in attracting staff with the necessary skills and experience. For example, the executive leading the office explained that her position should be filled with an experienced senior executive who can lead complex organizational change and that such experience may be difficult to find. She noted her successor would need both relevant expertise and the ability to manage relationships with the Maritime Administration, various Academy stakeholders, and relevant congressional staff. She said that DOT is in the process of finalizing the announcement for her replacement, and that the Academy has interviewed several applicants for support positions but has not yet filled the positions. In the absence of continuous leadership and a dedicated team for the Office of Facilities and Infrastructure, the Academy does not have assurance that it will be able to implement the numerous projects arising from the real property master plan that the Academy is developing and address the many campuswide maintenance activities the office must also manage.

Strategic workforce planning. The Academy and the Maritime Administration have not conducted strategic workforce planning to determine the needed skills and capabilities for the Office of Facilities and Infrastructure. Strategic workforce planning includes identifying workforce gaps and strategies to fill those gaps.¹⁰ Our past work has shown that strategic workforce planning—including succession planning for leadership and other key positions—is critical for mission accomplishment.¹¹ The Academy and the Maritime Administration have not

previously had the staff or expertise to conduct strategic workforce planning at the Academy, according to Academy officials.

The Academy recently hired a new director for human resources who plans to conduct workforce planning for all Academy offices. However, addressing the workforce needs of the Office of Facilities and Infrastructure will require more involvement from DOT. For example, Academy senior leaders explained that the Director of Facilities and Infrastructure position is not hired at the Academy but rather at DOT headquarters, which can slow the process. Academy senior leaders added that the Academy faces staffing constraints more broadly, and the Superintendent told us it may be necessary to allocate at least some new positions to fill academic vacancies, rather than Office of Facility and Infrastructure vacancies.

In the absence of strategic workforce planning, the Office of Facilities and Infrastructure does not have complete information on the skills it needs to improve campus conditions, and how they should be acquired. For example, according to a senior official, the Academy does not have staff with the necessary qualifications to perform certain maintenance tasks. As a result, the official said it is typical to send maintenance staff to look at a problem and then issue a separate contract for the repair because the maintenance staff are not qualified to address the problem. As previously noted, the Academy signed a campuswide maintenance contract in 2022 to address its maintenance challenges, but that contract has not worked out as planned. To address this issue, the Maritime Administration is currently re-drafting the contract task order for maintenance to be more comprehensive.

Strategic workforce planning could help the Academy determine how to best acquire the right staff with the right skills, including determining which tasks are best performed by contractors or Academy employees. Moreover, it could ensure that a succession plan for senior leadership is in place to help provide the continuous leadership in the Facilities and Infrastructure office that is needed to sustain improvements to campus facilities.

What are the Academy's near-term priorities for improving campus conditions?

The Academy's near-term priorities for improving campus conditions include: (1) completing a long-range real property master plan and policies and procedures for capital investments; (2) starting work on new stormwater management system and seawall repair and rehabilitation projects; and (3) securing funds for projects to follow the stormwater management system and seawall repair and rehabilitation projects.

Long-Range Master Plan. The Academy is developing a new master plan to identify, prioritize, and plan future facility and infrastructure projects. A team of Maritime Administration and Academy employees began developing the plan in November 2023 and expect it to be complete by December 2024. Academy officials expect the plan to cover fiscal years 2026 to 2046, and to undergo review every 5 years to ensure alignment with Academy needs.

According to Academy officials, the new plan is necessary to address a recommendation from NAPA's 2021 report, which recommended a strategic approach to identifying and prioritizing facility and infrastructure needs. The officials also said that the new plan will address deficiencies in the prior, 2020 master plan including an absence of coordination between the Maritime Administration and the Academy in developing the plan. An Academy official told us that prior plans focused on constructing new buildings, but that greater attention is needed on the foundational infrastructure, such as the stormwater management system and seawall, discussed below. According to the officials, the Maritime Administration and the Academy have hired a consultant to bring

various campus stakeholders together and help ensure relevant input and approvals are included in the development of the new plan. In addition, officials said the new plan would include appropriate phasing of projects to ensure that academic needs can be met concurrent with renovation and construction work.

Academy officials said they are also planning to develop policies and procedures for capital projects, which they intend to publish within the new master plan. According to a DOT report, the policies and procedures will delineate roles and responsibilities among all the Academy and Maritime Administration officials required to complete all stages of capital projects.¹² The report also noted that these policies and procedures would address a recommendation from NAPA's 2021 report, which found that "inadequate pre-design discussion for new projects has led to a lack of clarity on project scope and costly miscommunication of roles and in project execution."

Stormwater Management System and Seawall Projects. The Academy has identified the need to start on two infrastructure projects concurrent with completing a new master plan. These projects are (1) an update to the campus stormwater management system and (2) the repair and rehabilitation of the campus seawall. Academy officials said that these projects are critical to addressing immediate problems, particularly rainstorm-induced flooding and waterside erosion of campus property.

According to an Academy report, campuswide water intrusion issues are due to the poor condition of the existing stormwater management system, which generally dates to 1950 (see fig 4.). Some sections of the campus date to before the campus's opening when the area was a residential property, with key aspects of the stormwater management system, including water outlet pipes, connected to the seawall, according to Academy officials. The need to replace the seawall was previously identified in the Academy's fiscal year 2014 Capital Improvement Program annual report. Since then, the Academy has made some repairs to the wall, but officials told us these repairs are not a viable solution. They said an extensive repair and rehabilitation project is needed.

Figure 4: U.S. Merchant Marine Academy Stormwater Management System Project



Project description: The stormwater management system is designed to control runoff from rain. The system uses various methods to control the quantity and quality of water discharged from the system. This can help mitigate consequences including flooding, water pollution, and water intrusion into facilities. The current system dates to 1950. An infrastructure assessment conducted for the Academy in 2022 noted that the stormwater management system and campus seawall were in “exceptionally poor condition.”

Project objective: To address stormwater runoff that degrades many buildings, roads, and parking lots on campus.

Estimated cost: \$50 million

- Design/Construction: \$33.5 million
- Building-specific mitigations: \$16.5 million

Sources: GAO analysis of U.S. Merchant Marine Academy information; GAO (photos). | GAO-24-106875

According to Academy documents, the stormwater management system and seawall projects are intended to address the Academy’s strategic goal to provide facility and infrastructure that are safe, in a good state of repair, and in compliance with applicable standards and regulations. Academy officials said that these projects will also help to create drier soil conditions that will be key to effectively executing future capital projects, such as constructing new buildings and renovating existing buildings. The fiscal year 2024 budget request for the Maritime Administration sought \$70 million for these two projects, and the Consolidated Appropriations Act, 2024 appropriated this amount for the Maritime Administration for capital improvements at the Academy.¹³ Academy officials told us that they expect to use this funding for the two projects. Figure 5 describes the Academy’s seawall repair and rehabilitation project.

Figure 5: U.S. Merchant Marine Academy Seawall Repair and Rehabilitation Project



Project description: The seawall protects the Academy waterfront and campus from the tides and waves of Long Island Sound. The seawall has four sections, made of different materials. All four sections are in various states of deterioration. An infrastructure assessment conducted for the Academy in 2022 noted that the stormwater management system and campus seawall were in “exceptionally poor condition.”

Project objectives:

- Repair existing seawall structure across the whole property.
- Increase the height of seawall to meet storm level surges and potential sea-level rise.
- Demolish Cressy Pier and Prosser Boat House and replace with seawall.
- Incorporate storm water management system into seawall repairs/improvement designs.

Estimated cost: \$20 million or more

The Academy notes that actual costs may be significantly higher than \$20 million given a variety of factors, including a yet-to-be determined height for the new wall.

Sources: GAO analysis of U.S. Merchant Marine Academy information; U.S. Merchant Marine Academy (photos). | GAO-24-106875

Future Improvement Plans. Academy officials told us that, while the Academy continues to develop its long-range master plan, it is important to maintain a “steady pipeline” of projects given the extensive improvement needs. They said the projects will need to be phased in to avoid disrupting campus operations. For fiscal year 2025, the budget request for the Maritime Administration includes \$64 million for capital improvement projects and \$22 million for facility maintenance, repair, and equipment. Specifically, the Academy is seeking capital improvement funding to repair roads, parking lots, and sidewalks following completion of the stormwater management project and funds to renovate six dormitories, a dining facility, and an administrative building.

How do the Academy’s policies and procedures for estimating costs for its capital improvements compare to best practices?

We found that (1) the Academy does not have policies establishing how it estimates costs for capital improvements, and (2) the procedures it used to estimate costs for its near-term project priorities—stormwater management system and seawall repair and rehabilitation—do not reflect cost estimating best practices. Academy officials told us that the Academy plans to use “rough order of magnitude” cost estimates, updated in 2022, to help inform its new master plan, get stakeholder approval for capital improvement projects, and prepare budget requests for capital improvement projects.¹⁴ Final project cost estimates, according to Academy officials, are only determined after funding is approved

and a bid is received from a contract solicitation. We found that the Academy has taken steps to improve its rough order of magnitude estimates but found few details for the cost estimates it prepared for its near-term capital improvements projects. Specifically:

Costs to Repair and Renovate Existing Assets. In April 2022, the Academy entered into an agreement with a cost estimator from FAA to update the Academy's prior, 2012, rough order of magnitude cost estimates to help inform its budget requests. Academy officials said they used the FAA cost estimator because the Academy does not have staff expertise in this area. The 2012 cost estimates covered what would be needed to ensure the operational continuity of campus facilities and infrastructure for a short-term period (5-years) and help plan for long term (6- to 20-years) major capital investments. The estimated total cost across the 48 assets evaluated in the 2012 report was \$176.5 million.

The Academy's 2022 report updated the cost findings of the 2012 report and addressed some deficiencies in that earlier report. For example, the 2012 report did not apply inflation factors and did not include repair of root causes of asset problems. The 2022 report included these costs and updated the project list to reflect changes since 2012. In total, the Academy's 2022 report included 51 potential repair and renovation projects with a final rough order of magnitude estimate of \$399 million. According to Academy officials, these estimated costs only cover repairs and renovations to existing facilities and infrastructure and do not represent the total costs of implementing the Academy's long-range master plan, currently in development. For example, the officials said that the total estimate in the 2022 report does not include the costs for any potential new facilities that may be identified in the new master plan. The 2022 report also does not cover existing capital improvement projects or near-term priorities, such as the stormwater management system and seawall repair and rehabilitation projects, because these projects and priorities are either already active or funding has already been requested for them.

Costs for Near-term Capital Improvement Priorities. We found that the Academy's procedures for estimating the costs of its stormwater management system and seawall repair and rehabilitation projects do not reflect cost estimating best practices. As previously discussed, the fiscal year 2024 budget request for DOT sought \$70 million for capital improvements. This included \$50 million for stormwater management and \$20 million for seawall repairs and rehabilitation. Academy officials told us that the cost estimate information on these projects was in the Academy's "Capital Improvement Program" annual reports for 2022 and 2023. However, these reports provide few details on the estimates for these projects, and the Academy was unable to provide us with cost models for the estimates. Specifically:

- For the \$50 million stormwater management system project, the cost is broken out only into campus-wide infrastructure (\$33.5 million) and building-specific mitigations (\$16.5 million). However, the Academy was unable to provide us with any details on the source of these breakouts, underlying ground rules and assumptions, or the estimating methodology.
- For the \$20 million seawall repair and rehabilitation project, the Academy was unable to provide any cost breakout. The Academy's fiscal year 2023 Capital Improvement Program annual report added that the seawall estimate may be significantly lower than the final cost because the estimate was derived from a 2017 estimate to replace a small section of the campus's seawall. An Academy official told us that there is a "100 percent risk" to the seawall project estimate because until the project gets started it is unclear what kind of challenges they may encounter.

Furthermore, the final cost will be heavily influenced by how tall the new seawall will need to be to mitigate against sea level rise and storm surge.

Academy officials told us that while the cost estimates for the stormwater management system and seawall projects are not necessarily accurate estimations for the projects' costs, they were included in the fiscal year 2024 budget request for the Academy given a critical need to address the deteriorating condition of both infrastructure assets.

GAO's *Cost Estimating and Assessment Guide* (Cost Guide) outlines best practices for cost estimating and presents 12 steps that, when incorporated into an agency's cost estimating policies, should result in reliable and valid cost estimates that management can use to make informed decisions.¹⁵ A reliable cost estimate provides the basis for informed decision-making, realistic budget formulation and program resourcing, and accountability for results.¹⁶ GAO's Cost Guide notes that rough order of magnitude estimates can be helpful for evaluating alternatives at a high level. As such, the Academy's rough order of magnitude estimates could help it compare the potential costs of renovating versus replacing existing facilities when it completes its new master plan. Moreover, GAO's Cost Guide notes that because they are developed from limited data, a rough order of magnitude analysis should not be considered a budget-quality cost estimate. Although the Academy plans to develop policies and procedures for capital investments, officials told us they had not planned to develop policies and procedures for cost estimation. However, the officials acknowledged that having cost estimating policies and procedures would be helpful moving forward.

Without cost estimating policies and procedures that align with cost estimating best practices, the Academy and DOT do not have reasonable assurances that they are reliably estimating project costs. Having high-quality estimates for future projects can have multiple benefits, including reducing the risk of project delays and cost overruns if initial funding proves to be insufficient to complete the project. Moreover, reliable estimates based on cost estimating policies and procedures that reflect best practices can help provide Congress and other stakeholders with a more accurate picture of the resources needed and strengthen confidence in the Academy's plans for improving campus conditions.

Conclusions

The changes made by DOT and the Academy to improve oversight and leadership of campus improvements are positive first steps toward the goal of ensuring that campus facilities are well-maintained, safe, and support academic requirements. However, sustaining improvements to campus conditions will require ensuring that the Academy has continuous leadership and a team capable of carrying out the necessary tasks. Because DOT and the Academy are currently reliant on temporary leadership over its Office of Facilities and Infrastructure, and they have not completed the strategic workforce planning necessary to acquire the staff capable of carrying out all the necessary tasks, the progress made at the Academy is fragile. Focused attention from DOT could help ensure that the Academy has a dedicated leadership and implementation team for the Office of Facilities and Infrastructure and a strategy to acquire the resources and skills to address long-standing challenges with campus conditions.

Fully achieving long-term improvements to the campus will also require the Academy to have better cost estimates for the many critical facility and infrastructure investments needed. Because the Academy does not have policies and procedures to reliably estimate the costs of these investments, stakeholders and Congress may not have full assurance that the Academy's budget estimates provide a comprehensive and accurate picture of the full costs to rehabilitate and modernize the campus. Developing such policies and procedures would give the

Academy the tools necessary to assess the costs of its forthcoming master plan and could help the Academy establish priorities for implementing that plan.

Recommendations for Executive Action

We are making the following three recommendations to the Maritime Administration:

The Administrator of the Maritime Administration should take steps to ensure that the U.S. Merchant Marine Academy maintains continuous leadership in the Academy's Office of Facilities and Infrastructure. Such steps should include establishing a dedicated leadership and implementation team in the Office of Facilities and Infrastructure and succession planning for leadership positions in that office. (Recommendation 1)

The Administrator of the Maritime Administration should ensure that the U.S. Merchant Marine Academy conducts strategic workforce planning to determine the needed resources, capabilities, and any skill gaps in the Office of Facilities and Infrastructure. (Recommendation 2)

The Administrator of the Maritime Administration should ensure that the U.S. Merchant Marine Academy develops and implements cost estimating policies and procedures for facility and infrastructure projects that align with best practices for cost estimating. (Recommendation 3)

Agency Comments

We provided a draft of this report to DOT for review and comment. In its written comments, which are reproduced in appendix I, DOT concurred with all three of our recommendations.

How GAO Did This Study

To inform our work, we reviewed reports on facility and infrastructure issues at the Academy, including NAPA's 2021 report, conducted a site visit to the Academy to observe campus conditions and discuss progress on campus improvements, and interviewed Academy and Maritime Administration officials.

To assess progress on campus improvements we also obtained project information on the seven capital improvement projects identified in the Academy's fiscal year 2023 Capital Improvement Program annual report, including information on cost, schedule, and factors affecting cost and schedule. To assess near-term and future projects, we reviewed DOT and Academy information, including the fiscal year 2024 and fiscal year 2025 budget requests for DOT and the Academy's fiscal year 2023 Capital Improvement Program annual report.

To examine efforts to change how DOT and the Academy manage facilities and infrastructure at the Academy, we reviewed documents describing the changes, including the Academy's fiscal year 2022 and 2023 Capital Improvement Program annual reports, and charters for oversight bodies. We also discussed the Academy's efforts to change its approach to facilities and infrastructure with Academy executive leaders—including the Superintendent, the Director of the Office of Facilities and Infrastructure, and the Director of Human Resources—and the Administrator of the Maritime Administration. We compared the Academy's leadership and workforce to relevant leading practices for agency reforms related to leadership attention and strategic workforce planning and leading practices for federal real property asset management.¹⁷

To evaluate how the Academy estimates costs for capital improvement projects, we reviewed the Academy's fiscal year 2022 assessment of campus facilities and infrastructure, which includes rough order of magnitude costs for repairing and renovating campus facilities, and fiscal year 2023 Capital Improvement Program

annual report. We interviewed officials responsible for preparing these documents and project cost estimates. We assessed how the Academy estimates costs relative to cost estimating best practices included in the GAO Cost Guide.¹⁸

We conducted this performance audit from June 2023 to August 2024 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Congressional Committees

The Honorable Maria Cantwell
Chair
The Honorable Ted Cruz
Ranking Member
Committee on Commerce, Science, and Transportation
United States Senate

The Honorable Mike Rogers
Chairman
The Honorable Adam Smith
Ranking Member
Committee on Armed Services
House of Representatives

The Honorable Sam Graves
Chairman
The Honorable Rick Larsen
Ranking Member
Committee on Transportation and Infrastructure
House of Representatives

We are also sending copies of this report to the Secretary of Transportation and other interested parties. In addition, the report is available at no charge on the GAO website at <https://www.gao.gov>.

GAO Contact Information

For more information, contact: Andrew Von Ah, Director, Physical Infrastructure, VonAhA@gao.gov, (202) 512-2834.

Sarah Kaczmarek, Acting Managing Director, Public Affairs, KaczmarekS@gao.gov (202) 512-4800.

A. Nicole Clowers, Managing Director, Congressional Relations, ClowersA@gao.gov, (202) 512-4400.

Staff Acknowledgments: Matt Barranca (Assistant Director), Jim Leonard (Analyst-in-Charge), Mike Armes, Melissa Bodeau, William Laing, Jennie Leotta, Rosa Leung, Jonathan Munetz, Kate Shlepr, Mike Soressi, Sarah Veale, and Elizabeth Wood.

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Appendix I: Comments from the Department of Transportation



U.S. Department of
Transportation
Office of the Secretary
of Transportation

Assistant Secretary
for Administration

1200 New Jersey Avenue, SE
Washington, DC 20590

July 16, 2024

Andrew Von Ah
Director, Physical Infrastructure
U.S. Government Accountability Office (GAO)
441 G Street NW
Washington, DC 20548

Dear Mr. Von Ah:

The Department of Transportation (DOT or Department) and the United States Merchant Marine Academy (USMMA or Academy) are committed to modernizing the Academy's facilities and infrastructure to support the Academy's critical national security mission. The Academy's infrastructure-related challenges have been well-documented, but we are pleased to report that USMMA is making positive strides toward ensuring that the Academy, through its Office of Facilities and Infrastructure (F&I) Management, benefits from continuous, onsite, executive-level leadership, as well as the most modern approaches to cost-estimation and construction management. Further, the Department is committed to ensuring that USMMA will be well-positioned to leverage relationships with interagency partners and federal construction agents.

To maximize the Academy's modernization efforts,

- The Department has initiated the process to hire a permanent Director of USMMA F&I Management whose full-time post of duty will be on the USMMA campus in Kings Point, NY. In the interim, the Academy's Deputy Superintendent will assume direct oversight of the F&I organization beginning in November, when the current detail ends, and continuing until the newly selected F&I executive onboard.
- USMMA's Director of Human Resources is leading a strategic workforce planning effort to assess and optimize the Academy's F&I organizational structure and staffing levels. This work to evolve the F&I organization is on the leading edge of the Academy's broader effort to implement a Strategic Workforce Planning model that utilizes best-practices in human capital management, succession planning, and talent acquisition.

Upon review of GAO's draft report, the Department concurs with GAO's three recommendations to ensure that the Academy (1) maintains continuous leadership in the Academy's Office of Facilities and Infrastructure, (2) conducts strategic workforce planning to determine the needed resources, capabilities, and any skill gaps in the Office of Facilities and Infrastructure, and (3) develops and implements cost estimating policies and procedures for facility and infrastructure projects that align with best practices for cost estimating.

The Department appreciates the opportunity to respond to the GAO draft report. We will provide a detailed response to these recommendations within 180 days of the final report's issuance. Please contact Gary Middleton, Director of Audit Relations and Program Improvement, at 202-366-6512 with any questions or to obtain additional details.

Sincerely,

Philip McNamara
Assistant Secretary for Administration

Endnotes

¹National Academy of Public Administration, *Organizational Assessment of the U.S. Merchant Marine Academy: A Path Forward*. (Washington, D.C.: November 2021); U.S. Merchant Marine Academy, *Red Sky in the Morning: A Report by the U.S. Merchant Marine Academy Capital Improvements Advisory Panel, March 2010*, U.S. Department of Transportation, Maritime Administration.

²The National Academy of Public Administration is a non-profit, non-partisan, and independent organization of public management and organizational leaders. As required by the National Defense Authorization Act for Fiscal Year 2020, the Secretary of Transportation entered into an agreement with the National Academy of Public Administration to conduct a comprehensive assessment of the U.S. Merchant Marine Academy's systems, training, facilities, infrastructure, information technology, and stakeholder engagement. National Academy of Public Administration,

Organizational Assessment of the U.S. Merchant Marine Academy: A Path Forward. (Washington, D.C.: November 2021); see Pub. L. No. 116-92, § 3513, 133 Stat. 1198, 1979–80 (2019).

³Maritime Administration, *United States Merchant Marine Academy Capital Improvement Program Annual Report, Fiscal Year 2023*.

⁴According to an Academy report, projects cannot be broken up to avoid the \$1 million threshold. However, the MMARINER Council may agree to fund a particular project in phases or through multiple contract vehicles once it has approved a project.

⁵The U.S. Merchant Marine Academy's organizational structure is subject to Maritime Administrative Order 150-1 (July 15, 2008). As defined in the Department of Transportation, an order is "a directive that, at the time of issuance, the issuing official expects to remain in effect for more than one year." Directives can be used to define the structure of an organizational unit of the Department, and such directives require the approval of the Secretary of Transportation or the relevant Administrator or Assistant Secretary. See DOT Order 1320.16D (Jan. 19, 2021).

⁶Maritime Administration, *United States Merchant Marine Academy Capital Improvement Program Annual Report, Fiscal Year 2023*.

⁷GAO, *Government Reorganization: Key Questions to Assess Agency Reform Efforts*, [GAO-18-427](#) (Washington, D.C.: June 13, 2018).

⁸GAO, *Federal Real Property Asset Management: Agencies Could Benefit from Additional Information on Leading Practices*, [GAO-19-57](#) (Washington, D.C.: Nov. 5, 2018).

⁹[GAO-18-427](#).

¹⁰For more information on key principles of strategic workforce planning, see *Human Capital: Key Principles for Effective Strategic Workforce Planning*, [GAO-04-39](#) (Washington, D.C.: Dec. 11, 2003).

¹¹[GAO-18-427](#).

¹²U.S. Department of Transportation, Maritime Administration, *Status of Implementation of the 2021 Recommendations from the National Academy of Public Administration*, September 2023.

¹³Consolidated Appropriations Act, 2024, Pub. L. No. 118-42, 138 Stat. 25.

¹⁴A rough order of magnitude cost estimate is developed when a quick estimate is needed and few details are available. Usually based on historical information, it is typically developed to support what-if analyses and can be developed for a particular phase or portion of an estimate or the entire cost estimate, depending on available data. It is helpful for examining differences in high-level alternatives to see which are the most feasible. However, a rough order of magnitude estimate should not be considered a budget quality estimate. See GAO, *Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Program Costs*, [GAO-20-195G](#) (Washington, D.C.: Mar. 12, 2020).

¹⁵[GAO-20-195G](#).

¹⁶The Office of Management and Budget's Capital Programming Guide, part of Circular A-11 (2023), Preparation, Submission, and Execution of the Budget, refers to our Cost Guide to help agencies meet most cost estimating requirements.

¹⁷[GAO-18-427](#) and [GAO-19-57](#).

¹⁸[GAO-20-195G](#).