SCORE@F the French Field Operational Test to deploy cooperative systems

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On behalf of SCORE@F consortium
Project Summary

- Duration: 30 months since 1\textsuperscript{st} September 2010
- Total funding/budget: 2.7 M€/5.6 M€ (French national and regional funding)
- Mission: to prepare the deployment of Cooperative systems
- Consortium: 20 partners (co-ordinated by Renault)
- Competitiveness Pole: MOV’EO
- Experiment on Test circuit, Motorway and Urban / Rural environment in Yvelines department
Consortium

Automobile
- LEADER
- RENAULT
- PSA PEUGEOT CITROËN
- HITACHI
  Inspire the Next
- UTAC
- LAB

Road Infrastructure
- COFIRoute
- egis mobilité
- neavia
- IFSTTAR

Telecom & Services
- senda
- Viveris Technologies
- orange
- Intempora
- DEVERYWARE
- MARBEN

Research Institutes
- EURECOM
- TELECOM SudParis
- INRIA
- CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE
- CETE Ille-de-France
- Ministère de l’Écologie, de l’Énergie, du Développement durable et de la Mer
Contributions

- **Impact evaluations:**
  - Technical evaluation (technologies, use cases, system architecture)
  - User acceptability / driver behavior
  - Social and economic values
  - Legal and organizational issues
  - Business model

- **Exploitation of results:**
  - Deployment strategy (PPP)
  - System engineering (e.g. Validation)
Cooperations

SCORE@F Co-ordination

CO-DRIVE Agreement for Integration in Expérimentation @France

SCORE@F Co-ordination

Other Projects, CG38, CG91

SCORE@F Technical Platform and Motorway, CG78 Field Operational Tests

SPITS Helmond, Netherlands Level 1

SAFER Gothenburg, Sweden Level 2

SCORE@F Yvelines, France Level 2

Test Site Italy Brenner Motorway, Italy Level 2

SISCOGA Galicia, Spain Level 3

Coop TS Finland Tampere, Finland Level 2

simTD Frankfurt/Main, Germany Level 2

EasyWay
FOT Geographical Coverage

- Two types of test sites in Yvelines area and Orleans area, 28 RSUs:
  - Controlled test tracks (SATORY): for system validation and road safety applications
  - Natural test site: open traffic test in highway, urban/rural roads
- Other test facilities:
  - Laboratory test: 802.11p modem test bench, 802.11n, 3G
  - Simulation

Highway A86: 10km tunnel
No RSU inside the tunnel

Urban road in Versailles: 5 intersections with traffic lights

Close test tracks: SATORY-IFSTTAR
3 tracks from 2-4km, 6 RSUs

N12 / D91: 3.5km / 4.4km, 6 RSUs (main spot) Urban/Rural

Versailles area

Orleans area

Highway A10 near Orleans (operated by Cofiroute): 13 km, 2x3lanes highway
Equipped with induction loop
Development of an Ecological and Economical Road Side Unit

... in the overall architecture
SCORE@F tests not only driver awareness (information based) but also collision avoidance applications (warning based).

- The collision avoidance applications are tested in a controlled environment.
- Additional functional/performance requirements:
  - Lane information; Positioning accuracy; Application design
### SELECTED USE CASES

**Priority 1**

<table>
<thead>
<tr>
<th>Use Cases</th>
<th>ETSI Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CAA</td>
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<tr>
<td>Road work</td>
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<tr>
<td>Traffic Jam</td>
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<td>Stationary Vehicle</td>
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<td>Human on the road</td>
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<td>Low stability</td>
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<td>Signal Violation</td>
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<table>
<thead>
<tr>
<th>Use Cases</th>
<th>Motorway</th>
<th>RD91</th>
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<tbody>
<tr>
<td>EFCD</td>
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<tr>
<td>Contextual Speeds (CSL)</td>
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<tr>
<td>Recom. Itinerary (TIRI)</td>
<td></td>
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<tr>
<td>Stop – Start at TL (S-S TL)</td>
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<tr>
<th>Use cases</th>
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<tr>
<td>In-Vehicle Signage (VMS)</td>
</tr>
<tr>
<td>Intermodality HUB (P&amp;R, OTS)</td>
</tr>
</tbody>
</table>
SELECTED USE CASES
Priority 2

ROAD SAFETY

Use Cases
- Approaching Vehicle
- Counter sens Vehicle
- Warning from a Third Party
- Road Obstacle

ETSNI Reference
<table>
<thead>
<tr>
<th>CAA</th>
<th>LCRW</th>
<th>ICRW</th>
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</thead>
</table>

TRAFFIC MANAGEMENT

Use Cases
- Motorway
- RD91

COMFORT & MOBILITY

Use Cases
- Electric Vehicle Point of Charge Notification (EVC SN)
- Fleet Management
## Reference Specifications

<table>
<thead>
<tr>
<th>APPLICATIONS</th>
<th>MESSAGES</th>
<th>REF SPEC</th>
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</thead>
<tbody>
<tr>
<td>ROAD SAFETY</td>
<td>CAM &amp; DENM V2 + SPAT, IT</td>
<td>ETSI TS 101 539</td>
</tr>
<tr>
<td>Collect CAM &amp; DENM, transfer to Traffic Management Center</td>
<td>DATEX 2</td>
<td>CEN TC 278 WG16</td>
</tr>
<tr>
<td>Contextual Speed Limits</td>
<td>CSM</td>
<td>CEN TC 278 WG16</td>
</tr>
<tr>
<td>Traffic Info and Recommended Itinerary</td>
<td>TIRIM</td>
<td>DRIVE C2X ?</td>
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<tr>
<td>Stop – Start at Traffic Light Service Announcement</td>
<td>SPATM + Intersec. topology</td>
<td>ETSI TS 101 539 (SAE / SIM – TD)?</td>
</tr>
<tr>
<td>In-Vehicle Signage (VMS)</td>
<td>VMSM</td>
<td>CEN TC 278 WG16</td>
</tr>
<tr>
<td>POI Mobility HUB (Public Transport)</td>
<td>HPRM</td>
<td>SCORE@F</td>
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<tr>
<td>POI Mobility HUB (OTS)</td>
<td>HOTSM</td>
<td>SCORE@F</td>
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<tr>
<td>POI Security Management (VIA)</td>
<td>SMM</td>
<td>SCORE@F</td>
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<tr>
<td>POI EV Charging Spot Notification</td>
<td>EVC SMM</td>
<td>ETSI TS 101 556</td>
</tr>
</tbody>
</table>
TRAFFIC MANAGEMENT USE CASES

- Transfer pre-processed CAM & DENM
- Contextual Speed Limits
- In-Vehicle Signage
- Traffic Info & Recommended Itineraries
GATEWAY DATEX 2

• Messages from RSU to TCC are intended:
  • To transmit measured data, particularly traffic data
  • To supply event information
  • To transmit developed data (incident detection, traffic jam, rain, …)

• Messages from TCC to RSU are intended:
  • To transmit information to users through informative messages about user actions, the impact of an event or non-road event
  • To offer users a recommended itinerary
  • To provide information on available multimodal report
  • To provide value added service
GATEWAY DATEX 2 - Architecture

Data recovery system

MySQL

Datex Gateway (generate xml, xml parser, xml2java, Java2xml,..)

RSU

Datex Gateway

RSU

Datex Gateway

Clients

Back-office/ TCC

Server
GATEWAY DATEX 2 – Send message push mode

Datex Gateway
(generate xml, xml parser, xml2java, Java2xml,..)

Data recovery system

Back-office/ TCC

Server

RSU
Datex Gateway

Clients
Datex Gateway
GATEWAY DATEX 2 – Receive message

- Data recovery system
- Back-office/TCC
- Server
- RSU
  - Datex Gateway
  - Datex Gateway (generate xml, xml parser, xml2java, Java2xml,..)
- Clients
GATEWAY DATEX 2 – use cases

- Roadworks
- Traffic Jam
- Immobilized vehicle
- Obstacle
- Human presence
- Wrong way vehicle
- Poor visibility
- Traffic data
- Speed limits
- Travel time

- Each use case has its specific application
Assessment Purpose

• Technical assessment of critical road safety applications (calibration) in controlled environment
• Conformance Testing, Interoperability, performance testing.
• Driver Behaviour in controlled and natural environment.
• Driver acceptance and customer value
Organizational impact (life cycle management / Security.
• Cross exchange of assessment results with other DRIVE C2X National FOT
Thank you for your attention

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