



EAST WEST GATEWAY
COUNCIL OF GOVERNMENTS
**METROLINK SYSTEM-WIDE
SECURITY ASSESSMENT**
BEST PRACTICES REPORT



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EXECUTIVE SUMMARY

Table 1 provides an overview of the best practices examined in this report.

Table 1. Best Practices Summary Table

BEST PRACTICE	DESCRIPTION	APPLICABILITY TO METROLINK
Security Strategy	Strategic approach to a security program defined in a Security Plan.	Would provide a “roadmap” for the security program and define an approach to all elements of security.
CPTED	Security philosophy that proposes that proper design and effective use of the built environment can lead to a reduction in the fear and incidence of crime.	Managing and designing the physical Metrolink environment utilizing CPTED will impact criminal behavior and perception of security.
CCTV	A technology that can be used as an investigative tool for safety / security incidents if implemented appropriately.	MetroLink’s current CCTV application has limitations due to age and installation strategy. Revision of this technology will assist in incident investigation.
Passenger Assistance & Emergency Telephones	A communication technology that provides passenger communication for assistance and emergencies.	MetroLink currently has this technology but revisiting the newest technology and paring it with CCTV may improve passenger perception of security.
TVMs and Validators	Fare technology is evolving with new technology and fare instruments available for transit and rail application.	Understanding the current approaches to fare technology can assist Metro as they are currently updating fare media and technology for the system.
Radio	Effectiveness of radio for both external and internal communications is a function of the technology itself, how it is used, and how reliable it is.	Radio usage within Metro and with external agencies is inconsistent and often muddled. Redundant communication, clear normal and emergency SOPs, and interoperability would help improve internal and external communications.
Body Cameras	The effectiveness of body cameras in producing desired outcomes (e.g., decreased use of force, fewer civilian complaints) is actively under evaluation and not yet conclusive.	Metro has expressed that it is considering using body cameras on its public safety officers. Expectations around use of body cameras should remain conservative and not count on large-scale improvements in desired outcomes.
In-House Police/Security	Most agencies have some type of in-house security staffing, though it varies from full transit police services to staff who oversee security functions for the agency.	Metro is revisiting the current security department organization, roles and responsibilities. The information regarding policing strategies may inform the organization discussion.
Contracted Police/Security	Many agencies use some elements of contracted security staffing. This ranges from contracting for policing services to supplementing in-house services with contract security staff.	Metro is revisiting the current security department organization, roles and responsibilities. The information regarding policing/security strategies may inform the organization discussion

BEST PRACTICE	DESCRIPTION	APPLICABILITY TO METROLINK
Partner Agencies	Most transit agencies pass through multiple jurisdictions, encountering various law enforcement agencies.	Metro is revisiting the current security department organization, roles and responsibilities. The information regarding policing/security strategies may inform the organization discussion
Security Staffing Determination	There are industry-accepted approaches to determining how many security staff FTEs are required to provide coverage for a transit system.	Metro is revisiting the current security department organization, roles and responsibilities. The information regarding policing/security strategies may inform the organization discussion
Sworn Versus Non-Sworn Security Staff	Security can be provided by sworn, non-sworn or a combination of both. Deciding what approach is appropriate takes evaluating the system.	Metro is revisiting the current security department organization, roles and responsibilities. The information regarding policing/security strategies may inform the organization discussion.
Relationships	Good relationships with all security/law enforcement partners is critical to the success of a security program.	Metro has a disrupted relationship with critical law enforcement partners and has minimal relationships with transit and rail industry sources. To be successful, positive relationships should be developed.
SOPs	Clearly defined procedures set expectations for performance and expectations.	Metro would benefit from clearly defined processes/procedures for the security and emergency management program.
Passenger Code of Conduct	Defining a code of conduct for passengers and the public for the rail system communicates expected behavior, if it is consistently enforced.	One of MetroLink's biggest challenges is disorderly behavior. Defining and communication expectations, along with enforcement of the expectations, could improve this.
Training	Training improves competency to handle challenging situations.	Re-orienting MetroLink training to be proactive and customer focused will improve staff/partner's capacity to impact security on the system.
Fare Authorization and Policy	Implementing fair and equitable fare enforcement requires good policies, and appropriate authorization.	MetroLink struggles with fare enforcement and fare evasion, but may find potential solutions in other industry practice.
Customer Experience	Perception of the equity of the fare program impacts customer's experience on the transit system.	Customer perception on MetroLink is that most people do not pay and that this is related to other criminal behavior. Addressing customer experience around this issue will impact customer perception of MetroLink security.
Operational Approach	Strategies around fare enforcement have evolved but must be thoughtfully applied to eliminate bias or the perception of bias.	Application of the lessons learned and implemented strategies from other rail agency's will strengthen MetroLink's program.
Management and Measurement	Metrics and measurement are a critical component of any successful fare program	Improving the data around MetroLink fare program will assist in understanding program effectiveness and the ability to address program challenges.

OVERVIEW AND APPROACH

As domestic and international transportation venues experience **crime** and **terrorism**, concern for transportation security is growing across transportation and rail providers; as well as stakeholders. To operate **safely** and **securely**, the St. Louis MetroLink system must consider how these security **threats** and **vulnerabilities** manifest locally on the system.

Throughout this report, terms included in the Definitions & Acronyms section are **bolded** upon first use.

In response to these growing transportation security concerns, the East West Gateway Council of Governments (EWG) initiated a system-wide security assessment for MetroLink and contracted with a WSP-led team to execute the assessment. This Best Practices Report considers the practices that are being used in the industry to enhance the security of transit systems and the people who interface with those systems. Results from this report contribute to a peer transit agency review of MetroLink and will feed into a system-wide **Threat and Vulnerability Assessment** (TVA) that will ultimately lead to recommendations and an implementation plan.

This report is organized into the following categories of best practices:

- 1 Security strategy
- 2 **Crime Prevention Through Environmental Design** (CPTED)
- 3 Technology
- 4 Security staffing
- 5 Procedures and training
- 6 Fare and fare enforcement

The following sources were used to compile the best practices:

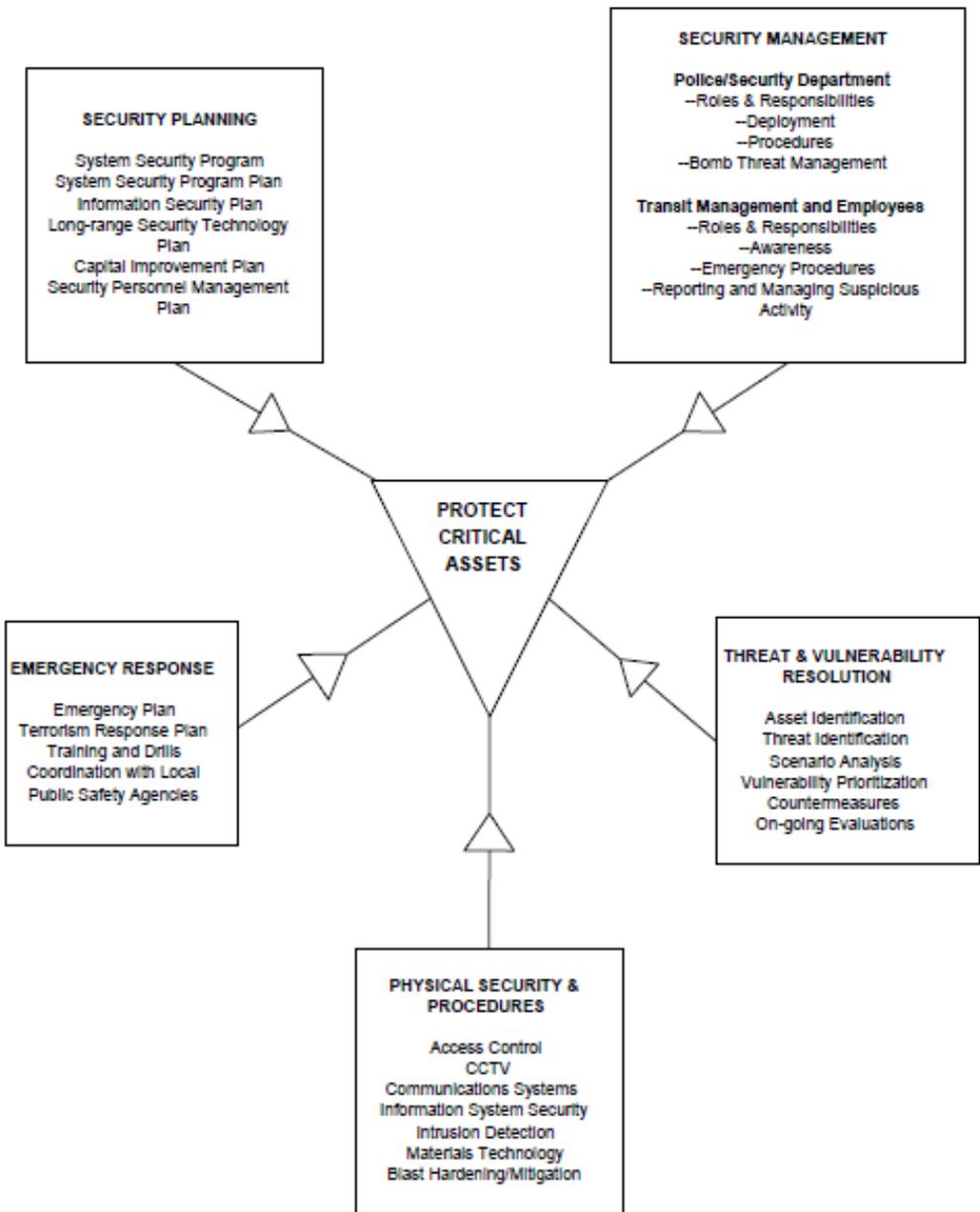
- **Industry best practices**: resources from the American Public Transportation Association (APTA), the Transportation Research Board (TRB), the US Department of Justice's Office of Community Oriented Policing Services (COPS), among others (refer to Appendix A for an annotated list of resources)
- **Peer agency practices**: examples and direct input from the Tri-County Metropolitan Transportation District of Oregon (TriMet), Sacramento Regional Transit District (SacRT), Phoenix Valley Metro, Minneapolis Metro Transit, San Diego Metropolitan Transit System (MTS), Washington Metropolitan Area Transit Authority (WMATA), Bay Area Rapid Transit (BART), Charlotte Area Transit System (CATS), Milwaukee County Transit System (MCTS), New York Metropolitan Transportation Authority (NY MTA), Seattle Sound Transit, Caltrain, Port Authority in Pittsburg, and Utah Transit Authority (UTA)
- **Expert knowledge**¹: contributions from a team of industry experts under each best practice.

¹ This report also incorporates confidential information shared from industry sources and experts that are not specifically cited in the bibliography due to Sensitive Security Information (SSI) considerations.

I SECURITY STRATEGY

The security program for a transit or rail agency is comprised of multiple elements, layered to provide a robust security environment. Security is multi-faceted, as depicted in Figure 1 (FTA 2003). Security programs must address all elements to be effective.

Figure 1. Elements of Protection



Source: FTA 2003

Transit security programs should be **risk** based, and elements should reflect the environment in which the system operates. Larger, multi-model systems with large fleets and multiple facilities require a strategic security strategy that comprehensively addresses all elements of the system.

All security practice guidance and recommendations start with defining and planning for security based on security risk and security risk tolerance. This is consistent with a data-driven approach, as the **risk assessment** provides the data to address the risk and provide protection and mitigations to transit employees, passengers, the public and the infrastructure.

The effectiveness of **layered security** is assessed by the ability to deter, delay, detect, respond, and recover. Implementing a strategic approach that includes all facets provides for redundancy and **defense-in-depth**. The defined security strategy should be documented in a **security plan**. A security plan sets the path for the security program. The plan should address roles and responsibilities for system stakeholders. Risk assessment methodology is delineated with **acceptable risk** criteria and protocols for infrastructure protection defined. The security plan should be a living document, that grows and changes as the system evolves.

1.1 SECURITY RISK ASSESSMENT

A security risk assessment, also known as a TVA, is intended to evaluate the transit system's susceptibility to security threats and to identify vulnerabilities and potential **consequence**. The assessment forms the basis for security design measures, plans and procedures that are to be implemented to reduce or mitigate security risk. It is industry best practice to base security plans and programs on assessed risks.

The process for determining security risk begins with the identification and grouping of agency **assets** critical to operations, their attractiveness as targets for crime, security **incident** or terrorist attack, and their vulnerability to the impacts of a successful criminal or terror incident. **Critical assets** are defined as those assets required to provide services for the **system**. Specifically, critical assets are defined as:

- **People** – Passengers, employees, visitors, vendors, surrounding businesses and communities, and contractors working within the transit environment
- **Property** – Stations and stops, maintenance facilities and yards, rolling stock, tracks, tunnel portals, bridges, crossing protection devices, park-and-ride lots, wayside facilities (signaling equipment, communication rooms/cabinets, and signal rooms/cabinets), fare vending machines, equipment technology, and communication /industrial control systems
- **Information** – Operations and maintenance procedures, security procedures and assessments, computer network information, passwords and facility access codes

There are many acceptable methods of assessing risk with guidance and industry standards available as resources. The Transportation Security Administration (TSA) is currently sponsoring the development of a security risk process for transit and rail operations which should be available in early 2019. Other sources include:

- Guide for Conducting Risk Assessment, National Institute of Standards and Technology (NIST) Special Publication 800-30 Revision. 2012.
- National Infrastructure Protection Plan (NIPP), Department of Homeland Security (DHS). 2009.

- Security Risk Assessment for Transit Operations (State Government of Victoria. Department of Transport). 2012.
- A Guide to Highway Vulnerability Assessment for Critical Asset Identification and Protection (American Association of State Highway and Transportation Officials [AASHTO]). 2002.
- Integrated Rapid Visual Screening Series (IRVS) of Mass Transit Stations, Buildings and Infrastructure Protection Series (BIPS 02). (DHS). 2011.
- The Public Transportation System Security and Emergency Preparedness Planning Guide. Department of Transportation. Federal Transit Administration (FTA). 2003.

Utilizing a risk based methodology provides for judicious allocation of resources to provide the optimal benefits to the system's security.

2 CPTED

Crime Prevention Through Environmental Design, or CPTED (pronounced Sep-Ted), is a crime prevention philosophy based on the theory that proper design and effective use of the built environment can lead to a reduction in the fear and incidence of crime, as well as an improvement in the quality of life. There are four principles of CPTED:

- 1 **Natural Access Control** – The physical guidance of people coming and going from a space by the judicious placement of entrances, exits, fencing, landscaping and lighting.
- 2 **Natural Surveillance** – The placement of physical features, activities and people in such a way as to maximize safety.
- 3 **Territorial Reinforcement** – The use of physical attributes that express ownership, such as fences, pavement treatment, art, signage, and landscape.
- 4 **Maintenance** – Allows for the continued use of a space for its intended purpose. It serves as an additional expression of ownership, prevents reduction of visibility from landscaping overgrowth and obstructed or inoperative lighting.

2.1 CPTED BEST PRACTICES OVERVIEW

CPTED best practices provide various tools to evaluate environmental conditions and utilize intervention methods to control human/criminal behavior to reduce the perception and/or fear of crime. The following best practices are organized based on the four principles previously listed. However, it should be noted that many of these practices overlap with respect to professional discipline and jurisdictional responsibilities. It truly takes a village—working with various local, state, regional and federal agencies, as well as business owners, customers, and residents—to realize the full potential of CPTED.

CPTED concepts and strategies use the four interrelated principles of natural surveillance, natural access control, territorial reinforcement, and maintenance. Using knowledge of the behavior of people, crime generators, the physical environment, and the space of an area, CPTED can provide benefits of safety and security if applied to the project planning and design stages, implemented in construction, and maintained during operations. Planning the use of a facility—such as a bus and/or parking garage, transit center, intermodal terminal or a park and ride lot—should also encompass details for optimizing user safety and security. CPTED concepts and strategies have been applied to built environments for years and incorporated into the designs of public facilities not related to transit. By creating an improved sense of safety and security using CPTED principles, it may be possible for transit agencies to increase ridership and build community support for the system.

CPTED emphasizes using the structures, spaces, lighting and people around an area to deter crime and increase loss prevention. While all stakeholders must be responsive to meeting the objectives of the safety and security programs, CPTED concepts and strategies should be identified in consultation with security staff.

In the 2009 TCRP Synthesis 80, *Transit Security Update*, agencies were surveyed regarding security practices and 30 of 33 responding transit agencies indicated a moderate to high investment in CPTED (TCRP 2009).

Minneapolis Metro Transit utilizes CPTED when planning and reviewing transit corridors and utilizes a CPTED-oriented checklist within its *Handbook for Transit-Oriented Development Grant*.

Refer to Appendix B for a checklist from APTA's *Recommended Practice for Crime Prevention Through Environmental Design for Transit Facilities* (APTA SS-SIS-RP-007-10). This checklist is useful for determining which principles may be applicable to MetroLink.

NATURAL ACCESS CONTROL

Natural access control means controlling access to a site such as a station, rail platform, or park and ride lot. The strategic design of streets, sidewalks, building entrances, and landscaping physically guides people through a space. Natural access control denies access to crime targets and creates a perception of risk for potential adversaries. This is achieved by:

- Ensuring that entrances are visible, well lit, and overlooked by windows of storefronts, residences, activity areas, etc.
- Clearly defining entryways and controlling other points of access to a site.
- Highlighting main entrances.
- Clearly marking public walkways and paths.
- Implementing a comprehensive wayfinding system to eliminate confusion for passengers as well as prevent people with criminal intent from taking advantage of such confusion.
- Using landscaping that defines territory, controls access, and creates ownership.
- Installing lighting that illuminates common areas, pathways, parking areas, and entryways.
- Using landscape structures and architectural designs to discourage access to private areas.
- Designing streets, roadways, pathways, driveways and neighborhood gateways to mark public routes.
- Providing an indication of where people are allowed and not allowed.



NATURAL SURVEILLANCE

Natural surveillance is the placement of physical features, activities, and people in a way that maximizes visibility. The intent is to increase the perception that people can be seen, thereby increasing the threat of apprehension to discourage crime. Areas of natural surveillance can be created by:

- Designing landscapes that allow clear, unobstructed views of surrounding areas.
- Maintaining landscaping where ground cover and bushes are no higher than 3 feet and tree limbs are no lower than 6 feet. Proper selection of plant species can reduce the amount of maintenance needed for any landscaping design.
- Improving visibility with lighting and/or transparent building materials.
- Avoiding lighting that creates glare or shadows and ensuring adequate illumination of public areas.
- Avoiding the creation of building entrapment areas (e.g., hiding or ambush points).
- Maximizing visibility by designing doors and windows to look into public areas, including parking lots, roadways or sidewalks.
- Implementing efforts directed at keeping potential intruders under observation.



TERRITORIAL REINFORCEMENT

Territorial reinforcement refers to the development of areas or places where the users feel a strong sense of ownership. It is an umbrella concept embodying all natural surveillance and access control principles. Territorial reinforcement is achieved by:

- Posting signage that expresses ownership.
- Using bollards and knee walls that define transition zones between public and private space while still maintaining natural surveillance.
- Using barriers that are transparent for surveillance, are unobtrusive, and create a sense of community.
- Installing fencing and walls that define territory, express ownership, and provide character and a sense of place.
- Clearly distinguishing the difference between restricted and public areas.
- Implementing landscape plantings, pavement surface treatments, fences, T-walls, etc., to reinforce the territory of restricted or public areas.
- Creating physical designs that enhance or extend the sphere of influence so users develop a sense of ownership.



MAINTENANCE

Care and upkeep demonstrate expression of ownership for the intended purpose of the area. A lack of care indicates loss of control of a space or area and can signal a tolerance for disorder. The following strategies address maintenance:

- Developing asset management plans and programs to ensure regular maintenance is incorporated into the annual budgeting process.
- Keeping up with repairs; making necessary replacements; painting; trimming landscaping; removing trash and debris; enforcing a zero- tolerance policy to graffiti and vandalism; and maintaining aesthetic appearance of assets, equipment and facilities.
- Creating a corporate culture where team members are enabled to report maintenance issues.
- Removing graffiti, trash, and outdated notices from facilities.
- Maintaining the cleanliness and functionality of revenue and nonrevenue areas and spaces.
- Inspecting assets, equipment and facilities to ensure satisfactory operation and appearance.



3 TECHNOLOGY

Best practices around use of technology for securing public transit systems fall into two broad categories: technology that affects security but with a different primary purpose (e.g., ticket vending machines [TVMs]), and technology specifically designed for one or more components of security (e.g., closed-circuit television [CCTV]). This section outlines various transit system technologies that impact security of the system either directly or indirectly. Transit agencies usually pair multiple technologies to create an effective, layered security system.

3.1 CCTV

CCTV can be a powerful tool for transit agencies when its design, technology, and implementation matches its intended use. It becomes less effective, for example, when an agency attempts to use a CCTV system for transit security when it was originally installed for operational purposes only. For this reason, it is important that an agency clearly defines how it intends to use CCTV before it can identify which best practices apply. CCTV can be used for a single purpose or multiple purposes such as operational, responsive, investigative, monitoring, and/or deterrence. When used for security, CCTV is often paired with other technologies such as radio communications, silent alarms, and covert microphones to create an effective security system.

As with any technology, an agency must have effective policies and training in place before implementing CCTV to address both safety/security and liability risk of the system. When developing policies, agencies should consider the labor demands of various CCTV uses to avoid relying on CCTV beyond their ability to monitor activities. For example, an alternative to 24/7 monitoring is using event triggered surveillance that pairs remote-surveillance with intrusion-detection systems. Event-triggered surveillance can be particularly useful for vulnerable parts of the transit system that might not otherwise require constant observation, such as tunnel portals or power substations (FTA 2004).

Technology is continually evolving and CCTV camera, recording, and system design technology is no different. Agencies must be proactive with proper education, reference material, ethical vendors, and technology staff. Agencies must also keep up with future additions and technology updates to the system. Nonproprietary equipment, warranties, and service agreements also need to be looked at closely to keep the CCTV system reliable and up to date. APTA's recommended practice for use in transit-related CCTV systems covers camera specifications, system design, recording, transmission and storage (APTA 2011). Some highlights include the following:

- **CCTV technology** – tradeoffs between image quality, frame rate, and network load (data rate); choosing cameras that meet the agency's safety, operational and security requirements; black and white versus color cameras
- **Design and system architecture** – what questions an agency should ask itself to ensure the system meets the needs of the agency
- **Camera classifications** – how screen resolution requirements vary based on how the CCTV will be applied, i.e., to detect, monitor, recognize, and/or identify
- **Evidence handling and documentation for law enforcement** (chain of custody) – understanding chain of evidence requirements when drafting procedures and policies around handing, observing, accessing, and distributing CCTV-related files and data

- **Maintenance of equipment** – developing preventative maintenance schedules, testing camera locations, employing remote monitoring systems where possible, and keeping maintenance logs

A transit agency that uses CCTV must also establish with whom camera data will be shared. CCTV access should be shared with the appropriate law enforcement agency that works in conjunction with the transit agency security office. There should be command and control over who has access to recorded and live video. A privacy policy should be considered for managing the use of images and sounds recorded by the system. Live video viewing from platforms, station and passenger vehicles can be a cost-effective positive customer service tool and crime deterrence by providing a security presence without the cost and randomness of security patrols. A transit agency should have a policy for video viewing, hard copy sharing, and retention. Video for police investigations should have a strict chain of custody to insure the integrity of any prosecution.

3.2 PASSENGER ASSISTANCE AND EMERGENCY TELEPHONES

Passenger assistance and emergency telephones provide a quick connection to customer and **emergency** support, which can both reassure customers that help is readily available should it be needed and can deter potential crime actors by signaling the space is protected. These telephones can help customers feel more secure when waiting and riding the system and therefore enhance customer satisfaction. In addition, well-placed and easy-to-use emergency telephones may result in faster response times (FTA 2004).

The design, placement, and functionality of a passenger assistance and emergency telephone influences its level of effectiveness. Emergency telephones should notify the appropriate public safety personnel of an emergency upon being used. A means of voice communication should be installed at emergency exits and at selected locations within the transit system, and be conspicuously identified with graphics and lighting. This allows customers to quickly identify passenger assistance and emergency telephones and feel safer and more secure during their time using the transit system.

3.3 TVMs AND VALIDATORS

The overarching function of a TVM is to accept payment (e.g., cash, credit, debit, smart card) in exchange for issuance of receipts and ticket(s). Ticket validators facilitate sale of pre-paid tickets by date and time stamping tickets at the time of use. In this way, TVMs and validators support fare enforcement by providing a means for transit riders to purchase valid fare before using the system. TVMs also support data collection and analysis and audits by tracking revenue and ticket sales by type (APTA and CAPtech, Inc. 2010). Tracking revenue and ticket sales can help inform related future agency decisions and policies.

The design, user interface, and placement of TVMs and ticket validators influences their effectiveness. For example, if an agency chooses to mark and enforce a “paid fare zone” on their platforms, TVMs and validators need to be located *outside* the paid fare zone so customers can purchase and validate fare before entering. Similarly, the user interface must be intuitive and informative to maximize convenience for customers to purchase and validate fare. An agency’s decisions surrounding its TVMs and ticket validators should incorporate a multitude of considerations, including but not limited to: ticket sales, cost, passenger wait time and convenience, infrastructure constraints/station and stop layout, evasion opportunities, fare options, maintenance, presence of paid fare zone, and accessibility (TCRP 2002). A well designed and executed TVM and

ticket validator system facilitates fare enforcement, which is described in more detail in Section 6 of this report.

3.4 RADIO

Transit agencies can use radio technology for both external and internal voice communications. The effectiveness of radio is a function of the technology itself, how it is used, and how reliable it is. Communication interoperability between an agency and external public safety agencies is crucial, particularly in emergency situations when radio communications are often public safety personnel's only lifeline. Other key considerations for radio communications include the ability to simultaneously contact agency personnel instead of requiring individual notifications (e.g., for service changes, emergency situations, etc.); redundancy to eliminate single points of failure and reduce the risk of losing radio communications such as from loss of power or damage to equipment; and backup communication modes and procedures for their use, such as cell phones, email, pagers, dedicated landlines, and/or satellite phones (FTA 2004).

In addition to implementing redundant communication system technology, agencies must clearly establish and practice day-to-day and emergency radio procedures internally and with external partners. Familiarity with the agency's internal and external radio communications systems reinforces communications procedures and reduces confusion during emergencies.

In general, most transit agencies use one shared radio frequency that all safety and security personnel can use by listening and responding to requests from other personnel. Dispatch also needs access for a singular, unified system (FTA 2004). Optimally, the use of one radio system between a transit agency and its various public safety agency partners is the most seamless approach as multiple radio systems can be challenging if proper protocols are not in place. Any complications with communication can cause frustration, confusion and delayed response times. A singular radio system is not without its challenges, however. Overuse and misuse creates noise that can wash out the

“Interoperable communication facilitates the ability of personnel and equipment from different agencies and entities to share and communicate information and data.”

–TCRP Synthesis 80 (2009)

necessary messages and communication functions. Communication protocol and standards must be developed and strictly followed and enforced to create an effective and professional communication environment. Therefore, all personnel—internal and external—must be trained to the same standards of use and operation of radio technology.

3.5 BODY CAMERAS

Body cameras for security personnel are an emerging technology intended to aid incident investigations, clarify police testimony, and deter corrupt practices. The effectiveness of body cameras in meeting these intended benefits is actively under evaluation and not yet conclusive. Body cameras can potentially help ensure security personnel behave professionally and without escalating security events; aid in investigations and police testimony when concerns about an event are raised; and deter police officers and/or offenders into compliant behavior due to the threat of their actions being recorded on camera. A study conducted with the British police force found the odds of use of force were cut in half when body cameras are present (Henstock 2017). However, another study

released in the same year found a non-statistically relevant difference in use of force and civilian complaints when body cameras are present versus not present (Yokum et. al 2017). Until the effects of body cameras on use of force and civilian complaints are better understood, expectations around body cameras should remain conservative and not count on large-scale improvements in desired outcomes. Body cameras should not be considered a “silver bullet” and should not be deployed in isolation but as part of a layered, multi-pronged approach to transit security and security technology.

4 POLICE/SECURITY STAFFING

Staffing security for public transportation systems requires understanding the needs of the system, establishing clear roles and responsibilities across various security staffing types, and supporting open communication and collaboration. Most public transportation systems rely on a mix of security staffing sources to cover their systems. While there is no single “correct” approach to security staffing, there are certain baseline conditions that need to be satisfied in order to effectively staff a transit security team. This section first outlines best practices under the various sources of security staffing and then discusses effective approaches to establishing and managing the relationships between those security staff.

4.1 STAFFING DETERMINATION

Staffing should be a function of both an evaluation of an agency’s security needs and of the staffing requirements necessary to meet those needs.

PLANNING

Planning for a security force requires many decisions to determine the best fit for an agency. It is also important to understand that security staffing needs can evolve as the agency and the community evolve. Questions that should be considered include (NCHRP 2009):

- Is a security presence required?
 - How many full-time equivalents (FTEs)?
 - How many modes and facilities need to be covered?
 - What skill / training level?
- Can local law enforcement provide that presence?
 - Yes, as part of regular civic policing
 - Yes, as part of contracted policing services:
 - Define expectations, staff levels, oversight and other terms
 - Provide / participate in training
 - No: Develop other dedicated security force presence options
 - Partially: Supplement with another security staff option
- Would an in-house dedicated police function provide the needed presence?
 - Is there budget, legal/legislative approval and personnel resources available to develop an effective force?
 - Can the in-house dedicated police force successfully compete for and maintain qualified officers?
- What type of functions are required from the security staff?
 - Law Enforcement
 - Arrests
 - Investigation
 - Special Details

- Security
 - Armed vs Unarmed
 - Detain, Report, Intervene
- Combination

To understand how these issues impact the outcome, each decision is discussed below.

STAFFING REQUIREMENTS

The simplest approach to determine staffing for any security or police uses a relief factor to identify the appropriate number of staff per shift or assignment. This is calculated through the following steps (Local Government Performance Center 2012):

- 1 Determine amount of coverage needed; the staff hours required to cover each post for the year.
- 2 Calculate amount of available staff time: Evaluate staff time allowing for time off for weekends, vacation, sick leave, report writing and training. This requires understanding:
 - a The number of hours per year that an employee is scheduled to work,
 - b The number of hours per year, on average, that is allowed for any activity that would take the staff away from the security position or post. This includes vacation, sick leave, report writing, training, etc.
 - c Subtracting all the non-post hours (b) from staff hours (a) determines the number of hours an employee is available to cover a post or position.
- 3 Calculate number of FTEs required to cover one post: Divide post coverage hours (1) by the number of hours an employee is available to work (2).

The resulting relief factor translates to the estimated staff FTEs needed for each post and typically averages between 1.4 and 1.7 (Local Government Performance Center 2012).

Another approach to staffing calculation is the Security Manpower Planning Model, developed by the FTA (FTA 2008). The modeling tool requires the user to insert all security staff (internal security and external police) and to choose the number of staff hours needed to work, including training and vacation hours. The model breaks down locations for types of coverage such as fixed locations and trips, and can also be used for fare enforcement and bus and facility locations. This allows the user not only to see staffing needs but also assist in cost effectiveness. Agencies have used this tool in conjunction with staffing and budgeting to determine hours of coverage.

Both methods are tools that can be used as a basis for determining security staff requirements. Location specific needs, such as areas of concern, special details, large events, also must be factored into the calculations. These methods only provide for security staffing coverage, but does not address other security functions such as managing CCTV or other security technology, assessing security risk, performing security review of plans or designs or other functions that might be assigned to the security department or division.

DEPLOYMENT

Deployment strategies should be based on good data and an understanding of the security needs of the system. The FTA-sponsored Transit Cooperative Research Program's (TCRP) Web Only *Guidelines for the Effective Use of Uniformed Transit Police and Security Personnel* (TCRP 1997a) discusses 26 deployment security strategies and functions. Some of the most utilized strategies or functions include:

- Fixed posts
- Random patrol within a fixed post area
- Directed patrol with post area
- Visibility posts
- System or zone-wide directed mobile patrol
- Fare inspection
- Surveillance monitoring (cameras)
- Anti-gang (Outreach) activities
- Crime prevention (CPTED) implementation

Each of the strategies has a specific use or outcome. Effective security staffing typically utilizes a combination of strategies based on the goals of the program, and the security challenges being experienced. Good practice indicates that deployment strategies must be fluid and flexible, appropriately revisiting and switching strategies to address evolving security issues.

4.2 SWORN VERSUS NON-SWORN

Transit agencies in the US utilize both sworn police and non-sworn security, and often a combination of both to provide needed security presence. The strengths and weaknesses of each type of policing are expressed in Table 2 below:

Table 2. Comparison of Police Force and Security Force

POLICE (SWORN) FORCE		SECURITY (NON-SWORN) FORCE	
Strength	Weakness	Strength	Weakness
High crime deterrence	High operating costs (salary and benefits)	Low start-up costs	Limited powers of arrest or detention unless legislated
Power of arrest	Higher start-up costs, especially in-house	Provides for crime deterrence	Coordination with local police challenging
Coordination with other policing and security agencies obtainable	Legislation may be required	Allows for more personnel due to lower operating costs	Often no specialize units and minimum training due to cost
Respected as law enforcement	Transit policing differs from traditional policing	Lower operating costs compared to sworn police	Observe/report policy can delay response to security issue
Highly trained personnel with access to specialized units		High degree of control of operation	Limited availability of highly qualified personnel

Few large systems utilize only a security (non-sworn) unit to provide their system policing, though this is the basis for the model used in San Diego. San Diego does have four police officers that support their system but the primary security presence is provided by non-sworn security personnel comprised of in-house Code Compliance Inspectors and contracted security officers who work in tandem to ensure the safety and security of the transit system.

More frequently, transit agencies use non-sworn security to address temporary or short-term security needs such as for large events, new asset acquisition, or other changes in infrastructure where a permanent solution is still being considered. For most permanent security solutions, the more

common choice is a combination force that provides a solid transit police presence supplemented by a security force. This combination optimizes the strength of both options. The police force can be allocated where their expertise and training will provide the most benefit, while the security unit provides presence and feedback throughout the system at a lower cost.

IN-HOUSE POLICING AND SECURITY

In-house police and / or security provides for the highest degree of control over the activities and allows easy deployment strategy options. This model provides for security staff that uphold the transit agency's interests in providing transportation. Costs for establishing and maintaining an in-house police or security group are high, as all salary, benefits, training, equipment, hiring costs and liability for the activities must be covered. Depending on the size of the group or unit, remaining competitive and allowing for career advancement can be challenging.

IN-HOUSE TRANSIT POLICE

An in-house transit police department is used by several transportation agencies in the United States including WMATA in Washington DC, Metro Transit in Minneapolis-St. Paul, MTA in New York and New Jersey, and Port Authority in Pittsburgh. This model is especially effective on systems that transverse multiple jurisdictions as it allows for consistent policing across a system. An in-house transit police force allows complete control by the transit agency over policing the system and has the capacity for good coverage as there are no competing loyalties. The agency can define police policies and processes that completely fit the agencies goals and objectives. There are challenges with this model as it is costly, legislation may be required to be recognized as law enforcement, and it takes time to develop the capacity and the relationships with other police jurisdictions and security entities to make it effective. Other challenges include attracting and maintaining officers in a competitive market. Smaller transit police forces may be challenged to provide a competitive job market environment and keep officers trained and allow for growth opportunities. Few small and mid-sized transit agencies utilize this approach due to both need and cost. This model is most often found in older, large rail systems that require large security staff/police.

IN-HOUSE TRANSIT SECURITY

Non-sworn transit security, or security officers, can also be part of an in-house model. SacRT in Sacramento, CA, uses an in-house staff of Transit Agents, as shown in Figure 2. This staff provides the coverage on trains and stations for both fare inspection and staff coverage.

Figure 2. Transit Agent Job Description for SacRT

Sacramento Regional Transit District



Title: Transit Agent
FLSA Status: Non-Exempt

BRIEF DESCRIPTION:
The purpose of this position is to perform fare inspection activities aboard RT vehicles and within RT's Fare Paid Zone and to cover patrol responsibilities at the light rail stations and parking lots. This is accomplished by conducting fare inspection and citation issuance activities while vehicles are in-service and providing general customer service. Other duties include: writing reports; maintaining records; attending training; and providing court documentation and testimony. Ability to communicate clearly and professionally on a hand held radio is required.

This position will be considered a demonstration position for up to 2 years. Incumbents should recognize that the position would be eliminated at any time during that 2 year demonstration period and that no guarantee of continued employee exists. If the position were to be eliminated, incumbents could apply for other RT positions, but would have no guarantee of employment in any other classification.

ESSENTIAL FUNCTIONS:
Note: This information is intended to be descriptive of the key responsibilities of the position. The list of essential functions below does not identify all duties performed by any single incumbent in this position. Additionally, please be aware of the legend below when referring to the physical demands of each essential function.

(S) Sedentary	(L) Light	(M) Medium	(H) Heavy	(V) Very Heavy
Exerting up to 10 lbs. occasionally or negligible weights frequently; sitting most of the time.	Exerting up to 20 lbs. occasionally; 10 lbs. frequently; or negligible amounts constantly; OR requires walking or standing to a significant degree.	Exerting 20-50 lbs. occasionally; 10-25 lbs. frequently; or up to 10 lbs. constantly.	Exerting 50-100 lbs. occasionally; 10-25 lbs. frequently; or up to 10-20 lbs. constantly.	Exerting over 100 lbs. occasionally; 50-100 lbs. frequently; or up to 20-50 lbs. constantly.

#	Code	Essential Functions
1	M	Performs fare enforcement activities on-board RT vehicles. Checks for proof of fare; issues citations for fare violation infractions checks and verifies passenger identification documents.
2	L	Enters fare citation information into computerized system, completes various forms and reports including incident and accident reports, appear in court to present evidence and testimony related to job duties.
3	L	Perform patrol responsibilities at light rail stations and parking lots.

Deployed in-house security is not typical, but can be effective as it provides direct control of services. Like other in-house services, this approach is typically more expensive than utilizing contracted security.

A typical use of in-house security staff is to perform other security functions required by a transit or rail agency such as the development and implementation of the security strategy and plan for the agency, security reviews of project plans or project requirements, security risk assessments of the operation and facilities, managing security technology and gathering and tracking security data.

4.3 CONTRACTED POLICING AND SECURITY

Contracting for security staff, sworn or non-sworn, is a current practice for many transit and rail properties. The contracted model is utilized to take advantage of cost savings for security/ policing, to reduce agency liability or both. For either sworn or non-sworn, the concept allows for the provision of fully trained, qualified and vetted staff to be devoted to the transit environment. The qualifications, expectations and duties are defined within the contract and managed through contract management activities.

CONTRACTED POLICING

Contracting with existing policing jurisdictions to provide services is consistent with the current arrangement utilized by Metro under the memorandum of understanding (MOU). Depending on the number of jurisdictions involved in the alignment or system, agencies may utilize a single entity or multiple entities joined together to provide transit policing services. There are multiple transit agencies that utilize this model: Caltrain contracts with one entity, the San Mateo County Sheriff's Office. TriMet contracts with approximately fifteen Portland-area law enforcement agencies.

Contracted policing provides fully trained and qualified law enforcement officers, who are provided to meet the staffing needs defined in the agreement. This model mitigates the need to attract and maintain qualified officers. The officers maintain their status within the home law enforcement agency, allowing for growth potential. The home law enforcement agency provides oversight and escalation of discipline for the staff. There is also liability protection related to officer activities.

A challenge with contracted policing is developing the coordination or command structure, as well as developing and managing the contractual details to ensure appropriate dedication and response to the transit system. Processes need to address if and how the home law enforcement agency can temporarily "recall" or "borrow back" the seconded staff in times of need, so the transit system is not left without coverage. Success with this model is contingent on good contract management to keep the transit priorities and expectations clearly communicated and agreed upon by all parties. If these conditions do not exist, the contracted model will not produce the results needed and may become burdensome and ineffective. In Minneapolis, the transit system began with a contracted model, but developed an in-house transit police when the contracted service did not provide the needed coverage.

One of the critical considerations surrounding contracted policing is the nature of the agreements with local law enforcement. The contract must provide the basis for the provision of coordinated adequate and appropriate services. Without an adequate contract that has appropriate controls in place, security may be controlled by others, with as little or as much coverage provided as those entities determine necessary. There may be little or no control to match the coverage with security considerations; policing services may or may not match the customer environment or provide for operational concerns; and officers responding to events may not have training that would allow for safe response on the system. Systems that have adopted the contracted approach mostly budget and pay for the policing services from the law enforcement agencies, which provides for budgetary and management control. Without a strong contract or agreement for services and respectful coordination, this model can be challenging. Agencies with contracted law enforcement advise that strong, collaborative contracts that provide clear expectations, roles and responsibilities provide the best outcome for the transit agency.

CONTRACTED SECURITY

Most agencies that utilize non-sworn security as part of their policing plan contract for security services. This provides for a relatively low-cost approach where presence is needed but full law enforcement training and qualifications is not required. The contract should have defined roles and responsibilities, clear metrics for determining performance, and allow for adequate oversight and supervision. Contracted security can be armed or unarmed and can provide a variety of functions. Functional expectations should be fully defined and may range from observe and report to some degree of response and intervention. Typically, security guards provide presence and visibility, which acts as a deterrent to criminal activity. Contracts for non-sworn security must be even more defined than those for law enforcement. With law enforcement, a degree of training, qualifications and skills can be assumed based on the requirements of the law enforcement agency. With security guard contracts, nothing should be assumed and levels of training, physical qualifications, oversight and supervision expectations should be defined, along with metrics for performance.

4.4 PARTNER AGENCIES

Coordination and collaboration with local, state and federal partners is critical to maintaining a strong security presence and program. Threat and criminal trending can be accessed through these partnerships, allowing a data-based approach for security. Local law enforcement, even if not contracted or part of formal agreements, can and should be part of the security program for the agency. Federal and state agencies can provide resources, audits and access to security programs that support system security. Use of the resources available can be used to supplement agency resources, but shouldn't totally define a system's security program. The TSA has grants and programs that transit systems can utilize. TSA's major focus is terrorism, an activity that all agencies should be aware of but may not be the most likely threat for many transit agencies. Working with TSA to meet their objectives while also achieving the transit agency specific security goals is a smart use of resources.

Current practice throughout the industry includes participating in local Joint Terrorism Task Force groups and Surface Transportation Information Sharing and Analysis Center, collaborating with other transit agency police and security programs, and staying involved with the APTA security program. All these programs can inform and advise of advancements in transit security.

4.5 RELATIONSHIPS

All transit agencies inherently operate within and travel through one or more jurisdictions. It is imperative that positive working relationships are established among the transit agency, its internal and contracted security, and the police jurisdictions in which it operates. Establishing security plans that lay out roles and responsibilities, appropriate staffing, and collaborative meetings, facilitates the formation of positive relationships around a common goal. Alienation of any component of the security partners weakens the program.

5 PROCEDURES AND TRAINING

Best practices for policing public transportation systems emphasize **community policing**, which is distinct from the traditional enforcement-based police department approach to crime. Community policing is proactive and focuses on developing and maintaining relationships between officers and riders to build mutual trust and respect. When police and communities collaborate to address crime, they more effectively address underlying issues and change negative behavior on public transportation systems. Community policing often requires discrete transit-specific procedures and training for police and security staff. While there is overlap in best practices for the various types of security on a transit system, there are also distinct practices for each.

5.1 STANDARD OPERATING PROCEDURES

An effective set of policies and procedures that establish the various security system elements and functions is a crucial aspect of successful security programs and systems. Standard operating procedures (SOPs) act as a rule book for agencies to follow and use to carry out operations correctly and consistently. SOPs should also address contingencies for security issues that may arise. Clear, effective procedures allow security personnel to perform their duties well and to rely on an established process when making decisions (FTA 2004). Security-related SOPs should cover both internal and external emergencies and address the following (FTA 2003):

- The system’s policy regarding employee responsibilities for the identification and reporting of unusual conditions
- The provision of appropriate personnel and resources to ensure effective notification and management of these conditions, coordinating with local emergency responders as appropriate
- The system’s training, exercising, and assessment to initiate and maintain response capabilities and coordinate with local responders

5.2 PASSENGER CODE OF CONDUCT

Codes of conduct, or rider rules, should be a concise list of rules that are used to control the safety, security, and quality of life of people while utilizing the transit system. They should be posted on system vehicles, trains, stops, platforms, and public buildings. Posting codes of conduct helps deter negative behavior and communicate to each customer what is expected of them while using the system. These can be backed by a civil penalty or arrest and enforced by transit security, transit police, and/or specific security staff like San Diego’s Code Compliance Inspectors. Most agencies have similar baseline rules plus whatever specific rules required for that particular system, such as tunnel trespassing or ferry operations. Table 3 outlines various common code of conduct areas covered by a range of example transit agencies.

Table 3. Example Common Code of Conduct Areas by Transit Agency

CONDUCT AREA	TRANSIT AGENCY										
	BART	CATS	MCTS	MSP METRO	NY MTA	SACRT	SOUND TRANSIT	TRIMET	UTA	VALLEY METRO	WMATA
Designated seating			X	X	X	X	X	X			X
Distract, disrupt driver or service	X		X	X	X		X	X	X	X	
Eating, drinking restrictions	X		X	X	X	X	X	X	X	X	X
Flammable substances, hazardous materials	X	X			X	X	X		X	X	
Harass, disrupt others	X					X	X	X		X	
Correct Fare, Paid Fare Area	X		X	X	X	X	X	X		X	
Littering	X	X			X	X	X			X	X
Loitering, vagrancy		X			X					X	
Loud music, conversation, noise	X	X	X	X	X	X	X	X	X	X	X
Non-service animal restrictions	X	X	X	X	X	X	X	X		X	
Required clothing, shoes	X		X	X		X	X		X	X	X
Respect the ride, others			X	X	X	X	X				
Skateboarding, scooters, rollerblades		X			X	X			X	X	
Soliciting, non-transit activities	X	X			X	X	X			X	
Spit, urinate, defecate	X	X				X			X	X	
Smoking, alcohol, other drug use	X	X	X	X	X	X	X	X	X	X	X
Stroller, carts, baggage storage			X	X		X	X	X	X	X	
Trespass	X	X			X						
Vandalism, graffiti	X	X			X	X			X	X	
Violence, including threat of	X		X		X	X			X	X	
Vulgar language, gestures	X	X	X	X	X				X	X	
Weapons	X	X			X		X				

Bay Area Rapid Transit District (BART): <http://www.bart.gov/sites/default/files/docs/08-08-13%20Customer%20CofC.pdf>
 Charlotte Area Transit System (CATS): <https://charlottenc.gov/cats/bus/riding-cats/Pages/code-of-conduct.aspx>
 Milwaukee County Transit System (MCTS): <https://www.ridemcts.com/rider-information/rules-for-riders>
 Minneapolis/St. Paul Metro Transit (MSP Metro): <https://www.metrotransit.org/code-of-conduct>
 New York Metropolitan Transportation Authority (NY MTA): <http://web.mta.info/nyct/rules/rules.htm>
 Sacramento Regional Transit (SacRT): <http://www.sacrt.com/safety/rulesandregulations.aspx>
 Seattle Sound Transit: <https://www.soundtransit.org/Rider-Guide/know-you-go/rules-riding>
 TriMet (Portland): <https://trimet.org/guide/rules.htm>
 Utah Transit Authority (UTA): <https://www.rideuta.com/Rider-Info/Rider-Rules>
 Valley Metro (Phoenix): <https://www.valleymetro.org/respect-ride>
 Washington Metropolitan Area Transit Authority (WMATA): <https://www.wmata.com/rider-guide/rules/>

5.3 TRAINING

Training is an important component of any security strategy. A transit agency's security plan should outline its training program and requirements including qualification, requalification, familiarization, and refresher training programs, to ensure that employees demonstrate an understanding and proficiency in the application of rules, procedures, and equipment (APTA 2014; NCHRP 2009). Training programs should cover all aspects of an agency's security strategy from planning and design to operations and security awareness. Baseline security awareness training objectives for all transit employees should be established and include behavioral awareness, surveillance, response procedures and self-protection. Additional training should cover how to deal with different situations that may arise on systems such as mental illness and disorderly persons (APTA 2012b).

Training employees to deal with these safety and security issues is a crucial component of ridership safety and the safety of employees, giving employees the tools necessary to deal with unexpected and emergency situations. Transit employee response to and reporting of any incidents or suspicious behavior or activity provides a reliable source of information for an agency's transit security program (APTA 2012b). If contracted security staff, sworn or non-sworn, is utilized, specific training should be provided to them to inform of the transit environment.

6 FARE AND FARE ENFORCEMENT

Public transit agencies rely on fares to help sustain their facilities and services. However, public transit agencies—particularly those with open, “proof-of-payment” systems—are confronted with **fare evasion** when passengers use transit services without paying their required fare. Finances are a common challenge for public transit agencies and fare evasion is a direct hit to revenue.

Fare evasion can be contagious. If fare evasion is ignored and free-riders can ride without consequences, fare payment can be perceived as optional. Fare enforcement not only provides consequences for evaders, it reassures compliant customers that paying their fare was correct and valid. Fare inspection and enforcement also engenders an environment of order and safety.

Cities and states with significant public transit systems have in recent years begun reevaluating their fare evasion policies, and many are considering decriminalizing fare evasion. The National Association of City Transportation Officials, whose mission is to “build cities with places for people, with safe, sustainable, accessible and equitable transportation” has also publicly opposed criminal enforcement of fare evasion. Decriminalization of fare evasion is a significant trend that may or may not become a future best practice.

This section provides an overview of current best practices and focuses on fare enforcement at peer agencies, highlighting key issues and summarizing best practices. It is organized into four sections:

- Authorization and Policy
- Customer Experience
- Operational Approach
- Management and Measurement

A summary of best practices follows each of the four sections. The best practices are based on the information from interviews conducted with peer agencies and the policies and practices that they shared. Peer agency practices were validated against best practices compiled by TRB (TCRP 2002), as well as through additional research that included review of publicly available documents and articles.

6.1 AUTHORIZATION AND POLICY

Agencies rely on state and/or local codes as well as agency regulations for enforcement activities and actions. Clear legal authorization and clear, consistent and transparent policies create the foundation for fare enforcement. The fare enforcement environment is built on this foundation and it influences most policies, practices, and procedures.

AUTHORIZATION

The legal framework for fare enforcement is based on the jurisdiction(s) in which the transit system operates. Some agencies cross political sub-divisions and rely on multiple state and local codes to support their fare enforcement activities. Table 4 summarizes the authorization framework for five peer transit agencies with similar proof-of-payment fare collection environments.

Table 4. Authorization

	SD MTS	MSP Metro	TriMet	WMATA	SACRT
Authorization for enforcement (state, local, agency)	State and local ordinance (state penal code gives authority to enforce)	State Statute	Administrative code	State code for each potential subdivision	State and local ordinance
Legal instrument (citation, civil penalty, civil infraction, fare surcharge)	Citation	Citation	Citation	Citation (Montgomery County: initially out, citation escalates to criminal arrest)	Citation
Court of jurisdiction (superior, county, municipal)	Superior Court	County District Court	Municipal	District court of political subdivision (by county)	Municipal; Superior court

State and local codes, sometimes supplemented by administrative codes and regulations, provide transit agencies with authorization for enforcement. The specific framework varies by transit agency depending on the characteristics of the jurisdiction(s) that the agency serves.

Agencies use standard instruments to commemorate fare infractions. These instruments include citation, civil penalty, civil infraction, and fare surcharge. The surveyed peer agencies each use a citation. The fare infraction instrument used is consistent with the authorization for enforcement.

Courts of jurisdiction are also consistent with the authorization for enforcement and dictated by state and local laws. Some agencies work with courts to reduce their workload and handle matters administratively. The trend to reduce court workload is aligned with the trend to decriminalize fare evasion.

ORGANIZATIONAL POLICIES

Organizational policies stem from and are aligned with the legal framework that provides and authorizes fare enforcement. Basic policies for fare enforcement vary, but a common theme is the creation of a safe and orderly environment. Policies are designed to affirm the legal requirement to pay a fare and to assure fare-paying customers that they and other riders are being treated fairly.

Table 5. Policies

	SD MTS	MSP Metro	TriMet	WMATA	SACRT
Policy	Citations	Customer service and warnings to first time offenders	Decriminalizing with incentive to pay fine	Warnings to juveniles, criminal citations to adults	Citations and warnings with friendly inspections
Warnings	Limited	For first time offenders	For first time offenders	All juveniles, limited adults	No, but sometimes to juveniles
Discretion to Inspectors	Only on Quality of Life issues	Have discretion as officers	Information unavailable	Have discretion as officers	None
Removal of Evaders	Cited and removed	Officers discretion	Information unavailable	Citation, pay fare, free to go.	Discretion for youth, etc.

Some agencies issue warnings, particularly to first time offenders and juveniles. Others do not issue warnings, and strictly limit an inspector’s discretion to warn rather than cite. Agencies that use police officers for fare enforcement activities typically have organizational policies that grant them more discretion than policies for civilian fare enforcement agents and security guards.

TriMet plans to provide an *incentive for customers to pay fines on time that reduces the burden on the courts and increases agency revenue.*

TriMet, for example, is moving to decriminalize fare evasion and issue warnings for first time offenders. Offenders who are cited have an opportunity to pay their fine directly to TriMet within 90 days at a significantly reduced fee. If the fine is not paid the matter goes to court. The court may waive the fine if the offender

enrolls in a low-income fare program. It may also levy community service in lieu of a fine. Fines are collected by the municipality and TriMet gets a portion of the revenue, but TriMet collects the entire fee when the offender elects to pay the reduced fine within 90 days directly to the agency.

WMATA does not issue citations to juveniles and its officers are given discretion to issue warnings or provide assistance to customers who they believe did not intend to evade a fare. Even cited fare evaders on Washington’s system are free to go if they pay their fare after they are cited.

Policies toward removal of offenders also varies somewhat from agency to agency. Some agencies remove all offenders from the system; other agencies grant the inspector/officer discretion such as for school children without the proper fare.

Although organizational policies vary from agency to agency, best practice requires they are clearly stated, clearly understood and consistently enforced. Policies that are not clearly stated risk misinterpretation and misapplication. Misinterpretation can lead to inconsistency. Misapplication can lead to unintended outcomes or outcomes that are significantly outside of policy objectives.

SUMMARY TABLE

Table 6. Best Practices: Authorization and Policy

	BEST PRACTICE
Authorization	Clear, transparent legal authorization is imperative. Authorization may be from state, or local jurisdictions, from agency regulations or from a combination of them. Decriminalization in some systems may increase the role of administrative regulations.
Legal Instrument	Agencies use a standard instrument to commemorate fare infractions. These instruments may include the citation, civil penalty, civil infraction, and fare surcharge.
Court of Jurisdiction	Courts of jurisdiction are determined by state and local laws. Some agencies are working with courts to reduce their workload and handle matters administratively within the agency.
Policy	Policies reflect state and local laws and agency regulations. Fairness, transparency and demonstrating a visible presence are nearly universal policy objectives.

6.2 CUSTOMER EXPERIENCE

Although it may seem contradictory, many agencies strive to ensure that fare enforcement activities enhance rather than detract from the customer experience of using their services. Fare enforcement operations can help improve the perception of law and order in a system and many systems use fare inspectors and other personnel to help unfamiliar customers use the system and its ticketing mechanisms.

Transit agencies recognize that sometimes customers without a valid ticket or authority can have a valid reason and should be given an opportunity to explain it to a fare enforcement officer. In addition, it is important for transit agencies to post signs at every entrance indicating that fares are required within fare zones and on transit vehicles. It should also note that fares are enforced.

Customers should receive a certain level of customer service when they are challenged on ticketless travel. At a minimum, customers should be spoken to politely and clearly and feel confident they will be given an opportunity to provide an explanation. Customers should also have the penalty fare process explained to them, their questions answered, the right to a receipt if they pay the penalty fare in full or in part, and a statement of information related to the penalty fare. They should not feel victimized by fare enforcement officers.

For example, the policy for Metro Transit in Minneapolis is to have its officers focus on customer assistance and help with using the system. Metro Transit officers have discretion to forgive or warn first time offenders. If an officer is satisfied that the passenger did not intentionally evade paying fare, the officer will explain the fare system to the passenger, issue a verbal warning and may ask the passenger to exit the transit vehicle to pay the proper fare. The officer may also allow the passenger to ride to their destination and ensure that the fare is paid upon arrival. Metro Transit’s administrative policy is to cite repeat offenders, but officers still have discretion regarding whether to remove them after citing them. Those cited may be subject to trespassing if they return to the property within 30 days. Metro Transit, like other peer agencies, views fare enforcement not only as an important component of its security and revenue efforts, but as key element of customer service efforts as well.

SUMMARY TABLE

Table 7. Best Practices: Customer Experience

	BEST PRACTICE
Customer Experience	Fare enforcement efforts should improve the customer experience rather than detract from it. Transparency, included posted signs at all station entrances that fare policies will be enforced, helps set expectations. Uniformed officers provide a reassuring, helpful presence. Complete inspections help customers that have paid their fares prove that they did the right thing and reassures paying customers and free-riders that they will be treated fairly and justly.

6.3 OPERATIONAL APPROACH

Strategies for fare enforcement have been shifting in recent years. In the past, agencies focused their enforcement efforts in areas with significant reports of fare evasion. More recently, inspection strategies are moving toward fare sweeps and de-emphasizing targeted enforcement of fare evasion. Table 8 provides examples of inspection strategies from peer agencies.

Table 8. Operational Approach

	SD MTS	MSP Metro	TriMet	WMATA	SACRT
Inspection Strategy	Blanket inspections by train teams on beats Cycle through randomized targeted areas	Sweep vehicles and platforms Avoid targeting individuals	Sweep, do not target individuals Focus on intersecting lines Review citations and include those areas in regular cycles	Target specific areas of evasion based on data Uniformed officers at fare gates and fare zones	Cover entire system Reinforce perception of safety and security Check all tickets Customers want officials present and fares checked.

THE SWEEP STRATEGY

A sweep or blanket inspection of vehicles and fare zone areas is becoming a common practice among transit agencies. Every passenger is asked to show proof of payment. This practice reduces the risk of “profiling”; the targeting of inspections to certain passengers with a specific profile. Accusations of profiling have been leveled against transit agencies and featured in their local media. Some accusations have been accompanied by legal action. Many transit agencies are responding to these allegations by reviewing their inspection strategies to remove the potential for bias.

San Diego’s MTS inspection teams conduct blanket inspections of light rail trains on a routine basis by train teams who work “beats.” A beat is the light rail service between two set stations. Train teams get on a light rail train at a specific station and ride to another specified station.

Sweep inspections are used to **blanket entire vehicles and fare zones** and help agencies avoid allegations that they are targeting individuals or populations.

Metro Transit Police in Minneapolis also use sweeps to control fare evasion. Metro Transit Police officers are required to perform a systematic check of all people starting at one end of the train and proceeding to the other. Officers who are working the platform must check all people as they queue up and must avoid picking out individuals.

Like MTS and Metro Transit, TriMet staff in Portland use sweeps to control fare evasion. Staff start at the ends of a vehicle and move to the center or start at the center and move to the ends. Staff are instructed to sweep entire vehicles and not target individual people.

TARGETED STRATEGIES

Some agencies continue to use targeting as a key element or a component of their enforcement strategy. Targeting enables these agencies to focus their activities, but it can make them more susceptible to allegations of profiling. WMATA in Washington DC, TriMet in Portland, and MTS in Sand Diego each target areas based on fare evasion data.

WMATA uses area targeting as its primary fare enforcement strategy. WMATA police officers analyze crime statistics along with data from bus operators and station agents to identify high crime and high fare evasion areas and then focuses its police activities in those areas. WMATA also positions its police officers near entry and exit gates on its rail system as a deterrent and to target “hoppers” and “piggy-backers.”

Some agencies target fare enforcement areas based on crime statistics or other supporting data, but they *rotate targets* to avoid singling out specific populations or geographies.

TriMet targets areas where transit lines intersect for operational efficiency. It also uses a data-driven methodology to identify potential target areas for fare enforcement. TriMet staff review the number of citations issued in each area and send fare inspection personnel to those inspect fares in those areas. TriMet is careful, however, to avoid targeting specific populations and cycles its inspectors through different areas to help ensure that its approach is reasonable.

Although MTS train teams sweep vehicles and fare zones on their beats, MTS also randomly targets specific sections of a line for their activities. MTS changes its targeted areas so sweep patterns remain unpredictable. MTS also works with local police in its various jurisdictions to conduct joint sweeps.

SUMMARY TABLE

Table 9. Best Practices: Operational Approach

	BEST PRACTICE
Inspection Strategy	The inspection strategy should support the fare enforcement policy. Many agencies employ blanket or sweep operations that cover entire vehicles and fare zones for fairness and completeness.
Discretion to inspectors	Agencies underscore consistency and fairness. Discretion could lead to inconsistent enforcement. Some agencies may afford more discretion to sworn police officers.
Warnings	A clear policy and a clear practice regarding warnings is important. Some agencies do not issue warnings others allow warnings to first time offenders and juveniles.
Removal of evaders	Some agencies remove all evaders. Some agencies may make exceptions such as school-bound juveniles.
Repeat evaders	Tracking recidivism is important. Some agencies have robust internal systems to track repeat offenses, others rely on courts and the legal system.
Inspection Strategy	The inspection strategy should support the fare enforcement policy. Many agencies employ blanket or sweep operations that cover entire vehicles and fare zones for fairness and completeness.

6.4 MANAGEMENT AND MEASUREMENT

Most fare enforcement functions are largely carried out by agency employees, in some cases with assistance from other local agencies or through contracts with private forces. Some agencies use police officers to conduct fare enforcement functions, while others use civilian staff who are specially trained to perform fare inspections and fare enforcement functions. Agencies that use police forces for fare enforcement activities may use both uniformed and plain clothes officers in the function.

AGENCY PERSONNEL AND CONTRACT SECURITY OFFICERS

There is not a single best configuration of personnel for successful fare inspection and enforcement; the type of personnel used for fare inspection and enforcement activities varies by agency. Several peer agencies interviewed use either agency personnel or a mix of agency personnel and contract security officers.

Table 10. Inspection Personnel

	SD MTS	MSP Metro	TriMet	WMATA	SACRT
Inspector Type (personnel, contract, armed)	Agency staff Teams include an armed security agent that can stop but cannot cite	Metro Transit Police Officers	Agency staff Moving to mix of staff and contract personnel	WMATA Police Officers	Agency staff Agency police Local police
Uniformed/ Plain Clothed	Uniformed	Both	Uniformed	Both	Both

WMATA in Washington DC, for example, employs sworn officers to handle its fare enforcement activities. WMATA serves many jurisdictions and its police officers are trained and adept at dealing with varying codes, processes and systems scattered throughout the transit system. Police officers are expert at addressing emergencies and handling crimes in areas of need, and their fare collection activities reflect these priorities.

Metro Transit in Minneapolis also uses police officers for fare enforcement activities. Metro Transit officers provide a uniformed presence in the system and carry fare validators. Metro’s policy is for their officers to support customers and issue warnings for first time offenders.

MTS in San Diego relies on teams of agency personnel supported by security guards. The agency personnel are authorized to issue citations, while the armed security officers are authorized to stop evaders, but not cite them. MTS also works with local police on a regular basis to conduct joint sweeps of its system. Sacramento Regional Transit conducts similar sweeps with teams of local police that it refers to as “Blitzes,” which cover an entire station or **rail consist**. Blitzes also serve as a tool to conduct thorough assessments of fare evasion rates.

TriMet in Portland currently uses agency personnel for its fare enforcement activities. It is also retaining a new contract security service consisting of retired police officers that will supplement agency staff in fare enforcement activities.

Uniformed fare enforcement officers can be a *reassuring presence in the system.*

Regardless of the type of personnel that agencies deploy for their fare enforcement efforts, they each express a consistent message when describing the benefits of their enforcement activities: 1) uniformed fare enforcement personnel are viewed positively by customers who correctly perceive them as an extra presence in the system, and 2) most fare evaders are not criminals, but most criminals who use the transit system are fare evaders.

MONITORING AND TRACKING INSPECTIONS

Agencies *closely monitor the number and rate of inspections, but do not have quotas for citations.*

Many agencies have, or are deploying handheld devices used to validate fares. The devices are an important tool to accurately inspect fares and track inspections. Some agencies require inspectors carry more than one device – one for traditional magnetic and smart card media and one for Smartphones. A number of agencies that require more than one device are actively seeking to consolidate devices, but all report that mobile inspection equipment is a critical tool for monitoring fare enforcement activities.

San Diego MTS, for example, uses handheld devices as well as manual reports from inspectors to generate regular enforcement activity reports. MTS staff monitor and review results from these enforcement activity reports. MTS supervisors and executives routinely investigate unusual or atypical results and use the reports to manage inspection team activities. Some agencies that don't have validators rely on criminal and legal processes to track recidivism.

MEASURING EVASION RATES

Most agencies measure fare evasion through their fare enforcement activities. Evasion rates are simply the percentage of passengers inspected who do *not* possess adequate proof of payment. Further, evasion is defined as the total number of violators (i.e., warnings and citations) rather than citations alone. TriMet conducts an annual survey on its system to measure evasion. Surveyors blanket the system, ask passengers if they have a valid fare, inquire why if they don't and assure them that there are no consequences for their truthful response.

SUMMARY TABLE

Table 11. Best Practices: Management and Measurement

	BEST PRACTICE
Inspector Type	Some agencies employ fare inspectors, others use sworn police officers, some use both and a few are exploring contracted solutions. Some agencies work closely with local police to perform periodic joint sweep operations.
Inspection Devices	Handheld devices to support inspection of fare media, particularly smart cards and smart phone apps are imperative where visual inspection is not possible. Even where visual inspection is possible, inspection devices support tracking and may even be used for eTicketing/eCitations.
Uniformed / Plain clothes	Uniformed fare inspection teams provide the side benefit of uniformed presence in system.
Number of Inspectors	It is imperative to have sufficient inspectors to support proof of payment and supporting enforcement policies and strategies as well as assure a positive customer experience.

DEFINITIONS & ACRONYMS

Table 12. Definitions

TERM	DEFINITION
Acceptable risk	The level at which further risk reduction measures or additional expenditure of resources will not result in significant reduction of risk.
Assets	People, information, and property for which the transportation system is responsible as legal owner, employer, or service provider, which support the agency’s mission of moving people and goods.
Community policing	A proactive approach to policing that focuses on developing and maintaining relationships between police/security officers and civilians to build mutual trust and respect and collaboratively address crime and change negative behavior.
Consequence	The severity of impact and probability of loss for a given scenario. Consequences may be measured in qualitative or quantitative terms.
Crime Prevention Through Environmental Design (CPTED)	A multi-disciplinary approach to deterring criminal behavior through environmental design. CPTED concepts and strategies use the four interrelated principles of natural surveillance, natural access control, territorial reinforcement, and maintenance.
Crime	An illegal action or omission that constitutes an offense or is considered to be evil, shameful, or wrong.
Critical assets	Those assets required to provide services for the system. Critical assets include people (e.g., passengers, employees, visitors etc.), property (e.g., stations and stops, maintenance facilities and yards, rolling stock, tracks etc.), and information (e.g., operations and maintenance procedures, security procedures and assessments, computer network information etc.).
Defense-in-depth	A concept in which multiple layers of security controls (defense) are placed throughout a system. See Layered security.
Emergency	A sudden, urgent, usually unforeseen event during which injury, death, damage to property or a combination thereof may occur.
Fare evasion	When passengers use transit services without paying their required fare.
Incident	An unforeseen event or occurrence with the potential to cause injury or property damage.
Layered security	A security approach that utilizes measures at several different levels or “layers” throughout a system, and at each facility, to provide greater redundancy and defense-in-depth protection for assets and the system. The concept of layered protection recommends placing the most critical or vulnerable asset in the center of concentric levels of increasingly stringent security measures. This allows multiple opportunities for thwarting or disrupting terrorist and criminal activities and is a key aspect of an effective security management strategy.
Maintenance	Allows for the continued use of a space for its intended purpose. It serves as an additional expression of ownership, prevents reduction of visibility from landscaping overgrowth and obstructed or inoperative lighting.
Natural Access Control	The physical guidance of people coming and going from a space by the judicious placement of entrances, exits, fencing, landscaping and lighting.
Natural Surveillance	The placement of physical features, activities and people in such a way as to maximize safety.
Rail consist	The combination of two or more rail cars to form a unit such as a baggage car, passenger cars, and a diner car.

TERM	DEFINITION
Risk	The likelihood of occurrence of a hazardous event, and the severity of the consequence associated with the hazardous event.
Risk assessment	An analysis that examines and evaluates the assets and operations of the system taking into account possible hazards and consequence.
Safety	Freedom from <i>unintentional</i> harm.
Security	Freedom from <i>intentional</i> harm.
Security plan	A document adopted by the transit agency detailing its security policies, objectives, responsibilities and procedures.
System	A composite of people (employees, passengers, others), property (facilities and equipment), environment (physical, social, institutional), and procedures (standard operating, emergency operating, and training), which are integrated to perform a specific operational function in a specific environment.
Territorial Reinforcement	The use of physical attributes that express ownership, such as fences, pavement treatment, art, signage, and landscape.
Terrorism	Intentionally indiscriminate violence as a means to create terror or fear among masses of people or to achieve a religious or political aim.
Threat	Any intentional action with the potential to cause harm in the form of death, injury, destruction, disclosure, interruption of operations, or denial of services.
Threat and Vulnerability Assessment (TVA)	A security risk assessment that is intended to evaluate the system's susceptibility to security threats and to identify vulnerabilities and potential consequence. The TVA forms the basis for security design measures, plans and procedures that are to be implemented to reduce or mitigate security risk.
Vulnerability	Any weakness, flaw or condition that allows and/or can be exploited, for the successful realization of a potential threat against the system and its assets.

Table 13. Acronyms

ACRONYM	MEANING
AASHTO	American Association of State Highway and Transportation Officials
APTA	American Public Transportation Association
BART	Bay Area Rapid Transit
BIPS	Buildings and Infrastructure Protection Series
CATS	Charlotte Area Transit System
CCTV	Closed Circuit Television
COPS	Community Oriented Policing Services (US Department of Justice)
CPTED	Crime Prevention Through Environmental Design
DHS	Department of Homeland Security
DHS	Department of Homeland Security
EWG	East West Gateway Council of Governments

ACRONYM	MEANING
FTA	Federal Transit Administration
FTE	Full-Time Equivalent
IRVS	Integrated Rapid Visual Screening Series
MCTS	Milwaukee County Transit System
MOU	Memorandum Of Understanding
MTA	Metropolitan Transportation Authority (New York)
MTS	Metropolitan Transit System (San Diego)
NIPP	National Infrastructure Protection Plan
NIST	National Institute of Standards and Technology
SacRT	Sacramento Regional Transit District
SOP	Standard Operating Procedure
SSI	Security Sensitive Information
TCRP	Transit Cooperative Research Program
TRB	Transportation Research Board
TriMet	Tri-County Metropolitan Transportation District of Oregon
TSA	Transportation Security Administration
TVA	Threat and Vulnerability Assessment
TVM	Ticket Vending Machine
UTA	Utah Transit Authority
WMATA	Washington Metropolitan Area Transit Authority

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The references below provide further detail on the best practices described in this report and are followed by Table 14 that indicates which best practice(s) each referenced standard document covers. Refer to Appendix A for summaries of each standard document.

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- APTA. 2012b. Security Awareness Training for Transit Employees. APTA Security Risk Management Working Group SS-SRM-RP-005-12 Published March 2012.
- APTA. 2013a. Security Operations for Public Transit. Infrastructure Security Working Group SS-SIS-RP-012-13, Approved March 26, 2013.
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Table 14. Best Practice Area Covered by Referenced Industry Standards

RESOURCE	BEST PRACTICE AREA					
	SECURITY STRATEGY	CPTED	TECHNOLOGY	SECURITY STAFFING	PROCEDURES/ TRAINING	FARE/FARE ENFORCEMENT
APTA and CAPtech, Inc. 2010			X		X	
APTA 2010	X	X				
APTA 2011			X			
APTA 2012a					X	
APTA 2012b					X	X
APTA 2013a	X			X	X	
APTA 2013b					X	
APTA 2014					X	
ASIS International 2004				X	X	
ASIS International 2017					X	
COPS 2009				X	X	
FTA 2003	X				X	
FTA 2004	X	X	X	X	X	
FTA 2008				X		
Henstock, D. and B. Ariel 2015			X			
Local Government Performance Center 2012				X		
MTI 1991	X	X	X	X	X	
NCHRP 2009	X	X	X	X	X	
NCHRP 2014					X	
RTA 2010	X	X			X	
TCRP 1997a				X	X	
TCRP 1997b	X	X	X	X	X	X
TCRP 2000	X			X	X	
TCRP 2002			X		X	
TCRP 2003			X		X	
TCRP 2009	X	X	X	X	X	
TCRP 2011	X		X			
TCRP 2013			X		X	
TCRP 2015	X	X	X	X	X	X

RESOURCE	BEST PRACTICE AREA					
	SECURITY STRATEGY	CPTED	TECHNOLOGY	SECURITY STAFFING	PROCEDURES/ TRAINING	FARE/FARE ENFORCEMENT
TCRP 2016a			X		X	
TCRP 2016b					X	
TCRP 2016c			X		X	
TCRP 2017			X		X	
Yokum, D. A. Ravishankar and A. Coppock 2017			X			

APPENDIX

A SUMMARY OF STANDARDS & BEST PRACTICES

Table 15 below provides additional detail and summaries of the best practices and industry standards documents referenced in this report as they apply to Metrolink. The summary table is intended to provide enough information to identify which document covers the specific information sought after in a given situation at Metrolink. Refer to the source documents for further guidance.

Table 15. Summary of Referenced Industry Standards and Best Practices

RESOURCE	TOPIC(S)	SUMMARY
APTA and CAPtech, Inc. 2010. Rail Station Options [presentation]. Retrieved from https://www.apta.com/mc/fctt/previous/2010fare/Presentation/s/Rail-Station-Options.pdf .	Presentation on different types of TVMs and Validators	Explains the use of different types of TVMs and Validators for various-sized metro agencies.
APTA. 2010. Crime Prevention Through Environmental Design (CPTED) for transit facilities. Transit Infrastructure Security Working Group SS-SIS-RP-007-10, Approved June 24, 2010.	CPTED strategy overview; Applying CPTED strategies	Describes how CPTED emphasizes using the structures, spaces, lighting and people around an area to prevent crime and to increase loss prevention. Strategies include: <ul style="list-style-type: none"> • Risk assessment & CPTED survey - to determine which CPTED principles apply • Training - transit-specific application of CPTED • Accepted industry CPTED strategies <ul style="list-style-type: none"> ○ Natural surveillance - using physical features, activities, people to maximize visibility ○ Natural access control - channeling people into/along/out of spaces, deterring entry ○ Territoriality - psychological deterrent to crime, reinforces boundaries and use ○ Activity support - encouraging authorized use of space to discourage crime ○ Maintenance - demonstrates ownership and intolerance for disorder • Design (including a Design Consideration Checklist) - to help decide which principles may be applicable
APTA. 2011. Selection of Cameras, Digital Recording Systems, Digital High-Speed Networks and Trainlines for Use in Transit-Related CCTV Systems. Recommended Practice. CCTV Standards Working Group IT-CCTV-RP-001-11.	CCTV technology and documentation	Covers types of CCTV technology, storage, frame rates and best uses. Defines evidence handling procedures, documentation for law enforcement (chain of custody). Describes maintenance of equipment. Outlines evidence handling and how to document copying and sharing between partnering police agencies.
APTA. 2012a. Recognizing and Responding to Unattended Packages, Objects and Baggage. APTA Security Risk Management Working Group SS-SRM-RP-007-12. Approved December 2012.	Strategy to understanding unattended packages; what is and isn't a threat	Describes how to recognize and respond to Hidden, Obviously suspicious and not Typical (HOT), i.e., suspicious and nonsuspicious packages. Covers responding to suspicious items and how to escalate.
APTA. 2012b. Security Awareness Training for Transit Employees. APTA Security Risk Management Working Group SS-SRM-RP-005-12, Published March 2012.	Security issues all employees, including contracted should be made aware of and how to handle	Describes how to recognize the difference between normal, suspicious and dangerous activity and define roles in recognizing and reacting to suspicious activity; identify the transit priorities that effective security awareness will protect; recognize transit crimes (trespassing, vandalism, sabotage, personal crimes); address quality of life issues such as smoking on transit, loud raucous, unruly behavior, urination/defecation, alcohol and drug violations, throwing objects, unusual odors and loud music; address fare evasion.

APPENDIX

RESOURCE	TOPIC(S)	SUMMARY
APTA. 2013a. Security Operations for Public Transit. Infrastructure Security Working Group SS-SIS-RP-012-13, Approved March 26, 2013.	Security operations and awareness	Covers strategies for Transit Domain Awareness (TDA); rail sabotage awareness and reporting; Transit Watch; Not On My Shift; The Mark; If you See Something, Say Something; system security awareness; private security officer guidance; Screening of Passengers by Observation Techniques (SPOT); Security Manpower Planning Model (SMPM); and Visible Intermodal Prevention and Response (VIPR).
APTA. 2013b. Transit Incident Drill and Exercises. APTA Security Emergency Management Working Group SS-SEM-S-004-09, Approved June 27, 2009, Revised April 1, 2013.	Guide to effective drills and exercises	Documents how well-designed and well-executed exercises are the most effective means of assessing and validating policies, plans, procedures, training, equipment, assumptions and interagency agreements; clarifying roles and responsibilities; improving interagency coordination and communications; identifying gaps in resources; measuring performance; and identifying opportunities for improvement.
APTA. 2014. Standard for Training of Rail Operating Employees. APTA Rail Transit Operating Practices Working Group APTA RT-OP-S-013-03 Rev 1. Published September 28, 2003, Revised December 31, 2014.	Implementing training and guidelines on how to conduct training	Guide to developing and implementing training for transit systems. Includes training program development, testing phases, qualification, requalification, performance tracking, training program revision, and training documentation.
ASIS International. 2004. Private Security Officer Selection Training Guideline.	Security officer selection and training	Recommends minimum selection and training qualifications to improve the performance of private security officers and the quality of security services. Recommendations based on in-depth research effort, including studying requirements for private security officers from AZ, CA, FL, NY, OR, UT, VA, and ND.
ASIS International. 2017. Mass transit security. Supply Chain and Transportation Council.	Security Awareness by understanding what kind of target transit security is	Covers the role of transit employees in security, including gathering intelligence, surveillance (what to look for regarding suspicious activity) and conducting security tests.
COPS. 2009. Effective policing and crime prevention: A problem-oriented guide for mayors, city managers, and county executives.	Problem-Oriented Guide for Mayors, City Manager, and County Executive	Describes how to create effective policing, understanding the role of policing and crime intervention and how local governments can control and prevent crime and disorder.
FTA. 2003. The Public Transportation System Security and Emergency Preparedness Guide. Retrieved from https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/PlanningGuide.pdf .	Emergency response preparedness. Planning security and emergency within agency and with partners	Designed to assist agencies in compliance with mandatory rail transit safety and security requirements pursuant to CFP Part 659. Addresses procedures, plans, training, technology, and reporting/investigating. Covers security assessments, emergency preparedness program and plans, emergency response drills, security training and connecting communities. Advises to plan first, then spend money on preparedness and security. Transportation personnel should coordinate with local partners to invest in strategies and integration of them.

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RESOURCE	TOPIC(S)	SUMMARY
FTA. 2004. Transit Security Design Considerations. FTA-TRI-MA-26-7085-05. Retrieved from https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/ftasesc.pdf .	Importance of security for transit systems. Access management, systems integration, and communications	Comprehensive report focused on designing and implementing a security strategy. Covers utilizing mobile radio communications, rail communications and control, Operational Control Centers, public communication systems, data sharing systems, alternate communications centers, and network security. Security plans should include measures to deter, detect, minimize (damage), response and recovery.
FTA. 2008. Security Manpower Planning Model. Retrieved from https://www.transit.dot.gov/regulations-and-guidance/safety/security-manpower-planning-model-0 .	Calculating staffing	Provides a decision support tool to enable transit security planners the ability to assess impacts of strategic decisions on resources and staffing. Based on inputted data, the model estimates needed staffing levels and budgeting.
Henstock, D and B. Ariel. 2015. Testing the Effects of Body Worn Video on Police Use of Force during Arrest: A Randomized Controlled Trial. European Journal of Criminology. Retrieved from https://journals.sagepub.com/doi/abs/10.1177/1477370816686120 .	Study on body cameras on police officers	Study of the use of body cameras by British police force that evaluated = actions taken by officers during use of force encounters. Researchers found the odds of use of force were cut in half when body cameras were present.
Local Government Performance Center. 2012. Calculating staffing needs using the relief factor method. Retrieved from www.portal.sao.wa.gov .	Calculating staffing	Outlines steps using a relief factor to identify the appropriate number of security staff per shift of assignment. The resulting relief factor translates to the estimated staff FTEs needed for each post.
MTI. 1991. Designing and Operating Safe and Secure Transit Systems: Assessing Current Practices in the United States and Abroad. MTI Report 04-05. Retrieved from https://transweb.sjsu.edu/research/designing-and-operating-safe-and-secure-transit-systems-assessing-current-practices-united .	Environmental design and planning for a safe and secure system.	Security is based on prevention, and prevention begins with design. Utilizing mirrors, cameras and lighting, new tech to deter crime. Planning for Incident Response, Immediate Response to Incidents, and have a Long-Term Recovery Plan. Security planning includes; policing, security hardware/technology, public education/user outreach, environmental designed strategies. Improved coordination benefits systems as a whole.
NCHRP. 2009. Security 101: A Physical Security Primer for Transportation Agencies. TRB Surface Transportation Security Volume 14.	Risk management and assessment, Plans and strategies, Physical security countermeasures, Security personnel and training, Infrastructure protection, Homeland security	Provides a broad overview of how transportation agencies should approach physical security. Covers security plans and TVAs; security in the design process; funding for security; physical security countermeasures (e.g., signs, telephones, lighting, CCTV, etc.); security personnel, committees, and training; designating and securing critical infrastructure and assets; homeland security laws, statutes, directives, response and plans (e.g., National Infrastructure Protection Plan). Also includes an annotated bibliography in the appendix with additional resources surrounding physical security for transportation systems.

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RESOURCE	TOPIC(S)	SUMMARY
NCHRP. 2014. Incorporating Transportation Security Awareness into Routine State DOT Operations and Training. NCHRP Report 793. Retrieved from https://www.nap.edu/read/22263 .	Understanding what security awareness is and how it relates to agency	Guide for improving security of transportation systems within existing resource and budgetary constraints. Provides an overview to transportation security and covers organizational readiness, security awareness (distinct from security training), core components of a security awareness campaign, and cost-sensitive methods for promoting security awareness. Emphasizes the importance of security awareness for all transportation executives, employees, and contractors.
RTA. 2010. Reclaiming the corner of chaos. Retrieved from https://popcenter.asu.edu/sites/default/files/library/awards/goldstein/2010/10-20(F).pdf .	Application of CPTED principles	Description of the Greater Dayton Regional Transit Authority (RTA) multipronged approach to address crime and public perception of its headquarters and bus hub. Included environmental alterations; education of RTA personnel and police; and targeting of high-rate offenders. Disturbance calls dropped (involving 3 or more police units) from forty-seven (47) incidents in 2009 to only six (6) for first quarter of 2010, with none reaching media attention. Citizen perceptions of the area dramatically improved.
TCRP. 1997a. Guidelines for the Effective Use of Uniformed Transit Police and Security Personnel. TCRP Web Document 15 (Project F-6): Contractor's Final Report.	Uniformed policing and the effectiveness of it	Overview of transit policing, public spaces and fear of crime, and the needs of a transit security manager. Covers using uniformed police in Park and Ride and on the bus lines, station quality-of-life concerns, and maintenance difficulties. Discusses community policing for transit and guidelines for deployment. Uses a variety of agencies for case studies.
TCRP. 1997b. Improving transit security. TCRP Synthesis 21.	Explains various types of safety and security tactics	Discusses the impact of transit violence and the need for reliable transit crime data. Covers physical surveillance and security strategies such as patrols, CPTED, educational/informational campaigns, alarms and access systems.
TCRP. 2000. Developing Useful Transit-Related Crime and Incident Data. TCRP Web Document 18 (Project F-6A): Contractor's Final Report.	Suggested crime data analysis techniques from various transit agencies	Describes methods for collecting, analyzing, and using data on transit-related crime to inform decisions on personnel deployment and allocation of security resources. Recommendations include using dedicated transit police department; dedicated transit crime unit within local police force; and contracts with local law enforcement and/or private security companies.
TCRP. 2002. A Toolkit for Self-Service, Barrier-Free Fare Collection. TCRP Report 80.	Barrier-free fare collections technologies and suggestions	Explains the fundamental practices of self-service, barrier-free fare collection (SSFC) and related benefits and challenges with this style of collection including: comparison of different fare collection strategies, policy and enforcement (e.g., legal authorization for enforcement, measuring evasion rate, inspection strategy etc.), operational (e.g., fare structure, use of electronic fare media, etc.), and capital and equipment (e.g., SSFC, TVM, ticket validators, user interface, etc.).

APPENDIX

RESOURCE	TOPIC(S)	SUMMARY
TCRP. 2003. Intrusion Detection for Public Transportation Facilities Handbook. TCRP Report 86.	Explains the purpose and scope of Intrusion Detection Systems (IDS)	Addresses needs for evaluating and upgrading intrusion detection systems of transit agency facilities (including tunnels, bridges, buildings, power stations, transfer stations, rail yards, bus yards, parking lots) and their transit vehicles (such as buses, trains, support vehicles, and special purpose vehicles). Provides guidance on assessing system needs; developing system designs; and estimating system costs, benefits, and risks. Covers security data management systems (SDMS), intelligence software, sensor systems, video systems, lighting systems.
TCRP. 2009. Transit Security Update. TCRP Synthesis 80.	Counterterrorism and anticrime practices, crime trends, passenger perception of crime, performance metrics	Provides an overview of the state of transit security, including the terrorist threat. Covers passenger perception of crime and terrorism, crime and terrorism trends, security strategies and countermeasures, and data collection and interpretation.
TCRP. 2011. Video Surveillance Uses by Rail Transit Agencies: A Synthesis of Transit Practice. TCRP Synthesis 90.	Video surveillance development, use, and administrative considerations	Documents current use of electronic video surveillance technology by passenger rail agencies and considers the totality of its use, including onboard railcars and along the ROW. Describes administrative policies on monitoring video images; policies on archiving and storing images and access to them by employees, public agencies (e.g., police), and general public; and funding sources for installing new or upgrading existing systems.
TCRP. 2013. Use of Electronic Passenger Information Signage in Transit. TCRP Synthesis 104.	Electronic signage aids in customer satisfaction and opens avenue for private sector	Documents best practice use of electronic passenger information signage using five elements: underlying technology, sign technology, characteristics of the information, resources required, and decision process used to determine its use. Includes case study examples.
TCRP. 2015. Policing and Security Practices for Small- and Medium-Sized Public Transit Systems. TCRP Report 180.	Security risks for medium-sized transit agencies.	Provides baseline options following the 5 stages of protection (prevention, mitigation, preparedness, response, recover) and identifies potential security countermeasures that could be deployed by both small- and medium-sized transit agencies. Intended primarily for transit agency personnel without a security background whose work requires them to address, perform, or supervise security activities as a part of their overall job responsibilities.
TCRP. 2016a. Onboard Camera Applications for Buses. TCRP Synthesis 123.	Cameras provide safety and security of bus operators and passengers	Explores onboard camera current technologies, research, and opportunities. Demonstrates how surveillance systems are used to improve operations, safety, security, training, and customer satisfaction, and how surveillance also allows customers to feel safer and more secure on their rides.

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RESOURCE	TOPIC(S)	SUMMARY
TCRP. 2016b. Transit Agency Practices in Interacting with People Who Are Homeless. TCRP Synthesis 121.	Study on how to communicate and deal with homeless populations on transit systems	Describes effective practices, approaches, and outcomes regarding interactions within the transit industry with people who are homeless. Demonstrates how transit agency and police should work with local shelters/social work entities to deal with the homeless, which has shown to be successful for homeless and improved customer satisfaction.
TCRP. 2016c. Using Pictograms to Make Transit Easier to Navigate for Customers with Communication Barriers. TCRP A-33A Final Report.	Pictogram usage and purpose	Reviews of the effectiveness of using pictograms in communicating emergency information and behavioral modification in a transit emergency to people with communication challenges. Reports that pictograms can be effective but further study is required to identify which universal images convey the messages transit personnel consider most important.
TCRP. 2017. Addressing Difficult Customer Situations. TCRP Synthesis 127.	Guide to dealing with difficult customers	Identifies current practices used by transit agencies to prevent, prepare for, and deal with incidents involving difficult customers or passengers and the variety of circumstances that can arise when they use transit system facilities or vehicles. Covers extensive training of transit personnel and the use of technology to discourage and detect inappropriate behavior.
Yokum, D., A. Ravishankar and A. Coppock. 2017. Evaluating the Effects of Police Body-Worn Cameras: A Randomized Controlled Trial. The LAB @ DC. Retrieved from https://bwc.thelab.dc.gov/TheLabDC_MPD_BWC_Working_Paper_10.20.17.pdf .	Body cameras	Estimate very small average treatment effects on all measured outcomes (e.g., documented use of force, civilian complaints), none of which rose to statistical significance. Concludes expectations for large-scale behavioral changes in policing due to body cameras maybe be over-optimistic.

APPENDIX

B CPTED DESIGN CONSIDERATION CHECKLIST



APPENDIX

Table 16 is a checklist from APTA's *Recommended Practice for Crime Prevention Through Environmental Design for Transit Facilities* (APTA SS-SIS-RP-007-10). This checklist is useful for determining which principles may be applicable to MetroLink.

Table 16. CPTED Design Considerations Checklist (APTA 2010)

PERFORMANCE STANDARD AND FUNCTIONAL AREA CONSIDERATIONS	EVALUATION
<p style="text-align: center;">Building interior <i>Provide natural surveillance for common/open space areas.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Active uses or habitable rooms are positioned with windows adjacent to main common/open space area. <input type="checkbox"/> Adequate lighting is provided in hallways, restrooms, stairways and work areas. <input type="checkbox"/> The building has separate areas for receiving mail, deliveries, etc. <input type="checkbox"/> There is an integrated communication system throughout the building. <input type="checkbox"/> There are no obstructions that prevent visibility through windows. <input type="checkbox"/> Waiting areas and external entries to elevators/stairwells are located close to areas of active use to make them visible from the building entry. <input type="checkbox"/> Seating is in areas of active use. 	<p>Comments or other strategies used:</p>
<p style="text-align: center;">Entrances <i>Provide entries that are clearly visible.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Entrances are designed to allow users to see into them before entering. <input type="checkbox"/> Entrances are clearly identified. 	<p>Comments or other strategies used:</p>
<p style="text-align: center;">Fencing <i>Fence design should maximize surveillance from the street to the building and from the building to the street, and minimize opportunities for intruders to hide.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Front fences are predominantly open in design, such as pickets or wrought iron, or low in height. <input type="checkbox"/> High solid front fences are designed in a manner that incorporates open elements to allow visibility above the height of 5 feet. <input type="checkbox"/> If noise insulation is required, double glazing is installed at the front of the building rather than solid fences higher than 5 feet. 	<p>Comments or other strategies used:</p>
<p style="text-align: center;">Landscaping <i>Avoid landscaping that obstructs natural surveillance and allows intruders to hide.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Trees with dense, low-growth foliage are spaced, or their crowns are raised to avoid a continuous barrier. <input type="checkbox"/> Low groundcover, shrubs a maximum of 24 inches in height, or high-canopied trees (clean trimmed to a height of 8 feet) are used around parking areas and along pedestrian pathways. <input type="checkbox"/> Vegetation that conceals the building entrance from the street is avoided. 	<p>Comments or other strategies used:</p>

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PERFORMANCE STANDARD AND FUNCTIONAL AREA CONSIDERATIONS	EVALUATION
<p style="text-align: center;">Exterior lighting <i>Provide exterior lighting that enhances natural surveillance.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Lighting plan is prepared in accordance with Illuminating Engineering Society of America (IESA) Standards, which addresses project lighting in a comprehensive manner. Lighting approach is consistent with local conditions and crime problems. <input type="checkbox"/> Elevated light fixtures (poles, light standards, etc.) are located in a coordinated manner that provides the desired coverage. The useful ground coverage of an elevated light fixture is roughly twice its height. <input type="checkbox"/> For areas intended to be used at night, lighting supports visibility. Where lighting is placed at a lower height to support visibility for pedestrians, it is vandal-resistant. <input type="checkbox"/> Inset or modulated spaces on a building façade, access/egress routes and signage are well lit. <input type="checkbox"/> In areas used by pedestrians, lighting shines on pedestrian pathways and possible entrapment spaces. <input type="checkbox"/> Lighting takes into account vegetation, in both its current and mature forms, as well as any other element with the potential for blocking light. <input type="checkbox"/> Areas not intended for nighttime use are not lit, to avoid giving a false impression of use or safety. If danger spots are usually vacant at night, then avoid lighting them and close them off to pedestrians. <input type="checkbox"/> “Safe routes” are selected and lit so that these become the focus of legitimate pedestrian activity after dark. <input type="checkbox"/> Light standards and electrical equipment are located away from walls or low buildings to avoid climbing opportunities. <input type="checkbox"/> Photoelectric rather than time switches are used for exterior lighting. <input type="checkbox"/> In areas used primarily by older people, higher levels of brightness are provided in public/common areas. 	<p>Comments or other strategies used:</p>
<p style="text-align: center;">Mix of uses <i>In mixed-use buildings, increase opportunities for natural surveillance while protecting privacy.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Where allowed by city code, ticket kiosks and shops are located on lower floors and offices on upper floors. In this way, office workers can observe the businesses after hours, while the office entrances can be observed by the business during business hours. <input type="checkbox"/> Food kiosks, restaurants, etc. are included within parks and parking structures, if applicable. 	<p>Comments or other strategies used:</p>
<p style="text-align: center;">Security bars, shutters and doors <i>Where used and permitted by building and fire codes, security bars, shutters and doors should allow observation of the street and be consistent with the architectural style of the building.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Security bars and security doors should be visually permeable (see-through). 	<p>Comments or other strategies used:</p>

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PERFORMANCE STANDARD AND FUNCTIONAL AREA CONSIDERATIONS	EVALUATION
<p style="text-align: center;">ACCESS CONTROL</p> <p style="text-align: center;">Building identification</p> <p style="text-align: center;"><i>Ensure that buildings are clearly identified by street number to prevent unintended access and to assist people who are trying to find the building.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Street numbers are plainly visible and legible from the street or road fronting the property. <input type="checkbox"/> Street numbers are made of durable materials, preferably reflective or luminous, and unobstructed (e.g. by foliage). <input type="checkbox"/> For larger projects, location maps (fixed plaque format) and directional signage are provided at public entry points and along internal public routes of travel. 	<p>Comments or other strategies used:</p>
<p style="text-align: center;">Entrances</p> <p style="text-align: center;"><i>Avoid confusion in locating building entrances.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Entrances are easily recognizable through design features and directional signage. <input type="checkbox"/> Entry access into facilities is limited. <input type="checkbox"/> The number of entry points is minimized. 	<p>Comments or other strategies used:</p>
<p style="text-align: center;">Landscaping</p> <p style="text-align: center;"><i>Use vegetation as barriers to deter unauthorized access.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Consider using thorny plants as an effective barrier. 	<p>Comments or other strategies used:</p>
<p style="text-align: center;">Landscaping location</p> <p style="text-align: center;"><i>Avoid placement of vegetation that would enable access to a building or to neighboring buildings.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Large trees, garages, utility structures, fences and gutters are not located next to second- story windows or balconies that could provide a means of access. 	<p>Comments or other strategies used:</p>
<p style="text-align: center;">Security</p> <p style="text-align: center;"><i>Reduce opportunities for unauthorized access.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> There is some kind of active surveillance (CCTV, alarm systems, guard service or police patrols). <input type="checkbox"/> Floor-level windows are made of lexan, polycarbonate, etc. <input type="checkbox"/> Doors to critical areas are secured, or have access control. <input type="checkbox"/> The facility practices key control. <input type="checkbox"/> The facility practices inventory control. <input type="checkbox"/> Tamper-proof locking systems are used for the building and offices. <input type="checkbox"/> Consider the use of security hardware and/or human measures to reduce opportunities for unauthorized access. 	<p>Comments or other strategies used:</p>

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PERFORMANCE STANDARD AND FUNCTIONAL AREA CONSIDERATIONS	EVALUATION
<p style="text-align: center;">Signage <i>Ensure that signage is clearly visible, easy to read and simple to understand.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Strong colors, standard symbols and simple graphics are used for informational signs. <input type="checkbox"/> There is signage to reinforce transition zones and give direction. <p>Surface parking and parking structures:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Upon entering the parking area, both pedestrians and drivers can get a clear understanding of the direction to stairs, elevators and exits. <input type="checkbox"/> In multi-level parking areas, creative signage is used to distinguish among floors to enable users to easily locate their cars. <input type="checkbox"/> Users are advised of security measures that are in place and where to find them — i.e., security phones or the intercom system. <input type="checkbox"/> Signage is provided in the parking area advising users to lock their cars. <input type="checkbox"/> Where exits are closed after hours, this information is indicated at the parking area entrance. 	<p>Comments or other strategies used:</p>
<p style="text-align: center;">OWNERSHIP Maintenance <i>Create a “cared for” perception.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Building is well-maintained. <input type="checkbox"/> Landscaping is well-maintained, to give an impression of ownership, care and security. 	<p>Comments or other strategies used:</p>
<p style="text-align: center;">Materials <i>Use materials that reduce the opportunity for vandalism.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Consider using strong, wear resistant laminate, impervious glazed ceramics, treated masonry products, stainless steel materials, anti-graffiti paints, and clear over sprays to reduce opportunities for vandalism. Avoid flat or porous finishes in area where graffiti is likely to be a problem. <input type="checkbox"/> Where large walls are unavoidable, vegetative screens are used. <input type="checkbox"/> Common areas and/or street furniture are to be made of long-wearing, vandal-resistant materials and are secured by sturdy anchor points, or removed after hours. 	<p>Comments or other strategies used:</p>

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PERFORMANCE STANDARD AND FUNCTIONAL AREA CONSIDERATIONS	EVALUATION
<p style="text-align: center;">STATIONS AND TERMINALS (BUS OR RAIL) (continued)</p> <p style="text-align: center;">Interior layout:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Interior station layout provides unobstructed sight lines, minimizing hidden areas or remote passageways. <input type="checkbox"/> Kiosks, ads and other information are positioned so they don't disrupt sight lines. <input type="checkbox"/> Columns and blind corners are minimized. <input type="checkbox"/> Security mirrors are installed on columns and corners. <input type="checkbox"/> Operator booth is positioned for maximum presence and visibility within station. <input type="checkbox"/> Nonpublic facilities are hidden and not identified. <p style="text-align: center;">Systems and services:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Appropriate surveillance is provided at entrances, at access points to nonpublic areas and throughout the station. <input type="checkbox"/> Sufficient lighting is provided for nighttime surveillance. <input type="checkbox"/> Intrusion alarms are installed at access points to nonpublic areas. <input type="checkbox"/> Communication links to administrative and emergency response centers are provided. <input type="checkbox"/> Backup emergency lighting is installed. 	<p>Comments or other strategies used:</p>
<p style="text-align: center;">ELEVATED STRUCTURES</p> <p style="text-align: center;">Site layout:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Access to land below structure is restricted, where possible. <input type="checkbox"/> Structure is set back from roads, parking areas and other buildings, if possible. <input type="checkbox"/> Physical barriers such as fences, bollards and fenders enforce setbacks and prevent ramming. <input type="checkbox"/> Adjacent roadways are designed to inhibit high-velocity ramming of columns. <input type="checkbox"/> Clear sight lines are provided under and around the structure. <p style="text-align: center;">Interior layout:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Emergency and maintenance access points are limited. <p style="text-align: center;">Architectural features:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Emergency and maintenance access points are secured with gates, locks or other access- control measures. <input type="checkbox"/> "No Trespassing" signage is provided where applicable. <input type="checkbox"/> Columns are made difficult to climb (by choice of materials, dimensions or barriers such as fences). 	<p>Comments or other strategies used:</p>

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PERFORMANCE STANDARD AND FUNCTIONAL AREA CONSIDERATIONS	EVALUATION
<p style="text-align: center;">STRATEGIES FOR TRANSIT STOPS</p> <p style="text-align: center;">Site layout:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Physical barriers such as bollards and fencing are provided to prevent ramming, or to prevent unauthorized access if the stop has a segregated transit way. <p style="text-align: center;">Interior layout:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Kiosks, ads and information are positioned to not disrupt sight lines. <p style="text-align: center;">Architectural features:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Signage deters non-transit vehicles from the stop area. <p style="text-align: center;">Systems and services:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Emergency call boxes are provided to report incidents. <input type="checkbox"/> Adequate lighting is provided for surveillance. 	<p>Comments or other strategies used:</p>
<p style="text-align: center;">ADMINISTRATIVE BUILDINGS AND OCCs</p> <p style="text-align: center;">Site layout:</p> <ul style="list-style-type: none"> <input type="checkbox"/> The number of access points is minimized. <input type="checkbox"/> Building entrances face away from unsecured areas. <input type="checkbox"/> Sight lines are unobstructed around the building. <p style="text-align: center;">Interior layout:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Building layout provides unobstructed sight lines, minimizing hidden areas and blind corners. <p style="text-align: center;">Architectural features</p> <ul style="list-style-type: none"> <input type="checkbox"/> Critical equipment is secured with gates, locks or other access-control measures. <input type="checkbox"/> “No Trespassing” signage is provided where applicable. <input type="checkbox"/> Sufficient lighting is provided for nighttime surveillance. <input type="checkbox"/> Appropriate surveillance and access management system are provided at entrances. <input type="checkbox"/> Backup emergency lighting is provided. 	<p>Comments or other strategies used:</p>

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PERFORMANCE STANDARD AND FUNCTIONAL AREA CONSIDERATIONS	EVALUATION
<p style="text-align: center;">MAINTENANCE AND STORAGE FACILITIES</p> <p style="text-align: center;">Site layout:</p> <ul style="list-style-type: none"><input type="checkbox"/> Structure and vehicle-storage areas are set back from roads and public parking areas.<input type="checkbox"/> Physical barriers such as bollards, fencing and grade changes are used to enforce setbacks and secure the perimeter.<input type="checkbox"/> The number of access points is minimized.<input type="checkbox"/> Staffed security checkpoints are provided at site access points.<input type="checkbox"/> Sight lines are unobstructed throughout the site.<input type="checkbox"/> The parking area is segregated from transit vehicles and fuel storage. <p style="text-align: center;">Interior layout:</p> <ul style="list-style-type: none"><input type="checkbox"/> Building layout provides unobstructed sight lines, minimizing hidden areas and blind corners. <p style="text-align: center;">Architectural features:</p> <ul style="list-style-type: none"><input type="checkbox"/> Rolling doors restrict view or access into maintenance barns.<input type="checkbox"/> Critical equipment is secured with gates, locks or other access-control measures. <p style="text-align: center;">System and services:</p> <ul style="list-style-type: none"><input type="checkbox"/> Remote surveillance and alarm systems are installed.<input type="checkbox"/> Sufficient lighting is provided for nighttime surveillance.<input type="checkbox"/> Backup emergency lighting is provided.	<p>Comments or other strategies used:</p>

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PERFORMANCE STANDARD AND FUNCTIONAL AREA CONSIDERATIONS	EVALUATION
<p style="text-align: center;">TRACK, TUNNEL AND RIGHT OF WAY (RAIL ONLY)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Tracks and track right-of-way are protected against encroachment and unauthorized access. <input type="checkbox"/> Vegetation is eliminated from the track right-of-way and kept low in the areas adjacent to tracks. <input type="checkbox"/> Signage warns of potential dangers. <input type="checkbox"/> Natural barriers are used whenever possible. <input type="checkbox"/> Clearly identified boundary lines are established. <input type="checkbox"/> Tunnels are adequately illuminated. <input type="checkbox"/> Rooms, used or unused, are well-secured. <input type="checkbox"/> Intrusion detection prevents unauthorized entrance into tunnels, exits and ventilation shafts. <input type="checkbox"/> Access control is provided for employees into tunnels, shafts, etc. <input type="checkbox"/> Provisions are made for people to call for help. <input type="checkbox"/> Walkways are clearly identified. <input type="checkbox"/> Access points are isolated from public roadways and parking areas. <input type="checkbox"/> Physical barriers such as ditches, bollards, road spikes and fencing are provided around portals and other access points. <input type="checkbox"/> Vent ducts are situated in self-contained secure buildings, locked, elevated and hidden. <input type="checkbox"/> Tunnels do not contain unnecessary niches that may conceal people or explosives. <input type="checkbox"/> Physical barriers shield tunnel walkway from platform or portal access. <input type="checkbox"/> Emergency exit doors lock from the outside but allow unimpeded egress during emergencies. <input type="checkbox"/> Solid access doors are provided to ventilation shafts whenever grating is unnecessary. <input type="checkbox"/> "No Trespassing" signage is provided where applicable. 	<p>Comments or other strategies used:</p>