



Rijkswaterstaat  
Ministry of Infrastructure  
and Water Management

## Cooperative ITS Corridor Cross-border Interoperability TestFest



Road messages for a safer future! Successful testing of innovative cooperative ITS services in real traffic conditions and across national borders

March 2019, twelve teams from InterCor Member States France, Belgium, the United Kingdom and the Netherlands participated in the InterCor Cross-border Interoperability TestFest. The Dutch C-ITS Corridor project team was one of the participating teams and performed a large number of test runs in all countries involved.

The InterCor (Interoperable Corridors) project, co-financed by the European Union, aims to enable vehicles and road infrastructure to communicate data through cellular, ITS-G5 or a hybrid combination on road corridors within the four Member States. In this project technical specifications are developed and validated in a broad context to enable the roll-out of interoperable C-ITS services. The Dutch part of the C-ITS Corridor project is the technical core of the Dutch contribution to InterCor.

### Objective of the Cross-border Interoperability TestFest

The Flemish Department of Mobility and Public Works organized this fourth TestFest in InterCor. The objective of this TestFest was to validate the interoperability of the deployed C-ITS hybrid services RWW, PVD, IVS and GLOSA (Green Light Optimized Speed Advisory) across national borders, based on the common set of specifications developed in the InterCor project.

### Cross-border intelligent mobility

The Cooperative ITS (C-ITS) Corridor project is a cooperation of road operators in the Netherlands, Germany and Austria. Together with industrial partners, the road operators are working towards the introduction of Cooperative ITS services in Europe.

Initially, the C-ITS Corridor focussed on two services:

- Road Works Warning (RWW)
- Probe Vehicle Data (PVD, sensor data from vehicles)

The Netherlands is additionally also developing:

- Collision Risk Warning (CRW, stationary vehicles warning)
- In-Vehicle Signage (IVS)

The C-ITS Corridor project has carried out large-scale tests (pre-deployments) on various stretches of the Dutch section of the Rotterdam-Frankfurt-Vienna corridor. The project has participated in similar tests in Germany ('Probetrieb'), has organized and participated in the InterCor ITS-G5 TestFest in the Netherlands and participated in both the PKI Security TestFest in France and the Hybrid TestFest in the UK. All these tests provided the Corridor project with a solid basis for the technical specifications of the services. Results are being shared with the C-Roads platform to contribute to a complete harmonisation at European level.



### Test approach

Validation was to be achieved by testing the interoperability of user devices (Vehicle ITS stations or On Board Units) from the four member states at each other's pilot location(s). In preparation of the actual event, the Dutch team performed pre-tests in the UK, France and Belgium. These pre-tests confirmed that the Dutch in-car verification and validation tools performed adequately and were also able to generate feedback for the participating countries on the performance of the implemented infrastructure on their pilot sites. During the TestFest, the participating Dutch road operators performed tests with two dedicated test vehicles. Those vehicles were equipped with ITS-G5 as well as cellular capabilities and could be switched to either 'ITS-G5 only', 'cellular only' or 'hybrid' (both). Each vehicle was able to verify digital signatures (Public Key Infrastructure, PKI), but could also be switched to a setting without verification.

In the Netherlands Rijkswaterstaat and the Province of Noord-Brabant hosted the tests, which were performed on the sophisticated test beds on the A16 near Dordrecht and in Helmond. The test site on the A16 focussed on RWW and IVS, the test site in Helmond focussed on GLOSA.

### Main results and lessons learned

By participating in this TestFest we learned that in principal the overall C-ITS concept functions and allows for cross-border interoperability. This holds true for both ITS-G5, including PKI, and cellular communication. Four implementations from four different countries, together with systems from various other parties such as independent suppliers, proved to be able to perform the required services in each crosswise combination. However, the TestFest also showed that 'the devil is in the detail'. Although the interoperability testing was positive, there were still details in interpretation of specifications and differences in implementations preventing systems from working together properly. Participants jointly came to the conclusion that there is still a lot of work to be done with regard to fine-tuning of testing, specifications and documentation.

Participation in this TestFest also resulted in a number of lessons learned, some of the key items were:

- The amount of tests necessary with regard to various complex technical aspects of the associated services is underestimated
- Having a 'developers playground' as provided by the InterCor TestFests creates major opportunities for networking between all private and public parties
- The unavailability of an independent international validation body is a lack
- International, unambiguous agreements about specifications, profiles and methods of collecting log data still need to be further improved, for even better results en for evaluation purposes

### Reporting

The preliminary results were presented at the InterCor Connecting European Corridors conference in Antwerp on March 28. The relevant presentations can be downloaded on the [InterCor website](#). The detailed report on the results of the cross-border testing is expected to be available in summer 2019 and will also be published on the InterCor website.

### Participants in the project

- Rijkswaterstaat
- The Province of Noord-Brabant
- V-Tron
- Compass
- Swarco
- Be-Mobile
- Dutch Vehicle Authority (Rijksdienst voor het Wegverkeer)
- UL

