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APTA Security Risk Management Working Group

Gates to Control Access to Revenue and Nonrevenue Transit Facilities

Abstract: This recommended practice provides guidance for the installation of gates used to control access to areas under the jurisdiction of a transit agency.

Keywords: access control, assessment, crime prevention through environmental design (CPTED), gate, gate types, landscaping, lighting, security, threat and vulnerability analysis, video surveillance

Summary: A gate is a component of fencing and access control systems. Where fencing systems define perimeter boundaries, gates establish entry and egress points through the fencing system to an area. Gates are the only moveable component of a fencing system, and also its weakest point. Therefore, gates require additional protections against the vulnerabilities of their hinges and latches. Many gate types are available to the transportation industry, ranging from high-security grille types to cost-effective chain link. Gate types should be integrated with other security standards, including CPTED, lighting, barriers, etc., to provide balanced protection and to enhance other security solutions. Different gate types can also be used with protective vehicle barriers, but they should blend with area aesthetics and adhere to laws and local ordinances, including the Americans with Disabilities Act. This recommended practice should be considered using a "systems approach" to achieving security objectives.

Scope and purpose: The recommendations contained in this document are designed to provide guidance in achieving access control objectives through the effective design and placement of various gate types. This document supplements another recommended practice, "Master Fencing Systems to Control Access to Revenue and Nonrevenue Transit Facilities," which should be reviewed and considered when researching and developing gate types. The purpose of this recommended practice is to provide guidance in determining the appropriate gate system for transit access control.

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Introduction

This introduction is not part of APTA SS-SIS-RP-005-10, Rev. 1, "Gates to Control Access to Revenue and Nonrevenue Transit Facilities."

APTA recommends the use of this document by:

- individuals or organizations that operate rail transit systems;
- individuals or organizations that contract with others for the operation of rail transit systems; and
- individuals or organizations that influence how rail transit systems are operated (including but not limited to consultants, designers and contractors).

Gates to Control Access to Revenue and Nonrevenue Transit Facilities

1. Stakeholder considerations

Gates should be designed to meet the specific needs of users of transit station areas (i.e., parking, walkways, internal or underground areas) and nonrevenue facilities. To the extent possible, installation of gates should complement a fencing system or station entrance design, serve a meaningful purpose, be conducive to operations, and not become a financial or maintenance burden. System design should comply with local and community ordinances and codes, but also complement the crime prevention through environmental design (CPTED) principle of natural surveillance in the appropriate environment. Additional information that incorporates gate types with barricade systems is described in the recommended practice "Master Fencing Systems to Control Access to Revenue and Nonrevenue Transit Facilities," which should also be reviewed.

Gates can provide the following benefits:

- Provide notice of legal boundary of the outermost limits of a facility.
- Assist in controlling and channeling people into a specific area.
- Function as, or provide support in, deterrence, denial, delaying, detection and other security functions by providing a zone for installing intrusion detection equipment and video surveillance.
- Reduce personnel requirements at a site by optimizing the frequency and saturation of the patrol area, which may lead to enhanced detection and apprehension of unauthorized individuals.
- Provide a functional and cost-effective method of protecting facilities.

1.1 Risk assessment considerations

Transit agencies should evaluate risk and use system-wide and asset-specific risk assessments as guides in determining effective placement of gate types to maximize transit security. This standard is intended to be incorporated with the application of anti-personnel fencing and not anti-vehicle fencing. Additional information should be sought from "Master Fencing Systems to Control Access to Revenue and Nonrevenue Transit Facilities."

1.2 CPTED considerations

Completing a CPTED survey of the proposed area for installation of a fencing system may identify exposures and recommend enhancements that can be employed as crime prevention or other security measures. Keep in mind the need to adhere to standoff distances, and maintain clear lines of sight to either side of the gate, as well as through the gate/fencing materials.

1.3 Site considerations

Transit agencies should identify all installation, operations and maintenance factors when evaluating existing and designing proposed gate types. Geographic and site conditions, such as hills, terrain, soil conditions, installation of guardhouses, landscaping, lighting, etc. must be considered before finalizing design and installation of a gate at a site so that the gate functions properly and does not hinder operations. Additional

site considerations are described in "Master Fencing Systems to Control Access to Revenue and Nonrevenue Transit Facilities" and should be reviewed.

2. Gate systems

Gates control both vehicular and pedestrian circulation and access to an area. Gate materials, construction, installation method and design are factors to determining selection. Risk assessments and tolerances, terrain and operational aspects are key driving factors to making a final gate selection. Often, the construction material of a gate will match that of the attached fencing system associated with the gate type. Common industry gate types used in transit system environments are listed in **Table 1**. The table provides the type and description of each gate, as well as its potential uses in the transit environment.

TABLE 1
Gate System Types and Uses

Gate Type	Description	Potential Uses
Single-leaf metal mesh pedestrian gate 	• Welded metal or aluminum galvanized or zinc-coated pipe framed to appropriate size. • Metal or aluminum frame mesh material attached to frame. • Hinge and locking hardware attached to frame and post. • May be installed with lights/sensor to indicate malfunction or bypass, a device to count users, or an access-control system. • Posts are set in concrete based on gate width. • Height varies based on application, in accordance with the transit agency's risk assessment, but can range from 4 to 12 ft (1.21 to 3.65 m). • Top-guard treatments (e.g., barbed wire and razor tape) may be installed along the gate top.	• To provide pedestrian or vehicle circulation access control. • To restrict or authorize access to areas, sites, walkways or parking lots. • To provide temporary or permanent control of access to a perimeter. • When closed and locked, to restrict access to areas, sites, walkways or parking lots.
Pedestrian gate 	• Mechanical or electromechanical entry-exit device. • Metal and composite construction and mounted to a solid foundation. • Height varies based on environment, in accordance with the transit agency's risk assessment. • Armature activated remotely or locally by key, access card, switch or keypad. • May be augmented with lights to indicate malfunction or bypass, a device to count users, an access control system or a locking device to prevent use. • May be installed as a stand-alone system or in tandem with other turnstiles.	• To control the flow of individuals between areas. • To control access to sites, walkways, platforms or other areas. • When closed and locked, to restrict access to sites, walkways or other areas. • To measure throughput entering or departing a site, walkway, platform or other area. • When integrated with cameras, to monitor access points. • To control access to entrances and exits.

TABLE 1
Gate System Types and Uses

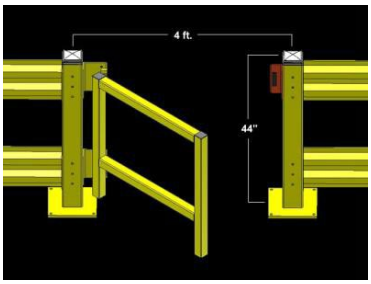
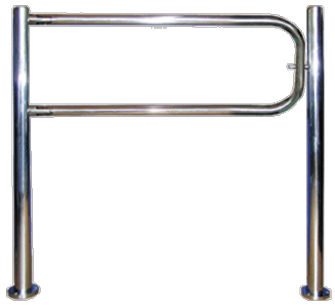
Gate Type	Description	Potential Uses
Ornamental pedestrian gate 	• Welded metal or aluminum framed to appropriate size. • Balusters or pickets attached to frame. • Hinge and locking hardware attached to frame and post. • Posts set in concrete based on gate width. • Height varies based on application, in accordance with the transit agency's risk assessment, but can range from 4 to 12 ft (1.21 to 3.65 m). • Top-guard treatments may be built into balusters or pickets along the gate top.	• To control pedestrian or vehicle circulation. • To restrict or authorize access to sites, walkways, parking lots or other areas.
Pedestrian swing gate, automated 	• Metal and composite construction. • Mounted in place to a solid foundation. • Mechanical or electromechanical entry-exit device. • Gate activated remotely or locally by a key or access card, or by a switch or keypad. • Top-guard treatments (e.g., barbed wire and razor tape) may be installed along the gate top. • May be installed as a stand-alone system or in tandem with other turnstiles.	• To control the flow of individuals between areas. • To control access to sites, walkways, platforms or other areas. • When closed and locked, to restrict access to sites, walkways or other areas. • To measure throughput entering or departing a site, walkway, platform or other areas. • When integrated with cameras, to monitor access points. • To control access to entrances and exits.
Pedestrian swing gate, manual 	• Metal and composite construction. • Mounted to a solid foundation. • Manually operated. • May be installed as a stand-alone system or in tandem with other turnstiles.	• To control the flow of individuals between areas. • To control access to sites, walkways, platforms or other areas. • When closed and locked, to restrict access to sites, walkways or other areas. • To measure throughput entering or departing a site, walkway, platform or other areas. • When integrated with cameras, to monitor access points. • To control access to entrances and exits.

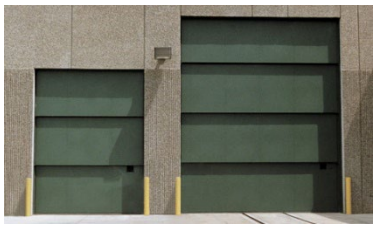
TABLE 1
Gate System Types and Uses

Gate Type	Description	Potential Uses
Full-height turnstile 	• Metal tubular construction. • Mounted in place to a solid foundation. • Mechanical or electromechanical entry-exit device. • Manufactured with anti-pass-back turnstile function. • Either interior or exterior installation. • Armature activated remotely or locally by a key or an access card, or by a switch or a keypad. • Can be augmented with lights to indicate malfunction or bypass, a device to count users, an access control system or a locking device to prevent use. • Height and width vary by manufacturer and model • Top-guard treatments (e.g., barbed wire and razor tape) may be installed along the gate top. • May be installed as a stand-alone system or in tandem with other turnstiles.	• To control the flow of individuals between areas. • To control access to sites, walkways, platforms or other areas. • When closed and locked, to restrict access to sites, walkways or other areas. • When equipped with counters, to count passengers entering or departing a, site, walkway, platform or other area. • When integrated with cameras, to monitor access points. • To control access to entrances and exits.
ADA-compliant double turnstile pedestrian gate 	• Metal tubular construction. • Mounted in place to a solid foundation. • Mechanical or electromechanical entry-exit device. • Either interior or exterior installation. • Manufactured with anti-pass-back turnstile function. • Armature activated remotely or locally by a key or an access card, or by a switch or a keypad. • Height and width vary by manufacturer and model. • Top-guard treatments (e.g., barbed wire and razor tape) may be installed along the gate top. • May be installed as a stand-alone system or in tandem with other turnstiles.	• To comply with ADA requirements. • To control the flow of individuals between areas. • To control access to sites, walkways, platforms or other areas. • When closed and locked, to restrict access to sites, walkways or other areas. • When equipped with counters, to count passengers entering or departing a site, walkway, platform or other area. • When integrated with cameras, to monitor access points. • To control access to entrances and exits.
Single-leaf swing vehicle gate 	• Wooden, composite metal or aluminum construction. • Posts are set in concrete based on gate width in accordance with the transit agency's risk assessment.	• To control vehicle entry or exit from a facility, yard, compound entrance or roadway.

TABLE 1
Gate System Types and Uses

Gate Type	Description	Potential Uses
Double-leaf vehicle gate 	• Posts are set in concrete based on gate width. • Height varies based on application, in accordance with the transit agency's risk assessment.	• To control vehicle entry or exit from a facility, yard, compound entrance or roadway.
Horizontal sliding vehicle gate 	• Metal tubular and plate construction. • Height varies based on application and security assessment results. • Posts are set in concrete based on gate width. • Width is commensurate with number of traffic lanes. • Top-guard treatments (e.g., barbed wire and razor tape) may be installed along the gate top.	• To control vehicle and pedestrian entry or exit from a facility, yard, compound entrance or roadway.
Accordion metal access gate 	• Formed by a series of rivet-connected metal flat bars to allow accordion flexibility. • When open, gate can be stored in place out of path of travel. • Metal flat bars extend the full width of the access opening where the gate is mounted. • Slats and metal rods are pivotally interconnected by circular ribs extending along the top and bottom edges of each slat. • May be locked by a chain interwoven through the flat bars and a padlock or a keyed locking device installed at the edge of the gate frame.	• To control the flow of individuals between areas. • To control access to sites, walkways, platforms or other areas. • When closed and locked, to restrict access to sites, walkways or other areas. • To control access to entrances and exits. • To provide ready visibility through the metal flat bars when extended.

TABLE 1
Gate System Types and Uses

Gate Type	Description	Potential Uses
Overhead rolling metal access gate 	• Formed by a series of horizontally extending transparent slats interconnected by a series of horizontally extending metal rods. • Slats and metal rods extend the full width of the access opening where the rolling gate is mounted. • Slats and metal rods are pivotally interconnected by circular ribs extending along the top and bottom edges of each slat. • Rolling gate is mounted above an access opening. • Locking device manufactured at the base of the slats.	• To control the flow of individuals between areas. • To control access to sites, walkways, platforms or other areas. • When closed and locked, to restrict access to sites, walkways or other areas. • To control access to entrances and exits. • To provide ready visibility through the slats and rods when lowered.
Vertical lift gate/door 	• Formed by one or more panels, running alongside tracks. • Panels are vertically lifted and stack above the opening. • Designed for applications where there is limited room to either side. • Panels can be customized for needed visibility through panels.	• To control the flow of individuals between areas. • To control access to sites, nonrevenue facilities, platforms or other areas. • When closed and locked, to restrict access to sites, nonrevenue facilities, or other areas. • To control access to entrances and exits. • To provide or not provide ready visibility through the panels when lowered.

Gate materials are typically steel, aluminum or wood construction. Each of the materials has specific maintenance issues and concerns that can impact the use and life expectancy of the overall gate type. Additionally, other materials, such as vinyl, plastics, composites, and combined wood-metal-plastics-composite products are being introduced in gate design and manufacture. Some of these materials have demonstrated use in reducing maintenance, upkeep, repair, etc., as well as increased life cycle, and should be considered in the final gate selection.

Gate protection that includes bollards or curbs should be implemented to protect gateposts and leaves from sustaining vehicle damage and potential inoperability. At least one perimeter vehicle gate should be designed and installed into the perimeter fencing system to accommodate first-responder vehicles as well as delivery vehicles for maintenance facilities. A vehicle turning radius analysis should be completed to determine the appropriate width of a first-responder vehicle gate.

Some gate types are designed and installed for temporary use, while others are installed for short- to long-term or even permanent use. A combination of the types of installation that may best suit a facility or an area's specific security requirements should be carefully evaluated as part of the security risk assessment and design processes. Because installation is key to gate design and selection, there are as many installation methods as there are varieties of gates. Therefore, the manufacturer's recommended installation methods should be followed.

Each type of gate has its strengths and weaknesses. There may be unique site and environmental conditions and factors that should be considered in the design. Regardless, all factors for each design should be carefully evaluated against each proposed gate type prior to a final procurement/installation decision. Similar to other security devices, the lifespan and level of protection provided by different gates will vary depending on maintenance attention and integration with other security components. **Table 2** describes the strengths and weaknesses associated with several common types of gates.

TABLE 2
Strengths and Weaknesses of Gate Types

Gate Type	Strengths	Weaknesses
Pedestrian access gate	• Low upfront cost. • Requires little to no maintenance. • Easily configured to meet almost any size or shape requirements. • Functions as a stand-alone unit or in tandem. • Easy to secure with a chain and padlock.	• Easy to evade. • The larger the opening, the easier it is to gain a foothold or handgrip to scale.
Double pedestrian turnstile gate	• May be configured to interface with other software applications. • Complements stand-alone or tandem operation.	• Medium to high upfront cost. • Mechanical functions require maintenance and occasional repair. • May slow pedestrian circulation.
ADA-compliant double turnstile pedestrian gate	• May be configured to interface with other software applications. • Complements stand-alone or tandem operation.	• Medium to high upfront cost. • Maintenance required for moving parts. • Mechanical functions require maintenance and occasional repair. • Easily evaded. • May slow pedestrian circulation.
Single-leaf metal swing vehicle gate	• Low to medium upfront cost. • Requires minimal maintenance. • Can be configured to meet almost any size or shape requirements. • Top guard may be installed. • When closed and secured, reinforces fencing barrier. • Easy to secure with a chain and padlock.	• Easily cut with bolt cutters or strong shears. • The larger the opening, the easier to gain a foothold or handgrip to scale. • Length of gate leaf limited by width of opening.
Double-leaf wooden vehicle gate	• Low to medium upfront cost. • Requires minimal maintenance. • Can be configured to meet almost any size or shape requirements. • Top guard may be installed. • When closed and secured, reinforces fencing barrier.	• Length of gate leaf limited by width of opening. • Easily damaged and susceptible to harsh environments and infestation.
Horizontal sliding vehicle gate	• Can be configured to meet almost any size or shape requirements. • Top guard may be installed. • When closed and secured, reinforces fencing barrier. • Easy to secure with a chain and padlock. • When opened, gate leaf clears posts and vehicle traffic area.	• High upfront costs. • Gate could be knocked off rail. • Sliding mechanism requires additional maintenance.

TABLE 2
Strengths and Weaknesses of Gate Types

Gate Type	Strengths	Weaknesses
Accordion metal access gate	• Allows air circulation while controlling access and inventory movements. • Can be used to augment overhead rolling metal gate when opened or closed. • Easy to secure with a chain and padlock.	• Requires regular maintenance. • Hinges are easily damaged, causing gate to be inoperable in either opened or closed position. • Must be anchored to building frame.
Overhead rolling metal access gate	• Augments accordion metal gate when opened or closed. • Allows air circulation while controlling access and inventory movements.	• Requires regular maintenance. • Tracks are easily damaged, causing gate to be inoperable in either up or down position.
Vertical lift gate/door	• Offers fast opening and closing. • Can be modified to close up sloped openings. • No storage required as gate stores vertically above opening. • Strong continuous duty as there is no cantilevered section. • Industrial grade hardware designed for long-term use.	• Very expensive compared with slide gate options. • Manual operation is slow and limited. • Installation is complicated and requires experienced installers. • Service work must be performed by qualified representative. • May be unsightly for high-profile sites.

3. Application of gate types

Height, application and type of a gate system depend on the environment. For example, where a 4 ft (1.21 m) gate system may be appropriate for a sidewalk or walkway, a 12 ft (3.65 m) gate system with barbed wire installed along the top may be equally appropriate for a critical infrastructure perimeter boundary. The type of gate system should be suitable to the application, environment, etc., some of which may be mechanical in nature and should be determined by the security assessment. Local ordinances and code requirements should be reviewed during the planning stages of design to determine if any gate system requirements or restrictions apply or exist. **Table 3** provides site application, height, material gauge and diameter of mesh/opening recommendations for gate types in the transit environment.

TABLE 3
Gate Application Examples

Site Application	Vertical Height	Recommended Gate Type
Pedestrian walkway or pathway	3 to 5 ft (0.91 to 1.5 m)	• Single-leaf swing
Maintenance yard roadway	6 to 8 ft (1.82 to 2.43 m)	• Double-leaf swing • Single-leaf metal swing vehicle • Double-leaf wooden/composite vehicle
Maintenance yard	6 to 8 ft (1.82 to 2.43 m)	• Horizontal sliding vehicle/pedestrian with top guard • Double-leaf swing with top guard
Platform	4 to 5 ft (1.21 to 1.52 m)	• Pedestrian access • Pedestrian swing • Pedestrian turnstile
Station entrance	Varies	• Vertical lift gate/door • Overhead rolling metal access gate

TABLE 3
Gate Application Examples

Site Application	Vertical Height	Recommended Gate Type
Perimeter boundary, pedestrian	6 to 8 ft (1.82 to 2.43 m)	• Single-leaf swing with top guard
Perimeter boundary, vehicle	6 to 12 ft (1.82 to 3.65 m)	• Horizontal sliding vehicle/pedestrian with top guard
Waterfront	6 to 8 ft (1.82 to 2.43 m)	• Horizontal sliding vehicle/pedestrian with top guard
Pier/wharf access	6 to 8 ft (1.82 to 2.43 m)	• Horizontal sliding vehicle/pedestrian with top guard
Fare lanes	3 to 6 ft (0.91 to 1.82 m)	• Pedestrian turnstile • ADA-compliant pedestrian turnstile
Pedestrian bridge overpass	6 to 9 ft (1.82 to 2.74 m)	• Single-leaf swing • Double-leaf swing
Maintenance storage	6 to 8 ft (1.82 to 2.43 m)	• Accordion metal • Overhead rolling • Single-leaf swing with top guard • Double-leaf swing with top guard

4. Common gate elements

The elements to a gate system should be complementary to the fencing system it supports. For example, a chain-link fencing system should also have a chain-link gate system. Where top guard is applied to a fencing system, it should also be applied to the gate system.

4.1 Hardware

Various materials, components and hardware make up a gate system. Most gates contain some type of common elements and are designed under guiding industry practices. The most commonly designed gate system elements and industry practices are listed below:

- **Posts.** Gate posts should be as tall as the material they support; be of sufficient strength to hold the gate in place; and be firmly set in the ground to prevent shifting by wind, erosion or other environmental conditions. The gap between the gate and the gatepost should be maintained at a minimum to prevent penetration of the gate system from between the gate and gatepost opening.
- **Frame.** Gate frames should be durable enough to hold the fencing material in place and be connected to the fencing system by hinges attached to line or end posts. Operational necessity is a function of gate width and framing.
- **Barbed wire arms** (also referred to as “outriggers”). These are metal arms that are used to hold barbed, razor or concertina wire or tape in place at the top of a gate system. The arm length, designed to be vertical to clear the fencing system when the gate system is opened, can increase overall height of the gate system.
- **Barbed wire.** Strands of barbed wire can be attached to arms at the top of the gate. Barbed wire may be securely fastened vertically or horizontally to the gate’s barbed wire arms, but it should be attached in strands of three or more.
- **Concertina wire** (also referred to as “barbed tape” or “barbed concertina wire”). Stretched-out coils may be attached to the top of gate or may come preinstalled there. Coils connected to the gate should be installed to prevent removal or shifting by winds or other environmental conditions.

- **Razor tape** (also referred to as "razor wire"). Stretched coils may be attached to the top of the gate or to preinstalled strands of barbed wire installed at the top of the gate. However, coils connected to the gate system should be installed to prevent removal or shifting by winds or other environmental conditions.
- **Mesh.** Gate mesh (wood panels, plastic weave, metal diamond mesh, pails, pickets, etc.) should be securely fastened to gate framing and supporting hardware (bracing bars, rods, wire, etc.) to prevent sag, sway or removal. The smaller the mesh opening, the more difficult it is to cut or to attain a foothold or handgrip with. Horizontal gate rails should be secured in place to prevent removal.
- **Clearance.** Gates should have a minimum bottom clearance of 2 in. (50.8 mm) to clear the ground or surface during operation. However, ground or surface clearance distances of more than 2 in. may allow penetration of the gate system from under the gate.
- **Hardware.** All gate hardware and components (nails, screws, nuts, bolts, hinges, bracing, rods, wire, latches, etc.) should be installed on the inside of the gate system.

4.2 Signs

Signage should be clearly posted to deter accidental or inadvertent trespass to an area by an intruder; it should also be attached to the gate system. Signage may provide directions to bus stops or transit stations; warnings, such as "No Trespassing," "Private Property," "Restricted Area," "Authorized Personnel Only," etc.; or other general information, such as operating hours or vending machine location and service. The language or illustration on the posted signage should broadly represent the cultural diversity of transit system ridership and the local community. Before posting signs, the transit agency should check local ordinances to ensure that signage will be compliant.

5. Gate security

A gate can increase or decrease the security requirements at a site and therefore should be closed and locked when not in use. When opened and in use, gates should be appropriately staffed or installed with equipment that can authenticate authorized access control credentials.

5.1 Hinge security

Hinge hardware is the key component to gate operation. Hinges are manufactured to operate manually or under a spring-loaded mechanism to operate in a self-closing mode. Hinge hardware can also be integrated into other gate systems (electrical, mechanical or hydraulic openers; lights; alarms; video surveillance; etc.) to provide access control. Hinges are the most vulnerable component of the gate system. Single or multiple hinges may be installed on a gate/gatepost system based on the design and structure of the gate.

Regardless of the number of hinges installed on the gate system, all hinge hardware should be positioned on the inside of the gate and gatepost. To prevent removal or manipulation, all hinge hardware should be welded or peened in place to prevent removal or manipulation.

5.2 Latching hardware security

Gate latches are manufactured in as many styles as there are gates and fencing. In its simplest form, the gate latch connects the gate to the gatepost, thereby keeping the gate either closed or opened. Gate latches are manual, hydraulic, mechanical or electrical and can be integrated with hinge hardware to close or open a gate. To prevent removal or manipulation, all latch hardware should be welded or peened in place. Heavy-duty hardened security chain and medium to high security padlocks may also be used to secure a closed gate. To prevent the chain and padlock from being misplaced, they should be welded or otherwise permanently connected to the fence. Depending on the results of the risk assessment, some organizations may opt to install EACS and/or BMS at gated entries and/or doors as an alternative to a padlock and chain.

5.3 Security best practices for gate types

Best practices applied to a gate system should mirror the best practices applied to the fencing system that it supports.

6. Inspection and maintenance

Gate systems should be regularly inspected for integrity, functionality and signs of damage—including frame, mesh, hinges, latch, locking devices, etc.—in unison with their fencing system. Visual and hands-on gate system inspections can provide the most complete assessment of a gate's overall condition. Maintenance should be performed according to the manufacturer's recommended schedule and in unison with fencing system inspections. Repairs, when necessary, should be completed promptly and return the gate to its original design and structural integrity.

7. Further information

Appendix D of APTA's "Fencing Systems to Control Access to Revenue and Nonrevenue Transit Facilities" provides guidance and information for planning and designing gates, but it is not all-inclusive. The checklist can be used to help identify selection criteria and determine design, location and installation of a gate for access control.

Related APTA standards

APTA SS-SIS-RP-003-10, "Fencing Systems to Control Access to Transit Facilities"

References

American Institute of Architects, "Selection of Gates & Gate Automation," Todd LaVigne, Tom Sibbald.

Underwriters Laboratories, Inc. (UL). ANSI/UL 325, "Safety for Door, Drapery, Gate, Louver, and Window Operators and Systems."

Abbreviations and acronyms

ADA Americans with Disabilities Act
BMS building management system
CPTED Crime Prevention Through Environmental Design
EACS electronic access control system

Summary of document changes

- Assorted changes to modernize standard contents

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