Chapter III Metal Detection

A. Walk-through metal detectors for personnel

1. Do metal detectors really work?—The basics
Metal detectors work very well—they are considered a mature technology and can accurately detect the presence of most types of firearms and knives. However, metal detectors work very poorly if the user is not aware of their limitations before beginning a weapon detection program and is not prepared for the amount of trained and motivated manpower required to operate these devices successfully.

A metal detection device in school security applications is used primarily to locate undesirable objects that are hidden on a person's body. When a questionable item or material is detected by the device, the detector produces an alarm signal; this signal can be audible, visible (lights), or both. Unfortunately, a metal detector alone cannot distinguish between a gun and a large metal belt buckle. This shortcoming is what makes weapon detection programs impractical for many schools; trained employees are needed to make these determinations.

Metal detectors are usually not effective when used on purses, bookbags, briefcases, or suitcases. There is usually a large number of different objects or materials located in or as part of the composition of these carried items that would cause an alarm.

If you ask the average person what a metal detector does and what property to which it is most sensitive, the answer to the first question would probably be that it is a device that detects only metal. The answer to the second question likely would be that a metal detector is more likely to detect metal objects with heavier mass. Both answers are incorrect.

A metal detector actually detects any conductive material—anything that will conduct an electrical current. The typical pulsed-field portal metal detectors generate electromagnetic pulses that produce very small electrical currents in conductive metal objects within the portal archway which, in turn, generate their own magnetic field. The receiver portion of a portal metal detector can detect this rapidly decaying magnetic field during the time between the transmitted pulses. This type of weapon detection device is "active" in that it generates a magnetic field that actively looks for suspicious materials or objects. A magnetometer, a passive device, was much more in use 20 years ago in the detection of weapons. The magnetometer depends on the Earth's magnetic field—it looks for a distortion caused by the presence of ferromagnetic (attracted to a magnet) material.

Counter to intuition, the mass of a particular object is not significant in metal detection. The size, shape, electrical conductivity and magnetic properties are the important properties.

For example, when a long thin wire is taken through a portal (walk-through) metal detector, and the wire is in any geometry except one in which the two ends (or any two points on the wire) are touching, it will rarely be detected. However, shape this same wire into a closed circle and the metal detector will most likely go off, even though the mass of the wire has not changed.

Delving even deeper into metal detector sensitivity, consider the orientation of an object. Take the same closed-loop wire described in the previous paragraph. Lay this loop on its side so that it is parallel to the ground. In this configuration, the portal metal detector is less likely to see it, but, if the wire loop is upright and parallel to the side panels of the metal detector, the detector will be much more likely to go off in this orientation.

Some people fear the use of a metal detector on themselves because of the possible side effects of being subjected to the magnetic field. This fear is unfounded; metal detectors emit an extremely weak magnetic field, weak enough to be of no concern even to heart patients with pacemaker-type devices. Indeed, the use of an electric hair dryer subjects the user to a much stronger field than would be received by a metal detection device.

Another widely held belief about metal detectors is that they are a straightforward technology, where the equipment does all the work. This is not true at all. The average first-time consumer will undoubtedly expect a metal detector to be much smarter and more helpful than it can possibly be. A metal detector is only as good as the operator overseeing its use.

In many facilities, the misconception exists that someone known by the operator, such as a fellow employee or a security person, should be allowed to circumvent the system. It must be clearly established that in order to ensure the integrity of any routine metal detection program, everyone must be subjected to the program requirements, including students, parents, teachers, custodial and maintenance staff, security personnel (except for sworn police officers who are required to carry a weapon), school administrators, and visitors. To require less would be counterproductive and prejudicial. Signage can be of great help: a sign at the school entrance explaining the importance of the detectors in maintaining a safe and comfortable learning environment provides policy notification. If a more aggressive approach is needed for a particular community, entry signs could spell out a particular school or district policy that requires the screening of all who enter the school, with access denied to those who refuse.

2. Space requirements and layout

The portal metal detector, also called a walk-through detector, is a stand-alone structure that resembles a deep door frame (exhibit 3.1). The typical walk-through detector will take up a space on the floor about 3 feet across and 2 feet deep. (This does not mean that if you have a 3 feet by 2 feet space at the entrance to your facility you necessarily have space for using a walk-through detector.) The typical height of most portal detectors is around 7 feet. Weight of a unit can vary from around 60 pounds to as much as 150 pounds; however, the awkward shape of most portals prohibits their being easily moved by one person. Portals are generally freestanding and are rarely attached to the floor or surrounding structures. Power requirements are for one plug to a typical 110-volt wall outlet.

The first space factor to take into consideration is where people who are waiting to walk through the portal (scannees) will stand. Ideally, there would be no wait for use of the portal, but this is probably unrealistic in a school environment where the entire population of students will be arriving over a very short period of time. Each school has to determine how many scannees will arrive and at what rate. Most detection programs will need to operate indoors, or at least under some type of

Exhibit 3.1. An illustration of a portal metal detector.

shelter, and most schools are going to want to provide a comfortable environment for those waiting. This usually means that there must be enough shelter for the queue of scannees that might build up at any one time and that they should not be overly crowded. There should also be some way of clearly forming a line for scannees to stand in if they will be arriving at a much greater rate than can be processed; eliminating the opportunity for cutting in line would clearly be important in a school to reduce possible fights.

To avoid sending conflicting signals to the detector, the scannee waiting in line to use the portal next should be kept back 3 feet from the current user walking through the portal. Operators of the equipment and scannees who have already walked through also need to be at least 3 feet from the portal in all directions. (Contrary to a scene in a popular movie of several years ago, a gun thrown along the outside of a metal detector by the scannee before entering the portal and retrieved on the other side after the scannee got through would cause an alarm.) Likewise, if more than one portal metal detector is being used, each needs to be at least 10 feet from the others unless they have been synchronized.

Without very special instructions and limitations for the scannee population, it would be most difficult to conduct a metal detection scanning program with only the use of portals. Hand-held scanners are usually required for use on scannees who have triggered an alarm walking through the portal but who fail to be able to immediately determine what object on (or in) the person caused the alarm. Also, it is highly recommended that any routine metal detection program incorporate the use of x-ray equipment for bookbags and purses because of the ease with which a contraband item or material could be hidden within carried baggage. (See the sections in this chapter on hand-held metal detectors and x-ray equipment for baggage.) This equipment mandates additional space.

Space for the scannee to follow procedures is also required. A person about to walk through the portal needs room to place his or her carried items on the x-ray machine, room to put his or her pocket items (coins, keys, heavy belt buckles) in a special pass-through container, space to pick up these items, and space to turnaround to walk through the portal a second time if necessary.

It is very important that there be neither space nor opportunity for particular members of the population, including employees, to walk around the detection system (exhibit 3.2). Very definitive boundaries must be established to prevent circumvention of the system and prevent passback of contraband, where such prohibited items are handed from outside the screening area to those who have already successfully cleared the scanning process.

In designing the layout of the metal detection system, the composition of surrounding walls, furniture, nearby electromagnetic equipment (such as an elevator), nearby plumbing in the walls, and even metal trash cans must be taken into account. The optimal effectiveness of a portal metal detector can be easily degraded by a poor location, a casually placed metal stool, or the nearby use of electromagnetic devices. See the section about sources of interference elsewhere in this chapter.

In schools, the metal detection equipment and personnel will generally be located directly within the front or

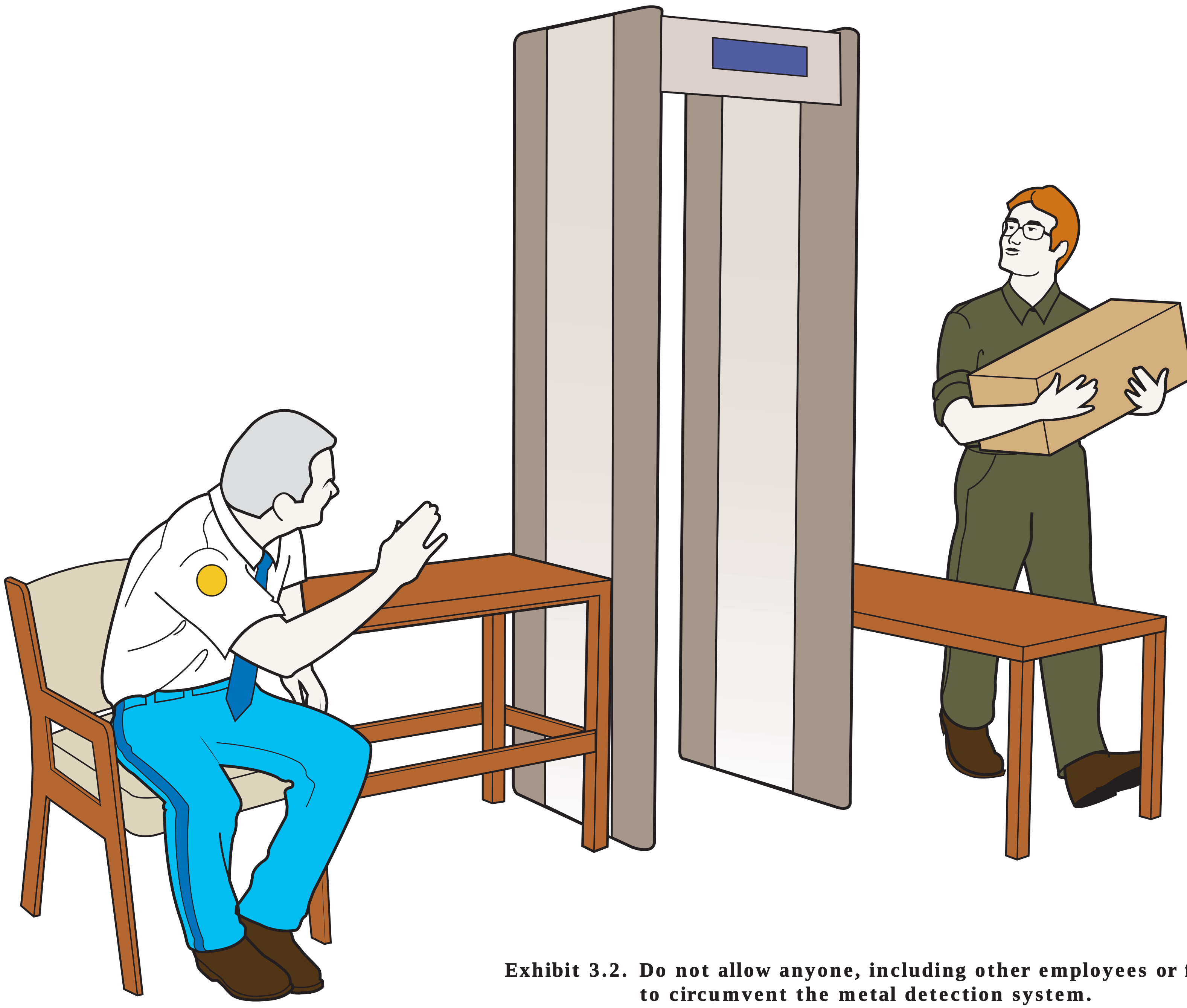


Exhibit 3.2. Do not allow anyone, including other employees or friends, to circumvent the metal detection system.

main student entrance. Unfortunately, the design of most schools does not lend itself to a comfortable staging area for this process. There is usually not nearly enough interior or covered space to allow for all the students waiting to enter the system. This may mandate that the metal detection staging area be located further within the facility, which may place administrative offices outside the cleared area. Conscious decisions must be made and potential risks must be realized when designing the weapon detection program.

A greater problem is often that the layout of schools will not allow for the limiting of only one or, at most two, entry points. Few schools can afford to have multiple entry setups with complete metal detection programs. The cost of the equipment would be quite high, but not nearly as prohibitive as the manpower to run these multiple systems.

3. Throughput

A well-trained and motivated operator should generally be able to process between 15 and 25 people per minute through a portal detector. This does not include investigation of alarms, nor does it take into consideration intentional or unintentional delays that might be expected in a student population.

Assuming that scanning personnel are well-trained, a school's throughput is going to be driven by three things: (1) the number of devices, (2) the rate at which students arrive, and (3) the motivation of the students to cooperate and move through the system quickly and the ability of the school staff to make certain that scannees move along quickly. The breakdown of equipment or the arrival of visitors who are not familiar with the scanning routine will also cause a definite slowdown; the impact of this must also be considered by the school administration but is not taken into account here. (The need for backup equipment must be considered by each facility, whether the equipment is borrowed from the vendor or a pool of spare equipment is shared within a district.)

Keep in mind that any population that is aware that it has to regularly go through the scanning process will soon compensate and adjust their routine. These adjustments will generally be that: (1) the population will attempt to take fewer prohibited items with them into the facility (hopefully), (2) scannees will learn which otherwise acceptable items in their possession will still cause an alarm and will tend to shy away from these items (except maybe in the case of students who wish to create a hassle and who are undaunted by any consequences for doing so), and (3) the population will allow for the additional few minutes in their schedule, perhaps even going so far as to come early enough to miss the main rush. Travelers flying out of busy airports know to allow for a few minute delay at the metal detection scanners and will not cut their arrival time so close that they miss their flight. Students will do likewise, whether they need to show ID cards at the front gate, go through a metal detection system or meet with their friends before class. However, unreasonably long waits of 15 minutes or more could result in staff, students, and parents alike reevaluating the need for a metal detector program. Nobody wants to add significantly to their workday, especially if they are not compensated for it. Employee organizations may bargain for extra pay for this additional at-school time.

Exhibits 3.3 and 3.4 depict the average number of students that would be waiting at each 5-minute interval before school to enter the weapon detection system for a school population of 1,000 and 2,000, respectively. For these calculations, it was assumed that metal detection equipment is in good working condition and optimally laid out, operators are motivated and comfortable in their tasks, and students move smoothly through the process. The arrival rate resembles a school morning where the bulk of students arrive within a 10- or 15-minute window, perhaps resembling a school whose students rely primarily on buses for transportation. (Whether or not the assumed arrival rate is truly typical of student arrival times is unknown; its use here is for enlightenment purposes only.) The overall throughput is gauged in terms of the number of students who will be waiting to enter the metal detection process at any particular time. The assumption is made that the portal metal detector will be the bottleneck of the scanning process and that other supporting components of the detection program will be able to perform their functions in an equal or lesser amount of time (although this may not necessarily be true at a particular school, depending on its setup). It is also assumed that the process will be set up such that students who fail the initial portal screening will be immediately funneled to an alternative screening point and will not have to reenter or further delay those at the main entry portal.

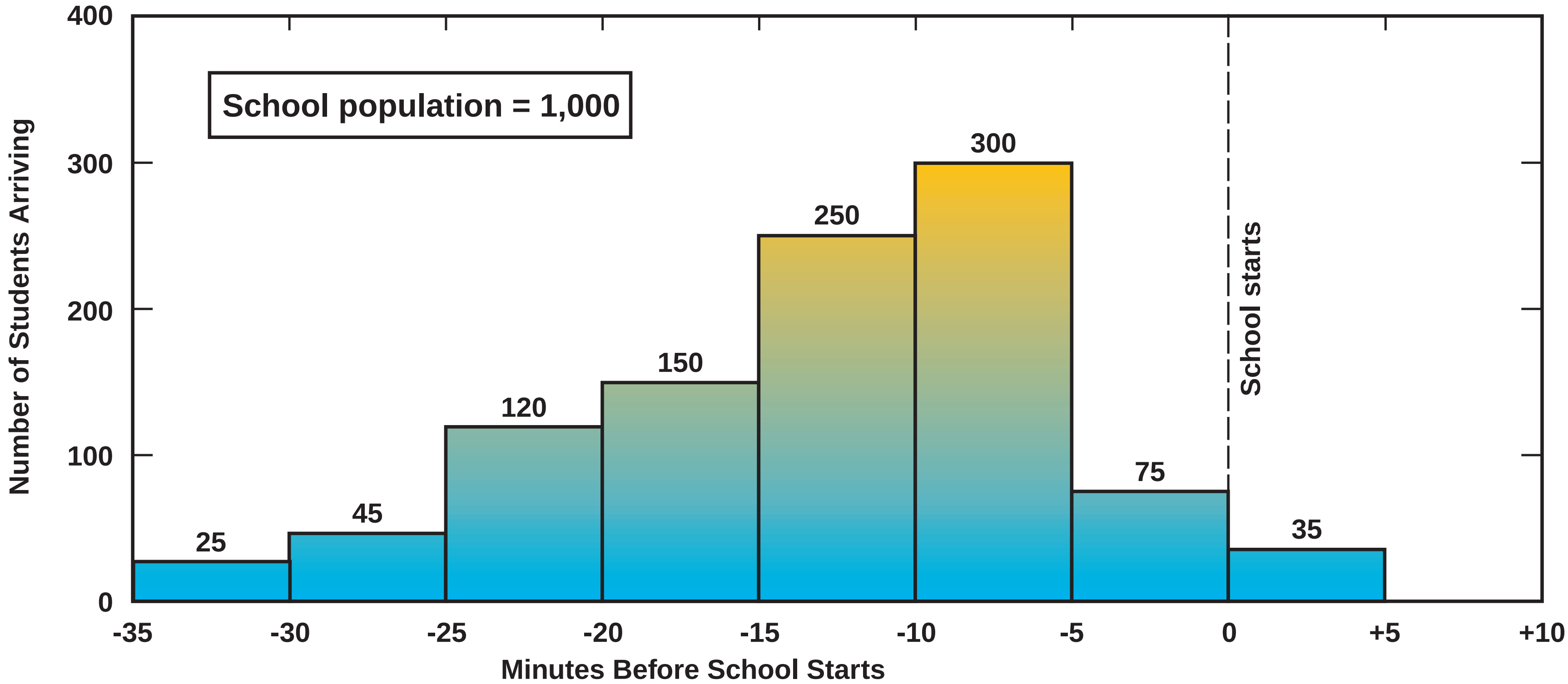
For students prepared to clear the portal who have minimized alarm-causing items and materials in their possession, the actual processing time through a metal detection program should be less than 10 seconds. For students who are not prepared, the processing time may add an additional 3–5 minutes or more for scanning the body with hand-held metal detectors and/or manual bag searches. This does not include the additional delay of waiting to be scanned.

After carefully calculating the necessary metal detection equipment, space, and personnel, and making adjustments for individual school characteristics, the administration may realize that there simply aren't enough resources available to handle its students in an acceptable manner. Some schools have overcome these limitations by staggering the schoolday start times for students, thereby spreading out the school's limited metal detection resources. Unfortunately, schools that rely heavily on bus service may not be able to utilize this solution.

4. Hardware costs and manpower costs

Portal metal detectors vary widely in price. Portals on the market range from as little as $1,000 up to as much as $30,000. The moderately-priced models around $4,000 to $5,000 probably offer the features and reliabilities required for a school metal detection program. Models closer to $1,000 are not recommended due to lack of sensitivity of these devices. Models in the higher price ranges generally offer enhanced capabilities that would not be necessary or warranted in a school environment.

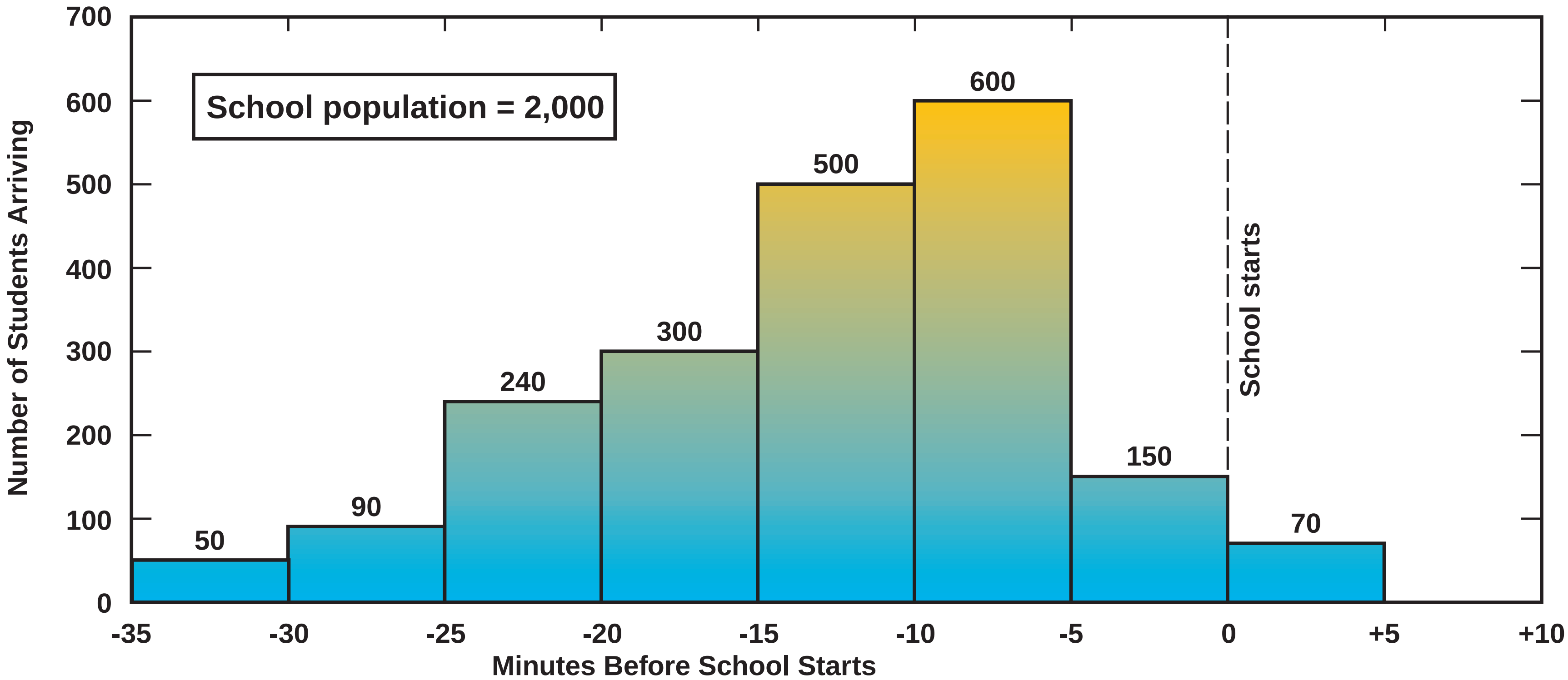
The initial purchase price of a portal metal detector is almost insignificant compared with the ongoing personnel costs to operate the equipment in a complete weapon detection program. An excellent example that illustrates this fact is the successful weapon detection program run by the New York City (NYC) Board of Education in about 50 of its inner-city high schools (exhibit 3.5). For just one of its schools with about 2,000 students, the weapon detection program requires 9 security officers for approximately 2 hours each morning. Two officers run the two initial portal metal detectors, two officers run the baggage x-ray



Number of Students Waiting (Scan time—15 scannees per minute per portal)										
1 Portal	0	0	0	45	120	295	520	520	480	405
2 Portals	0	0	0	0	0	100	250	175	60	0
3 Portals	0	0	0	0	0	25	100	0	0	0

Number of Students Waiting (Scan time—25 scannees per minute per portal)										
1 Portal	0	0	0	0	25	150	325	275	185	60
2 Portals	0	0	0	0	0	0	50	0	0	0
3 Portals	0	0	0	0	0	0	0	0	0	0

Exhibit 3.3. Calculation of number of students waiting to enter weapons screening system using an example arrival rate for a school of 1,000 students. (These numbers reflect ideal conditions; see text for additional information.)



Number of Students Waiting (Scan time—15 scannees per minute per portal)

1 Portal	0	0	15	180	405	830	1,355	1,430	1,425	1,350
2 Portals	0	0	0	90	240	590	1,040	1,040	960	810
3 Portals	0	0	0	15	90	365	740	665	510	285
4 Portals	0	0	0	0	0	200	500	360	120	0

Number of Students Waiting (Scan time—25 scannees per minute per portal)

1 Portal	0	0	0	115	290	665	1,140	1,165	1,110	985
2 Portals	0	0	0	0	50	300	650	550	370	120
3 Portals	0	0	0	0	0	125	350	125	0	0
4 Portals	0	0	0	0	0	0	100	0	0	0

Exhibit 3.4. Calculation of number of students waiting to enter weapons screening system using an example arrival rate for a school of 2,000 students. (These numbers reflect ideal conditions; see text for additional information.)

machines, one officer runs the secondary portal metal detector for students who fail the initial detector, two officers (a male and a female) operate the hand scanners on students who fail the secondary metal detector, and two officers keep the students flowing smoothly and quickly through the system, such that nobody is able to bypass any part of the system. It should be noted that the only way these schools are able to avoid huge waiting lines, even with this much equipment and this many officers, and still get everybody to class on time is by a complete restructuring of their class periods. There is a significant staggering of first period start times so that the students arrive over a 90-minute period. On average, NYC school safety officials estimate that they fund approximately 100 additional security officer hours a week for each of their schools that screen for weapons.

To make any metal detection program effective, school access during the rest of the school day, during off-hours, and during special activities needs to be tightly controlled. A motivated student can defeat a lax system. If there is a comprehensive metal detection program at the front entrance to the school, but the back entrance through the cafeteria is unguarded, the funding and efforts put into a well-meaning program can be wasted. A successful metal detection program cannot be poorly funded or run by an administration that is reticent to make major changes to school policies and procedures.

5. *Procedures for the operator*

The vendor of a particular portal metal detector will provide training and procedures that are geared toward the operation of its equipment. In addition, each school will need to develop specific procedures and policies as to the logistics of its metal detection program. This will include how to process or direct a student who has caused an alarm. The rest of this section will familiarize a facility with what to expect and to provide some general recommendations.

Once a portal metal detector has been set up and has been demonstrated to operate accurately in its current position and with its current settings, the operator will not be required to adjust the control settings. The operator of the portal should be aware of the possible sources of interference with the equipment; something as seemingly insignificant as setting a metal trash can alongside the portal metal detector after it has been put into operation can introduce an area of less sensitivity within the scanning area of the equipment. (See the section on sources of interference.)

Some points for the operator to be aware of are:

a. Do not allow the scannee to proceed through the portal too fast. Ideally, drawn footprints can be located at the base of the portal within the scanning zone. The operator should insist that each scannee actually place his or her feet on these footprints before proceeding. This will ensure that the scannee has not gone through the portal so fast that he or she could have been inadequately scanned.

b. Make certain that no other person is located within a 3-foot radius of the equipment while a scan is being performed. This includes the operator, unless he or she is devoid of any metal on his or her person.

c. Provide a rescan of any person who causes an alarm, even if he or she is able to identify what must have caused the alarm, such as a belt buckle or necklace. Confirm that this person no longer causes an alarm after the offending item is removed from his or her possession. (Particular programs may provide for a second, more sensitive

Photo by Chester A. Higgins Jr.

Exhibit 3.5. A photograph of a successful, but manpower-intensive, weapon detection program at a New York City high school.

scan to be performed by a different portal or by a person with a hand-held metal detector rather than by the original portal.)

d. Do not allow anyone on the outside of the cleared area the opportunity to hand something to a person who has already been cleared by the portal on the inside of the cleared area (exhibit 3.6).

For a portal metal detector that is located semipermanently in one position, the operator will need only to turn the equipment's power switch on, wait approximately 10 seconds for the unit to warm up, and do a quick performance test (see the section on acceptance testing and performance testing). This process should take less than 5 minutes each morning. For a portal metal detector that is moved into position each morning and put away afterward, more extensive procedures will be required. The equipment vendor will be able to give the school good advice as to what additional morning routines will be necessary.

6. *Instructions for the scannee*

The instructions provided to students, employees, and visitors need to be as short and simple as possible. The following example instruction set could be provided to students and employees in the student handbook and should be posted at the entry to the weapon detection area.

a. Remove any metal items from your body or pockets and put them in your purse or bookbag.
b. Place hats, carried jackets, purses, bookbags, and briefcases on the conveyer belt for the x-ray machine (or on the table to be searched by an officer).
c. Stay back from the portal until signaled by the operator to proceed.
d. Walk at a moderate pace through the portal, one person at a time, being sure to momentarily place your feet on the footprints at the base of the portal before proceeding.
e. If an audible alarm sounds as you go through the portal, follow the directions of the security officer for further scanning or search.

7. *False alarms*

No portal metal detector is manufactured with the correct adjustments that meet all users' needs. These adjustments or settings are generally made by the vendor when the detector has been installed in the area where it will ultimately be operational. Given equivalent environments, however, different facilities have different requirements for equipment sensitivities. A metal detection program in the U.S. Treasury Department will have very different equipment settings than a program for a school weapon-detection portal. The optimal settings for each facility will be a set of tradeoffs that balance false-positive errors against false-negative errors.

A false-positive error occurs when an alarm occurs for an otherwise acceptable item, such as a metal key ring. These errors occur more frequently in a program that seeks to err on the side of security. False positives can be extremely annoying to scannees and can increase the manpower required to support a metal detection program. Constant false-positive alarms can also cause the operators of a system to become desensitized to alarms, so that they eventually fail to fully investigate the sources of all alarms.

A false-negative error occurs when no alarm is triggered by an unacceptable item, such as a weapon. These errors may occur more frequently in a program

Exhibit 3.6. **"Passback" of a weapon from someone outside the facility to a person who has already cleared the scanning process is a common defeat method.**

that seeks to err on the side of convenience. A system set more toward false negatives can slightly increase the risk of a weapon entering the facility but generally helps a metal detection program to run as smoothly and quickly as possible. In such a program, when an alarm does occur, the operators will be more likely to take it seriously and to investigate fully what caused the alarm. Many school system programs will be set in this manner.

Most portal metal detectors are additive; they will generate an alarm based on the total response received from the metal detected on a scannee. An alarm does not necessarily mean just one suspicious item has been detected. Because of this, a scannee who has multiple “borderline” items on his other body has a better chance of causing a false alarm. See exhibit 3.7 for a pictorial description.

Item	Source of an alarm?
Most boots with steel shanks	Yes
Orthodontic braces	No
Orthodontic braces with head gear	Borderline
Zippers in clothing	No
Underwires in brassieres	No
Large closed-loop earrings	Yes
Small closed-loop earrings	No
Large loop earrings that are not a complete circle	Borderline
Glasses (for vision) with metal rims	Borderline
Soda can	Yes
Keys	No
Key rings	Borderline
Three-ring metal binder	Yes
Musical instruments and cases	Yes
Foil gum wrappers and cigarette packages	Borderline

8. Sources of interference

Even the best portal metal detector will fail to operate properly if it is not located in an area that minimizes outside interference. There are many different shapes and forms of interference to a metal detector. School administration and security staff should be aware of potential problems. Below is a partial list of possible interference sources (see also exhibit 3.8):

- A metal stool or metal trash can placed close to the portal.
- Fluorescent lights located directly above the operating area of the portal and within 1–2 feet of the top of the portal.

Typical Portal Metal Detector Sensitivities

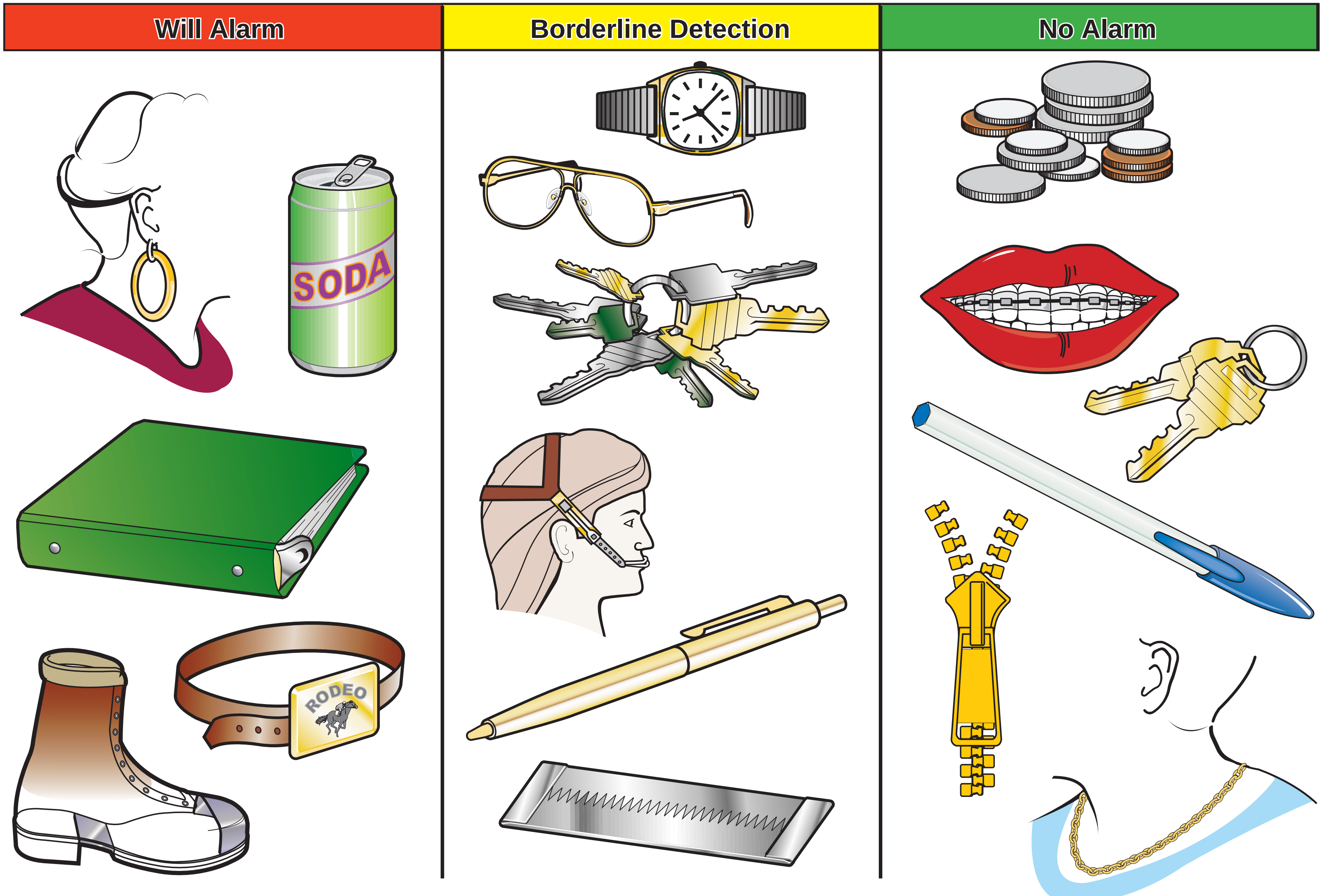


Exhibit 3.7. This drawing illustrates items that are normally accepted, rejected, or whose chance of causing a false alarm will depend upon the particular metal detector used and how it has been programmed.

Exhibit 3.8. Portal metal detectors are subject to many sources of interference that can reduce their sensitivity if not compensated for in the initial programming.

- Motors or anything that causes a spike of electromagnetic energy nearby (within a few feet).
- An elevator motor. If it is a large motor, the elevator can cause interference even up to 10–15 feet away.
- Nearby air ducts in the wall with metal components that expand/contract slightly when the cooling/heating system is in operation.
- Plumbing within a nearby wall such that the pipes vibrate when water is running through them.
- Chain link fencing.

Most nearby metal structures will not prohibit use of a portal metal detector. However, the instrument sensitivities of the detector should be set to allow for the presence of these structures. Any change in position of the portal in relation to nearby metal structures can affect the equipment's sensitivity.

9. *Acceptance testing and performance testing*

Acceptance testing is a series of rigorous trials designed to determine if a walk-through metal detector is accomplishing what is expected of it. This series of tests is performed after installation and must be repeated after any relocation of the equipment or change to the surrounding environment. The vendor of each particular type of portal will have a series of tests to be performed after setup. Vendor tests are designed to aid in determining the ideal sensitivity settings of the equipment for a particular location and the contraband items of greatest concern. Each school should also have a series of rigorous tests that it will run before accepting or paying for any piece of equipment. The same set of tests can be used by the school later if there is any change to the equipment's environment, especially if the school cannot afford to bring the vendor back in to support them later.

A series of acceptance tests can be devised with knowledge of the weapons that are likely to be present in any particular community. (This threat varies widely in different parts of the country and can change over the years. As no facility can protect itself from every possible weapon in existence, the local law enforcement agency or the school's security department can help determine the most likely threats for that area.)

1. Determine the three or four most likely weapons for a particular school.
2. Obtain replicas or equivalent-composition and similarly shaped items for each of these weapons from the vendor, local law enforcement agency, or school security department.
3. Place these items one at a time on the body of a tester who will walk through the portal with the item placed in various hard-to-detect locations. Conduct about 20 walk tests per location per item. Good locations to test include: the hand, and stuck up into the sleeve, stuck into a sock on the exterior of the leg, stuck into the inside front of the belt, and hidden inside a baseball cap. (Note that this amounts to 20 different trials for each of four different weapons for each of four different body locations—a total of 320 trials.)
4. Determine the three or four most likely borderline items that are acceptable items to bring into the school but that may cause an alarm.
5. Place these items one at a time on the body of a tester who will walk through the portal with the item placed in typical locations—i.e., glasses on face, pocket change in pocket, necklace around the neck. The tester should walk through 20 times with each item.

A particular portal may be said to be accepted when at least 19 of each of the 20 walk-through tests for each weapon results in an alarm, and at least 19 of each of the 20 walk-through tests for each acceptable item does not result in an alarm.

In contrast, a performance test is a much shorter and simpler set of trials that should be conducted by the operators of the system at the beginning of each morning before the equipment goes into operation. This test may consist of walking through the portal four or five times with a piece of metal on different locations of the body. If the portal goes off on each walk-through, then the system is said to be performing well and is ready for operation. If the system fails these tests, and no obvious reason for these failures is evident, such as the recent relocation of a metal object next to the portal, the vendor should be called, and the device should be taken out of operation until serviced.

10. Maintenance and expected lifespan

A good portal metal detector is generally quite reliable and unlikely to need much repair after it is installed and found to be performing well, other than for accidental or careless damage to the equipment. Because of this, the warranties that come with the equipment are probably all that is needed; a maintenance contract is probably not necessary. (Performance tests need to be run on a regular basis. See the section on acceptance testing and performance testing.)

A portal metal detector can be expected to have a fairly long life, probably ten years or more. The useful life of the detector will more likely be limited only by newer and better technologies available on the market in subsequent years.

11. Working with the vendor

Vendors of portal metal detectors may be willing to come to a school with the equipment and perform a demonstration. After the vendor has set up the portal, preferably in the area the school is considering for the ultimate placement of the equipment, and the device's own internal diagnostics and acceptance tests have been run, the demonstrator should be told to set the sensitivities to what he or she considers to be the optimal settings. After this point, the demonstrator should not be allowed to adjust these settings further. (If allowed to constantly readjust the equipment, a less scrupulous demonstrator could constantly reset a device with the knowledge of what is to be the target for each test, such that each target is detected or not detected, as desired.) The school would then run its own set of tests to determine the sensitivities of the equipment. This should include walking volunteer students through with weapon replicas and walking students through who have normal borderline items on their body. (See the section on items that can cause false alarms.) After two or three such demonstration sessions by different vendors, most law enforcement agencies or school security departments will develop a familiarity with portal metal detector features and what their own application may require.

When issuing a bid for a portal metal detector, a school should require in the RFQ that a bidder meet a series of performance tests, such as those defined in the section on acceptance testing and performance testing. The vendor who is chosen must be required to set up his equipment where desired at the school and then meet the required performance tests. It should also be specified that the vendor will not be paid until these requirements are met. Language in the contract should allow the school to withdraw the contract if the chosen vendor fails to meet these obligations within 2–3 weeks after initial installation.