

# Standardization challenges in cooperative driving

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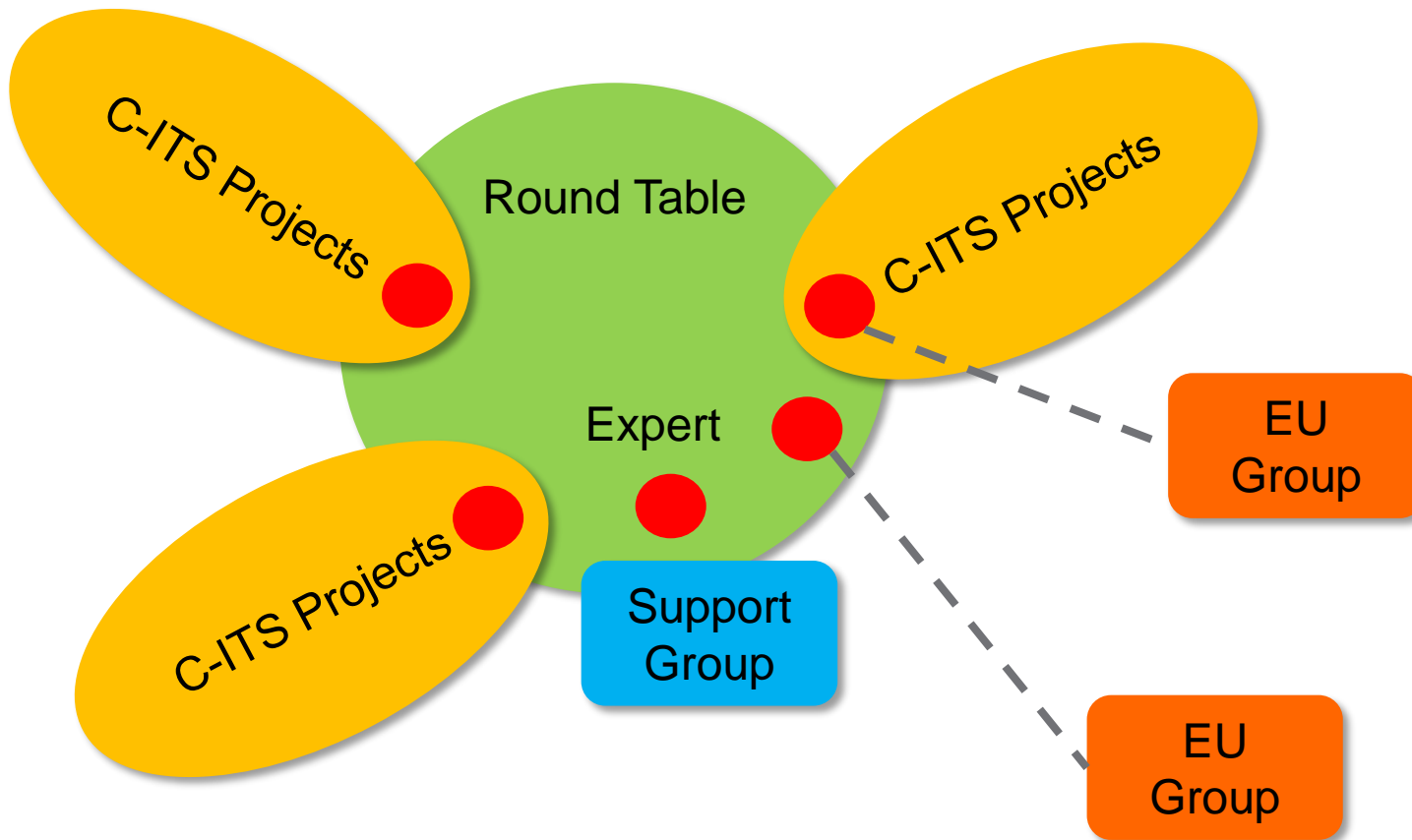
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# From Projects to National Deployment

- From:
  - Architecture and standard choices made within the scope and deadlines of the projects based on available services of the market parties involved.
- To:
  - National, project independent, choices based on interoperability with other countries and guaranteeing a sustainable open marketplace.

# Round Table model



# Application Layer

ETSI TS 102 638  
Basic Set of  
applications (BSA)

ETSI TS 101 539-1  
Road Hazardd  
Signaling (RHS)

# Management Layer

ETSI EN 302 665 V1.1.1  
Comm. Architecture

ETSI TS 102 965  
ETSI TC ITS  
Registration list

# Facilities Layer

ETSI EN 302 637-2  
Cooperative Awareness  
Message (CAM)

ETSI EN 302 894-1  
Facility Layer Structure

ETSI EN 302 894-2  
Common Data Dictionary  
(CDD)

SAE J2735  
Signal Phase and Timing  
& MAP (SPAT/MAP)

ETSI EN 302 895  
Basic Local Dynamic map  
(LDM) (Vehicle oriented)

ISO TS 17419 ITS-AID  
(Application ID)

ETSI EN 302 637-3  
Decentralized  
Enviromental Notification  
Message (DENM)

ETSI TR 103 300  
Vulnerable Road Users  
(VRU)

ISO TS 19091  
SPAT (Signal Phase and  
Timing) message , MAP

ISO TR 20025  
Probe Data Application  
and System  
requirements

ISO TS 18750  
Extended Infrastructure  
oriented Local Dynamic  
map (LDM)

ETSI TS 103 301  
Facility Protocols

# Security Layer

ETSI TS 102 867  
Security mapping for  
IEEE 1609.2

ETSI ES 202 910  
Identity management  
and protection in ITS

ETSI TS 102 941  
Identity, trust, and  
privacy (and update)

ETSI TS 102 942  
Access control, secure  
and privacy preserving  
services

ETSI TS 102 943  
Confidentiality Services,  
(and update)

ETSI TS 103 097  
Security header and  
certificate formats for  
ITS G5

# Networking and Transport Layer

ETSI EN 302 636-1/2/3  
GeoNet Requirements and  
scenarios

ETSI EN 302 636-4-1  
GeoNetworking Media  
Independent

ETSI EN 302 636-5-1  
Basic Transport protocols

ETSI EN 302 931  
Definition of GeoAdres

# Access Layer

ETSI EN 302 663  
Profile standard on  
European on ITS G5

ETSI TS 102 687  
PHY/MAC Congestion  
control

ETSI TS 102 724  
ITS G5 channel  
configuration

ETSI EN 302 571  
Radiocommunications  
equipment operating in  
5855-5925 MHz

ETSI TS 102 792  
Mitigation techniques to  
avoide interference CEN  
DSRC/ITS-G5

IEEE 802.11  
Lower Layer specifications  
(ensuring ITS in 5.9 GHz)

ETSI

CEN/ISO

SAE

IEEE

To Contribute

To be  
reviewed

Lead  
Contribute

To be  
checked

Clarification  
of use

No contribution

Monitor change

# Use Case driven standardisation Process

C-ITS Use Case Overzicht	Planning				Transmission	
	2015	2016		TBD	3/4G	G5
	2015	Q1/2	Q3/4			
<b>Intersections</b>						
Energy Efficient Intersection Service			X		X	X
Green Light Optimal Speed Advice	X	X			X	X
Green Wave		X			X	X
Stopping Behaviour Optimization		X			X	X
Red Light Violation Warning	X		X			X
Priority Request	X					
Virtual VRI in Traffic center						
<b>Vulnerable Road Users</b>						
Bicycle Priority						
Bicycle Data (FCD)		X				

Via a RSU the traffic light can broadcast information to nearby vehicles. This includes information about the topology of the intersection and the phase schedule of each traffic light signal. Approaching vehicles can receive this information and calculate the optimal approaching speed.

InterCor (Logistic) Usecases

# The Dutch ITS Profile

- The aim of the Dutch ITS Profile is to be the **single point of reference** in the Netherlands to secure the interoperability and conformity between ITS applications and system implementations to support stakeholder common and individual business cases.
- To that end the Dutch ITS Profile contains an **architectural system description** with **base requirements** and **profiling of base standards** to support the deployment of selected ITS use-cases.
- It reflects the way the table members and other Dutch stakeholders **expect to use** Standards and other Specifications for deployment of ITS Use-Cases in the Netherlands.



# Dutch ITS profile

VERSION V0.20

<http://www.ditcm.eu/its-round-tables/architecture-interoperability>

## 1.1 USE CASES

Road Works Warning	DP_Annex C_RWW_v151125	®
Priority Request	DP_Annex B_PR_v151125	®
Green Light Optimization	DP_Annex A_GLOSA_v151125	®
Probe Data	DP_Annex D_PVD_v151125	®

## 1.2 ARCHITECTUUR

Referentie Architectuur Architecture for C-ITS Applications 2015-

## 1.3 DUTCH PROFILE

Dutch ITS Profile Dutch\_its\_profile.0.20 ®



# Dutch Profile Program 2016-2017

Use cases (with sub-use cases)	G5	Hybrid	C-ITS Message sets
GLOSA	X	X	SPaT, MAP
Priority Request	X	X	SPaT, MAP, SRM, SSM
Road Works Warning	X	X	DENM
Probe Vehicle Data	X	X	CAM
Red Light Violation	X		SPaT, MAP, CAM, DENM
Shockwave Damping		X	?
Cooperative Cruise Control	X		CAM
In-Vehicle Signage & Information		X	IVI
Extended RWW		X	DENM, IVI, MAP

InterCor (Logistic) Usecases



# Working towards Compliance



**LETTER OF INTENT**

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