



MODSafe

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MODSafe Modular Urban Transport Safety and Security
Analysis**

MODSAFE Glossary

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1. Introduction

This document defines the significant Terms and Abbreviations used in MODSAFE project.

The purpose of this MODSAFE Glossary is:

- to gather all terms and abbreviations that are used by the different work packages of MODSAFE: it will therefore facilitate the common understanding of terms and abbreviations at a System level and allow to avoid the inconsistencies between definitions used in different deliverables.
- to simplify the content of the glossaries to be defined for each MODSAFE deliverable: hence, for a given deliverable, its glossary will only include terms and abbreviations that are specific to this deliverable.

In the following table (§2):

- the column “source” lists the original and official documents from which are issued the definition of the terms and abbreviations used in MODSAFE (see below)

The list of documents and glossaries that were consulted is as follows:

- MODURBAN deliverable D129: MODSAFE Glossary
- IEC 61508-4:2010: Functional safety of electrical/electronic/ programmable electronic safety-related systems – Part 4: Definitions and abbreviations
- EN 50126-1:1999: Railway applications – The specification and demonstration of reliability, availability, maintainability and safety (RAMS) – Part 1: Basic requirements and generic process
- CLC/TR 50126-2:2007: Railway applications – The specification and demonstration of reliability, availability, maintainability and safety (RAMS) – Part 2: Guide to the application of EN 50126 for safety
- EN 50129:2003: Railway applications – Communication, signalling and processing systems – Safety related electronic systems for signalling
- CLC/TR 50506-2:2009: Railway applications – Communication, signalling and processing systems – Application Guide for EN 50129 – Part 2: Safety assurance
- EN 45020:1998: Standardization and related activities. General vocabulary
- Directive 96/48/EC of 23 July 1996 on the interoperability of the trans-European high-speed rail system
- TSI Control/Command and Signalling for High Speed and Conventional Rail Systems
- EEIG General Glossary – Version 2 (see ERTMS initiative)
- ERTMS /ETCS Functional Requirements Specification – FRS: V 4.29
- Subset 023 ERTMS: 2000: Glossary of terms and abbreviations
- IEC 62290-1:2006: Railway applications - Urban guided transport management and command/control systems - Part 1: System principles and fundamental concepts
- IEC 62290-2:2011: Railway applications - Urban guided transport management and command/control systems - Part 2: Functional requirements specification
- IEC 62267:2009: Railway applications - Automated Urban Guided Transport (AUGT) – Safety requirements
- IEEE P1474-2004 (R2009): Communications – Based Train Control (CBTC) Performance and Functional Requirements
- ISO/IEC Directives, Part 2, 2004 (Rules for the structure and drafting of International Standards)
- IEC/UIC 60050-821:1998: International Electrotechnical Vocabulary Part 821: Signalling and security apparatus for railways
- Metro Railway Signalling (IRSE, London 2003)

- CA & SE, LLC, NCHRP Report 525 Surface transportation Security Vol. 14, November 2009: Security 101: A Physical Security Primer for Transportation Agencies
- EU project COUNTERACT, D 3 PT4, SSP4/2005/TREN/05/FP6/S07.4889 1, March 2007: Generic guidelines for conducting risk assessment in public transport networks
- Volpe Risk Assessment and Prioritization, Volpe Journal, 2003
- US, MITRE Corporation: "How Do You Assess Your Organization's Cyber Threat Level?" By Deb Bodeau, Jenn Fabius-Greene, and Rich Graubart
- Commission regulation (EC) No 352/2009: Adoption of a common safety method on risk evaluation and assessment as referred to in Article 6(3)(a) of Directive 2004/49/EC
- Directive 96/48/EC, 23 July 1996: the interoperability of the trans-European high speed rail system
- UK CPNI Good Practice Guide: "Process control and SCADA security"
- International Telecommunication Union (ITU) ITU-T Study Group 17
- Council Framework Decision 2002/475/JHA of 13 June 2002 on combating terrorism

Any term not given a source reference is by definition a MODSAFE defined term. Some terms from the references have been redefined to match the context. These are now MODSAFE defined terms.

2. Terms and definitions

Term	Description	Source
Acceptance	The status given to a product by a final user. In case of urban guided transport (UGT-) system the final user is the operator, so the acceptance shows the operator's positive opinion about a specified technical system. (This does not necessarily mean a final permission for putting the system into service, as in many cases further permissions are also required, like e.g. independent safety assessment or certification)	
Accident	An accident is an unintended event or series of events that results in death, injury, loss of a system or service, or environmental damage.	EN 50129
Approval	The final (formal) decision to permit to use a system, regardless of which body, authority or institution makes this final decision. (In some cases the final decision is made by the operator – in these cases acceptance and approval may cover the same activity.)	
Assessment	The undertaking of an investigation in order to arrive at a judgement, based on evidence, of the suitability of a product.	EN 50126
Asset	Person, facility, activity or system that presents value to its owner or to the society as a whole.	
Assurance	Level of guarantee that a security system will behave as expected.	
Authorisation/Approval	The Formal permission to use a product within specified application constraints.	EN 50129
Automatic Train Protection	The functionality which maintains the safety of train movement.	MODURBAN
Availability	The proportion of time that an item is capable of operating to specification within a large time interval.	MODURBAN
Biological agents	Living organisms or the materials derived from them that cause disease in or harm to humans, animals, or plants or cause deterioration of material. Biological agents may be used as liquid droplets, aerosols, or dry powders.	^a
Central command & control centre	Multipurpose control centre integrating all the necessary functions to operate a UGT system and to conduct incident management as required.	
Certification	A procedure of examination or investigation, fulfilled by an independent body (i.e. independent from the developer, the supplier and the operator of the system), in order to state, whether the examined product or system fulfils some functional and/or safety requirements. (The independent body can be in some cases an authority or another designated, competent person or body.)	

Term	Description	Source
Chemical agent	A chemical substance that is intended to kill, seriously injure, or incapacitate people through physiological effects. Generally separated by severity of effect (e.g. lethal, blister, and incapacitating).	a
Competent authority	Person or organization that has the legally delegated or invested authority, capacity, or power to perform a designated function.	MODURBAN
Concourse	Main passenger transit hall at the heart of a hub or terminal, intersecting and linking all the connexion halls serving the various transport modes and services.	Volpe Risk Assessment and Prioritization, Volpe Journal, 2003
Consequence	Magnitude of the negative effects if an attack is successful.	Volpe Risk Assessment and Prioritization, Volpe Journal, 2003
Countermeasure	Way to stop a threat from triggering a risk event.	
Crime	<p>An act or commission of an act that is forbidden or the omission of a duty that is commanded by a public law and that makes the offender liable to punishment by that law. Crime can be divided into four main categories:</p> <ul style="list-style-type: none"> - Reported - Unreported - Unacknowledged - Undetected <p>The majority of crime is represented by the last three categories.</p>	a
Crisis	<p>Period of time resulting from a major incident during which the impacted organization is destabilized.</p> <p>Crisis management ends once an ad hoc contingency plan is adopted to allow for incident management.</p> <p>An operator can face a media crisis even though the ground situation is back under control.</p>	
Cyber attack	<p>Damage to, unauthorized use of, or exploitation of, and, destruction of electronic information to ensure confidentiality, integrity, and availability of information networks and wireline, wireless, satellite, public safety answering points, communications and information systems.</p> <p>Note: The use of the term cyber attack is not yet universal, and often the term electronic attack is used interchangeably with cyber attack.</p>	CPNI

Term	Description	Source
Cyberspace	The collection of information communications and technology (ICT) infrastructures, applications, and devices on which the organization, enterprise, or mission depends, typically including the Internet, telecommunications networks, computer systems, personal devices, and (when networked with other ICT) embedded sensors, processors, and controllers.	MITRE Corp.
Cyber security	<p>Until Cyber security is defined, the following definition is proposed:</p> <p>Cyber security is the collection of tools, security concepts, security safeguards, guidelines, risk management approaches, actions training best practices, assurance and technologies that can be used to protect the cyber environment and organisation and user's assets. Organisation and user's assets include connected computing devices, personnel, infrastructure, applications, services, telecommunications systems, and the totality of transmitted and/or stored information in the cyber environment. Cyber security strives to ensure the attainment and maintenance of the security properties of the organisation and user's assets against relevant security risks in the cyber environment. The general security objectives comprise the following:</p> <ul style="list-style-type: none"> - Availability, - Integrity, which may include authenticity and non-repudiation, - Confidentiality. <p>As the use of the term cyber security is not yet universal, the term Electronic security is used interchangeably with cyber security.</p>	International Telecommunication Union (ITU) ITUT Study Group 17
Danger point	The location after the end of movement authority beyond which the front of the train may not pass without creating a hazardous situation.	MODURBAN
Defence in depth	Never rely on one single security measure alone.	
Dirty bomb	Device that uses a conventional explosion to disperse radioactive material so that the blast will contaminate an area with radioactive particles. A dirty bomb or salted bomb is not a true nuclear weapon and does not yield the same explosive power. It uses conventional explosives to spread radioactive material, most commonly the spent fuels from nuclear power plants or radioactive medical waste.	a
Driving mode	A driving mode describes how a train should be driven in a defined situation and can be performed either by an acting driver or automatically.	MODURBAN
Emergency	Unforeseen or unplanned situation with life-threatening or extreme loss implications requiring immediate attention.	

Term	Description	Source
Emergency braking	Brake or combination of brakes which ensures that the train will stop with the brake rate agreed between authority having jurisdiction, transport authority and train manufacturer.	IEC 62290-2
Exploit	A vulnerability that has been triggered by a threat - a risk of 1.0 (100%).	
European for Civil Aviation Equipment	A non-profit organisation of aviation stakeholders developing documents, specifications and standards to aid compliance to European Technical Standards Orders. Working Group 72 – Aeronautical System Security charge with developing guidelines to address security concerns in aeronautical systems.	
European Public Transport and Rail Sector	A grouping of 7 transport organisations (CER, COLPOFER, EIM, ERFA, RAILPOL, UIC and UITP) representing the entire public transport and rail industry in Europe to speak as one voice towards the European institutions on the topic of public transport and railway security.	
Facility	Installation, post, unit, building with a specific purpose or function: maintenance, repairs, command and control, data processing, support, etc.	
Failure	A deviation from the specified performance of a system. A failure is the consequence of a fault or error in the system.	EN 50129
Generic application	System with specific functions that are related to “a category of applications” associated with a general environmental and operational context, which is developed on the basis of criteria of standardization and parameterization of its elements, so as to render it serviceable for various tangible applications. By combining generic products or combining these with other generic applications, it is possible to obtain a new generic application.	CLC/TR 50506-2
Generic product	Component or product capable of performing certain functions, with specific performance level, in the environmental and operational conditions stated in the reference specifications. It can be combined with other products and Generic Applications to form other generic applications.	CLC/TR 50506-2
Grade of automation	Automation level of train operation, in which Urban Guided Transport can be operated, resulting from sharing responsibility for given basic functions of train operation between operations staff and system	IEC 62290-1
Gross domestic product	The Gross domestic product (GDP) is a measure for the economic activity. It is defined as the value of all goods and services produced less the value of any goods or services used in their creation. (http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/DE/tsieb010_esms.htm)	
Hacker	An individual who accesses a computer system by circumventing its security system.	

Term	Description	Source
Hawking	The act of selling merchandise, usually on the street and on the black market.	
Hazard	A condition that could lead to an accident.	EN 50129
Hazard	An unintentional event or physical condition that has the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, damage to the environment, interruption of business, or other types of harm or loss. For the purposes of MODSafe, hazard is the term referring to safety scenarios.	^a
Hyper terrorism	Terrorism with intent to maximize casualties, no warnings or negotiation possible. Often used to describe large scale terrorism since 9/11.	
Improvised Explosive Device	A home-made explosive device, built from scrap and off-the-shelf or commercially available materials. The explosive might contain nails, ball bearings, nuts, etc. to increase its lethality upon detonation.	
Incident	Widely used term to describe the various circumstances or situations impacting security from daily emergencies, to deliberate harmful acts, to elaborate criminal acts, intended to kill or injure, damage equipment and infrastructure, disrupt operations and achieve publicity.	
Independent safety assessor	An independent third party to assess safety in the field of urban guided transport applications.	
Infrastructure manager	Organisation responsible for providing, maintaining and controlling the use of the infrastructure used by public transport operators. This responsibility may be undertaken by a public transport operator.	
Intercom	Desk-top or wall-mounted 2-way direct-access communication link for instant person-to-person hands-free reporting	
Light Rail	Light Rail Transit (LRT) is an electric rail-borne form of transport which can be developed in stages from a tram to a metro-like system operated partially on its own right-of-way. The general term 'light transit' covers those systems whose role and performance lie between a conventional bus service running on the highway at one extreme and an urban heavy rail or underground metropolitan railway at the other. Light rail systems are thus flexible and expandable. Source: http://www.uitp.org/public-transport/light-rail/index.cfm	
Local authorities	Any level of local, public, municipal or regional government.	
Maintainability	The probability that a failed item will be restored to operational effectiveness within a given period of time when the repair action is performed in accordance with prescribed procedure.	MODURBAN
Member State	One of the 27 States of the European Union.	

Term	Description	Source
Metro	<p>Metropolitan railways are urban, electric transport systems with high capacity and a high frequency of service.</p> <p>Metros are totally independent from other traffic, road or pedestrians. They are consequently designed for operations in tunnel, viaducts or on surface level but with physical separation. Metropolitan railways are the optimal public transport mode for a high capacity line or network service. Some systems run on rubber-tyres but are based on the same control-command principles as steel-wheel systems.</p> <p>In different parts of the world metro systems are also known as the underground, subway or tube.</p> <p>Source: http://www.uitp.org/Public-Transport/metro/index.cfm</p>	
Mode of operation	<p>Way in which a safety function operates, which may be either low demand mode, high demand mode or continuous mode.</p> <p>Note 1: Definition is based on IEC 61508 part 4.</p> <p>Note 2: A more detailed definition will be given in MODSafe deliverable 4.3 depending on the definition of the concept of "low demand".</p>	
Movement authority	<p>Permission for a train to run safely to a specific location within the constraints of the infrastructure and within other applicable constraints.</p>	MODURBAN
Movement authority limit	<p>Location to which the train is permitted to proceed by a movement authority.</p>	MODURBAN
Non-operative UGTMS trains	<p>Non UGTMS equipped trains and trains with inoperative UGTMS equipment.</p>	IEC 62290-2
Notified bodies	<p>The bodies which are responsible for assessing the conformity or suitability for use of the interoperability constituents or for appraising the EC procedures for verification of the sub system.</p>	96/48/EC
Nuclear detonation	<p>An explosion resulting from fission and/or fusion reactions in nuclear material, such as that from a nuclear weapon.</p>	a
Operations	<p>Activities including traffics, activities in stations as well as in other sites.</p>	
Operations Control Centre	<p>Centre from which the traffic (and optionally additional functions) of one or several lines is supervised and managed.</p>	MODURBAN
Operator	<p>Company that runs operations (rail, any traffic, systems, services).</p>	
Operator (UGT)	<p>A public or private undertaking, the activity of which is to provide the transport of passengers by urban guided transport (UGT) systems.</p>	
Personnel security	<p>Personnel security measures help organizations manage the risk of staff or contractors exploiting their legitimate access to their premises, information and staff for unauthorized purposes.</p>	CPNI, LU & TfL

Term	Description	Source
Physical security	The part of security concerned with measures and concepts designed to (1) safeguard personnel; (2) prevent unauthorized access to equipment, installations, materiel, and documents; and (3) safeguard equipment, installations, materiel, and documents against espionage, sabotage, damage, and theft.	NCHRP Report 525
Public Transport Operator	Any public or private undertaking or group of such undertakings which operates public passenger transport services or any public body which provides public passenger transport services (e.g. by bus, tram, light rail, metro or train). A PTO is a legal entity registered according to national law which provides passenger public transport services operated on a full commercial basis and/or following public service requirements.	
Purchasing power standards	The volume index of GDP per capita in Purchasing Power Standards (PPS) is expressed in relation to the European Union (EU-27) average set to equal 100. If the index of a country is higher than 100, this country's level of GDP per head is higher than the EU average and vice versa. (http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/DE/tsieb010_esms.htm)	
Radiological Dispersion Device	A radiological weapon or radiological dispersion device (RDD) is any weapon that is designed to spread radioactive material with the intent to kill, and cause disruption upon a city or nation. NOTE: RDDs include various means of dispersal: explosion, the opening a container of radioactive materials in a populated area or dispersing powdered or aerosolized materials using sprayers or even airplanes.	
Railway Authority	The body with the overall accountability to a regulator for operating a (railway) system.	EN 50126
Railway operating company	Entity which is responsible for safe and orderly operation of a transport system and which is providing the transport service. NOTE: The term "railway operating company" shall stress the operational aspect (responsible for running and maintaining the system) of this entity but not indicate any regulatory or administrative power. Despite the different wording it is therefore by analogy with the definition for "railway authority" which is given in EN 50126.	
(Railway support) Industry	Generic term denoting supplier(s) of complete (railway) systems, their sub-systems or component parts.	EN 50126
Realization Entity	(Physical) Objects, software components, work procedures or regulations that perform a function.	
Regulation	Document providing binding legislative rules, that is adopted by an authority.	EN 45020
Reliability	The probability that an item can perform a required function under given conditions for a given time interval.	EN 50126
Reporting train	UGTMS equipped trains able to report its location and other relevant information.	IEC 62290-2

Term	Description	Source
Risk	The rate of occurrence of accidents and incidents resulting in harm (caused by a hazard or threat) and the degree of severity of that harm.	
Risk management	The process of identifying security actions (selection and implementation of safeguards) that are suitable to know, prevent, reduce or control the risks identified through a risk assessment.	b
Rolling stock	Vehicles both rail mounted (e.g. carriages, train cars) and buses.	
Sabotage	Intentional act to undermine the integrity of systems with the objective of causing damage, injury or death (e.g. derailment, interference with signalling, power supply or communications systems).	
Safety	Freedom from unacceptable levels of risks resulting from unintentional acts or circumstances.	
Safety acceptance	The safety status given to a product by the final user.	EN 50129
Safety approval	The safety status given to a product by the requisite authority when a product has fulfilled a set of predetermined conditions.	EN 50129
Safety assessment	The process of analysis to determine whether a product meets the specified safety requirements and to form a judgement as to whether the product is safe for its intended purpose.	MODURBAN
Safety authority	The body responsible for certifying that a safety-related system is fit for service and complies with relevant statutory and regulatory safety requirements.	EN 50129
Safety case	The documented demonstration that the product complies with the specified safety requirements.	EN 50126, EN 50129
Safety function	Function to be implemented by an E/E/PE safety-related system or other risk reduction measures, that is intended to achieve or maintain a safe state for the EUC, in respect of a specific hazardous event.	IEC 61508-4
Safety integrity	The ability of a safety-related system to achieve its required safety functions under all the stated conditions within a stated operational environment and within a stated period of time.	EN 50129
Safety integrity level	A number which indicates the required degree of confidence that a system will meet its specified safety functions with respect to systematic failures.	EN 50129
Safety measure	Means a set of actions either reducing the rate of occurrence of a hazard or mitigating its consequences in order to achieve and/or maintain an acceptable level of risk.	Commission regulation (EC) No 352/2009
Safety process	The series of procedures that are followed to enable all safety requirements of a product to be identified and met.	EN 50129
Security	Freedom from unacceptable levels of risks resulting from intentional acts or circumstance.	

Term	Description	Source
Security industry	Security industry encompasses traditional security industry based around the supply of general applications such as e.g. physical access control, security-orientated defence industry based on the utilisation of defence technologies in security applications or through acquisition and conversion of civilian technologies to security applications, as well as new entrants, i.e. mainly companies extending their existing (civilian) technologies to security applications, such as for example IT companies.	EC Industrial Policy
Security survey	The survey is a fact-gathering question-based process that uses various data collection tools to obtain necessary information about the characteristics of the organization, its systems and operations, and the consequences to the organization that would result from a successful attack against identified threat targets.	NCHRP Report 525
SEISES	Safe & Secure On-Board Systems (Systèmes embarqués informatisés, sûrs et sécurisés) is a French consortium comprised of major aerospace and technical assurance companies dedicated to the development of an integrated safety and security framework covering the life-cycle of embedded systems.	
Site	Area within which emergency services, public transport operators, other transport industry responders and other persons working on their behalf, are working in response to an incident.	
Standard	Document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context.	ISO/IEC CEN/ CENELEC
Sub-system	A combination of equipment, units, assemblies, etc., which performs an operational function and is a major subdivision of the system.	MODURBAN
Supervisory authority	The body entrusted with the tasks regarding supervision of the operation and maintenance of urban guided transport systems. The supervisory authority can be the same body as the safety authority with the legal power to grant operation (licensing) or to close it.	
Supplier	A contractor who provides the urban guided transport system or one of its sub-systems. Generally, a supplier is a manufacturer of a sub-system such as Rolling Stock or Infrastructure. In addition, a supplier may also be appointed as a company supplying the whole urban guided transport system by means of sub-contractors.	

Term	Description	Source
System	A composite of equipment, skills and techniques capable of performing or supporting an operational role, or both. A complete system includes all equipment, related facilities, material, software, services and personnel required for its operation and support to the degree that it can be considered a self-sufficient unit in its intended operational environment.	MODURBAN
Target	Valuable asset (e.g. persons, facilities, activities, physical, or virtual systems) that is the point of application or object of a given threat.	a
Terrorism	<p>The framework decision harmonises the definition of terrorist offences in all EU countries by introducing a specific and common definition. Its concept of terrorism is a combination of two elements:</p> <ul style="list-style-type: none"> - an objective element, as it refers to a list of instances of serious criminal conduct (murder, bodily injuries, hostage taking, extortion, fabrication of weapons, committing attacks, threatening to commit any of the above, etc.); - a subjective element, as these acts are deemed to be terrorist offences when committed with the aim of seriously intimidating a population, unduly compelling a government or international organisation to perform or abstain from performing any act, or seriously destabilising or destroying the fundamental political, constitutional, economic or social structures of a country or an international organisation. 	Council Framework Decision 2002/475/JH A of 13 June 2002 on combating terrorism
Threat	A threat is a method of triggering a risk event that is dangerous. It is characterized by the intention and the ability to achieve a risk event.	
Threat	<p>A potential action or situation that may cause harm to the infrastructure or its occupants.</p> <p>NOTE: Threats are distinct from hazards because they are not acts of nature, accidents, or organic happenstances for which tunnels are normally designed. Rather, threats are typically characterized as acts of intrusion; placement of explosive devices; and/or chemical, biological, or radiological attacks. In the case of terrorism, a threat consists of a scenario that combines a weapon, a perpetrator, or aggressor, a delivery mode, and tactics (path of approach, use of stealth or force). While hazards are associated with safety, threats are associated with security.</p>	EC, JRC, IPSC
Threat assessment	<p>A systematic effort to identify and evaluate existing or potential terrorist threats to a jurisdiction and its target assets. More broadly, security threat assessments for transportation agencies should consider all threats of criminal activity, as well as terrorist activity. Threat definition has two areas of focus:</p> <ul style="list-style-type: none"> - Potential threat scenarios, - Identification of likely adversaries, tactics, and capabilities. <p>NOTE: Evaluation and report of the threats aimed at a specific level, e.g. national, regional and local, etc. National threat assessments are conducted by governments. In the EU, the terrorist threat is assessed and reported annually by Europol.</p>	NCHRP Report 525

Term	Description	Source
Threat definition	Threat definition is the tool by which vulnerabilities of transportation operations and systems are measured. Agency police or security personnel, assisted by federal, state, and local law enforcement and homeland security professionals, must evaluate the actual and potential threats against their respective agencies in terms of both threat types and aggressor types.	NCHRP Report 525
Tiger-kidnapping	To abduct someone, or to hold someone hostage, in order to persuade someone else to assist in a crime, e.g. a person of importance to the victim is held hostage as collateral until the victim has met the criminal's demands. It is called tiger kidnapping because of the predatory stalking that precedes it.	
Tolerable hazard rate	Rate of occurrence of a hazard that would result in an acceptable level of risk for that hazard (normally judged acceptable by a recognised body e.g. railway authority or railway support industry by consultation with the safety regulatory authority or recognised by the safety regulatory authority itself).	CLC/TR 50126-2
Train separation	Means of keeping successive trains apart at a safe braking distance. The safe braking distance is the minimum distance in which a train can be guaranteed to be brought to rest	MODURBAN
Tram	A tram is an urban electric rail-borne system sharing the track right-of-way with the general road traffic. It is a special kind of "Light Rail".	
Transport authority	Entity which is responsible for safe and orderly operation of a transport system.	IEC 62267 IEC 62290-1
Urban guided transport	Urban Guided Transport (UGT) is defined as a public transportation system in an urban environment with self-propelled vehicles operated on a guideway.	MODURBAN
Urban guided transport system operator	The urban guided transport system operator (UGTSO) is an entity which is responsible for safe and orderly operation of an urban guided transport system. NOTE: For safety aspects the term "UGTSO" is equivalent to the term "railway authority" as used in EN 50126)	
Urban transport security	UTS is the integrated security of any urban public transport system inclusive of transport security, personnel security, property security and cyber security, in cooperation with external security service providers (police services, private companies, etc.).	
Validation	Confirmation by examination and provision of objective evidence that the particular requirements for a specific intended use have been fulfilled.	EN 50126
Verification	Confirmation by examination and provision of objective evidence that the specified requirements have been fulfilled.	EN 50126

Term	Description	Source
Vulnerability	<p>A weakness in a system that can potentially be exploited to become a risk. The gap between protective measures safeguarding a given system and identified risks. Vulnerability is a measure of the likelihood that various types of safeguards against threat scenarios will fail.</p> <p>NOTE: Any feature or characteristic of the design, or operation of a critical component, that could be exploited by a threat to disrupt or to destroy. The vulnerability of a given system generally increases with dependency.</p>	
Weapons of Mass Destruction	<p>A weapon of mass destruction (WMD) is a weapon that can kill large numbers of humans (and other life forms) and/or cause great damage to man-made structures (ie buildings), natural structures (ie mountains), or the biosphere in general. The scope and application of the term has evolved and been disputed, often signifying more politically than technically. Coined in reference to aerial bombing with chemical explosives, it has come to distinguish large-scale weaponry of other technologies, such as chemical, biological, radiological, or nuclear. This differentiates the term from more technical ones such as chemical, biological, radiological, and nuclear weapons (CBRN).</p>	
Zone of protection	A zone where no train is allowed to run as a response to various kinds of incidents.	IEC 62290-2

^a CA & SE, LLC, NCHRP Report 525 Surface transportation Security Vol. 14, November 2009: *Security 101: A Physical Security Primer for Transportation Agencies*

^b EU project COUNTERACT, D 3 PT4, SSP4/2005/TREN/05/FP6/S07.4889 1, March 2007: *Generic guidelines for conducting risk assessment in public transport networks*

3. Abbreviations

Abbreviation	Description
ΔR	Risk reduction
24/7	24 hours a day and 7 days a week
2D	Two-dimensional
3D	Three-dimensional
A	Frequency of, and exposure time in, the hazardous zone
AAA	Metaphor: Code indicating top achievement or top quality based on credit rating practices
AAC	Acceptance, Approval, Certification
AC	Aviation Code
AC/DC	Alternating current/direct current
ACAMS	Access Control and Alarm Monitoring System
ACIH	Analysis of Consequences of Human Unreliability
ADREP	Accident/Incident Data Reporting
AFNOR	French national standardisation body (Agence française de normalisation)
AFTA	ASEAN Free Trade Area
AIGLE	The computing programme and systems equipping RATP's Security Control Centre
ALARP	As Low As Reasonably Practicable
ANSI	American National Standards Institute
AOT	Autorité Organisatrice de Transports (Transport Organising Authority)
AP	Assurance Plan
APTA	American Public Transportation Association
ASEAN	Association of South-East Asian Nations
ASME	American Society of Mechanical Engineers
ASSR	Assessor
AT	Anti Terrorism
ATC	Automatic Train Control
ATM	Asynchronous Transfer Mode
ATO	Automatic Train Operation
ATP	Automatic Train Protection
ATS	Automatic Train Supervision
ATSP	Air Traffic Services Provider
AUGT	Automated Urban Guideway Transport
AZF	AZote Fertilisants

Abbreviation	Description
B	Biological
BASS	Behavioural Assessment Screening System (Logan airport, Boston, USA)
BCD	Benefits/Costs/potential Danger
BDO	Behaviour Detection Officers
BIRM-TG	Bureau Interdépartemental des Remontées Mécaniques et des Transports Guidés
BKA	Federal Office of Criminal Investigation (DE)
BME	Budapest University of Technology and Economics
BOKraft	Regulation for the operation of Motor Traffic Enterprises in Transport of Persons (including Public Transport, Non scheduled services, Long Distance Bus services and Taxi) (Verordnung über den Betrieb von Kraftfahrunternehmen im Personenverkehr)
BOStrab	Bau- und Betriebsordnung für Strassenbahnen (German Federal Regulations on the construction and operation of light rail transit systems (including metros)
BOT	Build-Operate-Transfer
BPR	Behavioural Pattern Recognition (UK)
BSPP	Brigade des Sapeurs Pompiers de Paris
BTP	British Transport Police
BTPA	British Transport Police Authority
BVG	Berlin Transport Company (Berliner Verkehrsbetriebe)
C	Chemical
C	Consequences of hazardous events
C	Consequence reduction probability
CA	Canada
CAA	Civil Aviation Authorities
CAP	Change Assurance Plan
CAS	Critical Activity Sector
CBR	Chemical, biological, radiological
CBRe	Chemical, Biological, Radiological and Explosive
CBRN	Chemical, Biological, Radiological & Nuclear
CBRNe	Chemical, Biological, Radiological, Nuclear and Explosive
CBTC	Communication-Based Train Control
CC	Car-borne Controller
CC	Criminal Code
CCCC, C ⁴	Central Command and Control Centre
CCDSA	Commission Consultative Départementale de Sécurité et d'Accessibilité

Abbreviation	Description
CCDSN	National Advisory Security Council (Conseil consultatif de défense et de sécurité nationale)
CCOR	Completion & Consent to Operate Report
CCTV	Closed-Circuit TV
CDS	Conceptual Design Statement
CDSN	National Security Council (Conseil de défense et de sécurité nationale)
CDTF	Civil Defence Task Force
CE	Clearance Envelope
CEN	European Committee for Standardisation
CENELEC	Comité Européen de Normalisation Electrotechnique (European Committee for Electrotechnical Standardisation)
CEP	Complex Event Processing
CER	Certification
CER	Community of European Railway and Infrastructure Companies
CFSP	Common Foreign and Security Policy
CGP	Common Ground Picture
CI	Critical Infrastructure
CIEM ITAC	Centre intégré d'évaluation des menaces (CA) – Integrated Threat Assessment Centre (CA)
CIO	Critical Infrastructure Operator
CIP	Critical Infrastructure Protection
CIRAS	Confidential Incident Reporting and Analysis System
CNESTG	Commission Nationale d'Évaluation de la Sécurité des Transports Guidés (National Committee for Evaluation of Guided Transport Safety)
CNIL	French National Commission of Information and Freedom (Commission nationale de l'informatique et des libertés)
COC	Combined operations centre
COLPOFER	Collaboration des services de police ferroviaire et de sécurité (Organisation of European railway companies and railway police forces)
COM	Communication
Comms	Communications
Coms	Radio communications
CONTEST	COunter TErrorist STrategy
COO	Cooperation
COR&GEST	Driving on Rails and traffic management Platform (Plate Forme de Conduite sur Rail et de Gestion de Trafic)
COTS	Commercial Off-The-Shelf

Abbreviation	Description
COUNTERACT	Cluster Of User Networks in Transport and Energy Relating to Antiterrorist ACTIVITIES
CPC	Criminal Procedure Code
CPNI	Centre for Protection National Infrastructure
CPTED	Crime Prevention Through Environmental Design
CR	Concept Report
CRC	Cyclic Redundancy Check
CRI	Crisis management
CSI	Common Safety Indicators
CSM	Common Safety Methods
CT	Counter Terrorism
CTR	Consent to Test / Trial Report
CTX	Computed Axial Tomography
Cyat	Cyber attack
CYB	Cyber security
Cysy	Cyber security
D	Germany
DAE	Authorization Application Testing (Dossier d'Autorisation d'Essais)
DAkKS	Die Deutsche Akkreditierungsstelle GmbH (German accreditation body)
DART	Directors' Assurance Review Team
DAuTE	Authorization Application Testing and tests (Dossier d'Autorisation de Tests et Essais)
DB	Deutsch Bahn
DCC	Design Check Certificates
DDE	Direction Départementale de l'Équipement (Departmental Directorate of Equipment)
DDR	Detailed Design Reviews
DDS	Dossier de Définition de Sécurité (Safety Definition Case)
DE	Germany
DES	Designer
DES	Design
DetAct®	Detect and Act
DfT	Department for Transport
DG	Directorate-General
DG MOVE	DG Mobility and Transport
DG TREN	Directorate-General for TRansport and ENergy
DHS	Department of Homeland Security (US)

Abbreviation	Description
DM	Ministerial Decree
DNA	Deoxyribonucleic acid
DNS	National Security Directive for public transport and rail (Directive Nationale de Sécurité pour les transports collectifs et ferroviaires)
DOC	Document Of Compliance
DoT	(US) Department of Transportation
DPS	Dossier Préliminaire de Sécurité (Preliminary Safety Case)
DRACCT	Directors' Risk Assurance and Change Control Team
DREIA	Direction Régionale et Interdépartementale de l'Équipement et de l'Aménagement d'Ile de France (Regional and Interdepartmental Directorate of Equipment and Development for Ile de France area)
DREIF	Direction Régionale de l'Équipement d'Ile de France (Regional Department of Equipment for Ile de France area) NOTE Replaced by DREIA since 2010)
DS	Dossier de Sécurité (Safety Case)
DST	Direction de la surveillance du territoire (French Counter Terrorist Bureau)
DTO	Driverless train operation (GOA3)
DTSD	Delegate for Transport Security & Defence
DVIS	Dienst Veiligheid en Interoperabiliteit der Spoorwegen Note: DVIS/ SSICF are the acronyms of the same department in Flemish/French
E	Explosive(s)
E	Exposure probability of hazard
E/E/PE	Electrical/Electronic/Programmable Electronic
E/E/PES	Electrical/Electronic/Programmable Electronic System
EAM	Elementary Activity Module
EASA	European Aviation Safety Agency
EB	Emergency Brake
EC	European Commission
EC	European Community
ECAC	European Civil Aviation Conference
ECI	European Critical Infrastructure
ECSS	European Co-operation for Space Standardisation
EDU	Education
EEMA	European Emergency Management Agency
EEMC	European Emergency Management Centre
EESC	European Economic and Social Committee
EIM	European Rail Infrastructure Managers
EIRF	Electronic Incident Investigation Form

Abbreviation	Description
EITS	European Institute for Transport Security
EMP	Electromagnetic pulse
EMSA	European Maritime Safety Agency
EN	European Standard (Norm)
ENAC	Ente Nazionale Aviazione Civile (Italian Civil Aviation Authority)
EOQA	Expert ou Organisme Qualifié Agréé (Independent Assessor Body accredited by the National Safety Authority)
EPCIP	European Programme for Critical Infrastructure Protection
EPSF	French Railway Safety Authority (Etablissement Public de Sécurité Ferroviaire)
EPTRS	European Public Transport and Railway Sector
ERA	European Railway Agency
ERFA	European Rail Freight Association
ERN-CIP	European Reference Network for Critical Infrastructure Protection
ERTMS	European Railway Traffic Management System
ESAC	Engineering Safety & Assurance Case
ESC	Engineering Safety Case
ESDP	European Security and Defence Policy
ESHL	Engineering Safety Hazard Log
ESRIA	European Security Research & Innovation Agenda
ESRIF	European Security Research & Innovation Forum
e-security	Electronic or cybersecurity
ETDS	Explosive Trace Detection System
ETSI	European Telecommunications Standards Institute
EU	European Union
EU UTS WG	European Urban Transport Security Working Group (DG MOVE)
EUC	Equipment Under Control
EUROCAE	European Organisation for Civil Aviation Equipment
EUROCONTROL	European Organisation for the Safety of Air Navigation
EUROPOL	European Police
EXP	Explosives
F	France
F	Frequency of, and exposure time in, the hazardous zone
F	Hazard frequency
F_{np}	Frequency – no protection
F_p	Frequency – protected
F_t	Frequency – tolerable
FAA	Federal Aviation Authority

Abbreviation	Description
FGV	Ferrocarrils de la Generalitat Valenciana
FMEA	Failure Mode and Effects Analysis
FP7	Seventh Framework Programme
FR	France
FR	Functional Requirement
FTA	(US) Federal Transportation Administration
G	Defence against danger/consequences
G	Possibility of failing to avoid the hazardous event
GAIN	Global Aviation Information Network
GAME	Globalement Au Moins Equivalent (Globally at least equivalent)
GARTs	Generally Accepted Rules of Technology
GDP	Gross Domestic Product
GER	Germany
GIGN	Groupement d'intervention de la gendarmerie nationale (counter terrorist team of the French Gendarmerie)
GLA	Greater London Authority
GOA	Grade of Automation
GPS	Global Positioning System
H	Hazard
H	Hungary
H factor	Human factor
HA	Hazard Analysis
HA	(US) Highway Administration
HAZMAT	Hazardous material
HDD	Hard Disk Drive
HF	Human Factor
HMG	Her Majesty's Government
HMI	Human Machine Interaction
HMI	Human Machine Interface
HMRI	Her Majesty's Railway Inspectorate
HOT	Hidden, Obvious, and Typical
HQ	Headquarters
HR	Hazard Rate
HR	Human Resources
HSE	Health and Safety Executive
HVAC	Heating, Ventilating and Air Conditioning
HW	Hardware (including Middleware or MW)

Abbreviation	Description
I/O	Input/Output
IATA	International Air Transport Association
ICAO	International Civil Aviation Organisation
ICP	Independent Competent Person
ICS	Industrial Control Systems
ICSC	Integrated Control & Security Centre
ICT	Information and Communications Technology
ICTS	International Consulting for Targeted Solutions
ID	Identifier
ID	Identification
IEC	International Electrotechnical Commission
IED	Improvised explosive device
IEEE	Institute of Electrical and Electronics Engineers
IFSO	In-Flight Security Officer
IHT	International Herald Tribune
IL	Interlocking
IM	Infrastructure Manager
IM	Interchangeable Module
IMO	International Maritime Organisation
IMPACT	Innovative Measures for Protection Against CBRN Terrorism
IMTT	Instituto da Mobilidade e dos Transportes Terrestres
INCA	Incident Capture and Analysis
INF	Information
INF	Information management
INFRACOS	Infrastructure Companies
INRETS	French National Institute for transport and safety research (Institut National de Recherche sur les Transports et leur Sécurité)
IP	Internet Protocol
IPSC	Institute for the Protection and the Security of the Citizen
IR	Infra Red
IRF	Incident Report Form
IRF	Individual Risk of Fatality
IS	Information System(s)
IS	Information Security
ISA	Independent safety assessor
ISA	International Society of Automation
ISC	Integrated security centre

Abbreviation	Description
ISCAPS	Integrated Surveillance of Crowded Areas for Public Security
ISM	Industrial, Scientific, and Medical
ISM	Information Security Management
ISMS	Information Security Management Systems
ISO	International Organization for Standardization
IT	Information Technology
IT	Italy
ITS	Intelligent Transport Systems
ITU	International Telecommunication Union
IV&V	Independent Verification and Validation
IVW	Inspectie Verkeer en Waterstaat
JRC	(EU) Joint Research Centre
JvSFS	Järnvägsstyrelsens författningssamling
K9	Canine
KHVM	Közlekedési, Hírközlési és Vízügyi Minisztérium (Hungarian Ministry for Water, Telecommunication and Transportation Affairs)
KITE	KITE Solutions s.n.c.
LAS	London Ambulance Service
LBRL	Least Risk Bomb Location
LC	LifeCycle
LCD	Liquid Crystal Display
LFB	London Fire Brigade
LLP	Lessons Learned Process
LOPD	Spanish Data Protection Law (Ley Orgánica de Protección de Datos)
LOTI	French National Transportation Law (Loi d'Organisation des Transports Intérieurs)
LPF	Loss of Process form
LR	Light Rail
LRT	Light Rail Transit
LU	London Underground
LUL	London Underground Limited
LUSATS	London Underground Safety Action Tracking System
LUSEA	London Underground Safety and Environmental Analysis database
M	Mandatory
MA	Movement Authority
MAL	Movement Authority Limit
MCC	Main [traffic] Control Centre
MET	Methodology

Abbreviation	Description
MM	Metro Madrid
MMG	[European] Major Metropolises Group [of urban public transport operators]
MODSafe	Modular urban transport safety and security analysis
MODTRAIN	Innovative modular vehicle concepts for an integrated European railway system
MODURBAN	Modular urban guided rail systems
MOO	Mode of operation
MooN	M out of N channel architecture (for example 1oo2 is 1 out of 2 architecture, where either of the two channels can perform the safety function)
MPS	Metropolitan Police Service
MS	(EU) Member State
MSP	Master Security Plan (Plan de sécurité d'opérateur)
MTA	Metropolitan Transport Authority
MTBHE	Mean Time Between Hazardous Events
MTI	(US) Mineta Transportation Institute, Massachusetts
MTTH	Mean Time To Hazard (h)
MTTR	Mean Time To Restore (h)
MW	Middleware
N	Nuclear
NA	Not Applicable
NAC	North Atlantic Council
NATO	North Atlantic Treaty Organisation
NCHRP	National Cooperative Highway Research Program
NERC CIP	North American Electric Reliability Corporation - Critical Infrastructure Protection
NKH	National Transport Authority
NoBo	Notified Body
NP	New Proposal
NR	Network Rail
Nr	Number
NSW	New South Wales
NTO	Non-automated Train Operation (GOA1)
O	Optional
O&M	Operation & Maintenance
OCC	Operations Control Centre
Ops	Operations

Abbreviation	Description
ORG	Organisation
ORR	Office of the Rail Regulator
OSCT	Office for Security and Counter Terrorism
OSS	Office of Safety and Security
P	Accident probability reduction
P	Possibility failing to avoid the hazardous event
PA	Public Address
PAX	Passengers
P&P	Plans & Policy
PBefG	Law for transport of Persons (Personenbeförderungsgesetz)
PCHC	Project Completion & Handover Certificate
PED	Platform Edge Doors
PEP	Project Execution Plan
PFD	Probability of Failure on Demand (average probability of dangerous failure on demand of the safety function)
PFDavg	average Probability of dangerous Failure on Demand of the safety function, (PFDavg), for a low demand mode of operation; it corresponds to its average unavailability (see IEC61508)
PFH	Probability of Failure per Hour (average frequency of a dangerous failure of the safety function per hour)
PHA	Preliminary Hazard Analysis
Ph.D	Doctor of Philosophy
PIS	Public Information System
PLA	Planning
PLA	Plans
PLATERCAM	Territorial Civil Protection Plan of the Community of Madrid (Plan Territorial de Protección Civil de la Comunidad de Madrid)
PM	Prime Minister
PM	Project Manager
PMA	Paris Metropolitan Area
PMF	Project Management Framework
POAM	Plan Of Action and Milestones
PPP	Public Private Partnership
PPS	Purchasing Power Standards
prEN	Draft European standard
PS	Public Security
PSD	Platform Screen Doors
PT	Public Transport

Abbreviation	Description
PTC	Public Transport Safety
PTO	Public Transport Operator
PTP	Platform/Track Protection
PTS	Public Transport Security
PTZ	Pan-Tilt-Zoom
PUB	Public Relations
PUI	Potentially Unsafe Incident
PXCH	Passenger Exchange
QRA	Quantitative Risk Assessment
R	Dirty bomb
R	Radiological
R	Risk
R _{np}	Risk – not protected
R&B	Rail & Bus Consultant
R&D	Research & Development
R&I	Research & Innovation
RA	Railway Authority
RA	Risk analysis
RAID	Recherche, assistance, intervention et dissuasion (French Police SWAT)
RAILPOL	[International network of] Railway Police [organisations]
RAM	Reliability, Availability and Maintainability
RAMS	Reliability, Availability, Maintainability and Safety
RAND	Research and Development Corporation
RATP	Régie Autonome des Transports Parisiens (Autonomous Paris Transport Authority)
RDD	Radiological Dispersion Device
RE	Restricted
RER	Réseau Express Régional (Express Regional Network)
RFID	Radio Frequency IDentification
RIDDOR	Reporting of Injuries, Diseases and Dangerous Occurrences Regulation
RISC	Railway Interoperability and Safety Committee
ROGS	Railways and Other Guided Transport Systems (Safety) Regulations 2006
RPB	Rail Police Brigade
RS	Requirement Specification
RS	Rolling Stock

Abbreviation	Description
RSC	Railway Safety Commission
RSPG	Railway Safety Principles and Guidance
RSSB	Railway safety and standards board
RTT	Round Trip Time
RU	Railway Undertaking
RWIIF	Record of Workplace Injury or Illness Form
S	Scaling factor
S	Severity of hazard consequences
S	Sweden
SAR	Safety Assessment Report
SARF	Staff Assault Report Form
SC	Safety Case
SCADA	Supervisory Control And Data Acquisition
SCC	Security Control Centre
SCEP	[SMRT] Community Emergency Preparedness Programme
SCP	Security Cycle Process
SCSTSD	Senior Civil Servant for Transport Security & Defence
SD	Railway Safety Directive
SDO	Standards Development Organization
SDOC	Standards Development and Oversight Council
SE	System Element / Safety Element
SecCom	(UITP) Security Commission
SecOps	Security Operations
SECUR-ED	[EU Urban Transport] Security Demonstrations [Project]
SECUREMETRO	Inherently secure blast resistant and fire safe metro vehicles
SEISES	Systèmes embarqués informatisés, sûrs et sécurisés (Safe & Secure On-Board Systems)
SEPP	Security and Emergency Preparedness Plan
SGDSN	General Secretariat for National Defence and Security (Secrétariat général de la défense et de la sécurité nationale)
SI	Safety Integrity
SIG RZA NE	Richtlinie für die Zulassung und Abnahme von Bahnsignalanlagen bei Nichtbundeseigenen Eisenbahnen (Guideline for approval and acceptance of railway signaling systems of non-federally owned railways)
SIL	Safety Integrity Level
SL	Severity Level
SLC	Safety LifeCycle

Abbreviation	Description
SMC	Safety Management Certificate
SMRT	Singapore Mass Rapid Transit
SMS	Safety Management System
SMS	Short Message Service
SNCF	Société Nationale des Chemins de Fer
SOP	Standard Operational Procedures
SP	Spain
SPAD	Signal Passed At Danger
SPICA-RAIL	Simulation platform of the university of technology of Compiègne
SPMU	Speed and Position Measurement Unit
SPTS	Spot Transmission Sub-system
SR	Safety Requirement
SRC	Safety Regulation Commission
SRS	System Requirement Specifications
SSC	System Safety Case
SSICF	Service de Sécurité et d'Interopérabilité des Chemins de Fer Note: DVIS/ SSICF are the acronyms of the same department in Flemish/French
STD	Standard
STIF	Syndicat des Transports d'Ile de France
STO	Semi automated train operation (GOA2)
STPG	Safety of Public Guided Transit
StrabVO	Verordnung über den Bau und den Betrieb von Straßenbahnen (Austrian Federal Regulations on the construction and operation of light rail transit systems)
STRMTG	Service Technique des Remontées Mécaniques et des Transports Guidés (French Technical Agency for Ropeways and Guided Transports safety)
SUG	[MODSafe] Support User Group
SVS	Safety Verification Scheme
SW	Software including upgraded SW or Intelligent SW
SWAT	Special Weapons And Tactics [unit]
Sy	Security
TAB	Technische Aufsichtsbehörde (Technical Supervisory Authority)
TAR	Tolerable Accident Rate
TDB	Terrorist Database
TBTC	Transmission Based Train Control
TC	Technical Committee
T _{CE}	Channel equivalent mean down time (hour) for 1oo1, 1oo2, 2oo2 and 2oo3 architectures

Abbreviation	Description
TCMS	Train Control and Monitoring System
TE-SAT	Terrorism - Situation And Trends [Europol Report]
Telecoms	Telecommunications
TETRA	Terrestrial Trunked Radio
TETRAPOL	TETRA Police
TFFR	Tolerable Functional Failure Rate
TfL	Transport for London
TFM	Target Failure Measure
TFT	Thin Film Transistor
TFT LCD	Thin Film Transistor Liquid Crystal Display
THERP	Technique for Human Error Rate Prediction
THR	Tolerable Hazard Rate
THRi	Initial THR
TIP	Threat Image Projection
TIR	Target Individual Risk
TL	Tube Lines
TMB	Transports Metropolitans de Barcelona
TO	Transport Operator
TOS	On-sight Train Operation (GOA0)
TPP	Train protection profile
TR	Technical report
TR SIG ZA	Technische Regeln – Zulassung und Abnahme von Signal- und Zugsicherungsanlagen gemäß BOStrab (Approval and acceptance of signalling systems according to BOStrab)
TRANSPAL	TRANSformation de PALettes
TRANSEC	TRANsport Security and Contingencies
TRB	Transportation Research Board
TRG	Training
TRIPS	Transport Infrastructures Protection System
TRS	Technical Requirements Specification
TSI	Technical Specification for Interoperability
TSO	Technical standard Order
TSR	Temporary Speed Restriction
TU	University of Technology
TUD	Technische Universität Dresden
TV	TeleVision
UGT	Urban Guided Transport

Abbreviation	Description
UGTMS	Urban Guided Transport Management System
UHF	Ultra High Frequency
UIC	International Union of Railways
UITP	International Association of Public Transport (Union Internationale des Transports Publics)
UK	United Kingdom of Great Britain and Northern Ireland
UKAS	United Kingdom Accreditation Service
UML	Unified Modelling Language
UN	United Nations
UNIFE	Union of the European Railway Industries
U(R)GT	Urban (Rail) Guided Transport
US	United States
USA	United States of America
UTK	Urząd Transportu Kolejowego
UTO	Unattended train operation (GOA4)
UTS	Urban Transport Security
UTSR	Urban Transport Security Recommendation
V&V	Verification and Validation
VAL	Validator
VAL	Villeneuve-d'Ascq-Lille (Siemens Matra System)
VAP	Verification Activity Plan
VBIED	Vehicle borne improvised explosive device
VCA	Video Content Analysis
VDV	Verband Deutscher Verkehrunternehmen (Association of German transport undertakings)
VER	Verifier
VL	Speed limit
VLAN	Virtual Local Area Network
Vol.	Volume
VRC	Video Review Centre
VSS	Video Surveillance Systems
VT	Actual train speed
VVR	Verification and Validation Report
W	Probability of the unwanted occurrence
W	Probability of danger occurrence
WG	Working Group
WMATA	Washington [D.C.] Metropolitan Area Transportation Authority

Abbreviation	Description
WMD	Weapons of mass destruction
WP	Work Package
XMI	XML (extensible markup language) metadata interchange
XML	Extensible markup language
ZC	Zone Controller
λ_{DD}	Detected dangerous failure rate (per hour) of a channel in a subsystem
λ_{DU}	Undetected dangerous failure rate (per hour) of a channel in a subsystem
λ_I	Occurrence rate of the potentially hazardous situation [h-1]
λ_{SE}	Wrong side failure rate of the safety element (function) [h-1]
λ_{SYS}	overall failure rate of the system (occupy the unsafe state) operating in low demand mode [h-1]
μ_R	repair rate of the safety function [h-1] in case of undetected dangerous failure
μ_{SE}	Repair rate / inspection rate of the safety element (function) [h-1]
μ_{SR}	transition rate of the safety function [h-1] in case of an occurred Potentially Unsafe Incident (hazardous situation) back into safe state