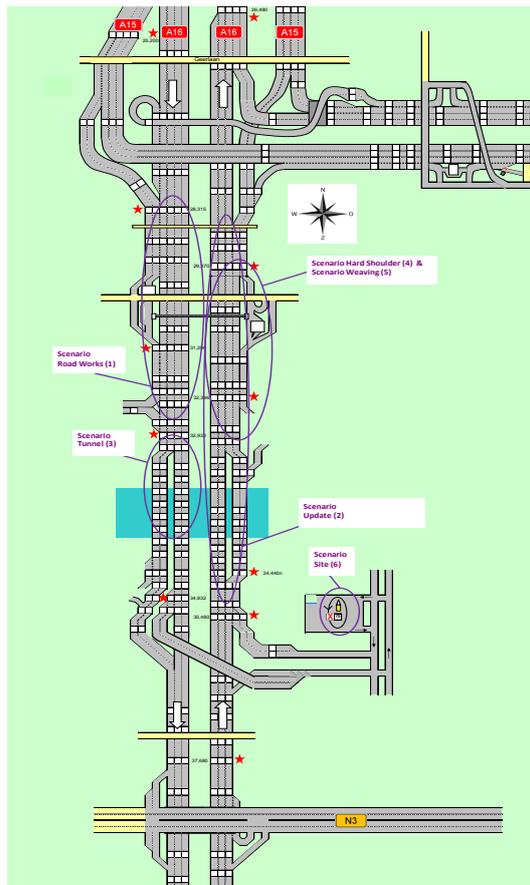


## Plan of action TESTFEST ITS-G5 for Participants only

RIJKSWATERSTAAT

Dordrecht Netherlands, July 3rd-6th 2017

Date 14 June 2017  
Status Final





## Colophon

Published by	Rijkswaterstaat. Programs, Projects and Maintenance
Project coordinator	Ronald Adams
Information	Peter Schmitting
Phone	+33 6 08515187
Email	<a href="mailto:p.schmitting@mail.ertico.com">p.schmitting@mail.ertico.com</a>
Editor	Edwin van der Walle
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## Abbreviations

<b>Table of Abbreviations</b>	
EC	European Commission
PD	Pre-deployment, activity within phase 2 Dutch C-ITS Corridor
RWS	Rijkswaterstaat
MS	Member State
CU	Central Unit
CAM	Cooperative Awareness Message
DENM	Decentralized Environmental Notification Message
PKI	Public Key Infrastructure
OBU	Onboard Unit
RWW	Road Works Warning
CRW	Collision Risk Warning
PVD	Probe Vehicle Data
IVS	In Vehicle Signage
IVI	In Vehicle Information
HMI	Human Machine Interface
VMS	Variable Message Sign
RSU	Roadside Unit

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## 1 Introduction

This document is the plan of action for the InterCor ITS-G5 TESTFEST, to be held July 3<sup>rd</sup> – 6<sup>th</sup> 2017.

The aim of this document is to inform TESTFEST participants<sup>1</sup> of the TESTFEST about the TESTFEST scope and objectives, the site, the test scenarios, the time schedule and other relevant items.

Rijkswaterstaat (RWS) team members of C-ITS Corridor and InterCor have drafted this document.

The Rijkswaterstaat C-ITS Corridor team has prepared the test-site for this event. Under the responsibility of the test-site manager on motorway A16 near Dordrecht, a number of services will be active, based on the common specifications from InterCor. Dordrecht is on the major Transport Corridor between Rotterdam and Antwerp, part of the Ten-T Core Network.

In this context also C-ROADS should be mentioned. The C-ROADS Platform is a EU member state driven platform, with the objective to harmonise C-ITS deployments across Europe. In this respect several implementation projects on completely different levels are cooperating and contributing to the C-Roads Platform, with their results regarding tests, evaluations and deployment. All four countries in the InterCor project participate in C-ROADS and contribute to this platform, in order to reach further EU-harmonisation.

---

<sup>1</sup> Registered public and private organisations (road operators, systems suppliers, service providers, vehicle

## 2 TESTFEST ITS-G5 Description

### 2.1 Introduction InterCor

Being a part of Intelligent Transport Systems, cooperative ITS (C-ITS or cooperative systems) encompass a group of technologies and applications that allow effective data exchange through wireless communication technologies between components and actors of the transport system, very often between vehicles (vehicle-to-vehicle or V2V) or between vehicles and infrastructure (vehicle-to-infrastructure or V2I and infrastructure-to-vehicle or I2V)

The deployment of C-ITS is an evolutionary process that will start with the less complex use cases. These are referred to as 'Day-1' services, encompassing messages about traffic jams, hazardous locations, road works and slow or stationary vehicles, as well as weather information and speed advises to harmonise traffic. Using probe vehicle and infrastructure related data, all C-ITS services shall be transmitted directly into the vehicles in a way that allows users to get informed but not distracted.

InterCor Action aims to streamline C-ITS implementation in four EU member states (MS) linking the different national initiatives towards a harmonized strategic rollout and the use of common specifications. C-ITS pilot sites able to send data through ITS-G5 and/or cellular networks will be installed in the Netherlands, Belgium (Flanders), UK and France, for the operation and evaluation of C-ITS services. InterCor initially focuses on the deployment of 'Day-1' services as recommended by EC 'C-ITS platform' such as Road Works Warning, Green Light Optimized Speed Advisory, In Vehicle Signage and Probe Vehicle Data. In the second phase, it will also test other logistic services such as Multimodal cargo optimization, Truck Parking and Tunnel logistics.

The InterCor Action is a study project with three main pilot activities:

- Pilot Roll out Preparation
- Pilot Operations
- Pilot Evaluation.

InterCor will commence with activity 2, the pilot preparations by developing a set of common specifications for ITS-G5, Hybrid communication, PKI and C-ITS services on logistics and traffic management and validating them in interoperability testing events (TESTFESTs) in the four member states with the overall aim to deliver roll out guidelines for future deployment. In the third activity, the project coordinates the pilot operations in the four member states by providing a common pilot framework and rolling out the set of common specifications. In the fourth activity, called Pilot Evaluation, the study will provide a common evaluation framework for all member states and deliver a technical evaluation, impact assessment and user acceptance for the pilots in the four member states.

The first InterCor TESTFEST focuses on ETSI-G5 and will be organized, under responsibility of RWS, by member state The Netherlands.

The following table summarizes the services to be tested in the scope of InterCor. Highlighted is the scope of the TESTFEST ITS-G5.

Services	The Netherlands	France	Belgium	UK
In vehicle signage	x	x	(x)	x
Probe data	x	x		x
Road works warning	x	x	x	x
GLOSA	x	x	x	x
Multimodal cargo transport optimisation	x	x		
Truck Parking	x	x		
Tunnel logistics	x		x	

Table: InterCor services (scope ETSI-G5 TESTFEST highlighted)

## 2.2 Introduction C-ITS Corridor

With the Cooperative ITS Corridor project, road operators in the Netherlands (i.e. Rijkswaterstaat), Germany and Austria, working together with industry partners, are taking concrete steps towards the introduction of cooperative services in Europe.

Among the three countries it is agreed to start with providing two services on the corridor Rotterdam-Frankfurt-Vienna:

- Road Works Warning (warning for road works ahead)
- Probe Vehicle Data (collecting sensor data from vehicles)

In the Netherlands, additional services are being developed:

- In Vehicle Signage (information on road signs, initially primarily focussed on Road Works Warning)
- Collision Risk Warning (stationary vehicles warning)

Until March 2017 there have been four large-scale so-called “pre-deployments” (tests) on various and for the Netherlands typical, stretches of the Dutch section of the international Cooperative ITS Corridor. These tests provided input to the Corridor-project team to finalise the technical specifications of the services. For pre-deployment 1, in which fixed Roadside Units (RSUs) were installed on gantries of the existing motorway management system, a representative pre-deployment site has been created on the A16 motorway near Dordrecht. This site is the base for the test site for the InterCor TESTFEST in July.



Figure: C-ITS Corridor Rotterdam-Frankfurt-Vienna

### 2.3 C-ITS Corridor and pilot operations InterCor

The C-ITS Corridor and InterCor projects are closely related. Both projects focus on Day-1 services and ITS-G5. Aspects like harmonization, interoperability and PKI are areas of main interest in both projects. In the Netherlands, also the proposed networks physically overlap.

The timelines of both projects are very similar as well. The figure below shows a mapping of C-ITS Corridor and InterCor timelines.

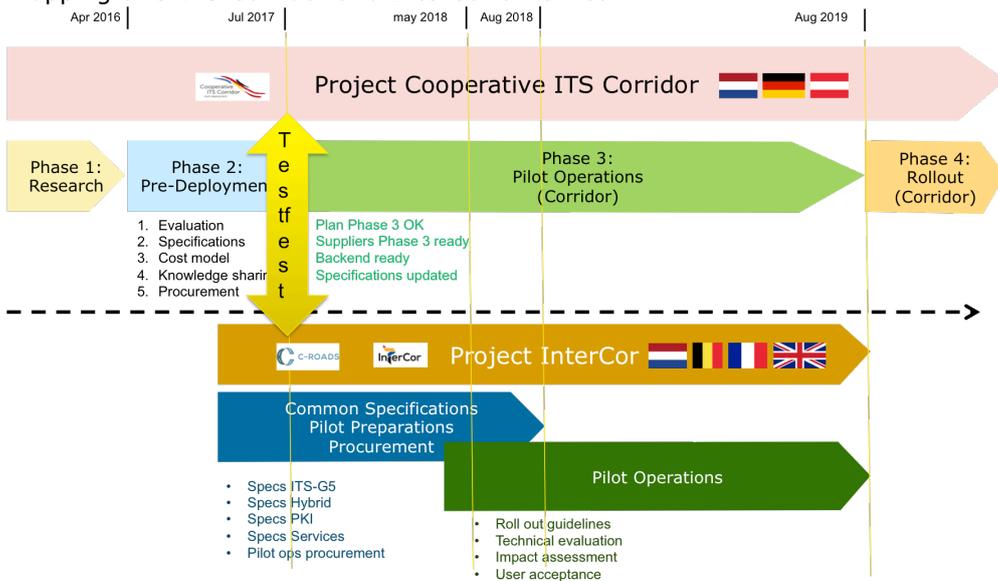


Figure: timelines C-ITS Corridor and InterCor

An important feature of the InterCor pilot operations is the approach to strengthen existing initiatives. Because of the similarities between the projects, it is evident to build upon the already operational C-ITS Corridor pre-deployment site on the A16

motorway as a major testsite for InterCor, both for TESTFEST and for pilot operations purposes.

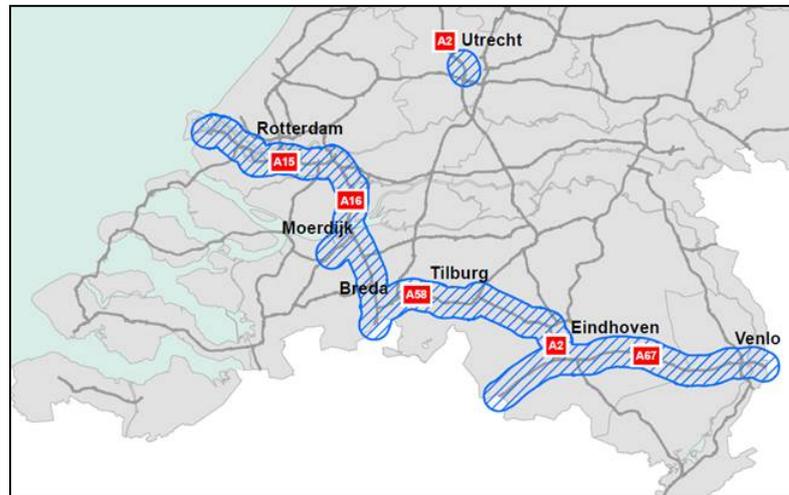


Fig.: Combined Dutch Corridor Area.

## 2.4 Objective of the TESTFEST ITS-G5

The objective of this TESTFEST is to validate the interoperability of existing ITS-G5 services based on the common set of specifications developed in the InterCor project's sub activity 2.1a.

This set of specifications needs to be validated against its main goal being to ensure the roll out of internationally interoperable C-ITS services. The validation is done, as usual for communication and services based on specifications, by testing the interoperability of user devices (OBUs) from the four Member states at one test location. This TESTFEST is a first of a set of 4 TESTFEST interoperability events that will be carried out, to assess the quality of the common set of specifications and consistency with the resulting ITS station and service application implementations. The focus is on service interoperability rather than on product interoperability, as OBUs from several vendors from different countries will interoperate with a fixed set of RSUs at a test site in the Netherlands.

OBUs are assumed to be compliant to standards, e.g. be able to pass the ETSI plug tests (test tools). Compliancy is the responsibility of the participant; there will be no entry tests.

Each TESTFEST will provide a report, describing the test setup and summarising the outcome of this TESTFEST event.

### **Activity 2.2 Validation of Specifications**

#### **Activity 2.2a: TESTFEST events**

The common set of specification needs to be validated against its main goal being to ensure the roll out of interoperable C-ITS services. The validation is done, as usual for communication and services based on specifications, by testing the interoperability of user devices (Vehicle ITS stations) in the four Member states. Therefore a set of **4 TESTFEST interoperability events** will be carried out, to assess the quality of the common set of specifications and consistency with the

resulting ITS station and service application implementations. This task will provide a report, summarising the outcomes of each TESTFEST events, materialising the suitability for use of the common set of specifications, each TESTFEST focusing on a specific deployment phase:

1. **ITS-G5 TESTFEST event (Validating the common set of specifications for existing services through ITS-G5)**
2. Hybrid communications TESTFEST (validating the final set of upgraded specification for hybrid communication)
3. PKI TESTFEST event (validating the common certificate policy (CP))
4. C-ITS services TESTFEST (validating the common service specifications upgraded for logistics services and traffic management)

Each TESTFEST event will be used as an indicator to assess the completion of the set of specification at each stage of the activity 2.1.

Figure: description activity 2.2a

## 2.5 Services to be tested

The following services will be tested during the TESTFEST.

Service	Message format	Comments
Road Works Warning (RWW)	DENM	Will be tested during live road works and also continuously available as Virtual RWW
In Vehicle Signage (IVS)	IVI	Continuously available, during live road works as well.
Probe Vehicle Data (PVD)	CAM	Probe data based on CAM aggregation
<i>Collision Risk Warning (CRW)</i>	<i>DENM</i>	<i>Additional C-ITS Corridor scope, not an InterCor service!</i>

Table: available services at the test site, InterCor services highlighted

## 2.6 Preconditions

By participating in the TESTFEST, participants explicitly agree with the following rules and instructions:

1. Attendance at the safety instruction session is mandatory for all participants. A safety instruction session is scheduled each TESTFEST day, before actual testing. You will be denied access to the TESTFEST when you have not attended the safety instruction session. On request additional safety instruction sessions will be held.
2. Dutch law and Dutch traffic signs and regulations in the Netherlands are applicable.
3. Rijkswaterstaat is not liable for any damage due to reduced availability of the ITS-G5 services and/or the test track for whatever reason.
4. Participants are to follow up instructions from safety managers, roadside inspectors and duty officers at all times.
5. The Test Centre will be accessible for registered participants only.

6. Participation is non-exclusive for InterCor members. Invitations have been sent to C-Roads partners, C-ITS Corridor partners and via the Ertico and DITCM/Connekt/AutomotiveNL mailing lists as well. The invitation has also been distributed via TenderNed.nl<sup>2</sup>
7. Participants take part in the TESTFEST at their own expense.
8. Because of time and budget constraints, other use cases than described in this document, will not be included for testing in this TESTFEST.
9. Participants have to bring their own test vehicle and peripherals (i.e. antenna, cables, adaptors, power supply etc.) to the TESTFEST.

Please note that videos and/or pictures can be shot during the TESTFEST for InterCor and Rijkswaterstaat P.R. purposes.

## 2.7 Reporting

After each of the TESTFEST events a report about the event will be produced. The reports will include:

- Presentation of the test site
- Description of the tested services
- Test scenarios and test descriptions
- Qualitative and quantitative test results
- Lessons learned and conclusions.

Those reports will be made available to all TESTFEST participants and will also be published on the InterCor website ([intercor-project.eu](http://intercor-project.eu)). Further communication means (Press release, twitter, etc.) may be used to advertise the TESTFEST results to the wider public.

The totality of the four reports of the planned TESTFEST events will be compiled into a single deliverable for InterCor milestone M7 (Completion of validation of specifications) due October 15, 2018.

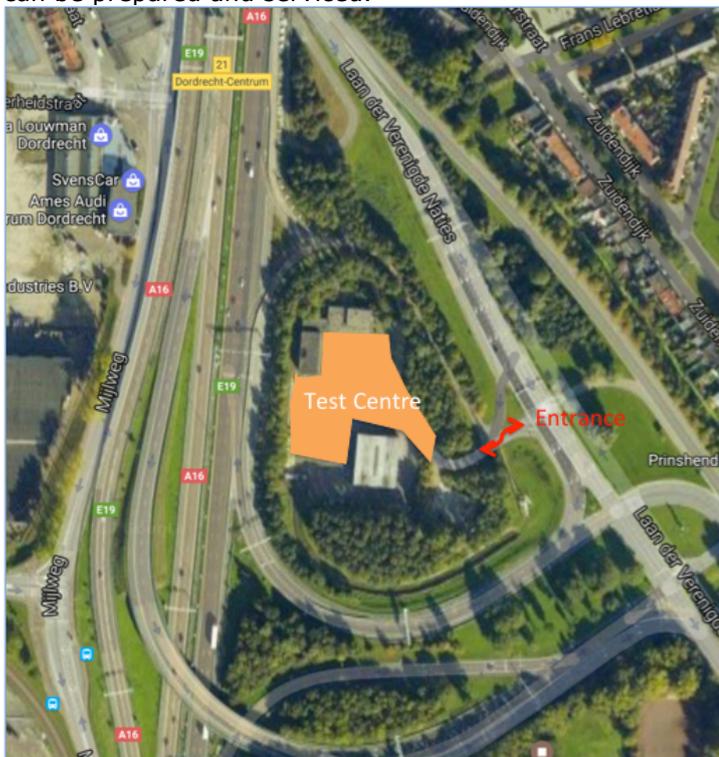
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<sup>2</sup> TenderNed is the Dutch government's online tendering system. All Dutch authorities are obliged to publish their national and European tenders on TenderNed's announcement platform, so businesses can access all public publications from a single webpage.

## 3 Site

### 3.1 Description of the test centre

The TESTFEST test centre is a temporary facility located at a permanent Rijkswaterstaat Road Maintenance facility (called "Steunpunt"). The Test centre is next to the open road test site on the A16 motorway and directly located near the exit and entrance to the A16. The test centre has a service area where test vehicles can be prepared and serviced.



Picture: location of the test centre next to the test site



Picture: entrance to the test centre

At the test centre there will be facilities for desk and lab testing and meetings. Depending on the number of participants and their special needs, additional temporary facilities will be organized.

### 3.2 Description of the Field test

From 3 – 6 July road works with temporary traffic management measures are being planned on the A16. One or more lanes will be closed for the purpose of placing machines and executing road works. During these traffic management measures (10:00h – 14:00h) it will be possible to drive past the road works in order to execute real live tests.

The Dutch implementation of RWW on roads with traffic signaling systems is based on both DENM and IVI, which means that:

- A fixed Roadside Unit (RSU) sends for every subsequent closed lane one (1) DENM message with information about the road works;
- A fixed RSU sends one or more IVI messages with information supporting the DENM - RWW message. The IVI messages contain the current signaling information on display from the centrally controlled VMS (variable message signs) on gantries.



*Figure: closed lane during Road Works, accompanied by reduced maximum speed signaling on the variable message displays.*

The RSU (beacon) that sends the IVI message does not necessarily need to be the same one as the one sending the DENM message. It is possible though, but it depends on the specific situation.

An Onboard Unit (OBU) will process the DENM and/or IVI messages into useful information for the driver of the vehicle. The responsibility for the correct operation of the OBU and the way user information is being displayed on the HMI lies with the participant.

The process of generating messages:

- First, the traffic manager at the traffic management centre gives the road works contractor permission to implement a road closure (i.e. positioning a safety trailer etc.). Although this had been scheduled, the actual moment depends on current traffic conditions. Consequently, the traffic manager will place the applicable images (e.g. max. speed/red cross) on the centrally controlled variable message signs.
- Based on the current images on the variable message signs and information about the type of road works the Central Unit (CU) automatically composes DENM and IVI messages, which are relayed to the RSU(s) at the roadside.



Figure.: traffic manager at the traffic management centre.

The RSUs are also suitable for receiving Probe Vehicle Data messages from the test vehicles. These CAM messages will be collected and stored on the RSUs. In chapter 4 you will find a description of the TESTFEST test scenarios.

### 3.3 Open road test track

Fixed WiFi-P RSUs (beacons) have been placed on strategic locations on the A16, compliant with the Dutch C-ITS Corridor specification 'placement guideline RSU'. In the Netherlands, sending Road Works Warning messages from RSUs including supporting IVI messages is being applied on motorways with centrally controlled VMS on gantries. Therefore RSUs on trailers are not being used in the TESTFEST.



### 3.5 TESTFEST support team on site

Name	Organization	Role	Phone number	E-mail
Ronald Adams	InterCor	Project manager	+31 6 51848077	<a href="mailto:ronald.adams@rws.nl">ronald.adams@rws.nl</a>
Peter Schmitting	InterCor	TESTFEST manager	+33 6 08515187	<a href="mailto:p.schmitting@mail.ertico.com">p.schmitting@mail.ertico.com</a>
Bart Netten	InterCor	TESTFEST evaluation	+31 6 11700495	<a href="mailto:bart.netten@tno.nl">bart.netten@tno.nl</a>
Abraham Bot	RWS C-ITS Corridor	Projectmanager C-ITS Corridor	+31 6 22960379	<a href="mailto:abraham.bot@rws.nl">abraham.bot@rws.nl</a>
Edwin van der Walle	RWS C-ITS Corridor	Technical manager / Site manager	+31 6 27028597	<a href="mailto:edwin.vander.walle@rws.nl">edwin.vander.walle@rws.nl</a>
Bart Wolfs	RWS C-ITS Corridor	PR manager	+31 6 52055105	<a href="mailto:bart.wolfs@rws.nl">bart.wolfs@rws.nl</a>
Irene Lacroix	RWS C-ITS Corridor	Project officer	+31 6 31794199	<a href="mailto:irene.lacroix@rws.nl">irene.lacroix@rws.nl</a>
Axel Zandbergen	RWS C-ITS Corridor	Test manager	+31 6 10057326	<a href="mailto:axel.zandbergen02@rws.nl">axel.zandbergen02@rws.nl</a>
Dave van Hillo	RWS C-ITS Corridor	Crew	+31 6 29440839	<a href="mailto:dave.van.hillo@rws.nl">dave.van.hillo@rws.nl</a>
Yvonne Dierikx	RWS C-ITS Corridor	Crew (Specs leader)	+31 6 51450163	<a href="mailto:yvonne.dierikx@rws.nl">yvonne.dierikx@rws.nl</a>
Martijn van der Zalm	RWS C-ITS Corridor	Crew (test engineer)	+31 6 43219850	<a href="mailto:martijn.vander.zalm@rws.nl">martijn.vander.zalm@rws.nl</a>
Igor Passchier	RWS C-ITS Corridor	Technical coordinator	+31 6 53907097	<a href="mailto:igor.passchier@tassinternational.com">igor.passchier@tassinternational.com</a>
Marianne Oosterbroek	RWS C-ITS Corridor	PR	+31 6 11598617	<a href="mailto:marianne.oosterbroek@rws.nl">marianne.oosterbroek@rws.nl</a>
Ron de Waard	Compass	Crew (Project manager RSU and Road works)	+31 6 22733120	<a href="mailto:ron.dewaard@compass.nl">ron.dewaard@compass.nl</a>
Tommy van Dijk	Compass	Safety Manager	+31 6 22733099	<a href="mailto:tommy.vandijk@compass.nl">tommy.vandijk@compass.nl</a>
John Hogers	Compass	Crew		<a href="mailto:John.hogers@compass.nl">John.hogers@compass.nl</a>
Jaap Zee	Swarco	Crew (Engineer CU)	+31 6 28985296	<a href="mailto:jaap.zee@swarco.com">jaap.zee@swarco.com</a>
Kees van Walraven	Swarco	Crew (Engineer CU)		<a href="mailto:kees.vanwalraven@swarco.com">kees.vanwalraven@swarco.com</a>

### 3.6 Test centre amenities

The Rijkswaterstaat test centre and service area will be fully available during the TESTFEST for all registered participants. Parking facilities are available for participants.

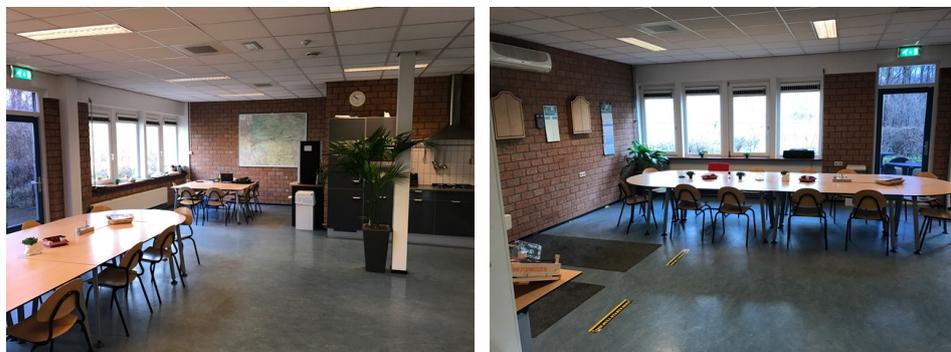
The test centre will be accessible daily from 8:00 until 18:00.

The test centre has several offices that can be used during the event. Rooms will be available for participants and for plenary sessions like the daily de-briefings.



Picture: meeting room

During the TESTFEST there will be permanent catering facilities for lunch available in a simple cafeteria.



Picture: cafeteria

To the left of the entrance of the test centre there will be a portacabin for the TESTFEST support team. From this portacabin, the TESTFEST leader will coordinate the TESTFEST.



Picture: portacabin

Participants will operate from their designated team room.



*Picture: Team rooms*

### **3.7 Internet Access**

The Dutch Corridor hosting project will offer special event broadband Internet access. Participants have to bring their own devices to get online. There will be Internet access in the offices as well as outside in the service area. Printing facilities will also be available.

Depending on the requirements as stated by the Leader of Evaluation, facilities will be arranged in the Grand Meeting room. Possible options are:

- Presentation equipment (screen for demonstrations and joint analyses)
- Data sharing facilities for test results etc.
- Printing facilities
- Wi-Fi facilities

## 4 Test scenarios

### 4.1 Introduction and general approach

The tests will focus on the use cases RWW, IVS, PVD and CRW as follows:

- **Road Works warning (RWW).** RWW will be tested by providing DENM messages from strategically chosen Roadside Units (RSU(s)) upstream from the event. These RSUs can be any of the RSUs on a 17 km stretch on the A16 motorway. Events may be road works which are actually happening or they may be 'virtual'.
- **In Vehicle Signage (IVS).** IVS will be tested by providing IVI messages on strategically chosen RSU(s) upstream of the sign(s). The RSUs can be any of the RSUs on the 17 km stretch on the A16 motorway. Messages may relate to signs which are actually displayed on the road or they may be 'virtual'.
- **Probe Vehicle Data (PVD).** All RSUs on the 17 km stretch will collect all CAM messages sent from all passing vehicles (e.g. not only the basis PVD subset but all CAMs). The CAM messages will not be interpreted or condensed but will be stored as raw data on the RSUs and will be uploaded to the Central Unit on a daily basis.
- **Collision Risk Warning (CRW).** CRW will be tested by providing virtual DENM messages warning for imaginary stationary traffic inspector vehicles. CRW is not an InterCor service and will be evaluated by Rijkswaterstaat.

Tests will be performed on three levels:

- **Desk tests.** These tests can be performed inside the offices of the Test site. The Dutch Cooperative ITS Corridor project will provide Wi-Fi-P coverage, transmission of IVI and DENM messages as well as reception of CAM messages inside the building, allowing participants to perform initial tests such as debugging on their equipment inside the test centre.
- **Lab tests.** These tests can be performed outside the test centre. The Dutch Cooperative ITS Corridor project will provide Wi-Fi-P coverage, transmission of IVI and DENM messages as well as reception of CAM messages on the service area within the compounds of the test site. These tests will allow participants to drive at low speeds (max. 10 km/h) for short distance along a Roadside Unit in order to test proper functioning of their equipment in an open-air 'laboratory' environment. This environment will allow actual driving in short loops with the possibility to directly correct flaws if so required.
- **Open Road test.** These tests can be performed on an actual motorway, the A16 from Dordrecht to Rotterdam. The Dutch Cooperative ITS Corridor project will provide Wi-Fi-P coverage, transmission of IVI and DENM messages as well as reception of CAM messages over a 17 km stretch. These tests will allow participants to test their equipment in a real live environment.

Wherever possible data will be collected during the day and will be exchanged at the end of the day with all participants. Wherever possible at the end of each day all participants will collectively draw conclusions. If this cannot be achieved, data will

be made available afterwards in order to enable participants to evaluate at a later stage.

## 4.2 Test configuration

The Central Unit (CU) composes the content of the DENM and IVI message, based on information from various sources. Next this message is being transferred to a RSU (or RSUs, if applicable) at the roadside, upstream from the road works. Road works can differ per situation and are often dynamic. Therefore the specific situation at a given moment is not known at the traffic centre. This means that the message will be generated tailor made especially for the given situation, conform the relevant Profile. PVD information, received from the Onboard Units and transferred via the Roadside Units, will be stored by the CU.

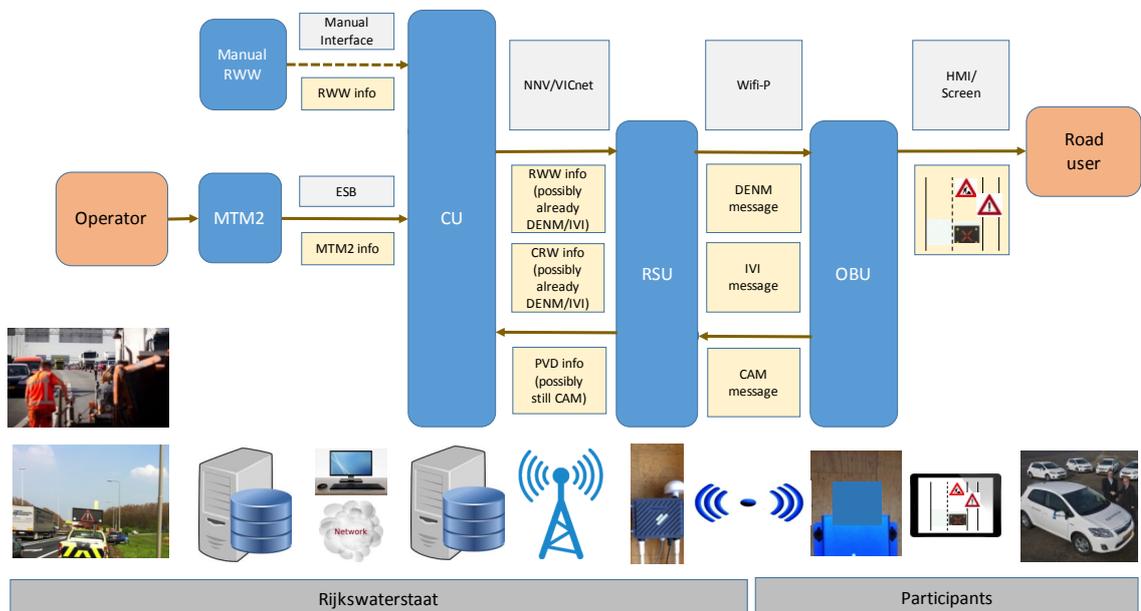


Figure: Test configuration C-ITS Corridor

## 4.3 Specifications

The TESTFEST will be based on the following specifications:

1. Dutch C-ITS Corridor Profile, Version 3.0 Final, 12-05-2017.
2. Data logging for TESTFEST #1, version number 1.0, 15-05-2017 (including two MS Excel supplements:
  - a. InterCor\_CommonCommunicationLogFormat\_v0.5.xlsx
  - b. InterCor\_CommonApplicationLogFormat\_v0.5.xlsx
3. Proposed test Scenarios (included in this Plan of Action TESTFEST ITS-G5 v1.0).

Applicable specifications for the TESTFEST are downloadable at:

[InterCor website](#)

#### 4.4 Informative documents

The following informative documents are available for participants:

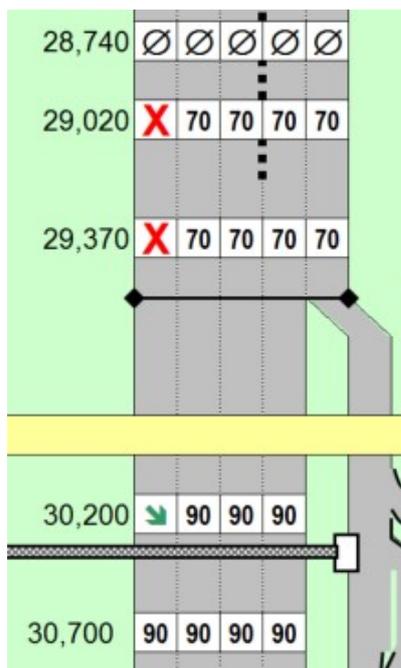
1. Description of the System Concept, final v1.0, 4 July 2016.
2. RSU Placement Guidelines, final v1.0, 27 October 2016.
3. Test PCAPs and XML schemes of comparable DENM and IVI messages.

Informative documents for the TESTFEST are downloadable at:  
[InterCor website](#)

#### 4.5 Overview of Test scenarios types

The TESTFEST envisages the following seven types of messages to be used in the test scenarios:

- **Known-Real-RWW.** There will be one predefined actual real-life road works. It is expected that this will be a situation where one lane, and one lane only, is blocked by a trailer.
- **Known-Real-IVS.** Accompanying these real-life road works there will be road signs on overhead variable message signs on gantries. These signs will depict red crosses, arrows pointing left or right, speed limits (90, 70, 50) or end-of-restrictions.



Example of a road works scenario.

- **Known-Virtual-RWW.** Additionally there will be several predefined but virtual road works. These scenarios will be supported by a photo-script depicting imaginary trailers on the road.
- **Known-Virtual-IVS.** Comparable to Known-Virtual-RWW there will also be Known-Virtual-IVS with road signs on overhead variable message signs on gantries.
- **Known-Virtual-CRW.** Comparable to the above there will also be a limited set of virtual events denoting a traffic inspectors vehicle standing still on the motorway.
- **Unknown-Real-RWW:** Apart from the known scenarios, there may - since we are operating in a live environment - also be unknown road works. It is quite possible that maintenance work performed by others takes place during the test days. In case such events happen on a stretch, which also holds a virtual scenario, the virtual scenario will prevail.
- **Unknown-Real-IVS.** As for the unknown-real-RWW there may also be unknown-real-IVS. The signalling system may, for instance due to congestion, automatically generates warnings on overhead variable message signs. The relevant IVI messages will be generated automatically. Here also, in case of a conflict, the virtual scenario prevails.

#### 4.6 Scenarios overview

The scenario overview for the TESTFEST is presented below.

Preliminary Scenario Overview								
Types of scenarios		Known					Unknown	
		Real		Virtual			Real	
Scenarios		RWW	IVS	RWW	IVS	CRW	RWW	IVS
1	Road Works							
2	Update							
3	Tunnel							
4	Hard Shoulder							
5	Weaving							
6	Site							
7	RWW							
8	IVS							

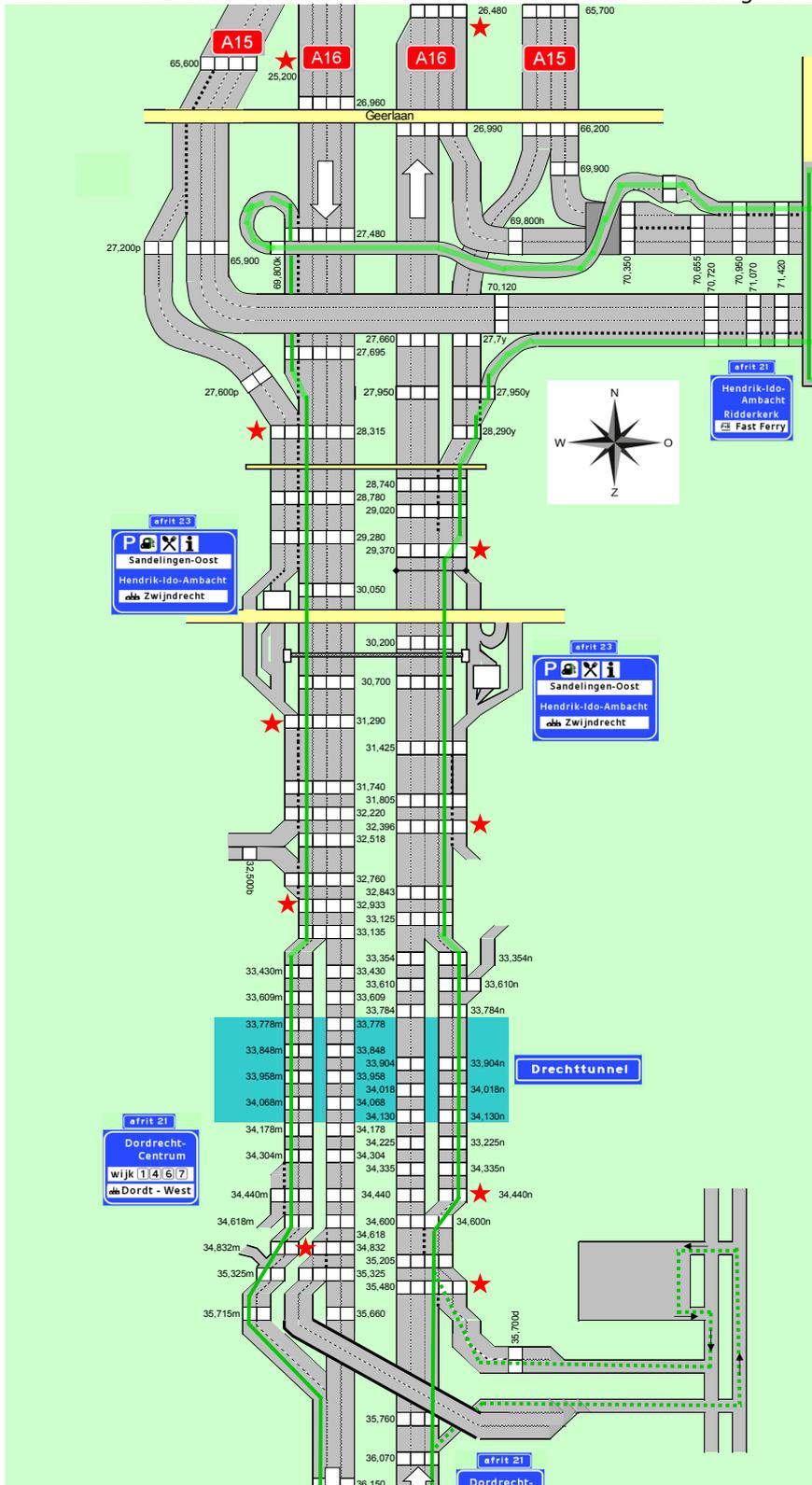
**4.7 Scenario Schedule**

The preliminary scenario schedule for the TESTFEST is presented below.

<b>Preliminary Scenario Schedule</b>				
	<b>Monday 3 July</b>	<b>Tuesday 4 July</b>	<b>Wednesday 5 July</b>	<b>Thursday 6 July</b>
<b>8.00</b>	Arrival	Set-up	Set-up	Set-up
<b>8.30</b>				
<b>9.00</b>				
<b>9.30</b>				
<b>10.00</b>	<ul style="list-style-type: none"> <li>• Site</li> </ul>	<ul style="list-style-type: none"> <li>• Site</li> <li>• Road Works</li> <li>• Weaving</li> </ul>	<ul style="list-style-type: none"> <li>• Site</li> <li>• Road Works</li> <li>• Weaving</li> </ul>	<ul style="list-style-type: none"> <li>• Site</li> <li>• Road Works</li> <li>• Weaving</li> </ul>
<b>10.30</b>				
<b>11.00</b>				
<b>11.30</b>				
<b>12.00</b>		<ul style="list-style-type: none"> <li>• Site</li> <li>• Road Works</li> <li>• Hard Shoulder</li> </ul>	<ul style="list-style-type: none"> <li>• Site</li> <li>• Road Works</li> <li>• Hard Shoulder</li> </ul>	<ul style="list-style-type: none"> <li>• Site</li> <li>• Road Works</li> <li>• Hard Shoulder</li> </ul>
<b>12.30</b>				
<b>13.00</b>	<ul style="list-style-type: none"> <li>• Site</li> <li>• Weaving</li> <li>• Tunnel</li> </ul>			
<b>13.30</b>				
<b>14.00</b>		<ul style="list-style-type: none"> <li>• Site</li> <li>• Update</li> <li>• Tunnel</li> <li>• RWW/IVS</li> </ul>	<ul style="list-style-type: none"> <li>• Site</li> <li>• Update</li> <li>• Tunnel</li> <li>• RWW/IVS</li> </ul>	<ul style="list-style-type: none"> <li>• Site</li> <li>• Update</li> <li>• Tunnel</li> <li>• RWW/IVS</li> </ul>
<b>14.30</b>				
<b>15.00</b>				
<b>15.30</b>		De-briefing	De-briefing	De-briefing
<b>16.00</b>	De-briefing			
<b>16.30</b>				

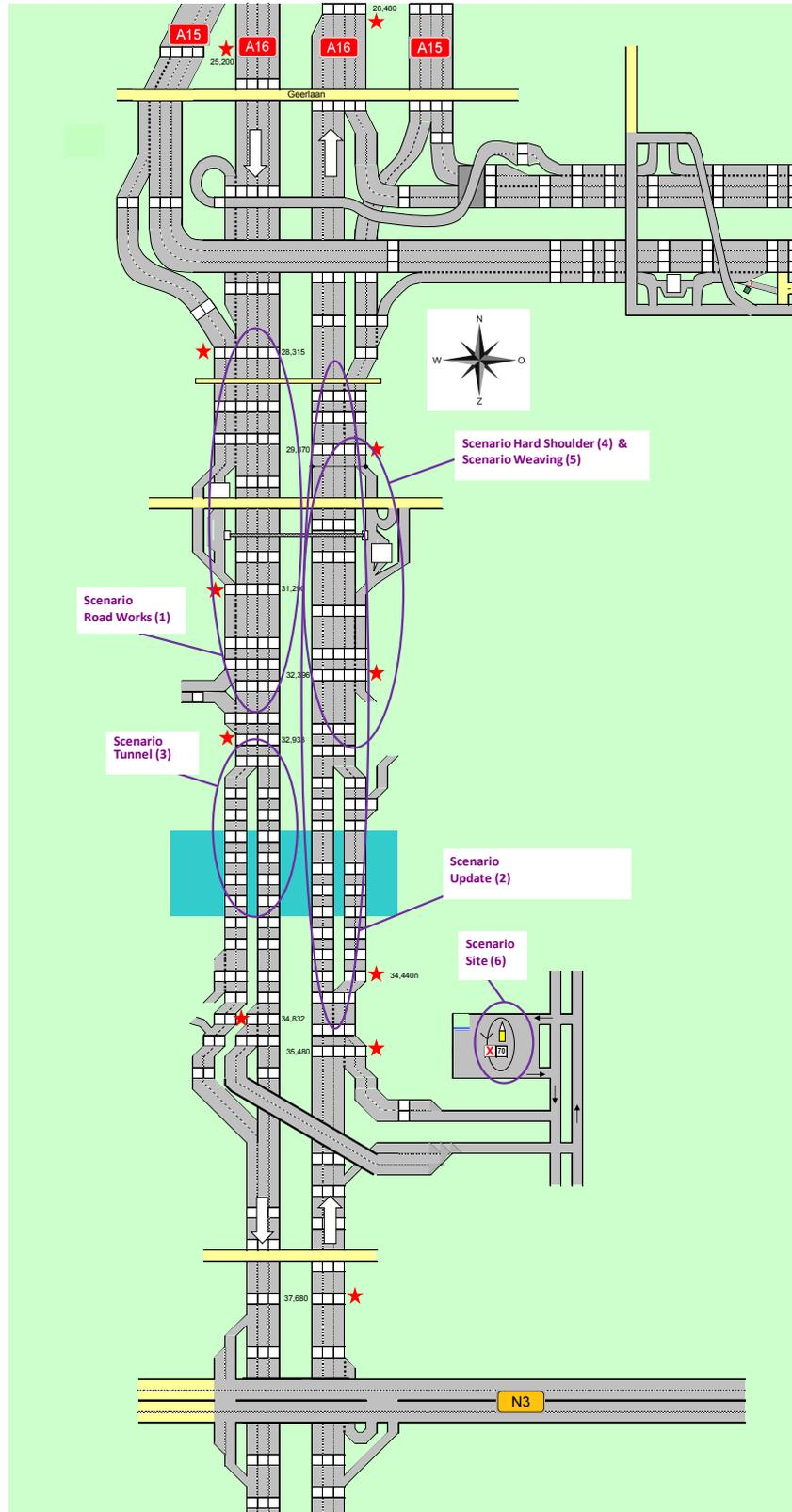
### 4.8 Recommended Route

The recommended route for the TESTFEST open road testing is presented below. It takes around 20 minutes from start to finish under normal driving conditions.

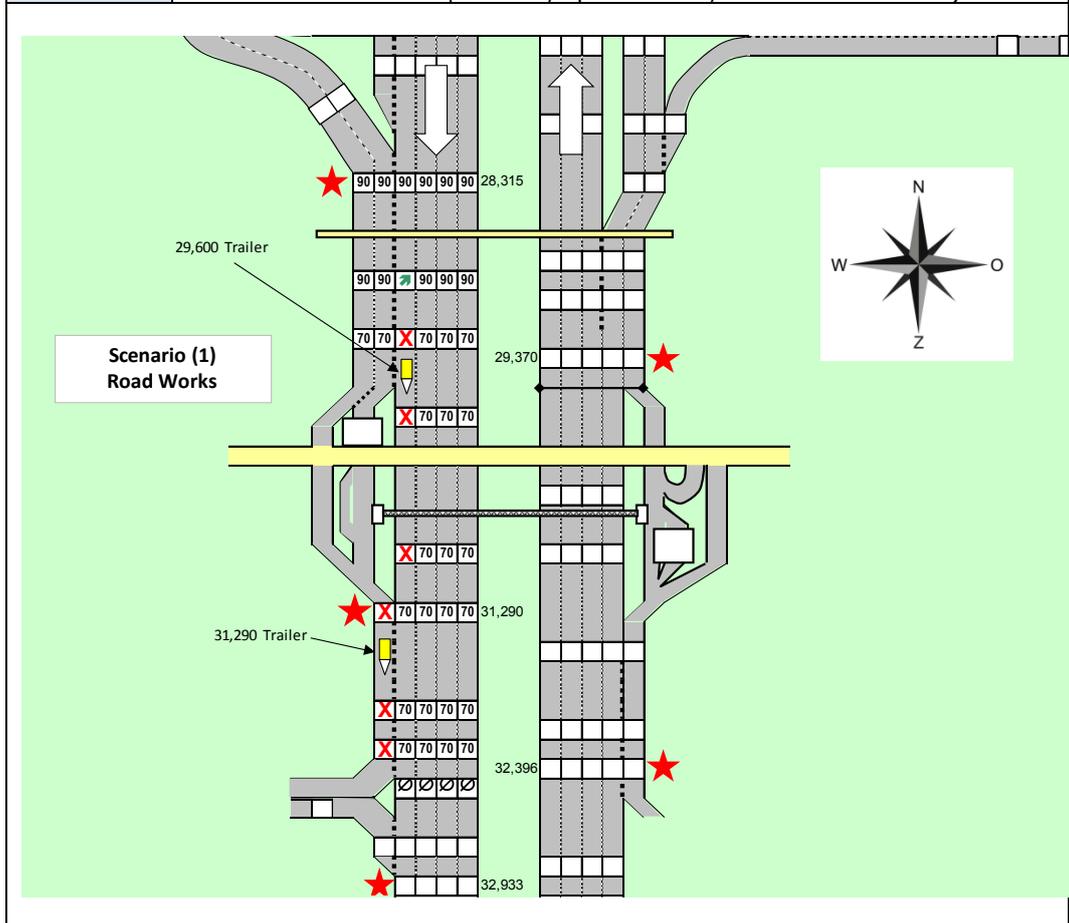


### 4.9 Test scenarios

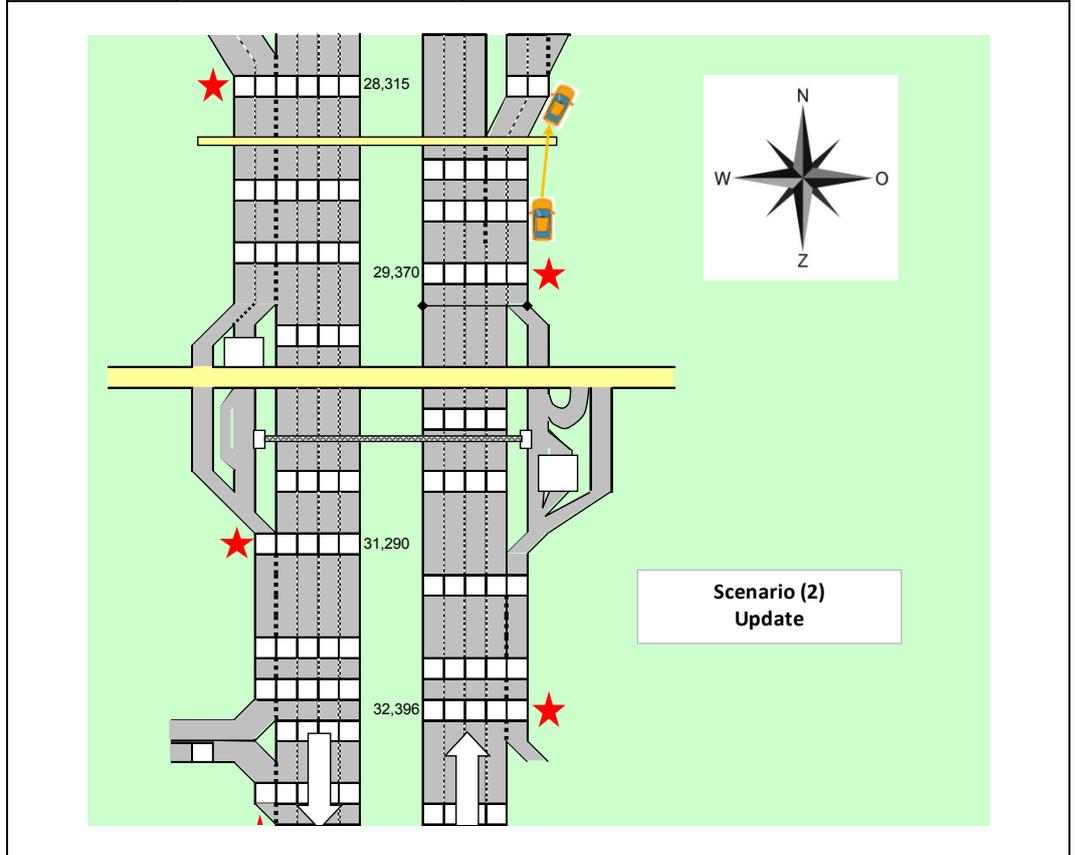
See below for an overview of the TESTFEST scenarios:



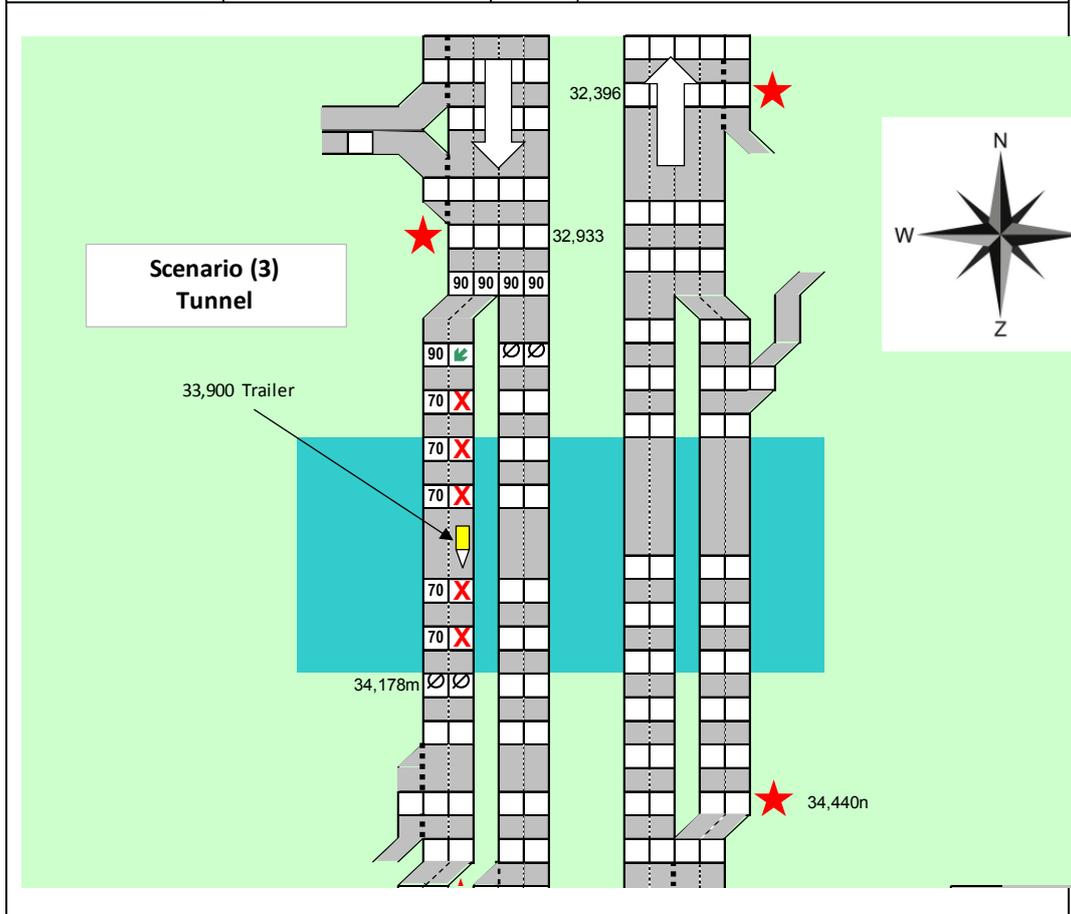
<b>Scenario</b>	<b>1</b>	<b>Road Works</b>
<b>Type</b>	Known-Real-RWW	Known-Real-IVS
<b>Aim</b>	To test RWW and IVS under real life road works conditions.	
<b>Location</b>	A16R 28.3	A16R 32.5
<b>Direction</b>	From North to South	
<b>Messages</b>	DENM	2 DENM messages with RWW content. The event positions are the locations of the trailers.
	IVI	9 IVI messages with IVS content with Variable Message Signs information (red crosses, arrows, speed limits, end-of-restrictions)



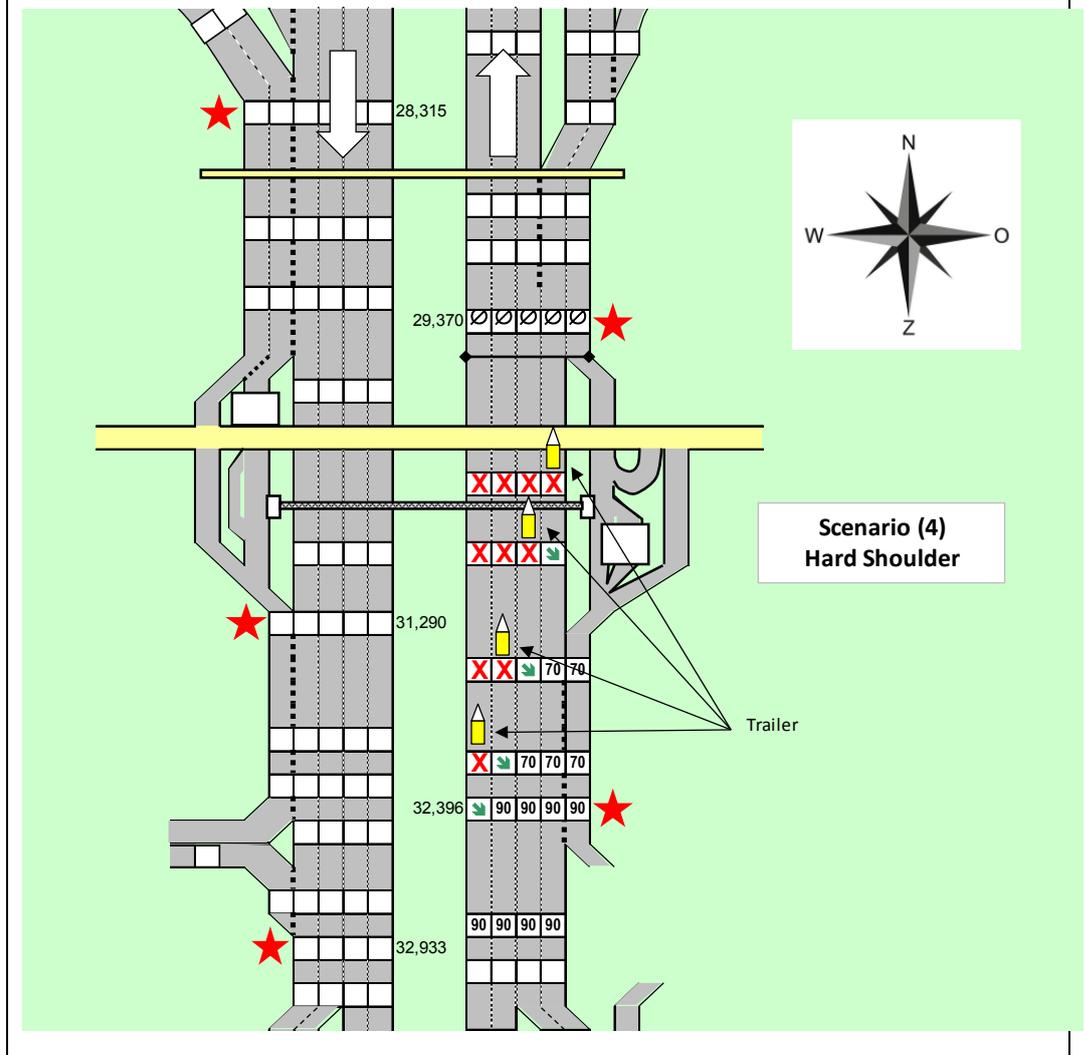
<b>Scenario</b>	<b>2</b>	<b>Update</b>
<b>Type</b>	Known-Virtual-CRW	
<b>Aim</b>	To test the CRW use case as well as the DENM update mechanism in actual road conditions.	
<b>Location</b>	A16L 32,4	A16L 28,3
<b>Direction</b>	From South to North	
<b>Messages</b>	DENM	Basic DENM message with CRW content with subsequent update message from next RSU.



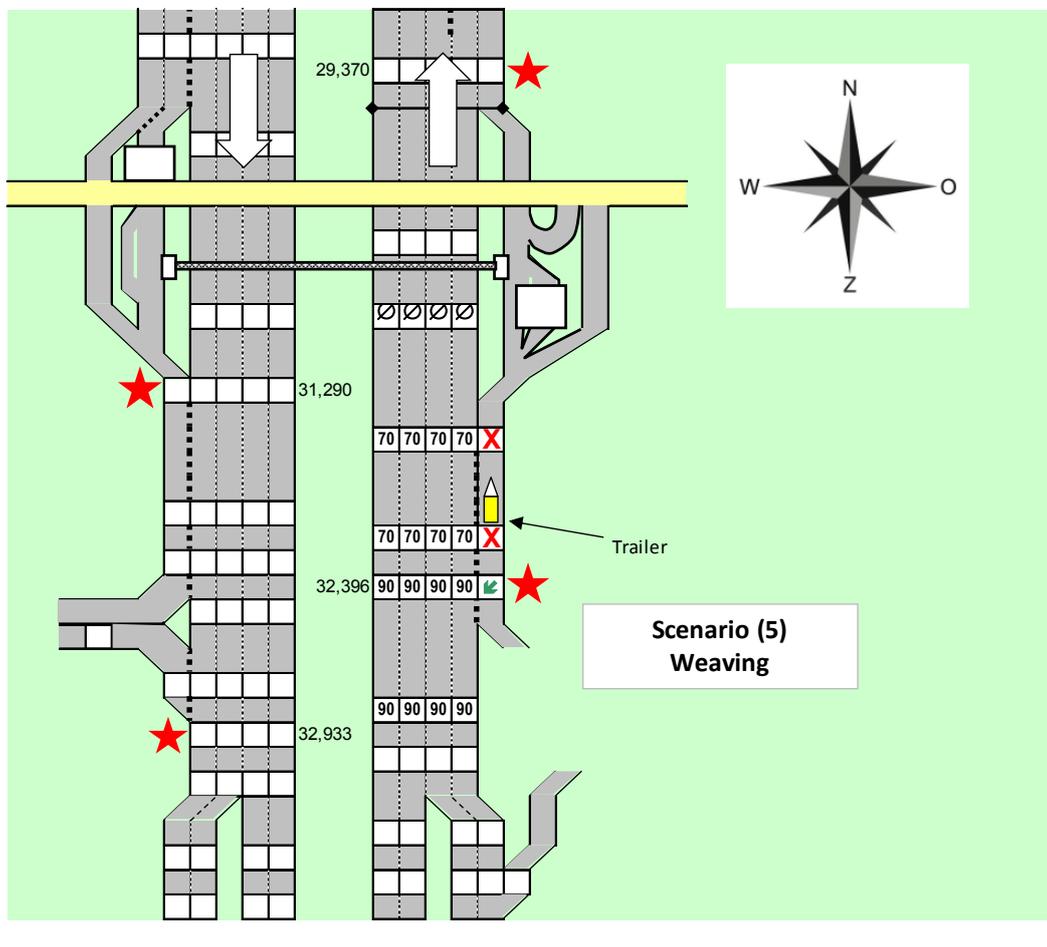
<b>Scenario</b>	<b>3</b>	<b>Tunnel</b>
<b>Type</b>	Known-Virtual-RWW	Known-Virtual-IVS
<b>Aim</b>	To test the effect of loss of GPS inside a tunnel with messages transmitted upstream outside of the tunnel.	
<b>Location</b>	A16R 33.1	A16R 34.1
<b>Direction</b>	From North to South	
<b>Messages</b>	DENM	1 DENM message with RWW content depicting an (imaginary) trailer in the tunnel. The event position is inside the tunnel (note that this scenario is for testing purposes only. This scenario will not occur in real life).
	IVI	9 IVI messages with IVS content with Variable Message Signs information (red crosses, arrows, speed limits, end-of-restrictions). Some of the signs will be inside, some will be outside of the tunnel.



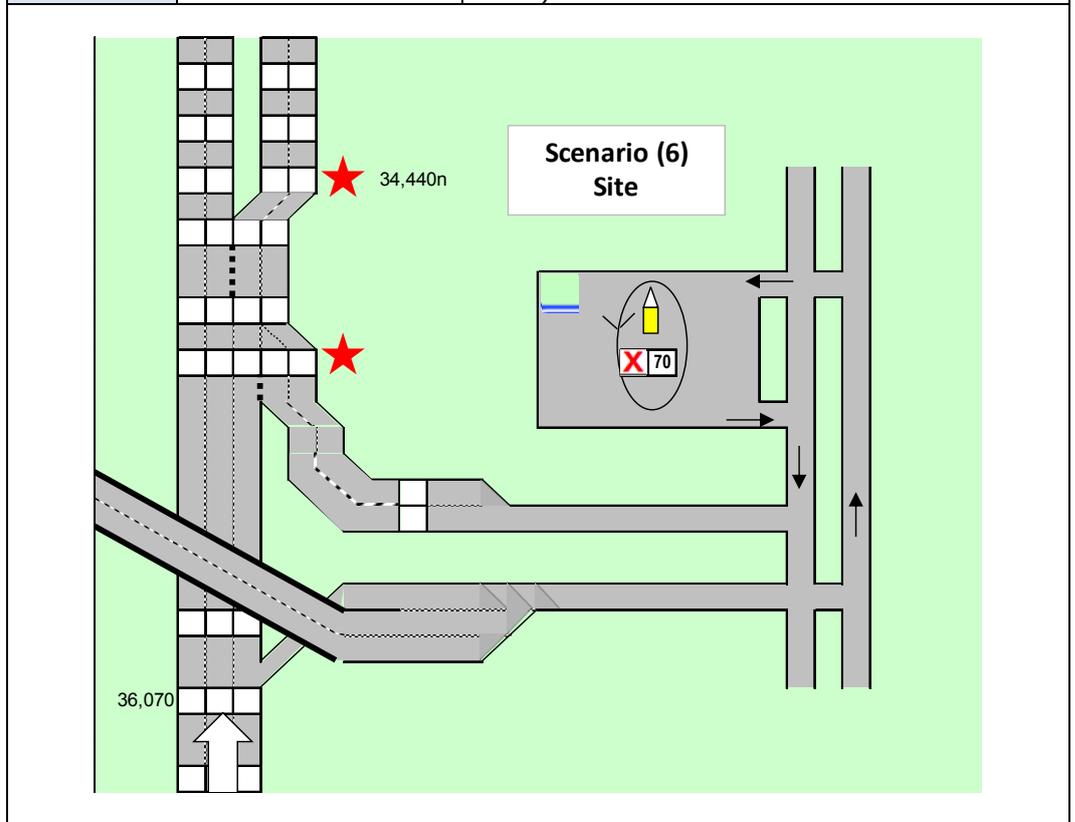
<b>Scenario</b>	<b>4</b>	<b>Hard Shoulder</b>
<b>Type</b>	Known-Virtual-RWW	Known-Virtual-IVS
<b>Aim</b>	To test RWW and IVS in a complex traffic situation where all lanes are blocked and traffic is diverted over the hard shoulder. Additionally this scenario provides the possibility to test how the system functions on a parallel road.	
<b>Location</b>	A16L 32.4	A16L 29.3
<b>Direction</b>	From South to North	
<b>Messages</b>	DENM	4 DENM messages with RWW content. The event positions are the locations of the trailers.
	IVI	7 IVI messages with IVS content with Variable Message Signs information (red crosses, arrows, speed limits, end-of-restrictions).



<b>Scenario</b>	<b>5</b>	<b>Weaving</b>
<b>Type</b>	Known-Virtual-RWW	Known-Virtual-IVS
<b>Aim</b>	To test RWW and IVS in a complex traffic situation where carriageways merge and diverge. Additionally this scenario provides the possibility to test how the system functions on a parallel road.	
<b>Location</b>	A16L 32.4	A16L 30.7
<b>Direction</b>	From South to North	
<b>Messages</b>	DENM	1 DENM message with RWW content. The event position in RWW is the location of the trailer.
	IVI	5 IVI messages with IVS content with Variable Message Signs information (red crosses, arrows, speed limits, end-of-restrictions).



<b>Scenario</b>	<b>6</b>	<b>Site</b>
<b>Type</b>	Known-Virtual-RWW	Known-Virtual-IVS
<b>Aim</b>	To test (lab test and desk test) the basic functionality of the system within the premises of the test site, without going on the road.	
<b>Location</b>	Test site	
<b>Direction</b>		
<b>Messages</b>	DENM	1 basic DENM message with RWW content. The event position in RWW is on the parking lot.
	IVI	1 basic IVI message with IVS content (e.g. red cross).

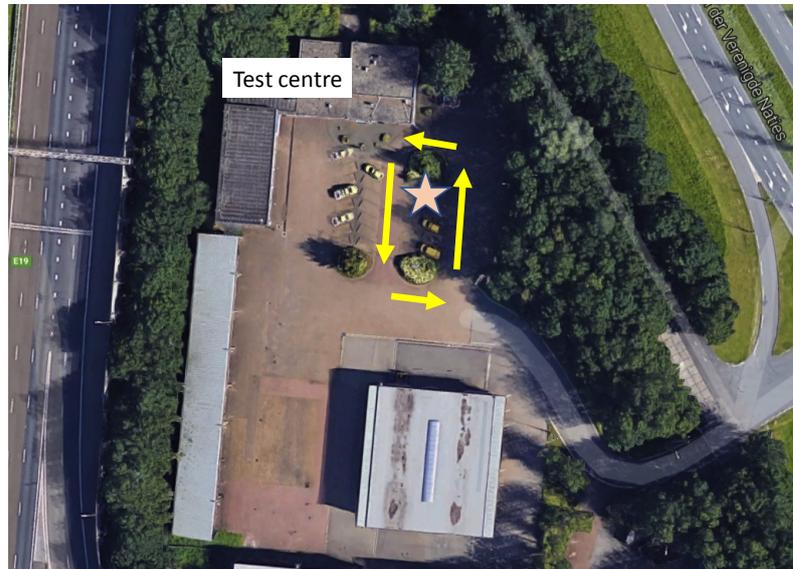


<b>Scenario</b>	<b>7</b>	<b>RWW</b>
	<b>8</b>	<b>IVS</b>
<b>Type</b>	Unknown-Real-RWW	Unknown-Real-IVS
<b>Aim</b>	To test unpredictable, real life RWW and IVS events, triggered by real life traffic conditions.	
<b>Location</b>		
<b>Direction</b>	Both directions	
<b>Messages</b>	DENM	DENM messages manually generated when a real life road works event occurs.
	IVI	IVI messages automatically generated when the Variable Message Signs change.

#### 4.10 Test facilities

The Dutch C-ITS Corridor project will provide the following facilities:

- 13 deployed Roadside Units on a 17 km track (both directions) on the A16 motorway.
- Test Roadside Unit at the test centre location.
- Test DENM and IVI messages on the A16 and at the test centre for known and unknown as well as real and virtual events.
- Collection of CAM data sent by passing OBUs.
- Test PCAPs and XMLs of a comparable scenario (allowing participants to prepare their equipment at home in advance of the TESTFEST).
- Photo scripts for known-virtual events.
- Desks with broadband Internet connection (please bring your own laptop).
- waveBEEtouch analyser, allowing detection and interpretation of DENM (and IVI) messages.
- Logs of CU and RSU data as well as PCAPs and XMLs of data transmitted during the test days.
- Demonstration Onboard Units (these OBUs are demonstration devices built by the Dutch Cooperative ITS Corridor project itself for demonstration purposes only), in order to demonstrate the correct working of the RWW, IVS, bPVD and CRW use cases.



#### 4.11 Test tooling

##### Data logging

- InterCor will define log formats
  - for CAM, DENM and IVI in encoded (binary, xml) or decoded (csv, sql) formats.
  - for applications we will produce a generic design in csv or sql format
- Participants can deliver log data in this format (via USB stick or upload to central repository)
- Alternatively, participants use their own log format (with comparable content). In that case participants must contact the organization in advance to specify the format. This data can be used (for evaluation) afterwards.

#### 4.12 Support procedure during testing

- The Rijkswaterstaat support team will available daily from 10:00 until 17:00. The Test centre opens at 8:00 for participants to prep and setup.
- Participants can ask technical questions regarding testing by email via TESTFEST manager [p.schmitting@mail.ertico.com](mailto:p.schmitting@mail.ertico.com).
- The TESTFEST manager will answer the questions or make contact between Rijkswaterstaat support team and participants, if technical intervention is needed.
- All questions and answers will be relayed to Rijkswaterstaat for archiving and after event analysis.
- Subject line in the email to start with TESTFEST for easy identification.
- One contact point per test team

#### 4.13 Evaluation

The evaluation during the ITS-G5 TESTFEST will be done on two levels of detail. On the higher level, the assessment of the correct test behaviour will result from the observation of the behaviour of the OBU, i.e. is the correct information displayed at the right time, and optionally the checking of protocol messages. During an interoperability test session, several ITS related behaviours can be tested. Each test behaviour corresponds to a test scenario. The test scenarios are non-formal description of the expected test behaviour. The participants will be asked to fill in a result sheet where they self-assign a test verdict per test scenario, either PASS, if all went according to the test scenario description or FAIL, if no, incomplete or inopportune information was displayed by the HMI of the OBU. In the case of a FAIL verdict the TESTFEST participants will be asked to describe the details of the test outcome. From the totality of test verdicts an overall assessment of the interoperability for the ITS-G5 services (RWW and IVS) will be made. This will be percentage figures per test scenario for the PASS/FAIL ratio highlighting the most common problems that lead to FAIL verdicts.

On the lower, i.e. more technical level, the processing and interpretation of CAM, DENM and IVI messages will be verified for the services under test RWW, IVS and PVD. ITS-G5 communication performance will also be verified to evaluate RSU deployment and the effects on services. For that purpose the log data from OBUs and RSUs will be analysed to verify interoperability directly during the TESTFEST, and also for further evaluation of interoperability after the TESTFEST. To that end a common log format will be provided so that participants can provide their log data with minimal development efforts either directly from unit logging or by transformation of their existing logging. If participants can provide logging in the common format(s) during the TESTFEST, than the data can be analysed and evaluated in the debriefings during the TESTFEST. Data in other formats are still welcomed for evaluation and included in the reporting shortly after the TESTFEST.

5 Time schedule

5.1 TESTFEST time schedule

The time schedule for the TESTFEST is presented below.

ITS-G5 TestFest Programme									
Monday, 3 July 2017 Lab tests		Tuesday, 4 July 2017 Open road tests		Wednesday, 5 July 2017 Open road tests		Thursday, 6 July 2017 Open road tests			
08:00	Participants arrival & set-up		Participants arrival & set-up		Participants arrival & set-up		Participants arrival & set-up		
09:00	Participants arrival & set-up		Participants arrival & set-up		Participants arrival & set-up		Participants arrival & set-up		
10:00	LabTesting Test Center and A16 stretch	Support team C-ITS Corridor available	Open road testeing	Support team C-ITS Corridor available	Open road testing	Support team C-ITS Corridor available	Open road testing	Support team C-ITS Corridor available	
11:00									
12:00									
13:00									
14:00			collecting results		collecting results		collecting results		
15:00							De-briefing		
16:00	De-briefing	Support team C-ITS Corridor available	De-briefing		De-briefing		TESTFEST end non InterCor participants	InterCor partners-only De-briefing	
17:00			free program		free program				
18:00	Closing test centre		Closing test centre		Closing test centre				

Table: time schedule TESTFEST

## 6 Visitor information

### 6.1 Access and route description

The test-site is located on the motorway A16 between Rotterdam and Antwerpen. The test centre is adjacent to the test site and can be accessed either by car or by public transport.

The test centre is located at Laan der Verenigde Naties 115, 3317LV, Dordrecht.

<p>Coming from Rotterdam / The Hague</p>	<ul style="list-style-type: none"> <li>• Follow the A16 motorway (direction: Breda).</li> <li>• Take the exit 21 Dordrecht-Centrum.</li> <li>• Turn left onto the Laan der Verenigde Naties.</li> <li>• Follow the road for 500 meters: you have reached the test centre (on the right hand, cross the continuous line).</li> </ul> 
<p>Coming from Breda</p>	<ul style="list-style-type: none"> <li>• Follow the A16 motorway (direction: Dordrecht/Rotterdam).</li> <li>• Take the exit 21 Dordrecht-Centrum.</li> <li>• Turn left onto the Laan der Verenigde Naties.</li> <li>• Follow the road for 300 meters: you have reached the test centre (left hand).</li> </ul> 
<p>Public transport</p>	<ul style="list-style-type: none"> <li>• From Dordrecht central train station, take city bus 4 (direction Wielwijk).</li> </ul>

	<ul style="list-style-type: none"> <li>• Exit at bus stop Frans Lebrethlaan. Walk for 5 minutes:</li> <li>• Head south on Viottakade towards Frans Lebrethlaan.</li> <li>• Continue onto Jan Vethkade</li> <li>• Turn left onto Zuidendijk</li> <li>• Turn right onto Patersweg</li> <li>• Keep right to stay on Patersweg</li> <li>• Turn right onto Laan der Verenigde Naties</li> <li>• Follow the road for about 600 meters: you have reached the test centre (left hand)</li> <li>• Use caution: route may be missing sidewalks!</li> <li>• For public transportation travel information: <a href="http://9292.nl/en">http://9292.nl/en</a></li> </ul>
Taxi	<ul style="list-style-type: none"> <li>• From Dordrecht central train station, a metered cab to the test centre will charge you about € 12,40 (7 minutes ride)</li> </ul>

## 6.2 Airports

Nearby airports serving international flights include:

Airport	Road distance to test centre
Schiphol Amsterdam Airport	83 km
Rotterdam The Hague Airport	31 km
Eindhoven Airport	89 km
Brussels Airport Zaventem	121 km

## 6.3 Hotels

Visitors can book an overnight stay nearby. Options close to the test centre include:

Van der Valk Hotel Dordrecht: [Vandervalk](#)

Postillion Hotel Dordrecht: [Postillion](#)

Bastion Hotel Dordrecht: [Bastion](#)

## 6.4 Catering

During the TESTFEST, all TESTFEST participants will be provided with coffee, tea and water. Lunch will be served daily from 12:00 till 13:00.

From 15:00 a selection of cold drinks will be available. There will be no alcoholic drinks.