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SIS04 – Green ITS

**Cooperative Systems for Inter-Urban Traffic / Freight
& Fleet**

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2009-09-23

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Presentation outline

- The CVIS project – building the cooperative framework
- Problem statement #1 – Inter-urban congestion
- Solution Example #1: CVIS Cooperative Travellers Assistance / Enhanced Driver Awareness
- Problem statement #2 – Urban delivery
- Solution Example #2: CVIS Urban Parking Zone booking
- Conclusions

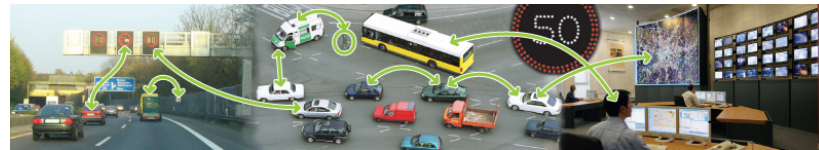
The CVIS project – building the cooperative framework

- **Vision**

- Create a wireless network between vehicles & infrastructure
- Increase efficiency & safety through vehicle-infrastructure cooperation

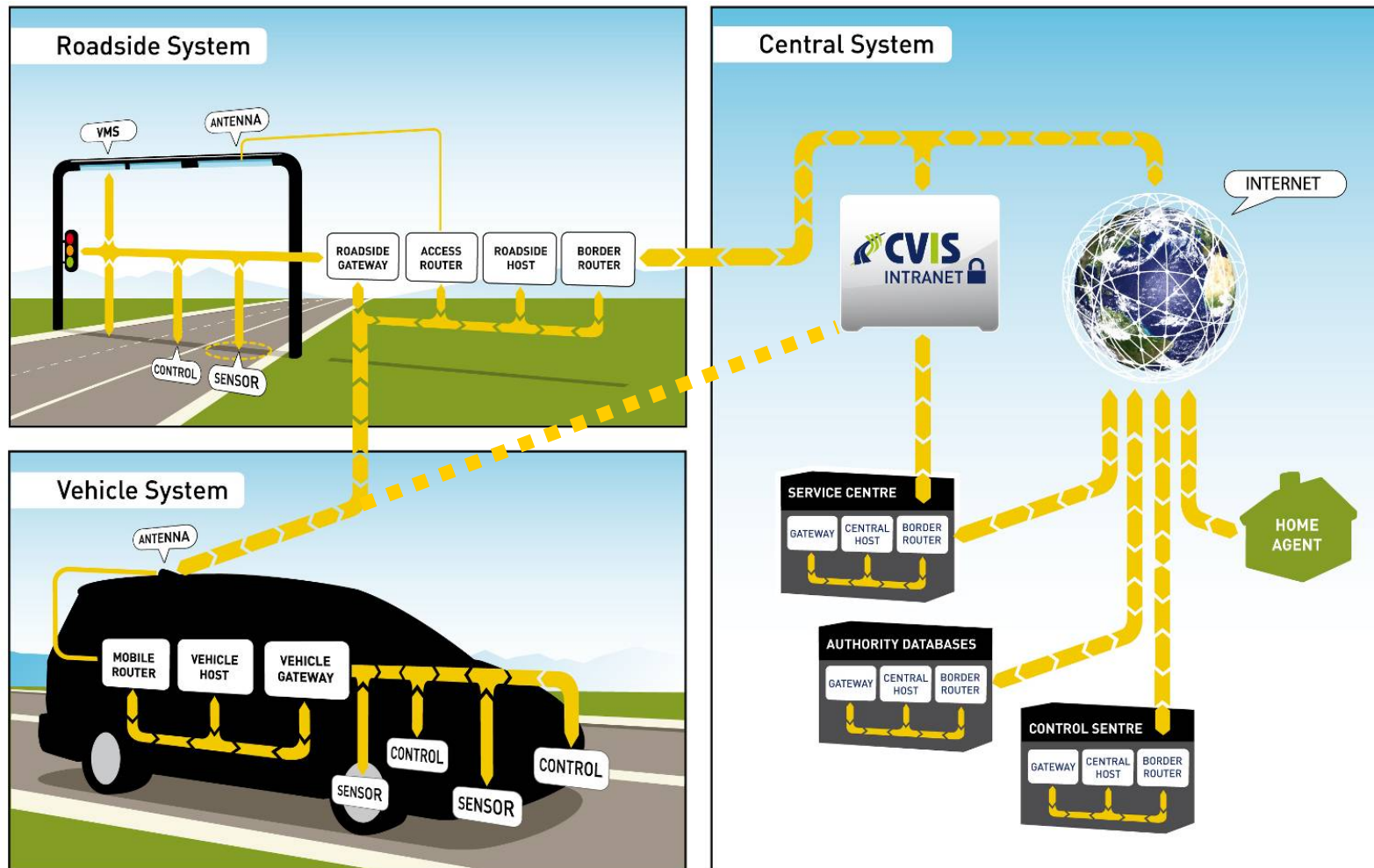
- **Project objectives**

- Develop a rich set of core technologies for Cooperative Systems (communication, positioning, traffic information collection, application middleware)
- Demonstrate a set of sample applications (Urban, Inter-Urban, Freight & Fleet)
- Evaluate deployment factors



Coordinator: ERTICO ITS Europe
Duration: 2006-2010
Total budget: €41 Million / \$ 51 Million
Consortium: 60 partners - 12 countries
Co-funded by the European Commission FP6

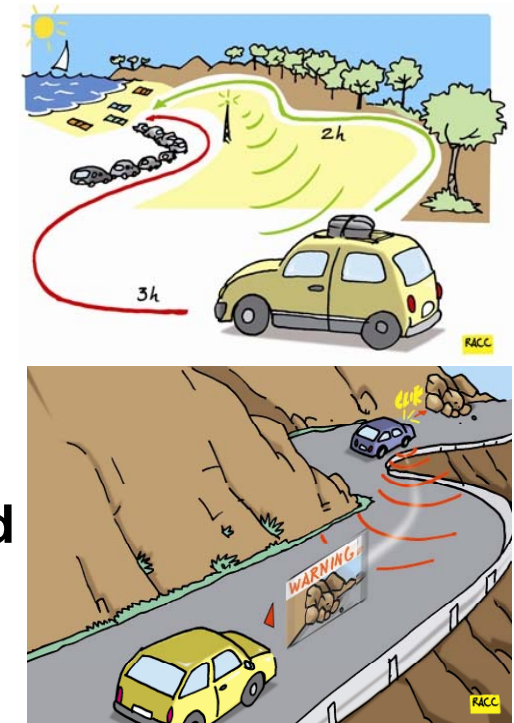
CVIS Architecture overview



Inter urban problem

- The traveller is unaware of upcoming events (roadblocks, congestion, accidents)
- Often gets the information too late (delay 15-30 minutes)
- Get general information
- Does not have a clear vision on alternative roads
- Road authorities do not have the means to address single cars on all cars on a particular road

These points causes even more congestion and leads to unsafe situations



Inter urban solutions

Long- term Cooperative Traveler Assistance

- Create a personal profile and a service provider
- Inform the traveller about the events of his choice and relevance
- Provide direct advice to the driver

Short term – Enhanced Driver Awareness

- Bring information such as speed advice directly in the car < 5 seconds
- Avoid dangerous situations such as a ghost driver by informing the driver immediately

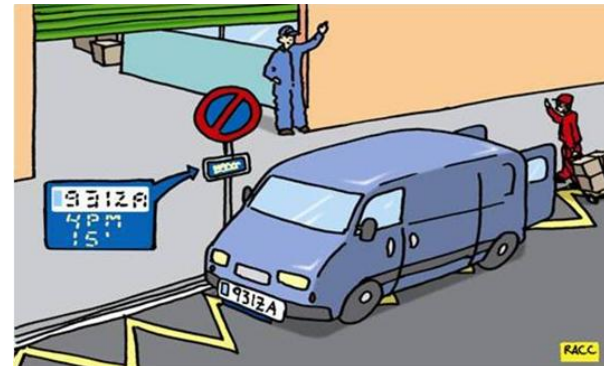
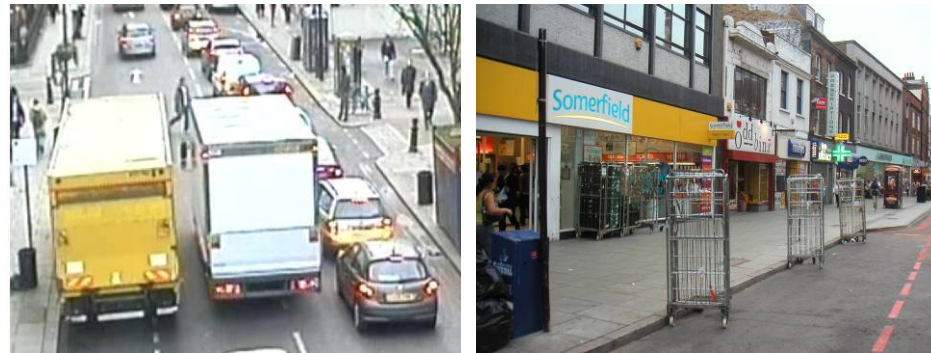
These are examples to contribute to a safer and less congested highways, and will be validated in the CVIS field trials

Problems in urban goods delivery

- **Time to find parking space**
- Lack of adequate (un)loading and parking places for goods vehicles
- **Existing (un)loading places for goods vehicles often blocked by parked cars**
- **Neglect of freight transport issues in town and traffic planning**
- Addresses difficult to find (navigation systems not perfect)
- Traffic regulations (one-way streets, no parking, cities divided in zones, time restrictions etc.)
- Historical city centres with narrow streets and other obstacles
- Integration with the other parts of the supply chain
- **Congestion**
- **Environmental issues, pollution, noise etc.**

UK Test Site Deployment

- Urban Parking Zones Application
- One RSU deployed at a freight loading bay
- 10 OBU's distributed amongst 7 operators
- Evaluation of deployment on a mixed-use urban street (Earl's Court Road, London) with real fleet operators



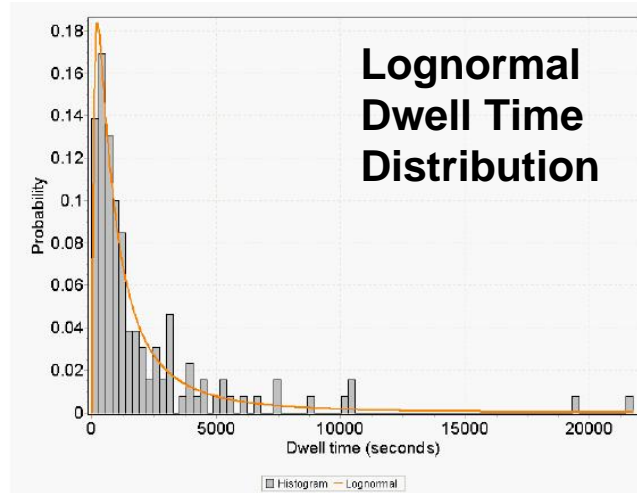
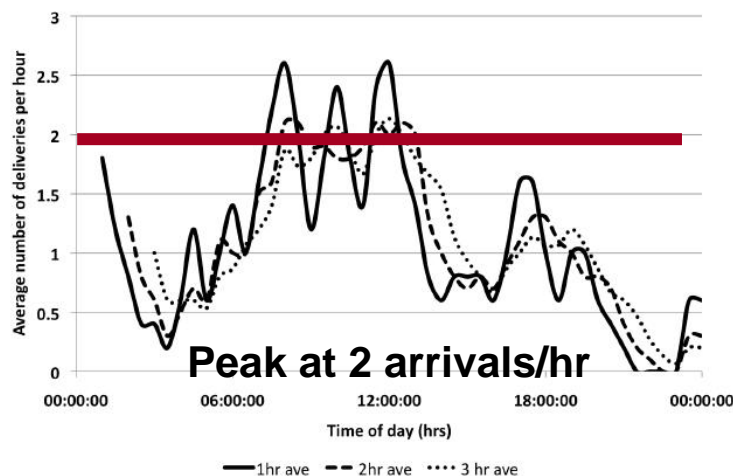
UK Test Site Validation

- Impacts of UPZ application driven by reductions in bay contention:
 - Occupied bays => detours or illegal parking
 - Co-operative bay use => fewer conflicts => increased efficiency
- Evaluate on-street bay activity with & without CVIS
 - Arrival rates, arrival times and dwell times
- Use simulation approach to estimate impacts for different scenarios
 - Impact on freight vehicles
 - Impact on other traffic
- Questionnaires to evaluate user response

Estimating bay contention rates

Source: Robin North, Micael da Costa

Imperial College London Centre for Transport Studies



Realistic distributions selected	4 Arrivals	3 Arrivals	2 Arrivals
	(2 per hr)	(1.5 per hr)	(1 per hr)
Average number of contention instances (from 100 random seeds)	1.82	1.39	0.81
Contention rate (contentions / hr)	0.94	0.695	0.405

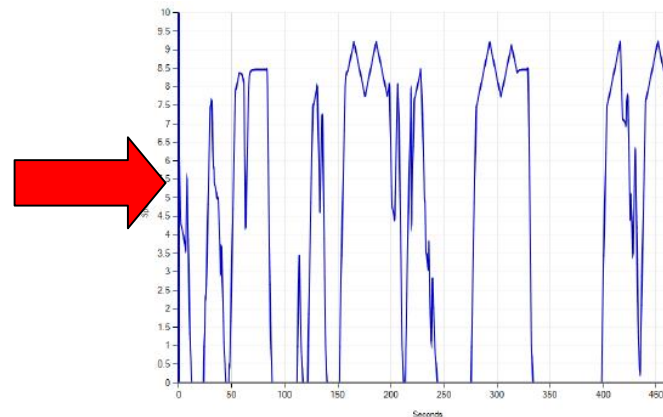
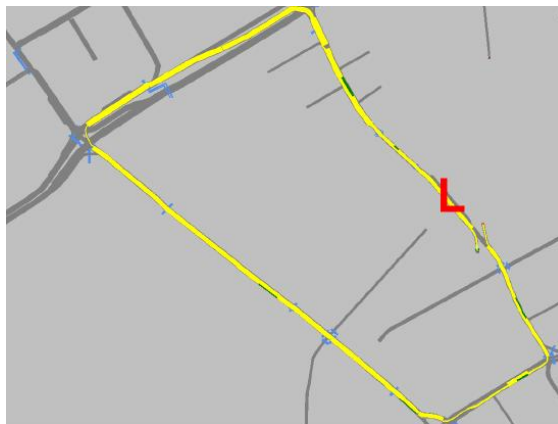
Table 3.7: Average bay contention rate for the three arrival rates

Example: Energy impact of detours

Source: Robin North, Micael da Costa

Imperial College London Centre for Transport Studies

- Use TNO EnViVer emissions estimation tools
- Evaluate fuel/energy costs of detours



	Average CO ₂ emissions	Fuel consumption	Energy wastage ⁶
Large vehicle (HGV)	5095 grams	1.90 litres	20.3 kWh
Small vehicle (LGV)	3311 grams	1.23 litres	13.2 kWh

Conclusions

- Cooperative Systems enables all stakeholders on the transport chain to be “**always connected**”, **share the information** and **target individual vehicles**
- Well informed drivers who can plan their trips in advance and/or quickly adapt to new situations will consume less fuel (=less CO2) and will have a reduced environmental impact
- Co-operation should give benefits to all sides (driver / fleet operator / city authorities). E.g.
 - **Fleet operator:** quicker and more efficient delivery
 - **Shop owner:** more timely delivery
 - **The city:** less search traffic / less congestion, safe / legal parking

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Thank you!

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