



Boxborough Public Safety Facilities

Overview of operational practices, staffing and space needs estimates

The Boxborough Building Committee (BBC) is charged with making recommendations to the Select Board for public safety facilities that will serve the town's needs through 2050. The committee will evaluate options for upgrade and renovation as well as all-new construction. The BBC will consider projections of staffing requirements for police, fire and dispatch operations, current and future equipment needs, space estimates, and location options for the facilities. Context Architecture, a Boston architectural firm specializing in public safety facilities, was recently retained to conduct a review of 2015 estimates by HKT Architects together with input from the police and fire departments. The Context and HKT analyses of space requirements agree within 2 percent. These studies both lead to the following conclusions:

- The current police and fire stations are significantly undersized for equipment and apparatus. Their present locations provide no room for growth.
- Current facilities do not provide adequate space for personnel to carry out the work.
- The buildings do not provide proper accommodations for male and female employees and are not ADA-compliant.
- Additional space is required even now to store essential equipment, supplies and records. Housing additional personnel is not seen as an issue. The projected increase of six public safety personnel through 2050 will require less than 3 percent additional space.

Operational practices

The objective of Boxborough's public safety operations is to ensure there are adequate facilities, personnel, and equipment to protect Boxborough's residents and property, and to fulfill our responsibilities to provide support for interagency emergency responses in nearby towns. Our proximity to I-495 continues to expose us to increased demand for law enforcement, firefighting, and emergency medical response. The continued growth of our aging population, currently greater than 26 percent of residents, has resulted in an increasing need for in-town emergency medical services.

In accordance with best practices, it is essential to ensure our public safety personnel are themselves safe when providing their services. At its most basic level, this means that there should be at least two police officers on each shift patrol to backup and cover each other during public interventions, such as traffic stops. When a fire alarm is struck, we need to ensure there

are enough emergency medical technicians and firefighters (EMT/FF) to respond with both the ambulance and two fire engines. Normally this requires use of call EMT/FF in addition to full-time staff. It is also essential that all shifts for both fire and police have adequate supervision by senior staff.

These best practices can be satisfied with a modest increase of six public safety personnel through 2050.

Present Status and Needs

Both our existing law-enforcement and firefighting facilities are inadequate for our current needs. Besides providing insufficient meeting and office space, current facilities provide inadequate space for storage of supplies and equipment, and, from the perspective of best practices and building code regulations, are deficient in many respects. Overall, space for storage and maintenance of equipment and supplies is the critical need that must be addressed in planning for future facilities. The table below summarizes some of the issues.

TABLE I
CURRENT DEFICIENCIES IN OUR FACILITIES

Police Dept. Building Issues	Fire Dept. Building Issues
No proper evidence room, chain of custody	Exterior masonry in poor condition
No secure/safe area for interviews	Vehicle bays, doors, windows uninsulated
Not ADA compliant	Not ADA compliant
No acoustic privacy, dispatch comms. issues	No male/female separation, bunks, toilets
No locker/storage space for dispatch	Apparatus bays too small for future vehicles
No safety/security for dispatch personnel	Turnout gear stored in apparatus bay
No proper armory	No decontamination area for equip./personnel
Records storage beyond capacity	No climate control storage for medical supplies
Unsafe use of sally port/garage for storage	HVAC system at, or near, end-of-life
No separate female locker room	No public areas
Booking/detention area inadequate	Existing masonry walls not to code
Extensive interior/exterior repairs required	2 nd story roofing requires structural upgrade

Meeting these needs at minimum would require an estimated additional 20 percent more space for the police department, and 60 percent more for the fire department. A comparison of current areas against minimum requirements is shown in Table II

TABLE II
2023 ACTUAL CURRENT VS NEEDED SPACE AT CURRENT STAFFING

2023 Space (ft ²)		
	Current	Minimum needed
Police	4,613	5,525
Fire	8,469	13,365

The firefighting deficiency is particularly pressing, with barely room enough now for apparatus, equipment, and supplies, and no room for future growth. The present fire station cannot properly house equipment that is necessary to fight fires in Boxborough. The cramped facility is in violation of building codes and exposes Boxborough firefighters to an unsafe environment. Expansions that would correct these problems are limited by various constraints of the present Massachusetts Avenue site.

Staffing needs and projections to 2050

Space needs planning must account for current and future department personnel who require office space. Future facilities must ensure there is sufficient space for both equipment and people and provide an environment that permits safe and efficient workflow. Special police officers are included in the department roster but are not included in office space planning. A per diem or part-time deputy fire chief is included in space needs planning.

Context Architecture and the police and fire chiefs have carefully reviewed the 2015 HKT Space Needs Analysis as well as their departmental staffing needs projected to 2050. They recommend that future facilities should plan for space to accommodate six additional staff, three in each department, as detailed in the Context staffing report and summarized in Table III below. The modest projected increase in personnel will add only 2-3 percent to total space requirements.

Police additions: officer, sergeant, detective

Fire additions: EMT/FF, officer, deputy chief

TABLE III
CURRENT STAFF AND FUTURE STAFF PROJECTIONS

	Staff requiring dedicated office space		
	Current	Additions	2050
Police	20	3	23
Fire	8	3	11
Total Offices	28	6	34

Fire Department

The Boxborough Fire Department is projecting growth of two additional full-time personnel, between now and 2050, who would regularly be in the station during a day shift. Planning should also allow for an EMS coordinator or additional per diem officer. These positions all require dedicated space.

The first full-time position is a deputy chief. This position is currently slated as a per diem position and has been unfilled for the past several years. Prior to the departure of the last deputy chief, this position was consistently filled on a part-time basis.

The second full-time position is the addition of an officer (fourth firefighter) to the day shift. This addition is not projected to be in the near term but is certainly a likely possibility during the period for the expected useful life of a future facility through 2050.

Although the EMS coordinator and per diem officers may not be consistently in the building due to the nature of their positions, they do require secure and dedicated storage and workspace, adding to office space requirements.

Police Department

Police departments require space for workstations, a training area, a booking facility (lockup), dispatch center, equipment storage, evidence room, interview stations, roll call room, and administrative offices. Space is also required for more personalized areas such as locker rooms, showers, and a break area. The long-term outlook (to 2050) of the Boxborough Police Department requires a staffing model that could increase personnel by three sworn members. The growth of the town, both in population and commercial and light industrial activity, along with increased responsibilities and requirements in the policing profession dictates planning for the possibility of one additional supervisor, one detective, and one patrol officer. Growing traffic volume on I-495 will increase demands for both police and fire first responders.

It is essential that officers have proper supervision on every shift. To that end, if the department grows by two additional non-supervisors (one detective and one officer), one additional supervisor will be warranted. It should be noted that all supervisors have additional responsibilities in addition to their supervisory patrol function. These include, but are not limited to, training, scheduling, maintenance (fleet and building), investigations, public records requests, and community outreach. An additional detective will be needed as more investigations occur. In particular, cases such as fraud and identity theft continue to increase and often require longer-term investigations. Boxborough's location on a county line also increases the likelihood for cross-jurisdictional investigations which often take additional time and resources. Detectives also participate in all court proceedings along with evidence control and crime scene management. An additional patrol officer will ensure proper and timely responses to calls for service on all shifts in a safe and productive manner, while also ensuring proactive activity is maintained, such as motor vehicle enforcement, school and youth resource involvement, and engagement with community and business owners throughout Boxborough.

Estimates of space requirements

Given that the current fire station of 8,469 square feet and police station of 4,613 square feet are inadequate, the BBC asked Context Architecture to review the public safety staffing and building occupancy assumptions with the police and fire chiefs. They then reviewed the 2015 space needs analysis performed by HKT Architects, and the 2021 revisions by the BBC and the chiefs to check consistency with the staffing models.

Based on a combined facilities model, both the original HKT analysis and Context Architecture estimate the total space required for public safety – police, fire, and dispatch – is about 34,000 square feet. The Context and HKT analyses agree closely – within 2 percent.

Figure 1 below shows the approximate space utilization in the fire station and police/dispatch stations. Personnel account for a small fraction of total space requirements. The key space issue is the need for adequate equipment and supplies storage. For the fire station, about 41 percent of the area will be required for large fire apparatus alone, including the ambulances.

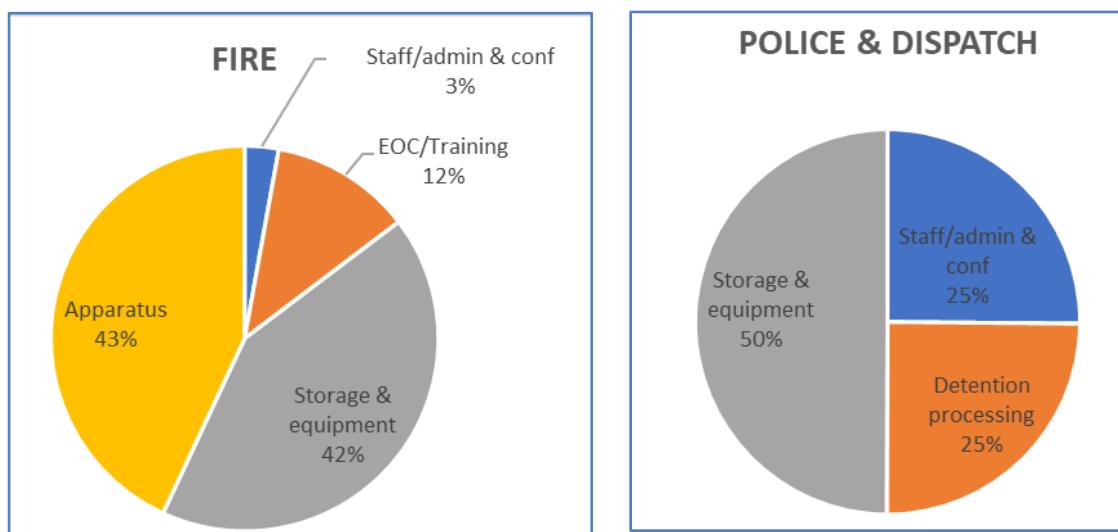


Figure 1. Space utilization in the fire station and the police/dispatch station

Sharing police and fire functions in a combined facility would realize certain economies through the sharing of common building infrastructure – for example, HVAC systems, and public areas such as lobbies and meeting rooms.

Context Architecture also estimated the space needs for stand-alone fire and police/dispatch stations. Their analysis estimates that a new stand-alone fire station would need 24,013 SF and a new stand-alone police station would need 13,013 SF, for a total of 37,026 SF. In other words, separate facilities would require 9 percent greater space compared to a combined facility. Table IV below compares areas for combined vs separate facilities.

TABLE IV
COMPARISON OF FUTURE NEEDED SPACE FOR SEPARATE AND COMBINED FACILITIES

	Needed Space At future (2050) staffing (ft²)	
	Separate facilities	Combined facilities
Police	13,013	12,232
Fire	24,013	22,070
Combined	37,026	34,202

Separating the functions into two buildings would increase total cost because the total building area would be increased. If construction of the two facilities were to be phased (for example, first fire then police) costs would be further increased due to inflation – so-called construction cost escalation. The additional cost of phasing can be estimated from construction industry inflation data and standard financial models for the bond market. The decision whether to pursue phased or delayed construction will require broad public input from town meeting members and many committees and residents.

A future addition of six public safety personnel would require a gross additional area of somewhat less than 800 square feet, out of a total of about 34,000 square feet, or 2.4 percent. The projected modest growth in personnel will have a minor impact on overall space needs planning.

The BBC is examining site locations, including the current site with the possibility of renovation and additions to the present police station. It will also review and prioritize all the space needs and attempt to identify and prioritize avenues for space and cost savings that can be achieved without impairing the town's ability to provide excellent public safety services.