

Safety related message sets – Selection of DATEX II Codes, DENM Event Types, TPEG2-TEC Causes and TMC Events for EC high level Categories

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1 Introduction

In Directive 2010/40/EU ("ITS Directive") the European Commission developed for Priority Action C an EU Regulation named "Data and procedures for the provision, where possible, of road safety related minimum universal traffic information free of charge to users" (EC Delegated Regulation No 866/2013). It defines amongst others a single list of categories of safety related traffic information to be provided at no extra cost for the end user at the point of use.

In Paragraph 7 (1) the EU Regulation says:

“Public and/or private road operators and/or service providers shall share and exchange the data they collect pursuant to Article 6. For that purpose, they shall make these data available in the DATEX II (CEN/TS 16157) format or any fully compatible and interoperable with DATEX II machine-readable format through an access point.”

Therefore, this “Terms and Definitions” provides a subset of DATEX II Codes, DENM Event Types, TMC Events and TPEG2-TEC Cause Codes, which shall be defined and declared as the message sets to be used for safety related messages. Furthermore, for the selected message sets a correlation in the focused standards DATEX II, DENM, TMC, and TPEG2-TEC is defined.

The first version of the following list of messages was collated based on discussions within a joint group of experts incorporating TISA experts (for TMC and TPEG2-TEC Technology) and key experts of the DATEX II specification.

The resulting document was reviewed among a wider audience including all members of TISA, and also the appropriate experts within DATEX II. The resulting TPEG2-TEC message sets were tested at the 2nd TISA Testfest (Munich, 09.-11.12.2013) by providers and clients of traffic information.

In a subsequent update of this document in 2017, corrections to the DATEXII codes were made. Furthermore, DENM event types were added in alignment with the TPEG2-TEC event codes (these are closely related – but not always identical). This was based on the C-ITS Corridor project experiences in Germany and Austria. This addition was coordinated with the C-ITS community through the Amsterdam Group.

2 Basic principles of the Message sets

The events or conditions to be covered by the road safety related minimum universal traffic information service shall consist of at least one of the following categories (according Paragraph 3 of the EU Regulation):

- a. Temporary slippery road
- b. Animal/people/obstacles/debris on the road
- c. Unprotected accident area
- d. Short term road works

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- e. Reduced visibility
- f. Wrong-way driver
- g. Unmanaged blockage of a road
- h. Exceptional weather conditions

Each of the focused data protocol standards, be it DATEX II, DENM, TMC or TPEG, is a powerful tool box that allows describing an event in very detail and in almost every variation.

The proposed basic principle for the here mentioned selection of event codes for the safety related categories has been to select as few event codes as possible for each safety related category and to choose only those event codes that represent the intended warning nature of the message best, for the following reasons:

To improve ease of implementation within the whole service chain and future work of harmonisation in presentation of messages to users, the number of safety related messages selected within this document have been minimised.

Having in mind a later end user service drivers already receive quite a lot of messages while driving – mostly information only. If a huge number of events codes were selected for the safety related categories there might be a risk that the warning nature of the message will not be entirely implemented in order to avoid an overflow of warning “beeps” to the driver.

The selected event codes are DANGER warnings, and it has to be guaranteed that the defined event codes in either DATEX II or DENM or TMC or TPEG if selected by a content provider is really a WARNING message. All following partners of the value chain must interpret that code as a dangerous message with the appropriate presentation. Such a required quality and reliability of the service can be reached best by concentrating as few codes as possible.

A more detailed description of the safety related traffic information, like for example the reason of the traffic impact, increases the acceptance of the information on the one hand, but has – mostly – no impact for additional safety.

In exception, in some special cases, for example if the driver isn't able to notice the danger on first view (e.g. black ice) or if additional care is required (e.g. children on the street), the corresponding event code has also been added to the list presented in this paper.

Of course it is possible and desired to offer more information than presented in this paper. For example it can be distributed as an additional “premium” service to traffic relevant safety information.

The aim is to allow service providers to implement a simple but efficient warning service and to avoid misinterpretations of the warning nature of event codes. The proposed solution is a compromise that tries to reflect the business cases affected as far as possible without losing the principal idea of warning drivers free of charge.

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2.1 Warning Level

For an automated processing in devices a classification of safety messages in categories makes sense. According to this classification, the devices identify the warning level of the message and take appropriate actions, such as specific acoustic and visual warnings.

It is important, that a safety related traffic information has the same warning level in every standard.

2.1.1 Warning Level in TPEG2-TEC

The TPEG2-TEC-Standard contains a warning level, which explains the category of danger of the message. The following four levels are possible in TPEG2-TEC:

Code	TISA English "WORD"	Comment	Example
1	informative	This level is of standard informative nature.	-
2	danger level 1	This level is used for acquiring attention by the driver.	Attention, there is a dangerous obstruction due to fog
3	danger level 2	This level is used for local hazard warnings being dangerous.	Attention, there due to deer
4	danger level 3	This level is used for local hazard warnings being highly dangerous.	Attention, highest danger due to ghost driver

Tab. 2-1: Warning Levels in TPEG2-TEC

2.1.2 Warning Level in TMC

In RDS-TMC an urgency level is defined for every TMC event, even if this is not a safety-relevant information. Every TMC event has a default urgency assigned, which can be overridden by adding a (optional) control code during transmission. At the moment, in many end-user devices the message presentation appears independent of the actual transmitted urgency level.

Description	Specification
(blank) normal urgency	make available to end-users on request
urgent	present to end-users having selected this location, immediately
extremely urgent	present to all end-users immediately

Tab. 2-2: Urgency Levels in TMC

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2.1.3 Warning Level in DATEX II

The current version of DATEX II (version 2.3) contains an approved extension¹ *Safety Related Messages* that has been created to clearly mark data elements of type *SituationRecord* (i.e. the type used for elementary content of traffic messages) explicitly as “safety relevant”.

The extension adds a new, optional attribute *safetyRelatedMessage* with potential values “true” and “false” to the class *SituationRecord* which **shall** be present and **shall** be set to “true” for content in the scope of the delegated regulation for safety related messages.

The definition for this new attribute is: *Indicates, whether this SituationRecord specifies a safety related message according to Commission Delegated Regulation (EU) No 886/2013.*

2.1.4 Warning level in DENM

The current version of DENM has no possibility to mark a message as “safety relevant”. This function could be added in a future version of the DENM specification.

The current version of DENM also has no mechanism to set an urgency level for a message. End-user devices need to consider the appropriate presentation based on the specific message as received.

¹ An “approved extension” in DATEX II is an extension that the DATEX organisation has confirmed to be incorporated into the next update of the corresponding part(s) of CEN/TS 16157.

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2.2 Category a) Temporary slippery road

Definition: <i>EC Delegated Regulation No 866/2013</i>	“Temporary slippery road” means any unforeseen condition of the road surface which makes it slippery for a certain amount of time, causing low adherence of the vehicle to the road.
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The following messages belong to the category “temporary slippery road”:

- Flooding
- Danger of aquaplaning
- Surface water hazard
- Slippery road
- Mud on road
- Loose chippings
- Oil on road
- Petrol on road
- Ice
- Black ice
- Snow drifts
- Icy patches

DATEX II (CEN/TS 16157)			TMC Events (EN ISO 14819-2)			TPEG-TEC (ISO/TS 21219-15)				DENM (ETSI EN 302 637-3)		
DATEX Class	TYPE	Supplementary Position Description	Line	Text (CEN-English)	Code	Cause Code	Sub Cause Code	Warning Level	Text SubCauseCode trumps Cause Code	Cause Code	Sub Cause Code	Text SubCauseCode trumps CauseCode
EnvironmentalObstruction	flooding		880	flooding. Danger	908	5	1	3	flooding	9	0	hazardous location - surface condition
WeatherRelatedRoadConditions	surfaceWater		980	danger of aquaplaning	1002	7		3	aquaplaning	6	0	adverse weather condition -adhesion
WeatherRelatedRoadConditions	surfaceWater		977	surface water hazard	1041	7		3	aquaplaning	6	0	adverse weather condition -adhesion
WeatherRelatedRoadConditions	slipperyRoad		979	slippery road (above Q hundred metres)	1003	6		3	slippery road	6	0	adverse weather condition -adhesion
NonWeatherRelatedRoad Conditions	mudOnRoad		981	mud on road. Danger	1055	6	3	3	mud on road	6	3	mud on road
NonWeatherRelatedRoad Conditions	looseChippings		985	loose chippings. Danger	1056	6	8	3	loose chippings	6	8	loose chippings
NonWeatherRelatedRoad Conditions	oilOnRoad		987	oil on road. Danger	1057	6	7	3	oil on road	6	7	oil on road
NonWeatherRelatedRoad Conditions	petrolOnRoad		989	petrol on road. Danger	1058	6	2	3	fuel on road	6	2	fuel on road
WeatherRelatedRoadConditions	ice		992	ice (above Q hundred metres)	1006	6	5	3	ice on road	6	5	ice on road
WeatherRelatedRoadConditions	blackIce		996	black ice (above Q hundred metres)	1008	6	6	3	black ice on road	6	6	black ice on road
WeatherRelatedRoadConditions	snowDrifts		1006	snow drifts (above Q hundred metres)	1016	9	5	3	snow drifts	9	5	snow drifts
WeatherRelatedRoadConditions	icyPatches		996	icy patches (above Q hundred metres)	1047	6	5	3	ice on road	6	5	ice on road

Tab. 2-3: Corresponding Message Subsets for the category “temporary slippery road”

The selection of the messages is based on the following rules:

- The significant message is “slippery road (above Q hundred metres)”, which explains the effect of the category.

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- The other messages are also selected, because they give drivers important information for to adjust their driving behaviour. For example, some of them can't be seen on first view (e.g. oil, petrol or black ice).
- Categories such as heavy snowfall or heavy rain are not relevant in this category, because they are part of category "h) exceptional weather conditions".

Characteristics in the translation to DATEX II:

No conceptual mapping is available for aquaplaning in the translation to DATEX II.

Characteristics in the translation to TMC:

No special characteristics in the translation to TMC.

Characteristics in the translation to TPEG2-TEC:

No special characteristics in the translation to TPEG2-TEC.

Characteristics in the translation to DENM:

DENM has no specific means to code flooding, aquaplaning, or surface water hazards.

- For flooding, the general cause code "hazardous location - surface condition" was selected to indicate hazardous driving conditions.
- For aquaplaning and surface water hazard, the cause code "adverse weather condition - adhesion" was selected to indicate a potential loss of grip on the road.

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2.3 Category b) Animal/people/obstacles/debris on the road

Definition: <i>EC Delegated Regulation No 866/2013</i>	“Animal, people, obstacles, debris on the road” means any situation where animals, debris, obstacles or people are positioned on the road where one would not expect to find them so that an emergency manoeuvre might be required to avoid them.
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The following messages belong to the category “**animal/people/obstacles/debris on the road**”:

- Objects on the road
- Obstructions on the road
- Shed loads
- Fallen trees
- Avalanches
- Rockfalls
- Landslips
- Animals on the road
- People on roadway
- Children on roadway
- Cyclists on roadway
- Large animals on roadway
- Herds of animals on roadway
- People throwing objects onto the road
- Broken down vehicles

The selection of these messages is based on the following rules:

- In this category the reason of the impact is also included, because some of the events can move very quickly other are more static.
- Events, which warn of small things, like for example small animals on the road, are not relevant in this category, because they are not safety relevant for a typical vehicle.

DATEX II (CEN/TS 16157)			TMC Events (EN ISO 14819-2)			TPEG-TEC (ISO/TS 21219-15)				DENM (ETSI EN 302 637-3)			
DATEX Class	TYPE	Supplementary Position Description	Line	Text (CEN-English)	Code	Cause Code	Sub Cause Code	Warning Level	Text SubCauseCode trumps Cause Code	Cause Code	Sub Cause Code	Text SubCauseCode trumps CauseCode	CauseCode
GeneralObstruction	objectOnTheRoad		866	(Q) object(s) on the road. Danger	63	10		3	objects on the road	10	0	hazardous location - obstacle on the road	
GeneralObstruction	obstructionOnTheRoad		863	(Q) obstructions on the road. Danger	902	10	4	3	large objects	10	4	large objects	
GeneralObstruction	shedLoad		868	(Q) shed load(s). Danger	359	10	1	3	shed load	10	1	shed load	
EnvironmentalObstruction	fallenTrees		875	(Q) fallen trees. Danger	906	10	5	3	fallen trees	10	5	fallen trees	
EnvironmentalObstruction	avalanches		887	avalanches. Danger	992	5	2	3	danger of avalanches	10	4	large objects	
EnvironmentalObstruction	rockfalls		892	rockfalls. Danger	998	9	1	3	rockfalls	9	1	rockfalls	
EnvironmentalObstruction	landslips		894	landslips. Danger	999	5	4	3	landslips	10	4	large objects	
AnimalPresenceObstruction	animalsOnTheRoad		944	animals on the road. Danger	923	11		3	animals on roadway	11	0	hazardous location -animal on the road	
GeneralObstruction	peopleOnRoadway		945	people on roadway. Danger	1482	12		3	people on roadway	12	0	human presence on the road	

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DATEX II (CEN/TS 16157)			TMC Events (EN ISO 14819-2)			TPEG-TEC (ISO/TS 21219-15)				DENM (ETSI EN 302 637-3)			
DATEX Class	TYPE	Supplementary Position Description	Line	Text (CEN-English)	Code	Cause Code	Sub Cause Code	Warning Level	Text SubCauseCode trumps Cause Code	Cause Code	Sub Cause Code	Text SubCauseCode trumps Cause Code	Cause Code
GeneralObstruction	childrenOnRoad way		946	children on roadway. Danger	1483	12	1	3	children on roadway	12	1	children on roadway	
GeneralObstruction	cyclistsOnRoad way		947	cyclists on roadway. Danger	1484	12	2	3	cyclists on roadway	12	2	cyclists on roadway	
AnimalPresenceObstruction	largeAnimalsOn TheRoad		948	large animals on roadway	1067	11	4	3	large animals	11	4	large animals	
AnimalPresenceObstruction	herdOfAnimals OnTheRoad		949	herds of animals on roadway	1068	11	2	3	herd of animals	11	2	herd of animals	
DisturbanceActivity	attackOnVehicle		961	people throwing objects onto the road. Danger	897	20	3	4	stone throwing persons	20	3	stone throwing persons	
VehicleObstruction	brokenDown Vehicle		532	(Q) broken down vehicle(s). Danger	393	13		3	broken down vehicles	94	2	vehicle breakdown	

Tab. 2-4: Corresponding Message Subsets for the category “animal/people/obstacles/debris on the road”

Characteristics in the translation to DATEX II:

No special characteristics in the translation to DATEX II.

Characteristics in the translation to TMC:

No special characteristics in the translation to TMC.

Characteristics in the translation to TPEG2-TEC:

No special characteristics in the translation to TPEG2-TEC.

Characteristics in the translation to DENM:

DENM has no means to code impassability situations due to e.g. landslips or avalanches. The general cause code “large objects” (meaning obstruction) is selected for these situations to indicate the potential situation of a (partly) blocked road.

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2.4 Category c) Unprotected accident area

Definition: <i>EC Delegated Regulation No 866/2013</i>	“Unprotected accident area” means the area where an accident has occurred and which has not yet been secured by the competent authority;
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The following message belongs to the category “**unprotected accident area**”:

- Unprotected accident area(s)

The selection of this message is based on the following rule:

- An accident is protected at the moment, when a competent authority (e.g. the police) arrives at the place of accident. Because of this all other types of accidents are protected and not part of the category.

DATEX II (CEN/TS 16157)			TMC Events (EN ISO 14819-2)			TPEG-TEC (ISO/TS 21219-15)				DENM (ETSI EN 302 637-3)		
DATEX Class	TYPE	Supplementary Position Description	Line	Text (CEN-English)	Code	Cause Code	Sub Cause Code	Warning Level	Text SubCauseCode trumps Cause Code	Cause Code	Sub Cause Code	Text SubCauseCode trumps CauseCode
GeneralObstruction	Unprotected AccidentArea		955	(Q) unprotected accident area(s)	857	2	7	3	unsecured accident	2	7	unsecured accident

Tab. 2-5: Corresponding Message Subsets for the category “unprotected accident area”

Characteristics in the translation to DATEX II:

No special characteristics in the translation to DATEX II.

Characteristics in the translation to TMC:

No special characteristics in the translation to TMC.

Characteristics in the translation to TPEG2-TEC:

No special characteristics in the translation to TPEG2-TEC.

Characteristics in the translation to DENM:

No special characteristics in the translation to DENM.

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2.5 Category d) Short term road works

Definition: <i>EC Delegated Regulation No 866/2013</i>	“Short-term road works” means any temporary road works that are carried out on the road or on the side of the road and which are indicated only by minimum signing because of the short-term nature of these works.
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The following messages belong to the category “short term road works”:

- Clearance work
- Maintenance work
- Slow moving maintenance vehicle(s)
- Road marking work

The selection of these messages is based on the following rules:

- Short term roadworks describe roadworks, which are in the most cases only protected by a (moving) trailer. Construction sites for a longer duration are signalled more in front of the location and are therefore not part of the list.

DATEX II (CEN/TS 16157)			TMC Events (EN ISO 14819-2)			TPEG-TEC (ISO/TS 21219-15)				DENM (ETSI EN 302 637-3)		
DATEX Class	TYPE	Supplementary Position Description	Line	Text (CEN-English)	Code	Cause Code	Sub Cause Code	Warning Level	Text SubCauseCode trumps Cause Code	Cause Code	Sub Cause Code ²	Text SubCauseCode trumps Cause Code
GeneralObstruction	rescueAndRecoveryWork		540	rescue and recovery work in progress. Danger	1066	15		3	rescue and recovery work in progress	15	0	rescue and recovery work in progress
MaintenanceWorks	maintenanceWork		831	(Q sets of) maintenance work	703	3		3	roadworks	3	4 (0)	Short-term stationary roadworks
VehicleObstruction	SlowMovingMaintenanceVehicle		926	(Q) slow moving maintenance vehicle(s)	1700	3	3	3	slow moving maintenance	3	3 (0)	slow moving road maintenance
MaintenanceWorks	RoadMarkingWork		953	(Q sets of) road marking work. Danger	824	3	2	3	road marking work	3	2 (0)	road marking work

Tab. 2-6: Corresponding Message Subsets for the category “short term road works”

Characteristics in the translation to DATEX II:

No special characteristics in the translation to DATEX II.

Characteristics in the translation to TMC:

No special characteristics in the translation to TMC.

Characteristics in the translation to TPEG2-TEC:

No special characteristics in the translation to TPEG2-TEC.

Characteristics in the translation to DENM:

The DENM codes for road works are derived from the “basic service” and “Stand-alone service” modes for the C-ITS Corridor Road Works Warning Service (White Paper RWW_MessageSet).

² The preferred sub Cause code in DENM is based on the “basic service” mode, the fallback sub Cause code (between parentheses) is based on the “stand-alone service” mode of the Road Works Warning Service.

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2.6 Category e) Reduced visibility

Definition: <i>EC Delegated Regulation No 866/2013</i>	“Reduced visibility” means visibility affected by any condition that reduces the sight range of drivers and which might affect safe driving.
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The following messages belong to the category “**reduced visibility**”:

- Visibility reduced
- Smoke hazard
- Dense fog
- Patchy fog
- Blowing snow
- Low sun glare

The selection of these messages is based on the following rules:

- The main message in this category is “visibility reduced”, which explains the category generally.
- The other selected messages are also relevant, because they need different adapted reactions of the driver. Reduced visibility because of fog, snow or rain is not a safety relevant message, because in many Member States this is a normal weather situation.

DATEX II (CEN/TS 16157)			TMC Events (EN ISO 14819-2)			TPEG-TEC (ISO/TS 21219-15)				DENM (ETSI EN 302 637-3)		
DATEX Class	TYPE	Supplementary Position Description	Line	Text (CEN-English)	Code	Cause Code	Sub Cause Code	Warning Level	Text SubCauseCode trumps Cause Code	Cause Code	Sub Cause Code	Text SubCauseCode trumps CauseCode
PoorEnvironmentConditions	visibilityReduced		1068	visibility reduced (to Q)	1318	18		3	visibility reduced	18	0	adverse weather condition - visibility
PoorEnvironmentConditions	smokeHazard		1075	smoke hazard (visibility reduced to Q)	1309	18	2	3	visibility reduced due to smoke	18	2	visibility reduced due to smoke
PoorEnvironmentConditions	denseFog		1081	dense fog (visibility reduced to Q)	1301	18	1	3	visibility reduced due to fog	18	1	visibility reduced due to fog
PoorEnvironmentConditions	patchyFog		1084	patchy fog (visibility reduced to Q)	1307	18	1	3	visibility reduced due to fog	18	1	visibility reduced due to fog
PoorEnvironmentConditions	heavySnowfall		1077	blowing snow (visibility reduced to Q)	1323	18	3	3	visibility reduced due to heavy snowfall	18	3	visibility reduced due to heavy snowfall
PoorEnvironmentConditions	lowSunGlare		1080	low sun glare	1325	18	6	3	visibility reduced due to low sun glare	18	6	visibility reduced due to low sun glare

Tab. 2-7: Corresponding Message Subsets for the category “reduced visibility”

Characteristics in the translation to DATEX II:

No special characteristics in the translation to DATEX II.

Characteristics in the translation to TMC:

No special characteristics in the translation to TMC.

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Characteristics in the translation to TPEG2-TEC:

TPEG2-TEC doesn't distinguish between dense and patchy fog.

Characteristics in the translation to DENM:

DENM doesn't distinguish between dense and patchy fog.

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2.7 Category f) Wrong-way driver

Definition: <i>EC Delegated Regulation No 866/2013</i>	“Wrong-way driver” means a vehicle travelling on the wrong side of a divided carriageway against the oncoming traffic;
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The following message belongs to the category “**wrong-way driver**”:

- Vehicle(s) on wrong carriageway

DATEX II (CEN/TS 16157)			TMC Events (EN ISO 14819-2)			TPEG-TEC (ISO/TS 21219-15)				DENM (ETSI EN 302 637-3)			
DATEX Class	TYPE	Supplementary Position Description	Line	Text (CEN-English)	Code	Cause Code	Sub Cause Code	Warning Level	Text SubCauseCode trumps Cause Code	Cause Code	Sub Cause Code	Text SubCauseCode trumps CauseCode	CauseCode
VehicleObstruction	vehicleOnWrong Carriageway		1401	(Q) vehicle(s) on wrong carriageway	1701	14		4	vehicle on wrong carriageway	14	0	wrong way driving	

Tab. 2-8: Corresponding Message Subsets for the category “wrong-way driver”

Characteristics in the translation to DATEX II:

No special characteristics in the translation to DATEX II.

Characteristics in the translation to TMC:

No special characteristics in the translation to TMC.

Characteristics in the translation to TPEG2-TEC:

No special characteristics in the translation to TPEG2-TEC.

Characteristics in the translation to DENM:

No special characteristics in the translation to DENM.

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2.8 Category g) Unmanaged blockage of a road

Definition: <i>EC Delegated Regulation No 866/2013</i>	“Unmanaged blockage of a road” means any blockage of a road, partial or total, which has not been adequately secured and signposted.
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The following messages belong to the category “unmanaged blockage of a road”:

- blocked
- bridge blocked
- tunnel blocked
- exit blocked
- connecting carriageway blocked
- entry blocked

The selection of these messages is based on the following rule:

- This category only contains events, which describe an unmanaged blockage of a road. If a blockage is secured by competent authority (e.g. the police) or if the road is closed for roadworks, the authority has enough time to plan a safeguard.

DATEX II (CEN/TS 16157)			TMC Events (EN ISO 14819-2)			TPEG-TEC (ISO/TS 21219-15)				DENM (ETSI EN 302 637-3)		
DATEX Class	TYPE	Supplementary Position Description	Line	Text (CEN-English)	Code	Cause Code	Sub Cause Code	Warning Level	Text SubCauseCode trumps Cause Code	Cause Code	Sub Cause Code	Text SubCauseCode trumps Cause Code
impact:trafficConstrictionType	roadBlocked		634	blocked	402	5		3	impassability	X	X	no DENM coding
impact:trafficConstrictionType	roadBlocked	onBridge	695	bridge blocked	26	5		3	impassability	X	X	no DENM coding
impact:trafficConstrictionType	roadBlocked	inTunnel	696	tunnel blocked	27	5		3	impassability	X	X	no DENM coding
impact:trafficConstrictionType	roadBlocked	exitSlipRoad	710	exit blocked	476	5		3	impassability	X	X	no DENM coding
impact:trafficConstrictionType	roadBlocked	onConnector	715	connecting carriageway blocked	485	5		3	impassability	X	X	no DENM coding
impact:trafficConstrictionType	roadBlocked	entrySlipRoad	729	entry blocked	473	5		3	impassability	X	X	no DENM coding

Tab. 2-9: Corresponding Message Subsets for the category “unmanaged blockage of a road”

Characteristics in the translation to DATEX II:

The type of the concrete instance of the abstract "SituationRecord" class is irrelevant. Whenever an "impact" element is present and has a "trafficConstrictionType" attribute set to the listed value, the record is semantically equivalent to the corresponding TMC/TEC code.

Characteristics in the translation to TMC:

No special characteristics in the translation to TMC.

Characteristics in the translation to TPEG2-TEC:

In TPEG2-TEC the cause code impassability was selected. The Location Reference shall refer to the proper location (the entry or exit location itself in case the entry or exit was blocked). Any further description can be added additional.

Safety related message sets – Selection of DATEX II Codes, DENM Event Types, TPEG2-TEC Causes and TMC Events for EC high level Categories

Characteristics in the translation to DENM:

Impassabilities cannot be coded with DENM. DENM does not contain a suitable cause code to indicate an impassability such as a blocked road (NB the corresponding TPEG2-TEC cause code category “impassability” is omitted in the 2014 DENM specification).

Safety related message sets – Selection of DATEX II Codes, DENM Event Types, TPEG2-TEC Causes and TMC Events for EC high level Categories

2.9 Category h) Exceptional weather conditions

Definition: <i>EC Delegated Regulation No 866/2013</i>	“Exceptional weather conditions” means unusual, severe or unseasonal weather conditions which might affect safe driving.
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The category “**exceptional weather conditions**” contains all the weather related events, which are not part of the categories “temporary slippery road” and “reduced visibility”.

The following messages belong to the category “exceptional weather conditions”:

- Heavy snowfall
- Heavy rain
- Storm force winds
- Strong winds
- Crosswinds
- Strong winds affecting high-sided vehicles

The selection of these messages is based on the following rules:

- Common weather conditions, like snow, rain or wind are not relevant for a safety relevant message, because in many Member States they are a normal weather situation.
- For a driver the exact definition of the wind is not important. He only needs to know that he has to anticipate strong wind.

DATEX II (CEN/TS 16157)			TMC Events (EN ISO 14819-2)			TPEG-TEC (ISO/TS 21219-15)				DENM (ETSI EN 302 637-3)		
DATEX Class	TYPE	Supplementary Position Description	Line	Text (CEN-English)	Code	Cause Code	Sub Cause Code	Warning Level	Text SubCauseCode trumps Cause Code	Cause Code	Sub Cause Code	Text SubCauseCode trumps CauseCode
PoorEnvironmentConditions	heavySnowfall		1051	heavy snowfall (Q)	1101	19	2	3	heavy snowfall	19	2	heavy snowfall
PoorEnvironmentConditions	heavyRain		1059	heavy rain (Q)	1109	19	1	3	heavy rain	19	1	heavy rain
PoorEnvironmentConditions	stormForceWinds		1114	storm force winds (Q)	1204	17	1	3	strong winds	17	1	strong winds
PoorEnvironmentConditions	strongWinds		1112	strong winds (Q)	1205	17	1	3	strong winds	17	1	strong winds
PoorEnvironmentConditions	crosswinds		1114	crosswinds (Q)	1210	17	1	3	strong winds	17	1	strong winds
PoorEnvironmentConditions	strongWinds		1118	strong winds (Q) affecting high-sided vehicles	1211	17	1	3	strong winds	17	1	strong winds

Tab. 2-10: Corresponding Message Subsets for the category “exceptional weather conditions”

Characteristics in the translation to DATEX II:

No special characteristics in the translation to DATEX II.

Characteristics in the translation to TMC:

No special characteristics in the translation to TMC.

Characteristics in the translation to TPEG2-TEC:

TPEG2-TEC doesn't distinguish between different types of strong wind.

**Safety related message sets –
Selection of DATEX II Codes, DENM Event Types, TPEG2-TEC
Causes and TMC Events for EC high level Categories**

Characteristics in the translation to DENM:

DENM doesn't distinguish between different types of strong wind.

Safety related message sets – Selection of DATEX II Codes, DENM Event Types, TPEG2-TEC Causes and TMC Events for EC high level Categories

3 References

ITS Directive (2010):

Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010 on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport (Text with EEA relevance).

EC Delegated Regulation No 866/2013 (2013):

Commission Delegated Regulation (EU) No 866/2013 of 15 May 2013 supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to data and procedures for the provision, where possible, of road safety-related minimum universal traffic information free of charge to users (Text with EEA relevance).

DATEX II (2011):

CEN/TS 16157-3:2011 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 3: Situation publication.

DENM (2014):

ETSI EN 302 637-3 V1.2.1 (2014-09), Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 3: Specifications of Decentralized Environmental Notification Basic Service.

TMC (2013):

EN ISO 14819-2:2013, Traffic and Traveller Information (TTI). TTI messages via traffic message coding Event and information codes for Radio Data System. Traffic Message Channel (RDS-TMC).

RWW_MessageSet (2016):

Amsterdam Group, Message Set and Triggering Conditions for Road Works Warning Service, White Paper, version 2.0, 8 April 2016.

TPEG2-TEC (2016):

ISO/TS 21219-15:2016, Intelligent transport systems -- Traffic and travel information (TTI) via transport protocol experts group, generation 2 (TPEG2) -- Part 15: Traffic event compact (TPEG2-TEC)

Safety related message sets – Selection of DATEX II Codes, DENM Event Types, TPEG2-TEC Causes and TMC Events for EC high level Categories

4 Appendix

DATEX II (CEN/TS 16157)			TMC Events (EN ISO 14819-2)			TPEG-TEC (ISO/TS 21219-15)				DENM (ETSI EN 302 637-3)		
DATEX Class	TYPE	Supplementary Position Description	Line	Text (CEN-English)	Code	Cause Code	Sub Cause Code	Warning Level	Text SubCauseCode trumps Cause Code	Cause Code	Sub Cause Code	Text SubCauseCode trumps CauseCode
(a) Temporary slippery road												
EnvironmentalObstruction	flooding		880	flooding. Danger	908	5	1	3	flooding	9	0	hazardous location - surface condition
WeatherRelatedRoadConditions	surfaceWater		980	danger of aquaplaning	1002	7		3	aquaplaning	6	0	adverse weather condition -adhesion
WeatherRelatedRoadConditions	surfaceWater		977	surface water hazard	1041	7		3	aquaplaning	6	0	adverse weather condition -adhesion
WeatherRelatedRoadConditions	slipperyRoad		979	slippery road (above Q hundred metres)	1003	6		3	slippery road	6	0	adverse weather condition -adhesion
NonWeatherRelatedRoad Conditions	mudOnRoad		981	mud on road. Danger	1055	6	3	3	mud on road	6	3	mud on road
NonWeatherRelatedRoad Conditions	looseChippings		985	loose chippings. Danger	1056	6	8	3	loose chippings	6	8	loose chippings
NonWeatherRelatedRoad Conditions	oilOnRoad		987	oil on road. Danger	1057	6	7	3	oil on road	6	7	oil on road
NonWeatherRelatedRoad Conditions	petrolOnRoad		989	petrol on road. Danger	1058	6	2	3	fuel on road	6	2	fuel on road
WeatherRelatedRoadConditions	ice		992	ice (above Q hundred metres)	1006	6	5	3	ice on road	6	5	ice on road
WeatherRelatedRoadConditions	blackIce		996	black ice (above Q hundred metres)	1008	6	6	3	black ice on road	6	6	black ice on road
WeatherRelatedRoadConditions	snowDrifts		1006	snow drifts (above Q hundred metres)	1016	9	5	3	snow drifts	9	5	snow drifts
WeatherRelatedRoadConditions	icyPatches		996	icy patches (above Q hundred metres)	1047	6	5	3	ice on road	6	5	ice on road
(b) Animal/people /obstacles/debris on the road												
GeneralObstruction	objectOnThe Road		866	(Q) object(s) on the road. Danger	63	10		3	objects on the road	10	0	hazardous location - obstacle on the road
GeneralObstruction	obstructionOnThe Road		863	(Q) obstructions on the road. Danger	902	10	4	3	large objects	10	4	large objects
GeneralObstruction	shedLoad		868	(Q) shed load(s). Danger	359	10	1	3	shed load	10	1	shed load
EnvironmentalObstruction	fallenTrees		875	(Q) fallen trees. Danger	906	10	5	3	fallen trees	10	5	fallen trees
EnvironmentalObstruction	avalanches		887	avalanches. Danger	992	5	2	3	danger of avalanches	10	4	large objects
EnvironmentalObstruction	rockfalls		892	rockfalls. Danger	998	9	1	3	rockfalls	9	1	rockfalls
EnvironmentalObstruction	landslips		894	landslips. Danger	999	5	4	3	landslips	10	4	large objects
AnimalPresenceObstruction	animalsOnThe Road		944	animals on the road. Danger	923	11		3	animals on roadway	11	0	hazardous location -animal on the road
GeneralObstruction	peopleOnRoad way		945	people on roadway. Danger	1482	12		3	people on roadway	12	0	human presence on the road
GeneralObstruction	childrenOnRoad way		946	children on roadway. Danger	1483	12	1	3	children on roadway	12	1	children on roadway
GeneralObstruction	cyclistsOnRoad way		947	cyclists on roadway. Danger	1484	12	2	3	cyclists on roadway	12	2	cyclists on roadway
AnimalPresenceObstruction	largeAnimalsOn TheRoad		948	large animals on roadway	1067	11	4	3	large animals	11	4	large animals
AnimalPresenceObstruction	herdOfAnimals OnTheRoad		949	herds of animals on roadway	1068	11	2	3	herd of animals	11	2	herd of animals
DisturbanceActivity	attackOnVehicle		961	people throwing objects onto the road. Danger	897	20	3	4	stone throwing persons	20	3	stone throwing persons
VehicleObstruction	brokenDown Vehicle		532	(Q) broken down vehicle(s). Danger	393	13		3	broken down vehicles	94	2	vehicle breakdown
(c) Unprotected accident area												
GeneralObstruction	Unprotected AccidentArea		955	(Q) unprotected accident area(s)	857	2	7	3	unsecured accident	2	7	unsecured accident
(d) Short term road works³												
GeneralObstruction	rescueAnd RecoveryWork		540	rescue and recovery work in progress. Danger	1066	15		3	rescue and recovery work in progress	15	0	rescue and recovery work in progress
MaintenanceWorks	maintenanceWork		831	(Q sets of) maintenance work	703	3		3	roadworks	3	4 (0)	short-term stationary roadworks
VehicleObstruction	SlowMovingMain tenanceVehicle		926	(Q) slow moving maintenance vehicle(s)	1700	3	3	3	slow moving maintenance	3	3 (0)	slow moving road maintenance
MaintenanceWorks	RoadMarkingWork		953	(Q sets of) road marking work. Danger	824	3	2	3	road marking work	3	2 (0)	road marking work

³ For short-term Roadworks, the preferred DENM sub Cause code is based on the “basic service” mode, and the fallback code (between parentheses) on the “stand-alone service” mode of the Road Works Warning Service (RWW_MessageSet, 2016).

Safety related message sets – Selection of DATEX II Codes, DENM Event Types, TPEG2-TEC Causes and TMC Events for EC high level Categories

DATEX II (CEN/TS 16157)			TMC Events (EN ISO 14819-2)			TPEG-TEC (ISO/TS 21219-15)				DENM (ETSI EN 302 637-3)		
DATEX Class	TYPE	Supplementary Position Description	Line	Text (CEN-English)	Code	Cause Code	Sub Cause Code	Warning Level	Text SubCauseCode trumps Cause Code	Cause Code	Sub Cause Code	Text SubCauseCode trumps CauseCode
(e) Reduced visibility												
PoorEnvironmentConditions	visibilityReduced		1068	visibility reduced (to Q)	1318	18		3	visibility reduced	18	0	adverse weather condition - visibility
PoorEnvironmentConditions	smokeHazard		1075	smoke hazard (visibility reduced to Q)	1309	18	2	3	visibility reduced due to smoke	18	2	visibility reduced due to smoke
PoorEnvironmentConditions	denseFog		1081	dense fog (visibility reduced to Q)	1301	18	1	3	visibility reduced due to fog	18	1	visibility reduced due to fog
PoorEnvironmentConditions	patchyFog		1084	patchy fog (visibility reduced to Q)	1307	18	1	3	visibility reduced due to fog	18	1	visibility reduced due to fog
PoorEnvironmentConditions	heavySnowfall		1077	blowing snow (visibility reduced to Q)	1323	18	3	3	visibility reduced due to heavy snowfall	18	3	visibility reduced due to heavy snowfall
PoorEnvironmentConditions	lowSunGlare		1080	low sun glare	1325	18	6	3	visibility reduced due to low sun glare	18	6	visibility reduced due to low sun glare
(f) Ghost driver												
VehicleObstruction	vehicleOnWrong Carriageway		1401	(Q) vehicle(s) on wrong carriageway	1701	14		4	vehicle on wrong carriageway	14	0	wrong way driving
(g) Unmanaged blockage of a road												
impact:trafficConstrictionType	roadBlocked		634	blocked	402	5		3	impassability	X	X	<i>no DENM coding</i>
impact:trafficConstrictionType	roadBlocked	onBridge	695	bridge blocked	26	5		3	impassability	X	X	<i>no DENM coding</i>
impact:trafficConstrictionType	roadBlocked	inTunnel	696	tunnel blocked	27	5		3	impassability	X	X	<i>no DENM coding</i>
impact:trafficConstrictionType	roadBlocked	exitSlipRoad	710	exit blocked	476	5		3	impassability	X	X	<i>no DENM coding</i>
impact:trafficConstrictionType	roadBlocked	onConnector	715	connecting carriageway blocked	485	5		3	impassability	X	X	<i>no DENM coding</i>
impact:trafficConstrictionType	roadBlocked	entrySlipRoad	729	entry blocked	473	5		3	impassability	X	X	<i>no DENM coding</i>
(h) Exceptional weather conditions (*not covered by category (a) or (e))												
PoorEnvironmentConditions	heavySnowfall		1051	heavy snowfall (Q)	1101	19	2	3	heavy snowfall	19	2	heavy snowfall
PoorEnvironmentConditions	heavyRain		1059	heavy rain (Q)	1109	19	1	3	heavy rain	19	1	heavy rain
PoorEnvironmentConditions	stormForceWinds		1114	storm force winds (Q)	1204	17	1	3	strong winds	17	1	strong winds
PoorEnvironmentConditions	strongWinds		1112	strong winds (Q)	1205	17	1	3	strong winds	17	1	strong winds
PoorEnvironmentConditions	crosswinds		1114	crosswinds (Q)	1210	17	1	3	strong winds	17	1	strong winds
PoorEnvironmentConditions	strongWinds		1118	strong winds (Q) affecting high-sided vehicles	1211	17	1	3	strong winds	17	1	strong winds

Tab. 4-1: Full list of road safety related events or conditions and Message Subsets corresponding