

# AVIATION PERIMETER SECURITY



## ***"Secure to the Far Edges"***

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# SECURE TO THE FAR EDGES

BY STEVEN H. MILLER

It's no secret that the weak link in U.S. airport security is the perimeter. Security in the airport's passenger areas is tight and getting tighter, closely scrutinized by airport authorities, law enforcement agencies, Congress, the press, and the public. By contrast, the miles and miles of airport perimeter have received very uneven attention. In many airports, it is literally a weak link: a chain link fence topped with barbed wire, the Transport Security Administration (TSA) minimum requirement. And not surprisingly, there have been repeated intrusions into airports, including into the Area of Aviation (AoA), even after all the security ramp-up that followed 9/11. In fact, in 2011, the TSA reported that there had been 25,000 airport breaches since November 2001.

The fluorescent green HySecurity SlideDriver and the HySecurity StrongArm M30 vehicle barrier arm protect the perimeter of a northeast international airport. The crash-tested barrier arm prevents unauthorized vehicles from penetrating the Area of Aviation (AoA).

In many cases, what holds back improvements in perimeter security are economics and politics. Airports are vast. A typical large airport serving a major metropolitan area can easily have over 10 miles of fence line. Upgrading that much fence, building landscape features to further deny intrusion, and adding cameras and other detection systems can get very expensive. Despite generally heightened concerns about terrorism, in fact, there have been no terrorist-related breaches of airport perimeters reported in the U.S., so not every jurisdiction with an airport has the willingness to spend that money.

In addition to fencing out unwanted visitors, there must be points of entry for airport workers, delivery people, and other authorized non-passengers who need access to the AoA. These entry points are controlled to allow validation of the credentials of those who should have access, and exclude those who should not. These access control points (ACP) are often in remote areas, not always manned by a live guard, meaning that both validation and entry must be controlled by automated systems.

Security expert Richard Woltjer, VP of marketing and business development for HySecurity, explains the dilemma in designing perimeter security. "One of the first things you want to ask is, 'How far away can we get the perimeter from the asset?' The farther away, the better off you are." Greater distance means more fencing, more remote ACPs, and more communication needed with the command and control center. Woltjer concludes, "The farther you are from the facility, the more costly it will be to protect and harden your perimeter."

"Most airport perimeter intrusions," continues Woltjer, "are people doing something stupid. You're trying to protect against a crazy person, drunk or otherwise, who is trying to get into the perimeter of the airport for other than terrorist reasons. But you also want to be protecting yourself against a terrorist vehicle."

### THE FIVE D'S

Airport perimeter security is a collaboration between a variety of systems including fencing, controlled entry, detection, and communications. Woltjer suggests that the strategy of perimeter security can be defined by the Five Ds: Deter, Detect, Deny, Delay, and Defend.

**Deterrence** is a matter of making a breach look too difficult or too costly to undertake. "I've heard it said that as much as 90 percent of security is perception. You want to make sure that the perpetrator doesn't want to penetrate that security because it's going to be too hard."

"If they've decided it's worth the risk and hassle and effort to break through," continues Woltjer, "then you want to detect them in real time and know exactly where they are. That is relatively easy but it isn't inexpensive. You want to have a system on the entire perimeter that not only tells you that it has been breached but where it has been breached within a 20-foot section, so you can send somebody to respond as fast as possible."

**Detection** can take many forms. Cameras are the tool everyone knows, but there are others. "There are sensors that detect people trying to climb the fence, an intrusion detection system that is integrated into the fence," explains Allen Wright, a business development manager specializing in the transportation industry for Ameristar Perimeter Security. "There are microwave systems that pick up people well before they get to the fence line. There are in-ground sensors." Often, multiple systems are used in combination.

Vibration detectors (aka fence rattlers) offer important information, but it can be ambiguous. Computerized systems in the command and control system have algorithms that can determine whether a vibration is likely to be an intruder or an animal brushing the fence or wind or lightning.

### THE FENCE LINE

**Denial** is about physically preventing entry. Denying a person on foot is a different problem than denying a vehicle.

Wright notes that chain link fence remains the most common fence line at U.S. airports. "They go with that because it's cheaper, but it's less secure. You go at it with bolt cutters and you'll be through in 30 seconds. You can throw a blanket over the top and the barbed wire is not effective at all."

Wright believes the best way to secure the area around an airport would be some kind of an anti-climb fencing with an integrated intrusion detection system. As an example, he cites Ameristar's Impasse II anti-climb fence. "Ours is a steel palisade product, steel pales with steel c-channel



Anti-climb pale fencing is both more difficult to scale and to cut through compared to chain link. Photo courtesy of Ameristar Perimeter Security.

rails. Steel pales increase cut-through times [as compared to chain link]. Anti-climb means 1 5/8-inch spacing between pales. It's harder to get a foothold in there. Moreover, you can integrate intrusion detection systems inside the rail. For cameras or vibration detection, the rail acts as a raceway for the wiring. That eliminates the need for hundreds of feet of trenching, which reduces cost."

Preventing vehicles from entering the AOA has a different set of parameters. The position of the fence line and the contour of adjacent landscaping can be important factors.

A vehicle trying to crash a fence needs to hit it at high speed. A road that approaches it at a perpendicular is like a runway for the intruder to gain speed. A landscaped trough along the fence can mitigate that weakness and stop the vehicle.

Hardening the fence against a crash would require some sort of cable system, according to Woltjer.



Crash test of a HySecurity Strongarm M50 hardened barrier arm. Before. Photo courtesy of HySecurity.

After. Photo courtesy of HySecurity.

### ACCESS CONTROL

Aside from preventing unauthorized access, the other major task of airport perimeter security is enabling safe, validated access. This applies to both people and vehicles.

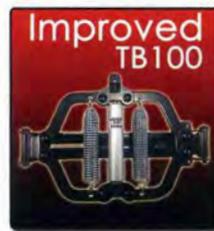
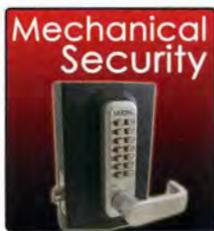
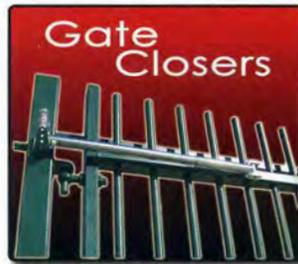
An ACP can be either manned by a guard, or unmanned and operated by a variety of devices. The physical control can be as simple as a barrier-arm. It can be as complex as a sally port, a two-gate system that is

somewhat akin to an airlock used in space exploration.

Most ACPs are unmanned, because there's very little traffic. They are sometimes quite remote from the terminal. An automated ACP uses detection systems not only to sense intrusions, but also for its basic operations. It informs the gate system when there is someone requesting admittance, and whether or not that person or vehicle has transited the ACP.

A "loop" in the ground or roadbed is an electrified wire that creates a magnetic field. When a significant amount of metal is close to it, it changes the voltage. It can distinguish between a vehicle and somebody with steel-toed shoes. Loops are used to help prevent tailgating, count vehicles, and determine whether or not a vehicle has fully transited the ACP. Alternatively, a microwave beam can be aimed across traffic. A break in the beam indicates a vehicle present.

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When a vehicle is detected, that arms the rest of the system to validate the credentials and either admit or deny the entry. Without a vehicle being detected, the entry system cannot be opened, preventing pedestrians from using a vehicle entry point. Credentials may be validated by a card-reader, a PIN reader, or both in combination.

### HARDENING STANDARDS

Barrier arms regulate vehicle access. They can be simple, lightweight arms that will stop a driver from entering the wrong

place accidentally (but could be easily broken through by a determined crasher), or they can be hardened, final denial devices that will stop a heavy vehicle moving at high speed.

The standard test for hardened barrier arms, gates, fences, and other denial devices such as wedges, hardened, or bollards, is to crash into it with a particular, standardized 15,000 lb. truck moving at 50 miles an hour.

Woltjer's company, Hy Security, makes deceptively lightweight-looking barrier arms, the Strongarm M30 and Strongarm M50, that are actually hardened to stop that

standard truck. At that speed, the truck is largely destroyed by the crash, and driver and passengers in it will likely be killed. Hardened gates perform similarly.

Other devices that can allow/deny vehicles, such as hydraulically operated bollards or Hy Security's M50 wedges, come up out of the pavement. They will also resist (and probably destroy) that standard 15,000 lb. truck.

Sliding gates are a more broad-range denial device, since they keep out pedestrians as well as vehicles. Once again, there are lightweight ones and there are hardened ones.

"If you have a hardened perimeter," Woltjer points out, "Your ACP may be your most permeable place for a breach. The most dangerous possibility is tailgating: an allowed vehicle goes through and another vehicle goes through right behind it. Some companies will say security at ACPs relies on the speed of gates, but those gates are completely permeable. You can get a crash-tested slide gate, but they're very expensive and you can't move a crash-tested sliding gate fast because it's too heavy."

### INTELLIGENT SYSTEMS

Instead, Woltjer recommends an intelligent gate operator system, a combination of detection, a control system, a traffic control/denial device, and a strong communications link between the ACP and the security command and control center.

"You want to determine if there's a threat that's going to occur before it occurs. You could have A, B and C loops: one outside, one at your sliding gate, one at the crash barrier arm. The outside loop might arm an access control device, so the only way to get your credential validated is if there's a vehicle there. The vehicle has to move across A, B, and C loops. If it gets past A and stops over B or C, and is standing for a long period of time, that's the potential breach condition. You're going to send an alert, turn on your camera, send your guards... whatever response you've got."

Loops can help prevent tailgating. As soon as a car transits and passes the first loop, the barrier arm in front of the loop closes, so a second vehicle would have to break through the barrier arm.

Joe Dagata, president of Obar Security and Obar Door and Gate, has noted a shift recently away from sliding gates and toward vertical gates. "Chain-operated gates have a chain that you can cut and open the gate.

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Vertical lift gates, such as this Tilt-Away gate made by AFA-member Ideal Mfg., Inc., are gaining acceptance because they are considered more difficult for an intruder to open manually than a sliding gate.

With hydraulic gates, there's a long rail. You can't just cut it, you have to take the entire rail off. Now, they want something more secure, where you can't slide anything. You have to pick it up, and the ways to open it are better protected. They are more secure." He notes that these vertical lift gates can be 1,500 lbs., making them very difficult to lift manually. Daga has been in the industry for more

than half a century. His company is both a distributor and an installer, and in the latter capacity, they are 'on call' with the TSA 24/7.

The fourth D, **Delay**, is the slowing-down effect that can be reaped even if a denial device fails to prevent a breach. For example, if a vehicle is stopped but the intruders get out and proceed on foot, they have been significantly slowed down.

Delay provides time for the fifth D, **Defend**. This is usually a human response, armed guards rushing to the scene of the breach. If the first three Ds are well-designed and constructed, the fifth D should rarely come into play.

Woltjer believes the security of airport perimeters is improving, but it requires more complicated systems. "Often 10 or 15 different manufacturers are involved. The devices all have to operate properly, doing specific things without fail." He suggests enlisting a perimeter security integrator, an expert who pulls together all the different systems during design, initial deployment, or during upgrade.

Considering the rise of terrorist incidents around the world, Woltjer suggests that airport security is among the most important issues for our society. "Our 'island' seems kind of protected by comparison with Europe. If someone were to take out the Washington Monument, from a psychological perspective, it would do huge damage to the American sense of security. Other than a nuclear power plant or a head of government, it's hard to imagine a site that has more importance or dangers to ourselves, to our psyche, than an airport." ■



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