Triggering Conditions and Data Quality Traffic Condition

CAR 2 CAR Communication Consortium

About the C2C-CC

Enhancing road safety and traffic efficiency by means of Cooperative Intelligent Transport Systems and Services (C-ITS) is the dedicated goal of the CAR 2 CAR Communication Consortium. The industrial driven, non-commercial association was founded in 2002 by vehicle manufacturers affiliated with the idea of cooperative road traffic based on Vehicle-to-Vehicle Communications (V2V) and supported by Vehicle-to-Infrastructure Communications (V2I). The Consortium members represent worldwide major vehicle manufactures, equipment suppliers and research organisations.

Over the years, the CAR 2 CAR Communication Consortium has evolved to be one of the key players in preparing the initial deployment of C-ITS in Europe and the subsequent innovation phases. CAR 2 CAR members focus on wireless V2V communication applications based on ITS-G5 and concentrate all efforts on creating standards to ensure the interoperability of cooperative systems, spanning all vehicle classes across borders and brands. As a key contributor, the CAR 2 CAR Communication Consortium and its members work in close cooperation with the European and international standardisation organisations.

Disclaimer

Document information

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		• Changed phrases:
		  ○ *traffic jam* to *traffic condition*
		  ○ *dangerous end of queue* to *sudden speed drop*
		  ○ *traffic jam ahead* to *local slow down*
		• Renamed document from *Triggering Conditions and Data Quality Traffic Jam* to *Triggering Conditions and Data Quality Traffic Condition*
			Release Management	Steering Committee

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Table 2: Changes since last release

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1 Introduction

Other (informational) **RS_tcTrJa_148**

This document describes the triggering conditions for traffic condition warning for the following two vehicle C-ITS services:

- traffic condition – sudden speed drop
- traffic condition – local slow down

2 Definitions

Definition **RS_tcTrJa_642**

‘*Vehicle speed*’ is the length of the velocity-vector of the reference position point.

3 Requirement specifications

3.1 Traffic condition – sudden speed drop

3.1.1 Description of cooperative intelligent transport systems (C-ITS) service

Other (informational) **RS_tcTrJa_93**

This vehicle C-ITS service transmits vehicle-to-vehicle (V2V) information on a situation where an ego vehicle detects the end of a traffic condition ('sudden speed drop'). Such a situation exists, when the traffic lane of the ego vehicle is blocked and the vehicle cannot proceed in its lane. Urban environment is not considered in this service.

Other (informational) **RS_tcTrJa_149**

The following vehicle C-ITS services are related to this service, because they share similar triggering conditions:

- 'dangerous situations – electronic emergency brake light'.

3.1.2 Triggering conditions

3.1.2.1 Preconditions

Requirement (i) **RS_tcTrJa_94**

The following preconditions shall be satisfied when this use case is triggered:

1. the ego vehicle is located in a non-urban environment, as determined in at least one of the following ways:
    1.1. the speed is greater than 80 km/h for a time block of at least 30 s in the 60 s prior to each detection and the absolute value of the steering wheel angle is less than 90 ° for a time block of at least 30 s in the 60 s prior to each detection;
    1.2. an on-board camera sensor indicates non-urban environment;
    1.3. an on-board digital map indicates non-urban environment.

Note: PTW do not use the steering wheel angle recognizing the non-urban environment (steering wheel angle is always treated as being < 90 °).

Tested by:

Requirement (i) **RS_tcTrJa_96**

The speed and angle values shall be measured continuously. The conditions shall be satisfied throughout the measurement duration. The process shall start over again if the conditions are not satisfied within measurement duration.

Tested by:

3.1.2.2 Service-specific conditions

Requirement (i) **RS_tcTrJa_105**

If the preconditions in RS_tcTrJa_94 and at least one of the following conditions are TRUE, the triggering conditions for this vehicle C-ITS service are fulfilled and the generation of a Decentralised Environmental Notification Message (DENM) shall be triggered:

- Condition 1: TRCO_0 AND (TRCO_2 OR TRCO_3 OR TRCO_4 OR TRCO_5 OR

TRCO_6)

- Condition 2: TRCO_1 AND TRCO_2.

Table 3: 'Traffic condition – sudden speed drop' service-specific conditions

ID	Triggering condition (TRCO)	Status
TRCO_0	The ego vehicle is driving with an initial speed exceeding 80 km/h and the initial deceleration is equal to or below 0,1 m/s². The driver reacts to the 'sudden speed drop' by reducing the speed from initial to target speed of 30 km/h or less. The duration between initial and target speed shall be 10 s or less. An instant deceleration between initial and target speed exceeding -3.5 m/s² is detected.	driver reaction
TRCO_1	Passengers of the ego vehicle react to the traffic condition by enabling hazard lights for at least 3 s	driver reaction
TRCO_2	At least three other vehicles with a speed of at least 7 km/h have hazard lights enabled for at least 3 s as indicated by: • an on-board camera sensor; or • CAMs.	environment or on-board sensors
TRCO_3	At least one DENM corresponding to the *'traffic condition - sudden speed drop'* vehicle C-ITS service has been received.	environment
TRCO_4	At least five different DENMs (i.e. with different *actionIDs*) corresponding to the 'traffic condition - local slow down' vehicle C-ITS service have been received from the downstream traffic.	environment
TRCO_5	At least one DENM corresponding to the 'special vehicle warning - *static safeguarding emergency vehicle'* vehicle C-ITS service has been received, with *linkedCause* equal to *trafficCondition* or d*angerous-End-of-Queue*.	environment
TRCO_6	On-board sensors of the ego vehicle recognise that the vehicle is facing a sudden speed drop.	on-board sensors

Tested by:

Requirement (i) **RS_tcTrJa_151**

A new DENM shall not be requested within the *Detection Blocking Time*. The *Detection Blocking Time* is launched after the event is detected and a DENM to that effect has been requested. In this way, a single event is not able to flood the transmission channel. The *Detection Blocking Time* shall be 60 s no matter how the event is detected. The detection period between two detected events shall be at least equal to the *Detection Blocking Time*. The detection algorithm may run during *Detection Blocking Time*.

Note: No period for the braking manoeuvres is presented, because the initial ego vehicle speed has no upper restriction.

Tested by:

Requirement (i) **RS_tcTrJa_107**

A condition shall be valid as long as it is active and for an extra period of 5 s (the period increases the determinism of the detection algorithm). The validity shall decrease from the

moment the condition is no longer satisfied, thus facilitating the combination of triggering conditions.

Tested by:

Requirement (i) **RS_tcTrJa_108**

CAMs and DENMs from remote vehicles used for evaluating service specific conditions as described above shall be relevant for the ego vehicle. The relevance shall be determined in one of these ways:

a) a digital map indicates that the event and the ego vehicle are separated by a distance of less than 500 m and share the same driving direction;

b) a path history match indicates that the event and the ego vehicle are separated by a distance of less than 500 m and share the same driving direction;

c) the Euclidean distance between the event and the ego vehicle is less than 500 m and the absolute value of the heading difference is less than 10 °. The traffic condition reference positions according to the DENMs are located in an area spanning from -45 ° to +45 ° starting at the ego vehicle's longitudinal axis.

Note: When counting vehicles or events, Authorization Ticket (AT) change should be considered in such a way that no vehicle or event is counted multiple times.

Tested by:

3.1.2.3 Information quality

Requirement (i) **RS_tcTrJa_109**

The value of the data element *informationQuality* in the DENM depends on how the situation is detected. TRCOs (see RS_tcTrJa_105) are divided into groups: driver reaction, vehicle dynamics, environment and on-board sensors. The *informationQuality* value shall be set according to the following table. The highest possible value shall be used.

Table 4: Information quality of 'traffic condition – sudden speed drop'

Event detection	Value of InformationQuality
No TRCO compliant implementation	unknown(0)
At least one TRCO from the driver reaction AND environment group is fulfilled.	1
At least one TRCO from the driver reaction AND on-board sensors group is fulfilled.	2
At least one TRCO from the driver reaction AND environment AND on-board sensors group is fulfilled.	3

Tested by:

3.1.3 Termination conditions

Requirement (i) **RS_tcTrJa_110**

A termination of the vehicle C-ITS service shall not be considered.

Tested by:

3.1.3.1 Cancellation

Requirement (i) **RS_tcTrJa_111**

A cancellation DENM shall not be used for this vehicle C-ITS service.

Tested by:

3.1.3.2 Negation

Requirement (i) **RS_tcTrJa_112**

A negation DENM shall not be used for this vehicle C-ITS service.

Tested by:

3.1.4 Update

Requirement (i) **RS_tcTrJa_113**

An update DENM shall not be used for this vehicle C-ITS service.

Tested by:

3.1.5 Repetition duration and repetition interval

Requirement (i) **RS_tcTrJa_114**

New DENMs shall be repeated for a *repetitionDuration* of 20 s with a *repetitionInterval* of 0,5 s.

Therefore, the interface parameters *Repetition duration* and *Repetition interval* between the application and the Decentralised Environmental Notification (DEN) basic service shall be set according to the above values.

Note: Where two DENMs with the same *causeCode originate* from the same vehicle C-ITS station, the case shall be managed by the receiving C-ITS station.

Tested by:

3.1.6 Traffic class

Requirement (i) **RS_tcTrJa_115**

New DENMs shall be set to *traffic class* 1.

Tested by:

3.1.7 Message parameters

3.1.7.1 DENM

Requirement (i) **RS_tcTrJa_116**

The following table specifies the data elements of the DENM that shall be set.

Table 5: DENM data elements of 'traffic condition – sudden speed drop'

<table>
<tr><th>Data Field</th><th colspan="3">Value</th></tr>
<tr><td colspan="4">Management container</td></tr>
<tr><td>actionID</td><td colspan="3">Identifier of a DENM. Shall be set according to [TS 102 894-2].</td></tr>
<tr><td>detectionTime</td><td colspan="3">TimestampIts-Timestamp at which the event is detected by the originating vehicle C-ITS station. Shall be set in accordance with [TS 102 894-2].</td></tr>
<tr><td>referenceTime</td><td colspan="3">TimestampIts-Timestamp at which a new DENM is generated. Shall be set in accordance with [TS 102 894-2].</td></tr>
<tr><td>termination</td><td colspan="3">Shall not be set, because neither negation nor cancellation are to be used in this vehicle C-ITS service.</td></tr>
<tr><td>eventPosition</td><td colspan="3">ReferencePosition. Shall be set in accordance with [TS 102 894-2].</td></tr>
<tr><td>relevanceDistance</td><td colspan="3">lessThan1000 m(4)</td></tr>
<tr><td>relevanceTrafficDirection</td><td colspan="3">upstreamTraffic(1)</td></tr>
<tr><td>validityDuration</td><td colspan="3">20 s (it is expected that vehicles will be facing a different traffic situation 20 s after detection)</td></tr>
<tr><td>stationType</td><td colspan="3">The type of the originating vehicle C-ITS station. Shall be set in accordance with [TS 102 894-2].</td></tr>
<tr><td colspan="4">Situation container</td></tr>
<tr><td>informationQuality</td><td colspan="3">See RS_tcTrJa_109.</td></tr>
<tr><td>causeCode</td><td colspan="3">dangerousEndOfQueue(27)</td></tr>
<tr><td>subCauseCode</td><td colspan="3">unavailable(0)</td></tr>
<tr><td colspan="4">Location container</td></tr>
<tr><td>eventSpeed</td><td colspan="3">Speed of the originating vehicle C-ITS station. Shall be set in accordance with [TS 102 894-2].</td></tr>
<tr><td>eventPositionHeading</td><td colspan="3">Heading of the originating vehicle C-ITS station. Shall be set in accordance with [TS 102 894-2].</td></tr>
<tr><td>traces</td><td colspan="3">PathHistory of the originating vehicle C-ITS station. Shall be set in accordance with [TS 102 894-2].</td></tr>
<tr><td rowspan="4">roadType</td><td colspan="3">RoadType of the road on which the detecting vehicle C-ITS station is situated.</td></tr>
<tr><td colspan="3">Shall be set in accordance with [TS 102 894-2] in combination with the following rules:</td></tr>
<tr><td>Urban / non-urban</td><td>Structural separation</td><td>Data element</td></tr>
<tr><td>Urban</td><td>No</td><td>urban-NoStructuralSeparation ToOppositeLanes(0)</td></tr>
</table>

	Urban	Yes	urban-WithStructuralSeparation ToOppositeLanes(1)
	Urban	Unknown	urban-NoStructuralSeparation ToOppositeLanes(0)
	Non-urban	No	nonUrban-NoStructuralSeparation ToOppositeLanes(2)
	Non-urban	Yes	nonUrban-WithStructuralSeparation ToOppositeLanes(3)
	Non-urban	Unknown	nonUrban-NoStructuralSeparation ToOppositeLanes(2)
	If the information about urban/non-urban status cannot be determined, the data element shall be omitted.		
Alacarte container			
lanePosition	If the lanePosition is provided by an on-board sensor (e.g. radar, camera), the value shall be set in accordance with [TS 102 894-2]. Use of GNSS and a digital map to estimate the lane number is not legitimate for this version of the triggering condition.		
	If the lanePosition is unknown, the data element shall be omitted.		

Tested by:

3.1.7.2 Cooperative Awareness Message (CAM)

Requirement (i) **RS_tcTrJa_117**

CAM adaption shall not be used for this vehicle C-ITS service.

Tested by:

3.1.8 Networking and transport layer

Requirement (i) **RS_tcTrJa_118**

The interface parameter destination area in IF.DEN.1 [ETSI EN 302 637-3] shall be equal to a circular shape with centre point equal to *eventPosition* and radius equal to r*elevanceDistance*.

Tested by:

3.1.9 Security layer

Requirement (i) **RS_tcTrJa_120**

When the triggering conditions as described in clause 3.1.2 apply, the application shall request the blocking of the AT changeover as defined in RS_BSP_184.

Tested by:

3.1.10 Scenarios

Other (informational) **RS_tcTrJa_152**

This clause has an informational character and is not part of the requirement specification.

The following list encompasses scenarios which are regarded as relevant or irrelevant considering the present vehicle C-ITS service:

Table 6: 'Traffic condition – sudden speed drop' scenarios

Count	Description	Status
SC_0	A towing maneuver consisting of two vehicles both with enabled hazard lights no matter whether stationary or moving.	Irrelevant
SC_1	A braking maneuver due to a red traffic light.	Irrelevant
SC_2	Freeway.	Relevant
SC_4	The ego vehicle is arriving at the end of a traffic queue. Other vehicles have hazard lights enabled to notify inbound traffic. Passengers of the ego-vehicle react by enabling hazard lights.	Relevant
SC_5	The ego vehicle is standing still at the end of a traffic queue with no vehicles behind. Hazard lights of the ego vehicle may be enabled.	Relevant
SC_6	The ego vehicle is performing a braking maneuver due to the end of a traffic queue. Hazard lights of the ego vehicle may be enabled.	Relevant
SC_6	Traffic on a different road.	Irrelevant
SC_7	Traffic in the opposite driving direction.	Irrelevant
SC_8	Other vehicles than passenger cars and PTWs.	Irrelevant
SC_9	Using hazard lights for 'saying sorry'.	Irrelevant

3.2 Traffic condition – local slow down

3.2.1 Description of vehicle C-ITS service

Other (informational) **RS_tcTrJa_121**

This vehicle C-ITS service transmits V2V information on a situation where an ego vehicle detects a traffic condition. Such a situation exists if the ego vehicle is surrounded by stationary traffic or a heavy volume of traffic. This service does not apply to urban environments.

It is important that a traffic condition shall be detected only in appropriate situations. All other situations though related with this vehicle C-ITS service or not, shall not be detected.

Other (informational) **RS_tcTrJa_155**

The following vehicle C-ITS services are related to this service, because they share similar triggering conditions:

- 'stationary vehicle warning – stopped vehicle';
- 'stationary vehicle warning – broken-down vehicle';
- 'stationary vehicle warning – post-crash';
- 'special vehicle warning – stationary recovery service warning'.

3.2.2 Triggering conditions

3.2.2.1 Preconditions

Requirement (i) **RS_tcTrJa_122**

The following preconditions shall be satisfied when this use case is triggered:

1. no ‘stationary vehicle warning’ service is detected;
2. no ‘special vehicle warning’ service is detected;
3. the ego vehicle is located in a non-urban environment, as determined in at least one of these ways:
    - 3.1. the speed is greater than 80 km/h for a time block of at least 30 s in the 180 s prior to each detection and the absolute value of the steering wheel angle is less than 90 ° for a time block of at least 30 s in the 60 s prior to each detection;
    - 3.2. an on-board camera sensor indicates non-urban environment;
    - 3.3. an on-board digital map indicates non-urban environment.

Note: PTW do not use the steering wheel angle recognizing the non-urban environment (steering wheel angle is always treated as being <90 °).

Tested by:

Requirement (i) **RS_tcTrJa_124**

The speed and angle values shall be measured continuously. The conditions shall be satisfied throughout the measurement duration. The process shall start over again if the conditions are not satisfied within measurement duration.

Tested by:

3.2.2.2 Service-specific conditions

Requirement (i) **RS_tcTrJa_131**

If the preconditions in RS_tcTrJa_122 and at least one of the following conditions are TRUE, the triggering conditions for this vehicle C-ITS service are fulfilled and the generation of a DENM shall be triggered:

- Condition 1: TRCO_0;

  Note: This condition covers the scenario where the ego vehicle is likely to be part of stop-and-go traffic. See SC_5 in RS_tcTrJa_158.
- Condition 2: TRCO_1 AND (TRCO_2 OR TRCO_3 OR TRCO_4 OR TRCO_5)

  Note: This condition covers a scenario in which the ego vehicle is stationary and surrounded by other road users which are either stationary or in stop-and-go traffic. See SC_4 in RS_tcTrJa_158.

The period T1 shall be 120 s and the period T2 shall be 30 s.

Table 7: 'Traffic condition – local slow down' service-specific conditions

ID	Triggering condition	Status
TRCO_0	The average speed of the ego vehicle is 30 km/h or less. The average speed shall be calculated over a period of T1. Stationary periods (see RS_BSP_511) shall not be included in the calculation. If a stationary period exceeds the duration of T2, the average speed calculation shall be restarted.	vehicle dynamics
TRCO_1	The ego vehicle is stationary (see RS_BSP_511) for at least T2.	vehicle dynamics
TRCO_2	At least one DENM corresponding to the '*traffic condition - local slow down'* vehicle C-ITS- service with the same driving direction and with an eventPosition within a 5 km radius around the ego vehicle´s position has been received.	environment
TRCO_3	At least one traffic condition notification with the same driving direction and with an eventPosition within a 5 km radius around the ego vehicle´s position has been received by means of mobile radio.	environment
TRCO_4	CAMs indicate a speed of 30 km/h or less of at least five other vehicles within 100 m and with the same driving direction.	environment
TRCO_5	On-board sensors indicate a speed of 30 km/h or less of at least five other vehicles within 100 m and with the same driving direction.	on-board sensor
TRCO_6	An on-board digital map indicates that the vehicle is: - on a non-urban road and - has not stopped on a parking lot nor on an entry or exit ramp during T1 or T2. If the event is detected by condition 1 then T1 shall be used. If the event is detected by condition 2 then T2 shall be used.	on-board digital map

Tested by:

Requirement (i) **RS_tcTrJa_156**

A new DENM shall not be requested in the *Detection Blocking Time*. The *Detection Blocking Time* is launched after the event is detected and a DENM to that effect has been requested. In this way, a single event is not able to flood the transmission channel. The *Detection Blocking Time* shall be 180 s no matter how the event is detected. The detection period between two detected events shall be at least equal to the *Detection Blocking Time*. The detection algorithm may run during *Detection Blocking Time*.

Tested by:

Requirement (i) **RS_tcTrJa_133**

A condition shall be valid as long as it is active and for an extra period of 5 s (the period increases the determinism of the detection algorithm). The validity decreases from the moment the condition is no longer satisfied, thus facilitating the combination of triggering conditions.

Tested by:

Requirement (i) **RS_tcTrJa_134**

CAMs and DENMs from remote vehicles as well as mobile radio events used to evaluate service-specific conditions as described above shall be relevant for the ego vehicle. The relevance shall be determined in one of these ways:

a) digital map indicates that the event and the ego vehicle are separated by a distance of less than 500 m and share the same driving direction;

b) a path history match indicates that the event and the ego vehicle are separated by a distance of less than 500 m and share the same driving direction;

c) the Euclidean distance between the event and the ego vehicle is less than 500 m and the absolute value of the heading difference is less than 10 °. The traffic condition reference positions according to the DENMs are located in an area spanning from -45 ° to +45 ° starting at the ego vehicle's longitudinal axis.

Note: When counting vehicles or events, AT change should be considered in such a way that no vehicle or event is counted multiple times.

Tested by:

3.2.2.3 Information quality

Requirement (i) **RS_tcTrJa_135**

The value of the data element *informationQuality* in the DENM depends on how the situation is detected. TRCOs (see RS_tcTrJa_131) are divided into groups: driver reaction, vehicle dynamics, environment on-board sensors and on-board digital map. The *informationQuality* value shall be set in accordance with the following table. The highest possible value shall be used.

Table 8: Information quality of 'traffic condition – local slow down'

Event detection	Value of InformationQuality
No TRCO-compliant implementation	unknown(0)
Al least one condition from the vehicle dynamics group is fulfilled.	1
At least one condition from the vehicle dynamics AND one from the environment group is fulfilled.	2
At least one condition from the vehicle dynamics AND one from the on-board sensor group is fulfilled.	3
At least one condition from the vehicle dynamics AND one from the environment group AND one from the on-board sensor group is fulfilled	4
At least one condition from the vehicle dynamics AND one from the on-board digital map group is fulfilled.	5

Tested by:

3.2.3 Termination conditions

Requirement (i) **RS_tcTrJa_136**

A termination of the vehicle C-ITS service shall not be considered.

Tested by:

3.2.3.1 Cancellation

Requirement (i) **RS_tcTrJa_137**

A cancellation DENM shall not be used for this vehicle C-ITS service.

Tested by:

3.2.3.2 Negation

Requirement (i) **RS_tcTrJa_138**

A negation DENM shall not be used for this vehicle C-ITS service.

Tested by:

3.2.4 Update

Requirement (i) **RS_tcTrJa_139**

An update DENM shall not be used for this vehicle C-ITS service.

Tested by:

3.2.5 Repetition duration and repetition interval

Requirement (i) **RS_tcTrJa_140**

New DENMs shall be repeated for a *repetitionDuration* of 60 s with a *repetitionInterval* of 1 s.

Therefore, the interface parameters *Repetition duration* and *Repetition interval* between the application and the DEN basic service shall be set in accordance with the values above.

Note: Where two DENMs with the same *causeCode* originate from the same vehicle C-ITS station, the case shall be managed by the receiving C-ITS station.

Tested by:

3.2.6 Traffic class

Requirement (i) **RS_tcTrJa_141**

New DENMs shall be set to *traffic class* 1.

Tested by:

3.2.7 Message parameters

3.2.7.1 DENM

Requirement (i) **RS_tcTrJa_142**

The following table specifies the data elements of the DENM that shall be set.

Table 9: DENM data elements of 'traffic condition – local slow down'

<table>
<tr><th>Data field</th><th colspan="3">Value</th></tr>
<tr><td colspan="4">Management container</td></tr>
<tr><td>actionID</td><td colspan="3">Identifier of a DENM. Shall be set in accordance with [TS 102 894-2].</td></tr>
<tr><td>detectionTime</td><td colspan="3">TimestampIts-timestamp at which the event is detected by the originating vehicle C-ITS station. Shall be set in accordance with [TS 102 894-2].</td></tr>
<tr><td>referenceTime</td><td colspan="3">TimestampIts-timestamp at which a new DENM is generated. Shall be set in accordance with [TS 102 894-2].</td></tr>
<tr><td>termination</td><td colspan="3">Shall not be set, because neither negation nor cancellation are to be used in this vehicle C-ITS service.</td></tr>
<tr><td>eventPosition</td><td colspan="3">ReferencePosition. Shall be set in accordance with [TS 102 894-2].</td></tr>
<tr><td>relevanceDistance</td><td colspan="3">lessThan1000m(4)</td></tr>
<tr><td>relevanceTrafficDirection</td><td colspan="3">upstreamTraffic(1)</td></tr>
<tr><td>validityDuration</td><td colspan="3">60 s (a traffic condition situation is expected to last at least 60 s)</td></tr>
<tr><td>stationType</td><td colspan="3">The type of the originating vehicle C-ITS station. Shall be set in accordance with [TS 102 894-2].</td></tr>
<tr><td colspan="4">Situation container</td></tr>
<tr><td>informationQuality</td><td colspan="3">See RS_tcTrJa_135.</td></tr>
<tr><td>causeCode</td><td colspan="3">trafficCondition(1)</td></tr>
<tr><td>subCauseCode</td><td colspan="3">unavailable(0)</td></tr>
<tr><td colspan="4">Location container</td></tr>
<tr><td>eventSpeed</td><td colspan="3">Speed of the originating vehicle C-ITS station. Shall be set in accordance with [TS 102 894-2].</td></tr>
<tr><td>eventPositionHeading</td><td colspan="3">Heading of the originating vehicle C-ITS station. Shall be set in accordance with [TS 102 894-2].</td></tr>
<tr><td>Traces</td><td colspan="3">PathHistory of the originating vehicle C-ITS station. Shall be set in accordance with [TS 102 894-2].</td></tr>
<tr><td rowspan="4">roadType</td><td colspan="3">RoadType of the road on which the detecting vehicle C-ITS station is situated.</td></tr>
<tr><td colspan="3">Shall be set in accordance with [TS 102 894-2] in combination with the following rules:</td></tr>
<tr><td>Urban / non-urban</td><td>Structural separation</td><td>Data element</td></tr>
<tr><td>Urban</td><td>No</td><td>urban-NoStructuralSeparationToOppositeLanes(0)</td></tr>
</table>

	Urban	Yes	urban-WithStructuralSeparation ToOppositeLanes(1)
	Urban	Unknown	urban-NoStructuralSeparation ToOppositeLanes(0)
	Non-urban	No	nonUrban-NoStructuralSeparation ToOppositeLanes(2)
	Non-urban	Yes	nonUrban-WithStructuralSeparation ToOppositeLanes(3)
	Non-urban	Unknown	nonUrban-NoStructuralSeparation ToOppositeLanes(2)
	If the information about the urban/non-urban status cannot be determined, the data element shall be omitted.		
Alacarte container			
lanePosition	If the lanePosition is provided by an on-board sensor (e.g. radar, camera), the value shall be set in accordance with [TS 102 894-2]. Use of GNSS and a digital map to estimate the lane number is not legitimate for this version of the triggering condition.		
	If the lanePosition is unknown, the data element shall be omitted.		

Tested by:

3.2.7.2 CAM

Requirement (i) **RS_tcTrJa_143**

CAM adaption shall not be used for this vehicle C-ITS service.

Tested by:

3.2.8 Networking and transport layer

Requirement (i) **RS_tcTrJa_144**

The interface parameter destination area in IF.DEN.1 [ETSI EN 302 637-3] shall be equal to a circular shape with centre point equal to *eventPosition* and radius equal to r*elevanceDistance*.

Tested by:

3.2.9 Security layer

Requirement (i) **RS_tcTrJa_146**

When the triggering conditions as described in clause 3.2.2 apply, the application shall request the blocking of the AT changeover as defined in RS_BSP_184.

Tested by:

3.2.10 Scenarios

Other (informational) **RS_tcTrJa_158**

This clause has an informational character and is not part of the requirement specification.

The following list encompasses scenarios which are regarded as relevant or irrelevant considering the present vehicle C-ITS service:

Table 10: 'Traffic condition – local slow down' scenarios

Count	Description	Status
SC_0	Freeway.	Relevant
SC_1	The ego vehicle is in a breakdown state.	Irrelevant
SC_2	The ego vehicle is in a crash state.	Irrelevant.
SC_3	The ego vehicle performs a rescue and recovery operation.	Irrelevant
SC_4	The ego-vehicle is stationary surrounded by other road users which are either stationary or in stop-and-go traffic.	Relevant
SC_5	The ego-vehicle is surrounded by stop-and-go traffic.	Relevant
SC_6	Traffic on a different road.	Irrelevant
SC_7	Traffic in the opposite driving direction.	Irrelevant
SC_8	Other vehicles than passenger cars and PTWs.	Irrelevant