C-ITS Deployment Initiatives from an urban & hub perspective

G. Somma

ERTICO – ITS Europe
C-ITS: Needs for Deployment

Integration

- Technology
  - Standardisation
  - Testing
- Policy
  - Privacy
  - Liability
- Organisation
  - Data access
  - Service access
- Financing
  - Procurement
  - Cost-benefit
- Usage
  - Acceptance
  - Awareness
  - Safe use
Compass4D pilot project

Objective:
• Deploy C-ITS services for road users to increase energy efficiency and road safety

C-ITS services:
• Energy Efficient Intersection Service (EEIS)
• Road Hazard Warning (RHW)
• Red Light Violation Warning (RLVW)

Vehicles & Infrastructure:
• Vehicles: 650+ (Heavy, Light and Emergency vehicles)
• Road-side units: 130+ (ITS-G5) + 150+ (3G/LTE)
• On-board units: 270+ (ITS-G5) + 450+ (3G/LTE)
• Drivers: 1200+

After-project: services continuation for sustainable market roll-out

http://www.compass4d.eu/en/results/
Objective:
- Deploy C-ITS services for freight transport to increase *sustainable mobility* of goods and *efficiency of logistics*

C-ITS services:
- Priority & speed advice
- Eco-driving support
- CO2 Footprint and Monitoring
- Multi-modal Cargo Transport Optimisation
- Intelligent Truck Parking and Delivery Areas Management

Logistics Hubs:

Multiple transport modes involved:

http://cogistics.eu/news-events/deliverables/
TM 2.0 Innovation Platform

Road authorities & service providers

Inform Driver → Guide Driver

Measure → Influence Traffic

http://tm20.org/category/library/
C-ITS: Needs for Deployment, 1/4

Technology:

• Invest in existing physical & innovative digital infrastructure rather than expand the road network

• **Physical** infrastructure will be partly replaced by “**virtual**” infrastructure for in-vehicle / on personal devices TM 2.0 capabilities provision

• Solutions to be **technology-neutral** to avoid lock-in and fragmentation risks and achieve seamless services continuity for different end-user categories:
  • Comms. Technology Evolution (X2X), Architectures vs. Services, Standards & Interoperability
  • V2X cooperative systems & services to be **integrated** with TM procedures and systems
  • New IT solutions to be assessed vs. real-life gaps vs. policy needs

• **Data** sharing and management as well as harmonised **evaluation** methodologies are key elements for both service level improvement and stakeholders engagement

• Spread **know-how** and define best practices for (cooperative) ITS solutions among local traffic managers and supply chain about: installation work → OBU / RSU configuration → programming → maintenance / upgrade, use of open standards for interoperability

• **Rationalise services**: multiple functionalities might create confusion / distraction (“many applications for the same people”)
C-ITS: Needs for Deployment, 2/4

Policy:

• Unveil full potential & limits of C-ITS through impact assessment and proof of benefits to shape a sustainable transport policies

• Harmonise Sustainable Urban Mobility / Logistics Plan (SUMP / SULP) with C-ITS services
  → Cities do not consider logistics hubs (ports, terminals) in the urban planning

• Raise policy makers & end-user awareness to change perception (focus on mobility, not on individual car drivers)
  • Cities often represented by consultants → policy issues not adequately addressed
  • Changes in political directions (due to elections) → lack of support from/to public authorities for after-project life expansion → loss of capital knowledge and investments
C-ITS: Needs for Deployment, 3/4

Organisation:

• Establish truly **functioning public-private partnerships** to overcome deployment fragmentation
• Learning-by-doing approach to lead to clear and coherent **reference organisational architectures** (who is involved, what are the “changing” roles & responsibilities, how to deploy, etc.)
• Address **governance and legal** aspects to overcome deployment fragmentation and address needs of heterogeneous stakeholder groups
• Address needs of **heterogeneous stakeholder groups** in light of fast business and market roll-out
C-ITS: Needs for Deployment, 4/4

Financing & Usage:

• Investment from whom? Benefits for who? \(\rightarrow\) Socio-economic CBA to raise awareness of investors (public, private), including end-users (professional, private)
  • High cost of (some) services for after-project expansion
  • Unambiguous choice of technology investment

• Innovation procurement to meet demand & offer, shaping new business models taking into account the entire value chain, incl. outsiders (e.g. innovative thinkers / start-ups) \(\rightarrow\) administrative & legislative barriers
  • download the [P4ITS recommendations / guidelines](#)

• ITS know-how for local public authorities & providers combined with awareness & support for end-user
  • exchange of knowledge, experiences and best practices based on common pan-European testing and validation in real-life conditions of existing cooperative mobility solutions
  • Social media / educational campaigns
Cooperative Mobility Services Roadmap

- Automation Services
  - Driverless
  - Fully automated
  - Highly automated
  - Partly automated
  - Assistance

- Information Services
  - Driver assistance
  - Incident/Event management
  - Traffic management
  - Mobility management
  - Access management

Cooperative Mobility Services
- Automated Cooperative Transport Systems
- Cooperative Automated Driving
- Interactive Traffic Management
- Cooperative Driving
C-MobILE Innovation Action

C-MobILE (Accelerating C-ITS Mobility Innovation and deployment in Europe)

• H2020 IA on large-scale C-ITS deployment, 8 European cities, 42 months starting on 1st May 2017
• Define a C-ITS framework with all key stakeholders for proposing deployment enabling solutions, including business cases, for the pilot sites as well as other cities and regions
• Deliver a Strategic Research Agenda addressing key innovation for C-ITS and automated transport
• Assess benefits of bundling C-ITS applications and integrating multiple transport modes
• Demonstrate large-scale C-ITS deployment in complex urban areas with large groups of end-users
• Create a platform with open access, secure software libraries to support C-ITS applications
• Define an operational process for large-scale deployment of sustainable C-ITS services in Europe
• Release testing methodologies to evaluate C-ITS architectures and applications effectiveness
• Demonstrate added value & economic viability through comprehensive CBA & impact assessment

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C-Mobile Service bundling

- Large-scale deployment of bundled existing Day 1-1.5 C-ITS services
  - in different settings (urban, interurban, cross-border)
  - in complex environments (highly dense or sparse population, compact cities with widespread outskirts, isolated or rural areas)
  - with large, different user groups (i.e. drivers, pedestrians, cyclists)

<table>
<thead>
<tr>
<th>Technology / Innovation Element</th>
<th>Current TRL</th>
<th>Target TRL</th>
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<tbody>
<tr>
<td>Bundle 1: urban efficiency</td>
<td></td>
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<tr>
<td>a.Rest time management</td>
<td>8-9</td>
<td>9</td>
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<tr>
<td>b.Motorway parking availability</td>
<td>8-9</td>
<td>9</td>
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<tr>
<td>c.Urban Parking availability</td>
<td>7</td>
<td>9</td>
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<tr>
<td>Bundle 2: infrastructure-to-vehicle safety</td>
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<tr>
<td>a.Road works warning</td>
<td>8</td>
<td>9</td>
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<tr>
<td>b.Road hazard warning (incl. traffic jams)</td>
<td>7-8</td>
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<tr>
<td>c.Emergency Vehicle Warning</td>
<td>7-8</td>
<td>8-9</td>
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<tr>
<td>d.Signal Violation Warning</td>
<td>5</td>
<td>7</td>
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<tr>
<td>e.Warning system for pedestrian (not limited to crossings)</td>
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<td>6-7</td>
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<tr>
<td>Bundle 3: traffic efficiency</td>
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<tr>
<td>a.Green priority</td>
<td>7</td>
<td>9</td>
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<tr>
<td>b.Green light optimal speed advisory / Dynamic eco-driving</td>
<td>6-7</td>
<td>8-9</td>
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<tr>
<td>c.Cooperative traffic light for pedestrian</td>
<td>5</td>
<td>6-7</td>
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<tr>
<td>d.Flexible infrastructure (HOV, peak-hour lanes)</td>
<td>5-6</td>
<td>7-8</td>
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<tr>
<td>e.In-vehicle signage (e.g. Dynamic speed limit)</td>
<td>5-6</td>
<td>7-8</td>
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<tr>
<td>f.Mode &amp; trip time advice (e.g. by incentives)</td>
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<td>8</td>
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<tr>
<td>g.Probe Vehicle Data</td>
<td>6</td>
<td>8</td>
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<tr>
<td>Bundle 4: vehicle-to-vehicle safety</td>
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<tr>
<td>a.Emergency Brake Light</td>
<td>7-8</td>
<td>8-9</td>
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<tr>
<td>b.Cooperative (Adaptive) cruise control (Urban ACC)</td>
<td>5-6</td>
<td>7-8</td>
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<td>c.Slow or Stationary Vehicle Warning</td>
<td>7-8</td>
<td>8-9</td>
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<tr>
<td>d.Motorcycle approaching indication (including other VRUs)</td>
<td>6-7</td>
<td>7-9</td>
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<tr>
<td>e.Blind spot detection / warning (VRUs)</td>
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<td>6-7</td>
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</tbody>
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The concept

Bringing cities, industry and users together to develop and deploy ITS solutions

The purpose

Public-Private Business Partnership with *better educated* stakeholders & tailor-made solutions for effective mobility in complex urban areas
Thank you for your attention

Giacomo Somma

g.somma@mail.ertico.com