



NDW IRS

**(National Data Warehouse for Traffic Information -
Interface Requirement Specifications)**

for roadworks and events

Requirements for the interfaces in the chain

B. de Vries

© Nationale Databank Wegverkeersgegevens

Contents

1	Scope	4
1.1	Identification	4
1.2	System overview	4
1.3	Document information	5
1.4	Purpose of the document	6
2	References	7
3	Interface requirements for roadworks	8
3.1	Requirements for the WW (roadworks) interfaces	10
3.2	Requirements for the IN (importing) interfaces	24
3.3	Requirements for the UI (exporting) interfaces	27
4	Examples of planned activities and measures for the WW requirements	28
4.1	Example for WW.4.1.1	28
4.2	Example for WW.4.1.3	31
4.2.1	Road closure for roads without separate carriageways	31
4.2.2	Carriageway closure	33
4.2.2.1	Closure of slip road (WW.4.1.3.4)	34
4.2.3	Closure accessible for emergency services	36
4.2.4	Lane closures (WW.4.1.4)	38
4.2.5	Diverted lanes/carriageways and temporary narrow lanes/road (WW.4.1.5)	40
4.2.6	Temporary speed restriction (WW.4.1.6)	42
4.2.7	Temporary traffic lights (WW.4.1.7)	44
4.2.8	Diversion (WW.4.1.8) (entirely in VILD)	45
4.2.9	Local/temporary DRIPs/text trailers (WW.4.1.9)	47
4.2.10	Traffic controllers (WW.4.1.10)	48
4.2.11	Public transport alternative (WW.4.1.11)	49
4.2.12	Risk of congestion (WW.4.1.12)	50
5	Examples of WW requirements for the transition from planned to actual	52
5.1	Situation 1: long-term activities with hindrance in phases, each phase in its own record	53
5.1.1	Situation until starting time	53
5.1.2	At the planned start time (non-managed work)	54
5.1.2.1	In the WW1+2 interfaces	54
5.1.2.2	In the WWA interface	57
5.1.3	If the message is actively managed at the actual starting time	59
5.1.3.1	In the WW1+2 interfaces	59
5.1.3.2	In the WWA interface	61
5.1.4	At the planned end time for a non-managed message	63
5.1.4.1	Completion notification in the WW1+2 interfaces	63

5.1.4.2	In the WWA interface	65
5.1.5	If the message is actively managed at the actual end time	67
5.1.5.1	Actual end time after planned end time	67
5.2	Situations 2 and 3: long-term activities with hindrance in phases, using validPeriods	68
5.2.1	Situation until the starting time	68
5.2.2	At the starting time	69
5.2.2.1	In the WW1+2 interfaces	69
5.2.2.2	In the WWA interface	73
5.2.3	If the message is actively managed at the actual starting time	75
5.2.4	At the planned end time for a non-managed message	76
5.2.4.1	Completion notification in the WW1+2 interfaces	76
5.2.4.2	In the WWA interface	78
5.2.5	If the message is actively managed at the actual end time	80
6	Examples of location reference (including openLR) for WW	81
6.1	GroupOfLocations 1 road, entirely in VILD	81
6.2	GroupOfLocations 2 roads, entirely in VILD	82
6.3	GroupOfLocations multiple roads, 1 of which is in VILD	83

1 Scope

1.1 Identification

This document is part of the NDW specifications. These specifications were drawn up in accordance with the J-STD-016:1995 standard documentation. Within that documentation, this document is the “Interface Requirements Specification” (IRS) for the interfaces for incoming and outgoing data flows for roadworks and events.

1.2 System overview

The interfaces are part of the information chain for exchanging and agreeing information about roadworks and informing road users about them, as coordinated by the NDW (National Data Warehouse for Road Traffic Information). The NDW system environment is described in the “System overview” section.

1.3 Document information

Document control table

Document number	Date	Circulation	Remark
2014.04.25 IRS NDW wegwerkzaamheden C.01	25-Apr-2014		Final draft for discussions with data providers
2014.04.29 ... C.02	29-Apr-2014		NDX changed to CNS-SG and a few spelling mistakes corrected.
2014.05.01 ... F.01	01-May-2014		Final version including processing of comments. FB NDW
2014.07.18 ... F.02	18 July 2014		Processing questions from suppliers, processing completeness relating to SSS MELD!
2014.11.11 ... F.04	11-Nov-2014		Extension by examples except for openLR. Addition of a few requirements that were missing or
2014.12.02 ... F.05	02-Dec-2014		Tightening the definition for location reference text message code in dataprocessingNote Addition of examples of location reference, in VILD or not
2015.02.06 ... F.06	06-Feb-2015		Tightened the definition for location reference text message code in dataprocessing Note removed again Detailing of measures with multiple and various carriageway offsets
2015.02.23 ... F.07	23-Feb-2015		Correction to numbering requirements through to WW.3
2015.03.04 ... F.08	04-Mar-2015		Addition of requirements for open hard shoulder and exit that is accessible, although the carriageway has been closed.
2015.03.04 ... F.08a	04-Mar-2015		replace emergencyLane with hardShoulder in requirement for use
2015.04.08 ... F.09	08-Apr-2015		Number of corrections of textual errors and requirements changed as a result of WV being rejected in MOGIN
2015.07.07 ... F.10	07-Jul-2015		REF references changed to match NL Profile 2015-1. Additional combination of Confidentiality and operatorActionStatus

1.4 Purpose of this document

This document describes the functional requirements imposed on the interfaces between:

- The systems of parties supplying data and the CNS-SG system of the NDW
- The interfaces from CNS-SG to systems receiving data.
- It also provides a description of the intended functioning of the interface to the end-users of the subscribing systems to make sure that end-users of various applications get the same information and that its interpretation is unambiguous.

This document is about roadworks and events. Sometimes the term 'roadworks' is used alone for convenience.

Unless expressly stated otherwise, all requirements apply to roadworks and to events.

This IRS describes the functional requirements of the interface and maps them out against the technical interface description that is included in the Dutch DATEX II Profile 2015-1. That technical specification in the interface description is broader than what is required for roadworks. This IRS is therefore intended to give concrete details of the use of the said interface description and to delimit it where necessary.

Information exchange for roadworks and events focuses on the 5 W's:

What	covers the cause of any traffic hindrance in the form of a description of activities or an event
Where	comprises the location of the activities or the event
When	defines the time frame;
With	answers the question of "with what hindrance?" in the form of traffic measures and any (additional) traffic congestion or delays. These have their own location and often also their own validity times or periods
Why	refers to the cause of the activities

2 References

- Dutch DATEX II Profile 2015-1, (REF1)

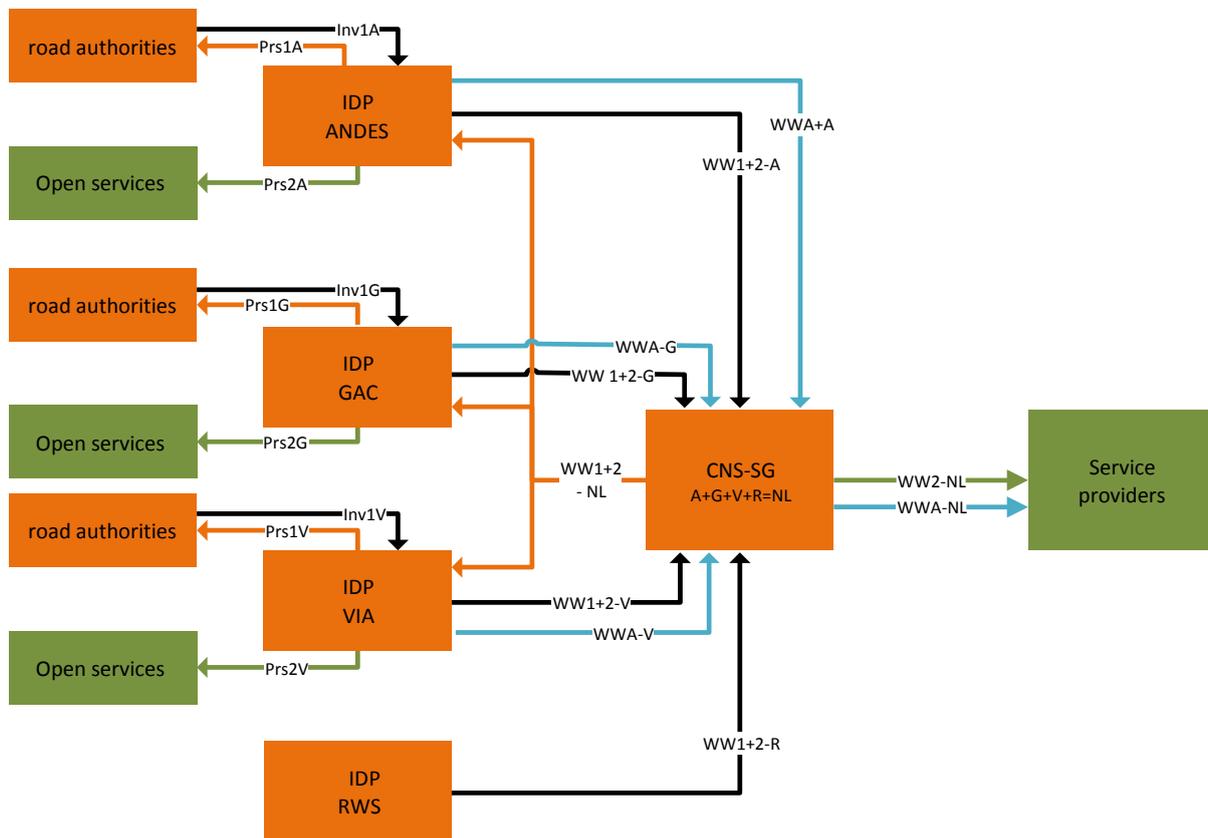
This IRS covers the interface requirements that arise as a result of the subsystem specifications (SSS) for the roadwork registration systems. At this stage, current registration systems do not have to meet the requirements in the registration systems SSS. Requirements imposed on the interfaces as a result of functionalities that are not currently supported by a registration system do not have to be implemented yet.

3 Interface requirements for roadworks

The chain for roadworks and events lists the interfaces shown in the diagram below. A number of interfaces can be grouped together in the interface identification diagram because they share a common function within the chain, but are then realised by different parties. There are two types of roadworks information within the roadworks chain:

- Details of planned roadworks, intended for aligning the work with other road authorities. This information will not be distributed to the general public yet, but only among road authorities
- Details of planned roadworks, intended as information for road users.

These flows are referred to as WW1 and WW2 respectively in the diagram below, i.e. WW2 is the flow of information to the road user.



Interfaces are shown with an arrow to indicate the direction of the data flow. The following types of interfaces can be distinguished in terms of their functions:

- **Inv1 plus a letter:** These are the input (“invoer”) interfaces that road authorities run to record roadworks and events for their area. The letter that follows is used to identify the supplier of the system.

- Prs1 plus a letter: These are the presentation interfaces for roadworks and events via the system in question used by the road authorities to align and agree the activities for the roadworks.
- Prs2 plus a letter: These are the interfaces for presenting roadworks to services for the general public.
- WW1+2 plus a letter: This interface contains roadworks details both for planning and agreement among road authorities (WW1) and for communication to the general public (WW2) in DATEX II format by the road authorities that are provided with data by the supplier.
- WW2-NL: This interface contains all roadworks and events that are available for communication to the general public in DATEX II format
- WWA plus a letter: This interface contains the activities plus the current temporary traffic measures.

The rest of the document states the requirements for these interfaces, in accordance with the following principles:

- A requirement for the user interface during data entry starts with IN, followed by a dot and a number that uniquely identifies the requirements (e.g. IN.3). These requirements are stated in Section 3.2
- A requirement imposed upon the user interface when presenting the input details starts with UI, followed by a dot and a number that uniquely identifies the requirements (e.g. UI.1.1). These requirements are stated in Section 3.3.
- A requirement applying to a technical interface starts with WW, followed by a dot and a number that uniquely identifies the requirements (e.g. WW.1). These requirements are stated in Section 3.1.

For the sake of clarity: no requirements are imposed on interfaces of type Prs2. However, NDW does recommend that the requirements imposed on Prs1 interfaces are followed

The following requirements apply to the interfaces in the roadworks and events chain:

Req_ID	Requirement description
WW.0	All WW interfaces must function in accordance with the requirements as described in Section 3.1.
WW.1	The roadworks and events details that are not yet intended for communication to the public must be identifiable as such in the WW flow. This is done as described in WW.4.1.
WW.2	The WWA interfaces only contain the roadworks and events that are taking place at that moment or that are about to take place. This feed only contains activities and their associated records where it is certain that they will take place (or have started), as described in REF1: sections 3.3.2 and 3.3.5.1. This requirement applies to activities that meet all three criteria stated below: <ul style="list-style-type: none"> ○ Notification of hindrance for road traffic (hindrance categories A, B, C and D)

- They will take place on the defined regional traffic management (RVM) network, or for which a diversion has been set up that uses the RVM network.
- They will take place in a specific region, known as 'Beter Benutten'.

- IN.1 All WW interfaces of type Inv1 must function in accordance with the requirements as described in Section 3.2
- UI.1 Interfaces of type Prs1 must present all information from the WW1+2NL interface in accordance with the requirements imposed on them in Section 3.3

3.1 Requirements for the WW interfaces

The requirements stated below are structured in such a way that requirements with a sub-number form a detail or addition to the requirements without the sub-number in question. Requirement 4.1.1 therefore is a sub-requirement of 4.1 and provides specifics of everything that is required in 4.1.

Req_ID	Requirement description
WW.3	Parties supplying and receiving data must set up the exchange with web services in accordance with the NDW chain protocol. See REF1: section 2.2.1
WW.4	The data must be supplied in accordance with the Dutch DATEX II Profile 2015-1 (REF1). The requirements stated below contain either further details of the use of the documents stated, or a prescribed relationship between functional information elements and the way that they should be returned in DATEX II messages. A number of cases state what is NOT allowed, where this is deemed valuable extra information.
WW.4.1	<p>A message about roadworks or an event is composed using situationRecords. The following record structure is used for this:</p> <ul style="list-style-type: none"> - 1 record to name and specify the activities or the event. This record contains the general information about the work. The hindrance, measures etc. are not included in a structured format here (see requirement 4.1.1 and its sub-requirements) - zero, one or several records to record the temporary traffic measures taken. A record for each measure is included for: <ul style="list-style-type: none"> ○ Complete closure (including information on whether emergency services can/may pass) WW.4.1.3 ○ Partial closure WW.4.1.4 ○ Narrowed or deviated lanes or carriageways WW.4.1.5 ○ Limit on maximum speed WW.4.1.6 ○ Temporary traffic regulation system (VRI) WW.4.1.7 ○ Rerouting WW.4.1.8 ○ Use of mobile text trailer, DRIP or similar WW.4.1.9 ○ Use of traffic controllers WW 4.1.10 ○ Recommendations to road users (e.g. to use public transport alternative) WW.4.1.11
WW.4.1.0	There should be an indication of whether work has to be agreed/aligned, or whether this has actually been done, and whether details of the work are ready for publication. Two elements are used for this: Confidentiality and operatorActionStatus.

Confidentiality = "restrictedToAuthorities", operatorActionStatus = "requested"; this work is only delivered to government bodies for agreement and is not yet for publication,

Confidentiality = "restrictedToAuthorities", operatorActionStatus = "approved"; this work has already been agreed (or agreement is not required), but not released for publication yet,

Confidentiality = "noRestriction", operatorActionStatus = "approved"; this work has been agreed (or agreement is not required) and it is suitable for publication: CNS-SG sends the details to road authorities and to subscriber systems.

Confidentiality = "noRestriction", operatorActionStatus = "implemented"; this work has been published and activated. CNS-SG sends details of the work to road authorities and to subscriber systems via both WW1 and WW2.

The use of Confidentiality must comply with REF1: section 6.1.1.4.1

The use of operatorActionStatus must meet the requirement REF1: section 6.3.1.1

WW.4.1.1 Information about roadworks consists of at least one situation, which contains at least one situationRecord. This situationRecord is of the abstract type RoadWorks, which is a special case of type OperatorAction.

It must comply with REF1: section 6.3.1. Roadworks are of type MaintenanceWorks for maintenance (including large-scale work) or of type ConstructionWorks for laying/new construction.

WW.4.1.2 Information about an event consists of at least one situation, which contains at least one situationRecord. This situationRecord is of the abstract type PublicEvent, which is a special case of type Activity. It must comply with REF1: section 6.3.2.3.4

WW.4.1.1.0 Activities in DATEX II are split up into types for construction and maintenance work. The type of work being carried out is recorded in subjectTypeOfWorks.

Construction consists of the following types (constructionWorkType):

Name	Explanation
blastingWork	activities for which explosives are used
constructionWork	construction and building activities
demolitionWork	demolition activities
roadWideningWork	road widening

constructionWork is only used to indicate the construction of civil engineering road infrastructure. The installation of other items is indicated in the other type of roadworks. Details about what is being constructed/built can be given using the element subjectTypeOfWorks. If the element is used in combination with the constructionWork, the user interface shows the explanatory text given:

Name	Explanation
bridge	bridge construction
buriedCables	laying underground cables
buriedServices	excavation work
crashBarrier	construction of crash barriers

gallery	gallery/walkway construction
gantry	installation of a gantry
gasMainWork	construction of gas mains/gas pipes
interchange	construction of an interchange
junction	construction of a junction
levelCrossing	construction of a level crossing
lightingSystem	installing a lighting system
measurementEquipment	installation of measurement equipment
noiseProtection	construction of noise barrier
other	other work
road	road construction
roadsideDrains	laying roadside drains
roadsideEmbankment	construction of roadside embankment / sand
roadsideEquipment	installation of roadside equipment
roadSigns	installation of road signs
roundabout	construction of a roundabout
tollGate	installation of a toll gate
tunnel	construction of a tunnel
waterMain	construction of a water main/piping

Road maintenance activities consist of the following types (roadMaintenanceType):

Name	Explanation
clearanceWork	clearance work
controlledAvalanche	causing a controlled avalanche
grassCuttingWork	grass cutting work
installationWork	installation work and similar activities
maintenanceWork	roadworks, maintenance work
other	other
overheadWorks	work above the road
repairWork	repair work and similar
resurfacingWork	asphalting and other resurfacing work
roadMarkingWork	applying road marking
roadsideWork	activities at the roadside
roadworks	roadworks, maintenance work
roadworksClearance	roadworks clearance measures
rockFallPreventativeMaintenance	activities to prevent rockfalls
saltingInProgress	salt is being spread
snowploughsInUse	snowploughs are being used
treeAndVegetationCuttingWork	pruning, cutting, tree-felling etc.

roadworks is the general value, for which further details about the activities are not given.

The following are used to specify more details:

- installationWork for road laying/construction/building
- maintenanceWork for maintenance work

- repairWork for repair work.

Details about what is being worked on can be given using the element subjectTypeOfWorks.

If this element is used in combination with **installationWork**, the user interface shows the explanatory text on the right.

Name	Explanation
bridge	bridge construction
buriedCables	laying underground cables
buriedServices	excavation work
crashBarrier	construction of crash barriers
gallery	construction of a gallery/walkway
gantry	installation of a gantry
gasMainWork	construction of gas mains/gas pipes
interchange	construction of an interchange
junction	construction of a junction
levelCrossing	construction of a level crossing
lightingSystem	installing a lighting system
measurementEquipment	installation of measurement equipment
noiseProtection	construction of noise barrier
other	other work
road	road construction
roadsideDrains	laying roadside drains
roadsideEmbankment	construction of roadside embankment / sand
roadsideEquipment	installation of roadside equipment
roadSigns	installation of road signs
roundabout	construction of a roundabout
tollGate	installation of a toll gate
tunnel	construction of a tunnel
waterMain	construction of a water main/piping

If this element is used in combination with **maintenanceWork**, the user interface indicates the explanatory text in the second column

Name	Explanation
bridge	bridge maintenance etc.
buriedCables	maintenance of buried cables
buriedServices	excavation work
crashBarrier	crash barrier maintenance
gallery	gallery/walkway maintenance
gantry	gantry maintenance
gasMainWork	gas mains/pipeline maintenance
interchange	maintenance work at an interchange
junction	maintenance work at a junction
levelCrossing	level crossing maintenance
lightingSystem	street lighting system maintenance
measurementEquipment	maintenance work on measurement
noiseProtection	maintenance work on noise barriers

other	other work
road	road maintenance
roadsideDrains	maintenance of roadside drains
roadsideEmbankment	roadside embankment maintenance
roadsideEquipment	roadside equipment maintenance
roadSigns	maintenance work on road signage
roundabout	roundabout maintenance
tollGate	toll gate maintenance work
tunnel	tunnel maintenance work
waterMain	water main maintenance

WW.4.1.1.0.0 If required, the `subjectTypeOfWorks` can also use the value 'other' in combination with `subjectTypeOfWorksExtended`, which has the type `SubjectTypeOfWorksExtendedEnum` that can take the following values:

enumLiteral	Explanation
sewer	sewers
trafficLights	traffic lights
publicTransportInfrastructure	public transport infrastructure
publicTransportStop	public transport stops and halts
publicTransportInformationSystem	public transport information system
metro	metro / subway / underground
streetParkingPlaces	parking space alongside the road
parking	car parking
districtHeatingPipe	city/district heating pipeline
heatTransportPipe	heat transportation pipeline
lock	locks
adjacentWaterBank	hydraulic engineering work on the waterside
footpath	pedestrian path
cyclePath	cycle path

WW.4.1.1.0.1 If large-scale activities are involved, the `roadworksScale` attribute can be included, containing the value 'major' (the values 'medium' and 'minor' are not used).

WW.4.1.1.0.2 If an activity has not been planned, although it is required in order to repair the consequences of an unplanned incident (e.g. a burst sewer or a burning car that damaged the road surface), the roadworks can be included and flagged as involving urgent activities (shown by including the `urgentRoadworks` attribute with the value 'true').

WW.4.1.1.1 The hindrance class of the activities and events is expressed as delays in terms of impact.

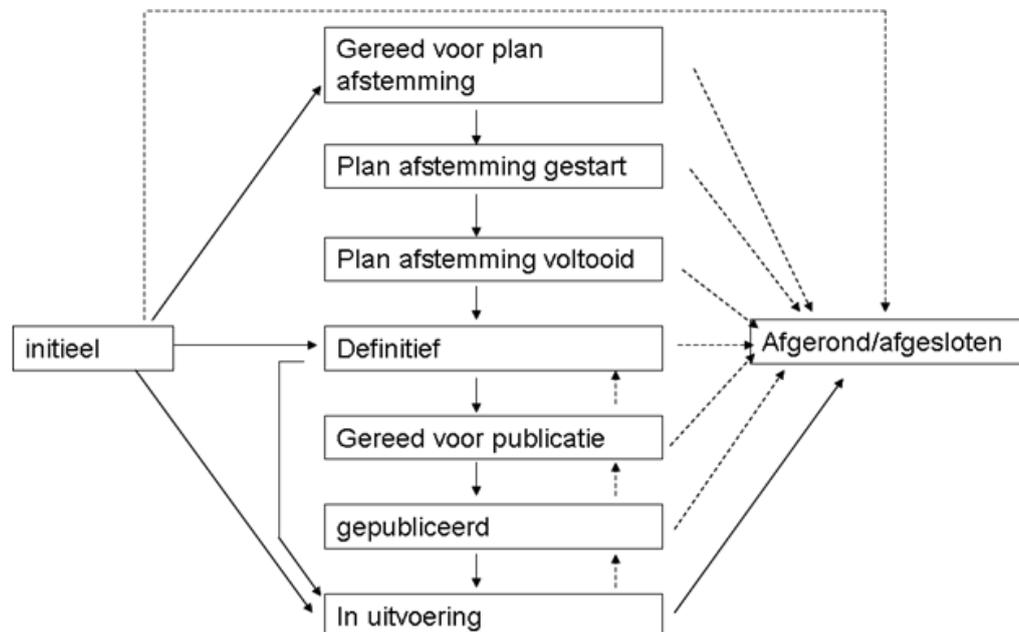
Its classification is as follows:

hindrance class 0 - `delayBand` contains the value 'negligible'; hindrance class 1 - `delayBand` contains the value 'upToTenMinutes' and `delayTimeValue` contains the value 300; hindrance class 2 - `delayBand` contains the value 'upToTenMinutes'

hindrance class 3 - delayBand contains the value 'betweenTenMinutesAndThirtyMinutes'; hindrance class 4 - delayBand contains the value 'betweenThirtyMinutesAndOneHour'

Roadworks has an extension (see REF3) where:
roadworkHindranceClass can give the hindrance class as a label (optional)
roadworkHindranceCategory indicates the hindrance category as a label (required)

WW.4.1.1.2 The status and status transitions of an activity run through the following stages:



The status of an activity is recorded in roadworkStatus in the extension of roadworks as stated in WW.4.1.1.1.

Consistency of values regarding the attributes resulting from requirement WW.4.2 has to be ensured by the data provider.

WW.4.1.1.3 Free-format texts have to be recorded as generalPublicComment in accordance with REF1: section 6.2.9
Using the comment types in generalPublicComment is only allowed in the following combinations:

- internalNote project name
- warning the situation that the road user has to be warned of.
The use of this comment type is a journalistic representation of the hindrance that is caused. (Details about it are usually given later on in situation records that describe the hindrance exactly in information that can be processed automatically.) If no journalistic function is used to record this information, the field will not be used. Repeating the encoded data is not allowed.

- other additional information that is not encoded or can be placed in an otherwise specified free-format text field. Use of this field should be avoided as much as possible. The information in this field can be seen by all actors in the chain.

Using other specified types is not allowed, given that such information must be included in the situation in a structured way.

WW.4.1.1.4 The reason why an activity is being carried out is recorded in causeDescription. Using the causeType element is also mandatory. The flag 'other' has to be used if the cause cannot be described using one of the defined enumerator values.

WW.4.1.1.5 References to project/work websites and any fact sheets etc. are included in urlLink (in accordance with REF1: section 6.2.10). Using references to the general websites of municipalities or other government bodies must be avoided. If a website is referred to, the urlLinkType should be 'html' (HTML sites). If a fact sheet is referred to, the urlLinkType should be 'Pdf' (PDF documents).

WW.4.1.1.6 The road authority is noted in sourceName. For municipalities, the word "Gemeente" plus the full municipality name is filled in here; for provinces, the word "Provincie" plus the full province name is filled in here; and for the Directorate-General for Public Works and Water Management (Rijkswaterstaat) it contains the RWS district code + RWS district name. The nomenclature is based on the notation

WW.4.1.1.7 If activities are described in more than one situation record, the situations must refer to each other using the relatedSituation attribute in 'Situation', in accordance with REF1: section 6.1.1.2

WW.4.1.2.0 Events in DATEX II are subdivided into types for public events and planned disruptions. Public events are situationRecords with the type PublicEvent and their content can be the following:

Name	Explanation
agriculturalShow	agricultural show or fair
airShow	air show
athleticsMeeting	athletics tournament
ballGame	ball sports game or competition
baseballGame	baseball game
basketballGame	basketball game
bicycleRace	bicycle (road) race
boatRace	water sports competition
boatShow	boats/water sports show or fair
boxingTournament	boxing match
bullFight	bullfight
ceremonialEvent	ceremonial event
commercialEvent	commercial event
concert	musical concert

cricketMatch	cricket match
culturalEvent	cultural event
exhibition	exhibition, trade fair, etc.
fair	fair, street party, etc.
festival	festival
filmTVMaking	film or TV recording
footballMatch	football match
funfair	fairground attractions etc.
gardeningOrFlowerShow	gardening or flower show
golfTournament	golf tournament
hockeyGame	hockey match
horseRaceMeeting	horse race meeting
internationalSportsMeeting	international sporting event
majorEvent	major event
marathon	marathon
market	market
match	match / competition
motorShow	motor show
motorSportRaceMeeting	motor sports meeting
other	other
parade	parade
procession	procession
raceMeeting	race meeting
rugbyMatch	rugby match
severalMajorEvents	multiple major events
show	show
showJumping	equestrian meeting / show-jumping
sportsMeeting	sporting event
stateOccasion	state visit and similar
tennisTournament	tennis competition
tournament	tournament
tradeFair	annual trade fair or similar
waterSportsMeeting	water sports meeting
winterSportsMeeting	winter sports tournament

Planned disruptions are situationRecords with type DisturbanceActivity and their content can be the following (under disturbanceActivityType, highlighted yellow for clarity; the remainder are not allowed):

Name	Explanation
airRaid	aerial attack
altercationOfVehicleOccupants	'road rage' or other argument
assault	assault
assetDestruction	vandalism and destruction of
attack	attack
attackOnVehicle	attack on vehicle
blockadeOrBarrier	blockade or barrier

bombAlert	bomb alert
crowd	crowd of people
demonstration	demonstration
evacuation	evacuation
filterBlockade	a blockade that is only allowing certain vehicles to
goSlowOperation	go-slow action (slow vehicles)
gunfireOnRoadway	gunfire on the road
illVehicleOccupants	sick vehicle occupants
march	march
other	other
publicDisturbance	civil disorder / public
radioactiveLeakAlert	radioactivity leak alert
riot	riot
sabotage	sabotage
securityAlert	security measures
securityIncident	security incident
sightseersObstructingAccess	'rubbernecking' - sightseers obstructing
strike	strike
terroristIncident	terrorist incident
theft	theft
toxicCloudAlert	toxic cloud alert
unspecifiedAlert	unspecified alert

WW.4.1.3

A distinction is made for road closures between a road with carriageways in the two directions that are separated by a median strip and/or crash barrier, or where there is no such separation.

For a road with (partially) separated carriageways in the work area, a separate situation record of type `carriagewayClosures` has to be created for each direction, in accordance with REF1: section 6.3.1.2.7.1

If a road without separated carriageways is closed in both directions, type `roadClosed`

- should be used, in accordance with REF1: section 6.3.1.2.7.1. In the location, the element 'direction' then indicates that this applies to both directions.
- If the road is closed in one direction only, that direction is indicated in the location (see WW.4.3)

For the sake of clarity: the term 'block' or 'road block' is never allowed here. In all national and international traffic information standards, the terms 'block' and similar are used for incidents that cause unplanned and uncoordinated blockages of the road. If an action is carried out on behalf of or with permission of road authorities or the police, this is called a 'closure'.

- WW.4.1.3.1 If the closure only applies to a certain target group, this is recorded in a `forVehiclesWithCharacteristicsOf`, stating the `vehicleType` attribute. One of the following types can be selected: agricultural vehicle, bicycle, bus, car with trailer, work traffic, lorry, motorbike, moped, scooter, van (to be included in REF1: section 6.3.1.2.3.3).
- WW.4.1.3.2 If a route segment has been closed for vehicles with certain characteristics in terms of height, width and/or weight, this is indicated by means of a `forVehiclesWithCharacteristicsOf` of the type `heightCharacteristic`, `widthCharacteristic` and/or `grossWeightCharacteristic`.
- WW.4.1.3.3 To indicate that the road can still be used by emergency services despite a total road closure, a situation record has to be included with the location data of the closed segment in question. The record type must be `NetworkManagement`, where `forVehiclesWithCharacteristicsOf` is used to fill the `vehicleUsage` attribute with the value 'emergencyServices'. `UseOfSpecifiedLanesOrCarriagewaysAllowed` is included in `roadOrCarriagewayOrLaneManagementType`.
- WW.4.1.3.4 A closure of an entry or exit slip road is included by a record that states the slip road in a point location, where the `supplementaryPositionalDescription` contains the `affectedCarriageway` value 'exitSliproad' or 'entrySliproad'.
- WW.4.1.3.5 In the event of a partial closure where the number of original lanes varies over the length of the closure, the impact class of the lanes is left empty, because no consistent information can be provided for the route segment as a whole. In the situation where the lanes on which work is being carried out (or to which the closure applies) do not change, no separate records or 'linears' are created.
- WW.4.1.3.6 If a measure causes a change in the number of lanes that the measure applies to (e.g. first one lane closed, then two lanes closed), this has to be recorded in the situation record using an itinerary that includes a linear stating the lanes concerned in `affectedCarriagewaysAndLanes` for each change in the number of lanes affected. If these measures are precursor measures, the linears making up the itinerary all contain the same primary and secondary locations, and reference values in the offsets are used to indicate the exact locations where the number of lanes affected by the measure changes.
Do please note: if there is going to be a complete carriageway closure, there will be two situation records:
- One record with the precursor lane closures (if any), where the starting location is the point of the first lane closure (first red cross for RWS roads with traffic signage above the lanes) and an end location where the total carriageway closure starts.
 - One record that contains the actual carriageway closure.

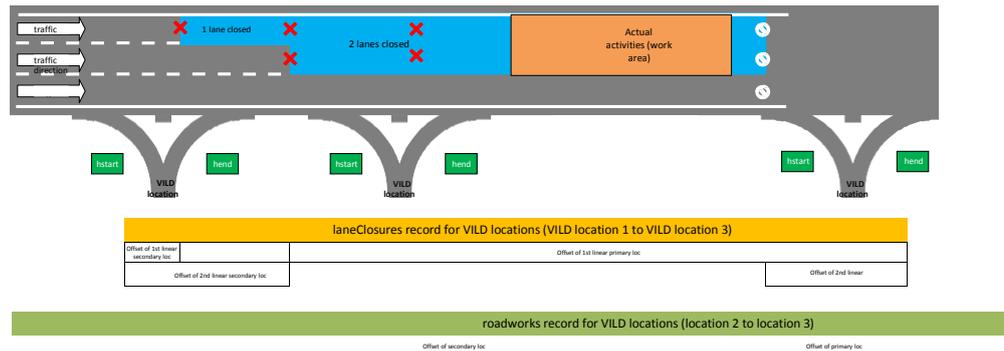


Figure 1 Activities with lane closures + precursor measures

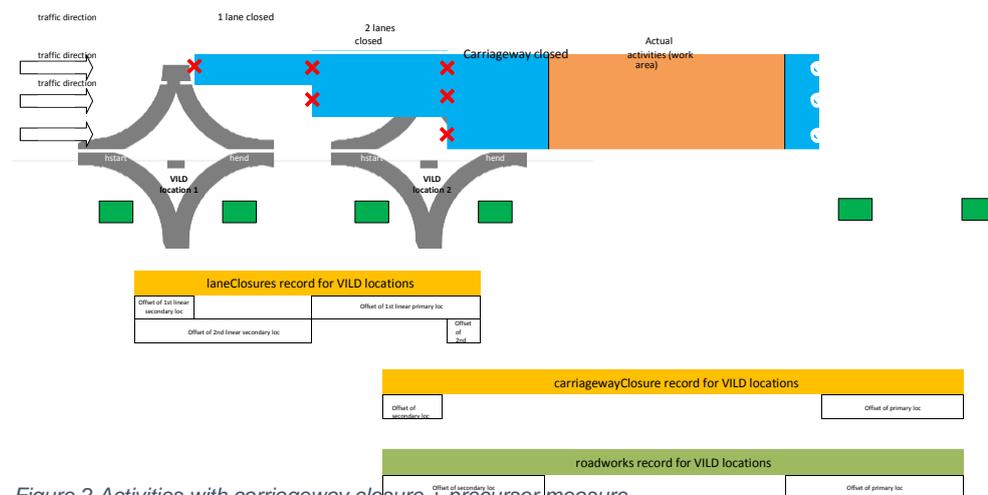


Figure 2 Activities with carriageway closure + precursor measure

WW.4.1.3.6

To indicate that traffic has to be diverted onto the hard shoulder during a lane closure or carriageway closure, a situation record has to be included giving the location data for the route segment where the hard shoulder is to be used. If a lane or carriageway has been moved and the hard shoulder there is discontinued, this record will not be added.

The record type must be NetworkManagement, with useOfSpecifiedLanesOrCarriagewaysAllowed included in roadOrCarriagewayOrLaneManagementType. In the AffectedLanesAndCarriagewayAndLanes class in GroupOfLocations:

- the lane attribute has to contain 'hardShoulder'.
- the carriageway attribute has to contain the correct carriageway (mainCarriageway, parallelCarriageway or connectingCarriageway).

WW.4.1.3.7

If there is a carriageway closure where an exit or entrance slip road is still accessible, this can be indicated (even though the 'white point' shows the carriageway has been closed before the exit or after the entrance). A situation record can be included in such a situation to indicate that the slip road concerned can be used.

- The record type must be NetworkManagement, where useOfSpecifiedLanesOrCarriagewaysAllowed is included in roadOrCarriagewayOrLaneManagementType.

In GroupOfLocations, the carriageway attribute in the class AffectedLanesAndCarriagewayAndLanes has to contain the appropriate carriageway (exitSlipRoad, entrySlipRoad or connectingCarriageway).

- The groupOfLocations states the corresponding slip road in the form of a point location.

- WW.4.1.4 If lanes are closed but traffic can still use the road in that direction, a situation record is included in accordance with REF1: section 6.3.1.2.7.1; the type will be laneClosures.
- WW.4.1.4.1 The information about the number of closed lanes and the number of original lanes is stated in the impact, in accordance with REF1: sections 6.2.7.2 through 6.2.7.5. If available, the remaining capacity can be represented as a percentage in accordance with section 6.2.7.1
- WW.4.1.4.2 The exact indication of the closed carriageway/lanes is included in groupOfLocations in accordance with the requirements imposed on the location reference in WW4.3 and its subsidiary requirements.
- WW.4.1.5 If lanes and carriageways are diverted and/or narrowed, a situation record is included in accordance with REF1: section 6.3.1.2.7.1. The type will be narrowLanes if only road narrowing is involved and lanesDeviated if there is chicane or a diversion of the lane/carriageway in addition to the any narrowing.
- WW.4.1.5.1 The information about the available carriageway width is stated in impact, as a residualRoadWidth.
Any restrictions to maximum permissible vehicle widths are defined using a separate record in accordance with the requirements in WW.4.1.3 and 4.1.3.2
- WW.4.1.6 If the maximum speed is temporarily restricted, a situation record is included in accordance with REF1: section 6.3.1.2.8.1. The type will be for speed management, where the speedManagement type will contain speedRestrictionInOperation and the temporary maximum speed is given in temporarySpeedLimit (with complianceOption holding the value 'mandatory').
- WW.4.1.7 If temporary traffic lights have been installed, a situation record is included in accordance with REF1: section 6.3.1.2.4.1. Its type will be temporaryTrafficLights. The details can be defined either by including a record for each traffic light, where the location of the traffic regulation system is recorded as a point location, or by adding a record for the entire route segment, in which case it is no longer possible to determine where exactly the traffic lights are installed
- WW.4.1.8 If diversions have been applied, a situation record has to be included for each deviation route in accordance with REF1: section 6.3.1.2.6 in which the diversion route has been included as an alternativeRoute.
- WW.4.1.8.1 If used, the content of the reroutingItineraryDescription must contain a textual representation of the diversion that can be presented by the system subscribers to their end-users as-is, i.e. as text without further processing. This may consist of a list of route instructions for non-urban roads

- (“follow Apendorp at the junction with the Nxx, then take the A2 towards Amsterdam at interchange BBB”), or on urban roads a list of street names comprising the diversion, preceded by a destination if necessary (“diversion via Kerkstraat, Dorpsstraat and Lindelaan”)
- WW.4.1.8.2 The location data for the diversion does not contain the route segment with the roadworks, but instead gives the point where the closure is on the road, i.e. the point where the diversion starts.
- WW.4.1.8.3 If a diversion has been set up using road signs, reroutingManagementType must contain the value ‘followDiversionSigns’. In that case, signedRerouting = true must also be included. The identification of the route to be followed is added to the reroutingItineraryDescription.
If the diversion route has no signs, useIntersectionOrJunction must be used.
- WW.4.1.9 If a local DRIP or message trailer is used, this fact will not be included in the message. The details of this information will be included in a subsequent version of the NDW interface description and will be based on the SignSetting specific case of OperatorAction.
- WW.4.1.10 If traffic controllers are used, a situation record will be included in accordance with REF1: section 6.3.1.2.4.1; the type is trafficBeingManuallyDirected. Make sure that the times that when traffic controllers are being deployed are correct and have not simply been matched one-on-one with the times of the work.
- WW.4.1.11 If the road authorities offer or recommend a public transport alternative, this will be included in the extension of RoadWorks as a publicTransportAlternative (see REF1: section 6.3.1.4.8.1). If there is an alternative but no further details are given, using the Boolean parameter will suffice. Further details can be given as free-format text using the publicTransportAlternativeDescription field (REF1: section 6.3.1.4.8.2)
- WW.4.1.12 If the road authorities want to warn about congestion caused by the measures, a situation record has to be included of type abnormalTraffic, where probabilityOfOccurrence contains the value ‘riskOf’. The times that congestion is expected should preferably be filled into ‘validity’ in accordance with requirements WW.4.2 and 4.2.1.
The location in this record must contain the route segment where the traffic jams are expected to occur. Normally, this route segment will not (only) be the road on which the activities are being carried out.
The expectation that there will be congestion should only refer to future times. Stating that congestion is expected currently is not necessary, as up-to-date information is obtained everywhere on the regional traffic management network, meaning that actual traffic jams/delays are already known.
- WW.4.2 The way that situations and situation records are structured and handled over time, particularly at the moment of the transition from planned to current, and the way that information is provide at the transition from a planned end time to an actual end time, must comply with REF1: sections 3.3.2.1, 3.3.2.2 and 3.3.5.1 (read the introduction to 3.3.2 too).

- WW.4.2.1 Using recurringTimePeriodOfDay and recurringDayWeekMonthPeriod is only allowed if these periods genuinely occur more than once within the validPeriod. It is not intended for use to indicate that 23 March is on a Tuesday.
- WW.4.2.2 To indicate that a situationRecord is overrunning compared to the originally indicated end time, the transmitting party can use the 'overrunning' attribute. If the event in the situationRecord overruns, an update in which either the end time is changed or in which the end time is no longer stated must be sent by no later than the moment that the original end time is reached. A record that is reporting an active event must not have an end time that is in the past. Overrunning is only included if this would be expected based on the rules of REF1: section 3.3,2.2.1. The 'false' value is not included in the message.
- WW.4.2.3 At the moment that a measure becomes active as a result of the work activities, that measure must be published on the WWA interface using:
- Its own situation ID
 - A reference in the situationRecordCreationReference field to the situationRecord_ID of the corresponding record in the WW1+2 feed.
- NB: if there is a gap between the measures that leaves a period when no active measures are visible for traffic, the complete situation in the WWA feed has to be marked as complete. This means that the situation has to be published in the WWA feed with a NEW situation_ID that has not been used before when the next measure becomes active. Do please note that new version numbers are used too. And please note also that the IDs and the versions of the records are changed too.
- WW.4.3 The primary location reference system for the status data is VILD. All roads in the RVM-NL network are (or will be) included in VILD. All activities and events must therefore contain VILD locations as described in REF1. section 3.1.1
- WW.4.3.1 If there are separate carriageways for the different traffic directions: create a situation record for each direction. Situations that belong together must refer to each other using relatedSituation (REF1: section 6.1.1.2). Using the InBothDirections value for the direction in NetworkLocation is only allowed in road situations where both directions are on the same carriageway.
- WW.4.3.1.1 If there are activities or measures in both directions on a route segment and this can be expressed in a single Situation, the OperatorAction.NetworkManagement.applicableForTrafficDirection attribute is included containing the value 'bothWays', independently of the location reference method. Other values from this list are not allowed.
- WW.4.3.2 If roadworks or events are taking place on roads that are not included in VILD, the corresponding location information must be defined using a combination of the coordinates of route determination points and the RoadSideReferencePoint extension. Both of these must be used in accordance with REF1: sections 3.3.1.2.2.2 and 3.3.1. The interface description states that this applies to diversions. The method is applied for activities and/or events in this way.

Supplying (x,y) coordinates alone is not allowed because exchanging the road names/street names greatly improves the interoperability and user interaction. In addition, the principle of the NDW is that receiving systems do not need to be based on maps in order to interpret the data.

WW.4.3.3 Alternative routes must be included in accordance with the requirements for route segments for road works.

WW.4.3.4 For locations on unnumbered roads (VILD location code > 25,000), alertCLocationName must be supplied and the location name must consist of the street name of the location in question and of the road crossing it at the site. This information cannot be retrieved properly from VILD, which is why it is recommended that this should be generated from map material.

WW.4.3.5 The (x,y) coordinates of the start and end of a segment must be given in the linearExtension.

WW.4.3.6 If an activity or measure is taking place on an contiguous segment of various roads/streets, a GroupOfLocations of type Itinerary has to be included. The itinerary is a logical route created by running through all the indices one after the other. The itinerary is made up of EITHER:

- at least 2 linears of type AlertCLinear, where VILD locations are available for a route segment. Do please note: the offset of the primary location of the first route segment and the offset of the secondary location of the second route segment are normally zero; OR
- at least 3 points of type roadsideReferencePoint; OR
- at least 2 points of type roadsideReferencePoint combined with at least one linear of type AlertCLinear. A subsidiary segment that is defined by roadside reference points is always defined by at least 2 points. One of these two points is always at the crossing/transition with the linear.

WW.4.3.7 A groupOfNonOrderedLocations can be used in cases where a large number of locations are closed at the same time for an event, while no route segment or geographical consistency or sequence is involved (e.g. an event for which an entire town centre is closed off). A groupOfNonOrderedLocations must not be used for other applications of location references.

3.2 Requirements for the IN (data import) interfaces

Req_ID	Requirement description
IN.2	The supplying system does not have to be restricted to the fields stated in this document. However, the fields stated here must be supported in the manner described here.
IN.3	The supplying system must require in a friendly way that users fill in all the information fields that are relevant according to this IRS.

- IN.3.1 In the event of temporary measures, road users have to be assisted when selecting the correct location data of the measure, and any different times (e.g. the event starts at 10:00 but the measures have been effective since 08:00)
- IN.4 For the various information elements included in section 3.1, the supplying system must only have one place at which each field for each situation record
- IN.5 The user interface of the supplying system must make the logical structure visible to the user, along with the distinction between an activity/event and its associated traffic measures, to ensure that the logical structure in the DATEX II messages corresponds to the user's interactions.
This is the only way to create a common operational picture that is the same for all users of the information.
- IN.6 The input system must not combine fields to fill a required DATEX II field (except for location input). Or in other words, the DATEX II fields must have a 1-to-1 relationship with the input fields of the system.
- IN.7 The input system must not have other fields that are functionally comparable to the prescribed fields based given in section 3.1
- IN.8 There is a 1-to-1 relationship between the fields in DATEX II and the input system. This does not however mean that the user has to see all fields.
- IN.9 If fields are automatically derived from the user's input (e.g. location information), this derivation must be done in such a way that the requirements of section 3.1 are met
- IN.10 Where information elements in section 3.1 use selection lists, the input system must only offer options for selection that are supported by DATEX II in accordance with REF1. The use of free-format text fields is not allowed for this.
- IN.11 When determining speed restrictions, the user must be able to choose from a list of the following maximum speeds:
10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90 and 100 km/h. This list can be shortened, depending on the road network that the speed restriction is being entered for (e.g. only ≤ 70 within a built-up area)
- IN.12 For supporting requirement WW.4.1.3.3, the user interface must have been set sufficiently simply the requirement to record the information is pointed out to the user actively. Correct information about whether the road is available to emergency services or not can literally be a matter of life and death.
- IN.13 The system of the supplier must ensure only structured recording of the details of the restrictions as a result of requirement WW.4.1.3.2, as this information is used by the RDW for granting permits for exceptional transports. There may later even be a legal obligation for road authorities to supply this information in this way.
- IN.14 The system must generate automated and configurable warnings (configurable by period and frequency) and display them to the user of the system, if:
- the planned starting time of an event that has to be registered actively is imminent (adjustable time period beforehand)

- the planned end time of an event that has to be notified as complete actively is imminent.
- overrun is active for a period longer than 24 hours.

IN.15

If the system detects that a planned event that is still set to 'not for publication' is starting or imminent, this must be reported. This message should also be configurable by frequency and period. If an event is still set to 'not for publication' by the start of the event (at the latest), it should be set to 'for publication' automatically. The idea behind this is that if something is registered as active, it will certainly be present on the road and road users must therefore be informed of it.

3.3 Requirements for the UI (export) interfaces

Req_ID	Requirement description
UI.2	Data from road authorities who use other input systems that can be received on WW1+2 NL interfaces must be displayed in the same fields as those that the road authorities' own users record the information in
UI.3	<p>The VILD location information has to be displayed when displaying textual location information. For this, the information about the numbered road network (location codes < 25,000) must be displayed using (town/city name) road number segment name (adjusted for the direction) and secondary location name – primary location name</p> <p>This can be complemented by hectometre marker values and “in both directions”, if necessary. Example: N259 Bergen op Zoom – Dinteloord between Steenberg and Dinteloord in both directions</p>
UI.4	When displaying information about unnumbered roads (VILD location codes > 25,000), the AlertCLocationName has to be used, if it has been included in the record to be displayed. The road number from VILD must never be used for these locations, as it does not correspond to the actual road number.
UI.5	The interface must be able to show warnings to users (IN.14 and IN.15) that users must respond to quickly, but that they can also choose to ignore (temporarily). The warnings must be very prominent and must draw the user's attention immediately when opening the application, without interfering with the user's activities (significantly).

4 Examples of the WW requirements for planned activities and measures

Chapters 4, 5 and 6 discuss examples of the various requirements in the previous chapters. Chapter 4 is primarily a discussion of the general structure of the content of messages of the type 'situationRecord'.

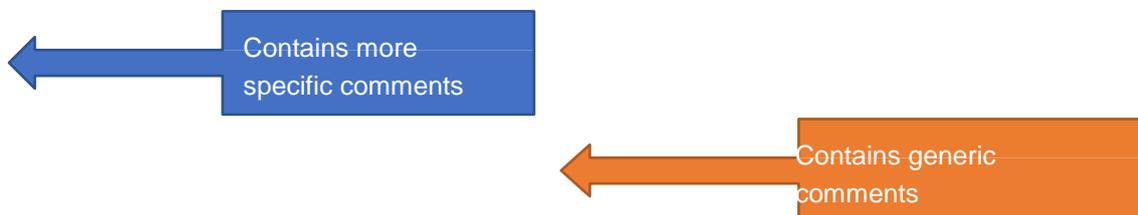
Chapter 5 is about the transition of events from planned status to actual status. Chapter 6 is about the location reference methods that have to be supported.

The various other items are discussed regularly in these chapters too. However, all items are discussed in detail in their specific chapter.

Example: To have a proper understanding of how the location reference works, you have to follow the examples in Chapter 6. The location reference used in Chapter 4 will not be wrong, but should not be used as reference material.

Parts of a DATEX II publication are used in the examples below to illustrate how and where certain aspects occur in the message. The message structure is kept intact and documented and given references to the requirements using annotations and comment areas. The examples in this chapter assume that they refer to future activities and that the agreement phase has already taken place. Examples of how to deal with an activity and/or measures that become actual are given in the following chapter.

The XML examples have been given arrows with comments. The arrows come in two colours, lighter or darker blue, and orange. The blue ones are specifically for a requirement that the example has created to demonstrate. The orange ones are more generic.

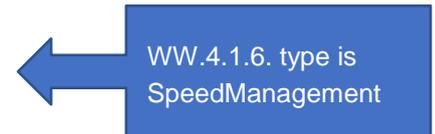


4.1 Example for WW.4.1.1

4.2.1 Closure accessible for emergency services

4.2.2 Lane closures (WW.4.1.4)

4.2.3 Temporary speed restrictions (WW.4.1.6)



4.2.4 Diversion (WW.4.1.8) (entirely in VILD)

An example has been detailed below for a diversion on the A12 at the Ouderijn interchange for traffic to Arnhem/Nijmegen. Traffic is being rerouted via the A2 towards Den Bosch and then (at the Deil interchange) onto the A15 towards Nijmegen.

4.2.5 Alternative (WW.4.1.11)

See the example in 4.2.1

4.2.6 Risk of congestion (WW.4.1.12)

Based on more or less advanced traffic model analysis, road authorities can indicate that they are expecting traffic jams on a route segment as a result of activities or measures.

5 Examples of WW requirements for the transition from planned to actual

This chapter contains examples of the changes in messages on the transition from a planned status into the status that they are actually on the road. The figure below is a summary of what was stated in the requirements and is included here for ease of use.

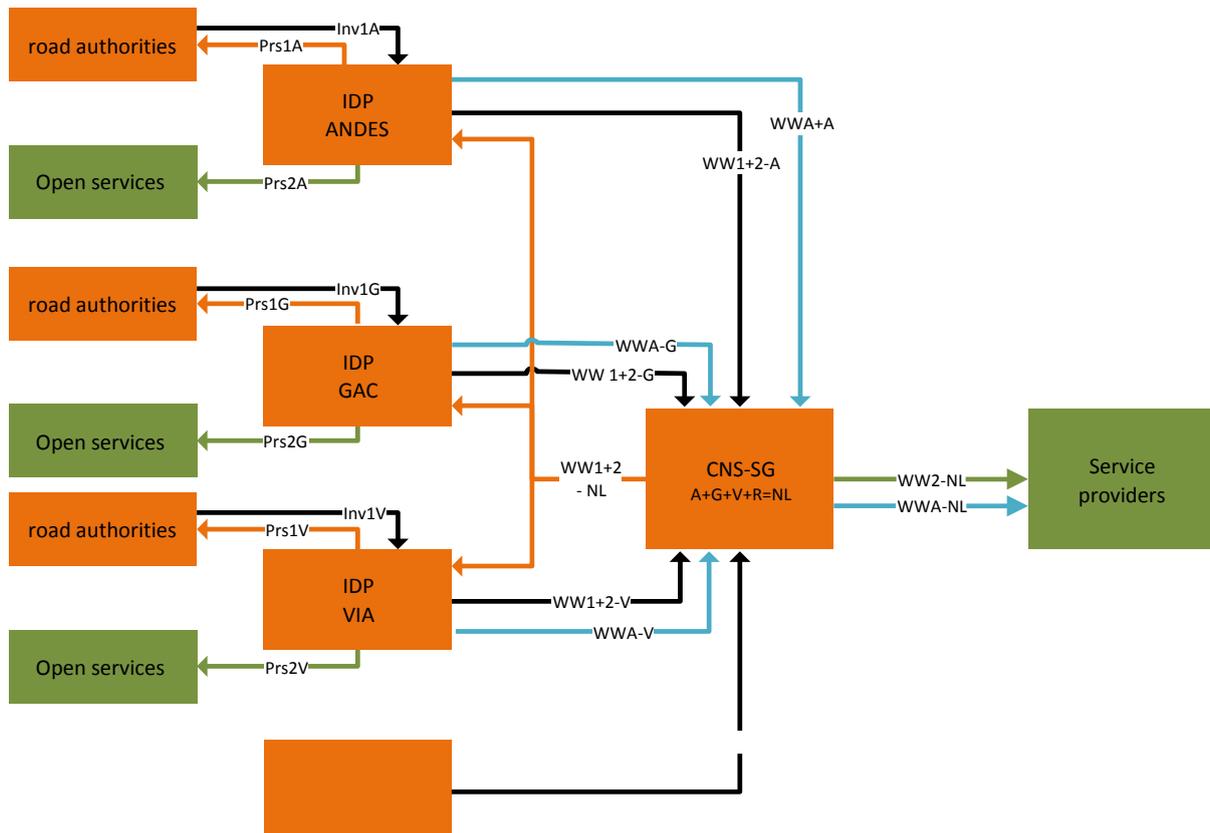


Figure 3 Interfaces between systems in the WWA chain

We can distinguish 3 situations:

- Long-term activities with measures that cause hindrance in various phases that have been included in their own records
- Long-term activities with measures that cause hindrance in various phases, which have been defined using validPeriods.
- Recurring activities, where no (visible) activities are carried out between the periods of working (e.g. the tiles in the tunnel tube of the Schiphol tunnel are washed every second Monday in the month).

The XML examples stated below do not contain complete messages. Instead, they only have the parts that are relevant when explaining examples. The set of examples with XML messages contains the complete messages.

5.1 Situation 1: long-term activities with hindrance in phases, each phase in its own record

Description: the activities will last from 07:00 on 1 February to 17:00 on 14 February 2014.

There will be two road closures during this period: From

1 February to 8 February in one direction

From 8 February to 14 February in the other direction.

5.1.1 Situation until starting time

Until the starting time, the IDPs only communicate details of the work using the interfaces WW1+2 in *Figure 3 Interfaces between the systems in the WWA chain*

Until 1 February, the situation in questions appears as follows. The probabilityOfOccurrence for all records is 'probable'. The operatorActionStatus for all records is 'approved' and the roadWorkStatus is one step prior to 'running'.

5.1.2 At the planned starting time (non-managed activity)

When a measure causing hindrance has reached its starting time, an IDP has to send a number of updates and/or new messages, depending on:

- the interface (WW1+2 or WWA)
- whether the measures in the message are actually activated and/terminated (see 0)

5.1.2.1 In the WW1+2 interfaces

An update of the situation in which the records that are becoming actual have been changed is sent on WW1+2. The changes involve the records with the activities and the records with the measures that are becoming active. The other records remain unchanged. The changes are: operatorAction becomes 'implemented'

roadwork status becomes 'running'

(and the version numbers are incremented, of course)

5.1.2.2 In the WWA interface

A new situation is published on the WWA interface, only containing the situation records that are relevant in terms of pertinence (being up to date). This new situation has its own unique situation ID and in the relatedSituation field refers to the situation ID as used on the WW1+2 interfaces for the

situation in question. In addition, the reference to the corresponding record in the WW1+2 feed is included in the situationRecordCreationReference field in each record.

5.1.3 If the message is being managed actively at the actual starting time If measures are being managed actively (in other words, if they are activated and deactivated when something actually changes on the road), two situations can be distinguished:

- The measure is activated before the planned starting time has passed
- The measure is activated when or after the planned starting time has passed.

Start before or at the planned starting time:

The following attributes are given new values:

- operatorAction becomes 'implemented'
- roadwork status becomes 'running'
- probabilityOfOccurrence becomes 'certain'
- the overallStartTime of the records in question contains the actual starting time.

Start after planned starting time:

The steps from 5.1.2 must have been carried out by the planned starting time.

After that, an external trigger determines that the work/measure has been activated. The following attributes are given a new value at that moment:

- probabilityOfOccurrence becomes 'certain'
- the overallStartTime of the records in question contains the actual starting time.

5.1.3.1 In the WW1+2 interfaces

On the WW1+2 interfaces:

5.1.4 At the planned end time for a non-managed message

5.1.4.1 Marked as complete on WW1+2 interfaces

An update of the situation for which the records are ending and have been changed is sent on WW1+2. The changes affect the records with the activities and with the measures that are being ended. The other records remain unchanged. The changes are:

The operatorAction becomes 'approved' in the record for the activities

The records that are terminating are marked as complete by including the lifecycle management attribute with the value 'true' in the message.

(and the version numbers of the changed records are incremented, of course)

5.1.4.2 In the WWA interface

An update of the situation is published on the WWA interface, notifying the pertinent records as having been completed. If no active measures are left, the activities record is marked as complete too. That is the case in this example.

5.1.5 If the message is actively managed at the actual end time

If measures are being managed actively (in other words, if they are activated and deactivated when something actually changes on the road), two situations can be distinguished:

- the measure is deactivated before the planned end time has passed
- the measure is activated at the planned end time or after it has passed.

End before or at the planned end time:

The records that are terminating are notified as complete by including the lifecycle management attribute with the value 'true' in the message (and incrementing the versions of the changed records, of course) and with the overallEndTime of the pertinent records containing the actual end time.

If the situation still has active measures left over, nothing will change in the roadworks record.

If only planned measures are left in the situation, the values of the following attributes will change:

- operatorAction becomes 'approved'
- probabilityOfOccurence becomes 'probable'
- the overallEndTime of the records in question is filled with the actual ending time.

Actual end time after planned end time:

At the planned end time, updates are sent for the records whose end time has elapsed, either removing the overallEndTime or giving a new value that is in the future. The overrunning attribute is included in the message with the value 'true' specified in its 'validity'.

An external trigger then determines that the work/measure has ended. The following attributes are given a new value at that moment:

- probabilityOfOccurence becomes 'certain'
- the overallEndTime of the records concerned is filled with the actual end time.

The records that are terminating are notified as complete by including the lifecycle management attribute with the value 'true' in the message (and incrementing the versions of the changed records, of course).

The rest of the mechanism is the same as notification of completion at a planned end time.

5.1.5.1 Actual end time after planned end time

An update has to be sent on both WW1+2 and WWA just before the planned time (at least 1 minute) to prevent the receiving system from deeming situation records to have lapsed.

The content of the update is merely a change of validity. In this case, it becomes:

5.2 Situations 2 and 3: long-term activities with hindrance in phases, defined using validPeriods

Description: the activities will last from 07:00 on 21 September to 20:00 on 28 October 2014.

There will be two road closures during this period: From 21 to 23 September

From 25 to 28 September

Document: NDW Interface Requirement Specifications for roadworks and events

Date: 07-Jul-2015

5.2.1 Situation until starting time

Until the starting time, the IDPs only communicate details of the work using the interfaces WW1+2 in *Figure 3 Interfaces between the systems in the WWA chain*

Until 21 September, the situation in questions appears as follows. The probabilityOfOccurrence for all records is 'probable'. The operatorActionStatus for all records is 'approved' and the roadWorkStatus is one step prior to 'running'.

5.2.2 At the starting time

When a measure causing hindrance has reached its starting time, an IDP has to send a number of updates and/or new messages, depending on:

- the interface (WW1+2 or WWA)
- whether the measures in the message are actually activated and/terminated (see 0)

5.2.2.1 In the WW1+2 interfaces

An update of the situation in which the records that are becoming actual have been changed is sent on WW1+2. The valid period that is becoming active is retrieved from the record in question and new records are created containing the times for the activated period in the overallStartTime and overallEndTime.

In the record with the planned measures (i.e. the update), the roadworks status is now 'running'.

The following changes affect the new records with the work and the records with the measures that are becoming active:

operatorAction becomes 'implemented',
 roadworks status becomes 'running'
 (and the version sequence numbers are 1, of course)

5.2.2.2 In the WWA interface

A new situation is published on the WWA interface, only containing the situation records that are relevant in terms of pertinence (being up to date). This new situation has its own unique situation ID and in the relatedSituation field refers to the situation ID as used on interfaces WW1+2 for the situation in question. In addition, the reference to the corresponding record in the WW1+2 feed is included in the situationRecordCreationReference field in each record.

5.2.3 If the message is being managed actively at the actual starting time If measures are being managed actively (in other words, if they are activated and deactivated when something actually changes on the road), two situations can be distinguished:

- The measure is activated before the planned starting time has passed
- The measure is activated when or after the planned starting time has passed.

Start before or at the planned starting time:

When new records are being created, the actions are as per the example in 5.2.2.

The following attributes are given new values:

- operatorAction becomes 'implemented'
- roadwork status becomes 'running'
- probabilityOfOccurrence becomes 'certain'
- the overallStartTime of the records in question contains the actual starting time.

Start after planned starting time:

The steps from 5.2.2 must have been carried out by the planned starting time.

After that, an external trigger determines that the work/measure has been activated. The following attributes are given a new value at that moment:

- probabilityOfOccurrence becomes 'certain'
- the overallStartTime of the records in question contains the actual starting time.

The rest of these mechanisms are the same as the examples in 5.1.3

5.2.4 At the planned end time for a non-managed message

5.2.4.1 Marked as complete in the WW1+2 interfaces

An update of the situation in which the records that are terminating are longer present is sent on WW1+2. The changes affect the records with the activities and with the measures that are being ended. The other records remain unchanged. The changes are:

The operatorAction becomes 'approved' in the record for the activities

If there are no longer any active or planned measures in the latest version of the situation, the records that are terminating are notified as complete using the lifecycle management attribute with the value 'true' (not in this example).

(and the version numbers of the changed records are incremented, of course)

5.2.4.2 In the WWA interface

An update of the situation is published on the WWA interface, notifying the pertinent records as having been completed. If no active measures are left, the activities record is marked as complete too. That is the case in this example.

5.2.5 If the message is actively being managed at the actual end time

This is done in the same way as for messages where no validPeriod is used.

6 Examples of location reference (including openLR) for WW

6.1 GroupOfLocations, 1 road entirely in VILD

6.2 GroupOfLocations, 2 roads entirely in VILD

6.3 GroupOfLocations multiple roads, 1 of which is in VILD

This example is a segment consisting of a route that starts on two roads that are not in VILD, followed by a road that is in VILD and then a street that is not in VILD.

The route segment is made up of:

- 3 roadside reference points for:
 - o start of activities/start of route segment measurement
 - o first decision point for taking the other road
 - o point in the route segment after which VILD locations are available.
- 1 linear with a route segment in VILD, including the (x,y) coordinates in the linear extension. The (x,y) coordinates of the starting location must be the same as the coordinates of the final RRP (roadside reference points) preceding it
- 2 roadside reference points for
 - o the point where the final location is that can be defined using VILD. The coordinates must be the same as the final location of the linear.
 - o point where the work/measure ends