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Cooperative ITS for Mobility in European Cities

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C-ITS FOR EUROPEAN CITIES:

THE CIMEC ROADMAP

OBJECTIVES

“Numerous R&D projects have shown cooperative systems to work at a technical level, but that have yet to prove how they can contribute to policy objectives and/or cost-effectiveness in urban environments... [CIMEC] aims at contributing to bridging this gap”

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THE CIMEC ROADMAP

- IS
  - A medium-term perspective that European cities can recognise and agree with
  - A guide for EC, MS, and suppliers on where they should best put their development efforts
- IS NOT
  - A statement of cities what cities should be doing
  - A programme and timetable for delivery of specific city C-ITS

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CITIES AND TRANSPORT

- Cities are highly diverse: politically, financially, and organisationally
- However many transport goals are common:
  - To reduce congestion
  - To improve the environment – specifically pollution
  - To maintain safety on the network
  - To promote excellent public transport
- Technology is not itself a goal – it is a cost!

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BENEFITS OF C-ITS

- Claimed potential benefits include improved flow, safety, emissions etc
  - But not much is yet proven at large scale
- Before implementing a city will need to know:
  - Who receives benefit (e.g. all vehicles, buses only, specific vehicles, cyclists only)
  - How widespread benefit is (e.g. single junction vs city-wide)
  - How benefit is valued (e.g. money, time saved, accident reduction, or just political)
  - Crucially, how robust the benefit estimate is

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URBAN C-ITS USE CASES

Information to road users

UC1: Individual routing of vehicles
UC2: In-vehicle signs
UC3: In-vehicle signal information
UC12: Inform about incidents in the road network and access control to these areas
UC13: Inform about emergencies in the road network and access control to these areas

Traffic light management

UC8: Traffic light management
UC7: Green lights for police and emergency vehicles
UC9: Green lights for public transport vehicles
UC10: Green lights for cyclists

Access control

UC5: Access control for heavy goods vehicles with dangerous goods
UC6: Regulation of access to free lanes for electrical vehicles
UC14: Dynamic access control for air quality management

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URBAN C-ITS USE CASES

Vulnerable road users (VRUs)

UC10: Green lights for cyclists
UC15: Speed enforcement around schools
UC16: C-ITS services for vulnerable road users
UC17: Pedestrians crossing in front of bus/tram
UC18: Bike lane change and unusual crossing

Parking management

UC11: Parking management

Emergency vehicles

UC7: Green lights for police and emergency vehicles

Freight vehicles

UC4: Management of loading and unloading areas for freight vehicles
UC5: Access control for heavy goods vehicles with dangerous goods

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UNDERSTANDING THE COSTS

- Cost of acquiring (or upgrading) roadside devices
- Cost of installing and commissioning roadside devices
- Cost of acquiring (or upgrading) central systems, including the additional cost of integration of roadside devices
- (Additional) cost of the city's communication network between centre and roadside; also possibly additional costs of electricity supply
- Cost of acquiring and/or training staff to use the system
- Cost of maintenance, repair, upgrade and replacement of system elements
- Any direct contribution to the cost of in-vehicle systems – in the case of city vehicles, the whole cost
- Cost of marketing to prospective road users
- Cost of technical support to actual road users
- Potential costs associated with consequences such as complaints and claims

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RISK CONCERNS

- Breach of privacy
- Accident liability
- Political risk (e.g. through poor public reception)
- Supply failure
- Imposition of excessive costs or other burdens on road users
- Operational inadequacy (e.g. through shortage of skilled staff)

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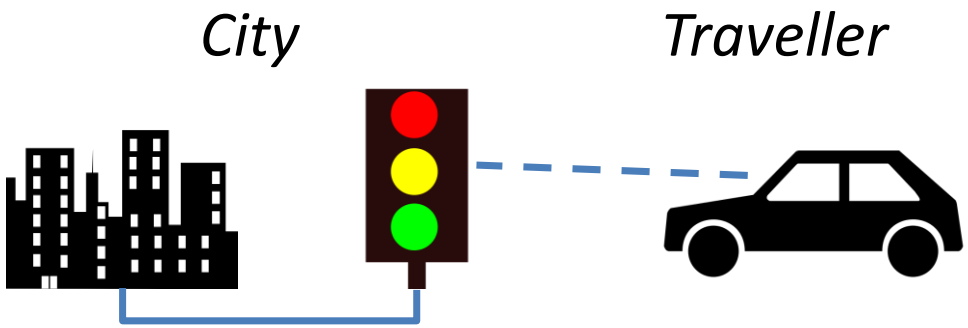
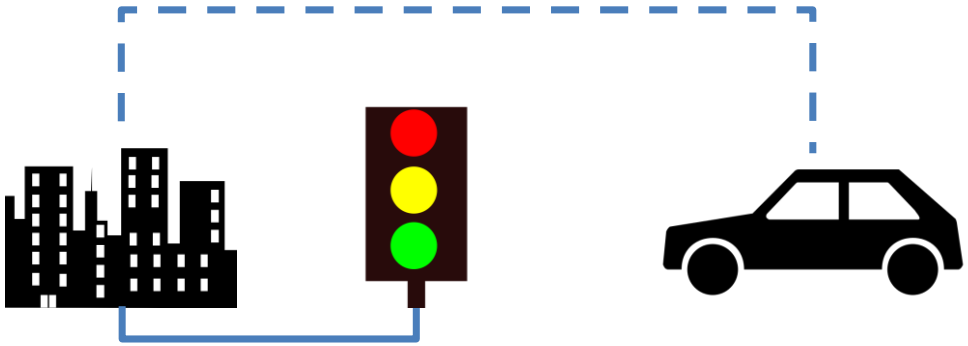
TECHNICAL ARCHITECTURES



The approach of ETSI ITS G5 – Focus on local/immediate relevance, low latency, high reliability



The cellular approach – Focus on strategic messages, wide relevance, reuse of existing systems

- Cost of implementation/support
- Ease of integration with existing systems

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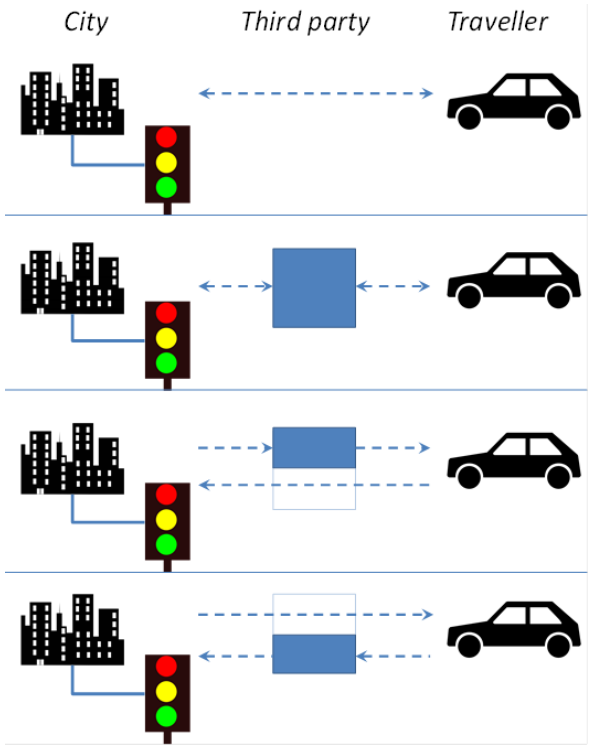
BUSINESS MODELS



City collect data and provide service directly to the road user, using its own technology - No third party involved

Third party collect data and provide service - No direct city involvement

Third party provide service on behalf of city - *city collect data* for own use

Third party collect and provide data to the city - *city provide service* to the road user

- Feasibility: political, technical and commercial
- Utility: to road users and city managers
- Social and legal issues: privacy etc.

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INDUSTRY PERSPECTIVE

- Urban C-ITS is seen as still at an early stage of large-scale deployment
- The supplier market is still very fragmented
- The market dynamics are not clear yet
- The market is not uniform across Europe
- There are complex interactions with other ITS developments

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CITIES AND ITS

- Cities need any technical solution to
  - Be available and meet the specification
  - Do the job better than another (cheaper) solution
  - Be well tested to achieve the outcome desired
  - Be well tested to be safe in the context
  - Have a price which is manageable within the budget
  - Integrate with legacy systems
  - Be future-proofed against obsolescence

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LINKED DEVELOPMENTS

- Automated/autonomous vehicles
  - Degree of interaction with C-ITS
  - City role: control or merely inform the vehicle?
- Personal smart devices
  - Intelligent Mobility (IM)
  - Mobility as a Service (MaaS)
- Smart cities
  - Broader city strategies for use of technology - transport is just one area
  - "Internet of Things" (IoT)
- Supporting alternative transport modes
  - E.g. powered two-wheelers (PTW)

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CONCLUSIONS

- Cities are very interested in cooperation, but don’t fully understand the technology options: what to buy, and whether it’s worth it
- Need to:
  - Establish evidence base for benefit of urban C-ITS
  - Continue to support coordination/communication among cities, advisers and suppliers

Harmonised city approach to C-ITS → a market for urban C-ITS

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PROJECT PARTNERS

SINTEF

POLIS

Albrecht Consult

Centaur

Statens vegvesen
Norwegian Public Roads Administration

Kassel documenta Stadt

Reading Borough Council
Working better with you

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clúster de movilidad y logística
mugikortasun eta logistika klusterra

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