

DRIVE



Accelerate cooperative mobility

DRIVE C2X Reference System

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DRIVE C2X project overview

Pan-European field operational test on cooperative systems
based on CAR-2-X communication using WLAN and 3G communication technologies

- **Project Info:**
 - Start in January 2011, 3 years duration
 - EC project 6th call
 - Successor of PRE-DRIVE C2X project
- **Consortium:** 32 partners, 10 support partners
 - Coordinator: Daimler
 - Automotive OEMs, electronics and supplier industry, IT and road traffic engineering, research institutes, road operators and others
- **Objectives:**
 - Carry out a comprehensive assessment of cooperative systems through extensive European Field Operational Tests (FOT)
 - Create and harmonize a European-wide testing environment for cooperative systems
 - Coordinate the tests carried out in parallel throughout the DRIVE C2X community
 - Evaluate cooperative systems
 - Promote cooperative driving
- **Liaisons**



Collaboration partner



Selected functions for DRIVE C2X

Safety

- Traffic jam ahead warning
- Roadwork warning
- Car breakdown warning
- Approaching emergency vehicle
- Weather warning
- Emergency electronic brake lights
- Slow vehicle warning
- Stop sign violation
- Post crash warning
- Obstacle warning
- Wrong way driving in gas stations and
- Motorcycle warning

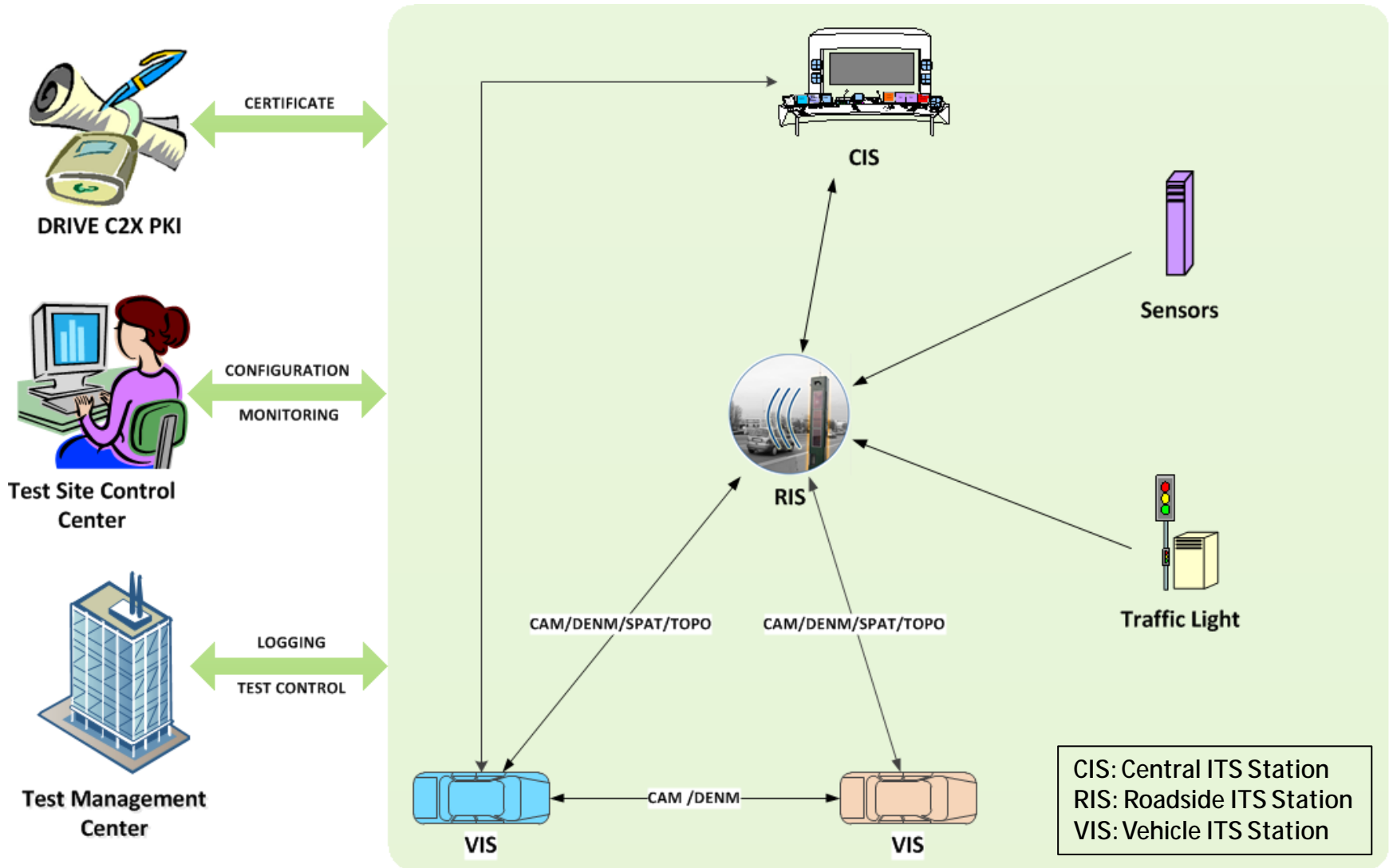
Traffic efficiency

- In-vehicle signage / speed limit
- Green light optimal speed advisory
- Traffic information and recommended itinerary

Infotainment, business

- Insurance and financial services
- Dealer management
- Point of interest notification
- Vehicle software provisioning and update
- Local electronic commerce
- Fleet management
- Transparent leasing

DRIVE C2X architecture



DRIVE C2X software components

- 46 software components

Configuration and Cross-Layer Management (MGMTCONF)	Approaching emergency vehicle (AEV)	Car breakdown warning (CBW)	Dealer Management (DM)	Emergency Electronic Break Light (EEBL)	Fleet Management (FM)	Green-light optimal speed advisory (GLOSA)
	Insurance and Financial Services (IFS)	In-vehicle signage (IVS)/ RegContext Speed Limit	Motorcycle Approaching Indication (MAI)	Obstacle Warning (OW)	Point of Interest Notification (POIN)	Post Crash Warning (PCW)
	Road Works Warning (RWW)	Slow Vehicle Warning (SVW)	Traffic Jam Ahead Warning (TJAW)	Transparent Leasing (TL)	Weather Warning (WW)	Wrong Way Driving in Gas Station (WWD)
	Backend Integration Mgr (BIM) (*)	CAM Mgr (CAM)	DENM Mgr (DENM)	HMI Device Provider (HMI-DP)(*)	HMI Support (HMIS)(*)	Security & Privacy (SEC)
	ITS Testing Unit (ITSTU)	Local Dynamic Map (LDM)	Map Matching (MAP)	Position & Time (POTI)	SPAT Mgr (SPAT)	
	TOPO Mgr (TOPO)	Vehicle Data Provider (VDP) (*)	Road Equipment Mgr (MGMTRS)(#)	Sensor Mgr (MGMTS)(#)	GeoNetw/BTP API (GNBTPAPI)	
GeoNetw + Basic Transport (GN&BTP)	IPv4	IPv6	IPv6 over IPv4	TCP & UDP		
Communication Management (CM)	ITS-G5 / IEEE 802.11p	3G	CAN (*)	Sensor Road Equipment (#)	GNSS	

(*) Only VIS, not RIS

(#) Only RIS, not VIS

Interoperability of Cooperative Systems and feedback to standards (1)

What is required?

- Project implementations should be compliant to standards developed in CEN & ETSI
- Projects should participate in plugtests
- Projects should offer their results to standardization process
- Coordination by COMeSafety-2
- Cooperation in industry consortia, such as Car-2-Car communication consortium

Interoperability of Cooperative Systems and feedback to standards (2)

DRIVE C2X reference system

- DRIVE C2X test sites implement the DRIVE C2X reference system
 - Adapted to their needs
 - Limited by their financial and resource situation
- Cooperation with other test sites
 - Possible if project schedule and budget allows
 - Generally restricted by project's consortium agreements
 - Opportunity by exchange of software and hardware components
- Cooperation between DRIVE C2X and PRESERVE projects
 - Document exchange agreed and first DRIVE C2X Deliverables made available to PRESERVE
 - System integration under discussion