Unwanted Fire Alarms

Assessing the Prevalence and Risk of Automatic Fire Alarms in Montgomery County, Maryland

University of Maryland
School of Public Policy

Claire Biffl

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About the Fellow

Claire Biffl is Master of Public Policy candidate at the University of Maryland's School of Public Policy. She is pursuing a specialization in international security and economic policy, and her policy interests center around biosecurity and intelligence. She previously worked at the National Academies of Sciences, Engineering, and Medicine on the Forum on Microbial Threats where she contributed to reports on global health issues including antimicrobial resistance, tuberculosis mitigation, and arboviral threats. She graduated with High Honors from Emory University in 2020 with a B.A. in Anthropology and a minor in political science.

As a Montgomery County Council Summer Fellow, Claire is working within the Montgomery County Fire and Rescue Service (MCFRS) in the Office of the Fire Chief.

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Executive Summary

In 2024, the Montgomery County Fire and Rescue Service (MCFRS) dispatched fire personnel to 18,614 fire-related calls. Nearly 60% of all fire-related calls were generated by Automatic Fire Alarms (AFAs), and only 5% of those AFA calls were found to be associated with real emergencies. Unwanted fire alarms are a burden on fire personnel, county resources, and community members, and could be decreased through various educational and alarm system enforcement mechanisms. Unwanted fire alarms and their impacts are felt disproportionately by those in the county identified to be socially vulnerable. In particular, residents of un-sprinklered high-rise buildings are at the greatest risk in the event of an actual emergency, so proper maintenance of fire alarm systems in those buildings is paramount to improving public safety.

Acronyms and Abbreviations

AFA	Automatic Fire Alarm
ASAP	Automated Secure Alarm Protocol
CAD	Computer-Aided Dispatch
ECV	Enhanced Call Verification
EMS	Emergency Medical Services
FARS	False Alarm Reduction Section
FARU	False Alarm Reduction Unit
LFB	London Fire Brigade
LFRD	Local fire-rescue department
MCFRS	Montgomery County Fire and Rescue Service
NFPA	National Fire Protection Association
NFIRS	National Fire Incident Reporting System
PSAP	Public Safety Answering Point
RMS	Records Management System
SFRS	Scottish Fire and Rescue Service
UFAS	Unwanted Fire Alarm Signals

1. Background

Montgomery County Fire and Rescue Service (MCFRS) Overview

The Montgomery County Fire and Rescue Service (MCFRS) is a full-spectrum public safety agency that serves the 1.1 million residents of Montgomery County across roughly 500 square miles (MCFRS, 2025a; U.S. Census Bureau, 2025). MCFRS is a combination (career and volunteer personnel) all-hazards department capable of providing a wide variety of emergency services including "medical, fire suppression, heavy and technical rescue, arson and explosive investigations, hazardous materials mitigation, and community risk reduction services," (MCFRS, 2024). Over 1,250 career personnel and 800 volunteers work for MCFRS, supported by over 100 professional staff and additional administrative volunteers (MCFRS, 2024). Montgomery County currently houses 35 fire stations and two rescue squads, including 19 local fire-rescue departments (LFRDs) (MCFRS, 2024). All fire and rescue stations within the county operate under the oversight and direction of Fire Chief Corey A. Smedley.[1]

In 2024, MCFRS personnel were dispatched to 138,032 calls within the county, an increase of over 28% from 2020 (Figure 1-1).[2] The cause for this increase in dispatches is not entirely known and outpaces population growth between 2020 and 2024. With a growing call volume, it is imperative that MCFRS' resources are used efficiently and effectively.

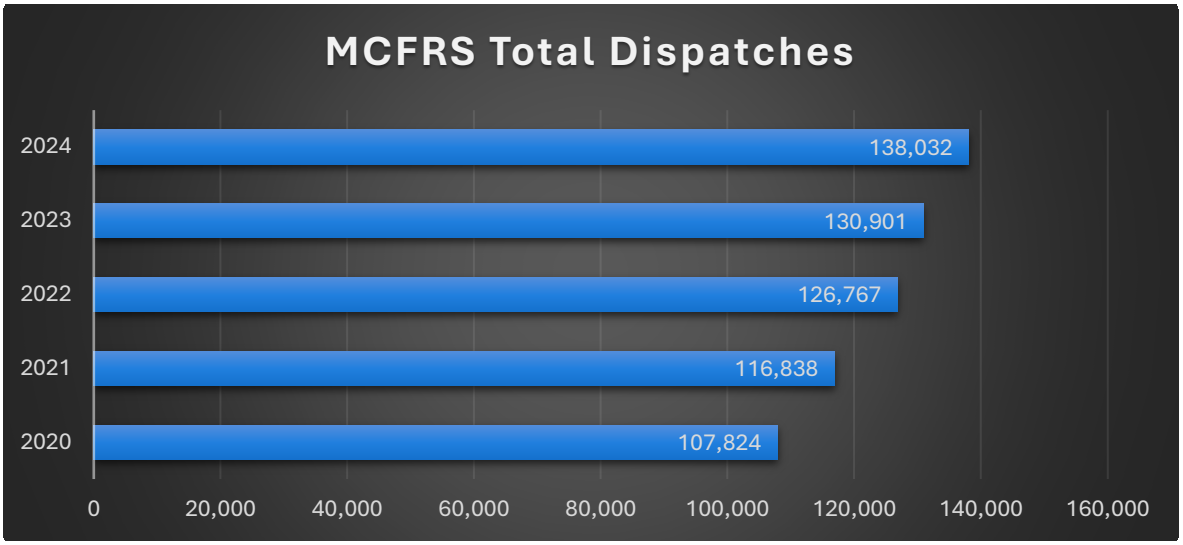

FIGURE 1-1 MCFRS Total Dispatched Calls (2020-2024).

[1] For more information on MCFRS' mission, authority, and operations see the 2024-2030 Master Plan.
[2] This data does not include calls onto federal jurisdiction or outside Montgomery County, though MCFRS does operate in collaboration with other counties' Fire Departments as needed during emergencies.

SOURCE: Generated from data provided by Melissa Schulze, manager, MCFRS Planning Section; data retrieved from MCFRS data warehouse incident tables.

Fire Monitoring Systems

Many buildings in Montgomery County are equipped with automatic fire detection and suppression systems, or automatic fire alarms (AFAs). These fire monitoring systems comprise interconnected devices and sensors that can detect potential signs of fire. They are often managed by third party alarm companies, which act as a connector from the alarm device to emergency personnel. Unlike smoke detectors, which are solely for the purpose of notifying residents of a building that an emergency may be underway, fire alarm systems from alarm companies are sold with the promise of a response from emergency personnel. Fire monitoring companies do not have explicit agreements with the fire department in Montgomery County; their monitoring agents wait in the same queue that any occupant of the county would enter when calling 911. All 911 calls, including alarm calls, are routed to various Public Safety Answering Points (PSAPs) throughout the jurisdiction, where operators code the incoming call type and connect the relevant emergency personnel to the incident. While alarm companies do not have any priority in receiving emergency responses, customers are increasingly willing to pay for the knowledge that their property is being monitored even when they are not home or aware of potential threats.

What is an unwanted alarm?

Fire monitoring systems are not perfect technologies and can often produce false signals. Sensors placed around a property might be triggered by power outages, loss of internet signal, significant weather events, loud noises, or any number of other non-emergency incidents. The data that these sensors send to monitoring agencies does not generally specify what triggered the sensor, just that a sensor was tripped. This results in a significant number of calls to PSAPs that do not turn out to be true emergencies but still receive a response from fire personnel.

In alignment with the National Fire Protection Association (NFPA), this paper will refer to such incidents when an alarm system activates a call to a 911-operating center and results in a dispatch that is later found to be unnecessary as “unwanted alarms” (NFPA, 2025b). An unwanted alarm, or “any alarm that occurs that is not the result of a potentially hazardous condition”, comprises malicious alarms, nuisance alarms, unintentional alarms, and unknown alarms (NFPA, 2025b).[3]

[3] For more information on the categories of unwanted alarms, see Chapter 3 of NFPA 72.

Problems Associated with Frequent Unwanted Alarms

Both AFA calls and unwanted alarms are increasing in Montgomery County (Figure 1-2). Although a small number of AFA calls result in structure fires or other emergencies, the vast majority of all alarm-related calls that MCFRS receives are determined to be unwanted alarms. In 2024, just 5% of all fire alarm calls required any emergency service to be performed, and only 0.53% of all AFA calls turned out to be structure fires. Further, of the total 18,614 fire-related dispatches that MCFRS attended in 2024, 59% originated from AFAs. 63% of alarm calls in which data were recorded originated from residential buildings.

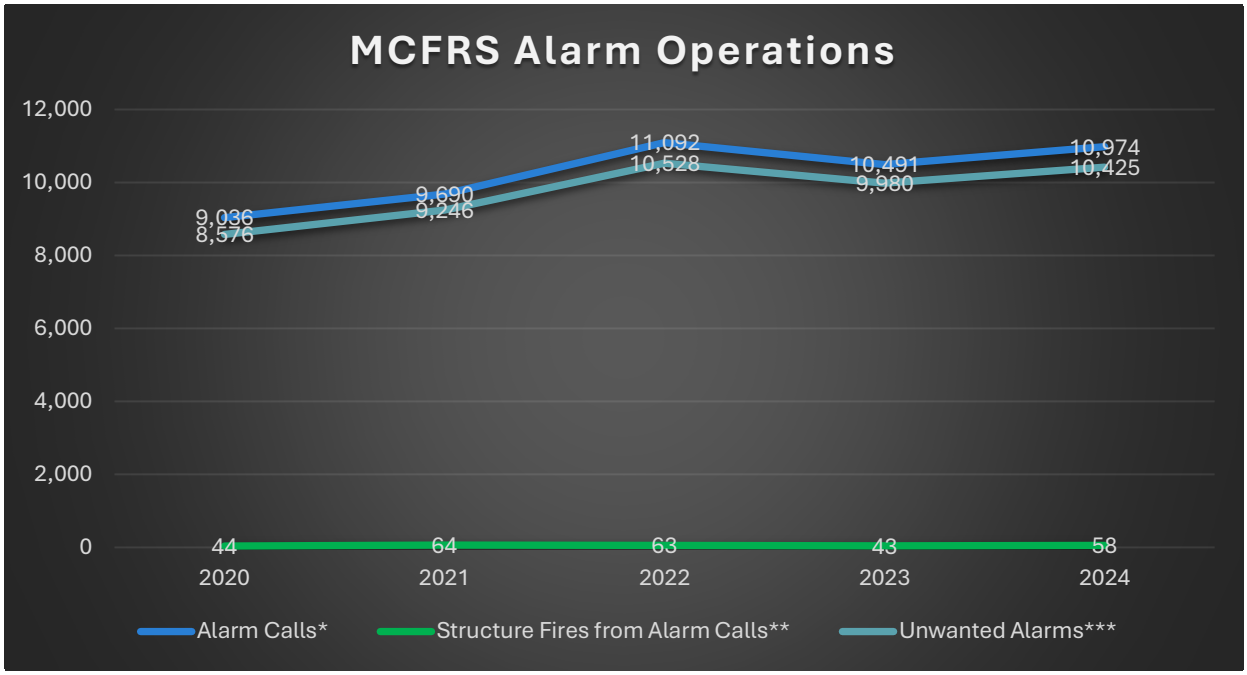

FIGURE 1-2 MCFRS Alarm Operations (2020-2024).
NOTES: *Call_Type: ALRMAFA, ALRMAFAR, ALRMHOME, ALRMHOMR, ALRMSE, or ALRMSER
**Incident_Type: 111, 112, 113, 114, 115, 116, 117, or 118; these are calls that started as an alarm and were categorized with the National Fire Incident Reporting System (NFIRS) structure fire code (111-118).
***Unwanted alarms: any alarm that did not result in a structure fire **or** have a hazardous condition present **or** result in some other emergency service being performed by Emergency Medical Services (EMS).
SOURCE: Generated from data provided by Melissa Schulze, manager, MCFRS Planning Section; data retrieved from MCFRS data warehouse incident tables.

Responding to unwanted alarms reduces MCFRS' capacity to respond to other emergencies and wastes county resources. Each fire station has a limited number of

vehicles available to respond to emergencies. If multiple engines are responding to unwanted alarms when a real emergency is called in, it may take other stations longer to reach the incident scene, potentially resulting in greater property damage, diminished medical outcomes, or even loss of life. Additionally, every call that a fire vehicle attends reduces its value due to depreciation and wear. As 95% of all alarm calls between 2020 and 2024 were determined to be "unwanted", reducing AFA calls is a clear opportunity to increase efficiency in fire responses at minimal cost to the county.

The risk to community members from frequent false alarms is also significant, though difficult to quantify. Studies have shown that "alarm fatigue" is a growing concern, particularly in hospitals where the effects are well-documented. In hospital settings, thousands of alarms may sound daily (Purbaugh, 2014). Desensitization to alarms leads to complacency and critical mistakes (Sendelbach and Funk, 2013). Both fire personnel and building occupants can develop alarm fatigue from repeated and regular unwanted alarms, which leads to problems during real emergencies. For fire personnel, the high frequency of unwanted alarms may predispose them to expect non-emergencies when responding to AFA calls. Similar to hospital personnel, critical mistakes can be made when emergency personnel are not expecting a real emergency. Residents of buildings that have frequent false alarms are also at greater risk during real emergencies. Evacuating a building, particularly in the middle of the night or in inclement weather, can be inconvenient, but it is essential in a real structure fire. Residents of buildings with frequent false alarms may be less likely to act on every fire alarm they hear, which could have detrimental effects during a real emergency.

Of particular note when evaluating the risks of alarm fatigue are county residents of the 136 un-sprinklered high-rise buildings in Montgomery County. These buildings lack fire-suppression systems that could extinguish fires before they spread. As a result, residents of these buildings are at higher relative risk, and therefore prompt fire response action is even more important when alarms originate from these buildings. However, that may not always be feasible. Frequent false fire alarms in un-sprinklered high-rise buildings result in the expectation of no emergency for both fire personnel and residents; this situation increases risk for all involved in the event of a real emergency.

2. MCFRS Response Processes

Tracing an Automatic Fire Alarm Call

When an automatic fire alarm sends a trouble condition signal to a monitoring company, an agent of the monitoring company will call a PSAP via a ten-digit phone number that is

provided to each alarm monitoring company (or in some jurisdictions an automatic call can be placed using the ASAP to PSAP system).[4] The alarm call enters the 911 queue, where the PSAP call-taker follows the appropriate ProQA Protocol to process the incident.[5] The PSAP call-taker codes the call by "type", indicating that it was an automatic fire alarm call and including any other relevant information. This call classification can be upgraded as the PSAP receives additional calls to substantiate the emergency. However, if no additional calls are received, the incident is coded as a type of "alarm call" and dispatch is organized (Figure 2-1).

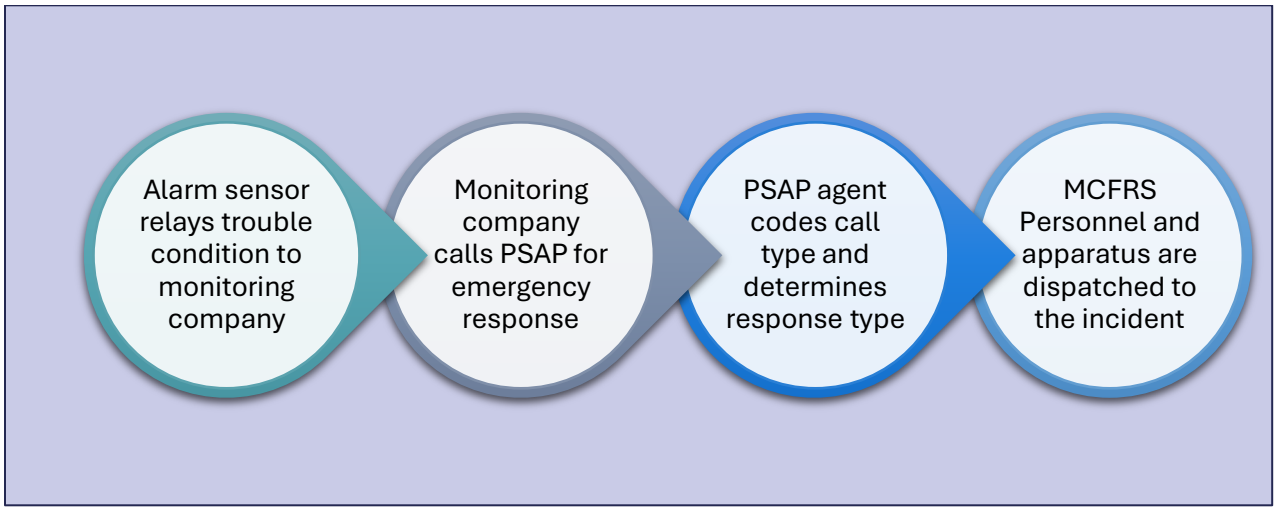

FIGURE 2-1 Automatic Fire Alarm Call Life Cycle.
SOURCE: Generated from information provided by Battalion Chief Ashley Robinson, MCFRS.

Each incident type (e.g. alarm) is mapped onto a response plan in a Computer-Aided Dispatch (CAD) system, meaning the number of vehicles and type of response (hot or cold) is generally pre-determined.[6] Each response is associated with specific vehicle and personnel requirements that must be met in the dispatch request. Various MCFRS vehicles are assigned different capabilities in order to tailor fire responses. In addition to the call type, the type of structure and other information provided by the alarm monitoring agent helps determine the response. Generally, high-rise buildings receive a greater compliment of apparatus than single-family homes due to the increased potential for risk. At any point

[4] ASAP to PSAP, or Automated Secure Alarm Protocol to Public Safety Answering Point, is a system that allows for the automated transfer of alarm signal information from a monitoring company directly to an emergency dispatch center without the need for a phone call. MCFRS does not currently use ASAP to PSAP, though it is used by the Montgomery County Department of Police.
[5] ProQA is a provider of 911 software for emergency dispatch. Different protocols exist for Emergency Medical, Fire, or Police dispatches.
[6] For more information on hot and cold response types, see section "Variation in Response by Structure Type".

during the call, dispatch, and incident response, the call type can be upgraded by PSAP call-takers if more information is reported or the emergency is substantiated by other calls.

Geographic Distribution of Unwanted Fire Alarm Calls

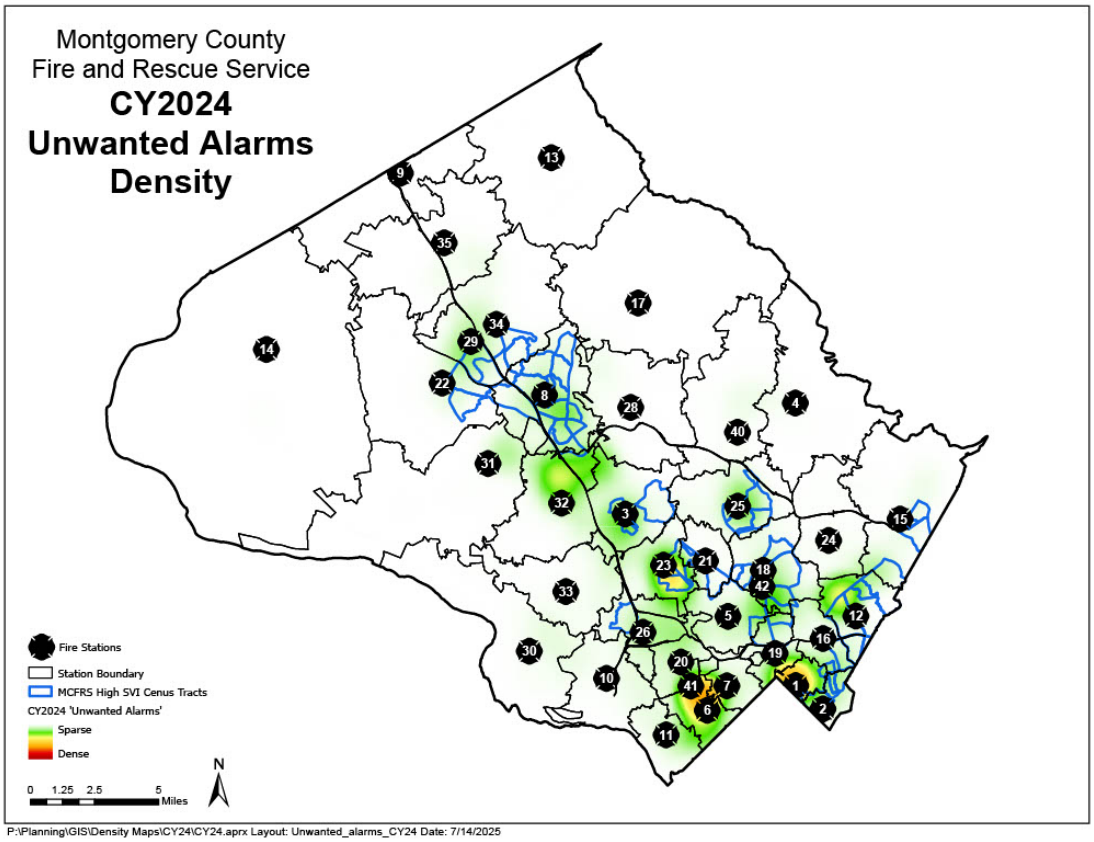

Figure 2-2 Geographic Distribution of Unwanted Alarms (2024).
NOTES: High social vulnerability areas are outlined in blue.
SOURCE: Generated by Sarah Ierley, GIS manager, from data provided by Melissa Schulze, manager, MCFRS Planning Section; data retrieved from MCFRS data warehouse incident tables.

Unwanted alarms in Montgomery County appear to be largely concentrated around population-dense areas, as well as areas identified to contain socially vulnerable populations, though more research into the exact nature of this relationship is needed (Figure 2-2). This distribution of unwanted alarms in the county appears to be primarily correlated with population density along the DC border and the I-270 corridor, as higher concentrations of residents could increase the likelihood of unwanted alarm activations. However, it is also important to consider the distribution of socially vulnerable populations in the county, as unwanted alarms are closely connected to these communities. “Social vulnerability” in this context refers to an individual or community’s greater susceptibility to

harm from external stressors compared to the population at large. This connection between unwanted alarms and social vulnerability in Montgomery County could indicate that perhaps older buildings, which are generally more affordable to lower-income households, contain fire monitoring systems that are not being properly maintained. Poorly maintained fire alarm systems are a significant cause of unwanted fire alarms, and individuals with fewer housing options will be less likely to exert the pressure on landlords necessary to effect change. As a result, it is possible that the burden of unwanted fire alarms falls largely on socially vulnerable county residents. More research should be conducted to illuminate the exact relationship between unwanted fire alarms and social vulnerability, as that work is not within the scope of this paper.

Variation in Response by Structure Type

The resources dispatched to different AFA calls vary by structure type and represent different costs to MCFRS and the county. The number and type of vehicles varies, as does the method of response. A "hot response" is a method of responding to an emergency call that is used in high-priority emergencies where urgency in response is critical. These cases include structure fires, hazardous materials incidents, cardiac arrest calls, and severe trauma. A hot response involves the utilization of emergency lights and sirens to reach an incident scene more quickly, as the speed with which emergency personnel reach the scene can have significant impacts on loss of life or damage control. Un-sprinklered high-rises in Montgomery County receive hot responses for AFA calls.

In contrast, a cold response is used when response time is not critical. During a cold response, emergency personnel will not use lights or sirens and will obey normal traffic laws while en route. This variations in response type represent different indirect risks to the county, as research indicates that use of lights and sirens has been associated with increased risk of vehicle crashes (Watanabe et al., 2019). However, the rate of hot to cold responses may not coincide with the rate of time-sensitive to non-time-sensitive calls and could merit further investigation; that research is outside the scope of this paper.

Quantifying the cost to county of any given unwanted fire alarm is largely dependent on the structure type from which the alarm originated. An AFA from a residential building will receive a single engine with a cold response. An AFA from a commercial building will receive one engine and one special service with a cold response.[7] An AFA from an un-sprinklered high-rise building will receive one engine and one special service vehicle with a hot response. These different response types cost the county varying amounts of money.

[7] A "special service" entails a vehicle other than a fire engine (e.g. an ariel or a rescue squad).

Cost Burden of Unwanted Alarms in Montgomery County

A significant consideration in assessing the burden of unwanted fire alarms on Montgomery County is the amount of money that is devoted annually to responding to these AFAs. In calculating an accurate cost for calendar year 2024, data on how long various MCFRS apparatus and personnel spent responding to the 10,425 unwanted alarm calls have been collected and estimated to cost over $1.8 million. In 2024, all various apparatus (engines, aerials, and rescue squads) spent approximately 149 days (3,578 hours) responding to unwanted alarms. A fire engine is staffed by four firefighters, which costs $9,659.75 per day of operation. Aerial and rescue squads are each staffed by three firefighters, which costs $7,294.99 per day of operation. The cost to operate each apparatus itself is estimated roughly at $150 per hour of use. The personnel and apparatus costs can be combined to total $1,831,141 in 2024 (Figure 2-3). Between 2020 and 2024, the annual cost of responding to unwanted alarms has increased 38%.

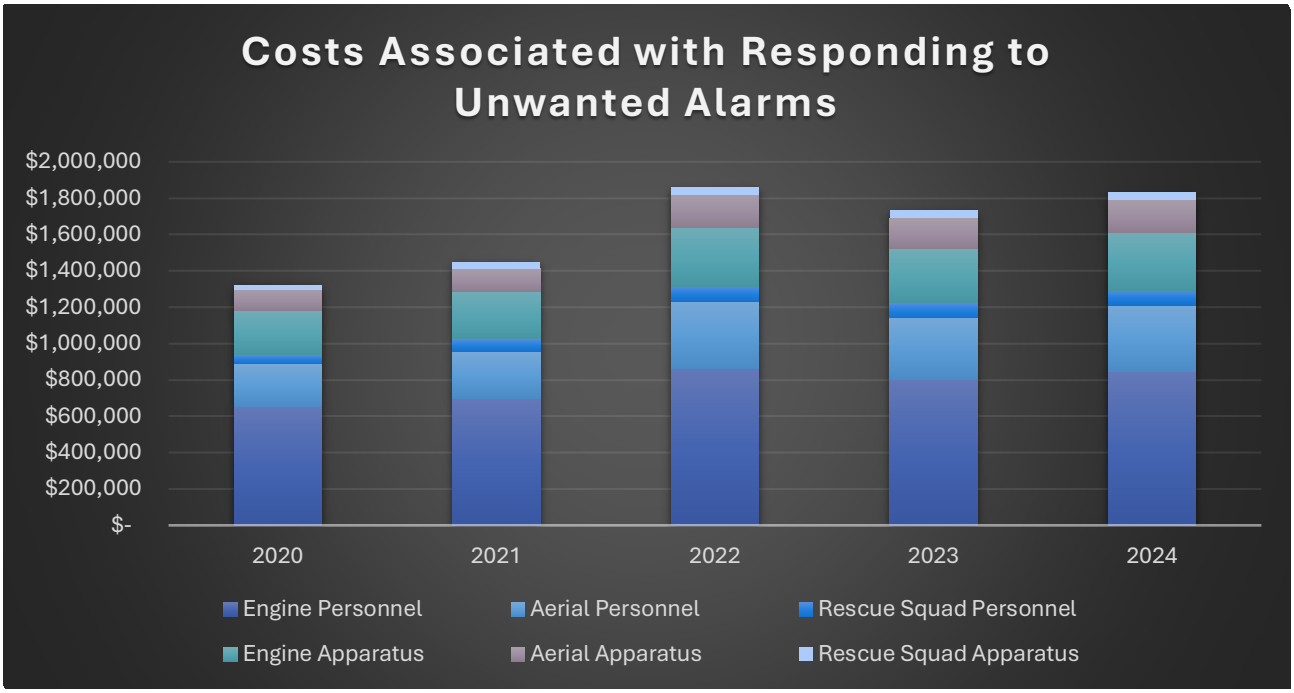

Figure 2-3 Costs Associated with Responding to Unwanted Alarms (2020-2024). SOURCE: Generated from data provided by Dominic Del Pozzo, Fiscal Management Division Chief, MCFRS.

As MCFRS personnel are paid for their time regardless of how many calls a given station receives, it is important to note that the costs associated with responding to unwanted alarms are not indicative of the total amount of money the county might save if unwanted alarms were eliminated. However, the total number of calls each station receives annually informs when new vehicles are added to stations at significant cost to the county. Reducing

unwanted alarms could decrease the urgency to add units throughout high-demand areas of the county and result in greater availability of existing units to respond to high priority calls.

While the figures from Montgomery County indicate that responding to one unwanted alarm in 2024 cost $176 in personnel and apparatus expenses, this figure is an extremely conservative estimate. A 2021 study on the economic burden of responding to AFAs in Australia estimated a significantly larger figure when additionally accounting for factors like productivity losses from businesses, injuries or fatalities from responding fire brigade collisions, and opportunity costs to fire personnel, residents, and bystanders. The average cost of responding to a single AFA in 2018-2019 was holistically estimated to be between AUD$4,952 and AUD$7,403 (USD$3,267 – USD$4,884) (Tannous, 2021). As Montgomery County does not yet have data about the full scope of the cost of responding to an unwanted alarm, this could be an important area for future research.

3. Montgomery County Department of Police: False Alarm Reduction Section (FARS)

False Alarm Reduction Section Overview

Throughout the 1980s and early 1990s, automatic burglar systems became more common in Montgomery County, which resulted in a growing burden on the Montgomery County Department of Police. In 1994, the county's burglar alarm law (regulation no. 1-19) went into effect with the establishment of the False Alarm Reduction Section (FARS). Since implementation, FARS has seen great success in reducing the number of unwanted alarms that the police department responds to annually, though it explicitly excludes fire alarms.

The previous alarm ordinance in Montgomery County was established in the 1980s with enforcement under the Office of Consumer Affairs. Alarm systems were not yet widely used throughout the county, but there were a growing number of false alarms originating from commercial business buildings. As alarm systems became more popular in the late 1980s and early 1990s, the Office of Consumer Affairs identified that enforcing response fees against constituents would be counterproductive to its mission. Enforcement was then moved to the Department of Police and FARS, as it operates today, began in 1994 (Hook, 2025). In 1994, the police responded to an estimated 42,821 unwanted alarms with 29,756 alarm users registered in the county. By 2024, the total number of dispatches to unwanted alarms had decreased to only 8,889, with an increase to 87,338 registered users throughout the county (Figure 3-1) (MCPD, 2025b).

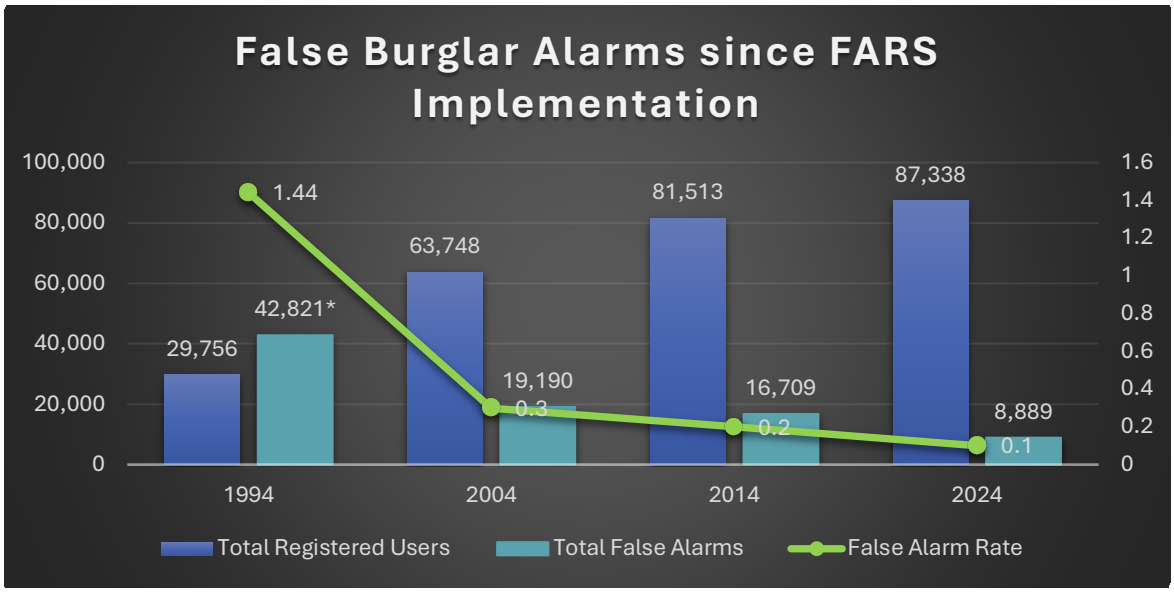

FIGURE 3-1 False Burglar Alarms (1994-2024).
NOTES: *The number of verified calls for 1994 is unknown. The total number of alarm dispatches was 42,821.
SOURCE: Generated from data from the False Alarm Reduction Program 2024 Annual Report.

The exact mechanisms of FARS' success are its registration requirements, call verification, and enforced fee structure, which encourage alarm users to install, operate, and maintain their systems properly. In order for alarm companies to install burglar alarms in Montgomery County, they must comply with FARS' requirements for proper installation and inspection. Alarm users must also register their systems with the Department of Police. Registration costs $30 and is valid for two years. When a burglar alarm sensor is activated, the county's burglar alarm law requires that the associated alarm company attempt to verify every alarm signal (except duress or hold-up) before police dispatch is requested. This means that the alarm company must call the customer to verify trouble at two separate phone numbers, generally referred to as a policy of Enhanced Call Verification (ECV). This gives the customer an opportunity to retract the call before the police are dispatched. If no one is reached via telephone, police officers are dispatched to the scene and must spend at least one minute onsite to determine whether a crime was committed. If the police find no evidence of an emergency and the alarm is determined to be "false", the property owner or individual responsible for the alarm is charged a fee (Figure 3-2) (Code of Montgomery County Regulations, 3A.00.01).

False Alarm Signal Occurrence	Non-residential False Alarm Response Fee	Residential False Alarm Fee
1st	$0.00	$0.00
2nd	$25.00	$25.00
3rd	$50.00	$50.00
4th	$75.00	$75.00
5th	$100.00	$100.00
6th	$150.00	$150.00
7th	$200.00	$200.00
8th	$250.00	$250.00
9th	$300.00	$300.00
10th	$400.00	$400.00
11th	$500.00	$500.00
12th	$600.00	$600.00
13th	$700.00	$700.00
14th	$800.00	$800.00
15th	$1,000.00	$1000.00 each
16th	$1,500.00	-
17th	$2,000.00	-
18th	$2,500.00	-
19th	$3,000.00	-
20th	$4,000.00 each	-

FIGURE 3-2 False Alarm Fee Structure.
NOTES: An additional fee of $100.00 applies to the first response and each subsequent response to a false alarm from an alarm system whose registration has expired.
Fees can be waived if the alarm system is determined to have been activated by "an act of God", including weather, power surges, etc.
SOURCE: Generated from data from Montgomery County Executive Regulation 1-19.

Current Operations in Montgomery County

In 2024, FARS generated $1,030,672 in revenue from false alarm fees (MCPD, 2025b). This revenue was added to the Police Department's general fund for use throughout the county (Hook, 2025). Additionally, FARS calculated that their enforcement of the alarm law led to 6,973 alarm calls that did not require police responses, leading to an estimated $955,301 in cost avoidance (MCPD, 2025b). The combined impact of revenue generation and cost avoidance from FARS totals nearly $2 million in 2024. The economic benefits of FARS, in combination with the public service benefits produced by incentivizing proper alarm maintenance and operation, make FARS an extremely successful program.

MCFRS responded to more unwanted alarms than the Montgomery County Police Department did in 2024, but without any regulatory or policy mechanism to address the issue. In 2024, the Montgomery County Police Department received 848,289 calls for service, to which police officers were dispatched to 207,871 (MCPD, 2025a). Of those 207,871 dispatches, 8,889 were related to false alarms (4.3%) (MCPD, 2025a; MCPD, 2025b). In contrast, MCFRS personnel were dispatched to 138,032 incidents, of which 10,425 were determined to be unwanted alarms (7.6%) (MCFRS, 2025b) (Figure 3-3).

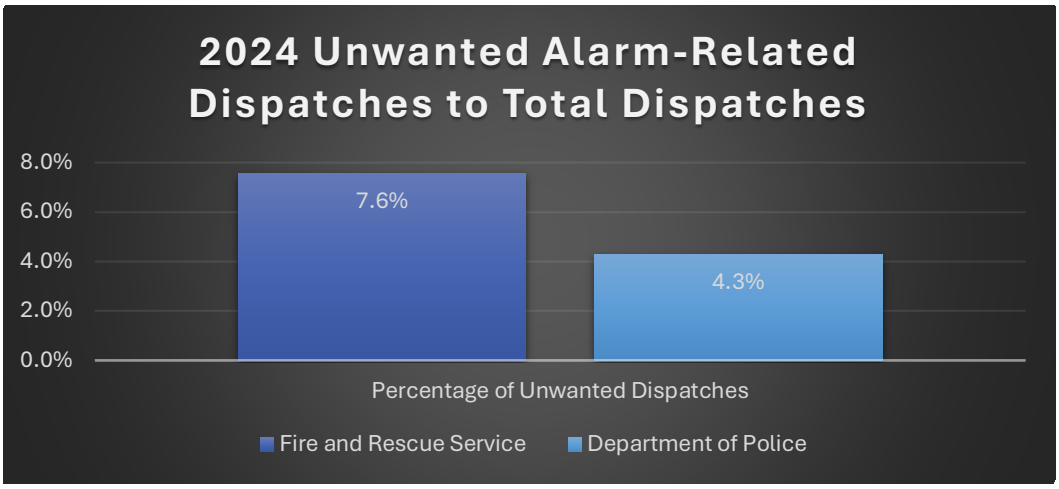

FIGURE 3-3 Percentage of Unwanted Alarm-Related Dispatches by Emergency Department (2024).
SOURCE: Generated from data from the Montgomery County Department of Police's 2024 Annual Report on Crime and Safety and the Montgomery County Fire and Rescue Service's 2024 Total Dispatched Incident Counts report.

4. Case Studies

Calvert and Charles Counties, Maryland

Calvert County and Charles County in Maryland have similar unwanted alarm reduction mechanisms. Both counties rely on their respective False Alarm Reduction Units (FARUs) to decrease the prevalence of unwanted alarms. Like the Montgomery County Department of Police's FARS, each FARU oversees and enforces a system of registration and installation requirements, maintenance standards, and increasing fees for unwanted alarm dispatches. Calvert and Charles Counties have both combined all burglar, fire, and emergency medical alarms under a single regulation or ordinance so that FARU personnel can provide oversight to all alarm systems in the county (Calvert County Maryland, n.d.; Charles County Maryland, n.d.).

London Fire Brigade

The London Fire Brigade (LFB), which covers over 600 square miles and services 9 million people, announced in 2024 that it would no longer respond to all AFAs (LFB, 2023; LFB, 2024). Reducing false alarms "due to [AFAs] in non-domestic building[s]" was identified as a priority area for increasing protection effectiveness in LFB's Community Risk Management Plan and a new policy was implemented as part of that effort (LFB, 2023).

As of October 2024, LFB no longer responds to AFAs in most non-residential buildings between the hours of 0700 and 2030, excluding "schools, nurseries, hospitals, care homes, listed heritage sites, and other exempt premises" (LFB, 2024). This policy decision was made in response to the abundance of false fire alarms calls the Brigade had been receiving, which comprised an estimated 40% of all calls. LFB decision-makers also noted that "less than 1 per cent of automatic fire alarms signal genuine fires – the remaining 99 per cent are false alarms, placing an unnecessary burden on the Brigade's resources," (LFB, 2024). The policy change was made after consultation with London residents, and in alignment with other United Kingdom fire and rescue services.

Scottish Fire and Rescue Service

The Scottish Fire and Rescue Service (SFRS) also identified a need to more efficiently respond to false alarm calls in its 2022-2025 strategic plan (SFRS, 2023b). As a result, SFRS implemented a policy in July 2023 to stop attending AFA "call outs to commercial business and workplace premises, such as factories, offices, shops and leisure facilities – unless a fire has been confirmed," (SFRS, 2023a).

A significant amount of research was conducted before SFRS' Unwanted Fire Alarm Signals (UFAS) policy implementation. Notably, around 600 responses were received during a 12-week public consultation in 2021 about amending SFRS' response to AFAs (SFRS, 2023c). Three policy options were proposed, with varying estimates of effectiveness in reducing the approximate 28,000 annual false alarms from workplace AFAs. Ultimately, the most conservative option, which estimated a 57% reduction in unwanted fire alarm attendance, was chosen and implemented. This option included automatic exemptions for hospitals, sleeping risk premises, and Residential Care Homes (SFRS, 2023c).

5. Recommendations

Unwanted Fire Alarm Reduction Mechanism

MCFRS has an opportunity to reduce the burden of unwanted fire alarms on the county before fire and rescue personnel are entirely overburdened by such calls by utilizing a similar approach to the Department of Police. FARS has been extremely successful in reducing the prevalence of false burglar alarms, promoting responsible alarm system upkeep, and generating revenue for the department. With coordination between MCFRS, MCPD, the County Council, and the County Executive, an enforcement mechanism could be adopted by MCFRS through Executive Action.

Alternately, FARS could be expanded to include automatic fire alarm systems. FARS is already operating in many of the buildings that also have automatic fire alarm systems, and with many of the same alarm companies. Expanding the operational scope of FARS to include fire alarms would require an expansion of the program but would make the best use of the years of knowledge and experience that FARS employees have generated while enforcing the best alarm practices.

The County Council should also consider the feasibility and merits of requiring alarm data from private alarm vendors and monitoring companies so that MCFRS could accurately calculate the number of fire alarm systems in the county. If all automatic fire alarm systems were registered with the county, and data were collected about trouble signals that result in calls to PSAPs, enforcement of proper installation and maintenance would be significantly easier to enact.

Enhanced Call Verification

Various jurisdictions across the United States have cited a need to reduce the burden of unwanted fire alarm calls on local fire departments, but responding to all potential emergencies is a difficult mission to balance with potential solutions. The population of Montgomery County expects that when 911 calls are placed, emergency personnel will respond. However, if emergency personnel are occupied with unwanted alarm calls, and PSAP call-takers are fielding calls related to automatic alarm alerts, there is a possibility that county residents could be negatively affected by hold times when they dial 911, or delayed responses from MCFRS personnel in transit. For this reason, the County Council should consider the merits of adopting legislation to require ECV, specifically two-call verification from alarm companies that are requesting emergency responses to automatic fire alarm calls.

Verifying every alarm signal would mean that before an alarm monitoring company could request MCFRS response, they must first attempt to call the alarm user via two telephone numbers. If the alarm user does not answer, or confirms the emergency, the alarm company would place the emergency dispatch request. However, it is likely that in many instances the alarm user would be able to cancel an emergency response by confirming that the sensor trouble condition was the result of a non-emergency situation, like loss of Wi-Fi or power.

A policy of ECV would add time between signal detection and emergency response in the event of a real emergency. However, as previously discussed, most unwanted alarms are already receiving cold responses from emergency personnel, meaning response time is not a major consideration. The additional one to two minutes it would take for an alarm monitoring agent to contact the alarm user would not significantly impact emergency response times, particularly when a single 911-call from someone substantiating the AFA would upgrade the call to a hot response. This would also shift a significant amount of burden from fire and rescue personnel to the alarm companies that are responsible for monitoring alarm systems

Sprinkler Incentives and Interim Measures

In order to significantly reduce the risk of fires in Montgomery County's highest-risk buildings, the remaining 136 un-sprinklered high-rise buildings must be retrofitted with fire-suppression systems. Property owners are not currently motivated to make any changes, as neither the county nor the state is enforcing the 2033 directive. Ultimately, the installation of sprinkler systems by the year 2033, as mandated by NFPA 101, will need to be enforced by local government officials or it will not be completed.

The County Council should consider the findings and recommendations of the Workgroup to Develop Fire Safety Best Practices for Pre-1974 High-Rise Apartment Buildings, which clearly outline the risk of un-sprinklered apartment buildings and proposes a layered approach to improving fire safety across the state of Maryland. Specifically, the Workgroup recommends immediately implementing interim measures to properly maintain fire alarm systems, ensure compartmentation of egress routes, uniformly enforce routine inspections, and provide regular fire safety education to residents of high-risk buildings while property owners prepare to install sprinkler systems (Workgroup to Develop Fire Safety Best Practices for Pre-1974 High Rise Apartment Buildings, 2025).

Incentivizing or subsidizing the installation of sprinkler systems should be considered by the County Council as possible mechanisms to expedite necessary building upgrades while allowing current property owners to keep ownership of their buildings. It would be

reasonable to assume that some owners of the 136 un-sprinklered high-rise buildings in Montgomery County may not be able to financially undertake sprinkler retrofitting and asbestos mitigation and would be forced to sell if mandate enforcement went into effect. In order to mitigate this risk, the County Council should consider supporting fire system upgrades through a one-time subsidization of a percentage of the total cost to the property owner.

Special efforts should be made to ensure that vulnerable populations are not displaced from their homes with no alternate living arrangements provided, so the County Council should make efforts to avoid building closures. Building owners who are unable to afford immediate building upgrades should be encouraged to work with the Fire Marshal to identify reasonable alternatives to sprinklers that would decrease risk to occupants in the event of a fire. This could include smoke curtains, improved compartmentation, frequent fire-related education events, and available fire extinguishers.

6. Challenges and Limitations

Estimates for the burden of unwanted fire alarms in Montgomery County are difficult to determine with complete certainty as the data collection is imperfect. This paper utilizes initial call types, classified by PSAP call-takers, minus all the calls that resulted in some emergency service being performed to determine how many unwanted alarms occur annually. This metric is useful but lacks the specificity that could be gleaned from data collected after incidents are fully completed. After fire personnel are dispatched to an incident and complete an emergency response, they complete an incident report in which a "final call type" is determined. This is done through the National Fire Incident Reporting System (NFIRS). NFIRS does not adequately capture the complexities of emergency incidents, and limitations of MCFRS' records management system (RMS) likely underestimate the number of unwanted alarms. Additionally, fire personnel are only trained briefly at the beginning of their careers on NFIRS, so there is significant variation in how different individuals code a single event, making this data unreliable. Of the many incident classification options that exist in NFIRS, some take significantly longer to code than others, incentivizing some fire personnel to code false alarms as other incident types. NFIRS is scheduled to be replaced by a new system at the end of calendar year 2025, but there is a need to ensure that the new coding system is user-friendly and that fire personnel are trained adequately to ensure reporting is as accurate as possible. This will allow for greater specificity in evaluating the true burden of unwanted fire alarms on MCFRS, and the cause of them (malicious alarm, nuisance alarm, unintentional alarm, or unknown alarm).

It is currently unknown how many automatic fire alarm systems exist in Montgomery County. The scope of enforcing a FARS-like program is difficult to estimate because little is known about how many alarm systems would need to be registered with the county. If the County Council pursues an unwanted fire alarm enforcement mechanism, project leaders will need to evaluate how many property owners in the county and alarm monitoring companies will need to be notified of the change.

7. Note for Discussion: High-Risk Buildings

Un-Sprinklered High-Rise Buildings

Between 2020 and 2024, nearly 2,500 alarm calls in Montgomery County originated from un-sprinklered high-rise buildings.[8] This represents 4.9% of all AFA calls in the county. Of the unwanted AFA calls originating from un-sprinklered high-rise buildings, nearly 50% came from four apartment buildings (Figure 7-1).

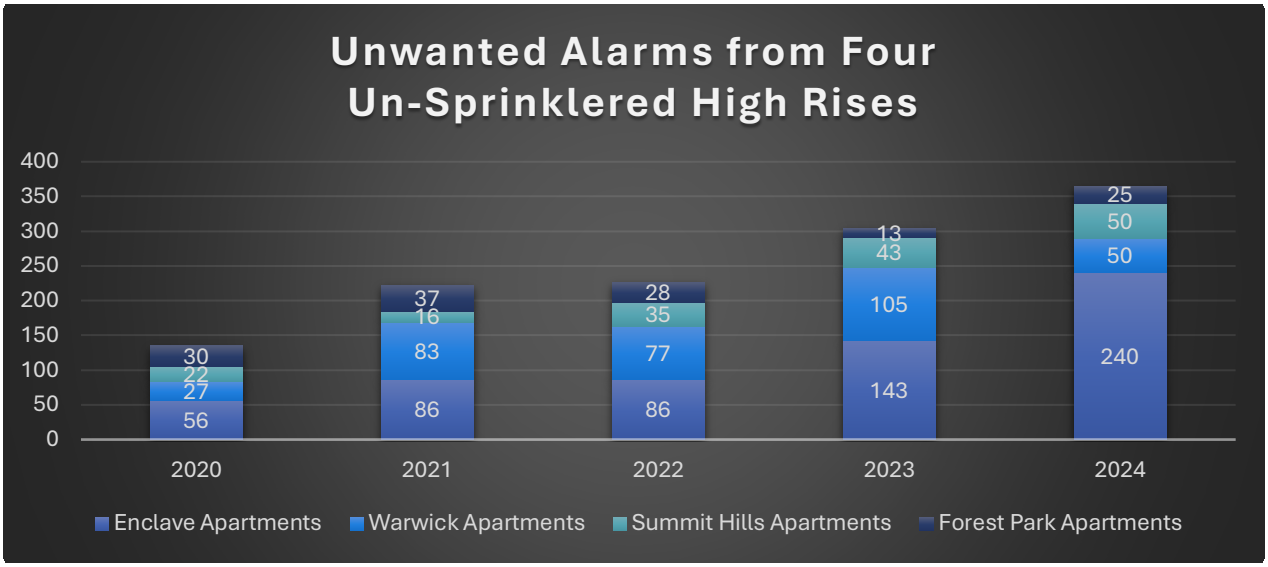

FIGURE 7-1 Unwanted Alarms from Four Un-Sprinklered High-Rise Buildings
SOURCE: Generated from data provided by Melissa Schulze, manager, MCFRS Planning Section; data retrieved from MCFRS data warehouse incident tables.

Though there are only 136 un-sprinklered residential high-rise buildings in Montgomery County, these buildings represent the county's "single greatest fire hazard, in terms of potential for loss of life," due to outdated infrastructure, lack of fire suppression systems, and high occupancy (MCFRS, 2024). A majority of un-sprinklered high-rise buildings are

[8] "High-rise" buildings are generally categorized by MCFRS as five stories or taller. Definitions of "high-rise" buildings vary across jurisdictions.

also located within areas of the county identified to have high social vulnerability (Figure 7-2).

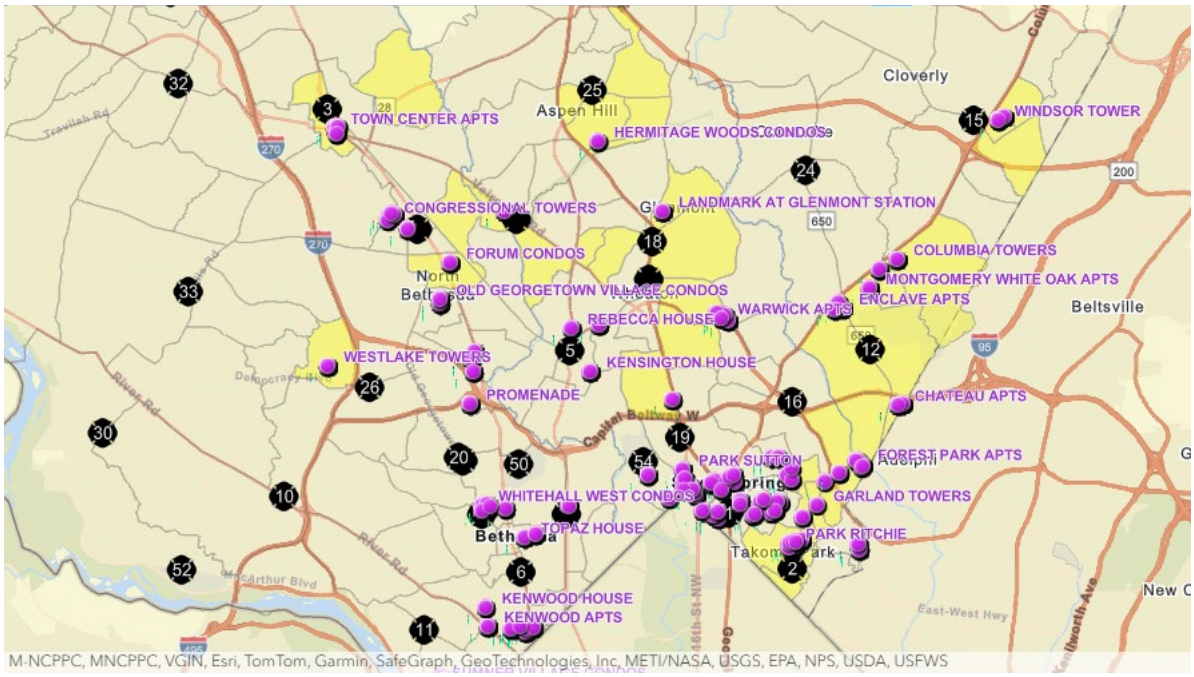

FIGURE 7-2 Distribution of Un-Sprinklered High-Rise Buildings
NOTES: High social vulnerability areas are highlighted in yellow.
SOURCE: Image provided by Melissa Schulze, manager, MCFRS Planning Section.

The potential for complacency that accompanies frequent false alarms puts residents of these buildings at even higher risk as they are less likely to evacuate or act quickly when a real emergency is taking place. The combination of psychological complacency and outdated physical infrastructure found in un-sprinklered buildings results in a significant threat to vulnerable populations with major possible consequences; this is a high-risk area for MCFRS to address with the aid of the Montgomery County Council.

Building Code

The Maryland State Fire Prevention Commission determined in 2018 that all un-sprinklered high-rise residential buildings in the state were a significant safety hazard. Shortly after, the Maryland State Fire Marshal mandated that these buildings must be fully sprinklered by 2033. However, in 2024, the Office of the Fire Marshal announced that the mandate would not be enforced, effectively eliminating the policy (Lerch, Early & Brewer, 2024). Montgomery County cannot rely on the state to require retrofitting of un-sprinklered buildings; outdated or absent fire suppression systems pose a real risk to residents and

communities. It is estimated the presence of a sprinkler system reduces the risk of dying in a home fire by 85% (NFPA, 2025a).

Montgomery County building code requires that as upgrades are made to older buildings, sprinklers must be installed if 50% of the building's structure is demolished or reconstructed over the course of renovations (COMCOR 08.00.02.148). However, there are significant gaps in this policy, as property owners can do significant cosmetic work that is considered "renovation" and not "reconstruction".[9] Property owners can also split their reconstruction work over several years to avoid the sprinkler retrofit requirement.

Retrofitting older buildings with sprinklers is a significant undertaking with a high cost to property owners. It can additionally necessitate asbestos mitigation, which can be extremely expensive. Montgomery County does not currently have a clear policy to provide financial incentives to building owners for sprinkler installation, and no enforcement is planned to ensure property owners upgrade their buildings' fire-suppression systems. As a result, little action is being taken to upgrade the county's 136 highest-risk buildings.

Risk to Community

In 2023, a fire broke out at a Silver Spring apartment building (8750 Georgia Avenue) and resulted in the tragic deaths of Melanie Diaz and her two dogs. The apartment in which the fire started did not have a fire alarm, and the 15-story building had no sprinkler system (Corin, 2023). Residents reported confusion about the gravity of the situation, which led to delayed responses in calling 911 and evacuating the building. By the time some residents were leaving, fire personnel noted that sheltering in place behind closed doors would have been the safest option. Diaz died of smoke inhalation in a stairwell while trying to evacuate the building (Montgomery County Council, 2023). The risk to residents in apartment buildings with no sprinkler systems is significant, and reducing the frequency of false alarms would make it clearer when true emergencies are taking place to both building occupants and fire personnel.

Appendix A: Equity and Social Justice Impact

The purpose of this work is to assess the burden of unwanted fire alarms on Montgomery County, but significant variations exist in where the burden is distributed, and which residents of the county would be most impacted by proposed solutions. Census tract data has been used to identify where within the county communities with high social

[9] For more information on building upgrade definitions, see Chapter 43 of NFPA 101 on Building Rehabilitation.

vulnerability exist, and these areas appear to be correlated with both more un-sprinklered high-rise buildings and more unwanted alarms. These connections have not been explored in great depth within this paper, but they merit further investigation in order to improve fire safety for the county's most at-risk populations.

The recommendations outlined above to reduce the prevalence of unwanted alarms would all have disproportionately negative impacts on those assessed to have high social vulnerability. In particular, the fee structure for poorly maintained alarm systems may incentivize property owners to raise rent prices to account for the cost rather than resolving underlying issues with alarm systems, or it could result in building sales if property owners determine that the costs of asbestos remediation and sprinkler installation are too expensive to undertake. As previously mentioned, any proposed sprinkler mandates should carefully consider the impact on low-income households or individuals that may become homeless if buildings are closed due to code violations.

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