Final InterCor TESTFEST
Cross-border Interoperability

1st Webinar

14th January 2019

Co-financed by the European Union
Connecting Europe Facility

INTRODUCTION

Moderator:

Peter Schmitting	ERTICO, Activity Leader InterCor TESTFEST

Speakers:

Peter Lewyllie	Agentschap Wegen en Verkeer, Project Manager InterCor Pilot Flanders
Axel Zandbergen	RWS, Testmanager TESTFEST NETHERLANDS
Oene Kerstjens	Project manager prov. Noord-Brabant, Netherlands
Guillaume Richard	C-ITS Projects Manager, IDnomic

InterCor-only UK & FR webinar:

Hacène Fouchal	Univ.-Reims, Project manager TESTFEST FRANCE
Jack Mayes	Highways England
Francesco Guariglia	Transport for London

Co-financed by the European Union
Connecting Europe Facility

Webinar Moderation

- All participants are muted during presentation
- Participants can “Ask questions”
  - Use the control panel to write your question during the presentation
  - Ideally refer to a slide number in your question
  - The moderator will review your question during the webinar
- Webinar will be recorded
- Recorded Webinar will be posted on the InterCor website
- FAQs from the webinar will be captured and posted on the InterCor website

Co-financed by the European Union
Connecting Europe Facility

Webinar Contents

1. Introduction to InterCor (Peter Schmitting)
2. TESTFEST objectives (Peter Lewyllie)
3. Pilot sites and services (BE&NL) (Peter L & Axel Zandbergen & Oene Kerstjens)
4. Specifications, Security, IF2 (Peter L & Guillaume Richard)
5. Programme, Venue, Conference (Peter Lewyllie)
6. Expected outcome and follow-up (Peter Schmitting)
7. InterCor partners only (March 18th-22nd)

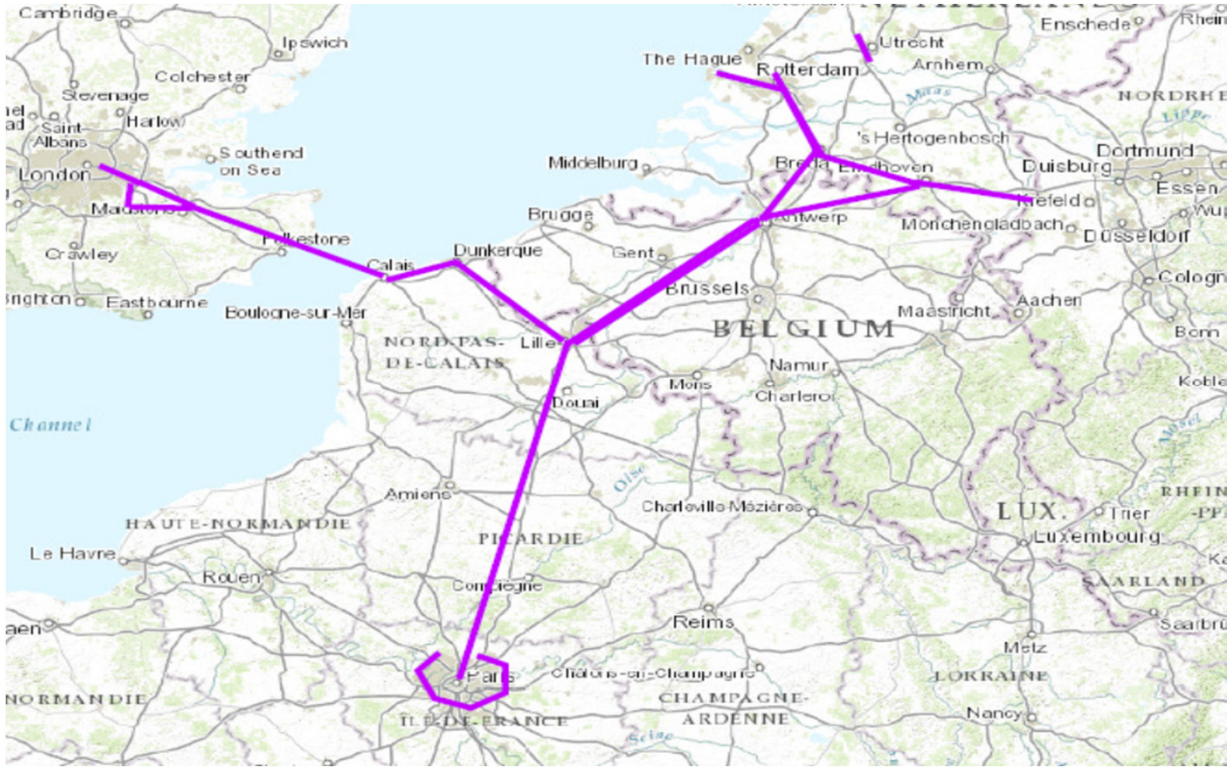
Co-financed by the European Union
Connecting Europe Facility

Peter Schmitting - ERTICO

Co-financed by the European Union
Connecting Europe Facility

InterCor Introduction

- InterCor is a study of 1530 km of four member states under the TEN-T Core road network connecting from the North Sea – Mediterranean to the Arc Atlantique Corridor.



Co-financed by the European Union
Connecting Europe Facility

InterCor Introduction

- InterCor is a CEF (Connecting Europe Facility) project
- Started September 2016 – ends August 2019
- Budget: 30 000 000€ - 50% funding
- 16 partners from four EU member states
  - Dutch Ministry of Infrastructure and the Environment (Coordinator)
  - French Ministry for Ecology, Sustainable Development, Energy
  - Flemish Department of Mobility and Public Works
  - UK Department of Transport
- 4 pilot sites

Co-financed by the European Union
Connecting Europe Facility

InterCor introduction

Streamline and pilot selected ‘Day 1 services’ in four member states and facilitate a first assessment of C-ITS services on freight and logistics by building on a common hybrid communication architecture

- **Traffic management**
  - In Vehicle Signage
  - Probe Data
  - Road Work Warning
  - GLOSA
- **Freight and Logistics**
  - Multi-modal Cargo Transport Optimization (MCTO)
  - Truck parking

Co-financed by the European Union
Connecting Europe Facility

InterCor TESTFEST Schedule

TESTFESTS to date:

- **ITS-G5, Netherlands, July 2017**
  - Services RWW, IVS, PVD, July 3 – 6, 2017 - Dordrecht
- **PKI, France, April 2018**
  - Services RWW, IVS, PVD, GLOSA, April 23 – 26, 2018, Reims
- **Pre- Hybrid, Netherlands, June 2018**
  - Services GLOSA (ITS-G5 +Cellular), June 13 – 14, Helmond
- **Hybrid, United Kingdom, October 2018**
  - Services RWW, IVS, PVD, GLOSA, October 8th – 12th , UK
- **Cross-Border Interoperability TESTFEST, March 2019**
  - Services RWW, IVS, PVD, GLOSA, Antwerp, March 25th- 28th 2019
  - InterCor partners: UK and FR, March 18th-22nd 2019

Co-financed by the European Union
Connecting Europe Facility

TESTFEST Objectives

Peter Lewyllie

Agentschap Wegen en Verkeer

(Flanders Agency for Roads and Traffic)

Co-financed by the European Union
Connecting Europe Facility

TESTFEST Objectives

- Main objective: to validate the cross-border interoperability of the deployed DAY 1 services in 4 MS
  - -Road Works Warnings
  - -In-Vehicle-Signage
  - -GLOSA
  - -Probe Vehicle Data

Co-financed by the European Union
Connecting Europe Facility

TESTFEST Objectives

1. Validate the interoperability of the services between the 4 InterCor Member States
   (Vehicles of the 4 MS driving in all 4 MS.)
2. Test I2V and V2I – communications ITS-G5 and cellular/ip-based
3. Use both real and simulated service information distributed directly into vehicles and collected from participating vehicles (i.e. PVD)
4. Investigate and assess the performance of the communication technologies
5. Utilise the findings to support the European harmonisation of C-ITS technology

Co-financed by the European Union
Connecting Europe Facility

Pilot Sites and Specifications

Peter Lewyllie	Agentschap Wegen en Verkeer
Axel Zandbergen	Rijkswaterstaat
Oene Kerstjens	Provincie Noord-Brabant

Co-financed by the European Union
Connecting Europe Facility

BE/FL and NL Pilot Sites

Flanders Pilot Services

Service	Use Case / Scenarios?	site
RWW	Lane closure or other restrictions	E34 + E313
	Alert planned road works – mobile	E34 + E313
IVS	Dynamic Speed Limit Information	E313
	Dynamic Lane Management - Lane Status information	E313
PVD	Vehicle data collection	E313/E34
	Event data collection	E314/E34
GLOSA	Time-to-green information (no speed advice)	N12
	Time-to-red information (no speed advice)	N12

Hybrid ITS-G5 & IF2

Co-financed by the European Union
Connecting Europe Facility

Flanders Pilot Site

Co-financed by the European Union
Connecting Europe Facility

Flanders
State of the Art

Flanders Pilot Site

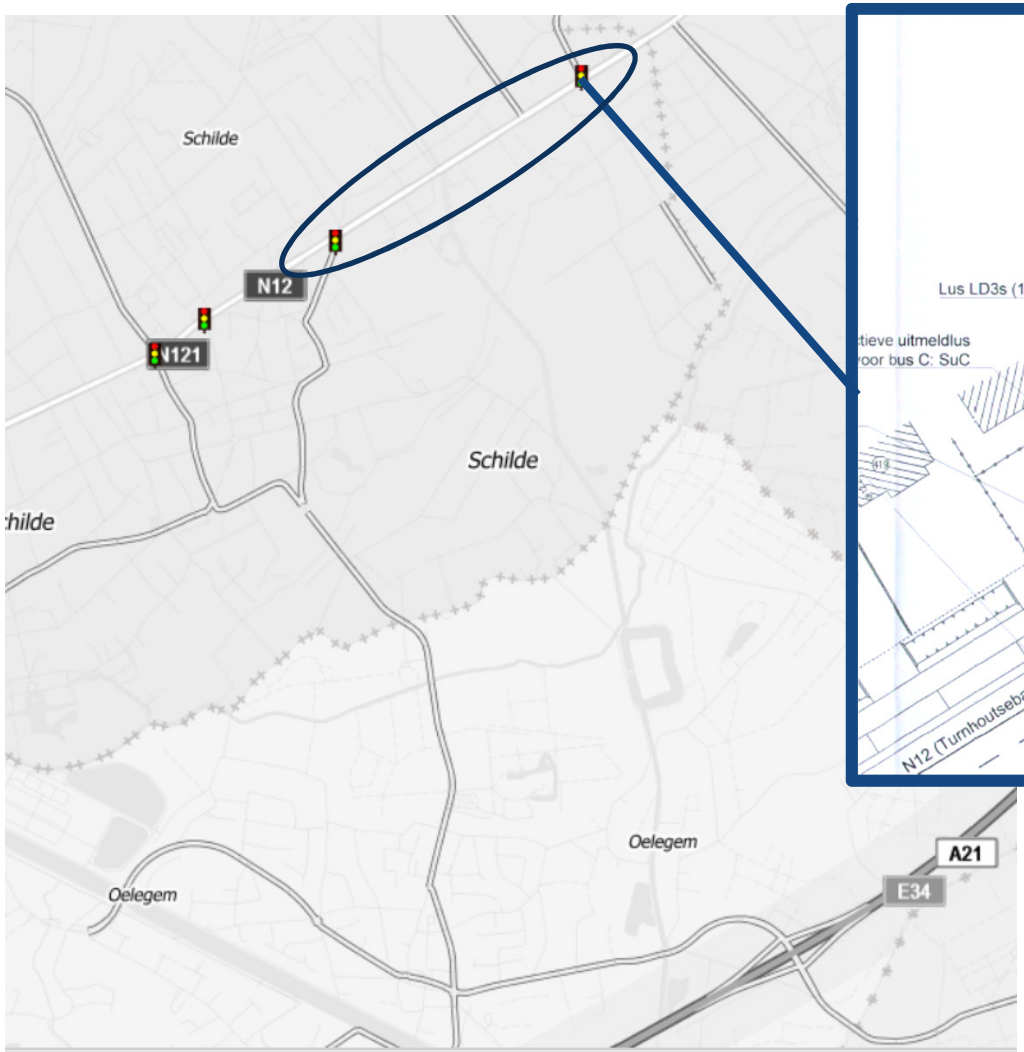
- IF2 ip-based interface
  coverage: all Flemish motorways

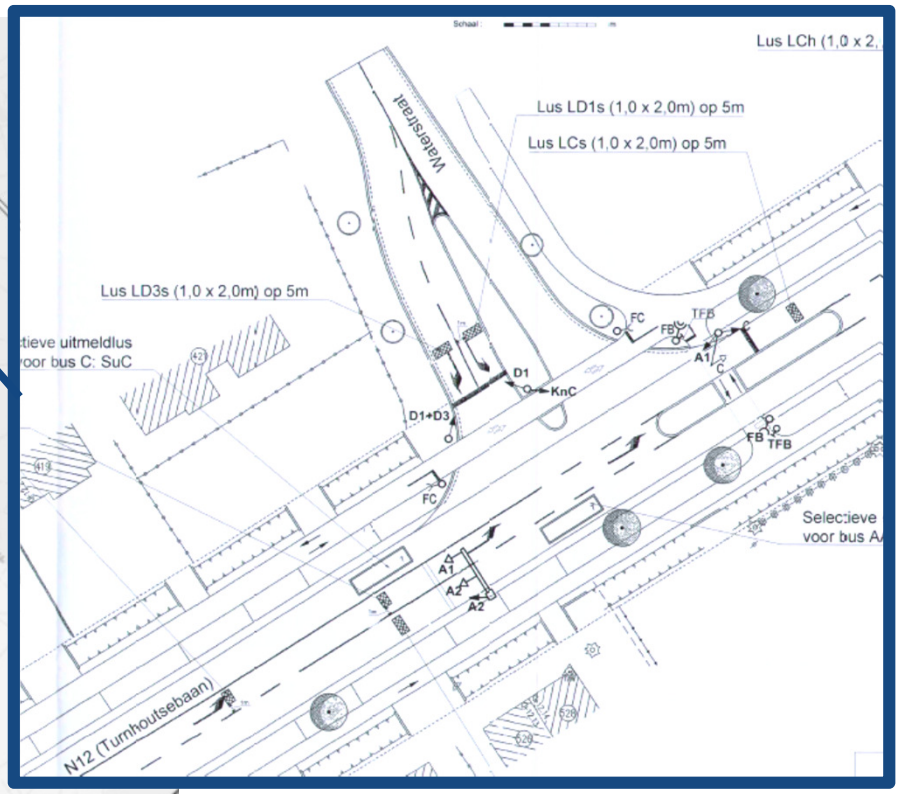
- ITS-G5: Antwerp E313 & E34 (23 km) & N12
  25 ITS-G5 Road Side Units on gantries

E313 (green): IVS & RWW
E34 (purple): RWW
N12 (yellow): GLOSA

Co-financed by the European Union
Connecting Europe Facility

Flanders GLOSA testsite: Schilde, N12-Waterstraat





Co-financed by the European Union
Connecting Europe Facility

Flanders
State of the Art

Flanders GLOSA testsite: Schilde, N12-Liersebaan

Co-financed by the European Union
Connecting Europe Facility

NL Pilot Services

- NL Pilot Site Dordrecht (A16)
- NL Pilot Site Helmond: GLOSA

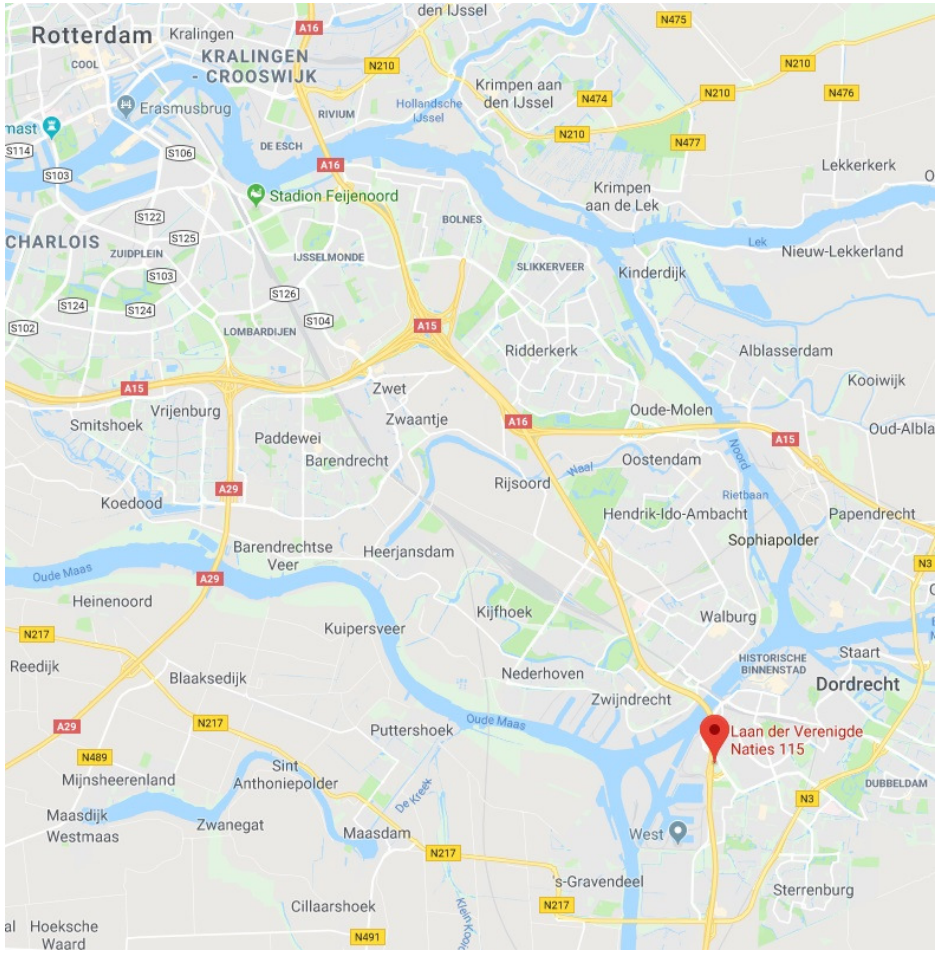
Co-financed by the European Union
Connecting Europe Facility

NL Pilot Site Dordrecht (1)

- Trajectory
  - Same as the TestFest ITS-G5 July 2017
  - Motorway A16
  - From Dordrecht to Rotterdam
  - From A16 37.680 to A16 22.425
  - North as well as South bound
  - Including the Drechttunnel

Co-financed by the European Union
Connecting Europe Facility

NL Pilot Site Dordrecht (2)



Co-financed by the European Union
Connecting Europe Facility

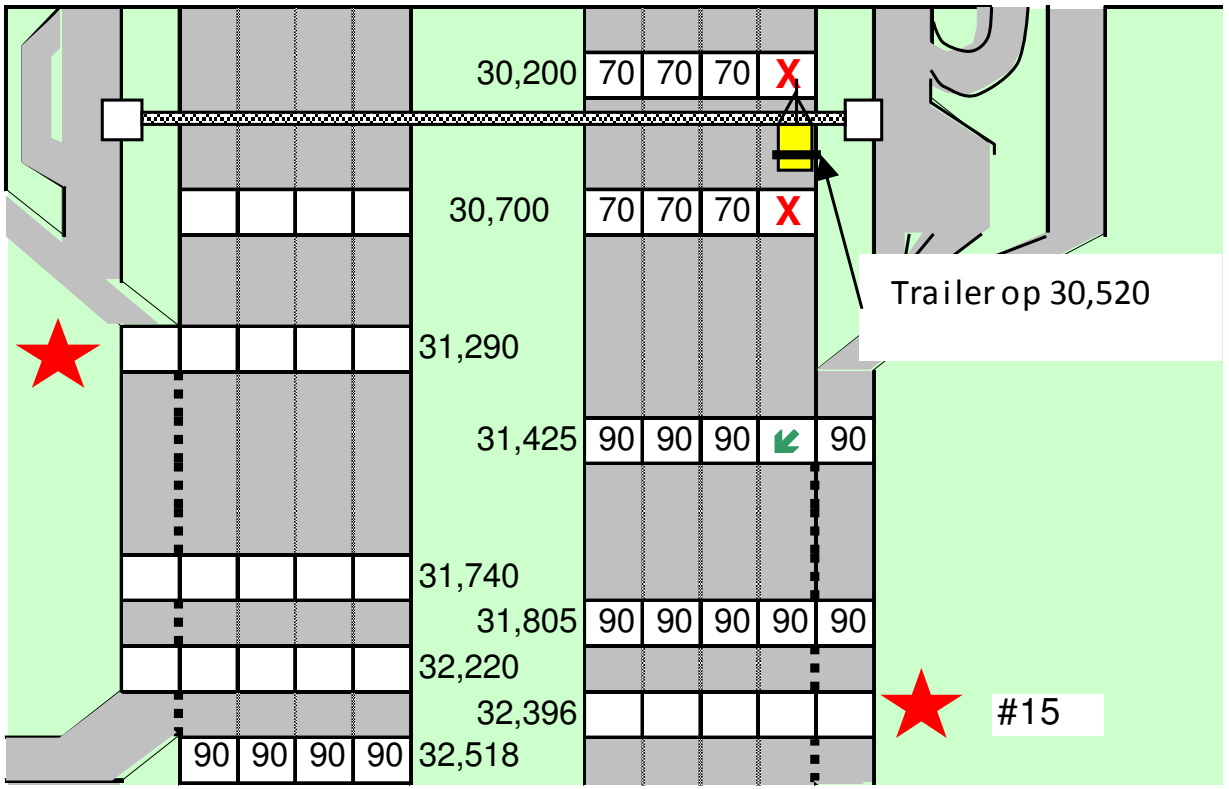
NL Pilot Site Dordrecht (3)

- Real live highway setting
- Hybrid system; both ITS-G5 and cellular
- 13 ITS-G5 RSU's connected to a CU.
- Cellular connected via IF2 via TLEX.
- Security/PKI: Certificates version 1.2.1.
- Use cases: RWW, IVS, PVD (+CRW)
- Messages: DENM, IVI, CAM
- Virtual test scenarios operational
- PKI test with revoked AA

Co-financed by the European Union
Connecting Europe Facility

NL Pilot Site Dordrecht (4)

- Many virtual scenarios along the trajectory
  - RWW
  - IVS
  - (CRW)



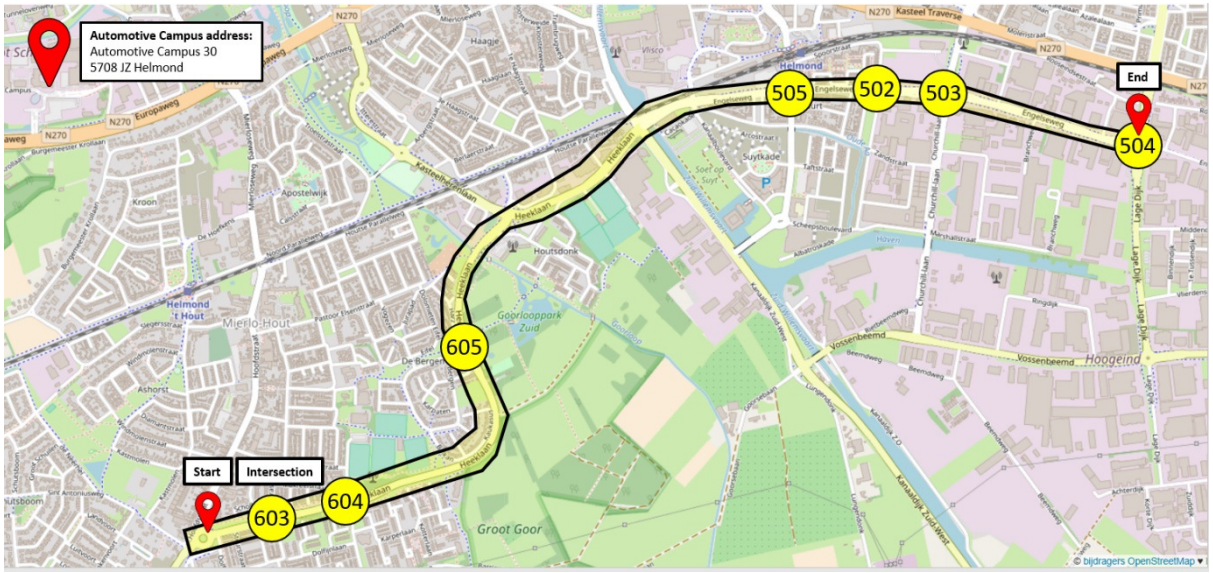
Co-financed by the European Union
Connecting Europe Facility

NL Pilot Site Dordrecht (5)

- Contacts:
  - General: edwin.vander.walle@rws.nl
  - Technical: axel.zandbergen02@rws.nl

Co-financed by the European Union
Connecting Europe Facility

NL Pilot Site: Helmond



- GLOSA service
- 3 intersections on the Heeklaan operational since Pre Testfest june 2018 (603-605)
- 4 more will receive an update and (probably) be available as well on the Engelse weg (502-505)

Co-financed by the European Union
Connecting Europe Facility

Specifications

Peter Lewyllie	Agentschap Wegen en Verkeer
Guillaume Richard	IDnomic

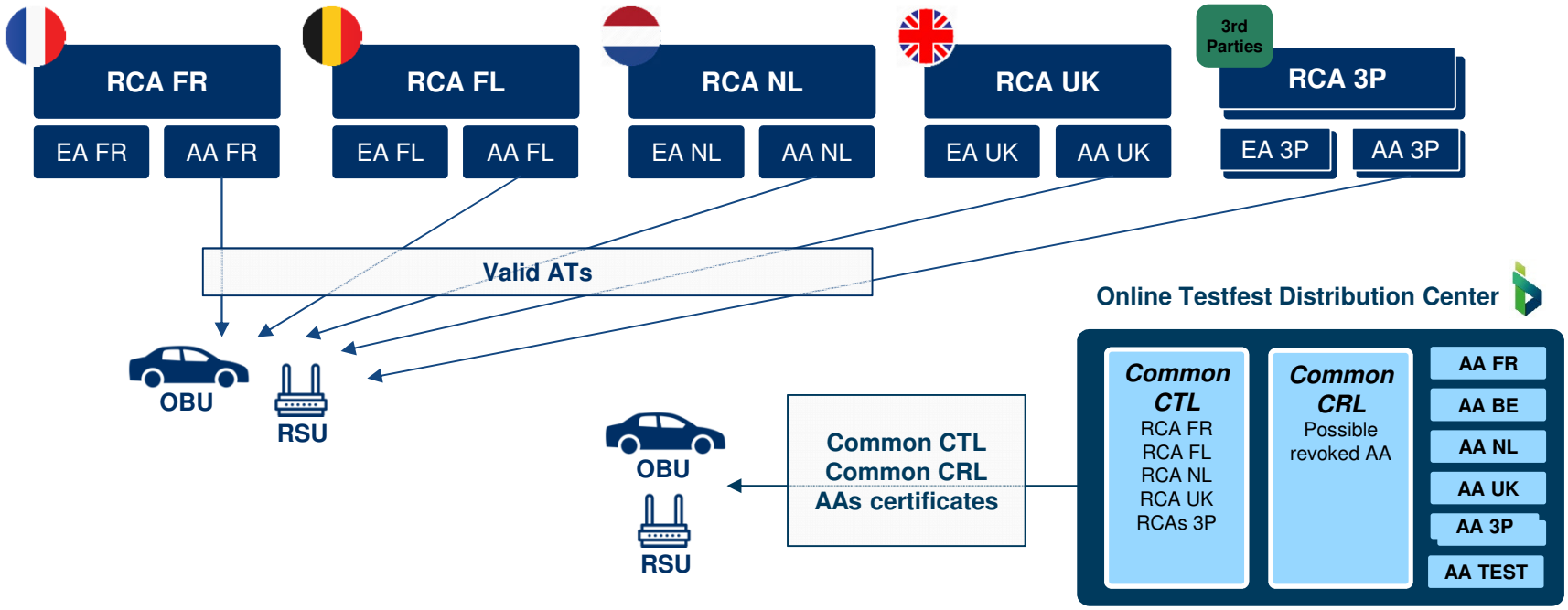
Co-financed by the European Union
Connecting Europe Facility

Baseline specifications

- Documents will be published on the InterCor website:
  - Intercor Milestone 3 – Common set of upgraded specifications for ITS-G5, version 1.1, 20/10/2017
    - 170629 MAP profile v1.2, version 1.2, 29-06-2017
    - 170629 SPAT profile v1.2, version 1.2, 29-06-2017
    - 170720 addendum SPAT profile v1.2 – TimeIntervalConfidence, 29/07/2017
  - Intercor Milestone 4 - Common set of upgraded specifications for Hybrid communication, version 2.1, January 2019
  - Intercor Milestone 5 - Common set of upgraded specifications for PKI and Common Certificate Policy (CP), version 1.0, 25/09/2018
  - Intercor Milestone 6 – Common set of upgraded specifications for Services, version 1.0, 15/10/2018
  - InterCor Common Log format version 0.7.7

Co-financed by the European Union
Connecting Europe Facility

Specifications – PKI architecture



Remarks

- ✓ If needed 3rd parties can request 2 valid ATs per station from **AA FL** - intercor.vlaanderen@wegenenverkeer.be
- ✓ Certificates are compliant with ETSI TS **103 097 V1.2.1**
- ✓ All OBUs & RSUs must be able to access the **online** distribution center remotely (*URL to be provided by IDnomic*)
- ✓ **Format and samples** of expected certificates can be provided by **IDnomic**
- ✓ All **messages exchanged over IF2 will be unsigned**

Co-financed by the European Union
Connecting Europe Facility

Specifications – Security scenarios

Most of TESTFEST test scenarios will be based on a straightforward security (no specific security tests cases) :

- ✓ Valid RCA
- ✓ Valid AA
- ✓ Valid ATs

However, we have defined **3 negative testing scenarios** (1 mandatory, 2 optional) that will only require RSU specific configuration (no change of vehicle configurations).

1. **Untrusted RCA** (mandatory) : FL or NL will provide 1 RSU using ATs from a RCA not included in the common CTL

- ✓ Verification by all participants OBU of message signature received from the dedicated RSU and signed by an AT, signed by a valid AA (AA TEST), signed by a non trusted RCA (not included in the common CTL)

2. **Revoked AA** (optional) : FL or NL might provide 1 RSU using ATs signed by a revoked AA

- ✓ Verification by participants OBU of message signature received from the dedicated RSU and signed by an AT, signed by a revoked AA (included in the common CRL), signed by a trusted RCA

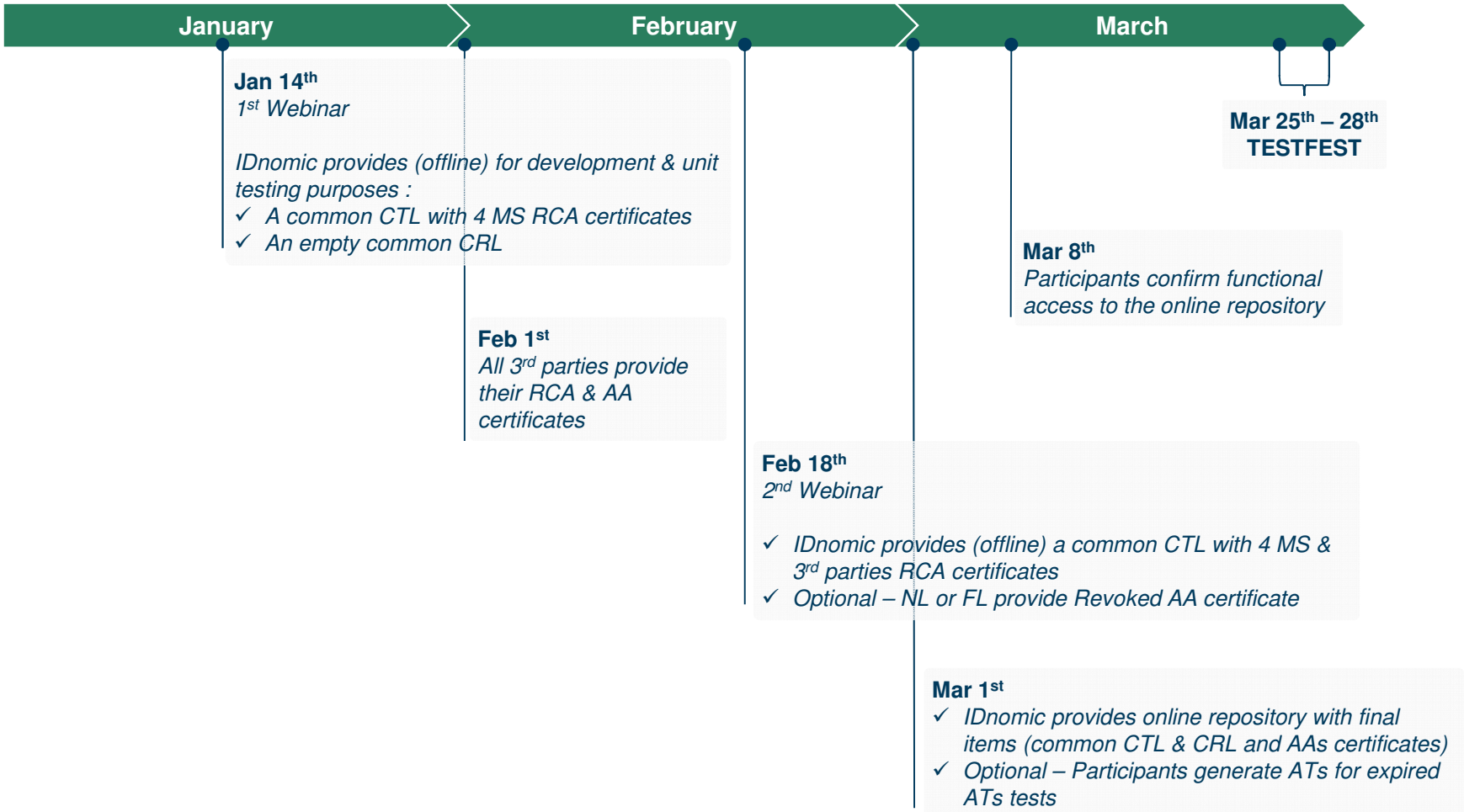
3. **Expired ATs** (optional) : any participant has the possibility to configure 1 RSU with expired ATs (invalid validity dates)

- ✓ Verification by participants OBU of message signature received from dedicated RSUs and signed by an expired AT

In terms of data logging, it is important that all stations log message signature verification errors with appropriate information (timestamp, error type, signature content, source station ID, certificates used).

Co-financed by the European Union
Connecting Europe Facility

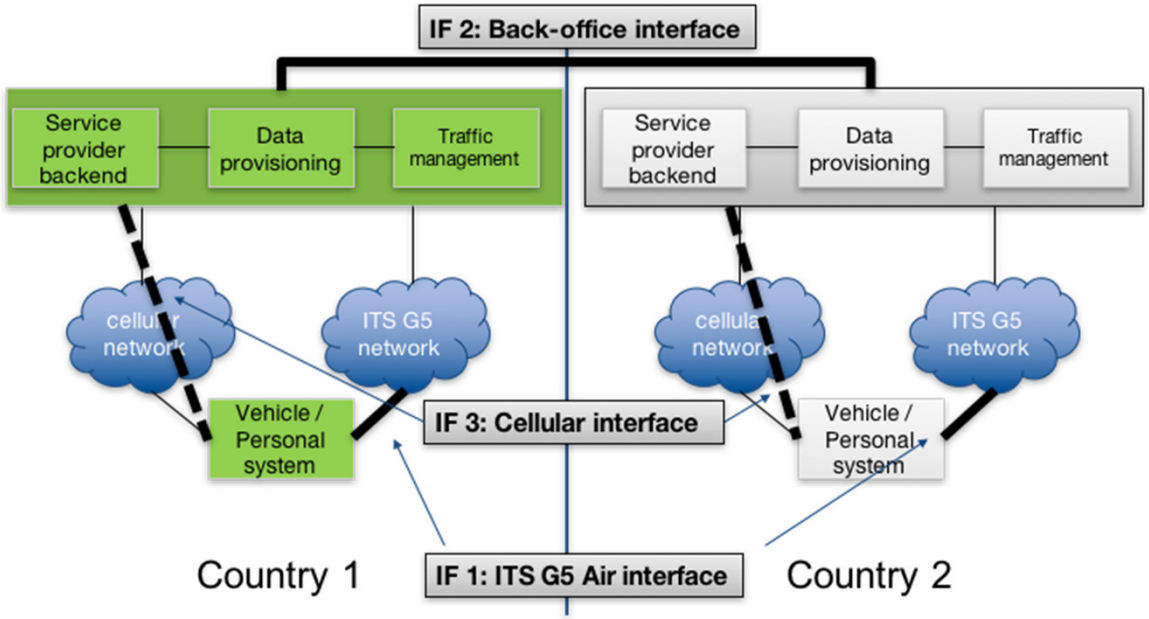
Specifications – PKI timeline



Co-financed by the European Union
Connecting Europe Facility

IF2: ip-based interface

- The IF2 interface is the InterCor ip-based interface, for message exchange between MS and service providers.
- Each MS has at least one IF2 server covering their region.
- Vehicles / apps subscribe to their service provider(s) (home, foreign or a participant cellular SP) to obtain those messages



Co-financed by the European Union
Connecting Europe Facility

IF2: ip-based interface

- The IF2 interface is the InterCor ip-based interface, for message exchange between MS and service providers.
- Each MS has at least one IF2 server covering their region.
- Vehicles / apps subscribe to their service provider(s) (home, foreign or a participant cellular SP)
- InterCor IF2 data exchange uses AMQP v0.91.
- Security between SP and vehicle/app is the responsibility of the SP
- Connection security includes username/password and TLS.
- Data integrity and authenticity: messages exchanged between IF2 servers and service providers will be unsigned for testing purposes.

Co-financed by the European Union
Connecting Europe Facility

IF2: requesting access

- IF2 access is to be requested with each MS.
  Early access will enable pre-testing.

- Flanders contact point: InterCor Vlaanderen
  - 2 servers: 1 read-only exchange for I2V, 1 read/write exchange for V2I and V2V

- Dutch contact point IF2:
  - Document ‘TLEX InterCor IF2 Deployment Documentation; v1.2.0; 20180503’
  - Contact: Oene Kerstjens

- French contact point: Hacène Fouchal

- UK contact point: InterCor partners only

Co-financed by the European Union
Connecting Europe Facility

Scenarios

- For third party participants, for testing purposes, we plan “published scenario” testing on certain parts of the pilot sites.

- For validation purposes, on the other parts of the pilot sites, we plan to run scenarios unknown to the participants.

- More details in webinar 2.

Co-financed by the European Union
Connecting Europe Facility

Follow up - Documents

- Action Plan
  - scope
  - test scenarios and timings
  - schedule
  - facilities
  - supporting information
- Baseline Specification
- Logging formats
- FAQs from webinar
- Due 31th January

Co-financed by the European Union
Connecting Europe Facility

Programme, Venue & Rules

Peter Lewyllie

Agentschap Wegen en Verkeer

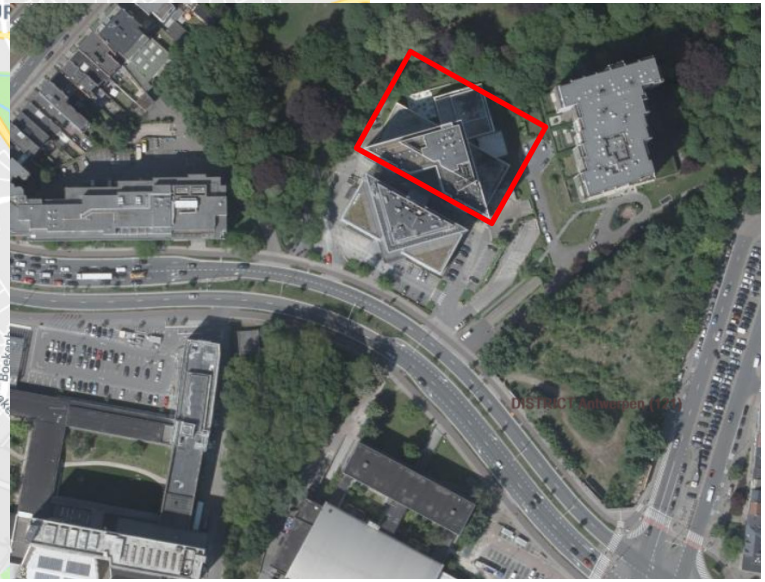
Co-financed by the European Union
Connecting Europe Facility

Venue

Ramada Plaza Hotel,

Desguinlei 94, 2018 Antwerpen

Rooms for participants: €89/night



Parking

Placeholder for webinar 2

More details and instructions follow

Co-financed by the European Union
Connecting Europe Facility

Preliminary InterCor TESTFEST Programme

	Monday, 25 March 2019 Open road tests	Tuesday, 26 March 2019 Open road tests	Wednesday, 27 March 2019 Open road tests	Thursday, 28 March 2019 Open road tests	Thursday, 28 March 2019 Conference
8:00	Participants arrival & set-up	Participants arrival & set-up	Participants arrival & set-up	Participants arrival & set-up	
9:00	Opening remarks and Briefing	Daily Briefing	Daily Briefing	Daily Briefing	Arrival participants
10:00	Open road testing, focus on RWW, IVS, PVD BE+NL (GLOSA operational)	Open road testing, focus on GLOSA BE+NL (RWW, IVS operational)	Open road testing, focus on RWW, IVS, PVD BE+NL (GLOSA operational)	Open road testing	Morning session
11:00					
12:00					
13:00				collecting results	Lunch break
14:00				Afternoon session (technical)	
15:00					
16:00	Collecting results	Collecting results	Collecting results	Reception & networking	
17:00	de-briefing	de-briefing	de-briefing		
18:00	Clean up	Clean up	Clean up		
19:00			Social dinner		
20:00					
21:00					

Conference day

Thursday 28th March:

Connecting European corridors

C-ITS services across borders

Morning session: high level speakers,
views on cross-border interoperability.

Afternoon technical session:
TESTFEST results & deployment guidelines

More details follow.

Co-financed by the European Union
Connecting Europe Facility

Flanders
State of the Art

Participation & Safety rules (draft)

1. A safety briefing is scheduled prior to each morning and afternoon testing session - attendance mandatory.
2. All drivers must be accompanied. The HMI will be used by passenger(s), not by the driver.
3. Participants are to ensure that their vehicles are appropriately insured, and that drivers have appropriate permits. Obey all local traffic rules.
4. Participation is non-exclusive for InterCor members subject to registration, the scope of participation and the availability of places; in that order.
5. Participants will take part in the TESTFEST at their own expense

Co-financed by the European Union
Connecting Europe Facility

Flanders
State of the Art

Participation & Safety rules (draft)

6. Participants must provide their own test vehicle, devices and peripherals.
7. Participants shall have a navigation system with the provided pilot locations of trajectories programmed up front.
8. Participants will participate in a TESTFEST Whatsapp group
9. InterCor partners are required to share test data; other participants are required to share findings related to interoperability.
10. Participants allow the processing of all transmitted data for research, evaluation and reporting purposes by InterCor partners

Participation & Safety rules (draft)

11. The organisation of the TESTFEST cannot take any responsibility, if tests cannot be carried out according to the planning, because of e.g. unexpected events on the motorway or unexpected failure of equipment.
12. ITS-Stations are assumed to be compliant to standards, e.g. be able to pass the previous ETSI Plugtests™. Compliancy is the responsibility of the participant.

Co-financed by the European Union
Connecting Europe Facility

Flanders
State of the Art

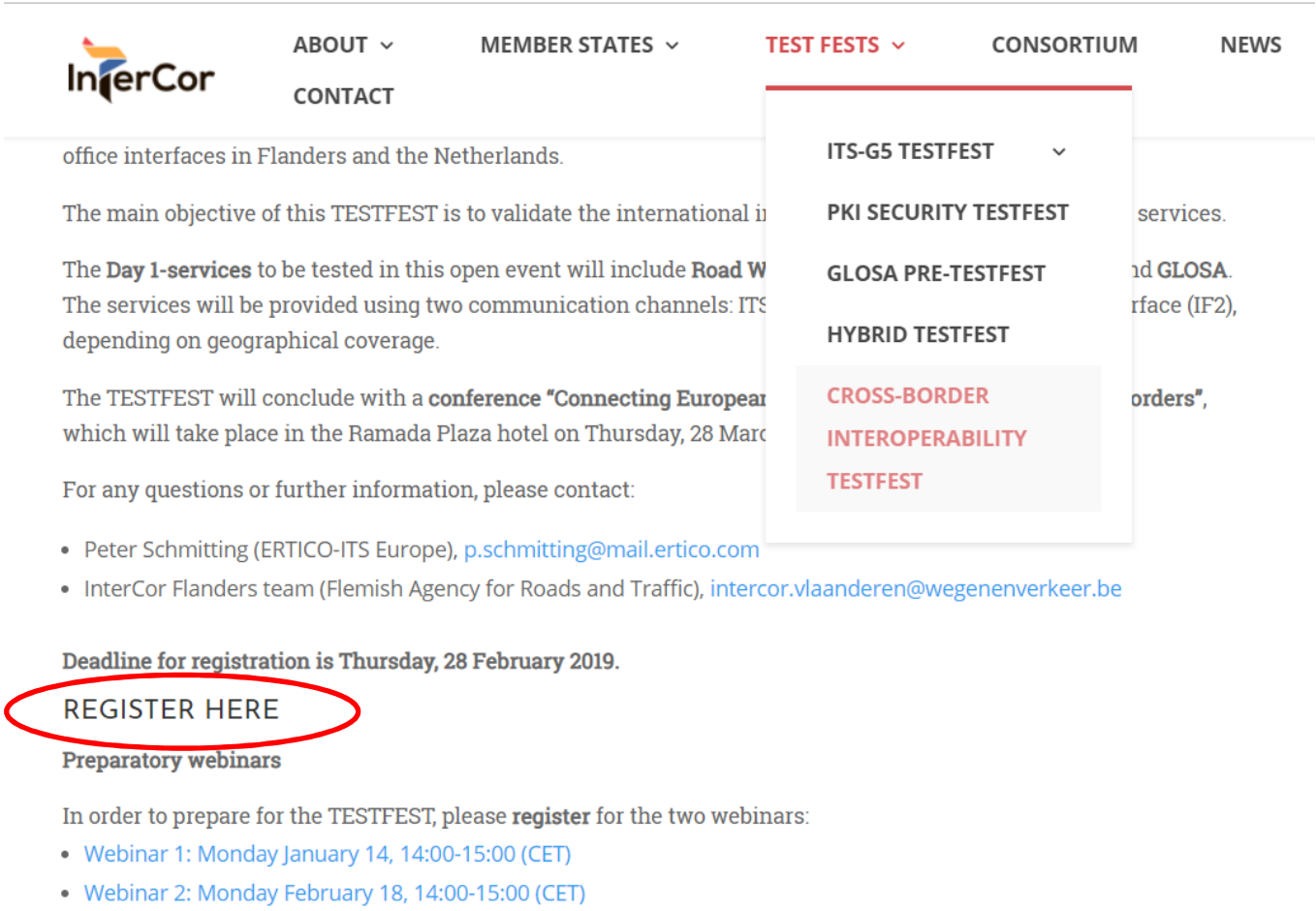
Expected outcome & follow-up

Peter Schmitting- ERTICO

Co-financed by the European Union
Connecting Europe Facility

Follow Up - Registration

Registration is open on InterCor website:



Co-financed by the European Union
Connecting Europe Facility

Follow up - Meeting

Scheduled date:

- 2nd webinar planned for 18 February 2019, 14:00, CET

Co-financed by the European Union
Connecting Europe Facility

CLOSING REMARKS

Peter Schmitting – ERTICO

Thank You – we look forward to welcoming you to the Cross-border Interoperability TESTFEST

Co-financed by the European Union
Connecting Europe Facility

For contact	p.schmitting@mail.ertico.com
Further information	intercor.vlaanderen@wegenenverkeer.be
InterCor:	www.intercor-project.eu

Co-financed by the European Union
Connecting Europe Facility