IVC – Quo Vadis?

• Strong leadership from car manufacturers
  – Car 2 Car communications consortium
  – Focus on active safety

• Road infrastructure equipment providers and operators
  – Amsterdam Group
  – Eco-mobility & traffic efficiency

• Are we ready for gradual (or massive) deployment?
IVC – Is it reliable enough?

• Sufficient testing? Interference or RF jamming as a threat
IVC – Is it reliable enough?

- Intersection Collision Avoidance application
  - Effective and successful warning probabilities for different channel load levels. Interferer located at 95m from the intersection. Fixed parameters: $P=17$dBm, $F=10$Hz, $R=6$Mbps

![Graphs showing probability of effective, successful, and last-minute warnings against CBT percentages.](image-url)
IVC – What is the value of a packet?

• Major concern is scalability: need for optimization
  – What is the value of a packet? Depends on the application

M. Sepulcre, J. Gozalvez, J. Harri, H. Hartenstein, "Application-Based Congestion Control Policy for the Communication Channel in VANETs", IEEE Communications Letters, October 2010
IVC – What is the value of a packet?

• Major concern is scalability: need for optimization
  – What is the value of a packet? Depends on the application and the context

IVC – What is the value of a packet?

- Major concern is scalability: need for optimization
  - Value estimation at the receiver or the transmitter?

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IVC – Quo Vadis?

• Major achievement: placing comms as a relevant part of vehicles
  – Vehicles are no longer isolated but part of the Internet of Things (IoT)
  – Vehicles can provide very useful data...but will not be the unique actor

• Vehicular cyber physical cloud computing (CPCC): information acquisition from vehicles or personal devices interfacing with vehicle
Vehicular CPCC: another scalability problem?
- Vehicular CPCC: another scalability problem?
  - How much data is really necessary for CPCC services?
  - How can we efficiently transmit the info from the cars?
  - Where is the intelligence taking place: where do we aggregate/fuse the information?
  - Where is the control of the data and who is responsible for effectiveness and consistency of info extracted and delivered?
• Vehicular CPCC: opportunities offered by heterogeneous comms

• **Vehicular CPCC**: opportunities offered by heterogeneous comms

There is no single winning V2I technology...even for mobile/portable communications
  – Will it also be the case for V2V?

Benefits from combining advantages of different technologies and communication modes

Life cycle of comms and mobile devices vs cars
  – Open XC: ‘Democratization of innovation’ (K. Venkatesh Prasad, Ford Research and Innovation)
  – Sharing data allows discovering/building things that individually was not possible
• Time to further develop VC-based infrastructure nodes?
• Is it time to also start discussing about legislation, liability, insurance, etc?
  – An interactive environment (like societies) requires the definition of rules and responsibilities