RESEARCH REPORT

The Role of Locked Doors and Access Control in School-Based Active Shooter Events

An Analysis of U.S. K–12 Active Shooter Incidents, 2000–2025

PREPARED BY:

The ALERRT Center

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Dedication

This report is dedicated to the students, educators, and school staff whose lives have been affected by school-based violence, and to the first responders, school safety professionals, and researchers working to prevent future harm.

Executive Summary

School-based active shooter incidents, though statistically rare, remain among the most consequential forms of targeted violence in the United States. Door locks and access-control measures are routinely cited in guidance documents, scholarly manuscripts, and after-action reports as central to school safety strategy, yet systematic evidence on how these measures function during real-world incidents has remained limited. This study, funded by the Security Industry Association, examines the role of door locks and related physical security features in school-based active shooter events.

The analysis centers on K–12 school settings in the United States between 2000 and 2025. Two categories of incidents are examined: completed school-based active shooter events identified under the Federal Bureau of Investigation's active shooter definition, and incidents in which a potential attack was averted or delayed by locked doors or other physical security measures. Data were drawn from public records requests, law enforcement after-action reports, media coverage, and, where available, direct communication with affected schools and agencies.

Scope and Methods

Fifty-four school-based active shooter events met the inclusion criteria for the descriptive analysis, yielding 66 doors with which perpetrators interacted. Four averted incidents were identified that satisfied the inclusion criteria and for which sufficient documentation was available to support case-level analysis. Two additional incidents—the May 24, 2022, attack at Robb Elementary School in Uvalde, Texas, and the September 10, 2025, attack at Evergreen High School in Evergreen, CO—were examined through structured case studies to illustrate the consequences of systematic security failures and the protective value of rapid, well-executed lockdowns.

Because investigative records for these incidents frequently focus on casualties, timelines, and perpetrator behavior rather than the configuration or condition of doors, locks, and glazing, meaningful missingness remains across several variables. Findings are accordingly presented as descriptive patterns grounded in the available evidence rather than causal estimates.

Key Findings

Secured doors are associated with fewer casualties.

Among 50 doors with known victim outcomes, 3 of 18 secured doors (16.7%) were associated with any casualty, compared with 10 of 20 unsecured doors (50%). The direction of this relationship was consistent across every analytic cut in the report.

Threat profiles differ by school level.

Current students accounted for 83.3% of high school perpetrators and 88.9% of middle school perpetrators, and in these settings exterior doors did not function as a barrier to entry. None of the ten elementary school perpetrators were current students; each gained access from outside the building, making the exterior door the primary point at which access could be denied or delayed. These patterns indicate that effective door-security strategy priorities, while overlapping, can differ by facility type: exterior perimeter integrity and controlled visitor access are most consequential at elementary schools, while rapid interior lockdown capability is most consequential at secondary schools.

Glass is the primary point of mechanical failure.

Nine mechanical breach attempts were documented across the 54 events, of which six were successful. In every successful breach, the perpetrator defeated the barrier by shooting through glass; no locking mechanism in the dataset was defeated mechanically. Four of the six successful breaches involved aluminum-frame exterior doors with glass panels. Flush doors with functional locks were never successfully breached.

Compliance, not hardware, is the most common failure mode.

Among 47 doors with known status, 29 (61.7%) were unlocked or propped open at the time of the attack. The most common way a perpetrator gained access to a space was not by defeating a lock, but by passing through an unsecured door. The Uvalde case study illustrates how routine noncompliance with locking policies, together with unrepaired hardware defects, can render existing security infrastructure ineffective.

Speed of lockdown shapes outcomes.

The Evergreen High School incident demonstrates the protective value of rapid response: staff initiated a lockdown 42 seconds after the first shot, and the attacker subsequently spent nearly three minutes unsuccessfully attempting to re-enter the building before abandoning the effort. Across the broader dataset, 75.9% of incidents involved some form of lockdown, but the timing of initiation varied widely. Locking hardware that can be engaged quickly from inside the room, integrated alert systems, and staff empowered to initiate lockdowns without awaiting administrative confirmation each contribute to shorter threat-to-secure intervals.

Recommendations

Eight recommendations follow from these findings and are presented in full in Section 6. In priority order, they are: (1) ensure every classroom door has a functional lock that can be engaged from inside the room; (2) secure all exterior doors during school hours with controlled, single-point visitor access; (3) assess and upgrade glazing materials at exterior and classroom doors with glass features; (4) establish and enforce a culture of compliance with door-security protocols, including maintenance tracking and regular audits; (5) invest in rapid lockdown capability through training, alert systems, and staff empowerment; (6) tailor security strategies to school level; (7) evaluate magnetic strip use and consider hardware alternatives; and (8) establish standardized protocols for documenting door and access-control hardware during post-incident investigations.

Acknowledgements

We gratefully acknowledge the contributions of the many individuals and organizations whose support made this study possible.

We are indebted to the law enforcement agencies that provided investigative records, after-action reports, and post-incident documentation. The willingness of these agencies to share information meaningfully expanded the evidentiary foundation of this report. We are similarly grateful to the school administrators, district officials, and staff who shared information about averted incidents and institutional security practices, frequently under difficult circumstances. Along these same lines, we thank the SISMS team for their support with additional documentation as well as contributions to the methodological design of this project.

We also thank the members of the project's technical advisory group, who served as subject-matter consultants on questions of door hardware, building security, and safety codes. Your contributions strengthened the overall project.

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Disclaimer

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Research Team

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Section 1. Background, Purpose, and Methods

School-based active shooter incidents remain among the most consequential forms of targeted violence in the United States. Although relatively rare, these events carry outsized social, political, and emotional consequences, particularly when they occur in K–12 educational settings. As a result, substantial attention has been devoted to prevention, response, and recovery strategies, including threat assessment, emergency response coordination, and behavioral intervention. Comparatively less empirical attention has been given to the role of physical security features, despite their centrality to most school safety strategies.

Door locks and related access-control measures represent one of the most basic and widely implemented forms of physical security in schools. Locked classroom and exterior doors are frequently cited in guidance documents[i], scholarly manuscripts[ii], and after-action reports[iii] as critical tools for limiting attacker movement, delaying entry, and reducing opportunities for harm. However, despite their prominence in both policy discussions and practitioner guidance, systematic evidence on how door locks function in real-world school shooting incidents remains limited.

This study was funded by the Security Industry Association[iv] to address that gap. The primary purpose of the study is to assess the role of door locks and related access-control features in school-based active shooter events. Using multiple data sources and a structured coding framework, the study examines completed attacks, incidents that were averted due to locked doors, and cases in which safety measures were bypassed or failed. The overarching goal is to provide empirically grounded insights that can inform school safety policy, security design decisions, and practitioner guidance.

Scope

The scope of this study is intentionally focused. The analysis centers on K–12 school settings in the United States and covers incidents occurring between 2000 and 2025. This time frame reflects both the availability of systematically documented active shooter data and the period during which modern school security practices became more widespread.

Three categories of incidents are examined. First, the study analyzes school-based active shooter events identified by the Federal Bureau of Investigation under its active shooter definition.[v] Second, it examines incidents in which a potential school shooting was averted, specifically cases in which locked doors or other physical security measures prevented attacker access and, as a result, the incident did not meet the FBI criteria for inclusion. Third, the study includes targeted case analyses of incidents in which safety measures were bypassed or failed, allowing an attacker to gain access to areas that were intended to be secured. This final section also provides a detailed case study where

safety measures were put in place and thwarted an attacker from inflicting additional harm once the attack began.

The study does not examine higher education campuses, school board meetings, or other education-related settings outside the K–12 context. Although such incidents are included in some federal datasets, the Security Industry Association request for proposals (RFP) was specific to primary and secondary schools, and the security environments, policies, and architectural designs of K–12 schools differ in meaningful ways from those of colleges and universities. Similarly, the study does not attempt to evaluate broader prevention strategies such as threat assessment teams or behavioral interventions.

Research Questions

Guided by the project objectives and scope, this study addresses three primary research questions:

1. What impact have door locks had on school-based active shooter events identified by the FBI?
2. What role have door locks had in averting potential active shooter events in K-12 school settings?
3. What factors contributed to the failure or success of physical security measures in school-based active shooter events?

Together, these questions are intended to capture both the protective and failure modes of door-based security measures. Rather than treating door locks as uniformly effective or ineffective, the study seeks to identify patterns in when and how these measures influence attacker access, movement, and outcomes across different incident contexts.

Data Sources

This study draws on multiple data sources to identify and document incidents relevant to each research question. Because no single dataset captures the full range of completed, averted, and failed-access school shooting incidents, a multi-source approach was required. Data collection procedures were designed to maximize coverage while prioritizing accuracy and transparency.

Research Question #1

For Research Question 1, school-based active shooter events were identified using the Federal Bureau of Investigation's active shooter dataset. Consistent with the FBI definition, an active shooter is defined as one or more individuals actively engaged in killing or attempting to kill people in a populated area. This definition includes incidents where the shooter is using a firearm(s), and it emphasizes that there is no specific pattern or method to the selection of victims. The FBI's definition excludes incidents that are the result of self-defense, gang or drug violence, domestic disputes, or the

byproduct of another ongoing criminal act. At the time of data collection, the FBI had identified 557 active shooter events in the United States. Of these, 52 events occurred at a K-12 school setting. Two additional cases occurred in 2025 that are likely to be included in the upcoming FBI dataset. These 54 events form the analytic sample for Research Question 1. An additional 22 events occurred at a university, community college, or during a school board meeting. However, these locations were excluded to maintain consistency with the study's scope.

Research Question #2

For Research Question 2, the study identifies averted school shooting incidents that did not meet the FBI criteria for inclusion because an attacker was prevented from gaining access or initiating an attack. These cases were identified through systematic open-source searches conducted across multiple platforms, including general web searches, news aggregators, and academic and legal databases such as LexisNexis and ProQuest. Structured Boolean search strategies were used to locate incidents involving schools, firearms or credible threats, and physical access barriers such as locked or secured doors. The search process was iterative, allowing the research team to refine terms as new cases were identified.

The research team also consulted two publicly available datasets to triangulate averted school shooting cases. The first source was the Averted School Violence database which is currently maintained by Safe and Sound Schools.[vi] The second source was the Averted School Shooting Tracker maintained by the K-12 School Shooting Database.[vii]

Research Question #3

For Research Question 3, the study uses detailed case studies to examine the factors that contributed to the failure or success of door security measures during school-based active shooter events. Two incidents were selected based on the availability of extensive official documentation and the central role of door security in shaping each event's trajectory. The May 2022 attack at Robb Elementary School in Uvalde, Texas, serves as the primary case illustrating how cascading failures in door security—including policy noncompliance, maintenance breakdowns, and unsecured interior doors—facilitated attacker access and movement. The September 2025 attack at Evergreen High School in Evergreen, Colorado, provides a contrasting case in which rapid lockdown initiation and locked doors prevented the attacker from re-entering the building and accessing additional victims. Together, these cases illustrate how the effectiveness of physical security measures depends not only on the hardware itself but on the policies, training, and institutional practices that support their use.

Across all three research questions, identified incidents were screened for relevance to door-based access control. Cases lacking sufficient information to determine door status, locking mechanisms, or access pathways were excluded from detailed analysis. Once identified, each incident was assigned a unique case file and prepared for structured coding using the procedures described in the following section.

Variables and Constructs of Interest

To evaluate the role of door locks and access-control features in school-based active shooter incidents, the study focuses on several interrelated categories of variables to address Research Question 1. These constructs were selected to capture the characteristics of the school environment, the dynamics of the incident, and the specific features of doors and locking mechanisms that influence attacker access. Detailed definitions and coding options for all variables are documented in Appendix B.

The first category includes *School Characteristics*, such as school type, grades served, and geographic location. These variables provide contextual information about the settings in which incidents occurred and allow for basic comparisons across different school environments.

The second category includes *Incident Characteristics*, capturing core features of the attack or attempted attack. These variables include the date and time of the incident, the general location of victims or attempted victims within the school, the attacker's relationship to the school, and whether a formal lockdown was initiated. Victim counts and attack resolution are also documented to support descriptive analysis.

The third category includes *Door and Access-Control Characteristics*, which form the central focus of the study. These variables capture the type of door involved (e.g., flush doors, doors with vision lights or sidelights), the status of the door at the time of the incident (locked or unlocked), and the type of locking mechanism in use. Where applicable, the study also documents whether a mechanical breach was attempted, whether the breach was successful, and the location of any breach (e.g., door or sidelight).

Coding and Data Verification Procedures

All incidents included in this study were documented using a structured coding process designed to maximize data accuracy and transparency while accounting for variability in source availability. Because no single source consistently provides complete information on school-based active shooter incidents, the research team employed a tiered data collection and verification framework that prioritizes higher-fidelity sources whenever possible. This coding and verification approach was adapted from the Sharing Information to Stop Mass Shootings (SISMS) project to ensure data fidelity.[viii]

Each incident was coded using standardized project code sheets developed specifically for this study. These instruments capture school characteristics, incident details, door and access-control features, and access outcomes relevant to the research questions. Coders were trained on the use of the code sheets and the application of variable definitions prior to data collection.

Data sources were categorized into three tiers based on reliability. Tier 1 sources consisted of official law enforcement records and formally commissioned after-action reports (AAR). Where available,

these materials were treated as the highest-fidelity sources. The research team possessed a number of Tier 1 records because of prior research efforts and ongoing collaborations with the SISMS team. It is important to consider that many of the victims in these events are minors. Therefore, official records were sometimes unavailable due to restrictions associated with juvenile victims or sealed investigations. For this reason, the team had 25 cases with documents obtained through public records requests (46%) and 11 officially commissioned AARs. The responding agency public record documents did not always contain relevant information for this study; however, the team exhausted the available agency records and AAR documents prior to moving to lower tier sources.

Tier 2 sources included direct communication with affected schools and responding agencies. The research team contacted schools and law enforcement agencies associated with identified incidents to conduct structured telephone interviews guided by the project code sheets. When interview participation was not feasible, respondents were offered the option to complete a fillable PDF form with instructions related to what information was requested. Information obtained directly from school or agency representatives, as well as official statements or interviews attributable to responding agencies, was coded as Tier 2 data.

Tier 3 sources consisted of media accounts and publicly available reporting. These sources were used only when Tier 1 and Tier 2 data were unavailable. To reduce the risk of error, any variable coded using Tier 3 sources required corroboration from at least two independent media reports. All media sources were archived and linked to the corresponding case file.

For each coded variable, the source tier was explicitly recorded. Following initial coding, a second member of the research team independently verified the coded information by reviewing the cited source materials. Discrepancies were resolved through discussion and re-examination of the original sources. This dual-coding and verification process was applied consistently across all incidents and research questions.

Although resource intensive, this approach was adopted to ensure that the resulting dataset could support reliable descriptive analysis, transparent case studies, and evidence-informed recommendations.

Analytical Approach

The analytical approach for this study was tailored to the nature of each research question and the types of data available. Rather than relying on a single analytic framework, the study employs a combination of descriptive analysis and structured case-based inquiry to examine how door locks and access-control measures function across different incident contexts.

For Research Question 1, the analysis focuses on school-based active shooter events. These data are examined primarily through descriptive and exploratory methods. Univariate summaries and frequency distributions are used to describe key variables related to door status, lock type, breach attempts, and access outcomes. Where appropriate, bivariate comparisons are used to explore

patterns between door-related characteristics and incident features, such as victim location or attack resolution. These analyses are intended to identify recurring patterns rather than to establish causal relationships.

For Research Question 2, the analysis centers on incidents in which potential school shooting attacks were averted. Because these events are not captured in standardized federal datasets and vary widely in context, the study relies on structured case summaries to document how locked doors or other access-control measures prevented attacker entry.

For Research Question 3, the analysis is conducted through detailed case studies of incidents in which safety measures were bypassed or were successfully implemented. These cases emphasize the mechanisms through which access controls were defeated, including unlocked doors, propped entrances, or breached barriers. Where possible, cross-case comparisons are used to identify recurring vulnerabilities or systemic issues that may inform future prevention efforts.

Organization of the Report

This report is organized into multiple sections that correspond to the study's research questions and analytical components.

Section 1 provided an overview of the study's purpose, scope, data sources, and methodological approach, establishing the foundation for the analyses that follow.

Section 2 presents descriptive findings from school-based active shooter events, addressing Research Question 1. This section focuses on patterns related to door status, locking mechanisms, breach attempts, and access outcomes, using descriptive statistics and exploratory comparisons to summarize the observed data.

Section 3 examines incidents in which potential school shooting attacks were averted, addressing Research Question 2. Using structured case summaries and cross-case comparisons, this section documents how locked doors and other access-control measures prevented attacker entry or escalation.

Section 4 presents case studies on incidents in which safety measures were bypassed or failed as well as successes, addressing Research Question 3. These case-based analyses highlight access-control vulnerabilities and contextual factors that contributed to attacker entry.

Section 5 synthesizes findings across all research questions and discusses their implications for school safety policy, security design, and practitioner guidance.

Section 6 provides policy recommendations for school administrators, law enforcement, and policy makers to consider.

Appendix A provides summaries of all the school-based active shooter events included in this report. **Appendix B** provides detailed documentation of coding instruments, variable definitions, and supplementary materials referenced throughout the report.

Section 2. Descriptive Findings

This section presents descriptive findings for the 54 school-based active shooter events included in the study. The analysis is organized in two stages. The first stage describes event-level characteristics, including the timing and location of incidents, perpetrator demographics and relationship to the school, victim counts and locations, event resolution, and whether a door was implicated in the attack. The primary unit of analysis in this stage is the event, not the individual door. The second stage shifts to door-level analyses, focusing on the 66 doors with which perpetrators interacted across these events and describing their construction, locking mechanisms, lock status, and mechanical breach outcomes. Because not every incident involved a door interaction, the number of observations differs between these analytic stages; these distinctions are noted throughout to avoid confusion about denominators. Within each stage, bivariate comparisons by school level and door status are presented to examine whether meaningful differences emerge across incident contexts. Throughout the section, callout boxes are used to highlight notable incidents that illustrate key patterns or unusual circumstances relevant to the findings being discussed.

It is important to acknowledge limitations in the available data. Despite exhaustive efforts to obtain complete information through the tiered data collection process described in Section 1, substantial missingness remains across several variables. Because the victims in these events are predominantly minors, many law enforcement agencies denied or redacted public records requests, and investigative records were frequently sealed or otherwise unavailable. These constraints were especially pronounced for door-specific variables. Police reports, investigative summaries, and media coverage tend to focus on casualties, timelines, and perpetrator behavior rather than the specific configuration or condition of doors, windows, locks, or window glazing. Obtaining this level of detail would require dedicated on-site documentation and close cooperation with investigative authorities soon after the event. As a result, the descriptive statistics presented in this section reflect only those cases for which reliable data were available to the research team. Because the overall number of incidents is small and several variables contain extreme values or zero-inflated distributions, the findings should be interpreted as descriptive patterns rather than causal claims.

The Event

Context

This subsection describes the temporal and institutional context of the 54 school-based active shooter events. Findings are organized by year of occurrence, geographic distribution, time of day/day of the week, school level, and whether a lockdown was initiated during the event. Together, these variables provide a broad contextual picture of when and where the school-based active shooter events occurred and how schools initially responded.

Year and Month

The 54 school-based active shooter events span a 26-year period from 2000 to 2025. The annual distribution of incidents is presented in Figure 1. Except for a small number of years in which no school-based attacks were recorded, the frequency of events remained relatively low and stable across the study period, with only modest year-to-year variation. Because the total number of cases is small and the data represent counts, apparent fluctuations in the annual distribution should be interpreted cautiously and are not necessarily indicative of meaningful trends.

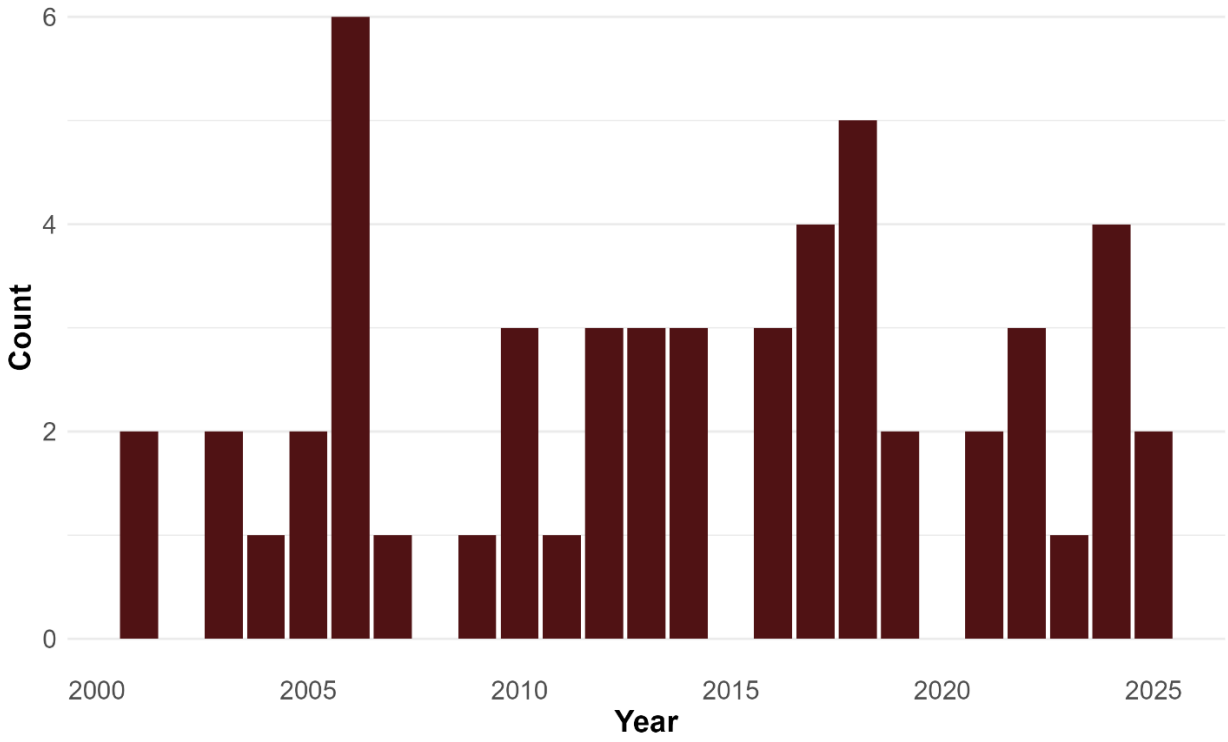


Figure 1. Year of Occurrence

The monthly distribution of events is presented in Figure 2. Incidents were distributed relatively evenly across the academic calendar, with a notable decline during June and July, consistent with the summer recess period when most K–12 schools are not in regular session.

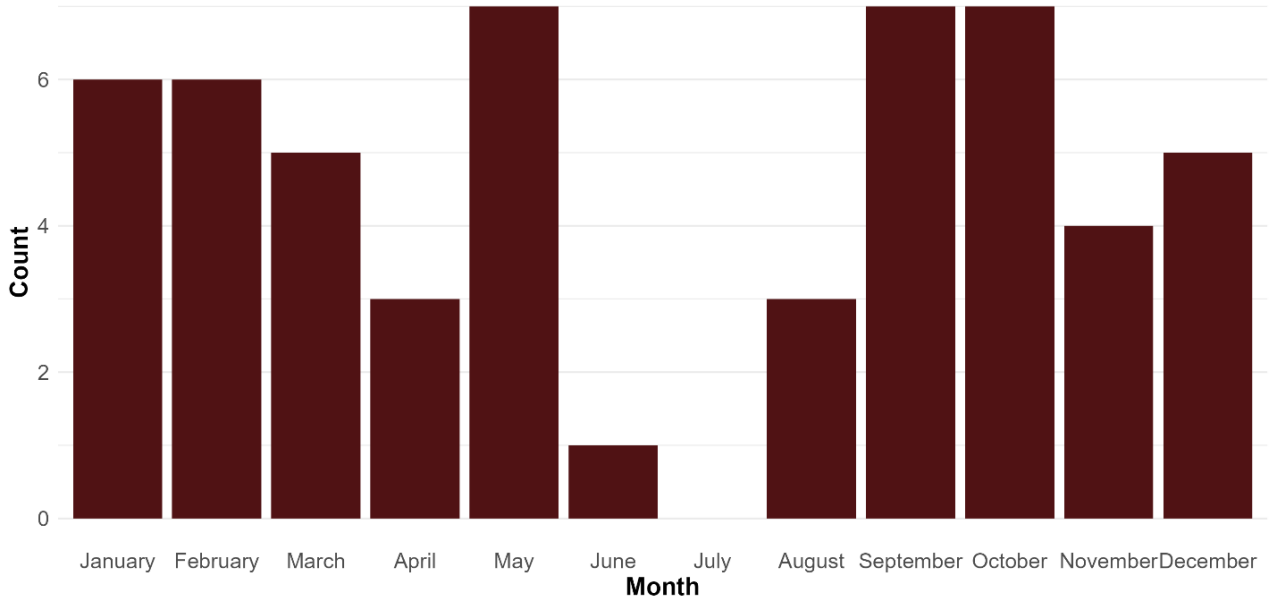


Figure 2. Month of Occurrence

Geographic Distribution

The geographic distribution of the incidents is presented in Figure 3. No events were recorded in Alaska, Hawaii, or U.S. territories. Among the contiguous states, incidents were distributed broadly but unevenly. Notable concentrations are visible in Colorado, California, the mid-Atlantic corridor between southern Pennsylvania and Washington, D.C., Ohio, the southern Wisconsin–northern Illinois region, and Tennessee. However, given the small number of total events, these clusters should not be interpreted as evidence of elevated regional risk.

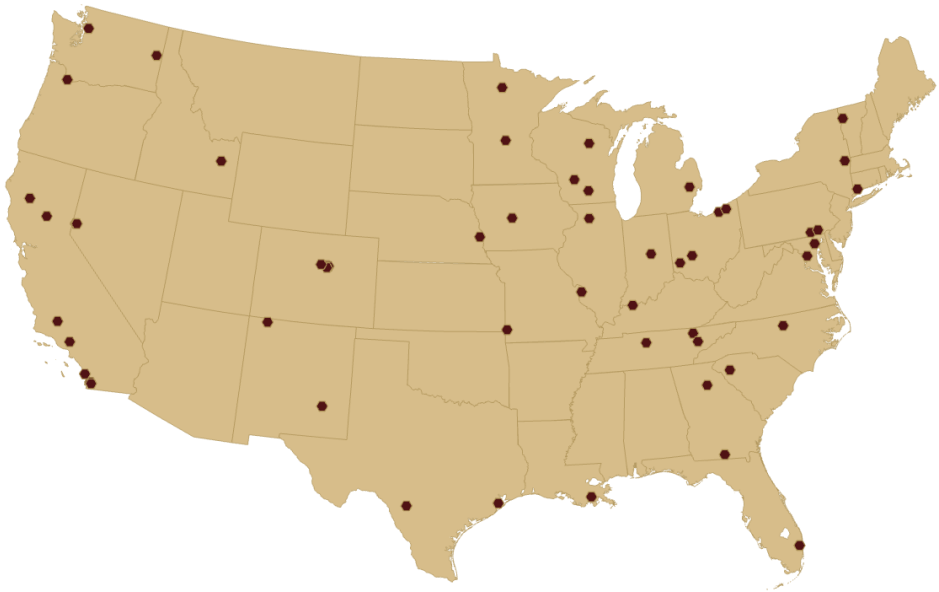


Figure 3. Geographic Distribution of Attacks

Time of Day and Day of Week

The distributions of incidents by day of week and time of day are presented in Figure 4. Attacks were distributed relatively even across weekdays, with slight peaks on Mondays and Wednesdays. No incidents occurred on Sunday, and only one occurred on a Saturday. The time-of-day panel is limited to school hours to improve readability; one incident is not represented in the figure—a Saturday night attack at Antigo High School in which a former student opened fire late at night during the school's annual prom. Apart from a modest concentration around early morning arrival times, attacks were distributed throughout the school day. Once again, given the small number of cases, neither day-of-week nor time-of-day variation should be interpreted as reflecting systematic temporal patterns.

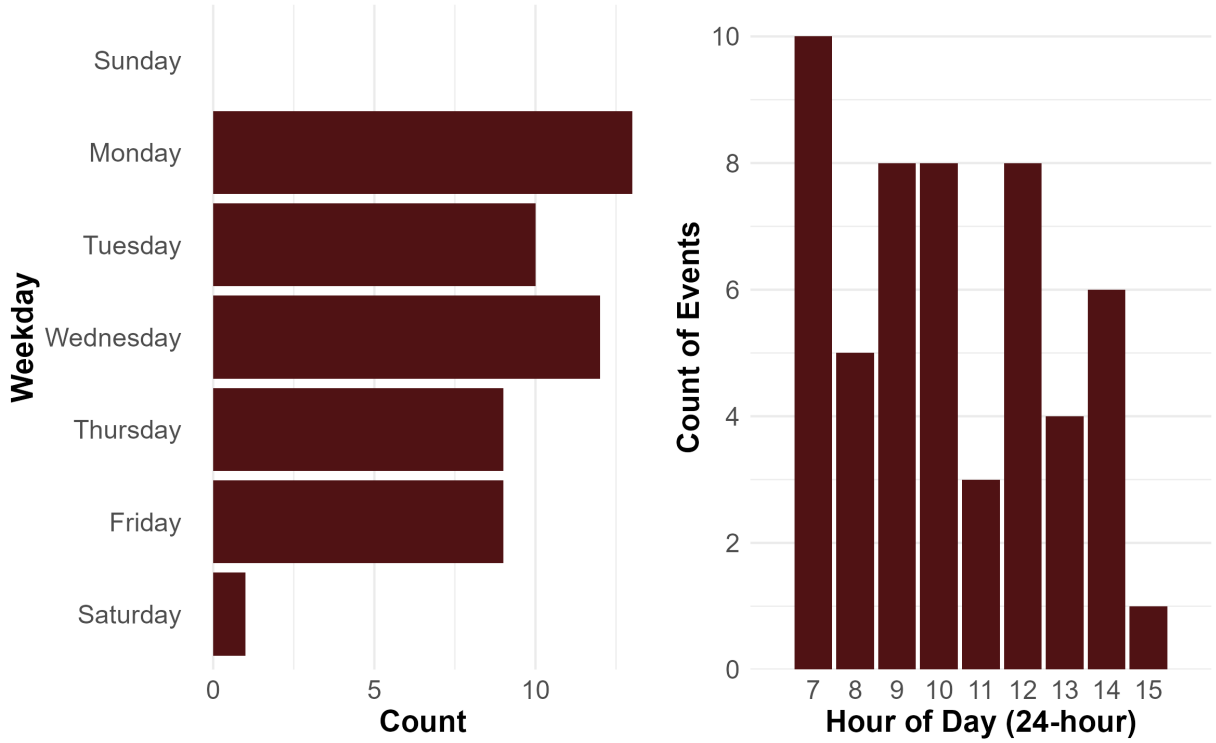


Figure 4. Attack Day-of-Week and Time-of-Day

School Level

Figure 5 presents the distribution of events by school level. The majority of the 54 events occurred in high schools (30 cases, 55.6%), followed by elementary schools (10, 18.5%) and middle or junior high schools (9, 16.7%). The remaining five incidents (9.3%) took place in schools serving non-standard grade configurations, including three K–12 schools, one 6–12 school, and one K3–12 school. Because these five cases do not align neatly with a single school level, they are grouped as "Other" here as well as subsequent analyses.

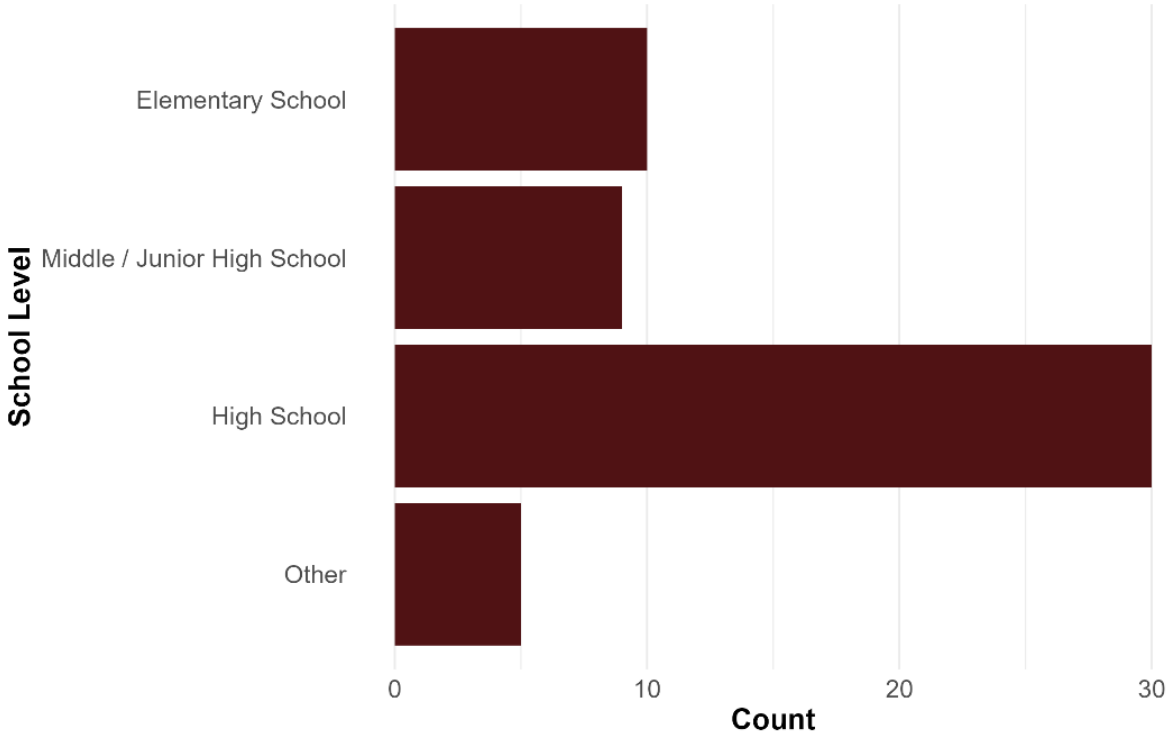


Figure 5. School Level

Lockdown Performed

Regarding lockdowns, in 41 of the 54 incidents (75.9%), a lockdown was initiated in response to the event. In four incidents (7.4%), no lockdown was performed, and for the remaining nine incidents (16.7%), it was unknown whether a lockdown was implemented based on the available data.

Of the 41 incidents in which a lockdown was performed, six (14.6%) were initiated after the attack had effectively concluded, limiting the degree to which the lockdown could have influenced attacker access or victim exposure during the event. An additional seven incidents ended so quickly that it is likely the lockdown was performed after the attack had ended. In total, 13 of the 41 lockdowns (31.7%) were initiated at or near the conclusion of the event.

Perpetrator Characteristics

This subsection describes the demographic and background characteristics of the individuals who carried out the 54 school-based active shooter events. In all but one incident, the attack was carried out by a single perpetrator. As a result, the 54 events involved 55 perpetrators. Findings are organized by demographic characteristics and the perpetrator's relationship to the school.

Perpetrator Demographics

Most attackers were male (51, 92.7%), and four were female (7.3%). Sex was coded based on biological sex.[1]

In terms of race and ethnicity, 40 attackers were White (72.7%), four were Hispanic (7.3%), four were Black (7.3%), five fell within an "other" race category (9.1%; e.g., Bi-Racial, Native American, Asian). Race or ethnicity was unknown for two attackers (3.6%).

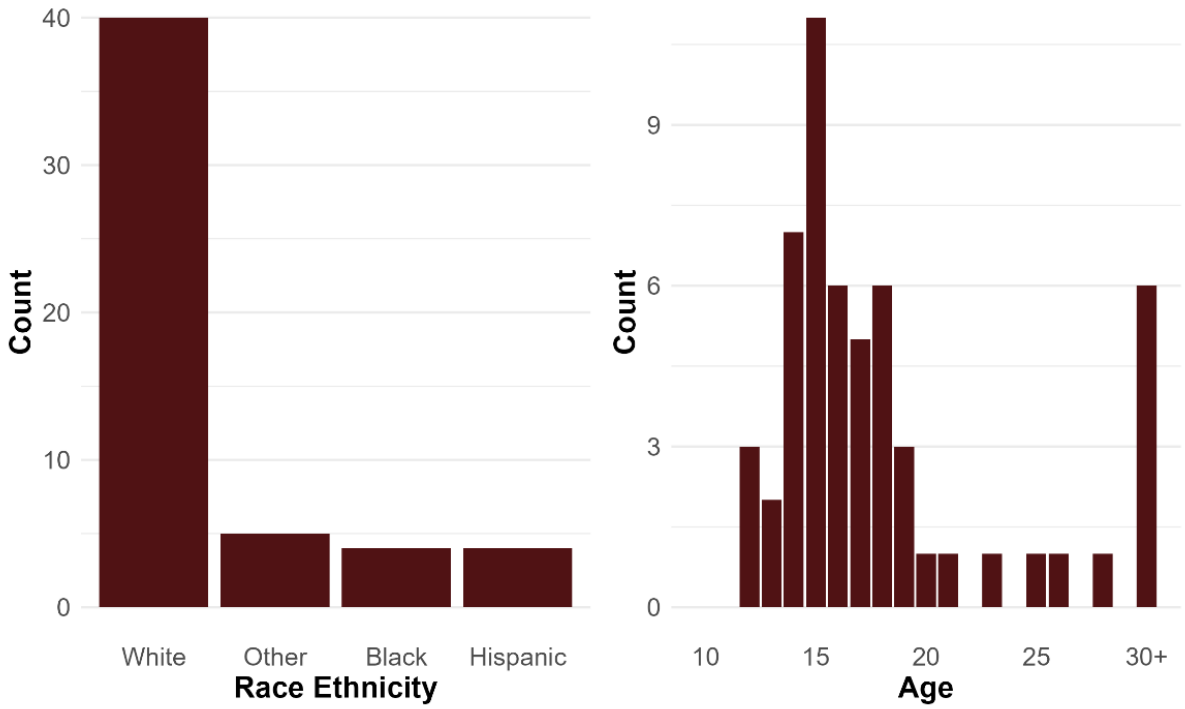


Figure 6. Attacker Race/Ethnicity and Age

Attackers were predominantly young. The majority fell within the 14–18 age range (35, 63.6%), consistent with the high proportion of current students in the sample. An additional five perpetrators (9.1%) were younger than 14, nine (16.4%) were between 19 and 30, and six (10.9%) were older than 30.

[1] In three incidents, the perpetrator's gender identity differed from their biological sex. In the Covenant Presbyterian School attack (Nashville, TN, 2023), the perpetrator was a transgender male who was biologically female. In the STEM School Highlands Ranch incident (Highlands Ranch, CO, 2019), one of the two perpetrators was also biologically female and identified as male. In the Perry High School attack (Perry, IA, 2024), the perpetrator was biologically male and identified as non-binary. In all three cases, sex was coded based on biological sex.

Relationship to School

The perpetrator's relationship with the school is summarized in Figure 7. The majority of perpetrators were individuals who had existing access to the school at the time of the attack. Current students accounted for 37 of the 55 perpetrators (67.3%), and one was a current staff member (1.8%). Ten perpetrators (18.2%) were former students, former staff, or otherwise connected to the school community. The remaining seven perpetrators (12.7%) had no known prior relationship with the school.[2]

The distinction between school-connected and unrelated perpetrators carries direct implications for physical security. Current students and staff typically have routine access to the building during school hours, meaning that exterior door locks and access-control measures are unlikely to serve as a barrier to entry. By contrast, perpetrators without a current relationship to the school must gain access from outside, making the status and integrity of exterior doors more consequential. This distinction is explored further in the forthcoming bivariate analyses.

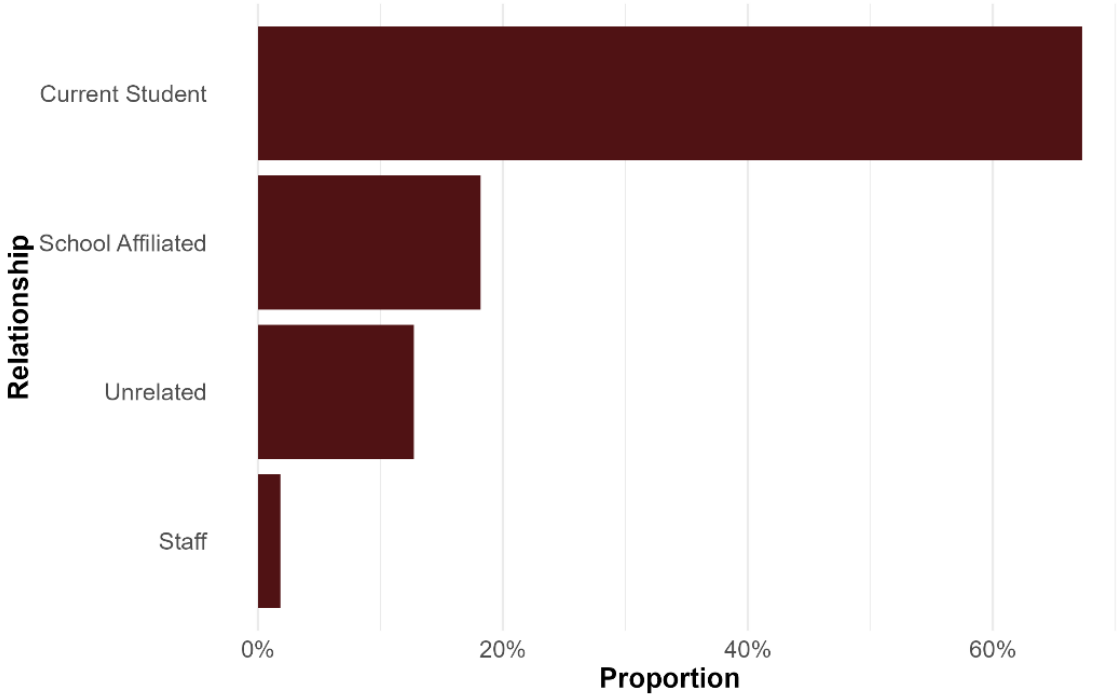


Figure 7. Attacker Relationship with the School

[2] Two cases involved borderline coding decisions regarding the perpetrator's relationship to the school. In the 2006 Essex Elementary incident (Essex, VT), the perpetrator was the ex-boyfriend of a teacher and was coded as part of the school community. This incident is atypical in several respects — it occurred during summer break, and the teacher was the intended target, though another teacher was also victimized. In the 2006 West Nickel Mines School shooting (Bart Township, PA), the perpetrator occasionally delivered milk to the school. Because his connection to the school was limited to infrequent deliveries, he was classified as unrelated to the school.

In summary, the typical perpetrator in these events was a young White male, most often between 14 and 18 years of age, who was a current student at the school at the time of the attack. This profile is consistent with the broader active shooter literature on K–12 incidents and has important implications for access control, as the majority of perpetrators in this sample already had routine access to the building at the time of the attack.

Attack Characteristics

This subsection describes characteristics of the attacks themselves. Weapon type is presented here as an attribute of the attack rather than the perpetrator.

Weapon Type

The primary weapon used across the 54 incidents are summarized in Figure 8.

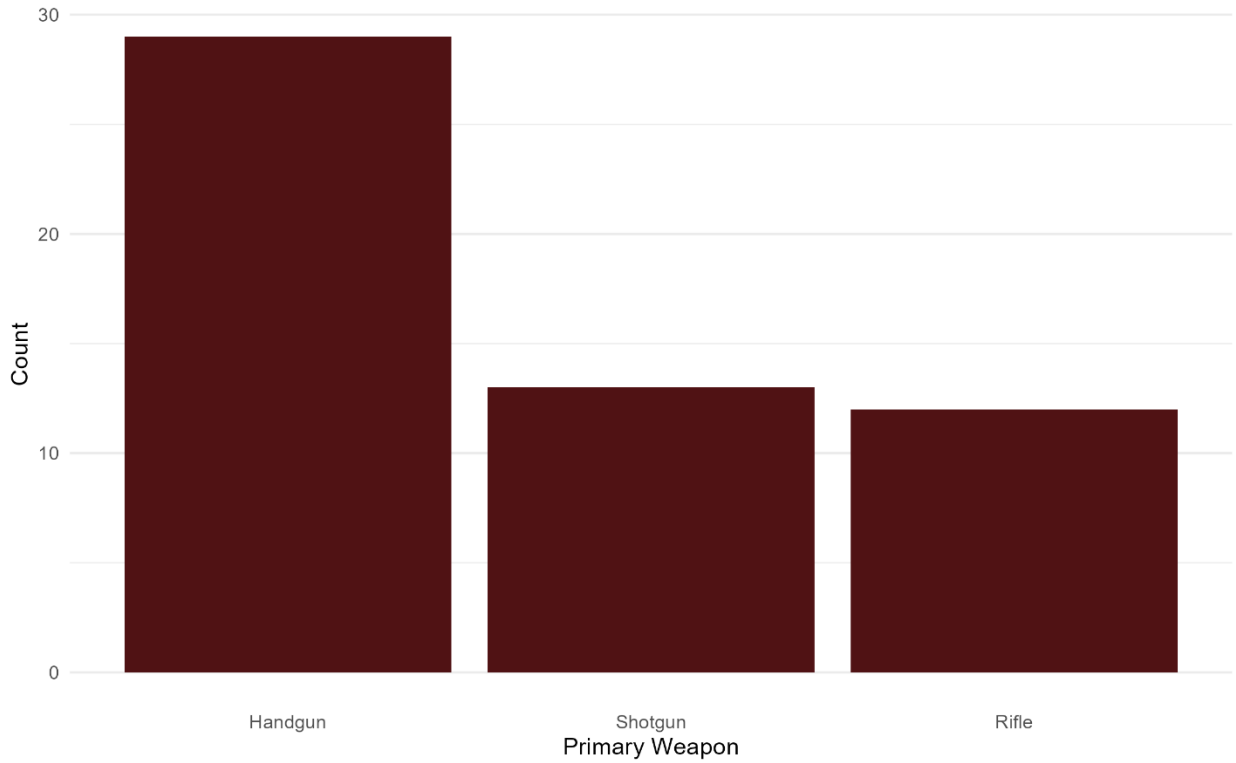


Figure 8. Primary Weapon

Handguns were the most common primary weapon used in 29 incidents (53.7%). Shotguns were used in 13 events (24.1%) and rifles were the primary weapon used in 12 events (22.2%). These figures reflect the primary weapon used during each incident. In 18 events (33.3%), the perpetrator

carried or used more than one firearm during the attack; a complete summary of all weapons present is provided in the footnote below.[3]

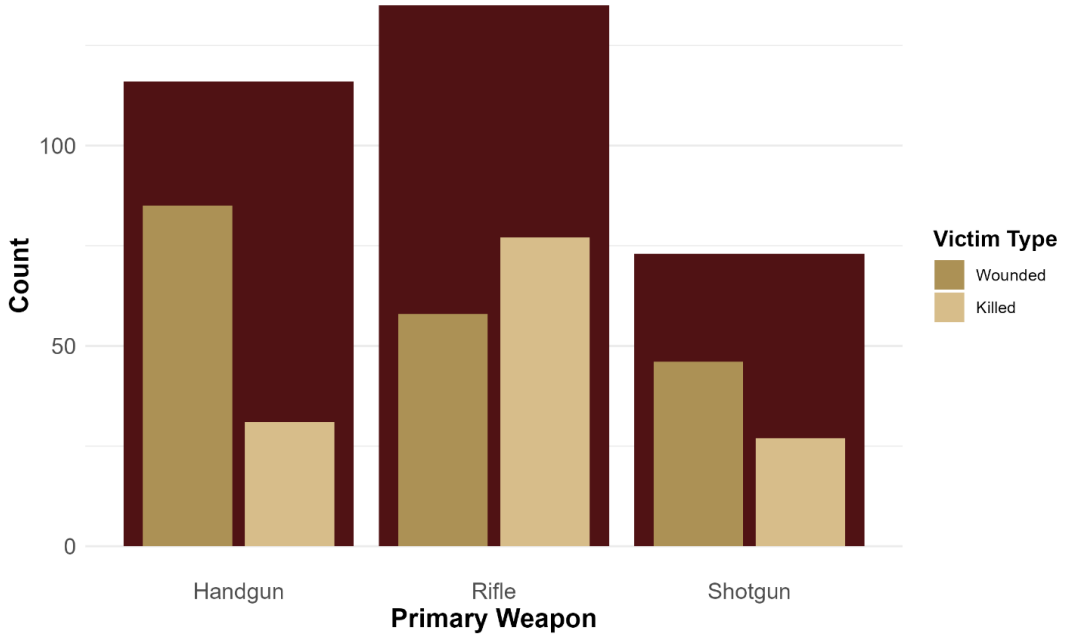


Figure 9. Victims by Primary Weapon

Although handguns were the most frequently used weapon type, rifles were associated with the highest number of fatalities (77, 57% of all fatal victims across the dataset). However, this total is heavily influenced by a small number of high-casualty events rather than being distributed evenly across rifle-involved incidents. For example, the attacks at Sandy Hook Elementary School (Newtown, CT, 2012), Marjory Stoneman Douglas High School (Parkland, FL, 2018), and Robb Elementary School (Uvalde, TX, 2022)—all involving semiautomatic rifles—accounted for 64 fatalities (83% of rifle fatalities), while the incident at Memorial Middle School (Joplin, MO, 2006), which also involved a rifle, resulted in no casualties.

Attack Start Location

The location within the school where each attack began is summarized in Figure 10. The most common start locations were hallways and areas outside the school building, each accounting for 13 of the 54 incidents (24.1%). Seven attacks (13.0%) began in a classroom, five (9.3%) in a cafeteria, four (7.4%) in an open space, three (5.6%) in a bathroom, three (5.6%) in an office, two (3.7%) in a

[3] Across the 54 incidents, 80 firearms were documented in total. Handguns accounted for 48 of these firearms and appeared in 40 incidents (74.1%), of which several involved weapons with relatively limited firepower, including revolvers (8) and small-caliber firearms such as .22 LR (11) and .25 ACP (2). Rifles accounted for 17 firearms and appeared in 15 incidents (27.8%), including two hunting rifles and one target-shooting rifle in a small caliber. Shotguns were present in 14 incidents (25.9%).

gym, and one each in a foyer and a locker room (1.9% each). For two events (3.7%), the start located was not known.

Notably, in 14 incidents (25.9%), the perpetrator first went to a restroom or similar space to prepare before initiating the attack, for example, to change clothing, load firearms, or otherwise ready themselves.[4] Most of these cases (9 of 14) occurred in high schools, where the perpetrator was a current student with routine access to the building. This pattern underscores that in many incidents, particularly those involving insiders, the perpetrator was already inside the school well before the attack began, limiting the role that exterior access controls could have played in preventing the event. Yet this is highly dependent on the type of school, as the perpetrators of attacks on elementary schools are primarily outsiders, as shown in the next section.

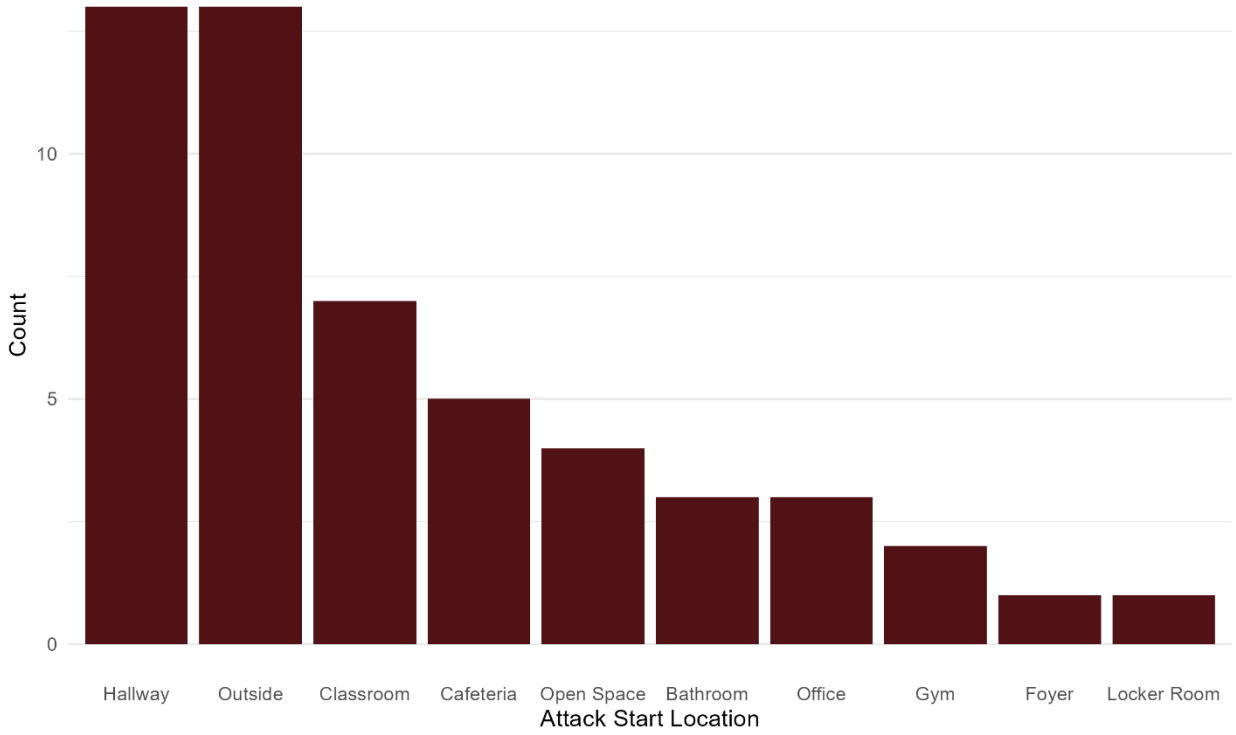


Figure 10. Attack Start Location

[4] Two recent incidents illustrate this pattern. In the 2024 Perry High School shooting (Perry, IA), the perpetrator spent an extended period in a school bathroom posting on social media and initiating a live stream before beginning the attack. In the 2024 Apalachee High School shooting (Winder, GA), the perpetrator prepared in a bathroom before attempting to return to a classroom. The classroom door had automatically locked when it was closed, denying the perpetrator re-entry and forcing him to move elsewhere in the building.

Victims

This subsection summarizes victim counts and the locations within the school where victims were shot.

Overall Victims

Across the 54 incidents, 135 people were killed and 189 were wounded, for a total of 324 victims. The median incident resulted in 1 fatality and 2 wounded. However, the distribution of victim counts is highly skewed, with a small number of high-casualty events accounting for a disproportionate share of the total. Fatalities per incident ranged from 0 to 26, and the number of wounded per incident ranged from 0 to 17.

Victim Locations

The locations within the school where victims were shot are summarized in Figure 11. The largest share of victims (155, 47.8%) were shot inside classrooms. Hallways accounted for 57 victims (17.6%), followed by common areas such as open spaces, gyms, bathrooms, and foyers (46, 14.2%), outside the school building (16, 4.9%), cafeterias (14, 4.3%), and offices (8, 2.5%). For 28 victims (8.6%), the location was unknown. Together, classrooms and offices (both spaces that can typically be secured with a locked door) accounted for just over half of all victims in the dataset.

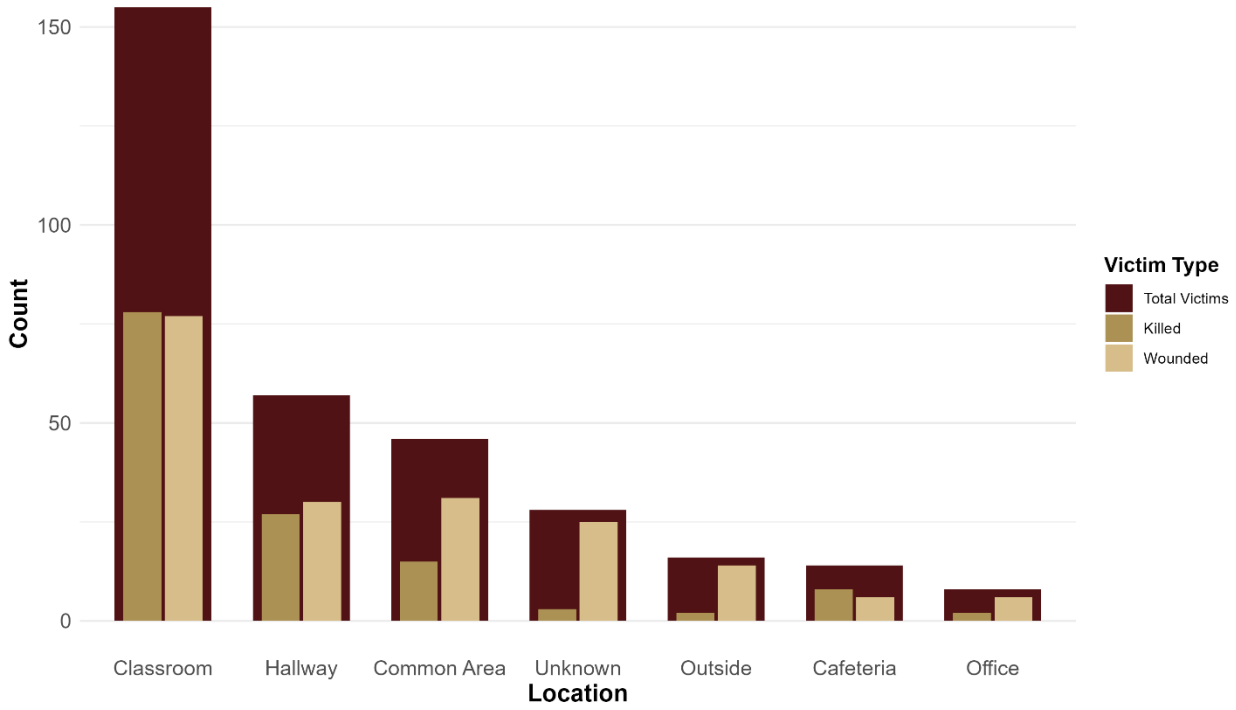


Figure 11. Location of Victims

Hallways, common areas, cafeterias, and exterior spaces, locations that are generally not easily secured once a perpetrator has gained access to the building, accounted for 133 victims (41.0%). This point is explored further in the door-level analysis starting on page 25.

Resolution

The way each incident ended is summarized in Figure 12. The most common resolution was civilian intervention through nonlethal means (15 incidents, 27.8%), typically involving teachers or staff who talked the perpetrator down or physically subdued them. Ten perpetrators (18.5%) died by suicide before law enforcement arrived, and seven (13.0%) died by suicide after law enforcement arrived. The distinction is analytically relevant, incidents ending in suicide prior to law enforcement arrival suggest that the attack had either run its course independent of the police response or the attacker did not want confrontation by the police, whereas post-arrival suicides may reflect the perpetrator's reaction to a law enforcement presence.

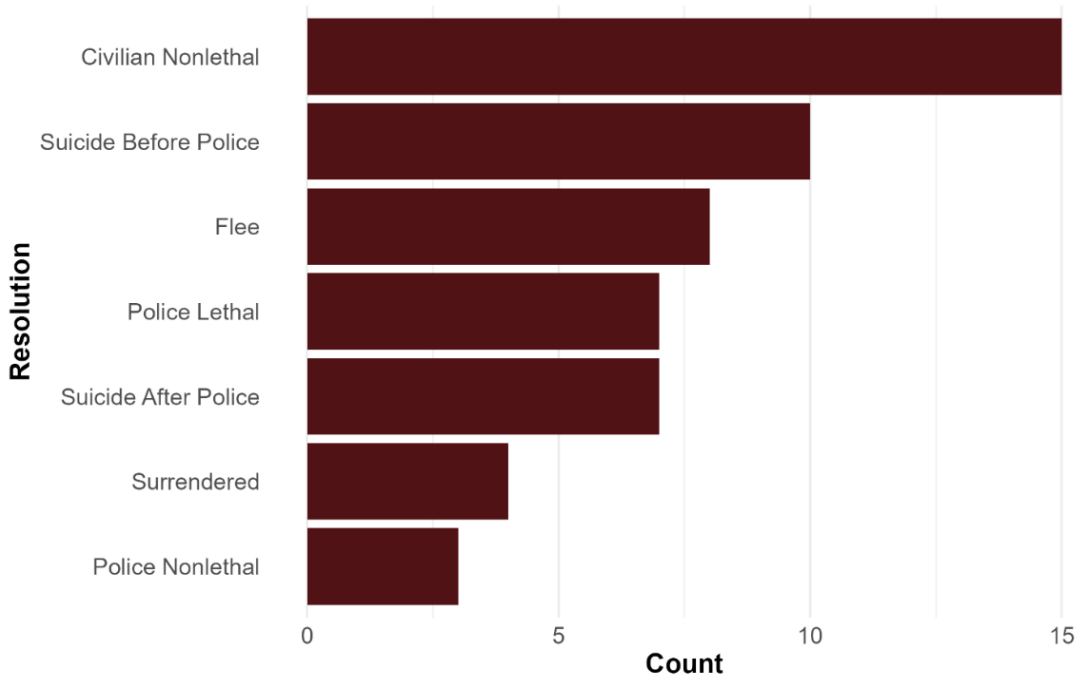


Figure 12. Attack Resolution

Eight perpetrators (14.8%) fled the scene. Seven incidents (13.0%) ended when the perpetrator was shot by law enforcement, and three (5.6%) ended through nonlethal law enforcement intervention, typically involving the officer confronting the perpetrator. Four perpetrators (7.4%) surrendered on

their own without any intervention. Notably, no incidents in the dataset were resolved through intervention by an armed civilian.[5]

Doors Involvement and Security Bypass

This subsection describes the extent to which doors were implicated in the 54 events and whether existing security measures were bypassed during the attack. These findings establish the subset of incidents for which door-level analyses are presented in the Door Level Data section on page 25.

Door Involvement

Of the 54 incidents, 23 (42.6%) involved a documented interaction between the perpetrator and one or more doors, including attempts to open, mechanically breach, or shoot through a door. In the remaining 31 incidents (57.4%), no door interaction was reported. The absence of a reported door interaction does not necessarily mean that doors played no role in the event; in some cases, information about door contact was simply unavailable. However, in many of these incidents the perpetrator was a current student who initiated the attack in a common area such as a hallway or cafeteria, where doors would not have served as a barrier to access.

> The October 2007 attack at SuccessTech Academy illustrates how building design can eliminate doors as a protective factor entirely. A current student entered the school carrying two revolvers and went to a bathroom to change clothes and load the weapons. He then moved rapidly through hallways and several classrooms over the course of approximately two minutes before entering an empty classroom and fatally shooting himself. Four people were wounded. The perpetrator was able to move freely between spaces in part because most of the school's rooms did not have doors — only open doorways. In a building without doors to secure, lockdown protocols that rely on closing and locking classroom doors cannot be executed.

Security Bypass

In 7 of the 54 incidents (13.0%), a security system or procedure designed to prevent unauthorized entry was in place, but the perpetrator bypassed or forcibly overcame it to gain access to the school. These cases are distinct from incidents in which doors were simply unlocked, or no security protocol existed. A bypass requires that a measure was in place and was defeated or circumvented.

This distinction is important for interpreting the data. For example, a perpetrator entering through an unlocked door at a school with no locking protocol would not be coded as a security bypass, because there was no security measure to defeat. By contrast, a perpetrator who used deception to

[5] In the 2005 Red Lake High School incident (Red Lake, MN), the perpetrator was shot by responding officers and subsequently killed himself. This case was coded as law enforcement intervention with lethal force because the police engagement was what initially stopped the attack.

gain entry to a school with a visitor screening process, or who engaged and overcame security personnel at a controlled access point, would be coded as a bypass.

The following cases illustrate the range of circumstances under which security measures were bypassed.

In the 2005 Red Lake High School incident (Red Lake, MN), the school had metal detectors and unarmed security guards at the entrance. The perpetrator shot and killed the security guard, allowing him to pass through the entry point and continue the attack inside the school.

In the 2024 Feather River Adventist School incident (Oroville, CA), the perpetrator used a fake identification to schedule a campus visit. Without this deception, he would not have been granted access under the school's visitor screening protocols.

By contrast, in the 2006 West Nickel Mines school incident (Bart Township, PA), the perpetrator entered through an unlocked door at a school with no formal locking protocol. Because there was no security procedure in place to defeat, this case was not coded as a security bypass.

Event Characteristics by School Level

This section presents bivariate comparisons of key event-level variables by school level. As previously mentioned, school level emerges as an important differentiating variable across several dimensions of these events. The comparisons presented here focus on three areas with direct relevance to the study's research questions: the perpetrator's relationship to the school, the location of victims within the school, and whether doors were involved in the event. Each of these variables has implications for the role that door locks and access-control measures may play in different school settings.

Bivariate comparisons of time of day, weapon type, and event resolution by school level were also examined but did not reveal meaningful patterns given the small number of incidents within each school level. These comparisons are not presented here.

For these analyses, the five incidents occurring at schools with non-standard grade configurations (e.g., K–12, 6–12) are grouped as "Other." Because this category is small and heterogeneous, observed patterns for this group should be interpreted with caution.

Perpetrator Relationship by School Level

The relationship between the perpetrator and the school varied meaningfully across school levels, as summarized in Figure 13.[6] In high schools, most perpetrators were current students (25 of 30,

[6] The 55 perpetrators are distributed across school levels as follows: elementary schools (10), middle and junior high schools (9), high schools (30), and other school configurations (6). Totals by school level reflect perpetrator counts rather than incident counts. The "Other" category includes six perpetrators from five incidents, as the STEM School Highlands Ranch attack involved two perpetrators.

83.3%), reflecting the routine access that enrolled students have to the building during school hours. A similar pattern was observed in middle and junior high schools, where eight of nine perpetrators (88.9%) were current students.

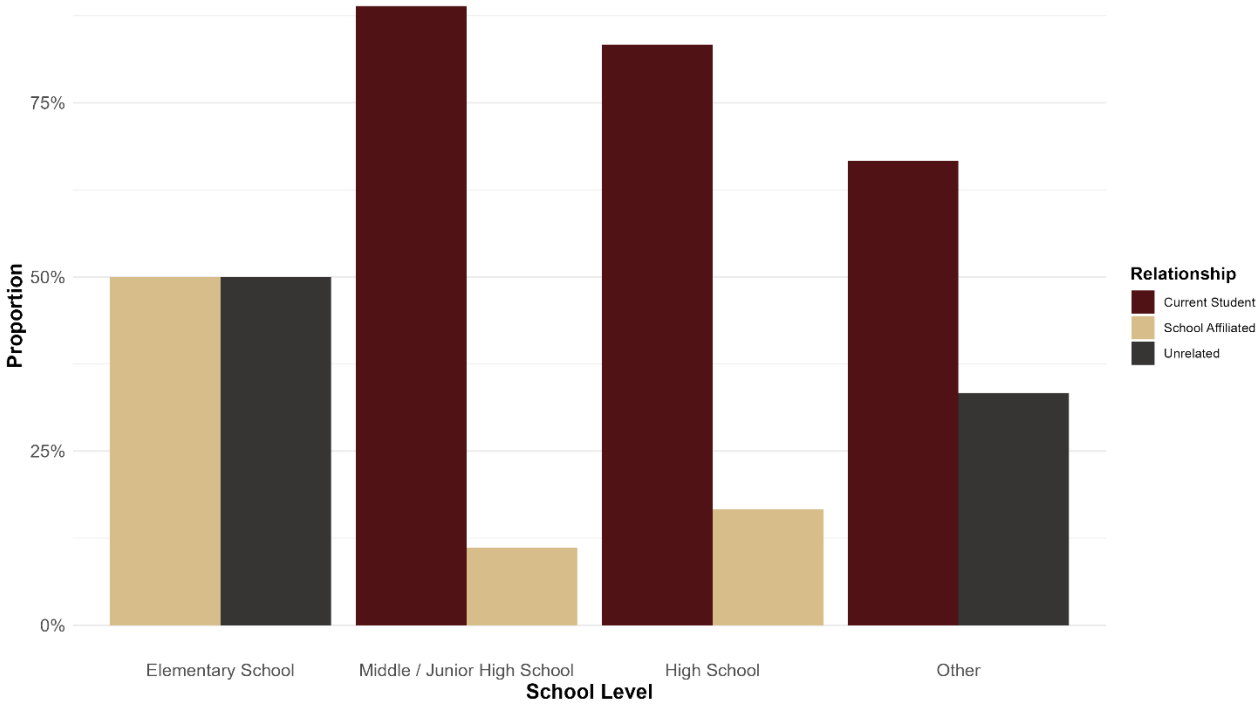


Figure 13. Perpetrator Relationship by School Level

In elementary schools, the pattern is markedly different. None of the 10 perpetrators were current students. Five (50%) had no prior relationship with the school, four (40%) were school affiliated (former students, former staff, or otherwise connected to the school community), and one (10%) was a current staff member. This distinction is consequential for physical security. In high schools and middle schools, where the perpetrator is almost always a student who is already inside the building, exterior door locks are unlikely to serve as a point of intervention. In elementary schools, where every perpetrator came from outside the current student body and half had no connection to the school at all, the status and integrity of exterior doors may be a more critical factor in whether an attacker can reach potential victims.

Victim Location by School Level

The distribution of victims by location within the school is presented by school level in Figure 14. Across the 54 incidents, 321 total victims were distributed across elementary schools (85), high schools (188), middle or junior high schools (16), and other school configurations (32). Three victims did not have specific information on their location.

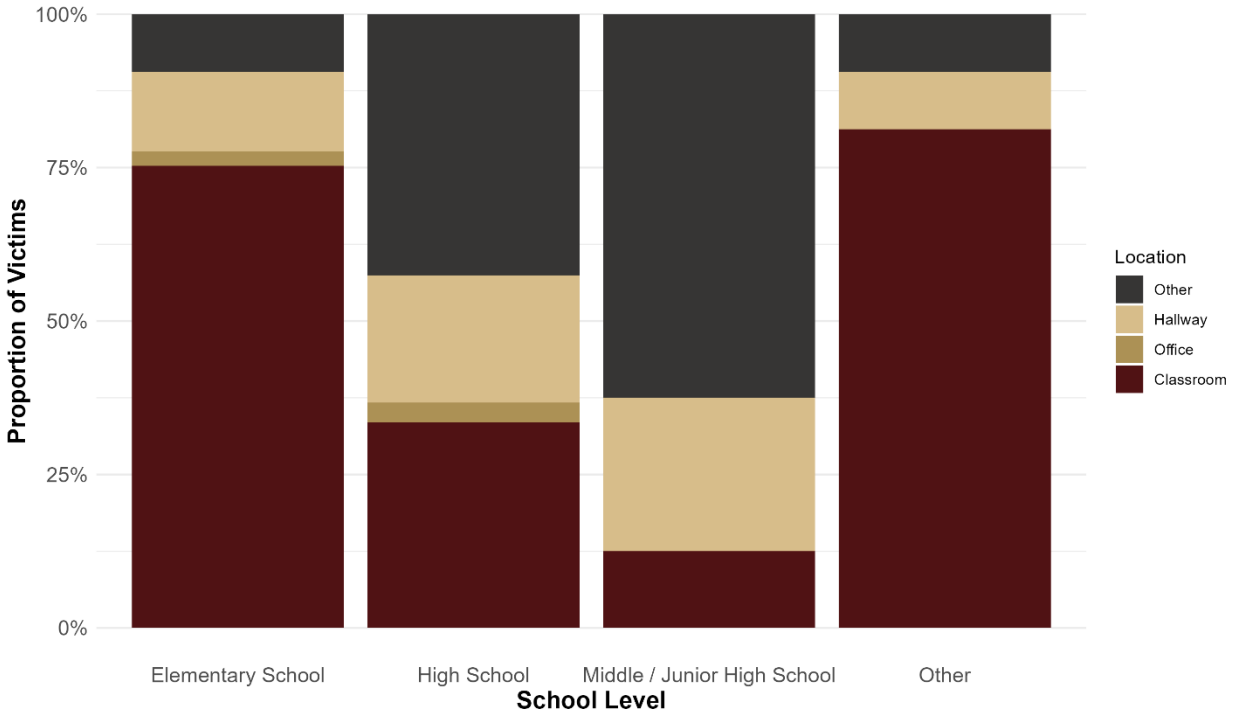


Figure 14. Victim Location by School Level

In elementary schools, victims were overwhelmingly concentrated in classrooms (64, 75.3%), with 46 of those killed and 18 wounded. The remaining elementary school victims were distributed across hallways (11, 12.9%), outside areas (5, 5.9%), common areas (3, 3.5%), and offices (2, 2.4%). This concentration is notable, more than three-quarters of all elementary school victims were in a space that could, in principle, be secured with a locked door.

High schools present a markedly different pattern. While classrooms still accounted for the largest single share of victims (63, 33.5%), victims were far more dispersed across the building. Hallways accounted for 39 victims (20.7%), common areas for 36 (19.1%), cafeterias for 13 (6.9%), outside areas for 7 (3.7%), and offices for 6 (3.2%). An additional 24 high school victims (12.8%) had unknown locations. This dispersion is consistent with the finding that most high school perpetrators were current students who initiated attacks in shared spaces such as hallways, cafeterias, and common areas. These are locations that cannot be easily secured once the perpetrator is inside the building.

The middle or junior high school and "Other" categories are too small to support detailed comparisons but are included in Figure 14 for completeness. It is worth noting, however, that the "Other" category includes three K–12 schools, and the victim distribution in this group more closely resembles the elementary school pattern than the high school pattern—26 of 32 victims (81.2%) were shot in classrooms.

Door Involvement by School Level

The proportion of incidents involving a documented door interaction is presented by school level in Figure 15. Half of all elementary school incidents (5 of 10, 50%) involved a door interaction, compared to 40% of high school incidents (12 of 30) and 22.2% of middle or junior high school incidents (2 of 9). In the "Other" category, four of five incidents (80%) involved a door interaction.

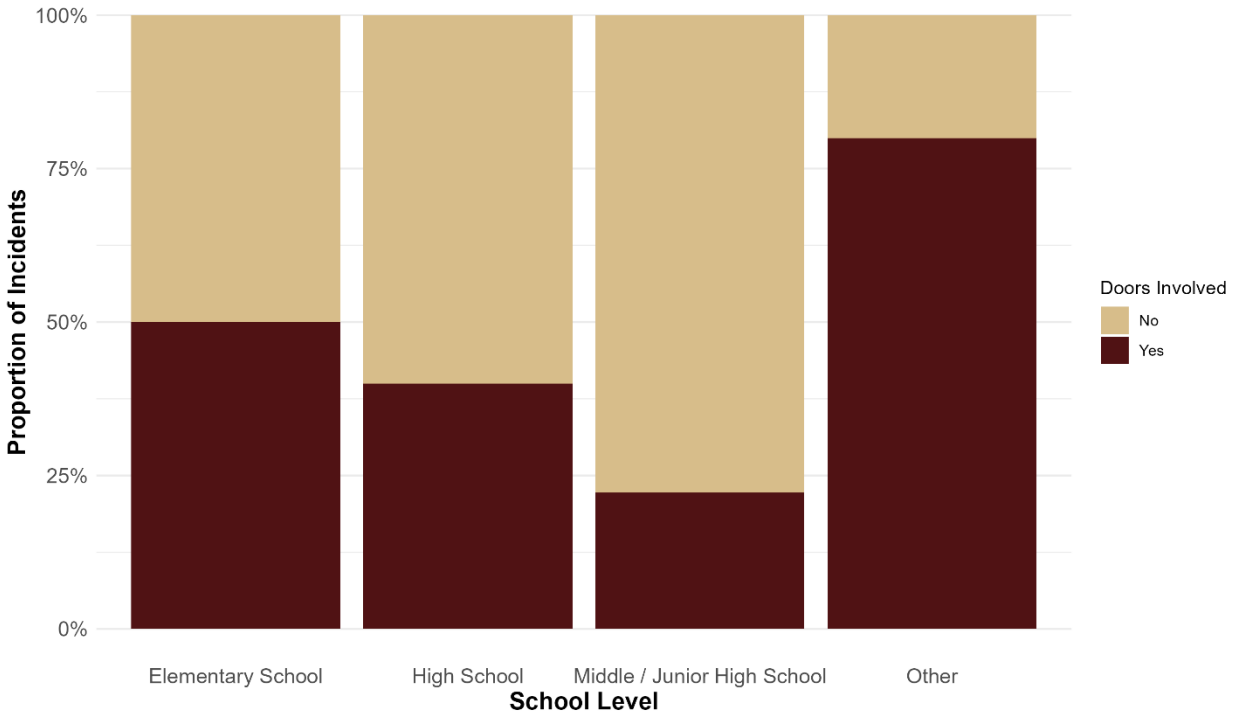


Figure 15. Door involvement by school level

The relatively low rate of door involvement in middle and junior high schools and high schools is consistent with earlier findings—most perpetrators at these school levels were current students who already had access to the building and frequently initiated attacks in common areas where doors did not serve as a barrier. That half of elementary school incidents involved a door interaction aligns with the finding that elementary school perpetrators were universally outsiders who needed to gain entry to the building. The high rate in the "Other" category likely reflects the K–12 school composition of that group noted in the previous subsection, where the attack dynamics more closely resembled elementary school incidents.

Table 1. Door Involvement by Location and School Level

School Level	Total Doors	Exterior	Interior
Elementary School	16	6 (37.5%)	10 (62.5%)
Middle / Junior High School	2	0 (0.0%)	2 (100.0%)
High School	43	5 (11.6%)	38 (88.4%)
Other	5	2 (40.0%)	3 (60.0%)

The nature of door interactions also differed by school level (see Table 1). Across the 66 doors with which perpetrators interacted, exterior doors accounted for 6 of 16 door interactions (37.5%) at elementary schools, compared to only 5 of 43 (11.6%) at high schools. This disparity reinforces a key distinction: in elementary schools, the exterior door frequently represents the primary point at which an attacker can be denied access, whereas in high schools the perpetrator has typically already passed through exterior entry points as part of normal daily access.

Door Level Characteristics

This section shifts the unit of analysis from the event to the individual door. Across the 23 incidents in which a documented door interaction occurred, perpetrators interacted with a total of 66 doors. These interactions include attempts to open, breach, or shoot through a door. Because some incidents involved multiple door interactions and others involved only one, the number of doors per incident varies. The analyses in this section focus exclusively on these 66 doors; the remaining 31 incidents in which no door interaction was reported are not represented here.

The section is organized into four parts. The first describes the physical characteristics of the doors themselves, including their location within the school, construction materials, and locking mechanisms. The second describes the status of each door at the time of the event, specifically whether it was locked, unlocked, propped open, or barricaded. The third examines perpetrator actions directed at doors, including breach attempts, efforts to open or shoot through doors, and the outcomes of those actions. The fourth presents victim counts in relation to door status. Together, these analyses provide a detailed picture of how door-based access controls functioned, and in some cases failed to function, during these events.

Door Characteristics

This subsection describes the physical characteristics of the 66 doors with which perpetrators interacted, including their location within the school, construction material, glazing features (i.e., glass features), and locking mechanism. As noted in the introduction to this section, detailed information about door hardware and construction was often unavailable. Missing data are noted throughout, and percentages are calculated based on known cases unless otherwise specified.

Door Locations

The locations of the 66 doors are summarized in Figure 16. Classroom doors accounted for the largest share (43, 65.2%), followed by exterior doors (13, 19.7%), other door types (4, 6.1%), hallway doors (3, 4.5%), and office doors (3, 4.5%). In many cases, additional door interactions may have occurred but were not documented, so these figures likely underrepresent the total number of doors encountered during an attack.

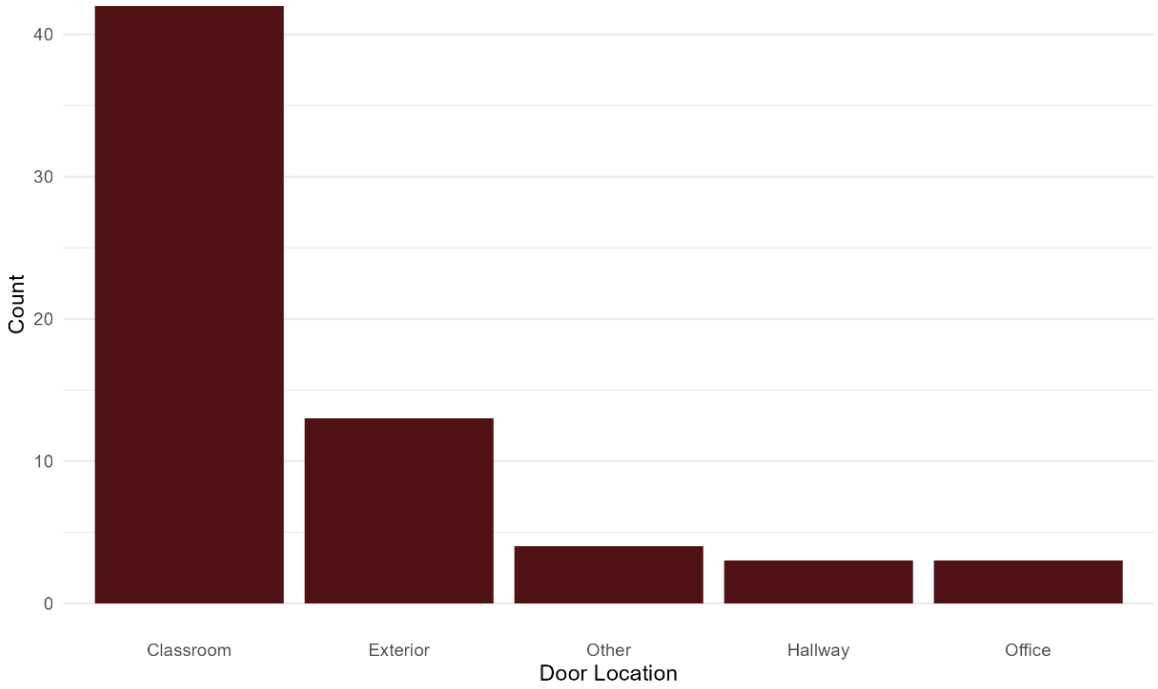


Figure 16. Door Location within School

Door Construction

Information on door construction material was available for 48 of the 66 doors (72.7%). Among doors with known construction, wood was the most common material (30, 62.5%), followed by metal (11, 22.9%) and aluminum entry doors with glass panels (7, 14.6%).[7] The remaining 18 doors (27.3%) had unknown construction materials. The predominance of wood is consistent with typical classroom door construction in older school buildings, though without information on the age or renovation history of each facility, this interpretation should be considered tentative.

[7] Six of the seven aluminum entry doors with glass panels in the dataset were exterior doors. The exception was a set of hallway doors at Aztec High School (Aztec, NM, 2017), which were confirmed as aluminum doors with glass panels based on photographs in the public record documentation.

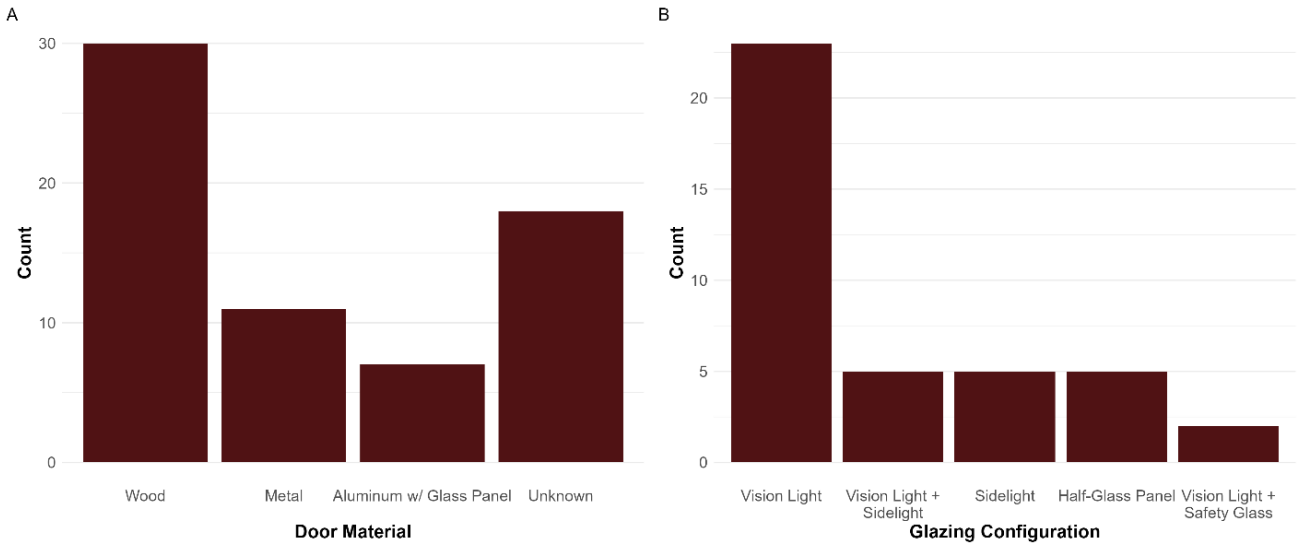


Figure 17. Door Construction

Glazing (glass) features were documented for 40 of the 66 doors (60.6%). Among these, the most common configuration was a vision light (e.g. a small inset window) alone (23 doors), followed by a vision light with an adjacent sidelight (5 doors), a standalone sidelight (5 doors), 1/2 glass panels (5 doors), and a vision light confirmed with safety glass wire mesh (2 doors). The presence and type of glass is relevant to subsequent analyses of breach attempts, as glass panels represent a potential vulnerability that can be exploited to circumvent an otherwise functional locked door.

Locking Mechanism

The type of locking mechanism was known for 38 of the 66 doors (57.6%). Among doors with known hardware, the most common type was a mechanical lock (28, 73.7%), which generally requires a key to lock or unlock from the corridor side.[8] Exit devices accounted for 8 doors (21.1%). One door had an electric lock, and one was classified as

An exit device (also known as a crash bar, push bar, or panic bar) is a horizontal bar mounted on the inside of a door that unlatches when pressed, allowing rapid exit. Exit devices are commonly found on exterior and stairwell doors in schools and are typically required by fire code. In their default position, an exit device locks the door from the outside while allowing free egress from the inside. Some models can be disengaged with a key or tool to allow entry from the outside, which can create a vulnerability if the door is left in this configuration.

[8] Many mechanical locks are also equipped with an interior locking mechanism such as a push button or thumb turn, allowing the door to be secured from inside the room without a key. The available documentation did not consistently specify whether the mechanical locks in this dataset included such a feature. For this reason, the 28 doors coded as mechanical should be understood as having at minimum an exterior key lock, with the possibility that some also had an interior locking option that was not documented.

"other," referring to a door at Aztec High School (Aztec, NM, 2017) that was reported as having no apparent locking mechanism; rather, it was equipped as a push/pull door. The remaining 28 doors (42.4%) had unknown lock types. A detailed description of each locking mechanism type is provided in Appendix B.

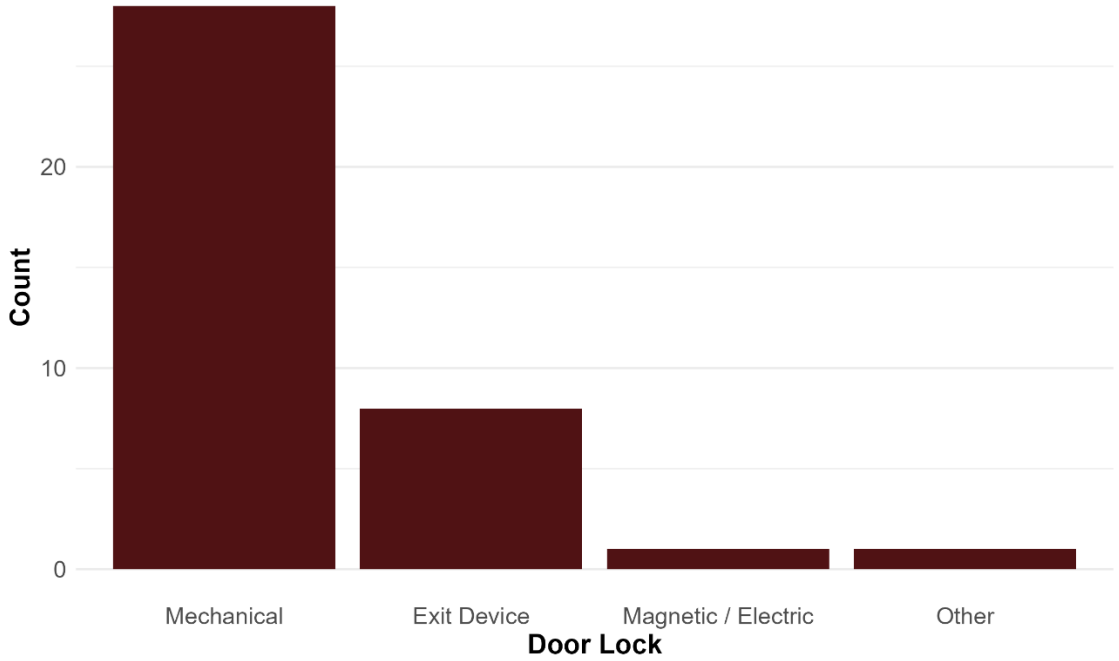


Figure 18. Locking Mechanism

Door Status

This subsection describes the status of each door at the time of the event, including whether it was locked, unlocked, propped open, or barricaded.

Lock Status

The lock status of the 66 doors at the time of the event is summarized in Figure 19. Of the 47 doors with known status, 24 were unlocked (51.1%), 18 were locked (38.3%), and 5 were propped open or otherwise unsecured (10.6%).[9] Status was unknown for the remaining 19 doors (28.8% of all 66 doors). Taken together, unlocked and propped doors accounted for 29 of the 47 doors with known status (61.7%), meaning that in most documented cases, the door did not present a physical barrier to the perpetrator at the time of the attack.

[9] The propped or otherwise unsecured category includes doors that were functionally unsecured despite the presence of locking hardware. For example, in the 2019 STEM School Highlands Ranch incident (Highlands Ranch, CO), a magnetic strip was used by both the attacker and victims. In the 2022 Robb Elementary School incident (Uvalde, TX), an exterior and interior door that was intended to be locked was unsecured due to a malfunctioning lock. Both cases are discussed further in Section 5 of the report

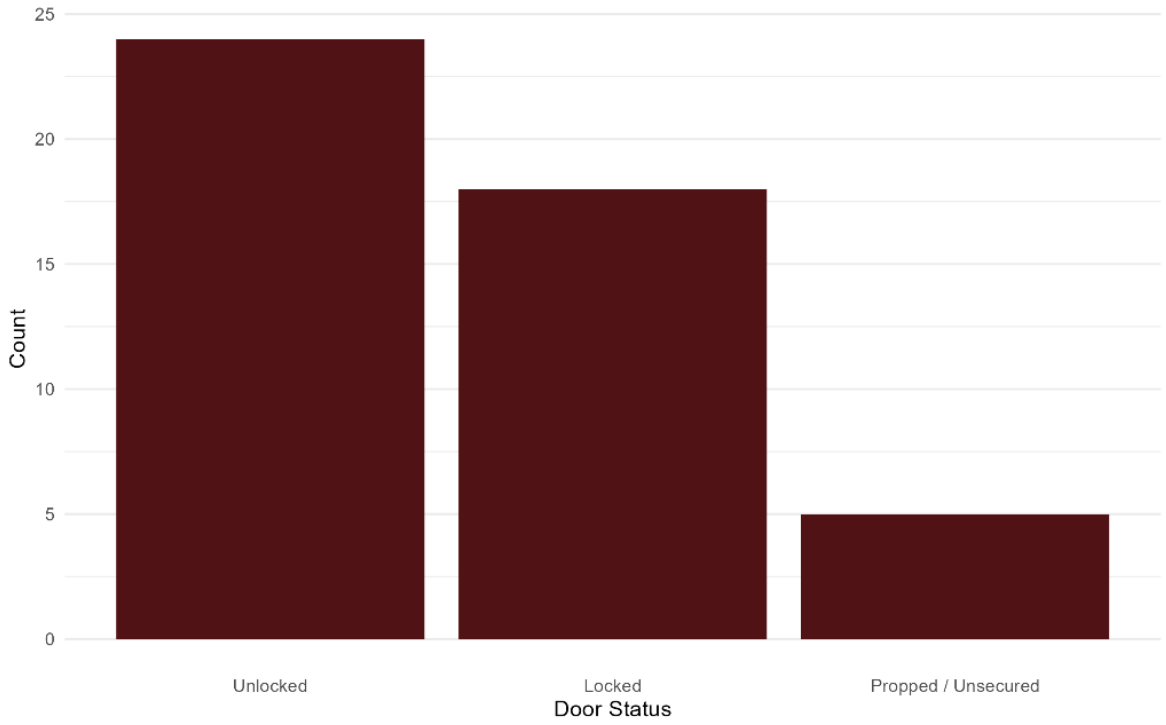


Figure 19. Door Lock Status

Magnetic strips are aftermarket devices, sometimes referred to as door latch magnets, which are placed on the door frame that prevent the latch from engaging with the strike plate, regardless of the lock type installed. When a magnetic strip is in place, the door can be closed but will not lock because the latch cannot seat properly. This is essentially a propped door. During a lockdown, the strip is intended to be removed so the latch engages normally and the door locks as intended. These devices are used in some schools to allow doors to remain functionally unlocked during normal operations while preserving the ability to secure the room in an emergency.

The use of magnetic strips in active shooter events, including circumstances in which they may create vulnerabilities, is discussed in Section 5 of the report.

Barricaded Status

Barricades are improvised physical barriers, intended to prevent or delay an attacker from entering a room in the incidents reviewed. These consisted of furniture or other items from inside a space placed in front of a door, or sometimes aftermarket barricade devices. Of the 66 doors, 31 (47.0%) were reported as unbarricaded, 6 (9.1%) were barricaded, and the remaining 29 had unknown barricade status or were not documented. Of the six barricaded doors, three were equipped with aftermarket barricade devices, one involved both an aftermarket device and furniture, and two were barricaded with furniture or available equipment. Of the six barricaded doors, two were also locked, two were unlocked, and two had unknown lock status. The two unlocked doors were barricaded with furniture and a ceramic kiln. Barricade devices will be further discussed in Section 5 of this report.

Perpetrator Actions

This subsection examines what perpetrators did when they encountered doors during an attack, including how they gained entry, whether they attempted to mechanically breach locked doors, and whether they fired through doors or windows.

How Perpetrators Gained Entry

Of the 66 documented door interactions, perpetrators entered through 29 doors (43.9%). In 30 cases (45.5%), the perpetrator did not gain entry. The outcome was unknown for the remaining 7 doors.

Among the 29 doors through which the perpetrator entered, the most common means of entry was simply passing through an unsecured door. Sixteen of the 29 doors (55.2%) were unlocked, and four (13.8%) were propped open or otherwise unsecured. Combined, unsecured doors accounted for 20 of the 29 successful entries (69%). Six entries (20.7%) involved the perpetrator mechanically breaching a locked door by shooting through the accompanying glass. The door status for the remaining three entries was unknown.

This finding underscores a straightforward point: in most cases where a perpetrator gained access to a space, the door was not secured at the time of the attack. Locked doors that were mechanically breached represent a smaller but important subset of cases, discussed in detail below.

Mechanical Breach Attempts

Across the 66 door interactions, nine involved a documented mechanical breach attempt in which the perpetrator tried to forcibly enter a locked space. Of these nine attempts, six were successful (66.7%) and three were not. A mechanical breach is defined here as forcible entry through or in circumvention of a locked or barricaded door. The six successful mechanical breaches are summarized below.

Four of the six successful breaches involved aluminum frame exterior doors with glass panels. In the 2012 Sandy Hook Elementary incident (Newtown, CT), the perpetrator shot through the glass next to the aluminum entry door to gain access to the building. In the 2022 Central Visual and Performing Arts High School incident (St. Louis, MO), the perpetrator shot through a locked aluminum frame exterior door. In the 2023 Covenant Presbyterian School incident (Nashville, TN), the perpetrator shot through two separate locked aluminum frame exterior doors. In each of these cases, the glass panels shattered and the perpetrator stepped or crawled through the opening.

The remaining two successful breaches involved wood doors with glass features. In the 2005 Red Lake High School incident (Red Lake, MN), the perpetrator breached a locked classroom by shooting through the adjacent sidelight and entering through the sidelight. In the CVPA incident, a second locked classroom door with a vision light was also breached by the shooting reaching through the vision light.

Attempted mechanical breach at Aztec High School.

Among the three unsuccessful breach attempts, the 2017 Aztec High School incident (Aztec, NM) provides a notable example. The perpetrator shot through a door lock in an attempt to defeat the lock but was unable to gain entry. The perpetrator in the 2005 Red Lake High School incident was also unable to defeat a second lock by shooting it. Additionally, the attacker during the 2024 attack at Perry High School shot the door and then tried the handle. In all three cases, the locked door held and the perpetrator moved on.

A consistent pattern emerges from these data. No mechanical breach in the dataset was accomplished by defeating a locking mechanism. In every successful case, the perpetrator bypassed the lock by destroying or shooting through glass, whether in the door itself or in an adjacent sidelight. Flush doors without glass components (e.g., solid wood or solid metal flush doors with functional locks) were never successfully breached.

Other Door Interactions

Beyond breach attempts, the data captured additional forms of perpetrator interaction with doors. In five cases (7.6% of the 66 doors), the perpetrator attempted to open the door, typically by trying the handle. In four of these cases the door held, and the perpetrator did not gain entry. In one case, the failed attempt was followed by a mechanical breach through the adjacent glass. In the remaining cases, the perpetrator either did not attempt to open the door or found it already open.

In one incident, the perpetrator attempted to use persuasion to gain entry. In the 2024 Apalachee High School shooting (Winder, GA), the perpetrator tried to convince occupants of a classroom to open the door. The attempt was unsuccessful. Notably, this occurred before the attack had fully escalated, as the classroom door was already automatically locked from the inside.

Shot Through Door and Windows

The perpetrator fired through the door in 31 of 57 cases with known information (54.4%). In 26 cases (45.6%), the door was not shot. The perpetrator fired through a window (including vision lights and sidelights) in 28 of 57 cases with known information (49.1%). These two variables overlap substantially: in 22 cases the perpetrator fired through both the door and the window, in 7 cases only the door was shot, in 4 cases only the window was shot, and in 21 cases neither was shot. The high degree of overlap reflects the fact that many school doors include inset glass panels or adjacent sidelights, meaning that firing at a door often involves firing through or near glass features as well.

Victims by Door Status

The preceding sections established that the majority of perpetrator entries occurred through unsecured doors and that locked doors were rarely breached through mechanical means. This subsection examines whether door status is associated with the likelihood of casualties behind a given door.

Rather than comparing mean victim counts, which are highly sensitive to a small number of extreme-casualty events, this analysis uses a binary indicator: whether any victim (killed or wounded) was recorded behind each door. This approach provides a more stable and interpretable comparison given the small sample and skewed distribution of victim counts.

For this analysis, doors that were locked or barricaded were classified as "secured," while unlocked and propped doors were classified as "unsecured." Among the six barricaded doors, two were also locked, two were unlocked, and two had unknown lock status. The two locked-and-barricaded doors would be classified as secure regardless of the barricade. The remaining four barricaded doors are classified as secured solely on the basis of the barricade, as their locks were either not engaged (in the case of the two doors barricaded with furniture or other objects) or their lock status was unknown (in the case of the other two).

Among the 50 doors with known victim outcomes, the probability of there being at least one victim differed substantially by security status.[10] Behind secured doors, only 3 of 18 (16.7%) resulted in any

[10] Of the 66 doors in the dataset, 16 were excluded from this analysis due to unknown victim outcomes: 11 had known door status but unknown victim counts, and 5 were missing both door status and victim information. For example, in the 2018 Santa Fe High School incident (Santa Fe, TX), 10 people were killed and 11 wounded across 5 different rooms connected by a corridor, but available interviews and public records did not specify which room individual victims were in, preventing the assignment of victim counts to specific doors.

victim. Behind unsecured doors, 10 of 20 (50%) resulted in at least one victim. For the 12 doors with unknown security status, 3 (25%) resulted in at least one victim, a rate that falls between the secured and unsecured groups, consistent with this subset likely containing a mix of both secured and unsecured doors. The pattern is summarized in Figure 20.

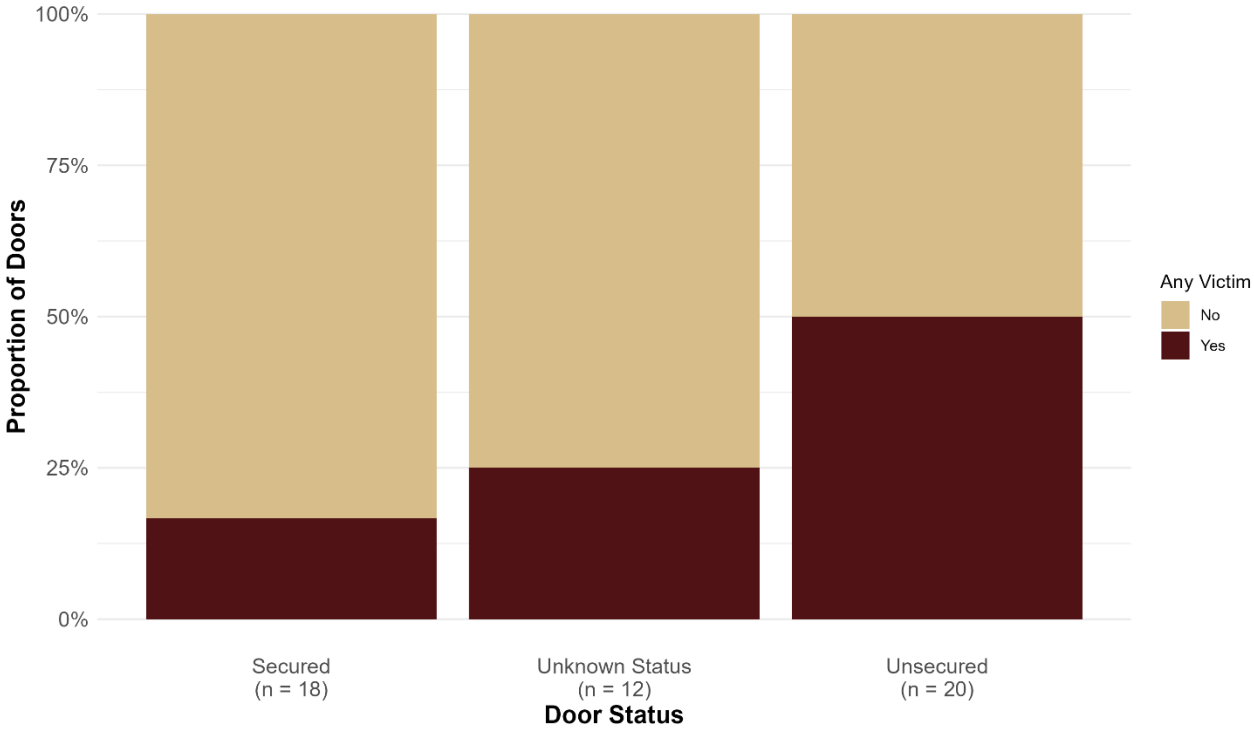


Figure 20. Presence of Any Victim by Door Status

These results should be interpreted with caution given the small number of doors in each category. Nevertheless, the direction of the relationship is consistent and aligns with the broader findings presented in this chapter: locked doors substantially reduce the likelihood that a perpetrator will gain access to a space and cause harm to its occupants.

Summary

The 54 school-based active shooter events examined in this section span 26 years and occur across a range of school types, geographic locations, and circumstances. Despite this variation, several consistent patterns emerge from the data that are directly relevant to the role of door locks and access-control measures in school safety.

The most fundamental finding concerns who carries out these attacks and how they access the building. In high schools and middle schools, perpetrators are overwhelmingly current students who already have routine access to the building. In these settings, exterior door locks are relatively less likely to serve as a meaningful barrier because the attacker enters through normal daily access. The

attack typically originates in a common area such as a hallway, cafeteria, or open space, and victims in high schools are dispersed across the building accordingly.

Elementary schools present a markedly different threat profile. None of the 10 elementary school perpetrators were current students, and half had no prior relationship to the school. Elementary school perpetrators must gain entry from the outside, making the exterior door the primary point at which access can be denied. Consistent with this, elementary schools showed a higher proportion of exterior door interactions (37.5%) compared to high schools (11.6%). Victims in elementary schools were overwhelmingly concentrated in classrooms (75.3%), spaces that could, in principle, be secured with a locked door. This pattern also extended to the "Other" school category, which includes K-12 campuses where attack dynamics more closely resembled elementary school incidents.

When perpetrators did interact with doors, the most common means of entry was simply passing through an unsecured door. Of the 29 doors through which a perpetrator entered, 20 (69.0%) were unlocked or propped open at the time of the attack. Mechanical breaches of locked doors were far less common, accounting for only 6 successful entries across the entire dataset. In every one of these cases, the perpetrator defeated the barrier by shooting through glass rather than overcoming the locking mechanism itself. Solid doors with functional locks were never successfully breached. Three of the unsuccessful breach attempts further reinforce this point, as locked doors held and the perpetrator moved on.

The relationship between door status and victim outcomes underscores these findings. Behind secured doors (locked or barricaded), only 16.7% resulted in any casualty. Behind unsecured doors, that figure rose to 50%. Although the sample sizes are small and the results should be interpreted with appropriate caution, the direction of this finding is consistent across every analytic cut presented in this section.

Taken together, these results point to two distinct, but interrelated, security challenges that vary by school level. While classrooms were where the majority of victims were attacked across all schools, in elementary schools, a high priority is preventing an outsider from breaching the exterior perimeter, with particular attention to glass doors and panels that represent a documented vulnerability. In high schools and middle schools, where the perpetrator is almost always already inside, a priority is ensuring that interior classroom doors can be secured quickly and reliably during an event. The policy and design implications of these findings are discussed in Section 5.

Section 3. Averted School Shooting Incidents

While Section 2 examined school-based active shooter events that met the FBI's operational definition, this section focuses on a fundamentally different but equally important category of incidents: attacks that were averted before they could unfold due to physical security measures. These are cases in which an individual approached a school with apparent intent to carry out an attack but was prevented from gaining access to the interior, because of locked doors or other physical security measures.

The study of averted attacks presents distinct methodological challenges. Unlike completed active shooter events, which typically generate extensive media coverage, law enforcement documentation, and/or after-action reports, averted incidents often receive less attention. As a result, identifying these incidents requires a broader search strategy, and analyzing them demands greater reliance on media accounts and direct communication with affected schools and agencies.

As described in Section 1, the research team conducted systematic searches across multiple platforms using structured Boolean. These searches were supplemented by consultation with two publicly available databases: the Averted School Violence database maintained by Safe and Sound Schools[ix] and the Averted School Shooting Tracker maintained by the K-12 School Shooting Database.[x]

Despite these comprehensive search efforts, the number of documented averted school shooting incidents involving door-based access control remained limited. The research team identified three incidents occurring between 2000 and 2025 that met the study's inclusion criteria for fully averted attacks and for which sufficient information was available to support case-level analysis. The three incidents involved complete prevention of harm, in which locked doors or other access-control measures denied the attacker entry to the building and no victims were injured or killed. A fourth incident represents a notable exception in which the attacker ultimately breached a locked entry door after being confronted by responding law enforcement officers. In this case, no students or staff were harmed despite the attacker's entry into the building.

This small sample size should not be interpreted as reflecting the true frequency of averted school shooting incidents. Rather, it reflects the limitations inherent in identifying these events through available sources. Unlike completed school-based active shooter events that often generate sustained national media coverage, some averted incidents only receive local news attention, or limited national attention, and may not be systematically cataloged in accessible databases. The four cases documented here represent only those incidents that could be identified through comprehensive searches of open-source materials and publicly available databases. It is likely that additional averted incidents occurred during the study period but remained beyond the reach of systematic identification efforts. As such, the cases presented in this section should be understood as illustrative

examples rather than a complete accounting of all averted school-based active shooter events during the study period.

Given the limited number of cases, this section employs a case study approach rather than quantitative analysis. Each incident is presented as a structured narrative that documents the circumstances of the event, the role of door locks or other access-control features, and the factors that contributed to prevention. Where appropriate, cross-case observations are offered to highlight recurring themes or patterns.

Complete Prevention: Locked Doors Denied Entry

The following cases represent incidents in which door-based access control measures successfully prevented an armed individual from entering school buildings, resulting in zero casualties within the school. In each case, locked doors functioned as the primary physical barrier that denied attacker access, bought time for law enforcement response, or both. These incidents varied in context and circumstance, but they all shared a common outcome: physical security measures prevented direct harm to students and staff inside the building.

Margolin Hebrew Academy - Memphis, TN

On July 31, 2023, shortly after noon, Memphis police received a call about an armed individual who had attempted to enter the Margolin Hebrew Academy-Feinstone Yeshiva of the South, in Memphis, Tennessee. The attacker, a 33-year-old former student of the academy, arrived at the school armed with a handgun. Although class was not in session, a number of staff members and construction contractors were present on campus. The attacker attempted to gain entry but was unsuccessful due to the school's security measures, including locked exterior doors. When he could not gain access, he had a brief confrontation with a contract worker outside the building and fired two shots from his handgun while retreating from the worker. He then returned to his vehicle and fired an additional two shots while leaving the property. The attacker was shot by police shortly after during a traffic stop.

The school's security features played a central role in preventing the attacker's entry. According to school leaders and media reports, Margolin Hebrew Academy had recently upgraded its security measures, including the installation of metal doors with electronic fob access, security cameras, and an emergency response system designed to quickly notify law enforcement of an active shooter. In a statement released the day after the incident, the school acknowledged both its security infrastructure and the swift law enforcement response, expressing shock and sadness at the events while noting gratitude that everyone remained safe thanks to the school's extensive security measures and the rapid police response.[xi]

Mount Horeb Middle School - Mount Horeb, WI

On May 1, 2024, Mount Horeb Middle School in Mount Horeb, Wisconsin, experienced a potential attack. Shortly before 11:15 a.m., a 911 caller reported observing a person approaching the school with a backpack and what appeared to be a long gun. The individual was later identified as a 14-year-old male student in the Mount Horeb Area School District who was not enrolled at Mount Horeb Middle School.

Mount Horeb police officers, including the school resource officer, responded to the scene and encountered the armed individual outside the school's main entrance. The school had already been placed on lockdown, and the individual was unable to gain entry to the building. Surveillance footage released by the Wisconsin Department of Justice showed the suspect banging on the locked doors outside of the school with the butt of his rifle.[xii] Officers ordered the suspect to drop the weapon, but he did not comply. The suspect pointed the weapon, later identified as a Ruger .177 caliber pellet rifle, at the officers. Police used deadly force, and the suspect died at the scene from his wounds. Police found a Molotov cocktail, commercial fireworks, and ammunition in his backpack. Investigators later found written material in his home indicated he intended to break into the school during the lunch period, burn the library, and attack a subset of students.

According to the school district superintendent, the school's security system required anyone entering the building to ring a doorbell and state the nature of their business before being granted access. This protocol, combined with the school's immediate lockdown response, prevented him from gaining access to the interior to execute his planned attack, and no students, staff, or law enforcement were injured.

Zwink Elementary School - Spring, TX

On March 10, 2026, shortly after 1:30 p.m., a 39-year-old man entered the front vestibule of Zwink Elementary School in Spring, Texas, wearing tactical gear and carrying a holstered handgun and a Taser. The man has no affiliation with the school. He gained entry to the outer entrance of the building during a 15-second window when the exterior door failed to fully latch after a parent exited the building.

The school’s security vestibule, a double-door entry system requiring visitor identification and staff authorization before interior access is granted, prevented the man from advancing beyond the front office area. When he failed to provide identification, the school’s armed campus security officer was notified. He never made it past the security vestibule and ultimately fled the scene only to be arrested shortly thereafter.

This case illustrates an important limitation of perimeter access control. A single compliance failure (a door that did not fully latch behind a departing parent) was sufficient to circumvent the outer security. What prevented potential harm was not the exterior door, but the secondary layer of access control provided by the security vestibule. This case demonstrates that layered security in which a

secondary barrier operates independently of the first, can assist if there is a failure in the outermost perimeter.

Notable Exception: Entry Delayed but Not Ultimately Prevented

The following case does not fit neatly into either the complete prevention or partial prevention categories but offers important insights about how physical security measures can delay attacker access during critical moments of law enforcement response. In this incident, the attacker was initially denied entry by locked doors, providing law enforcement time to arrive on scene. The attacker ultimately breached the door, but the delay may have influenced the outcome and prevented casualties.

Dennis Intermediate School - Richmond, IN

On December 13, 2018, a 14-year-old boy approached Dennis Intermediate School in Richmond, Indiana, with the intent to carry out a mass shooting. At approximately 8:15 a.m., the attacker's mother called 911 to report that her son had taken a family member hostage at gunpoint and was forcing the individual to drive him to the school. She told dispatchers that the attacker had taken at least five guns and stated his intention to kill himself, the hostage, and shoot up the school. Law enforcement from multiple agencies immediately responded to secure the school.

Richmond police alerted area law enforcement to the potential for violence at Dennis Intermediate, and the school was placed on lockdown before the attacker arrived. When the attacker reached the school at approximately 8:23 a.m., he was armed with a Remington rifle, a .45 caliber pistol, two magazines, a handwritten plan, and materials to create Molotov cocktails. Officers confronted him at the north entrance of the building, where the doors had been locked as part of the lockdown procedure.

Unable to gain entry through the locked door, the attacker shot out the glass of the door at approximately 8:24 a.m. and entered the building. Officers pursued him inside, where they exchanged gunfire with the suspect in a stairwell. The attacker ran through the school, passing by classrooms full of students who were sheltering behind locked doors. According to multiple accounts, the attacker moved quickly through the building without attempting to engage students in the classrooms. At approximately 8:30 a.m., the attacker took his own life in the south stairwell on the second floor.

No students or law enforcement officers were injured during the incident. A state police captain emphasized the critical role played by the attacker's mother in preventing a tragedy, stating that the early warning call enabled the school to implement lockdown procedures and law enforcement to respond before the attacker arrived. Without that call, authorities believed the outcome would have been dramatically different.

Although the attacker breached the locked door by shooting out the glass and subsequently entered the building, the locked doors served two important functions. First, the delay in entry allowed law enforcement to arrive on scene and engage the suspect outside and then immediately inside the building. Second, the locked classroom doors prevented the attacker from accessing rooms where students were sheltering. Despite being armed and inside the building, the attacker passed multiple locked classrooms without attempting to force entry. Whether this was due to the physical barrier, the presence of pursuing officers, or the attacker's own decision-making remains unclear.

This case illustrates that even when door-based access control does not prevent entry entirely, it can delay an attacker's movement and create opportunities for law enforcement intervention. The time bought by locked doors, combined with rapid law enforcement response and the lockdown of interior classroom spaces, contributed to an outcome in which no students or staff were harmed despite the attacker's entry into the building.

Cross-Case Observations

Across the four cases presented in this section, several recurring themes emerge regarding the role of door-based access control in averting school shooting incidents. These observations are offered with appropriate caution, given the small sample size and the variability in incident contexts, but they provide grounding for broader discussions about physical security in school settings.

First, door-based access control functioned as a consequential physical barrier in each case. In the Margolin Hebrew Academy and Mount Horeb incidents, locked exterior doors prevented the attackers from entering the building at all, resulting in zero casualties. In the Dennis Intermediate case, the locked entry delayed the attacker’s access and positioned law enforcement to confront him immediately upon breach. Interior classroom doors that were secured as part of the lockdown further restricted his movement once inside. Across cases, secured doors either denied access entirely or constrained the attacker’s mobility in ways that limited opportunities for direct harm.

Second, physical security measures were most effective when coupled with early warning and rapid institutional response. In each incident, school officials or law enforcement were alerted before or contemporaneously with the attacker’s arrival. This advance notice enabled lockdown procedures, secured entry points, and immediate police engagement. The cases therefore suggest that door-based access control operates most effectively as one component of a layered system that includes threat reporting, communication protocols, and coordinated response.

Third, attacker persistence varied. In one case, the suspect disengaged after being denied entry. In another, the suspect attempted to force access but was stopped by responding officers. In the Dennis Intermediate case, the attacker shot through glass to gain entry, but the delay associated with that breach and the presence of officers appear to have constrained his ability to engage students. In the Zwink Elementary case, the individual made no apparent attempt to bypass the vestibule once contained, suggesting that the combination of a supervised secondary barrier and an immediate

armed response assisted in resolving the situation. While locked doors do not guarantee that entry will never occur, they consistently introduce delay, and that delay appears operationally meaningful.

Finally, these cases must be interpreted cautiously. The small sample does not allow conclusions about the frequency with which locked doors avert attacks, nor does it establish the relative effectiveness of different locking mechanisms or entry configurations. The identified incidents also involved lone actors and rapid law enforcement engagement. As such, the cases provide illustrative examples of how door-based access control has functioned in documented prevention scenarios, rather than a comprehensive evaluation of its effectiveness under all conditions.

Taken together, the evidence presented here indicates that secured entry points can either prevent attacker access or create critical time and space for intervention. Their protective value appears strongest when integrated within broader institutional preparedness and response systems.

Section 4. Case Studies

This section examines two school-based active shooter incidents that illustrate the critical importance of door security. The May 24, 2022, attack at Robb Elementary School in Uvalde, Texas demonstrates how systematic failures in door security enabled an attacker to access multiple spaces and inflict mass casualties. In contrast, the September 10, 2025, attack at Evergreen High School in Evergreen, Colorado shows how properly functioning locked doors, combined with rapid lockdown procedures, played a role in reducing potential casualties. Together, these cases underscore that door security measures are only as effective as the organizational systems, maintenance protocols, and training that ensure their consistent implementation. The divergent outcomes presented in the two case studies demonstrate that while locked doors cannot prevent all harm, they can meaningfully constrain an attacker's access to potential victims when policies are followed and physical security infrastructure functions as intended.

Robb Elementary School - Uvalde, Texas

The May 24, 2022, attack at Robb Elementary School in Uvalde, Texas represents a tragic case study in how failures to maintain and utilize door security protocols can contribute to mass casualty outcomes. Both the Texas House of Representatives Investigative Committee[xiii] and the U.S. Department of Justice Critical Incident Review[xiv] conducted extensive examinations of the incident, revealing multiple door-related security breakdowns that enabled the attacker's access to the building and classrooms. This case study examines three critical door security failures: (1) unlocked exterior doors that permitted building entry, (2) unlocked or unsecured hallway doors to Room 111 that enabled initial classroom access, and (3) an unlocked interior connecting door between adjoining Rooms 111 and 112 that allowed the attacker to move between both spaces.

Building Entry: Unlocked Exterior Doors

The attacker's unimpeded entry into Robb Elementary's west building was facilitated by systemic noncompliance with established security protocols. School policy required exterior doors to remain locked at all times, yet all three exterior access points to the West Building were left unsecured on the day of the attack.[xv] At approximately 11:33 a.m., the attacker entered through the unlocked west door of the West Building. Both investigative reports confirmed that not only was the west door unlocked, but the exterior doors on the east and south sides of the building were also unlocked. The DOJ Critical Incident Review (CIR) determined that all of the exterior doors and at least eight interior doors of the West Building, where the incident took place, were unlocked.[xvi] The west door through which the attacker entered was fully closed but unlocked, allowing him to simply pull it open and enter unimpeded.

The report documented a pervasive culture of noncompliance with door security policies throughout Uvalde Consolidated Independent School District, with multiple witnesses reporting that personnel at Robb Elementary commonly left doors unlocked. Teachers regularly used rocks to prop open exterior doors for convenience, and surveillance footage from May 24 confirmed that someone had propped open the west door with a rock earlier that morning. Although a teacher removed the rock in response to the lockdown alert, the door remained unlocked, allowing the attacker to simply open it and enter.[xvii]

The DOJ report documented that this pattern of noncompliance extended across all Uvalde CISD schools and noted a culture of complacency regarding locked-door policies. Both exterior and interior doors were routinely left unlocked, and there was no enforced system of accountability for these policies.[xviii] School district police officers conducted periodic walk-throughs to check for unlocked doors and would remind teachers to keep doors locked. However, door audits were not conducted systematically, nor were they documented, and these efforts proved insufficient to overcome convenience-driven behaviors. Teachers cited various rationales for leaving doors unlocked, including lack of keys (particularly for substitute teachers), temporary accommodation for students using restrooms, and the general inconvenience of maintaining keys. The keying system itself was a complicating factor: the West Building was in the process of being rekeyed because the original key cut had been "retired," and there was not a single master key that opened all interior doors in the West Building. Due to key shortages, some teachers used magnetic strips to keep doors mechanically unlocked. Although these strips were marketed as lockdown magnets (designed to facilitate quick locking from the inside without a key) UCISD leadership had approved their use as a lower-cost alternative to rekeying, effectively sanctioning a practice that kept classroom doors mechanically unsecured.[xix]

The failure to secure exterior doors represented a critical breach in a school's layered security approach. While the Investigative Committee acknowledged that locking exterior doors may not have ultimately prevented the attacker from entering the building, it concluded that compliance with security policies could have slowed his progress for precious minutes—time that could have been used to receive alerts, hide children, secure classroom doors, and provide law enforcement greater opportunity to engage the attacker before he reached the classrooms.

Classroom Access: Unsecured Hallway Door to Room 111

After entering the west building, the attacker proceeded south down a hallway to the vestibule for Rooms 111 and 112. The DOJ CIR report describes the sequence: The subject begins shooting into classroom 111 or 112, a barrage that lasts approximately six seconds. The subject walked into the vestibule while shooting and appeared to try to access and may have entered room 112. Approximately 10 seconds later, the subject steps back out into the hallway again, continuing to shoot, and then appears to enter room 111.[xx]

Room 111's door had a documented history of mechanical problems. In March 2022, approximately two months before the attack, the teacher in Room 111 reported that his classroom door was not always locking properly. Multiple witnesses testified that the door could lock but required extra effort to ensure the latch engaged properly; if closed softly, it might not lock.[xxi] This defect was apparently well known among school personnel. Teachers and students throughout the fourth grade were aware of the condition of Room 111's door, as they regularly entered through it to access a printer located in that classroom.[xxii]

Despite the teacher reporting the problem to school administrators on several occasions, no formal work order was ever created to repair the lock. The DOJ report confirmed that the system showed no work orders for interior doors in the West Building in the 2021 and 2022 calendar years, though there were 244 total maintenance requests at Robb Elementary during that period, 13 of which related to interior or exterior doors not closing or locking properly.[xxiii]

This breakdown in communication represented a systematic failure in the school's maintenance protocols. While Uvalde CISD policy required each staff member to know procedures for requesting door repairs, Robb Elementary teachers testified they relied on school administrators to submit work orders rather than requesting repairs themselves. The absence of a formalized, reliable system for reporting and addressing security concerns created a gap between problem identification and resolution.

Access Between Classrooms: The Interior Connecting Door

Rooms 111 and 112 were adjoining classrooms that connected internally through an adjoining door on the shared wall. This interior connecting door played a critical role in enabling the attacker's assault. Once the attacker gained access to at least one of the classrooms from the hallway, he was able to move freely between both rooms through the unlocked interior connecting door.

This access allowed the attacker to spend approximately two and a half minutes rapidly firing over 100 rounds between the two spaces. The Texas House Committee's analysis indicated that of approximately 142 total rounds the attacker fired inside the building, over 100 were fired before any law enforcement officer entered.

Lessons Learned - Robb Elementary School

The Robb Elementary attack case study, as documented by both the Texas House Committee and the DOJ Critical Incident Review, reveals multiple interconnected failures in door security that created cascading vulnerabilities:

1. **Policy compliance failures**: Despite clear policies requiring locked doors, both reports documented a culture of complacency regarding locked-door policies throughout the school district that rendered security protocols ineffective. The DOJ report found that both exterior and interior doors were routinely left unlocked, and there was no enforced system of accountability for these policies. On the day of the attack, all three exterior doors and at least

eight interior doors in the West Building were unlocked. Teachers' convenience-driven behaviors, enabled by inadequate enforcement, insufficient key distribution, and the use of magnetic devices to circumvent locks, systematically undermined the protective value of locked doors.

2. **Maintenance system breakdowns**: The failure to repair the known defective lock in Room 111 exposed critical weaknesses in the school's maintenance request and follow-through systems. While 244 maintenance requests were processed during 2021-2022, including 13 related to doors not closing or locking properly, zero work orders were created for interior doors in the West Building despite teacher reports of problems. The gap between teacher reporting and custodial awareness suggests organizational silos or simply lack of follow-through that prevented effective resolution.

3. **Interior connecting door vulnerability**: The unlocked interior connecting door between Rooms 111 and 112 allowed the attacker to access both classrooms and move between them to target victims. This design feature, combined with the failure to secure it, created a situation where even a locked hallway door to one room would not have prevented the attacker from accessing both spaces. Schools must consider all access points, including interior connecting doors, and shared storage rooms between classrooms when implementing security protocols.

Both investigative reports concluded that while locking doors may not have been sufficient to prevent the attacker from ultimately entering the building and classrooms, compliance with existing security protocols could have slowed his progress enough to save lives. This case underscores that door security measures—including exterior doors, hallway classroom doors, and interior connecting doors—are only as effective as the systems that support their consistent implementation, maintenance, and verification. Policy documents alone cannot substitute for organizational cultures that prioritize security, reliable maintenance systems that address known vulnerabilities, classroom designs that account for all access points in security planning, and training that ensures both school personnel and law enforcement responders understand the status of physical security measures.

Evergreen High School - Evergreen, Colorado

The September 10, 2025, attack at Evergreen High School in Evergreen, Colorado demonstrates the effectiveness of locked doors and rapid lockdown procedures in preventing mass casualties during an active shooter incident. While the attack resulted in two critically injured students, law enforcement officials and security experts emphasized that the school's security measures—particularly locked classroom doors—prevented what could have been a significantly more deadly event. This case study examines how physical security barriers, combined with trained staff response, limited the attacker's access to potential victims despite a nine-minute incident timeline.

Incident Overview

On September 10, 2025, at approximately 12:24 p.m. a student at Evergreen High School attacked the school. The incident lasted nine minutes from the first shot until the attacker committed suicide at

12:33 p.m. Two students were critically injured: one student was shot inside the school building, and a second student who was shot outside the building across the football field.[xxiv]

The attack occurred at a school of approximately 900 students located in the foothills of Jefferson County, Colorado. At the time of the incident, many students were at lunch, with some in the cafeteria, others in hallways, and some outside the building. The part-time school resource officer assigned to both Evergreen and Conifer High Schools had left the Evergreen campus earlier that morning and was responding to an unrelated traffic incident when the shooting began. Deputies arrived on campus within 2.5 minutes of being dispatched at 12:24 p.m.

Timeline and Attack Sequence

The Jefferson County Sheriff's Office released a detailed timeline on October 10, 2025, based on school surveillance video and emergency dispatch records.[xxv] This timeline reveals the critical role that locked doors played in constraining the attacker's movements and access to potential victims. It is worth noting that the attacker was a current student on campus during normal school hours. The available information does not include details about his movements prior to the start of the attack. The following discusses the timeline in three distinct phases.

Initial Attack Phase

At 12:21 p.m., the attacker fired the first shot inside the school building. Twelve seconds later, he fired the first shot at an individual. Fourteen seconds later the first victim was shot inside the building. During this initial phase, the attacker moved through the school firing at windows, lockers, and individuals he encountered, reloading his revolver multiple times.

School staff initiated a lockdown just 42 seconds after the first shot was fired. This rapid response was critical to establishing the physical barriers that would prevent the attacker’s continued access to the building. Reports specify that security doors were closed, but it is unclear if these refer to doors within the hallway or classroom doors only.

Locked Door Prevention Phase

At 12:23 p.m., surveillance footage shows the attacker exiting the school building. The official timeline indicates that from 12:23 p.m. to 12:26 p.m. the attacker looks for people and then tries to get back into the school through several doors. He was unable to re-enter the building due to locked doors.

Jefferson County Sheriff's Office spokesperson Jacki Kelley described this critical phase: "I do know that he tried to gain access to areas that were locked down and those teachers and those students did their job and took into account what they learned, and it kept them safe. He came up against a roadblock on many of those doors. He couldn't get to those kids.”[xxvi]

Unable to breach the secured building, the attacker moved away from the school. At 12:27 p.m., surveillance footage captured him walking and running across the track moving northeast, then going out of camera view.

External Attack and Resolution

After being blocked from re-entering the school building, the attacker crossed the football field. At the corner of Olive Street and Buffalo Park Road, he encountered and shot the second victim. An eyewitness reported seeing the two in an altercation during which the attacker threw the victim against the street and fired a shot.

At 12:30 p.m., a deputy confronted the attacker at gunpoint. At 12:31 p.m., deputies began life-saving measures on the second victim. At 12:33 p.m., the attacker was reported down from a self-inflicted gunshot wound.[xxvii]

Lessons Learned - Evergreen High School

Multiple official sources have credited locked doors with preventing additional casualties during the Evergreen High School attack. The effectiveness of the security measures derived from several interconnected factors.

Rapid Lockdown Initiation

The 42-second interval between the first shot and lockdown initiation was crucial. This rapid response meant that classroom doors were secured before the attacker had exhausted his search for targets in the initial attack area. According to the Sheriff's Office, "During the shooting, Evergreen High School students and staff did an outstanding job following their lockdown procedures. The lockdown was initiated about 40 seconds after the first shot was fired. Their quick and calm actions saved lives."[xxviii]

Once the lockdown was initiated, locked classroom doors created physical barriers throughout the building. The official investigation concluded that security doors prevented the suspect from entering additional areas of the school, which authorities say likely prevented further casualties. This finding was based on surveillance footage showing the attacker attempting unsuccessfully to access multiple doors during the nearly three-minute period he spent trying to re-enter the building.

Forced Exit and Movement Restriction

The locked doors did not merely slow the attacker’s progress; they fundamentally altered the attack trajectory by forcing him to exit the building. Once outside, his access to potential victims was dramatically reduced. While he was able to encounter and shoot one student outside the building, the exterior environment provided far fewer concentrated targets than the interior hallways and classrooms would have during the lunch period.

The Jefferson County Sheriff's Office emphasized this point in their public statements: "Lives were saved yesterday because of the actions they took during their lockdown drill" and "many more people could have been hurt if not for some of the safety measures the school had in place, such as locked doors and the quick actions of staff and students."

Summary

The September 10, 2025, attack at Evergreen High School demonstrates that locked doors, when implemented rapidly and combined with trained staff and student response, can effectively prevent an active shooter from accessing areas of a school building containing potential victims. While the attack resulted in two critically injured students and significant trauma to the school community, law enforcement officials concluded that the locked doors and lockdown procedures prevented additional casualties that could have occurred if the attacker had maintained access to the building's interior spaces.

The nearly three-minute period during which the attacker attempted unsuccessfully to re-enter the school building represents the core finding of this case study: physical barriers, when properly deployed, can force an attacker to abandon planned attack locations and seek targets elsewhere. In this case, that redirection moved the attacker from a building containing approximately 900 students in classrooms, hallways, and common areas to exterior spaces with far fewer potential victims.

The contrast between the Evergreen High School incident and the Robb Elementary attack underscores a fundamental principle: security policies are only as effective as their implementation. At Robb Elementary, policies requiring locked doors existed but were systematically violated, resulting in catastrophic consequences. At Evergreen High School, rapid lockdown procedures were executed effectively, demonstrating that when physical security measures are properly implemented, they can meaningfully reduce casualties even when they cannot prevent all harm.

For school administrators, security professionals, and policymakers, the Evergreen case provides evidence-based support for investments in both physical door security infrastructure and the training systems that ensure rapid, effective deployment of that infrastructure during emergencies. The 42-second response time and the three minutes of prevented re-entry represent measurable intervals during which effective security measures operated to protect lives.

Section 5. Discussion

The preceding sections of this report examined door locks and access-control measures from three complementary perspectives: the descriptive analysis of 54 school-based active shooter events (Section 2), structured case studies of averted attacks (Section 3), and detailed case analyses of incidents in which safety measures failed or succeeded (Section 4). This section synthesizes findings across all three research questions and discusses their implications for school safety policy, security design, and practitioner guidance.

Across these analyses, several consistent patterns emerge. Secured doors are associated with substantially lower rates of victimization than unsecured doors. The nature of the threat differs meaningfully by school level, with elementary schools facing a predominantly external threat and secondary schools facing a predominantly internal one. When locked doors were mechanically breached, the failure point was consistently glass rather than the locking mechanism itself. And the effectiveness of physical security measures depended not only on the hardware in place but on whether that hardware was properly maintained, consistently used, and supported by rapid institutional response.

At the same time, the data make clear that door locks and access control measures, though essential, are only one part of a comprehensive school safety program. A substantial share of victims were located in common areas where doors are not a relevant barrier, and occupants behind locked doors were still exposed to gunfire through doors and windows in some incidents. Physical security measures can limit an attacker's access and reduce casualties, but they cannot eliminate all risk.

The Core Finding: Secured Doors Reduce Harm

The central finding of this study is that secured doors are associated with a substantially lower likelihood of casualties. Among the 50 doors with known victim outcomes analyzed in Section 2, only 3 of 18 doors (16.7%) that were secured resulted in any casualty (following a mechanical breach), compared to 10 of 20 unsecured doors (50%). While these sample sizes are small and the finding should not be interpreted as a precise estimate of effect size, the direction of the relationship was consistent across every analytic cut presented in the report.

This finding is reinforced by evidence from both averted and completed attacks. In the three averted incidents examined in Section 3, locked exterior doors either denied entry entirely (Margolin Hebrew Academy, Mount Horeb Middle School) or delayed entry long enough for law enforcement to arrive and intervene (Dennis Intermediate School). In the Evergreen High School case study (Section 4), a lockdown initiated 42 seconds after the first shot resulted in the attacker spending nearly three minutes unsuccessfully attempting to re-enter the building before abandoning the effort entirely.

The Uvalde case provides a counterpoint that reinforces rather than contradicts the core finding. At Robb Elementary, a culture of noncompliance with door-locking policies left exterior doors routinely unlocked, and a known defective lock in Room 111 went unrepaired for months despite repeated reports from the classroom teacher. The attacker entered the building and the classroom without encountering a functional physical barrier. Both the Texas House Investigative Committee and the Department of Justice Critical Incident Review concluded that compliance with existing protocols could have delayed his access and created opportunities for intervention.

Taken together, the evidence converges on a consistent conclusion: when doors are secured, the probability of harm to occupants behind those doors is substantially reduced. This recommendation is not novel, but the data presented in this report provide empirical grounding for a directive that has often relied primarily on expert consensus and anecdotal evidence.

Two Distinct Security Challenges

In high schools and middle schools, perpetrators were overwhelmingly current students. Current students accounted for 25 of 30 high school perpetrators (83.3%) and 8 of 9 middle school perpetrators (88.9%). Because these individuals already had routine daily access to the building, exterior door locks did not serve as a barrier to entry in those cases. Consistent with this, high school attacks frequently originated in common areas, and victims were dispersed across the building. Among high school door interactions, only 5 of 43 (11.6%) involved exterior doors.

Elementary schools present a fundamentally different threat profile. None of the 10 elementary school perpetrators in the dataset were current students. Half had no prior relationship to the school, and the remainder were former students, former staff, or otherwise connected to the school community. Every elementary school perpetrator had to gain access from outside the building, making the exterior door the primary point at which access could be denied or delayed. Exterior doors accounted for 6 of 16 door interactions (37.5%) at elementary schools, more than three times the rate observed in high schools. Victims in elementary schools were overwhelmingly concentrated in classrooms (75.3%), spaces that can be secured with a locked door.

These patterns suggest that an effective approach to school door security may involve prioritization based on facility type in order to be optimal effective. For elementary schools, the priority should be the integrity and security of the exterior perimeter: ensuring that all exterior doors are locked during school hours, that visitor access is controlled through a single monitored entry point, and that glass near entry points is reinforced or replaced with materials resistant to forced entry.

For high schools and middle schools, where the perpetrator is almost always already inside the building, the priority shifts to interior classroom door security. This places a premium on locking mechanisms that can be engaged quickly from inside the room without requiring a key, special knowledge, or corridor access, on staff training that supports immediate lockdown initiation, and on a school culture that treats door security protocols as non-negotiable.

The "Other" school category in the dataset, which includes three K-12 campuses, exhibited attack dynamics that more closely resembled elementary school incidents. Victim distributions in these schools were concentrated in classrooms (81.2%), and door involvement rates were high (80%). Schools serving wide grade ranges should consider implementing the exterior-focused security strategies recommended for elementary schools, particularly in wings or buildings housing younger students.

Glass as a Vulnerability

Across the 54 events examined in Section 2, nine documented mechanical breach attempts were identified. Of these, six were successful. In every successful case, the perpetrator defeated the barrier by shooting through glass rather than overcoming the locking mechanism itself. No mechanical breach in the dataset was accomplished by defeating a lock directly. Flush doors with functional locks were never successfully breached.

Four of the six successful breaches involved aluminum frame exterior doors with glass panels. At Sandy Hook Elementary School (2012), the perpetrator shot through the glass adjacent to the entry door to gain access to the building. At Central Visual and Performing Arts High School (2022), the perpetrator shot through a locked glass exterior door. At Covenant Presbyterian School (2023), the perpetrator shot through two separate locked glass exterior doors. The remaining two successful breaches involved wood doors with glass features: at Red Lake High School (2005), the perpetrator breached a locked classroom by shooting through an adjacent sidelight, and at CVPA, a second locked classroom was also breached through its glass component.

The three unsuccessful breach attempts further reinforce the finding. At Aztec High School (2017), the perpetrator shot through a door lock in an attempt to defeat the lock but was unable to gain entry. In all three cases, the locked door held and the perpetrator moved on.

Six of the seven aluminum frame doors with glass panels in the dataset were entry doors, indicating that the vulnerability is concentrated at the building perimeter. This is particularly consequential for elementary schools, where the exterior door represents the primary point at which an intruder can be denied access. When that exterior barrier is composed entirely of glass, an attacker with a firearm can defeat it regardless of the quality of the locking hardware installed.

The averted attack at Dennis Intermediate School (Section 3) illustrates both the vulnerability and the mitigating value of delay. The attacker shot out the glass of a locked exterior door and entered the building, but the time required to do so allowed law enforcement to arrive and engage the attacker before any students were harmed. Even when glass fails as a barrier, the delay it introduces can be operationally significant.

Schools should assess the glazing materials used in exterior doors and in classroom doors with vision lights or sidelights. Where feasible, tempered glass should be replaced with or supplemented by security glazing or security film that meets relevant standards. Prioritization should focus first on

exterior entry points, particularly at elementary schools, and second on classroom doors with glass features large enough to permit entry if shattered. The goal of glazing upgrades is not to create an impenetrable barrier but to extend the delay between the onset of an attack and the attacker's access to occupied spaces.

The Compliance Problem

A door lock is only effective if it is engaged. Among the 47 doors with known status in Section 2, 29 (61.7%) were unlocked or propped open at the time of the attack. Of the 29 doors through which a perpetrator successfully entered, 20 (69%) were unsecured. The most common way a perpetrator gained access to a space was not by defeating a lock but by walking through an unsecured door.

The Robb Elementary case study (Section 4) provides the most extensively documented illustration of this problem. Exterior doors were routinely left unlocked in violation of school policy. The classroom door to Room 111 had a known defective lock that went unrepaired for approximately two months despite the teacher reporting the problem to administrators on multiple occasions. No formal work order was ever created. The DOJ report characterized this as a systematic failure in the school's maintenance protocols and documented that the district lacked a centralized system for tracking and prioritizing security-related maintenance requests.

The pattern observed at Uvalde is not unique to that incident. The prevalence of unsecured doors across the dataset suggests that the gap between security policy and security practice is a recurring issue. This gap is not primarily a hardware problem. The 28 locks identified in Section 2 represent functional security hardware that, when engaged, was never defeated by a perpetrator through mechanical means. The problem is that having a lock is not the same as using a lock. The compliance problem operates at multiple levels: individual staff members who prop doors for convenience, administrators who do not enforce locking policies, maintenance systems that fail to prioritize security-related repairs, and institutional cultures that treat door security as discretionary rather than essential.

Addressing the compliance problem requires interventions at each of these levels: staff training that emphasizes unsecured doors as a documented vulnerability, regular audits of door status, maintenance tracking systems that flag security-related repairs for priority response, and school leadership that establishes door security protocols as non-negotiable requirements.

The contrast between Uvalde and Evergreen is instructive. At Robb Elementary, a culture of noncompliance rendered existing security hardware ineffective. At Evergreen High School, staff initiated a lockdown within 42 seconds of the first shot, and students maintained locked doors even when someone knocked and claimed to be law enforcement 20 to 30 minutes later. The difference in outcomes was not primarily a function of hardware but of institutional culture, training, and the willingness to follow established protocols under pressure.

Rapid Lockdown and Integrated Response

The effectiveness of door locks as a protective measure depends on how quickly they are engaged once a threat is recognized. The time between threat recognition and lockdown completion is a critical variable in determining whether physical security measures can influence the outcome of an attack. Optimally, perimeter and classroom doors that remain locked at all times are the most effective and do not require a physical act at the door to initiate a secure state during an active shooter event.

The Evergreen High School incident provides a clear illustration of effective security infrastructure and protocols. Staff initiated a lockdown just 42 seconds after the first shot was fired. By the time the attacker exited the building and attempted to re-enter, classroom doors throughout the building were already secured. The attacker spent nearly three minutes in an unsuccessful attempt to gain re-entry before abandoning the building entirely.

Across the broader dataset, 41 of the 54 incidents (75.9%) involved some form of lockdown. However, the timing of lockdown initiation relative to the attack sequence varied substantially, and in some cases the lockdown was initiated after the attack had effectively concluded. The protective value of a lockdown is greatest when it is initiated early, before the perpetrator has moved through the building and before victims in securable spaces have been exposed.

Rapid lockdown requires an integrated system: alert mechanisms that communicate threats immediately throughout the building, staff who are trained and empowered to initiate lockdowns without waiting for administrative confirmation, door hardware that can be secured quickly from inside the room, and regular drills that build procedural familiarity under stress.

Locking mechanisms that require inserting a key in the hallway side present an obstacle to rapid lockdown. These locks require a teacher to have immediate access to a physical key and, in some configurations, to step into the corridor to engage the lock. Under the stress of an active attack, this introduces delay and risk. Locking mechanisms that can quickly be engaged by anyone inside the room reduce both. Electronic locking systems offer the additional potential for building-wide lockdown from a single point of activation, though only one door in the dataset was equipped with such a system, so the data do not speak directly to their effectiveness in practice.

Schools and districts should evaluate their security posture not only in terms of what hardware is installed but in terms of whether the full system — training, culture, alert mechanisms, and maintenance — can execute a rapid lockdown when it matters.

Aftermarket Devices

This study includes analysis of incidents where aftermarket devices for use on doors were involved, barricade devices and door latch magnets, which have been the subject of substantial controversy in school safety circles.

Barricade Devices

Barricade devices are intended to prevent a closed door from being forced open. These devices are typically used in addition to the existing lock and are intended to provide an extra layer of resistance against forced entry in an active shooter situation. The dataset includes six barricaded doors across three incidents, involving both these devices and improvised furniture barricades.

At Oxford High School (2021), barricade devices were deployed behind two classroom doors with which there was interaction during the attack. However, in both cases, the interaction consisted of the perpetrator shooting through the doors but making no breach attempt. At Covenant Presbyterian School (2023), two classroom doors were reinforced with barricade devices during the attack; the perpetrator was unable to enter either barricaded room. Additionally, two doors across the dataset were barricaded with furniture. In the Santa Fe High School incident (2018), students barricaded a classroom door with a ceramic kiln after the perpetrator had already made multiple unimpeded entries into the room.

Concerns

Aftermarket door barricade devices remain a subject of debate. The concerns fall into four categories.

The first is that barricade devices may be unnecessary when code-compliant locks are properly installed and engaged. No locking mechanism in the dataset was defeated through mechanical means; every successful breach involved shooting through glass. If properly functioning locks are sufficient to prevent mechanical breach, a secondary blocking device adds complexity without adding meaningful protection. The Partner Alliance for Safer Schools and multiple federal task forces have echoed this position.[xxix]

The second concern relates to safety risks created by the devices themselves. Barricade devices can be difficult to deploy and remove, particularly for young children, individuals with disabilities, and injured occupants – or any individuals who must think and act under the stress of a potentially life-threatening situation. Fire and life safety codes universally require that building occupants be able to exit a room without specialized knowledge, tools, or abilities. Most of these devices make it more difficult to open a door from either side, requiring additional steps, which can impede egress during fire emergencies, medical events, or other situations requiring rapid evacuation. For these reasons, barricade devices are prohibited under the International Building Code and the International Fire Code, and many also raise compliance issues under the Americans with Disabilities Act.[xxx] Despite this, a small number of state jurisdictions have established exceptions to building code requirements in legislation in order to permit the use of barricade devices in schools.

The third concern is that barricade devices can be used offensively. In the 2018 Capital Gazette shooting in Annapolis, Maryland, the attacker purchased two commercially available barricade devices as part of his pre-attack planning. He deployed one on the rear exit of the newspaper office to prevent employees from escaping and placed a second near another exit but did not deploy it. When employees attempted to flee through the back door during the attack, they found it barricaded

and could not escape. Five people were killed. The Capital Gazette case is particularly instructive because the attacker did not improvise a barricade from available materials; he deliberately acquired a commercially manufactured barricade device designed to prevent door entry and repurposed it to prevent door exit. Making barricade devices readily available in classrooms introduces the possibility that an attacker, particularly a current student familiar with the school's security equipment, could deploy a device to prevent egress with the intent of harming students or staff.

Lastly, there is concern that once deployed, barricade devices can significantly delay law enforcement ingress. Unlike standard door locks, which can be opened from the outside using master keys, most barricade devices can only be released from the interior. This creates a serious problem when occupants are injured, incapacitated, or otherwise unable to remove the device, law enforcement and emergency medical personnel cannot enter without forced entry or a proprietary removal tool. The Oxford High School shooting illustrates this directly. Responding officers were unaware that the school had installed barricade devices and were unfamiliar with how to disengage them. After locating a removal tool from school administrators, officers had to take the device to another classroom and teach themselves how to use it before they could gain access to occupied rooms, rooms where students were doing exactly what they had been trained to do, staying quiet and not opening the door. A limited number of removal tools further slowed the building clearance, and officers reported a two-to-three-minute delay accessing one room where a teacher had been shot.[xxxi]

In any case, the critical variable in the dataset remains simply whether the door is secured. The difference between a secured door (16.7%) and an unsecured door (50%) is far larger than any plausible difference between a locked door and a locked-plus-barricaded door. The first priority should be to ensure that every classroom door has a code-compliant lock that can be engaged from inside the room

Magnetic Strips and Other Aftermarket Door Props

Magnetic strips are thin devices placed on the door frame that prevent the latch from engaging with the strike plate. When in place, a magnetic strip allows a door to close fully in appearance while remaining functionally unlocked. During a lockdown, the strip is intended to be removed so the latch engages and the door locks as designed. These devices are used in some schools as a convenience measure, allowing classroom doors to remain functionally unlocked during normal operations while preserving the ability to lock rapidly.

The STEM School Case and Implications

The 2019 STEM School Highlands Ranch shooting (Highlands Ranch, CO) illustrates both the intended use and the potential risks of magnetic strips. During the attack, one of the perpetrators, a current student familiar with the classroom's security setup, pulled the magnetic strip from the door frame so that the latch engaged and the door locked. The perpetrator then closed the door, effectively controlling the space from inside the room by preventing anyone in the hallway from entering.

Students and staff ultimately confronted and physically disarmed the attacker and forced him out of the room. Once the attacker was outside, the door locked behind him and prevented re-entry. The magnetic strip's removal was first exploited by the attacker to control the room and then by the occupants to secure the space after the attacker was expelled.

The STEM School case raises two concerns. First, a magnetic strip creates a situation in which a door appears closed and secured but is functionally unsecured, providing false assurance to occupants and administrators. Second, an attacker who is familiar with the device can manipulate it to gain tactical advantage. By removing the strip, the attacker converted a functionally unlocked door into a locked one, trapping occupants inside and preventing intervention from the hallway. This is the inverse of the intended security function.

This concern is particularly relevant in secondary schools, where the perpetrator is almost always a current student with daily exposure to the school's security practices. Any security device that relies on concealment or specialized knowledge for its effectiveness is vulnerable to exploitation by an insider.

The simple alternative is a locking mechanism that can be engaged and disengaged from inside the room without an auxiliary device. The prevalence of mechanical locks in the dataset (28 of 38 doors with known hardware) suggests that many schools adopted magnetic strips as a workaround for hardware that cannot be locked from inside the room. Rather than continuing to rely on this workaround, schools should evaluate whether their locking hardware can be upgraded to allow interior engagement or whether it may already include this function as is often the case.

Physical Security and its Limitations

Before recommendations are discussed, it is important to acknowledge that specific physical security measures are always components of a broader safety strategy. Overstating protective value risks creating a false sense of security, but understating could encourage taking unnecessary risks by not implementing measures where the protective value is established.

Not all individuals are located behind a secured door when an attack begins. Across the 54 events, 117 victims (36.1%) were shot in common areas and an additional 16 (4.9%) outside the building. These spaces are generally not securable with a locked door, and they account for a substantial share of total casualties.

And for securable spaces, the protective value of a locked door is contingent on the door being locked before the attacker arrives, which depends on the speed and completeness of the lockdown response, if doors are not already closed and locked under school policy.

And despite the clear protective role, a locked door does not entirely eliminate the risk of injury to occupants behind it. Perpetrators fired through doors in 54.4% of cases examined and through

windows in 49.1%. Gunfire through a locked door is less likely to produce the sustained, close-range exposure associated with the highest casualty counts, but it can still cause injury and death.[11]

Finally, while physical security measures address vulnerabilities, and can prevent or limit the success of attacks as demonstrated in the averted incidents covered in Section 3, outside of deterrent effects they do not prevent an attack from occurring. Prevention strategies, including threat assessment teams, behavioral intervention programs, anonymous reporting systems, and mental health services, while fundamentally different, operate interdependently with these measures. These approaches are beyond the scope of this study, but their importance should not be diminished by the findings presented here. The most effective school safety posture integrates physical security with prevention, early intervention, and response capabilities.

[11] Among the doors in the dataset that were fired upon but not mechanically breached, shot victims were documented behind three doors at two incidents - Marjory Stoneman Douglas High School (2018) and Oxford High School (2021). In these three cases, the lock status of the door at the time of the attack was unknown, precluding any conclusion about whether a secured door would have prevented or reduced the gunfire-related casualties.

Section 6. Recommendations

The following recommendations are derived from the findings presented in Sections 2 through 4 of this report. Each recommendation is grounded in specific patterns observed in the data and is intended to be actionable for school administrators, security professionals, and policymakers. These recommendations are organized by priority, beginning with the measures supported by the strongest and most consistent evidence.

Recommendation 1: Ensure that every classroom door has a functional lock that can be engaged from inside the room.

This is the single most important finding of this report. The difference in casualty likelihood between secured and unsecured doors (16.7% versus 50%) was the largest and most consistent effect observed in the data. No locking mechanism in the dataset was defeated by a perpetrator through mechanical means. The priority for any school that does not currently have functional interior-locking classroom doors should be the installation of locks that allow occupants to secure the room from within the classroom without requiring the use of a key, given the delay and exposure risks associated with corridor-side locking during an active event. Mechanical classroom security locks or electronic locking systems all meet this criterion. Schools currently relying on locks which must be secured with a key from the corridor or exterior side should develop and implement a security upgrade plan.

Barricade devices raise documented concerns related to fire and life safety codes, ADA compliance, egress during non-shooter emergencies, and the potential for attacker exploitation. The 2018 Capital Gazette shooting in Annapolis, Maryland, demonstrates this final concern: the attacker purchased commercially available barricade devices and deployed one on a rear exit to trap victims inside the building, directly contributing to the death toll. The first priority should always be to ensure that functional, code-compliant locks are installed and consistently used.

Recommendation 2: Secure all exterior doors during school hours, with controlled visitor access through a single monitored entry point.

Elementary school perpetrators in the dataset were universally outsiders who had to gain access from outside the building. In every averted attack examined in Section 3, locked exterior doors either denied entry entirely or delayed entry long enough for law enforcement to intervene. A school's exterior perimeter is the first and often most consequential line of defense against an outside threat. Exterior doors should remain locked during instructional hours, and visitor access should be funneled through a single-entry point equipped with visual verification or intercom-based screening. The culture of propping exterior doors or leaving them unlocked for convenience, as documented at

Robb Elementary and reflected in the broader dataset, represents one of the most correctable vulnerabilities identified in this study.

Recommendation 3: Assess and upgrade glazing materials on exterior doors and classroom doors with glass features.

All six successful mechanical breaches in the dataset were accomplished by shooting through glass. Four involved aluminum frame entry doors, and two involved wood doors with vision lights or sidelights. No flush door with a functional lock was breached. Schools should assess the glazing materials used in exterior entry points and in classroom doors with vision lights or sidelights and, where feasible, replace or supplement tempered glass with security glazing or security film that meets relevant standards. Prioritization should focus on exterior entry points at elementary schools, where the outsider threat profile makes the exterior door the primary intervention point, and on classroom doors with glass features large enough to permit entry if shattered.

Recommendation 4: Establish and enforce a culture of compliance with door security protocols.

The data consistently show that the gap between having security hardware and using it is one of the most significant vulnerabilities in school safety. At Robb Elementary, existing policies required locked doors, but a culture of complacency meant those policies were not followed. Schools and districts should implement regular, unannounced audits of protocols, establish clear accountability for door security compliance, and create maintenance tracking systems that flag and prioritize security-related repair requests. Reported defects in door locks or locking hardware should be treated as urgent maintenance items with defined response timelines. School leadership must communicate that door security protocols are non-negotiable expectations, not suggestions subject to individual discretion. Additionally, jurisdictions should consider implementing requirements for certain types of doors within schools to be inspected annually for functionality and adherence to life safety codes.[12]

Recommendation 5: Invest in rapid lockdown capability, including training, alert systems, and staff empowerment.

The Evergreen case demonstrates that the speed of lockdown initiation can fundamentally alter the trajectory of an attack. A lockdown initiated 42 seconds after the first shot resulted in the attacker being unable to re-enter the building. Rapid lockdown requires an integrated system: alert mechanisms that can communicate a threat throughout the building immediately, staff who are trained and empowered to initiate a lockdown without waiting for administrative confirmation, door

[12] Ohio enacted the Childhood Safety Act (S.B. 112) in 2024, requiring annual inspection of all protective door assemblies in school buildings by a qualified inspector. Ohio General Assembly. (2024). Substitute Senate Bill No. 112: Ohio Childhood Safety Act (135th General Assembly). https://search-prod.lis.state.oh.us/api/v2/general_assembly_135/legislation/sb112/05_EN/pdf/

hardware that can be engaged quickly by those inside the room or remotely, and regular drills that build procedural familiarity. Schools should evaluate their current lockdown capability with attention to the time required to communicate a threat, the time required for staff to secure individual rooms, and whether any hardware or procedural bottlenecks slow the process.

Recommendation 6: Tailor security strategies to school level.

The threat profile differs meaningfully between elementary and secondary schools. Elementary schools face a greater external threat from individuals who must gain access from outside the building; security strategies should emphasize exterior perimeter integrity, controlled entry, and reinforced glazing at entry points. High schools and middle schools face a greater threat from potential attackers that are current students who already have routine building access; security strategies should emphasize rapid interior lockdown capability, locking hardware that can be engaged from inside the room, and protocols for securing common areas during an event. Schools serving wide grade ranges (K-12, 6-12) should consider implementing exterior-focused strategies in wings or buildings housing younger students.

Recommendation 7: Eliminate the use of magnetic strips and other aftermarket door props.

Magnetic strips create an ambiguous security state in which a door appears closed and secured but is functionally unlocked. As the STEM School case illustrates, these devices can be manipulated by an attacker who is familiar with the school's security setup. Schools currently using magnetic strips should evaluate whether their locking hardware can be upgraded to allow interior engagement without the need for an auxiliary device. Schools should also consider that when a frame magnet is constantly depressing the lock latch, its spring is operating under static load. Door locks were not designed to operate in this condition. Springs under static load are prone to relax over time, which could affect the ability of the door to lock properly even when magnets are removed.

Recommendation 8: Establish standardized protocols for documenting door and access-control hardware during post-incident investigations.

One of the most persistent challenges encountered during this study was the absence of systematic documentation of door hardware in law enforcement investigative records. In many cases, critical details, such as lock type, door construction, locking mechanism status, and whether a breach was attempted or successful, were not recorded in official reports, making it difficult to determine what role physical security features played in the event. When such details were available, they were often incidental rather than the product of a deliberate documentation protocol. Law enforcement agencies that respond to school-based attacks should incorporate physical security documentation into their post-incident investigative procedures. This can be accomplished through relatively low-burden practices, such as photographing all relevant doors (including exterior entry points, classroom doors, and interior connecting doors) to capture lock type, hardware condition, door status, and any evidence of attempted breach. Agencies should also document whether doors were locked or

unlocked at the time of the event and whether locking mechanisms functioned as designed. Additionally, recording the location of building occupants (both survivors and victims) throughout the facilities can help add needed specificity to the data that drive recommendations.

To support this effort, the research team intends to develop a model documentation guide and template that law enforcement agencies can incorporate into existing investigative protocols. This resource is expected to be available in the third quarter of 2026. Standardized post-incident documentation of security hardware will strengthen the evidentiary foundation for future research, enable more precise identification of best practices, and ultimately support more informed security investments at the federal, state, and local levels.

Appendix A. Case Summaries

Santana High School (Santee, CA, 2001)

On March 5, 2001, a 15-year-old student attacked Santana High School in Santee, California at approximately 9:20 a.m. with a handgun. The attacker started the attack in a restroom before moving into the hallway and school quadrangle. He did not encounter any access-controlled areas. He killed two students and wounded 13 others (11 students and 2 staff members). Responding officers located the attacker in a restroom where he was reloading his weapon and took him into custody.

Granite Hills High School (El Cajon, CA, 2001)

On March 22, 2001, an 18-year-old student attacked Granite Hills High School in El Cajon, California at approximately 12:55 p.m. with a 12-gauge pump-action shotgun and a .22-caliber semiautomatic handgun. The attacker opened fire from the street outside the administration building, firing into the building's windows. He wounded five people (three students and two teachers); no one was killed. A school resource officer inside the administration building heard the shots, returned fire, and pursued the attacker into the street, where the attacker was shot and taken into custody — all within approximately one to two minutes of the first shots.

Red Lion Junior High School (Red Lion, PA, 2003)

On April 24, 2003, a 14-year-old student attacked Red Lion Area Junior High School in Red Lion, Pennsylvania at approximately 7:30 a.m. with three handguns—a .44-caliber Magnum, a .357-caliber Magnum, and a .22-caliber revolver. The attacker opened fire in the school cafeteria, where students were gathering before classes began. He shot and killed the school principal and wounded no others. The attacker then took his own life with a self-inflicted gunshot immediately after shooting the principal.

Rocori High School (Cold Spring, MN, 2003)

On September 24, 2003, a 15-year-old student attacked Rocori High School in Cold Spring, Minnesota around noon with a .22-caliber handgun. The attacker pulled the weapon from a gym bag as he exited the school locker room in the basement and shot two students before pursuing one of them up the stairs into the physical education area. He killed two students and wounded no others. A gym teacher confronted the attacker, who dropped the weapon, and was taken to the school office by the teacher.

Columbia High School (East Greenbush, NY, 2004)

On February 9, 2004, a 16-year-old student attacked Columbia High School in East Greenbush, New York at approximately 10:30 a.m. with a 12-gauge pump-action shotgun. The attacker walked past the main office unchallenged, went upstairs to a second-floor bathroom where he waited for roughly 20 minutes, then emerged into the hallway and began firing. He did not encounter any access-

controlled areas. He wounded one teacher and killed no one. An assistant principal tackled and subdued the attacker during a struggle, after which he was taken into custody.

Red Lake High School (Red Lake, MN, 2005)

On March 21, 2005, a 16-year-old student attacked Red Lake Senior High School in Red Lake, Minnesota at approximately 2:49 p.m. with a 12-gauge Remington 870 pump-action shotgun, a .40-caliber Glock 23 handgun, and a .22-caliber Ruger handgun. The attacker drove his grandfather's police vehicle to the school entrance and shot his way past a metal detector, killing an unarmed security guard. He then moved through the school, entered a classroom by breaching the door's sidelight, and killed a teacher and several students before continuing into the hallways and firing at random. He attempted to breach another door by shooting the lock but was unsuccessful. In total, he killed seven people at the school (five students, one teacher, and one security guard) and wounded at least seven others. After exchanging gunfire with responding tribal police officers—who struck him three times—the attacker retreated into a classroom and committed suicide with a self-inflicted gunshot.

Campbell County Comprehensive High School (Jacksboro, TN, 2005)

On November 8, 2005, a 14-year-old student attacked Campbell County Comprehensive High School in Jacksboro, Tennessee at approximately 2:11 p.m. with a .22-caliber handgun. The attacker concealed the weapon under a napkin and opened fire inside the school's administrative office after being confronted by the principal about possessing the gun. He killed one assistant principal and wounded two other administrators (the principal and a second assistant principal); no students were injured. The principal and an assistant principal wrestled with the attacker, and another teacher helped disarm him, after which he was taken into custody.

Pine Middle School (Reno, NV, 2006)

On March 14, 2006, a 14-year-old student attacked Pine Middle School in Reno, Nevada just before 9:00 a.m. with a .38-caliber revolver he brought to school in his backpack. The attacker loaded the revolver in a bathroom, then went into a hallway outside the cafeteria and fired multiple shots at a student he selected at random. He wounded two students and killed no one. A physical education teacher confronted the attacker, convinced him to drop the gun, restrained him until other staff arrived, and the attacker was then taken into custody by police.

Essex Elementary School (Essex, VT, 2006)

On August 24, 2006, at approximately 2 p.m., a 26-year-old man entered Essex Elementary School in Essex, Vermont. He was armed with a handgun of unknown caliber, make, and model and was reportedly seeking his ex-girlfriend, a teacher at the school, after killing her mother at a nearby residence.

Although students were on summer break, about 40 faculty and staff were present for an in-service day. Because the school had no security protocols for non-school days, exterior doors were unlocked. After the intruder entered, teachers and staff sheltered in classrooms; however, many classroom doors also remained unlocked due to the absence of a lockdown procedure.

Inside the school, the perpetrator shot two teachers in a classroom, killing one, and then fled. He was later found and taken into custody at a residence with two apparent self-inflicted gunshot wounds..

Orange High School (Hillsborough, NC, 2006)

On August 30, 2006, an 18-year-old former student attacked Orange High School in Hillsborough, North Carolina at approximately 12:00 p.m., after killing his father at home. He was armed with two 12-gauge pump-action shotguns of unknown make and model and several improvised explosive devices. The attacker drove into the student parking lot and fired at the school building from outside, striking a window and sending glass into the area. He wounded two students, one by gunfire and another by shrapnel; no one was killed at the school. An officer intervened and subdued the attacker during the shooting.

Weston High School (Cazenovia, WI, 2006)

On September 29, 2006, at approximately 8:00 a.m., a 15-year-old student attacked Weston High School in Cazenovia, Wisconsin. He was armed with a .22-caliber revolver and a shotgun of unknown make, model, and caliber, which he had taken from his father's locked gun cabinet. The student entered the school's main hallway carrying the weapons and aimed the shotgun at a teacher. A custodian intervened and wrestled the shotgun away, after which staff and students subdued the attacker and restrained him until police arrived and took him into custody. During the struggle, the shotgun discharged and struck the school principal, who later died at the hospital.

West Nickel Mines School (Bart Township, PA, 2006)

On October 2, 2006, a 32-year-old man invaded West Nickel Mines School (an Amish one-room schoolhouse) in Nickel Mines, Bart Township, Pennsylvania at approximately 10:30 a.m. He was armed with a 12-gauge pump-action shotgun, a .30-06 hunting rifle, and a 9x19mm pistol. The attacker entered the schoolhouse, ordered the boys and several adults to leave, then lined up and restrained a group of girls inside before beginning the shooting. He shot 10 girls (ages 6–13), killing five and wounding five others. As police approached/breached the building, the attacker killed himself inside the schoolhouse.

Memorial Middle School (Joplin, MO, 2006)

On October 9, 2006, at approximately 8:00 a.m., a 13-year-old student attacked Joplin Memorial Middle School (often referred to as Memorial Middle School) in Joplin, Missouri. He was armed with a rifle of unknown make, model, and caliber. Wearing a mask made from a white T-shirt, the attacker

entered the school, confronted administrators and students, and fired one shot into the ceiling before the rifle jammed. He then fled outside and was ultimately detained by police. No one was injured.

SuccessTech Academy (Cleveland, OH, 2007)

On October 10, 2007, shortly after 1:00 p.m., a 14-year-old student attacked SuccessTech Academy (a K-12 school) in Cleveland, Ohio. He was armed with two handguns: a .22-caliber revolver and a .38-caliber revolver. The attacker went to a men's bathroom on the fourth floor to load the revolvers. Then, he began shooting in the hallway and moved to classrooms, which had no doors. He wounded four people (two students and two teachers) before entering a classroom on the fourth floor and fatally shooting himself before police intervened.

Larose-Cut Off Middle School (Cut Off, LA, 2009)

On May 18, 2009, a 15-year-old student attacked Larose-Cut Off Middle School in Cut Off (Larose), Louisiana at approximately 9:00 a.m. with a .25-caliber pistol. The attacker left class, went to a restroom near a classroom to prepare, then entered the nearby classroom and fired a shot over the teacher's head before returning to the restroom and shooting himself.

Inskip Elementary School (Knoxville, TN, 2010)

On February 10, 2010, a 48-year-old teacher attacked Inskip Elementary School in Knoxville, Tennessee around 12:50 p.m. with a revolver. The attacker shot the principal and assistant principal in the school's administrative offices about an hour after students had been dismissed early because of snow. He fled but was stopped and arrested a short distance from the school. No one was killed in the attack.

Deer Creek Middle School (Littleton, CO, 2010)

On February 23, 2010, a 32-year-old man attacked Deer Creek Middle School in Littleton, Colorado at 3:12 p.m. with a .30-06 bolt-action rifle. The attacker opened fire outside the school in the parking lot/front area as students were leaving for the day, wounding two students. A teacher tackled the attacker, and with help from others, restrained and disarmed him until police arrived and took him into custody.

Kelly Elementary School (Carlsbad, CA, 2010)

On October 8, 2010, a 41-year-old man invaded Kelly Elementary School in Carlsbad, California at lunchtime (about midday) with a .357 Magnum revolver. The attacker opened fire on the school playground area while children were outside, firing multiple rounds into the crowd. He wounded two second-grade students and killed no one. After the attacker ran out of ammunition and attempted to return to his car, several nearby construction workers confronted and wrestled him to the ground, and he was then taken into custody.

Millard South High School (Omaha, NE, 2011)

On January 5, 2011, a 17-year-old student attacked Millard South High School in Omaha, Nebraska at approximately 12:50 p.m. with a .40-caliber semiautomatic pistol believed to be his father's police service weapon. The attacker was in the principal's office, where he fatally shot the assistant principal and wounded the principal and a custodian. The attacker left the school and later fatally shot himself in a vehicle about 2 miles away.

Chardon High School (Chardon, OH, 2012)

On February 27, 2012, a 17-year-old student attacked Chardon High School in Chardon, Ohio at approximately 7:30 a.m. with a .22-caliber handgun. The attacker began shooting in the school cafeteria before classes, then shot another student in a hallway while fleeing the building. He killed three students and wounded three others. A teacher and a football coach chased the attacker out of the school, and police arrested him outside near his car parked close to the school.

Perry Hall High School (Baltimore, MD, 2012)

On August 27, 2012, a 15-year-old student attacked Perry Hall High School in the Baltimore area, Maryland at approximately 10:40 a.m. with a shotgun of unknown make, model, and caliber he brought into the school in a bag. The attacker began the shooting in the school cafeteria during lunch, firing one shot that struck another student non-fatally. A guidance counselor and other school staff rushed and wrestled the attacker, and he was subdued with the help of a school resource officer and taken into custody.

Sandy Hook Elementary School (Newtown, CT, 2012)

On December 14, 2012, a 20-year-old man invaded Sandy Hook Elementary School in Newtown, Connecticut around 9:35 a.m. He carried a .223 Rem semiautomatic rifle and two handguns—a 10mm auto and a 9x19mm. He also had a semiautomatic 12-gauge shotgun in his car. The attacker shot his way into the locked front entrance by firing through a glass panel next to the doors, then moved into the building and carried out most of the shooting in two first-grade classrooms near the entrance. He killed 26 people (20 children and 6 adult staff members) and wounded at least two others. Responding officers heard a final shot and the attacker was found dead inside from a self-inflicted gunshot wound before he could be taken into custody.

Taft Union High School (Taft, CA, 2013)

On January 10, 2013, a 16-year-old student attacked Taft Union High School in Taft, California at around 9:00 a.m. with a 12-gauge shotgun. The attacker entered an in-session science classroom and fired multiple rounds, wounding a student and a teacher. A teacher and a campus supervisor talked the attacker into putting the shotgun down, after which he was taken into custody by responding deputies.

Sparks Middle School (Sparks, NV, 2013)

On October 21, 2013, a 12-year-old student attacked Sparks Middle School in Sparks, Nevada at about 7:15 a.m. with a 9x19mm semiautomatic handgun. The attacker began shooting outside on campus near the basketball courts/playground area before the first bell, shooting two students and fatally shooting a teacher who tried to intervene. The attacker then killed himself with a self-inflicted gunshot before police could take him into custody.

Arapahoe High School (Centennial, CO, 2013)

On December 13, 2013, an 18-year-old student attacked Arapahoe High School in Centennial, Colorado at about 12:30 p.m. with a 12-gauge pump-action shotgun, a machete and Molotov cocktails. The attacker entered through an unlocked/propped open exterior door, and fired in a hallway, killing a student and wounding another. He fatally shot himself inside the school before police could take him into custody.

Berrendo Middle School (Roswell, NM, 2014)

On January 14, 2014, a 12-year-old student attacked Berrendo Middle School in Roswell, New Mexico at around 7:30 a.m. with a 20-gauge shotgun. The attacker entered the school gymnasium and opened fire at students who were gathered there before classes began. He wounded two students and a school staff member; no one was killed. He then surrendered and was taken into custody.

Reynolds High School (Portland, OR, 2014)

On June 10, 2014, a 15-year-old student attacked Reynolds High School in Troutdale, Oregon at approximately 8:05 a.m. with a .223 Rem semiautomatic rifle. The shooting began in a locker room, where one student was killed. The attacker then moved into a hallway, where he shot and wounded a teacher, and subsequently entered a bathroom. Responding officers used a camera-equipped robot to check the bathroom and found the attacker deceased in a stall from an apparent self-inflicted gunshot wound before he could be taken into custody.

Marysville-Pilchuck High School (Marysville, WA, 2014)

On October 24, 2014, a 15-year-old student attacked Marysville-Pilchuck High School in Marysville, Washington at approximately 10:39 a.m. with a .40-caliber semiautomatic handgun. The attacker carried out the shooting in the school cafeteria during lunch, approaching a table where students were seated and firing multiple shots. The attacker died at the scene from a self-inflicted gunshot wound before police could take him into custody.

Madison Junior/Senior High School (Middletown, OH, 2016)

On February 29, 2016, a 14-year-old student attacked Madison Junior/Senior High School in Madison Township, Ohio around 11:18 a.m. with a .380-caliber semi-automatic handgun. The attacker shot two students in the school cafeteria, then fled the building and threw down the weapon while

running. Deputies tracked and apprehended the attacker just outside school grounds and took him into custody.

Antigo High School (Antigo, WI, 2016)

On April 23, 2016, an 18-year-old former student attacked Antigo High School in Antigo, Wisconsin at 11:01 p.m. outside the school during prom with a 7.62x39mm semiautomatic rifle. The attacker approached near the school's office entrance and opened fire outside, striking two students as they left the dance. A police officer engaged the attacker in a shootout in the parking lot, shot him multiple times, and the attacker later died at a hospital after being taken into custody. The wounded students survived the attack.

Townville Elementary School (Townville, SC, 2016)

On September 28, 2016, a 14-year-old boy attacked Townville Elementary School in Townville, South Carolina around 1:45 p.m. with a .40 S&W pistol after crashing a pickup truck into a fence near the playground. The attacker began firing outside near the playground/recess area and did not enter the school building. Three people were shot during the attack, one of which died later from injuries. The incident ended when the handgun jammed and a volunteer firefighter tackled/subdued the attacker until law enforcement took him into custody.

West Liberty-Salem High School (West Liberty, OH, 2017)

On January 20, 2017, at approximately 7:35 a.m., a 17-year-old student attacked West Liberty–Salem High School in West Liberty, Ohio. He brought a disassembled 12-gauge pump-action shotgun to school in a backpack, went into a restroom, assembled the weapon, and began the attack. He shot one student at close range; the victim survived. The attacker then entered a hallway and fired into two classroom doors before returning to the restroom area, but no one was injured by those shots. School administrators and staff confronted him, persuaded him to set the weapon down, restrained him, and held him until deputies arrived and took him into custody.

Freeman High School (Rockford, WA, 2017)

On September 13, 2017, a 15-year-old student attacked Freeman High School in Rockford, Washington at 10:08 a.m. with a .223 Rem semiautomatic rifle and a .32 ACP pistol. The attacker opened fire in a school hallway as students were changing classes between periods, killing one student and wounding three others. A school custodian/janitor confronted the attacker and forced him to drop his weapon, and the attacker was then taken into custody by responding law enforcement.

Rancho Tehama Elementary School (Rancho Tehama, CA, 2017)

On November 14, 2017, a 44-year-old man killed two neighbors, stole a car, and drove to Rancho Tehama Elementary School in Rancho Tehama, California. He was armed with a .223 Rem semiautomatic rifle and a .45 ACP pistol; some unconfirmed reports also indicated he may have had

an additional rifle. At 7:51 a.m., he drove through the school's locked front gate, entered the campus area, and fired repeatedly at classrooms/windows and other areas while staff initiated a lockdown and kept students inside. Two students were wounded, and no one was killed at the school. The attacker was unable to enter the school building and left the campus. Law enforcement later located and confronted him; he fled and was ultimately found dead from a self-inflicted gunshot wound.

Aztec High School (Aztec, NM, 2017)

On December 7, 2017, a 21-year-old former student attacked Aztec High School in Aztec, New Mexico at about 8:04 a.m. with a 9x19mm pistol. The attacker entered the school disguised as a current student, went to a second-floor bathroom to prepare, then began shooting—killing one student in the restroom and another in the hallway—before walking the halls and firing into walls and toward classrooms. He entered one unlocked classroom. He attempted to breach one locked door by shooting the lock, but he was unsuccessful at defeating the lock. The attacker later killed himself inside the school before law enforcement could take him into custody.

Marshall County High School (Benton, KY, 2018)

On January 23, 2018, a 15-year-old student attacked Marshall County High School near Benton, Kentucky at 7:57 a.m. with a handgun. The attacker opened fire in a commons area of the school as students were gathering before classes began. He killed two students and injured 14 others. The attacker then dropped his gun and hid among students in one of the rooms. Later on, he was identified and taken into custody.

Marjory Stoneman Douglas High School (Parkland, FL, 2018)

On February 14, 2018, a 19-year-old former student attacked Marjory Stoneman Douglas High School in Parkland, Florida at 2:21 p.m. with an .223 Rem semiautomatic rifle. The attacker entered the building through an unlocked door, retrieved the rifle in the stairwell, then moved through multiple floors and hallways firing into classrooms and at people he encountered; he also activated a fire alarm during the attack. He killed 17 people and wounded 17 others. The attacker then left the building, fled the campus by blending in with evacuating students, and was arrested off-campus.

Dixon High School (Dixon, IL, 2018)

On May 16, 2018, a 19-year-old former student attacked Dixon High School in Dixon, Illinois shortly after 8:00 a.m. with a 9x19mm handgun. The attacker fired several shots near the school gymnasium while students were gathered for graduation rehearsal, hitting nobody. After leaving the building, he exchanged gunfire with the school resource officer. He was wounded and taken into custody.

Santa Fe High School (Santa Fe, TX, 2018)

On May 18, 2018, a 17-year-old student attacked Santa Fe High School in Santa Fe, Texas at 7:32 a.m. with a short-barreled 12-gauge pump-action shotgun and a .38-caliber revolver. The attacker began by firing into an art class in the school's art complex and moved through connected rooms. He killed

10 people (eight students and two teachers) and wounded 13 others. The attacker surrendered when officers arrived on the scene.

Noblesville West Middle School (Noblesville, IN, 2018)

On May 25, 2018, a 13-year-old student attacked Noblesville West Middle School in Noblesville, Indiana at 9:06 a.m. with two handguns. The attacker left his seventh-grade science class, then returned to the classroom armed and opened fire, wounding a student and the teacher. The teacher intervened by throwing an object and then tackling/wrestling the attacker to the ground and disarming him, and the attacker was arrested shortly afterward by a school resource officer.

STEM School Highlands Ranch (Highlands Ranch, CO, 2019)

On May 7, 2019, two students (ages 18 and 16) attacked STEM School Highlands Ranch, a charter school in Highlands Ranch, Colorado at approximately 1:53 p.m. with handguns concealed in a guitar case and a backpack. The attackers opened fire in a classroom from two doors on opposite sides of the room, and the shooting continued in the immediate classroom/hallway area as the school went into lockdown. They killed one student and wounded six others. The attackers were confronted and physically stopped by students and others on scene and were then taken into custody by responding deputies.

Saugus High School (Santa Clarita, CA, 2019)

On November 14, 2019, a 16-year-old student attacked Saugus High School in Santa Clarita, California at 7:38 a.m. with a .45 ACP pistol. The attacker pulled the handgun from his backpack in the school's outdoor quad/courtyard shortly before classes began and fired at nearby students; surveillance video and officials' accounts said the shooting lasted about 16 seconds and the gun briefly jammed before he continued firing. He killed two students and wounded three others. The attacker then shot himself at the scene and later died from his self-inflicted wound.

Rigby Middle School (Rigby, ID, 2021)

On May 6, 2021, a 12-year-old student took a 9x19mm pistol to Rigby Middle School in Rigby, Idaho. At 9:12 a.m., she fired multiple rounds in a hallway and then moved outside, where additional shots were fired. She wounded three people (two students and one adult staff member/custodian) and killed no one. A teacher disarmed the student and held her until police arrived and took her into custody.

Oxford High School (Oxford, MI, 2021)

On November 30, 2021, at 12:51 p.m., a 15-year-old student attacked Oxford High School in Oxford Township, Michigan, using a 9x19mm semi-automatic handgun. Surveillance footage showed the attacker enter a bathroom and exit about a minute later with the handgun, then begin firing in a hallway as he moved through the school, shooting at students and classroom doors. He was unable

to enter classrooms because doors were locked and barricaded. He killed four people and wounded seven others, and he surrendered to deputies without incident when officers arrived.

Edmund Burke School (Washington, DC, 2022)

On April 22, 2022, a 23-year-old man attacked near Edmund Burke School in Washington, D.C. at around 2:00 p.m. by firing from a fifth-floor apartment window using a "sniper-type setup" with a rifle on a tripod (he also had another rifle and a handgun). The attacker fired indiscriminately at people below in the Van Ness neighborhood as the school and nearby institutions went into lockdown. The attack wounded four people. As police closed in and searched the building, the attacker died by suicide inside the apartment before he could be taken into custody.

Robb Elementary School (Uvalde, TX, 2022)

On May 24, 2022, at 11:33 a.m., an 18-year-old former student entered Robb Elementary School in Uvalde, Texas, through an unlocked exterior door. He was armed with a .223 Rem semiautomatic rifle and had previously shot his grandmother at home. After entering the building, he moved down a hallway and entered classrooms 111 and 112 (adjoining rooms). He killed 21 people (19 students and two teachers) and wounded at least 17 others. The attacker stayed in the classroom until about 12:50 p.m., when officers entered the room and shot the attacker.

Central Visual and Performing Arts High School (St. Louis, MO, 2022)

On October 24, 2022, a 19-year-old former student attacked Central Visual and Performing Arts High School in St. Louis, Missouri at 9:08 a.m. with a .223 Rem semiautomatic rifle. The attacker approached a locked side door and shot out the bottom glass panel to enter. Then, he moved to upper floors and fired in hallways and classrooms (including forcing entry into at least one classroom). He killed two people (a student and a teacher) and injured four others. Responding police entered the building, exchanged gunfire with the attacker, and shot and killed him.

Covenant Presbyterian School (Nashville, TN, 2023)

On March 27, 2023, at approximately 10:10 a.m., a 28-year-old former student attacked The Covenant Presbyterian School in Nashville, Tennessee. She was armed with two semiautomatic rifles chambered in .223 Rem and 9x19mm, and a 9x19mm pistol. She entered by shooting through a glass entrance door, then moved from the first floor to the second floor while firing multiple shots at victims in hallways and common areas and at classroom doors. She was unable to enter the locked classrooms. She killed six people, and no survivor was wounded. Responding officers located her on the second floor and shot and killed her.

Perry High School (Perry, IA, 2024)

On January 4, 2024, a 17-year-old student attacked Perry High School in Perry, Iowa with a 12-gauge pump-action shotgun and a handgun of unknown make, model, and caliber. The attacker entered the school around 7:12 a.m. and remained in a restroom for about 20 minutes. At about 7:35 a.m., he

exited the restroom, opened fire in a hallway, and then moved to a commons area where students were gathered, firing at them. He killed two people and wounded four others. Then, he moved down the hallways but was unable to break into occupied classrooms and ultimately shot himself. Responding officers entered the school within minutes and later found the attacker deceased inside the building.

Apalachee High School (Winder, GA, 2024)

On September 4, 2024, a 14-year-old student attacked Apalachee High School near Winder, Georgia with a .223 Rem semiautomatic rifle. Around 10:20 a.m., the attacker went to a restroom, where he prepared for the attack. After leaving the restroom, he tried to re-enter his classroom, but the door was locked. After being denied entry, he opened fire in the hallway and moved down the corridor, firing at classroom doors. He killed four people and injured four others. The attacker surrendered when school resource officers arrived at the scene.

Feather River Adventist School (Oroville, CA, 2024)

On December 4, 2024, at 1:08 p.m., a 56-year-old man invaded Feather River Adventist School near Oroville/Palermo, California carrying a 9x19mm pistol. The attacker gained access to campus by arranging a meeting with the principal about enrolling a fictitious family member. Shortly after the meeting ended, he opened fire on children outside near the playground area, wounding two students. The attacker then shot and killed himself near the playground before he could be taken into custody.

Abundant Life Christian School (Madison, WI, 2024)

On December 16, 2024, a 15-year-old student attacked Abundant Life Christian School in Madison, Wisconsin at 10:56 a.m. with a 9x19mm and a .22 LR pistol. The shooting occurred inside a classroom being used as a mixed-grade study hall. She killed two people and wounded five others. Responding officers arrived within minutes and found the attacker dead from a self-inflicted gunshot wound.

Evergreen High School (Evergreen, CO, 2025)

On September 10, 2025, at approximately 12:24 p.m., a 16-year-old student attacked Evergreen High School in Evergreen, Colorado with a .38 special revolver. The attacker fired both inside and outside the school building, injuring two students. He encountered security doors that prevented him from entering additional areas of the school. The incident ended when the attacker died from a self-inflicted gunshot after officers arrived on the scene.

S.L. Mason Elementary School (Valdosta, GA, 2025)

On September 25, 2025, a 25-year-old man attacked near S.L. Mason Elementary School in Valdosta, Georgia at approximately 2:30 p.m. with a handgun (unknown make, model, and caliber). The attacker fired at multiple cars in the pickup line outside the school, then entered the school campus and approached the front of the school as it was placed on lockdown. Responding officers confronted the attacker outside the school and shot and killed him at the scene.

Appendix B. Variables

Year: The recorded calendar year of the active attack.

Month: The recorded calendar month of the attack.

Location: The state and city of the attack.

Day of week: The weekday the attack occurred on.

Time: The hour of the day the attack occurred on (24-Hour)

School Level: Grades served by the school.

- Elementary School
- Middle / Junior High School
- High School
- Other

Lockdown: Was a lockdown initiated in response to the attack?

- Yes / No / Unknown

Perpetrator Sex: Biological sex of the attacker.

- Male / Female

Perpetrator Race/Ethnicity: Race or Ethnicity of the attacker.

- White
- Black
- Hispanic
- Other

Perpetrator Age: Age of the attacker.

Perpetrator Relationship: How was the attacker related to the school involved?

- Current Student
- School Affiliated
- Unrelated
- Staff

Primary Weapon: What was the main weapon type used by the attacker?

- Handgun
- Shotgun
- Rifle

Attack Start Location: The location where the attack immediately began.

Victim Type: The count, and status of victims involved in the event.

- Wounded
- Killed

Victim Locations: If a victim was wounded or killed, where were they located at the time of injury?

Resolution: How the attack ended.

- Civilian Nonlethal
- Suicide Before Police
- Flee
- Police Lethal
- Police Nonlethal
- Suicide After Police
- Surrendered

Door Involved: Whether or not a door was involved during the attack.

- Yes / No / Unknown

Security Bypass: A security system or procedure designed to prevent unauthorized entry was in place, but the perpetrator bypassed or forcibly overcame it to gain access to the school.

- Yes / No / Unknown

Door Locations: If a door is recorded, where in the school was the door located?

- Classroom
- Exterior
- Other
- Hallway
- Office

Door Material: If a door was recorded, what materials is it constructed from?

- Wood
- Metal
- Solid Glass
- Unknown

Glazing Feature: If a door was recorded, did it have a window feature?

- Inset Window
- Sidelight
- Half Glass
- Safety Glass Wire mesh

Door Lock: If a door was recorded, what style of door lock did it have?

- Mechanical
- Crash Bar
- Electric
- Other

Door Status: If a door was recorded, what was its lock status at the time of the event?

- Unlocked
- Locked
- Propped / Unsecured

Barricade: If a door was recorded, was it barricaded in any way at the time of the event?

- Yes / No / Unknown

Door Entered: If a door was recorded, did the attacker gain entry through the door?

- Yes / No / Unknown

Mechanical Breach: If a door was recorded, did the attacker forcibly defeat the door or its hardware to gain entry?

- Yes / No / Unknown

Attempt to Open: If a door was recorded, did the attacker attempt to enter through a door but did not enter?

- Yes / No / Unknown

Shot Door: If a door was recorded, did the attacker shoot through the door?

- Yes / No / Unknown

Shot Window: If a door was recorded, did the attacker shoot through a window attached to the door?

- Yes / No / Unknown

Locking Mechanism Types

This subsection provides descriptions of the locking mechanism categories used in this study. Because available documentation rarely specified exact hardware models or manufacturers, locks were classified into broad functional categories based on how the door is locked and from which side. Representative images are included for each type. These images are AI generated to showcase the functionality of the hardware while remaining brand agnostic.

Mechanical. A mechanical lock requires a physical key to lock or unlock the door from the corridor or exterior side, while allowing free egress from the inside. For classrooms, there are two primary variations: (1) *Exterior-Locking Only* and (2) *Interior-Locking*.

Exterior-Locking

Interior-Locking Push Button

Interior-Locking Thumb Turn

An exterior-locking device requires a teacher or staff member to have immediate access to a key to secure the door in an emergency. The individual must then step into the hallway and lock the door from the corridor or outside of the door. This delays lockdown execution and exposes teachers, staff, and students to potential threats.

An interior-locking device allows occupants to secure the room from the inside using a push-button, thumb-turn, or key from the interior side of the door. This eliminates the need to step into the corridor, which reduces exposure and time requirements when executing a lockdown.

Electric Locks. Electric locks use an electronic circuit to control the locking mechanism, allowing the door to be locked or unlocked remotely. These systems can be integrated with centralized access-control platforms, enabling building-wide lockdown from a single point.

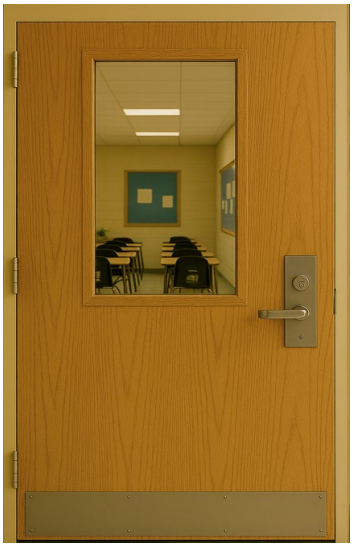
Exit Devices. An exit device, also referred to as a crash bar, push bar, or panic bar, is a horizontal bar mounted on the interior side of a door that releases the latch when pressed. These devices are designed to allow rapid egress in emergencies and are typically required by fire code on exterior, auditorium, library, and stairwell doors. In their default configuration, exit devices lock the door from the outside while allowing free exit from the inside. However, some exit device models can be temporarily disengaged using a key, an Allen wrench, or a proprietary tool, allowing the door to remain unlocked from the outside.

Door and Hardware Combinations

The report describes various combinations of door and hardware that were present at the affected schools. While not all encompassing, the following generated examples are provided to give additional context.

Aluminum Entry Door w/ Glass. An aluminum framed entry door with glass insets are commonly found on the exterior of the building.

Interior Door Combinations. There are several different combinations of interior doors present in the dataset. These are generally referred to as flush doors (i.e., flat construction made of wood, aluminum, or steel). These doors routinely are accompanied by one of the below glass options.



Flush Door w/ Half Glass

Flush Door w/ Sidelight

Flush Door w/ Vision Light

Endnotes and References

All in-text endnotes and references are included in this section.

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