



APTA SS-ISS-RP-010-26

First Published: October 12, 2026

Infrastructure and Systems Security
Working Group

Approaches to Determine the Criticality of Transit Assets

Abstract: This recommended practice provides considerations and approaches to assist transit agencies in determining the criticality of transit assets. Determining asset criticality is typically an early step required by risk, threat and vulnerability assessments, as it helps transit agencies prioritize analyses, resources and protective measures on an agency's most critical assets.

Keywords: asset criticality, Public Transportation Risk Assessment Methodology (PT-RAM), qualitative assessment, quantitative assessment, risk assessment, transit assets

Summary: The first step in conducting risk, threat and vulnerability assessments is to identify assets that require protection. Assets are typically defined as people, property and information. Every asset has a unique risk profile, influenced by factors such as its attractiveness to adversaries and significance to the transit system's operations. By determining the criticality of their assets, transit agencies can prioritize attention on their most critical components. Asset criticality is measured relative to an asset's contribution to transit agency functionality and operations.



Foreword

The American Public Transportation Association is a standards development organization in North America. The process of developing standards is managed by the APTA Standards Program's Standards Development Oversight Council (SDOC). These activities are carried out through several standards policy and planning committees that have been established to address specific transportation modes, safety and security requirements, interoperability, and other topics.

APTA used a consensus-based process to develop this document and its continued maintenance, which is detailed in the [manual for the APTA Standards Program](#). This document was drafted in accordance with the approval criteria and editorial policy as described. Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

This document was prepared by the Infrastructure and Systems Security Working Group as directed by the Security and Emergency Management Standards Policy and Planning Committee.

This document represents a common viewpoint of those parties concerned with its provisions, namely transit operating/planning agencies, manufacturers, consultants, engineers and general interest groups. The application of any recommended practices or guidelines contained herein is voluntary. APTA standards are mandatory to the extent incorporated by an applicable statute or regulation. In some cases, federal and/or state regulations govern portions of a transit agency's operations. In cases where there is a conflict or contradiction between an applicable law or regulation and this document, consult with a legal adviser to determine which document takes precedence.

This is a new document.



Table of Contents

Foreword	ii
Participants.....	iv
Introduction.....	iv
Scope and purpose	iv
1. Overview	1
1.1 Stakeholder considerations	1
1.2 Benefits	1
2. Transit agency assets.....	1
2.1 Asset identification	2
2.2 Stakeholder involvement in asset identification	3
3. Asset criticality assessment.....	3
3.1 Public Transportation Risk Assessment Methodology	3
3.2 Quantitative criticality assessment method.....	3
3.3 Qualitative criticality assessment method.....	6
Related APTA standards.....	9
References.....	9
Definitions.....	9
Abbreviations and acronyms.....	10
Document history.....	10

List of Figures and Tables

Figure 1 Transit Agency Assets	2
Figure 2 PT-RAM Asset Categories and Specific Assets for Bus Systems	3
Table 1 Criticality Attributes and Sample Weighting Values	4
Table 2 Sample Rating Value Guidance.....	5
Table 3 Critical Asset Worksheet.....	5
Table 4 Sample Asset Criticality Assessment of Transit Center	6
Table 5 Sample Asset Criticality Assessment of Communications Tower	6
Table 6 Sample Criticality Rating of Rail Assets.....	7
Table 7 Sample Criticality Rating of Bus Assets	8



Participants

The American Public Transportation Association greatly appreciates the contributions of the **Infrastructure and Systems Security Working Group**, which provided the primary effort in the drafting of this document.

At the time this standard was completed, the working group included the following members:

Branden Porter, *Sound Transit*, Chair

Pat Williams, *TriMet*, Vice Chair

Aldon Bordenave, *LA Metro*

Neil Crosier, *King County Metro*

Fred Damron, *TSA*

Matthew Dimmick, *STV*

Tony Easterling, *TSA*

Dean Fajerski, *TSA*

Kevin Franklin, *Bay Area Rapid Transit*

Michelle Gorman, *New York City Police Dept.*

Chris McKay, *TSA*

Maurice McKinney, *WMATA*

Michael Mackesy, *IK Systems*

John Plante, *METRA*

Harry Saporta, *WSP USA*

Jill Shaw, *Dallas Area Rapid Transit*

Lurae Stuart, *WSP USA*

Kirsten Tilleman, *WSP USA*

Mark Uccardi, *Booz Allen Hamilton*

Project team

Polly Hanson, *American Public Transportation Association*

Eric Halzel, *Eagle Hill Consulting*

Introduction

This introduction is not part of APTA SS-ISS-RP-010-26, "Approaches to Determine the Criticality of Transit Assets."

APTA recommends the use of this document by:

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

Scope and purpose

This document provides considerations and establishes recommended practices to assist transit agencies in determining the criticality of agency assets. APTA recommends the use of this recommended practice by any entity, public or private, that regulates, inspects, designs, specifies, builds, maintains and/or operates public transportation systems.

Approaches to Determine the Criticality of Transit Assets

1. Overview

Transit agencies are responsible for protecting their assets from security risk. The identification of critical assets is the first step of a security risk assessment process. Each asset carries a distinct risk profile, influenced by factors such as desirability as a target and importance to the overall transit system's operations.

After identifying critical assets, transit agencies should determine the level of criticality of those assets compared with one another. This ranking of critical assets determines the relative importance of protecting agency assets and helps agencies prioritize resourcing to the most important assets.

1.1 Stakeholder considerations

Security for transit systems should be based on the assessed risk to the system to ensure that resources are allocated judiciously and provide the optimal benefits to the transit system's security. Consideration should be given to the needs and requirements of agency operations, security, and other stakeholders.

1.2 Benefits

Transit and rail agencies that apply this standard to their transit operation will:

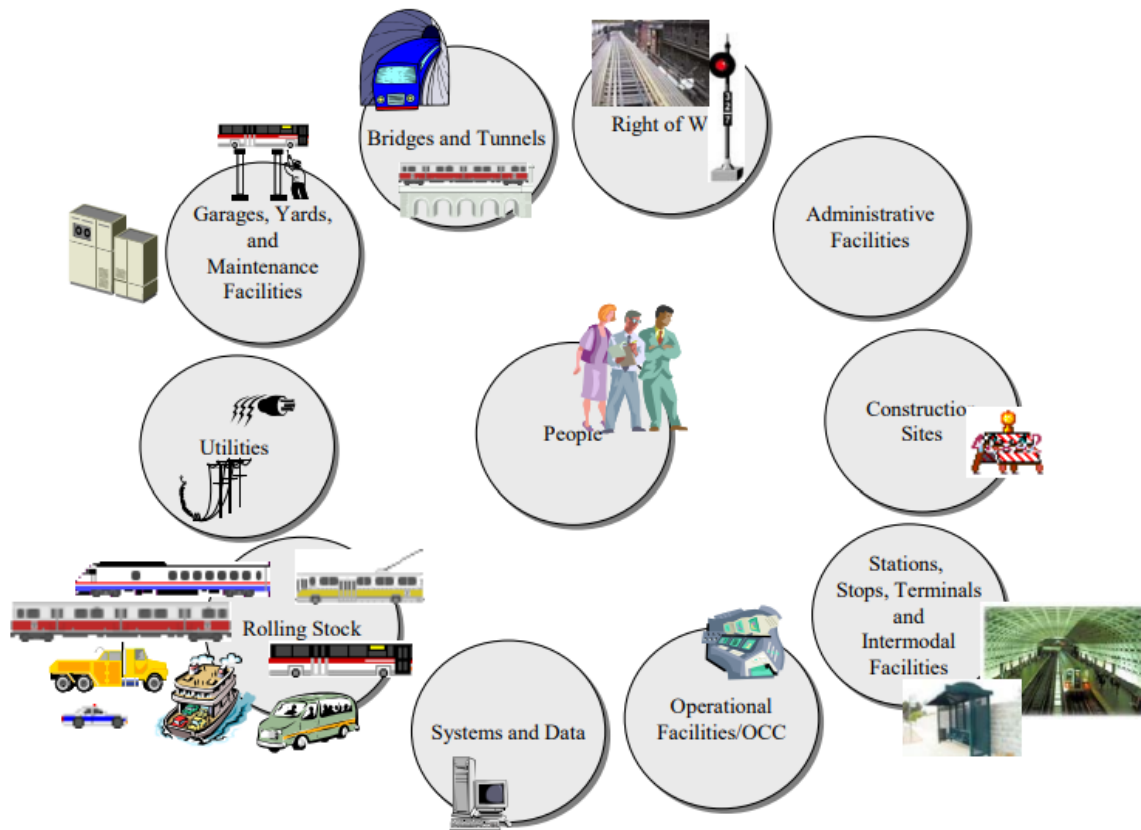
- understand how to identify and assess asset criticality to their transit system and system elements;
- measure the value of an asset in support of transit operations;
- measure an event against the severity or consequence to define security risk;
- provide a basis to allocate resources for the protection of assets; and
- have a reliable, repeatable methodology in the assessment of asset criticality.

2. Transit agency assets

The process of assessing security risk begins by identifying and categorizing transit agency assets critical to operations (see [Figure 1](#)). Agencies should then evaluate and rank assets based on their level of importance to the transit agency. Assets are defined as the following:

- **People:** Passengers, employees, visitors, vendors, surrounding businesses and communities, and contractors working within the transit environment.
- **Property:** Including but not limited to stations and stops, maintenance facilities and yards, administration facilities, control or dispatch centers, rolling stock, tracks, tunnel portals, bridges, crossing protection devices, parking facilities, 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, and passwords and facility access codes.

FIGURE 1
Transit Agency Assets



Source: FTA Security Design Considerations Final Report 2004

Critical assets are essential assets that agencies require to deliver services or maintain operational functionality within the transit system.

2.1 Asset identification

The objective of asset identification is to prioritize the protection of assets critical to public transportation services. Given the vast number of assets, a criticality assessment helps agencies focus on those crucial for transit agency operations. It is important to note that not all assets are critical, and not all assets should be equally protected. Asset criticality is measured relative to an asset's contribution to transit agency functionality and operations rather than on consequences. It is used to narrow down and prioritize assets for inclusion in the security assessment process.

Assets are generally evaluated based on their intrinsic or monetary value; however, their criticality in physical and operational contexts is proportional to their importance to transit operations. Key factors determining asset criticality include the asset's function, the dependence of transit agency operations on the asset and its monetary value. The asset assessment process involves identifying personnel, property/material and information assets that are essential for providing transit services and functions. Together these factors indicate the conditions, impacts and capabilities that establish an asset as critical.

Assets typically consist of smaller subsystems. For instance, maintenance facilities comprise various subsystems such as tracks, maintenance buildings, storage yards, and bus/rail wash units, among others.

These facilities are usually assessed as a single entity. Additionally, assets with similar physical characteristics and levels of importance should be grouped together. For example, train control and signal rooms, communication rooms, and traction power substations should each be evaluated as individual asset groups.

2.2 Stakeholder involvement in asset identification

Transit agencies should assemble a group, or hold an asset criticality workshop, to identify major transit system assets, define the operational physical attributes of those assets, assess the impacts if the asset is lost, determine the potential replacement costs of the assets, and rank the assets in terms of criticality to operations functionality. The group or workshop should include transit agency operations, maintenance and asset management personnel, as well as security personnel or staff assigned security responsibilities.

3. Asset criticality assessment

Transit agencies may determine asset criticality using quantitative or qualitative approaches. Quantitative analyses use numerical-based models to measure criticality. Qualitative asset rating applies descriptive measures that rely on stakeholders' judgment to determine the value and impact of an asset.

3.1 Public Transportation Risk Assessment Methodology

The Federal Emergency Management Agency and the Transportation Security Administration collaboratively developed the Public Transportation Risk Assessment Methodology (PT-RAM). PT-RAM applies a quantitative process to assess relative risks associated with acts of terrorism and natural disasters. FEMA uses PT-RAM to measure the return on investment (i.e., risk reductions) by FEMA's Transit Security Grant Program (TSGP). Accordingly, FEMA requires transit agencies to use PT-RAM methodology when applying for TSGP grant funding.

The PT-RAM guide identifies asset categories and specific assets for bus, commuter rail, heavy rail, light rail/trolley and ferry systems. PT-RAM asset categories for bus systems are shown in **Figure 2**. After identifying assets for their systems, transit agencies assign values to each asset using a range from 0 to 5 in increments of 0.25. The higher the value, the more critical the asset. PT-RAM recommends leveraging an expert panel to assign values.

FIGURE 2
PT-RAM Asset Categories and Specific Assets for Bus Systems

<i>Asset Category</i>	<i>Specific Asset</i>
Bus System Public Area	Headquarters Building
	System Owned Bus Station
Bus System Rolling Stock	Bus - Type 1
	Bus - Type 2
Bus System Control	Dispatch/Control Center
	Cyber Systems
Bus System Support	Fueling Facilities/Depots
	Maintenance Barns/Facilities

Please see FEMA's PT-RAM user guide for detailed instructions on its asset criticality scoring methodology.

3.2 Quantitative criticality assessment method

A quantitative alternative to PT-RAM uses a process that assigns a criticality value based on an asset's functional importance (criticality attribute) and how heavily transit agencies weigh that importance

APTA SS-ISS-RP-010-26
Approaches to Determine the Criticality of Transit Assets

(weighting value). Collectively, these factors show the conditions and capabilities that make the asset critical to facilitate scoring and prioritization.

Ultimately, transit agencies express weightings as numbers, showing how much influence each attribute has compared with others. A higher weighting value means greater significance or importance.

Table 1 lists example criticality attributes that transit agencies should consider when evaluating assets. However, transit agencies should review and revise provided criticality attributes and weighting values to tailor the criteria to each agency's unique circumstances and perspectives. Transit agency stakeholders should agree upon criticality attributes and weighting values early in the criticality assessment process and keep them the same for every asset they evaluate.

TABLE 1
Criticality Attributes and Sample Weighting Values

Criticality Attribute	Weighting Value ¹	Definition
Exposed population	0.30	The number of transit customers, employees, contractors and the general public who may be present at an asset at a specific time (e.g., peak hour, facility business hours). For assets such as bridges and tunnels, this would include multiple occupied trains or buses. The number of people directly affected by the asset's functionality often carries the most weight.
Operational/functional importance	0.25	The importance of the asset to the transit agency's operations. Ensuring the transit system's overall function depends on the role of critical assets, thus making this factor essential.
Replacement cost	0.10	This represents the estimated capital investment necessary to replace the asset. Though relevant, cost often plays a lesser role compared with human safety and operational importance.
Alternative availability	0.10	These are other assets that are immediately available to undertake the function or activity, for example alternate bridges.
Economic impact	0.10	Describes the significance of the asset to the region's economy. It outlines the potential effects on local and regional businesses, transit users, and other stakeholders if the asset were lost. While important, economic influence may not outweigh safety and operational concerns.
Importance to emergency response	0.15	The asset's role in the transit agency or city/regional emergency response activities and planning, whether through direct services or by facilitating access to emergency services. Assets of high importance to emergency response may include an Operations Control Center and Emergency Operations Center that coordinate response efforts, a critical bridge, or vehicles essential for mass evacuation of a city.

1. The sum of the weighting values should equal 1, as the weightings represent relative value.

The next step is to assign a rating to each asset attribute. **Table 2** provides an example to guide ratings, but transit agencies should adjust the scoring range for each critical attribute as needed. Transit agencies should typically assign a high weight value to facilities with people present. For example, a crowded revenue vehicle during rush hour would receive a high rating. On the other hand, a communications room (i.e., a small, secure space inside a facility that houses critical telecommunications and IT equipment) may get a low rating since employees are rarely present.

APTA SS-ISS-RP-010-26
Approaches to Determine the Criticality of Transit Assets

TABLE 2
Sample Rating Value Guidance

Criticality Attribute	Rating Value
Exposed population	1: 0 2: 1–10 3: 11–50 4: 51–100 5: >100
Operational/functional importance	1: Very low 2: Low 3: Medium 4: High 5: Very high
Replacement cost	1: \$500,000 or less 2: >\$500,000 to \$5 million 3: >\$5 million to \$10 million 4: >\$10 million to \$20 million 5: >\$20 million
Alternative availability	1: Full redundancy 2: Partial redundancy 3: No redundancy
Economic impact	1: Low 2: Medium 3: High 4: Very high
Importance to emergency response	1: Very low 2: Low 3: Medium 4: High 5: Very high

Table 3 is a sample asset criticality analysis worksheet.

TABLE 3
Critical Asset Worksheet

Criticality Attribute	Attribute Weighting Value (Table 1)	Rating Value (Table 2)	Sub-Criticality Score (Weighting Value x Rating Value)	Comments
Exposed population	0.30	4	1.20	
Operational/functional importance	0.25	4	1.00	
Replacement cost	0.10	2	0.20	
Alternative availability	0.10	2	0.20	
Economic impact	0.10	3	0.30	
Importance to emergency response	0.15	3	0.45	
Total asset criticality (sum of criticality scores):			3.35	

APTA SS-ISS-RP-010-26
Approaches to Determine the Criticality of Transit Assets

Table 4 and **Table 5** provide examples to compare asset criticality assessments.

TABLE 4
Sample Asset Criticality Assessment of Transit Center

Criticality Attribute	Attribute Weighting Value	Rating Value	Sub-Criticality Score	Comments
Exposed population	0.30	4	1.20	
Operational/functional importance	0.25	4	1.00	
Replacement cost	0.10	2	0.20	
Alternative availability	0.10	2	0.20	
Economic impact	0.10	3	0.30	
Importance to emergency response	0.15	3	0.45	
Total asset criticality (sum of criticality scores):			3.35	

TABLE 5
Sample Asset Criticality Assessment of Communications Tower

Criticality Attribute	Attribute Weighting Value	Rating Value	Sub-Criticality Score	Comments
Exposed population	0.30	1	0.30	
Operational/functional importance	0.25	4	1.00	
Replacement cost	0.10	2	0.20	
Alternative availability	0.10	2	0.20	
Economic impact	0.10	1	0.10	
Importance to emergency response	0.15	3	0.45	
Total asset criticality (sum of criticality scores):			2.25	

A comparison of **Table 4** and **Table 5** reveals that transit centers are more critical than communication towers. Therefore, transit agencies should prioritize transit centers in their initial threat and vulnerability assessments because these centers may need more protection from terrorist or criminal activity.

3.3 Qualitative criticality assessment method

Transit agencies may also apply a qualitative criticality assessment using terms such as “High” and “Low” to evaluate and measure criticality. Similar to quantitative assessments, transit agencies should assign criticality values to assets based on the potential impact on people (passenger, transport employees and vendors) and the ability of the system to sustain transit operations and services. Transit agencies should assign a criticality rating of “High” to assets that have great concentrations of people or whose loss would significantly impact transportation services. Conversely, transit agencies should assign a rating of “Low” to assets where the loss would not significantly affect transit services.

APTA SS-ISS-RP-010-26
Approaches to Determine the Criticality of Transit Assets

Certain assets may have different criticality values in different contexts and under varying conditions. As an example, a bus vehicle has a very low criticality when it is out of service and empty because its loss will likely not result in fatalities, nor have a significant financial or operational impact. A fleet of bus vehicles, however, even when empty, would be more critical to a transit system's ability to operate service if compromised. A single bus vehicle filled with passengers has increased criticality due to the potential for loss of life and injury. Criticality may therefore change temporally based on ridership cycles or specific utilization of a specific asset, so some assets may have a "Low–High" rating. Transit agencies should evaluate each asset and determine the most appropriate rating for its operations and services.

Table 6 and **Table 7** illustrate example qualitative asset criticality assessments for rail and bus assets.

TABLE 6
Sample Criticality Rating of Rail Assets

Asset	Criticality ¹	
	People	System
Communications/SCADA systems	Medium	High
Grade crossings and automatic warning devices	Medium–High	Low
Track/track structures	Low–High	High
Signals/switches/interlockings	Low–High	Low–Medium
Electrification systems (third rail, overhead contact system, etc.)	Low	High
Heavy maintenance facility	Low	Medium–High
Storage yard	Low	High
Service and inspection facilities	Low	Medium–High
Wayside support and maintenance facilities	Low	Low–Medium
Ancillary facilities and storage	Low	Low
Station	High	Medium–High
Platform	High	Medium
Transit Center	High	Low
Multiuse/intermodal facility (parking garage, commuter rail, light rail, bus)	High	Medium–High
Park-and-ride facility	Low–Medium	Low
Rail vehicles	High	Low–Medium
Operations Control Center	Medium	Medium–High
Revenue collection facility	Low	Medium
Administrative facilities	Medium–High	Medium–High
Employee parking lots/facilities	Low–Medium	Low
Transit police/security facilities	Medium–High	Medium–High

1. Degree of impact is dependent on the time of day an incident occurs and/or its location.

APTA SS-ISS-RP-010-26
Approaches to Determine the Criticality of Transit Assets

TABLE 7
Sample Criticality Rating of Bus Assets

Assets	Criticality ¹	
	People	Systems
Station	High	Medium–High
Transit center	High	Low
Multiuse/intermodal connection	High	Low–Medium
Bus stops and shelters	Medium–High	Low
ITS technology	Low	Low–Medium
Buses and vans	Medium–High	Low
Parking lots	Low–Medium	Low
Bus yards and storage facilities	Low	High
Heavy repair facilities	Low	Low–Medium
Service and inspection facilities	Low	Low–Medium
Inventory and storage facilities	Low	Medium
Fuel and alternative fuel facilities	Low	High
Communications systems	Low	Medium–High
Revenue collection facility	Low	Med
Multiuse/intermodal facility (parking garage, commuter rail, light rail, bus)	High	Low
Park-and-ride facility	Low–Medium	Low
Operations Control Center	Low	High
Administrative facilities	Medium–High	Medium–High
Employee parking lots/facilities	Low–Medium	Low
Transit police/security facilities	Medium–High	Medium–High

1. Degree of impact is dependent on the time of day an incident occurs and/or location.

Related APTA standards

APTA SS-SIS-S-017-21, “Security Risk Assessment Methodology for Public Transit”

APTA SUDS-TAM-RP-010-21, “Using Asset Criticality to Make More Informed Decisions in a Transit Agency”

References

American Society of Industrial Security, “Security Risk Assessment,” ASIS SRA-2024.

<https://store.asisonline.org/security-risk-assessment-standard-asis-sra-2024-softcover.html>

Atlas, R.I., “21st Century Security and CPTED: Designing for Critical Infrastructure Protection and Crime Prevention,” 2nd Edition, CRC Press, Taylor & Francis Group, Boca Raton, Florida, 2013.

Department of Homeland Security, “Supplemental Tool: Executing a Critical Infrastructure Risk Management Approach,” December 2020. https://emilms.fema.gov/is_0860c/groups/76.html#

General Accounting Office, “Domestic Terrorism: Prevention Efforts in Selected Federal Courts and Mass Transit Systems,” June 1998. <https://www.gao.gov/products/pemd-88-22>

Federal Transit Administration, “Transit Security Design Considerations,” FTA-TRI-MA-26-7085-05, November 2004. <https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/ftasesc.pdf>

Federal Transit Administration, “The Public Transportation System Security and Emergency Preparedness Planning Guide,” DOT-FTA-MA-26-5019-03-01, January 2003. <https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/PlanningGuide.pdf>

Transport Canada, “Code of Practice on Conducting Security Risk Assessments of Rail and Operations,” 2010. <https://publications.gc.ca/pub?id=365500&sl=0>

Transportation Security Administration, “Public Transportation Risk Assessment Methodology (PT-RAM).”

Definitions

asset: People, information, and property for which the public transportation system is responsible as legal owner, employer or service provider.

asset identification: Means of identifying and representing assets for the purpose of criticality assessment.

criteria: List of factors against which asset criticality is measured.

critical assets: A subcategory of assets whose loss has the greatest consequences for people and the ability of the system to sustain service. These assets may require higher or special protection.

criticality: The value assigned to each representative asset to place that asset in context with all other system assets. This factor demonstrates the importance of the asset to the system’s operation and functionality.

operations: Transit agency transportation and maintenance services.

APTA SS-ISS-RP-010-26
Approaches to Determine the Criticality of Transit Assets

risk assessment: A formal, methodical process used to evaluate risks to a transit system. The security portion of the risk assessment identifies security threats (both terrorism and crime) to the transit system; evaluates system vulnerabilities to those threats; and determines the consequences to people, equipment and property.

sub-asset: A sub-element of the affected asset impacted by the security risk (e.g., fuel farm, communications router).

transit agency: The organization that operates transit service and other related transportation services.

weighted scoring: A means of allocating scores to achieve a total score indicating asset criticality.

Abbreviations and acronyms

FEMA	Federal Emergency Management Agency
IT	information technology
ITS	intelligent transportation system
PT-RAM	Public Transportation Risk Assessment Methodology
TSA	Transportation Security Administration
TSGP	Transit Security Grant Program

Document history

Document Version	Working Group Vote	Public Comment/ Technical Oversight	CEO Approval	Policy & Planning Approval	Publish Date
First published	Aug. 8, 2025	Oct. 2, 2025	Oct. 26, 2025	Nov. 28, 2025	Oct. 12, 2026