

EDUCATION

Active Shooter Typology Report.

From well-known attacks to rarely discussed incidents, we look at each type — and what you can do to protect your campus effectively.

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Introduction

“Fire drill. Everyone line up to go outside.”

As 5th-period classes started at Westside Middle School in Jonesboro, AR, the fire alarm bells started ringing. Following their training, students lined up and filed out of the building

To the teachers' surprise, several “pops” rang out as they gathered near the gymnasium. It sounded like someone lit fireworks to make the drill more realistic. But it wasn't fireworks. Two students hidden in the treeline were firing shots at their classmates after they deliberately pulled the firearm to draw students outside.

Just like most other school shooters over the last 60 years, the attacks are committed by current and former students who know the layout of the school and the most vulnerable time and place for an attack.

Five were killed and 10 others wounded before students and staff realized what was happening and took cover inside the school.

ZeroEyes

Two decades later, in Parkland, Florida, a teen with a rifle snuck into Marjory Stoneman Douglas High School and became an “active shooter” as he fired in the school hallways. After firing hundreds of rounds and shooting 34 students and staff, he set down his rifle and walked away from the building with other teens fleeing the school.

School security nationwide ramped up after Parkland. Then on May 7, 2019, two students walked into STEM School Highlands Ranch, a charter school located in Douglas County, Colorado, just miles from Columbine High.

Their coordinated attack plan involved each going to separate areas of the school—one in the high school section and the other in the middle school section—corralling victims between both shooters.

One assailant entered the high school area, pulling a gun from a guitar case as he entered a classroom. Student Kendrick Castillo jumped on him and was fatally shot in the chest. Other brave students rushed and disarmed the shooter. In the middle school area, the other assailant wounded four victims, then was tackled by a security guard.



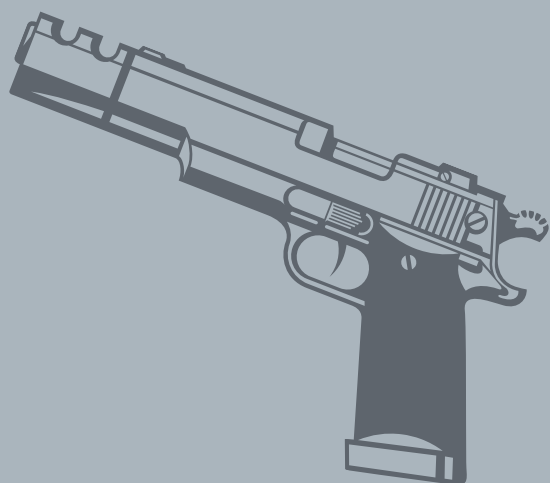
Just three years later, an “active shooter” crashed his truck through a fence and began firing as he ran into Robb Elementary School in Uvalde, Texas. Officers radioed reports of multiple “active shooters”—including an “active shooter” on the roof—before finally realizing there was a single teen with a rifle inside a classroom.

Each of these situations is distinctly different...

- At **Westside Middle School**, current students got classmates and teachers outside the school and **ambushed** them.
- In **Parkland**, a former student **knew he could sneak across campus** and slip away with the crowd when he stopped shooting.
- Inversely, at **STEM School Highlands Ranch**, current students were allowed to carry musical instrument cases into the building, and the **surprise attack** wasn't evident until the moment it started.
- The shooter at **Robb Elementary** was rushing toward a building he wasn't allowed to enter and was **determined to fight his way inside by any means possible**.

For a school principal drafting an emergency plan or for police officers responding, these cases can be deemed “active shooter” attacks — *even though they're all different.*

Planning for Just One Type of Attack Can Have Deadly Consequences



DID YOU KNOW

There are nine types of active shooter scenarios.

When the same terminology is used to describe multiple circumstances, the predictable result is that plans, training, and response procedures fail to account for the specific tactics needed to address each one.

What does “active shooter” really mean?

While it’s important to know the answer, it’s crucial to understand the nine different active shooter attack types. Here, we’ll examine them all.

Attacks are generally labeled as an “active shooter” when the perpetrator kills and/or wounds as many victims as possible, either targeted or random, within the school campus, business, or public space during a continuous episode of violence.

Active shooters often don’t stop shooting until they’re subdued, cornered, or apprehended by school staff, other students, or police.

The use of this definition/criteria for an “active shooter” blends the FBI’s definition with homicide literature’s differentiation between a rampage killing versus a traditional homicide, family annihilation, or episodic serial killer.

There are widely differing definitions for mass killer, serial killer, rampage killer, active shooter, and school shooter (Madfis, 2020; Newman, 2004; Duwe, 2007; Fox, 2018; FBI; USSS; DOJ).

There’s no legal definition or specific criminal charges for an “active shooter,” “mass shooter,” or “school shooter.”



Shootings Are Rarely Random

"Active shooter" is an inconsistently defined term that serves as an umbrella for multiple different attack types.

The locations of school shootings and mass public shootings are rarely random because the attack location has symbolic significance to the perpetrator. It's often a school where the shooter experienced unresolved trauma that manifests into a deep-seated grievance that they feel can only be resolved through indiscriminate violence (Peterson & Densley, 2021).

When there's a deep personal connection to the location, the perpetrator usually isn't a stranger to the venue, though many victims in public spaces or schools may be random.

Mass shooters are often current or former students or staff who, over time, have developed an increasingly negative and toxic relationship with school or company leadership, coworkers, and others.

Keep Reading for Warning Signs



School Shooting Red Flags

01 Written Plan

School shootings are planned for weeks, months, even years. The perpetrators almost always have written notes, drawings, hit lists, maps, or manifestos detailing when, where, and why the shooting will happen. These attacks are not secret. A written plan is part of a cry for attention.

03 Fixation on Violence

The desire to commit mass violence is rooted in a specific grievance against the school. When cries for attention and help are not heard, the shooter begins to fixate on public acts of violence as the only way to be noticed. Shooting becomes a method to get revenge for the perceived ways the school wronged them.

02 Overt & Veiled Threats

Committing the shooting is the final act in a long pathway to violence. Nearly all school shooters tell other students about their plan or make threats of violence multiple times to get to get attention before the attack happens.

04 Isolation, Despair, & Suicide

School shootings are a final act of public suicide when the shooter feels there is no other way than to commit violence. Most often, the shooter either plans to commit suicide, be killed by police, or be jailed for the rest of their lives. There is rarely an escape plan or 'second act' of the plot.

Insider Threat

Someone very familiar with the target location may be able to:

- **Bypass security**
- **Attack at the weakest points**
- **Cause predictable security responses** that can be used to the attacker's advantage (like setting a fire alarm, knowing it results in building security leaving their posts while students and staff congregating in an outdoor courtyard)

Along with understanding the significance of the targeted location, recognizing the type of attack that's happening is critical to determine if people should:

1. **run away**
2. **stay inside**
3. **lockdown/barricade in a safe place**

Let's look at the different types of attacks and some real-life examples...

The Nine Attack Types



■ Single Shooter: Inside Attack

01 | **Deadly Intent**

A surprise attack aimed to kill as many people as possible, both intended and random targets.

02 | **Deep Knowledge**

Insider knowledge of the target allows the shooter to freely access, bypass, or easily defeat security.

03 | **Meaningful Target**

Focus on symbolic target location aligning with the grievance of the shooter, often with a hit list of possible targets.

December 2019 — Saugus High, Santa Clarita, CA

When classes changed, a straight-A student with no disciplinary history pulled a gun from his backpack. He fired randomly into a crowd of students in the school courtyard, striking five classmates before killing himself. The entire attack was over in 16 seconds.

■ Multiple Shooter: Inside Attack

01 | Shared intent by two or more insiders

A coordinated surprise attack aimed to kill as many people as possible, both intended and random targets.

02 | Deep Knowledge

All of the attackers have insider knowledge and access to the target that allows them to bypass or easily defeat security. Plans involve working as a team to move targets into specific areas of vulnerability.

03 | Meaningful Target

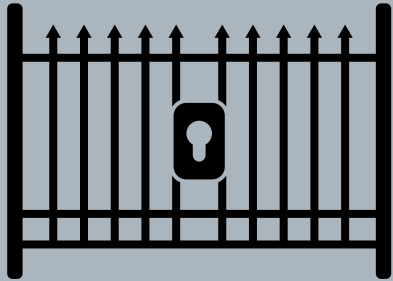
There is a grievance shared by a pair or group of shooters who direct their collective anger at the school. Often one student is the 'ring leader' with the deepest grievance who recruits others into the plot.

May 2019 — STEM School, Highlands Ranch, CO

Two current students entered the school armed with handguns and planned to shoot students at two separate locations. When one of the attackers walked into a classroom and pulled a gun from a guitar case, several students charged at him.

One student was killed as he tackled the shooter, giving two classmates time to subdue and disarm him. On the other side of the campus, the second shooter wounded four students before being tackled by a security guard.

■ Frontal Assault



Raiding a fixed target that the shooter(s) does not have permission to enter.

October 2022 — Central Visual Performing Arts High, St. Louis, MO

A former student with a semi-auto rifle and 600 rounds of ammo loaded in magazines broke the window of a locked side door. He walked up the stairway to the third floor and began shooting at students in the hallway. He shot six students and staff—two fatally—before barricading inside a third-floor classroom where he was eventually killed by police.

Students jumped from the third-story windows to avoid being trapped in a classroom with the shooter. More than 200 rounds were fired inside the school.



■ Sniper Attack



Firing at a fixed target from a distance beyond the security parameter.

April 2022, Edmund Burke School, Washington, DC

A 23-year-old man fired a rifle at students inside a glass pedestrian bridge on the school campus from his fifth-floor apartment building across the street.

The first 60 shots were fired in 18 seconds and 200 total rounds were fired. He then wounded a student on the glass bridge, a school security guard, a parent waiting in a vehicle to pick up a child, and another adult pedestrian.

The shooter committed suicide when police raided his apartment hours later. Police found six firearms, including rifles and handguns. The shooting was live-streamed with a camera inside the rifle scope. While waiting for police, the shooter made edits to the Edmund Burke School Wikipedia page to add his attack.

■ Assassination or Ambush

Targeted killing of a specific individual(s) because the shooter knows the specific victim(s) will be at the school.

8%

of school shootings are ambushes or assassinations.

October 2021: YES Prep, Houston, TX

A 25-year-old male former student, armed with a rifle, tried to open the locked doors and then fired shots to break the glass so he could get inside. He then fired shots down the hallway at the school principal.

The school went on lockdown, and the shooter surrendered to police when they arrived. The family reported that he had a history of mental illness and was hearing voices at the time of the shooting.

The shooter admitted the shooting to police and said the principal was not his target—he was looking for another staff member. No students were injured.

■ Hostage-Taking

Prior to 2004, this was the most common form of school attack.

Taking hostages based on ideology, grievance, or financial gains (ransom).

September 2012: Normal Community High School, Normal, IL

A 14-year-old student pulled a handgun inside a classroom and told the teacher “This is my class now.” He began talking about his struggles and bullying.

When students tried to get up, he fired four shots into the classroom ceiling and held the class hostage. When he lowered his gun for a second, the teacher tackled him.

The student had three handguns, a knife, and a hatchet in his backpack.



■ Criminal Activities

Robberies, drug sales, gambling, or sale of stolen goods for financial, not ideological, purposes.



November 2005: Campbell County High School, Jacksboro, TN

A student stole a handgun from his father and brought it to school to trade for prescription drugs.

During afternoon classes, a school administrator found out about the handgun and confronted the student.

He shot at the principal and then fired at two other school employees who attempted to stop him as he fled the building. One assistant principal, Ken Bruce, died due to the shooting.

■ Siege

Entering a facility and holding a defensive position as long as possible without taking hostages or having a plan to escape.

February 2018, Dalton High School, Dalton, GA

A teacher barricaded himself in his classroom and didn't let students in. When the principal tried to unlock the door, the shooter told him he had a gun and fired a shot out of the window.

The school resource officer was able to talk to the teacher through the door and eventually convinced him to unlock the classroom and peacefully surrender. No students, staff, or officers were injured.



Complex Coordinated Attacks

A hybrid of any combination of attack types.

ARAPAHOE SHERIFF INVESTIGATIVE REPORT: ARAPAHOE HIGH SCHOOL SHOOTING, DEC. 13, 2013

Behind the terror

Witness interviews show Karl Pierson frequently expressed anger toward fellow students and school staff in the months leading up to the Dec. 13 shooting. In September, Pierson threatened to kill Tracy Murphy, head librarian and head speech and debate team coach. On Dec. 11, Pierson was accidentally locked out of teacher Vicki Lombardi's classroom, and he began yelling and pounding on the door. Lombardi called for assistance, and assistant principal Kevin Kolasa responded and sent Pierson home for the day.

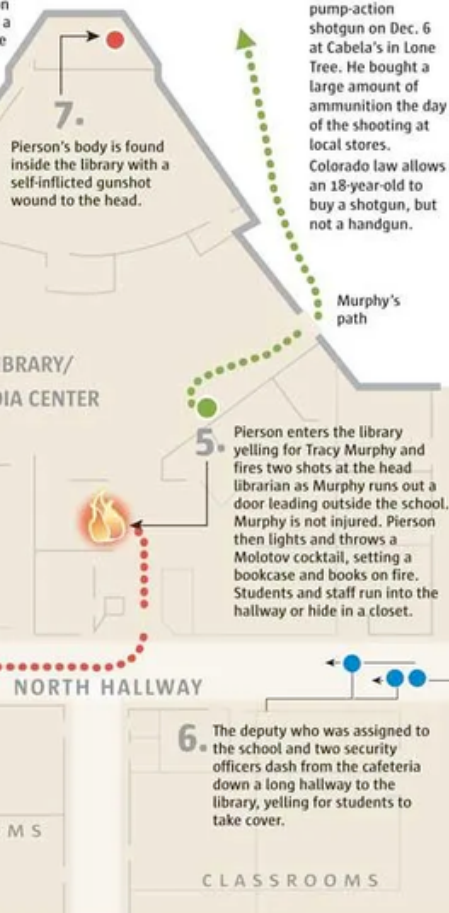


1. On Dec. 13, Karl Pierson parks in the north parking lot near the library. He is wearing a bandoleer of ammunition and carries a backpack filled with three Molotov cocktails. He is armed with a Savage Arms Stevens Model 320 pump-action shotgun and a large hunting knife. Pierson is observed by a school janitor, who notifies the school administration. The school immediately goes into lockdown.

2. Pierson enters through an unsecured north entrance at 12:33 p.m. He heads to the Trophy Hallway.

3. Pierson fires his shotgun at two female students sitting on a bench in the Trophy Hallway near the entry.

4. Pierson fires a second round, which hits Claire Davis in the head, causing her to fall forward. He then fires a third shot into a brick wall, and the ricochet from that shot strikes Claire Davis in the back.



Shooter Karl Pierson, 18, legally bought the pump-action shotgun on Dec. 6 at Cabela's in Lone Tree. He bought a large amount of ammunition the day of the shooting at local stores. Colorado law allows an 18-year-old to buy a shotgun, but not a handgun.

7. Pierson's body is found inside the library with a self-inflicted gunshot wound to the head.

5. Pierson enters the library yelling for Tracy Murphy and fires two shots at the head librarian as Murphy runs out a door leading outside the school. Murphy is not injured. Pierson then lights and throws a Molotov cocktail, setting a bookcase and books on fire. Students and staff run into the hallway or hide in a closet.

6. The deputy who was assigned to the school and two security officers dash from the cafeteria down a long hallway to the library, yelling for students to take cover.

December 2013, Arapahoe High School, Centennial, CO

A student walked into his school with a shotgun, Molotov cocktails, and extra ammunition.

He fired five shots down hallways, killing one student, then threw a Molotov cocktail into the library.

Before he could get to the librarian, he was confronted by a school resource officer and committed suicide. Police believe his intended target was the librarian, who was the staff sponsor of the debate team of which the shooter was a member.

Background

There is a rich body of academic literature on school shootings, but **the focus of most studies is either the underlying causes or impacts after an attack, rather than analyzing the characteristics of the attack itself.**

The causes of school shootings have been studied in the context of society and gun culture (Lawrence, 2006), as a byproduct of violent video games (Ferguson, 2008), how the media covers school shootings (Muschert, 2009; Wondemaghen, 2014), and how online subcultures influence potential school shooters (Lindgren, 2011).

Another research topic: The individual psychology of perpetrators and how their threatening behaviors in childhood and adolescence can be identified to prevent a future attack (Weisbrot, 2008; Allen, 2008; Meloy, 2011; Reeves, 2018).

Multiple studies look at the psychological trauma of victims following an incident (Suomalainen, 2011; Haravuori, 2011) and how student survivors recover emotionally after an attack (Brown, 2018; Turuen, 2014).

The long-term economic impact and lifetime earning potential of communities that experienced a school shooting has been analyzed by economists (Levine, 2021).

Organizational theory rather than psychology has been used to explore how failures occurred—like missing overt warning signs displayed by the attacker— and missed the opportunity to prevent attacks (Goodrum, 2022).

While the motive of mass shootings has been used to develop psychological profiles (Silva, 2022; Silva, 2021; Peterson, 2022; Fox, 2016), the tactical strategy selected by the shooter, has never been the focus of academic analysis.

The firearms tactics employed by terrorist groups around the world are grouped into the categories of “assassination, single-shooter attacks, two-shooter team attacks, frontal assaults, complex attacks, hostage taking, robbery, and siege” (Ross, 2012).

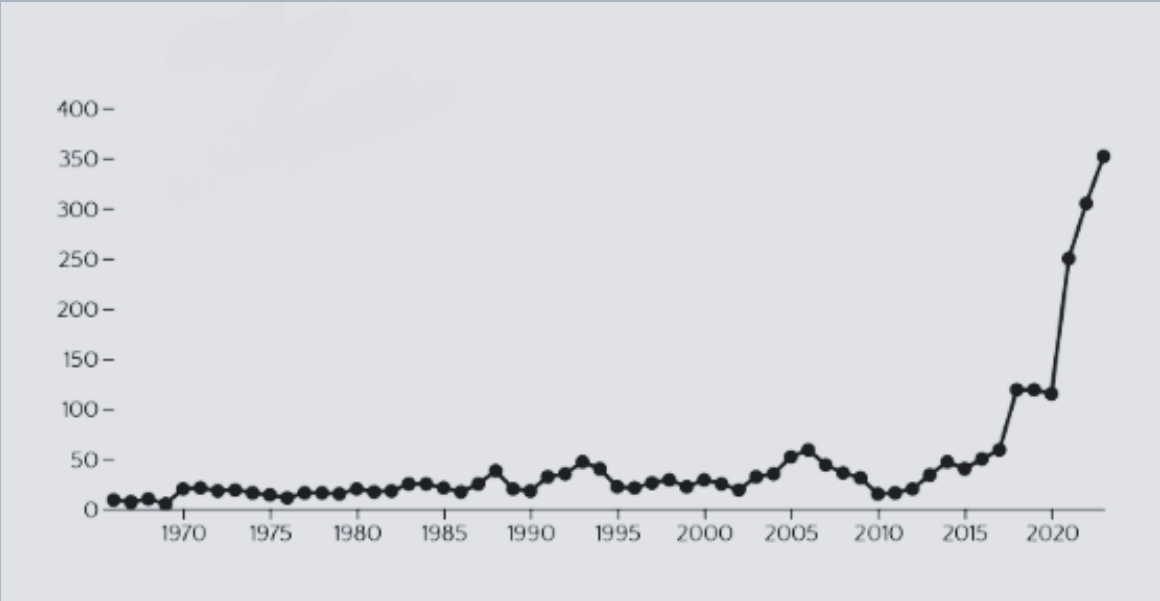
Unlike additional, motive-based analysis of mass shootings that reaffirm what we already know about individual social grievances, pathway to violence, and psychological traits of the attacker, **a tactics-based examination of school shootings is completely missing from the canon of existing literature on targeted attacks.**

Attacks at Schools

Since 1966, there have been 213 attacks at K–12 schools that fit the general “active shooter“ definition of an attack when the perpetrator killed and/or wounded victims, either targeted or random, within the school campus, business, or public space during a continuous episode of violence.

Number of Shootings at Schools

1966 - 2023



271

Incidents 1/1/23-10/20/23

199

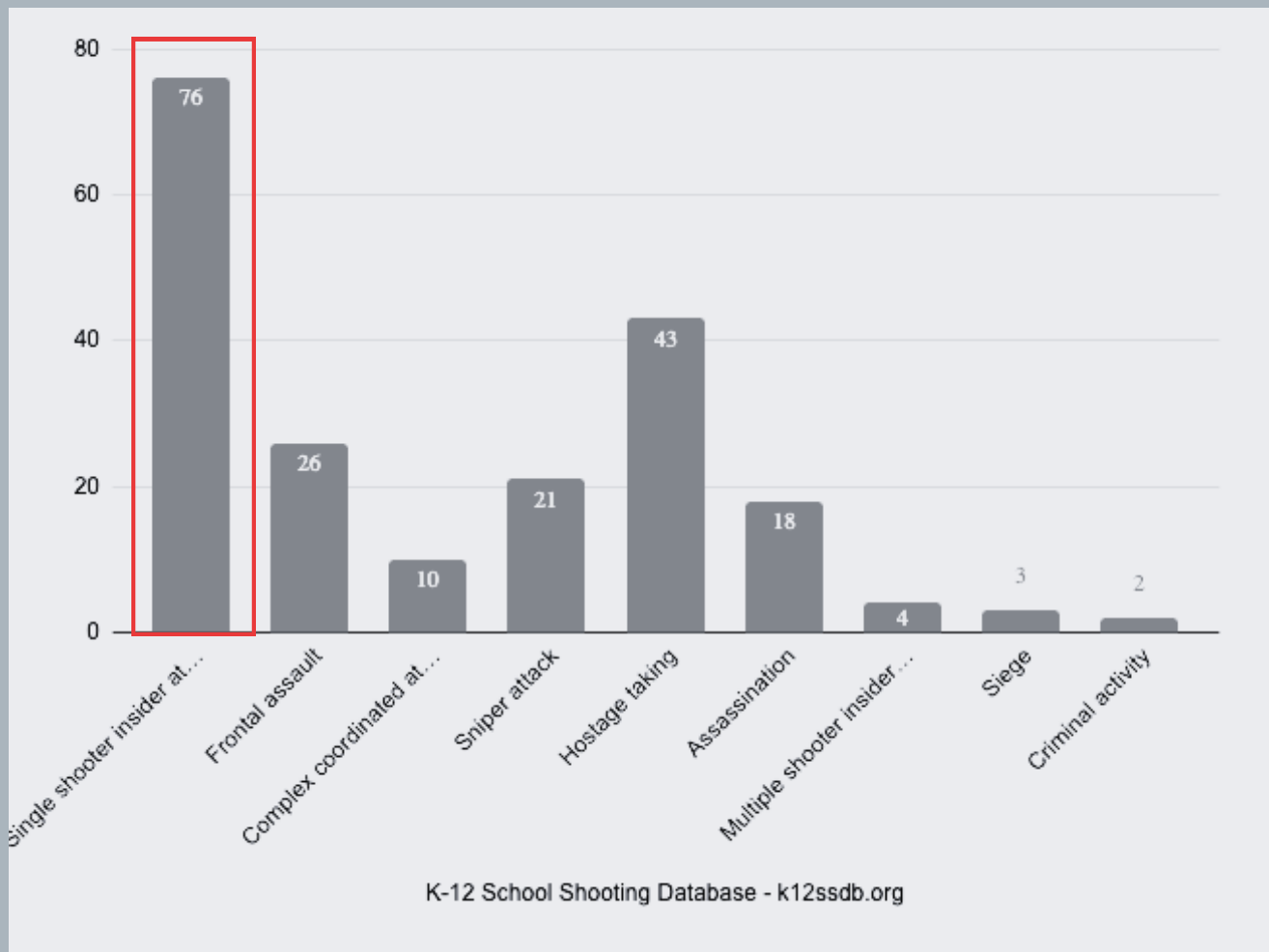
Victims 1/1/23-10/20/23

Looking closer at these incidents, the assailants’ tactics aren’t evenly distributed across the nine attack types.

Over half of all planned school shootings were single-shooter insider attacks or deliberate hostage-taking. Although common training scenarios include a second shooter or complex coordinated plot with a secondary attack on responders, these types of attacks only occurred 6.5% of the time.

Sniper attacks—which are rarely trained for—are twice as likely as a complex coordinated plot.

K-12 School Active Shooter Attack Types



Unprepared: Sniper Attack

In April 2022, a sniper with five rifles in a fifth-floor apartment fired more than 200 rounds at the Edmund Burke School in Washington, DC just before dismissal.

Few, if any, school shooting training exercises have ever prepared for an elevated sniper attack.



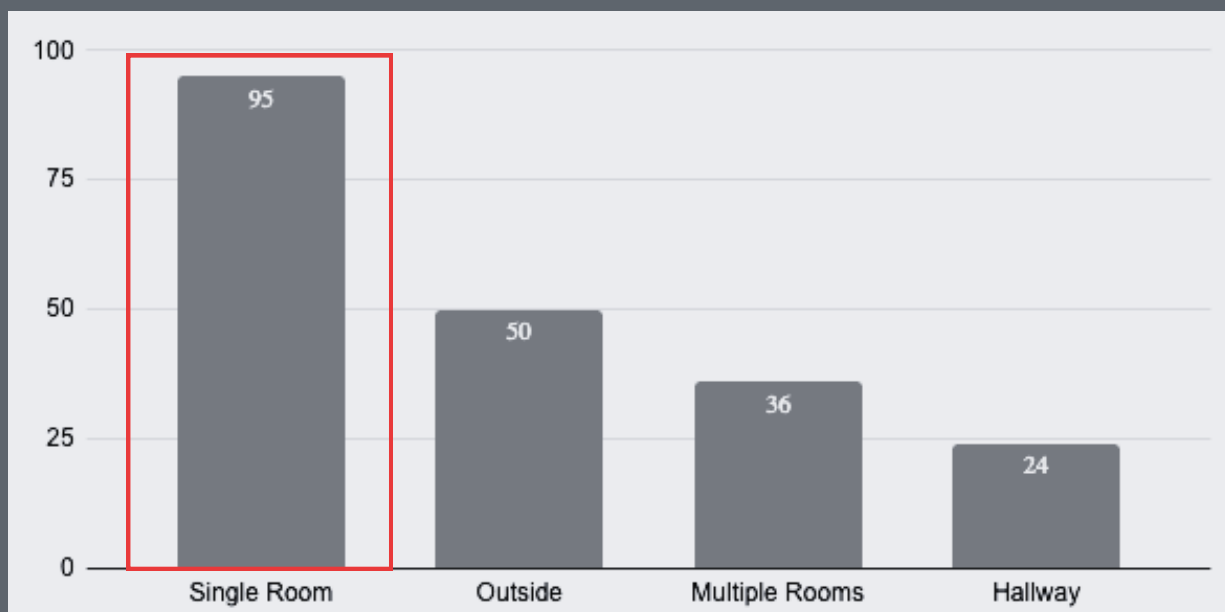
Assumptions versus Reality

Many school security plans and equipment are designed to prevent a shooter from moving between multiple classrooms—yet only 17% of shooters targeted victims in multiple rooms.

Most school shootings in this sample of 213 deliberate attacks occurred before fortifications were added, yet roughly half of the shootings were still contained, or the shooter chose to stay, in a single room.

Only
17%
targeted victims in
multiple rooms

In 50 of the 213 shootings, the shooting happened outside and the shooter never entered the building,



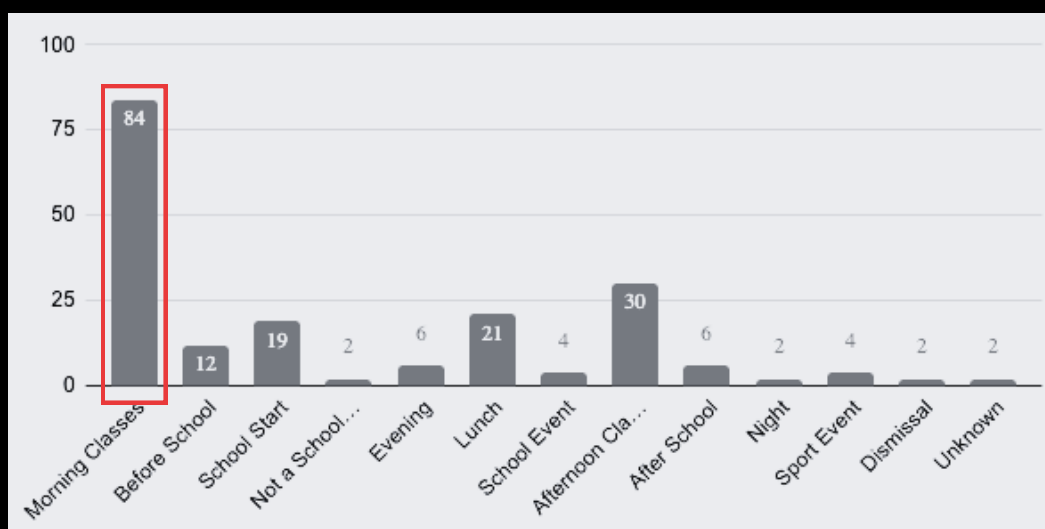
Understanding the Threat

Planned attacks at schools happen overwhelmingly **during morning classes**.

It's critical to note that 31 attacks occurred before the school opened or right at opening, before students were inside secure buildings or classrooms.

When shootings happen during this time, school doors may still be locked.

Three weeks before the Parkland shooting, a 15-year-old student killed two and wounded 18 at Marshall County High in Benton, KY. His planned attack occurred before classes started at 7:57 a.m. in a large hallway near the cafeteria.



Planned attacks at schools are carried out predominantly by current or former students with a direct connection to the campus.

Because students capable of planning attacks and obtaining weapons tend to be older teens, about two-thirds of these deliberate school shootings happen at high schools, or combined K–12 and 6–12 grade schools.

57%
of active shooters
target high schools

About 14% of active shooters target either elementary or middle schools. Some middle-school attacks are carried out by younger teens.

One such example occurred on March 25, 1998, at Westside Middle School in Jonesboro, AR. Two male students, 13 and 11, pulled the fire alarm and aimed at their fellow students as they evacuated the school. The boys had nine weapons and 2,000 rounds of ammunition that were stolen from a grandparent's house.



Implications for Securing Schools

Increasingly, school security falls into two categories:

- **Hardening the physical structure**, such as metal detectors, bulletproof glass, and ballistic materials.
- **Increasing campus policing or patrols**, including armed or unarmed security staff.

These security measures are not effective in 60% of cases.

Insiders who are allowed to access the school (**38%**), snipers who fire from a distance (**10%**), or frontal assaults where a heavily armed person shoots their way in (**12%**) would not have been prevented by these measures.

In the 10 complex coordinated plots, the attack plan was designed to draw students and staff away from the building or move victims towards IEDs and flammable liquid devices.

In all of these attacks, a hardened school building with officers on campus would not prevent the school shooting.

A root cause of misaligned security investments and strategies is that “active shooter” and “school shooting” are blanket terms used to describe multiple different attack types.

When school security strategies are developed based on a broad category rather than the specifics of different types, different security strategies may have varying levels of effectiveness for each scenario.

The nine attack types must be treated as distinctly different scenarios — each with its own unique set of plans and procedures.

Hostages are rarely considered during planning or training. Thirty-one of the 43 hostage situations (72%) were successfully negotiated without any victims being killed or wounded. Five other hostage situations had a single victim killed or wounded. If police use the common, generic, active-shooter response to “run to the sound of gunfire” during a hostage situation, this risks escalating a situation that could be peacefully negotiated.

Emergency response and protective actions for a surprise attack by a student versus a sniper attack from a distance are completely different.

If police and school officials lack planning and training for each scenario, the consequences of taking the wrong actions can be deadly.

Situational Awareness Can Save Lives.

DID YOU KNOW

AI gun detection technology provides school officials, law enforcement, and emergency medical services with critical, time-saving information.

Without real-time images and locations of the shooter, it's challenging for police and school officials to determine which of the nine attack types is happening.

ZeroEyes delivers a proactive A.I. gun detection solution that integrates into existing security cameras to stop mass shootings and gun-related violence by reducing response times, providing situational awareness, and delivering clarity...ultimately saving lives.

Our alerts provide images and location of the shooter to help determine what type of attack is happening and then determine the best response to the attack.

Active Shooter: Options

When a shooting starts, students and staff have two options: run or lockdown.

Detection Before an Attack

When ZeroEyes detects the shooter before they enter the building, or as they brandish a weapon outside for an attack, locking doors and avoiding windows can make the inside of the school a safe place for students to stay until police arrive—and can give SROs or other security officers the critical time need to stop the assailant.

Awareness During in an Attack

If there's a surprise attack inside the school, ZeroEyes can provide the shooter's location within seconds—telling students and staff if they should run or shelter. If the shooter is nearby, it's usually best to run away. On a large campus, if the shooter is on the opposite side of the building or in another building, it's probably best to shelter inside.

Safer Path Forward

By knowing the shooter's location in real-time, the type of firearm(s) brandished, and the number of assailants, students and staff can take the most effective action and use other safety measures to the fullest potential.

Without a system like ZeroEyes, it's hard to decide when it's best to run as far from the school as possible or lockdown inside classrooms with ballistic doors and windows.

Now, critical decisions can be made immediately: Situational awareness is within reach.

About the Author

David Riedman is the creator of the [K-12 School Shooting Database](#) and ZeroEyes' Director of Research. He conducts research on gun violence in all types of public spaces, including schools, and has authored multiple peer-reviewed articles on analyzing school shootings, homeland security policy, and critical infrastructure protection.

He formerly worked as the Homeland Security Adviser for the Downtown Washington, DC Business Improvement District and served for 18 years as a firefighter and emergency medical technician in Maryland, where he reached the rank of captain.

David has keynoted the largest conferences for public health, emergency management, and campus security. He's been cited by over 1,000 media outlets, including The New York Times, Washington Post, The Guardian, Chicago Tribune, National Public Radio, The Wall Street Journal, Al Jazeera, Bloomberg, and Forbes.

About ZeroEyes

Founded in 2018 by a team of Navy SEALs and elite technologists, ZeroEyes was created to protect people from facing similar circumstances.

Outraged by school mass shootings and their impact on children, educators, and communities, our cofounders—veterans, elite technologists, and parents—were compelled to develop a proactive solution to keep people safe.

The solution was developed using thousands of proprietary images and videos captured to train our AI weapons detection model, giving us the most comprehensive and superior technology in the market.

Today, our patented solution is recognized by the U.S. Department of Homeland Security (DHS) as a promising anti-terrorism technology and is the first video analytics technology to receive SAFETY Act DT&E Designation.

To learn more about how ZeroEyes saves time and saves lives, visit ZeroEyes.com.