

Monitoring of Safety Performance activity
“DEFINITIONS OF COMMON SAFETY
INDICATORS AND COMMON METHODS TO
CALCULATE ECONOMIC IMPACT OF
ACCIDENTS”

Amendment

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1 Introduction

1.1 MAIN LEGAL BASIS

Directive 2004/49 - Article 5 "Common safety indicators"

1. In order to facilitate the assessment of the achievement of the CST and to provide for the monitoring of the general development of railway safety Member States shall collect information on common safety indicators (CSIs) through the annual reports of the safety authorities as referred to in Article 18. The first reference year for the CSIs shall be 2006; they shall be reported on in the annual report the following year. The CSIs shall be established as set out in Annex I.

2. Before 30 April 2009 Annex I shall be revised in accordance with the procedure referred to in Article 27(2), in particular to include common definitions of the CSI and common methods to calculate accident costs.

1.2 DESCRIPTION OF THE DOCUMENT

This document defines the CSIs listed in Directive 2004/49 – Annex 1 and develops common methods to calculate economic impacts of accidents, as a result of the activity of the working group on CSIs/Safety Performance, led by the ERA.

The titles of definitions and methods reported in this document are highlighted in green, yellow and red, which stand for the following state of development:

- **Green**, definition/method agreed within the CSIs working group;
- **Yellow**, definition/method discussed within the CSIs working group and to be "finalised", currently subject of survey;
- **Red**, definition/method to be further discussed and developed within the CSIs working group.

2 Scope of Directive 2004/49 - Annex 1 statistics

2.1 CSIs ON ACCIDENTS

Directive 2004/49 - Annex 1 lays down: "For indicators relating to accidents under heading 1¹ below, Regulation (EC) No 91/2003 of the European Parliament and of the Council of 16 December 2002 on rail transport statistics shall be applied as far as the information is available".

Hence, the scope of Directive 2004/49 statistics is the same of Reg.91/2003 and its amendment, Reg.1192/03. This field of application is laid down in Reg.1192/03 - Annex H, where it is stated what is to be reported by Member States:

Table H1: number of significant accidents and number of serious injury accidents (optional), by type of accident

Table H2: number of accidents involving the transport of dangerous goods

Table H3: number of persons killed, by type of accident and by category of person

Table H4: number of persons seriously injured, by type of accident and by category of person

Considering the contents of Directive 2004/49, which does not deal with accidents involving the transport of dangerous goods, the tables of interest for this document are H1, H3 and H4.

Focusing on Table H1, significant accident is defined as follows in Reg.1192/03, art.3:

"significant accident" means any accident involving at least one rail vehicle in motion, resulting in at least one killed or seriously injured person, or in significant damage to stock, track, other installations or environment, or extensive disruptions to traffic. Accidents in workshops, warehouses and depots are excluded;

¹ Indicators relating to accidents

Accident is defined in Directive 2004/49, art. 3:

'accident' means an unwanted or unintended sudden event or a specific chain of such events which have harmful consequences; accidents are divided into the following categories: collisions, derailments, level-crossing accidents, accidents to persons caused by rolling stock in motion, fires and others;

To summarize, the scope of Directive 2004/49 statistics on accidents is composed of the definitions of "significant accident" and "accident"; therefore, an event, to be reported, has:

- To be related to a railway vehicle "in motion";
- To have caused at least one killed or seriously injured person, or significant damage to stock, track, other installations or environment, or extensive disruptions to traffic;
- Not to have happened in workshops, warehouses and depots;
- To be unwanted or unintended, this excludes, vandalism, suicides and terrorism acts;

The expressions "significant damage" and "extensive disruptions" are defined as follows²:

- 'significant damage to stock, track, other installations or environment' means damage that is equivalent to EUR 150 000 or more;
- 'extensive disruptions to traffic' means that train services on a main railway line are suspended for more than six hours;

Whether an accident led to a secondary accident (e.g. a fire following a derailment), it has to be reported under the type of the primary accident; this irrespective of the consequences of the primary and secondary accident.

2.2 CSI ON SUICIDES

One of the CSIs is related to suicides, these events will be classified according to the following criteria:

- if an event does not lead to injury/death of other people not wanting to commit suicide, it will feed the CSI "suicide";
- if an event leads to injury/death of other people not wanting to commit suicide, it will feed one of the CSIs:
 - collisions of trains, including collisions with obstacles within the clearance gauge
 - derailments of trains,
 - level-crossing accidents, including accidents involving pedestrians at level-crossings,
 - accidents to persons caused by rolling stock in motion,
 - fires in rolling stock,
 - others.

People involved will be classified in:

- passengers,
- employees including the staff of contractors,
- level-crossing users,
- unauthorised persons on railway premises,
- others

e.g.: a person who wants to commit suicide by car at level crossing, causing a collision with a train that leads to his/her death and to death of N passengers; this event is to be classified as a collision at level crossing which has as a consequence: 1 level crossing user + N passengers killed.

2.3 CSIs ON PRECURSORS TO ACCIDENTS

All the events (broken rails, track buckles, wrong-side signalling failures, signals passed at danger, broken wheels and axles) should be reported; if they lead to an accident they should be reported anyway. E.g.: a SPAD that leads to a collision should be reported as **1 SPAD + 1 collision**.

² Approved by the WG during the 3rd meeting on 21st March 2006, cooperation is in progress between the ERA and Eurostat, to harmonise REG.1192/03 to these values.

2.4 CSIs ON CONSEQUENCES OF ACCIDENTS

The economic impact of all accidents, significant (defined in §2.1) and non significant, should be reported.

3 Definitions of CSIs and common methods to calculate economic impact of accidents

3.1 INDICATORS RELATED TO ACCIDENTS

1. train

means one or more railway vehicles hauled by one or more locomotives or railcars, or one railcar travelling alone, running under a given number or specific designation from an initial fixed point to a terminal fixed point. A light engine, i.e. a locomotive travelling on its own, is not considered to be a train. (REGULATION (EC) No 1192/2003)

Further to discussion within the WG on CSIs, Eurostat has proposed an amendment of the aforementioned definition:

'train' means one or more railway vehicles hauled by one or more locomotives or railcars, or one railcar travelling alone, running under a given number or specific designation from an initial fixed point to a terminal fixed point. A light engine, i.e. a locomotive travelling on its own, is not considered to be train, *except for provision of data for Annex H³*

2. collision of trains, including collisions with obstacles within the clearance gauge

means a front to front or front to end collision between two trains or a (side) collision between a train and a part of another train not clear of the loading gauge, or a collision of a train with

- a. shunting movements;
- b. fixed objects such as buffer stops,
- c. objects temporarily present on or near the track (except at level crossings if lost by road vehicle/user), such as rocks, landslides, trees, lost parts of railway vehicles, road vehicles and machines or equipment for track maintenance;

Guide:

A collision that leads to a derailment is counted as a collision. For the purpose of these statistics, animals are counted as objects. Collisions between shunting movements/maintenance machines are classified as type of accident "others". Collisions against objects at level crossing lost by a road vehicle/user are classified as a level crossing accident.

3. train derailment

means any case in which at least one wheel of a train leaves the rails.

Guide:

Collisions against rolling stock/obstacle followed by a derailment are not included, these events are classified as collisions. Re-rail cases (if the accidents are significant) are to be included; derailments voluntary caused applying safety procedures are to be excluded. Derailments of shunting movements/maintenance machines are classified as others;

4. level crossing accidents⁴

means accidents at level crossings involving at least one railway vehicle and one or more road vehicles, other road users such as pedestrians or other objects temporarily present on or near the track if lost by a road vehicle/user;

Guide:

Collisions with obstacles on level crossings, which have not been lost by a road user or fallen from a vehicle, are classified as collisions, not as level crossing accidents.

³ This entails that locomotives travelling on their own are included in the railway statistics on safety

⁴ The Agency could develop a proposal of definition for precursors to these accidents, to be discussed within the CSI WG

5. accidents to persons caused by rolling stock in motion

means accidents to one or more persons that are either hit by a railway vehicle or by an object attached or that has become detached from the vehicle. Persons that fall from railway vehicles are included, as well as persons that fall or are hit by loose objects when travelling on-board vehicles.

6. suicide

means an act to deliberately injure oneself resulting in death, as recorded and classified by the competent national authority. (REGULATION (EC) No 1192/2003)

7. fires in rolling stock

means fires and explosions that occur in railway vehicles (including their load) when they are running between the departure station and the destination, both included as well as intermediate stops and re-marshalling operations.

Guide:

Vandalism acts are excluded. Fires during long stops in marshalling yards or in stabling yards are excluded.

8. other types of accidents

means all accidents other than collisions, derailments, at level crossing, to persons caused by rolling stock in motion, fires in rolling stock and suicides.

Guide:

The main cases belonging to this category should be:

- *Collisions/derailments of shunting movements/maintenance machines;*
- *Release, during the transport, of dangerous goods;*
- *Objects projected by a train, like ballast, ice, etc.*

9. rail passenger

means any person, excluding members of the train crew, who makes a trip by rail. For accident statistics, passengers trying to embark/disembark onto/from a moving train⁵ are included. (REGULATION (EC) No 1192/2003)

Guide:

People crossing the tracks in a station, where involved in an accidents would be classified: as an unauthorised person if he/she was not allowed to cross, otherwise he/she will be classified as others. People waiting on platform, where involved in an accident, will be classified as others.

10. employees (staff of contractors and self-employed contractors are included)

means any person whose employment is in connection with a railway and is at work at the moment of the accident. It includes the crew of the train and persons handling rolling stock and infrastructure installations.

11. level crossing users

means persons using a level crossing to cross the railway line by any mean of transportation or by foot.

12. unauthorised persons on railway premises

means any persons present on railway premises where such presence is forbidden, with the exception of level crossing users.

13. others (third parties)

means all persons not defined as “rail passengers”, “employees including the staff of contractors”, “level crossing users” or “Unauthorised persons on railway premises”.

14. deaths (killed person)

means any person killed immediately or dying within 30 days as a result of an accident, excluding suicides (REGULATION (EC) No 1192/2003)

⁵ The Agency could develop a proposal of definition for moving train to be discussed within the WG

15. injuries (seriously injured person)

means any person injured who was hospitalized for more than 24 hours as a result of an accident, excluding attempted suicides (REGULATION (EC) No 1192/2003)

3.2 INDICATORS RELATED TO PRECURSORS TO ACCIDENTS

16. Incident

means any occurrence, other than accident or serious accident, associated with the operation of trains and affecting the safety of operation. (Directive 2004/49, art.3)

17. broken rails

means any rail which is separated in two or more pieces, or any rail from which a piece of metal becomes detached, causing a gap of more than 50 mm in length and more than 10 mm in depth on the running surface.

18. track buckles

means faults related to the continuum and the geometry of track, requiring track obstruction or reduction of permitted speed immediately to maintain safety.

19. wrong side signalling failure

means any failure of a signalling system (either to infrastructure or to rolling stock), resulting in the signalling system displaying a less restrictive signal than that demanded;

Guide:

- a green light aspect presented instead of an indication at danger: signal warning to slow down, caution signal announcing a stop signal or a speed restriction signal;
- any signal less restrictive than a stop signal that is presented instead of a stop signal;
- the presentation failure of a distant signal announcing a stop signal or a speed restriction signal;

Malfunctions related to degraded modes are to be excluded.

20. Signal Passed at Danger (SPAD)

Any occasion when any part of a train proceeds beyond of its authorised movement

Examples of unauthorised movement:

1. To pass a trackside colour light signal *or semaphore* at danger, order to STOP
2. To pass the end of a *safety related* movement authority foreseen in automatic train control systems
3. To pass a point communicated by verbal or written authorization foreseen in regulations;
4. To pass stop boards (buffer stops are not included) or hand signals

Cases in which vehicles without any traction unit attached or a train that is unattended run away past a signal at danger are not included. Cases in which, for several and different reasons, the signal is not turned to danger in time to allow the driver to stop the train before the signal are not included.

21. broken wheels and broken axles

means break affecting the essential parts of the wheel or axle and creating a risk of accident (derailment or collision).

3.3 INDICATORS RELATED TO CONSEQUENCES OF ACCIDENTS

With the view to carrying out a sustainable transport policy, it is good practice to decide initiatives considering all the stakeholders, to ensure that all significant effects are taken into account. Otherwise, policy initiatives may not be optimal from a society perspective. The following CSIs measure the societal benefit of avoiding accidents:

a) Value of X casualties avoided = X* VPC in MLN €

(VPC stands for Value of Preventing a Casualty in the Member State)

b) Material damage avoided

c) Reduction of cost of delays⁶

d) Reduction of damage caused to environment⁶

NB: this approach would entail to reorganize the section of Directive 2004/49 – Annex 1 titled: “Indicators related to consequences of accidents”.

22. Value of Preventing a Casualty (VPC)

We recommend using values as follows:

a) Value of safety per se: Willingness to Pay (WTP) values based on stated preferences studies carried out in the Member State for which they are applied.

b) Direct and indirect economic costs: cost values appraised in the Member State, composed of:

- Medical and rehabilitation cost;
- Legal court cost, cost for police, private crash investigations, the emergency service and administrative costs of insurances;
- Production losses: value to society of goods and services that could have been produced by the person, if the accident had not occurred.

For a) and b) local values should be used wherever possible, provided that they have been developed using an appropriate methodology; if such values are not available, the values provided in Table 1 may be used.

The values of safety per se as well as the direct and indirect costs of fatalities are based on the HEATCO⁷ project values and assumptions. These values should be increased linearly with the growth of GDP per capita.

Table 1 - Estimated values for casualties avoided (€2002, factor prices⁸)

Country	a)Value of safety per se			b)Direct and indirect costs			VPC (a+b)		
	Fatality	Severe injury	Slight injury	Fatality	Severe injury	Slight injury	Fatality	Severe injury	Slight injury
Austria	1,600,000	208,000	16,000	160,000	32,300	3,000	1,760,000	240,300	19,000
Belgium	1,490,000	194,000	14,900	149,000	55,000	1,100	1,639,000	249,000	16,000
Cyprus	640,000	83,000	6,400	64,000	9,900	400	704,000	92,900	6,800
Czech Republic	450,000	59,000	4,500	45,000	8,100	300	495,000	67,100	4,800
Denmark	2,000,000	260,000	20,000	200,000	12,300	1,300	2,200,000	272,300	21,300
Estonia	320,000	41,000	3,200	32,000	5,500	200	352,000	46,500	3,400
Finland	1,580,000	205,000	15,800	158,000	25,600	1,500	1,738,000	230,600	17,300
France	1,470,000	191,000	14,700	147,000	34,800	2,300	1,617,000	225,800	17,000
Germany	1,510,000	196,000	15,100	151,000	33,400	3,500	1,661,000	229,400	18,600
Greece	760,000	99,000	7,600	76,000	10,500	800	836,000	109,500	8,400
Hungary	400,000	52,000	4,000	40,000	7,000	300	440,000	59,000	4,300
Ireland	1,940,000	252,000	19,400	194,000	18,100	1,300	2,134,000	270,100	20,700
Italy	1,300,000	169,000	13,000	130,000	14,700	1,100	1,430,000	183,700	14,100
Latvia	250,000	32,000	2,500	25,000	4,700	200	275,000	36,700	2,700
Lithuania	250,000	33,000	2,500	25,000	5,000	200	275,000	38,000	2,700
Luxembourg	2,120,000	276,000	21,200	212,000	87,700	700	2,332,000	363,700	21,900
Malta	910,000	119,000	9,100	91,000	8,800	400	1,001,000	127,800	9,500
Netherlands	1,620,000	211,000	16,200	162,000	25,600	2,800	1,782,000	236,600	19,000

⁶ to be appraised by the ERA Economic Evaluation Unit survey group whether this element is significant

⁷ “Developing Harmonised European Approaches for Transport Costing and Project Assessment”, <http://heatco.ier.uni-stuttgart.de/>

⁸ Items are valued as if no indirect taxation or subsidy were applied

Norway	2,630,000	342,000	26,300	263,000	64,000	2,800	2,893,000	406,000	29,100
Poland	310,000	41,000	3,100	31,000	5,500	200	341,000	46,500	3,300
Portugal	730,000	95,000	7,300	73,000	12,400	100	803,000	107,400	7,400
Slovakia	280,000	36,000	2,800	28,000	6,100	200	308,000	42,100	3,000
Slovenia	690,000	90,000	6,900	69,000	9,000	400	759,000	99,000	7,300
Spain	1,020,000	132,000	10,200	102,000	6,900	300	1,122,000	138,900	10,500
Sweden	1,700,000	220,000	17,000	170,000	53,300	2,700	1,870,000	273,300	19,700
Switzerland	2,340,000	305,000	23,400	234,000	48,800	3,700	2,574,000	353,800	27,100
United Kingdom	1,650,000	215,000	16500	165,000	20,100	2100	1,815,000	235,100	18,600

23. cost of replacement or repair of damaged rolling stock or infrastructure

means the cost of providing new rolling stock or infrastructure with the same functionalities and technical parameters as that damaged beyond repair, and the cost of restoring repairable rolling stock or infrastructure to its state before the accident. Both should be estimated by the Railway Undertaking/Infrastructure Manager on the basis of its experience. Possible costs related to leasing rolling stock, as a consequence of non availability of the damaged one, are to be counted

24. Cost of damages caused to environment⁹

means the cost that a Railway Undertaking/Infrastructure Manager appraises it has to bear, on the basis of its experience, in order to restore the damaged area to its state before the railway accident

Guide:

Accidents are to be counted whether they lead to liquid, solid or gas release of goods which are pollutant. Fires of trees caused by rolling stock in motion are also included.

⁹ DIRECTIVE 2004/35/CE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage, article 2:

1. 'environmental damage' means:

(a) damage to protected species and natural habitats, which is any damage that has significant adverse effects on reaching or maintaining the favourable conservation status of such habitats or species. The significance of such effects is to be assessed with reference to the baseline condition, taking account of the criteria set out in Annex I;

Damage to protected species and natural habitats does not include previously identified adverse effects which result from an act by an operator which was expressly authorised by the relevant authorities in accordance with provisions implementing Article 6(3) and (4) or Article 16 of Directive 92/43/EEC or Article 9 of Directive 79/409/EEC or, in the case of habitats and species not covered by Community law, in accordance with equivalent provisions of national law on nature conservation.

(b) water damage, which is any damage that significantly adversely affects the ecological, chemical and/or quantitative status and/or ecological potential, as defined in Directive 2000/60/EC, of the waters concerned, with the exception of adverse effects where Article 4(7) of that Directive applies;

(c) land damage, which is any land contamination that creates a significant risk of human health being adversely affected as a result of the direct or indirect introduction, in, on or under land, of substances, preparations, organisms or micro-organisms;

2. 'damage' means a measurable adverse change in a natural resource or measurable impairment of a natural resource service which may occur directly or indirectly;

25. cost of delays

means the monetary value of delays incurred by users, passengers and freight customers, of rail transport as a consequence of an accident, calculated by the following model:

VT = value of travel time savings

The underlying principle in the VT is that local values should be used wherever possible, provided that they have been developed using an appropriate methodology.

If such values are not available, the values provided in Tables A and B may be used. These values are based on the HEATCO project values and assumptions; they should be increased linearly with the growth of GDP per capita. VT is approximately 1/3 of Table A values for non work passengers.

Value of time for a passenger of a train (one hour)

$VT_1 = [VT(\text{table A}) * [\text{Average percentage of work passengers a year}] + (1/3) * [VT(\text{Table A})] * [\text{Average percentage of non work passengers a year}]$

Value of time for a freight train (one hour)

$VT_2 = VT(\text{table B}) * \text{Average tonnes of goods transported a train}$

Table A - Work passenger trips - VT (2002 € per passenger per hour)

Country	Business		
	Air	Bus	Car, Train
Austria	39.11	22.79	28.4
Belgium	37.79	22.03	27.44
Cyprus	29.04	16.92	21.08
Czech Republic	19.65	11.45	14.27
Denmark	43.43	25.31	31.54
Estonia	17.66	10.3	12.82
Finland	38.77	22.59	28.15
France	38.14	22.23	27.7
Germany	38.37	22.35	27.86
Greece	26.74	15.59	19.42
Hungary	18.62	10.85	13.52
Ireland	41.14	23.97	29.87
Italy	35.29	20.57	25.63
Latvia	16.15	9.41	11.73
Lithuania	15.95	9.29	11.58
Luxembourg	52.36	30.51	38.02
Malta	25.67	14.96	18.64
Netherlands	38.56	22.47	28
Poland	17.72	10.33	12.87
Portugal	26.63	15.52	19.34
Slovakia	17.02	9.92	12.36
Slovenia	25.88	15.08	18.8
Spain	30.77	17.93	22.34
Sweden	41.72	24.32	30.3
United Kingdom	39.97	23.29	29.02
EU (25Countries)	32.8	19.11	23.82

Table B - Freight trips VT (2002€ per freight tonne per hour)

Country	Per tonne of freight carried	
	Road	Rail
Austria	3.37	1.38
Belgium	3.29	1.35
Cyprus	2.73	1.12
Czech Republic	2.06	0.84
Denmark	3.63	1.49
Estonia	1.9	0.78
Finland	3.34	1.37
France	3.32	1.36
Germany	3.34	1.37
Greece	2.55	1.05
Hungary	1.99	0.82
Ireland	3.48	1.43
Italy	3.14	1.3
Latvia	1.78	0.73
Lithuania	1.76	0.72
Luxembourg	4.14	1.7
Malta	2.52	1.04
Netherlands	3.35	1.38
Poland	1.92	0.78
Portugal	2.58	1.06
Slovakia	1.86	0.77
Slovenia	2.51	1.03
Spain	2.84	1.17
Sweden	3.53	1.45
United Kingdom	3.42	1.4
EU (25 Countries)	2.98	1.22

N_p = number of passengers transported in one year

N_t = number of passenger trains operated in one year

C_m = Cost of 1 minute of delay of a train

$$C_{mp} \text{ (Passenger train)} = 1.5 * (VT_1/60) * (N_p/N_t)$$

$$C_{mf} \text{ (Freight train)} = 1.5 * (VT_2/60)$$

The factor 1.5, between VT and value of delay, is suggested in the HEATCO project

Cost of delays for an accident = C_{mp} * (Minutes of delay of passenger trains) + C_{mf} * (Minutes of delay of freight trains)

26. number of working hours of staff or contractors lost as a consequence of accidents

means the number of hours that, on the basis of its experience the Railway Undertaking/Infrastructure Manager estimates, were lost in terms of absence hours from work of staff or contractors that were injured in accidents.

27. total number of hours worked by staff or contractors in a year

means, on the basis of the Railway Undertaking/Infrastructure Manager estimation, the total number of hours that are to be worked in a year by "staff" and "contractors" for dealing with all company's activities, not only safety related.

3.4 INDICATORS RELATED TO TECHNICAL SAFETY OF INFRASTRUCTURE AND ITS IMPLEMENTATION

28. Automatic Train Protection (ATP)

means a system that enforces obedience to signals and speed restrictions by speed supervision, including automatic stop at signals.

Guide:

NSAs have to list, in their yearly safety report, the ATP systems in operation

29. Level Crossing

means any level intersection between a road and a railway, as authorised by the infrastructure manager and open to public or private road users.

30. Active Level Crossing¹⁰

means a level crossing where the crossing users are protected from or warned of, the approaching train by the activation of devices, when it is unsafe for the user to traverse the crossing.

The protection could be operated by physical devices:

- Half or full barriers;
- Gates.

The warning could be operated by:

- Visible devices: lights, torches, flags;
- Audible devices: bells, horns, klaxsons, etc;
- Physical devices, e.g. vibration of road bumps.

This type of crossing may be classified as those that are controlled by automatic systems and those that are controlled manually, by a railway employee (signaller, crossing keeper or a member of the train crew):

34. a) Level crossing with road side automatic protection and/or warning

means a level crossing where the crossing protection and/or warning are activated by the approaching train.

These level crossings can be classified as follows:

1. Level crossing with road side automatic protection
2. Level crossing with road side automatic warning
3. Level crossing with road side automatic protection and warning

Guide:

Level crossings with protection and/or warning activated by a railway employee are also included whether these are equipped of: an interlocked signal showing to the train a running aspect only whether protection and/or warning of the level crossing are activated.

34. b) Level crossing with road side manual protection and/or warning

means a level crossing where protection and/or warning is manually activated by a railway employee and there is not interlocked railway signal.

These level crossings can be classified as follows:

4. Level crossing with road side manual protection
5. Level crossing with road side manual warning
6. Level crossing with road side manual protection and warning

¹⁰ NB: this approach would entail to amend Directive 2004/49 – Annex 1, which lays down the CSI: percentage of level crossings with automatic or manual protection.

31. Passive crossing

means a level crossing without any form of warning system and/or protection activated when it is unsafe for the user to traverse the crossing.

Guide: They include a number of types used solely by pedestrians. The main examples of level crossings suitable for vehicle use, which fall into this category, include user-worked crossings (UWC), user-worked crossings with a telephone (UWC+T) and open crossings (OC). Crossings with just road side permanent signals, which inform on the presence of the crossing only, are included.

32. Road

means, for the purpose of data reported according to REGULATION (EC) No 1192/2003 - Annex H, any public or private road, street or highway, including footpaths and bicycle paths.

3.5 INDICATORS RELATED TO THE MANAGEMENT OF SAFETY

33. Audit.

means systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which audit criteria are fulfilled (ISO 9000).

3.6 SCALING FACTORS

34. train*Km

means the unit of measure representing the movement of a train over one kilometre. The distance used is the distance actually run, if available, otherwise the standard network distance between the origin and destination shall be used. Only the distance on the national territory of the reporting country shall be taken into account. (REGULATION (EC) No 1192/2003)

35. passenger*km

means the unit of measure representing the transport of one passenger by rail over a distance of one kilometre. Only the distance on the national territory of the reporting country shall be taken into account. (REGULATION (EC) No 1192/2003)

4 Acronyms

ATP	Automatic Train Protection
CSIs	Common Safety Indicators
SPAD	Signal Passed at Danger
VPC	Value of preventing a Casualty
VT	Value of Travel time savings
WG	Working group
WTP	Willingness to Pay