c2R
Traffic efficiency and safety system

COM2REACT
COoperative CoMmunication System
TO Enhanced Safety And EffiCiency
In European Road Transport

Project Presentation
Paris, 26th October 2007

Project Overview

Dr. Chanan Gabay
Motorola Israel

MOTOROLA   TRANSVER   INRIA   PSA PEUGEOT CITROËN   Intempora   Sphericon Ltd.

ARTTIC   TUM vt   MINES PARIS   everis   Jerusalem Transportation Master Plan   Telefónica TELEFÓNICA INVESTIGACIÓN Y DESARROLLO   NAVTEQ

COM2REACT Partners

MOTOROLA

V2C Communication

ARTTIC

Project Management

TRANSVER

VSC & Traffic Model

VT-TUM

Traffic Simulation &
Hazard Assessment Model

INRIA

Networking & Experiment

ARMINES

Sensors & Experiment

EVERIS

Business Model

PSA PEUGEOT CITROËN

In Car System Support

Telefónica – I+D

V2V Communication System

NAVTEQ
Digital Map & Map-Matching

INTEMPORA
In Car SW Integration

Sphericon
Driver Alertness Sensor

Jerusalem Transportation
User Needs Definition

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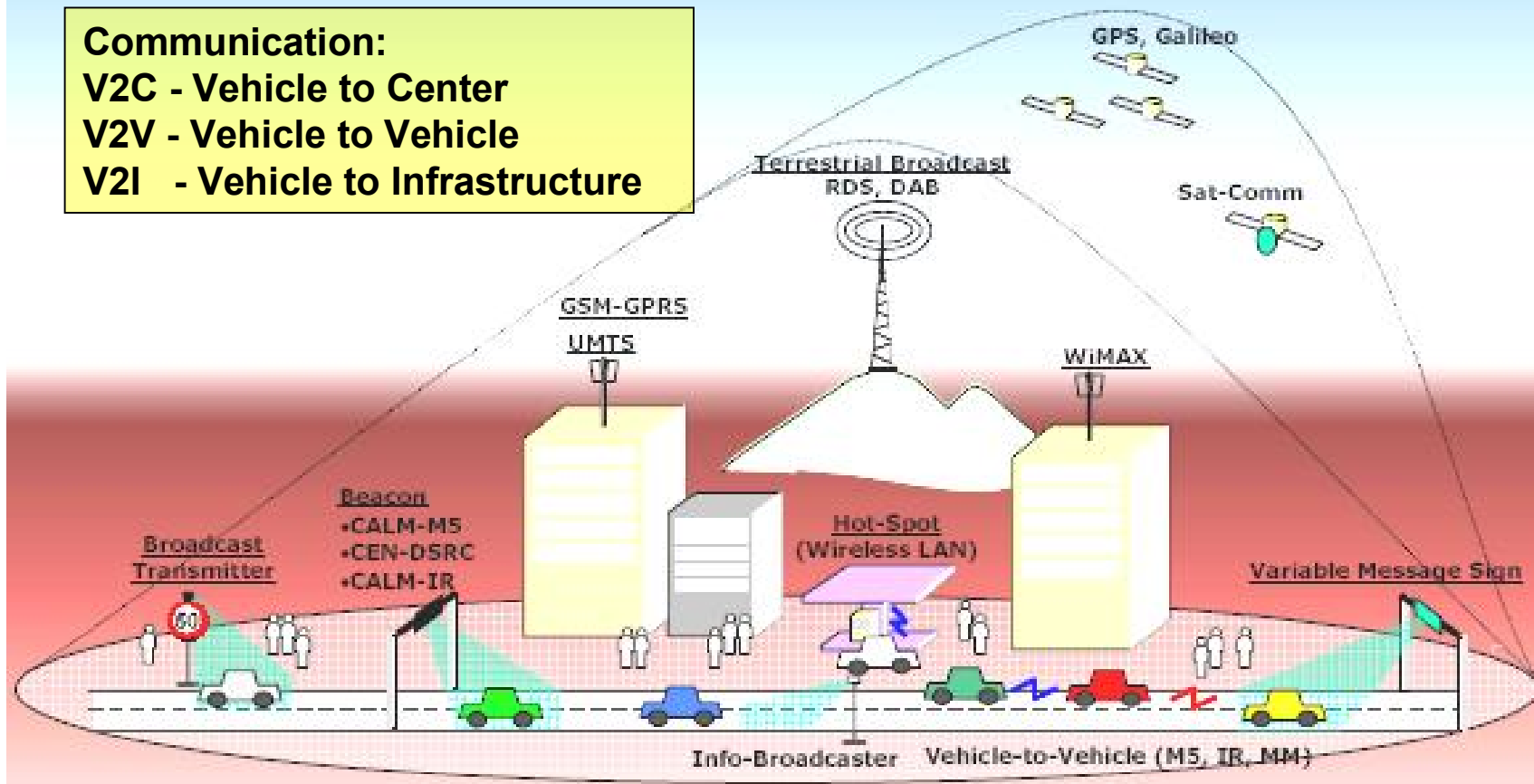Traffic efficiency and safety system

ITS – Intelligent Transportation Systems

Communication:
V2C - Vehicle to Center
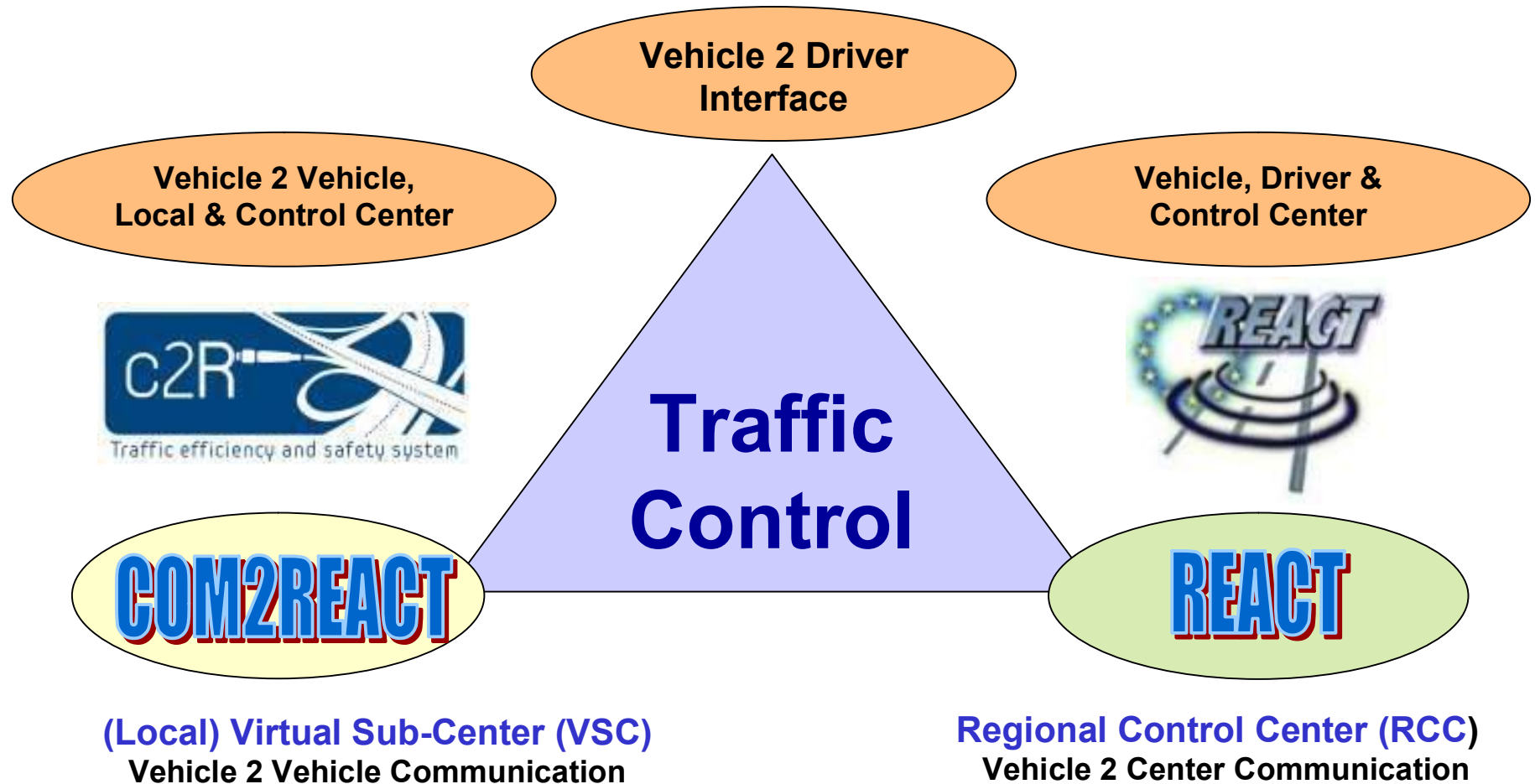V2V - Vehicle to Vehicle
V2I - Vehicle to Infrastructure

Vision: ITS technology **improve safety by managing traffic**
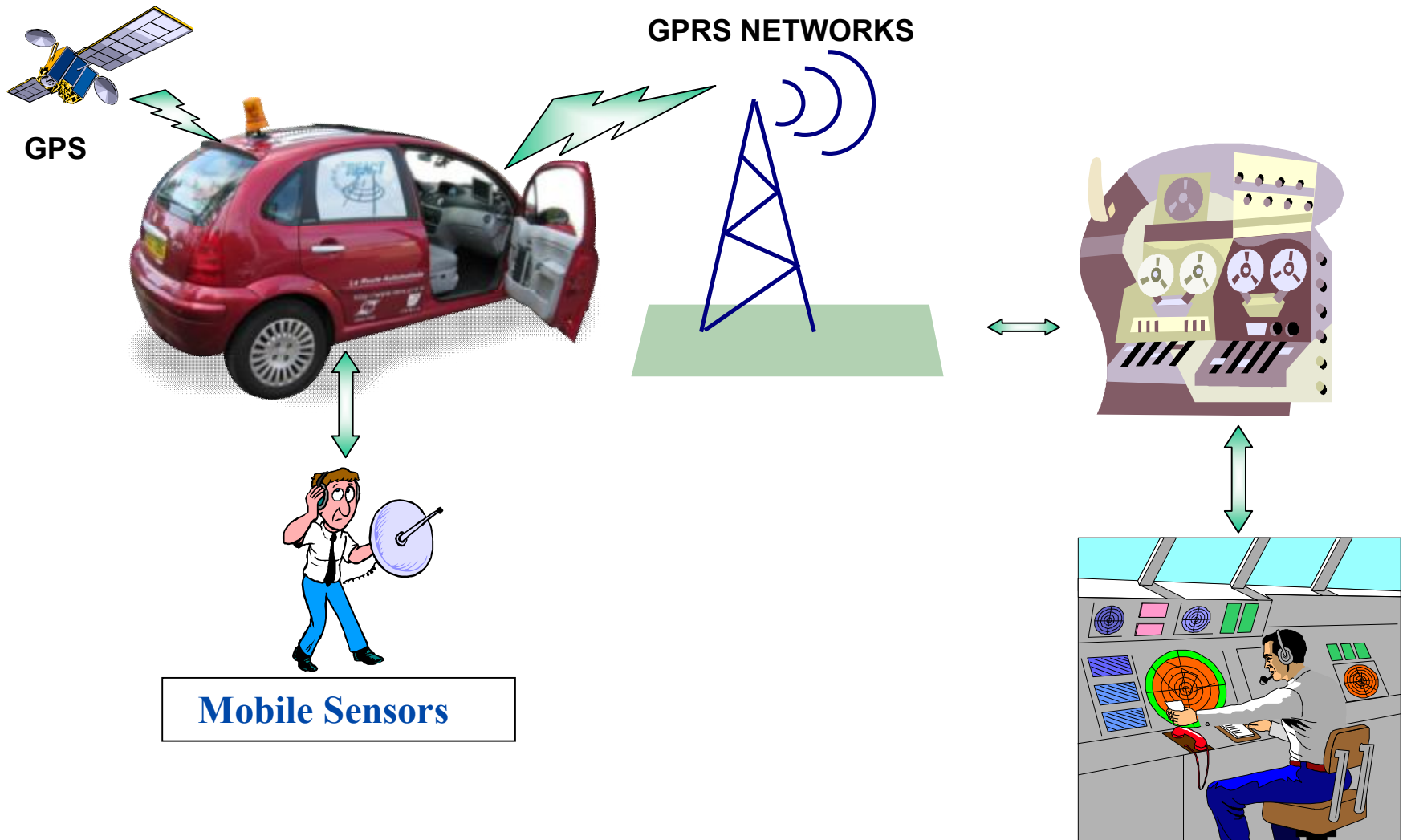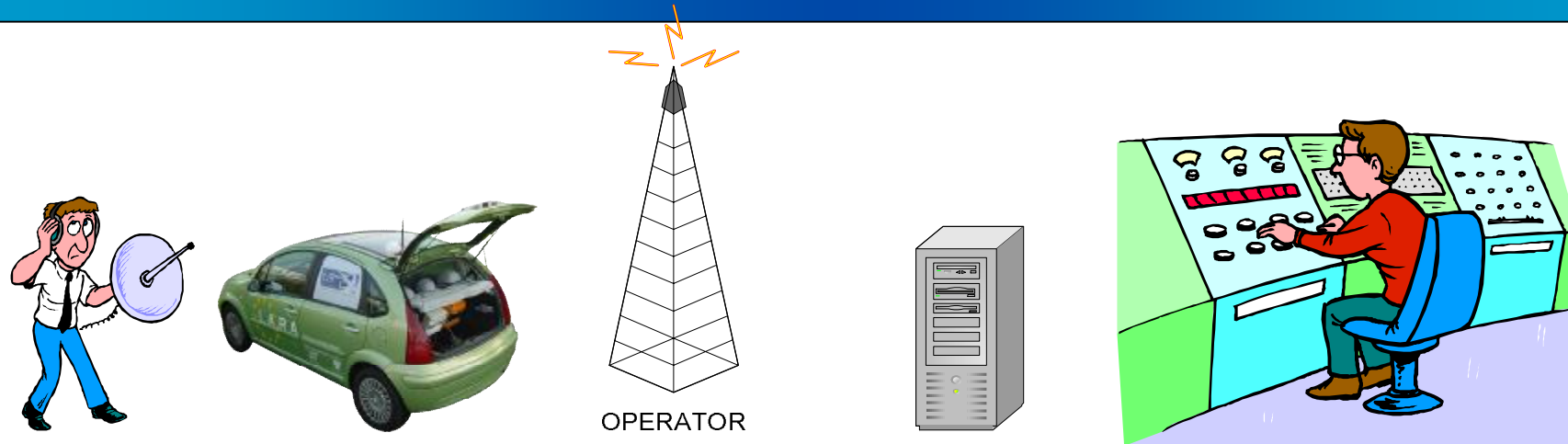Within the same road infrastructure

C2R Future is in M2M Networking

living

moving

driving

working

Out in...

MOBILE ME

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Traffic Management Models

Vehicle 2 Driver Interface

Vehicle 2 Vehicle, Local & Control Center

Vehicle, Driver & Control Center

Traffic Control

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REACT

(Local) Virtual Sub-Center (VSC)
Vehicle 2 Vehicle Communication

Regional Control Center (RCC)
Vehicle 2 Center Communication

Road and Environment Mobile Sensors

GPRS NETWORKS

GPS

Mobile Sensors

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Data Flow from Vehicle to Center

OPERATOR

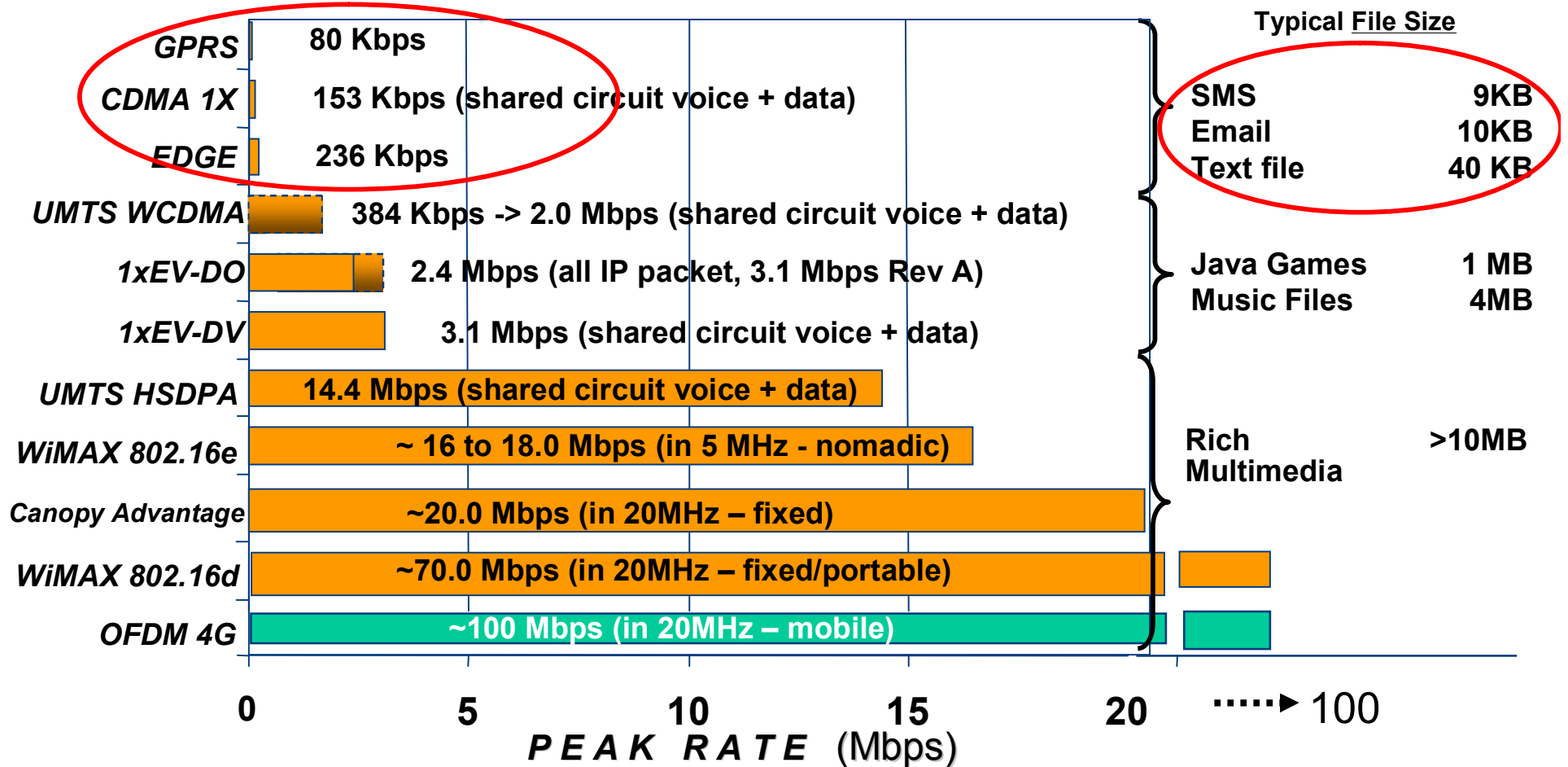| Mobile Sensors | Data Capture, Analysis, Store & Forward | Communication | Data, Network Management | Traffic Management | Service Provider |

MINES PARIS

RINRIA

Intempora

NAVTEQ

Sphericon Ltd.   TRANSVER

vt TLM

PSA PEUGEOT CITROËN

Telefónica

RINRIA

TRANSVER

Intempora

TRANSVER

vt TLM

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The Wireless Evolution

WPAN

WLAN

WMAN

4G

3G, 3.5G
Over 2B
users

2G, 2.5G
600M users

1G
Less than
10M users

• Broadband
• 2 Mbit/s
• Multimedia
• Packet oriented

• Digital
• 160Kbit/s
• WAP

• Analog
• 9.6kbps
• Voice only

1980   1990   2000   2010
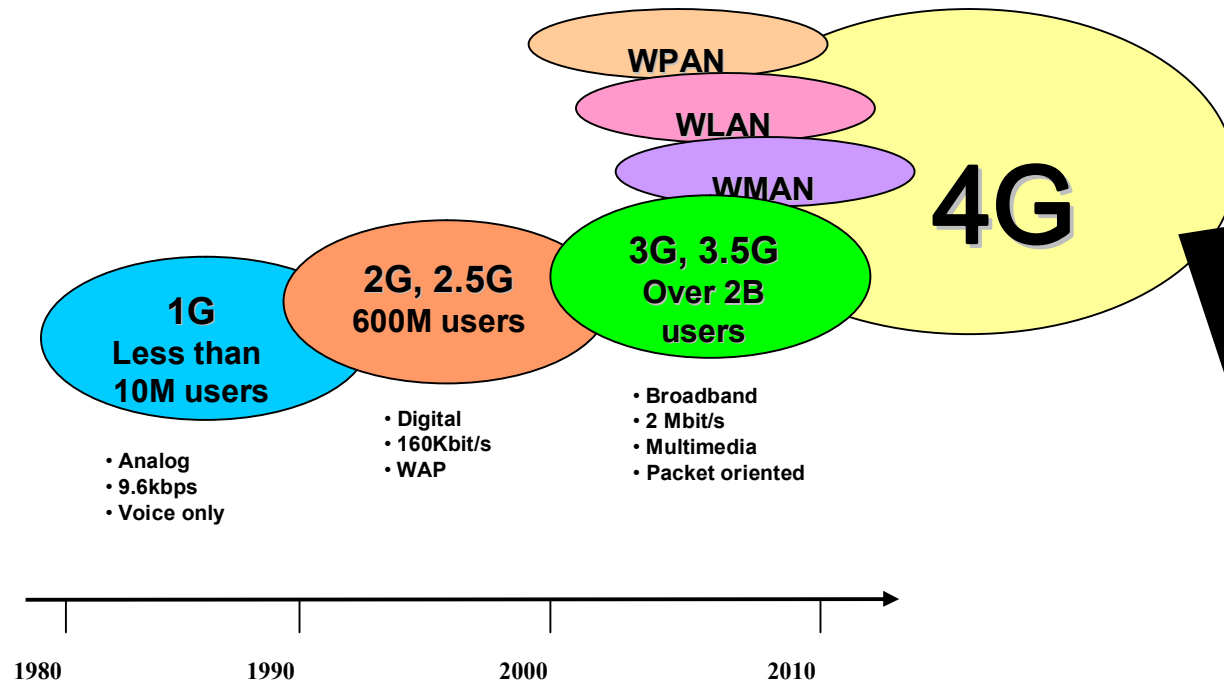
What is the optimal technology to be selected ?

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V2C Application Needs

PEAK RATE (Mbps)

Technology	Peak Rate
GPRS	80 Kbps
CDMA 1X	153 Kbps (shared circuit voice + data)
EDGE	236 Kbps
UMTS WCDMA	384 Kbps -> 2.0 Mbps (shared circuit voice + data)
1xEV-DO	2.4 Mbps (all IP packet, 3.1 Mbps Rev A)
1xEV-DV	3.1 Mbps (shared circuit voice + data)
UMTS HSDPA	14.4 Mbps (shared circuit voice + data)
WiMAX 802.16e	~ 16 to 18.0 Mbps (in 5 MHz - nomadic)
Canopy Advantage	~20.0 Mbps (in 20MHz – fixed)
WiMAX 802.16d	~70.0 Mbps (in 20MHz – fixed/portable)
OFDM 4G	~100 Mbps (in 20MHz – mobile)

Typical File Size

SMS	9KB
Email	10KB
Text file	40 KB
Java Games	1 MB
Music Files	4MB
Rich Multimedia	>10MB

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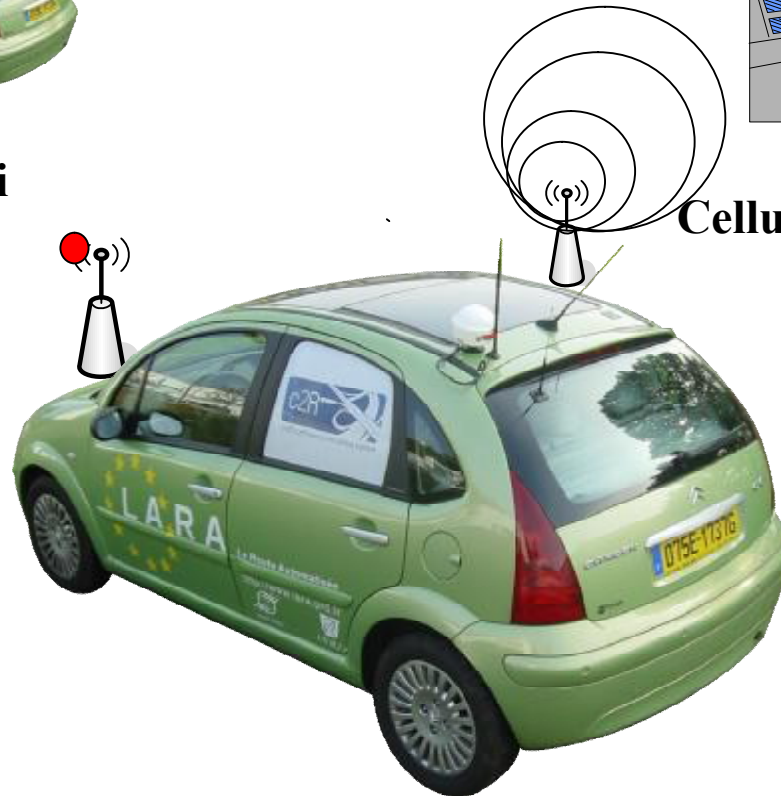Traffic efficiency and safety system

V2C

V2V

WiFi

Cellular

Muni-WiFi – next to the door

> **Mesh and Muni Wi-Fi are expanding Wi-Fi's reach**

- Lots of high-profile announcements
  - Philadelphia, London, Chicago, San Francisco, Taipei
  - Variety of smaller scale deployments in place today
- Enabling coverage from large campus deployments to cities
- Various pricing models in play
- This will be an interesting space to watch

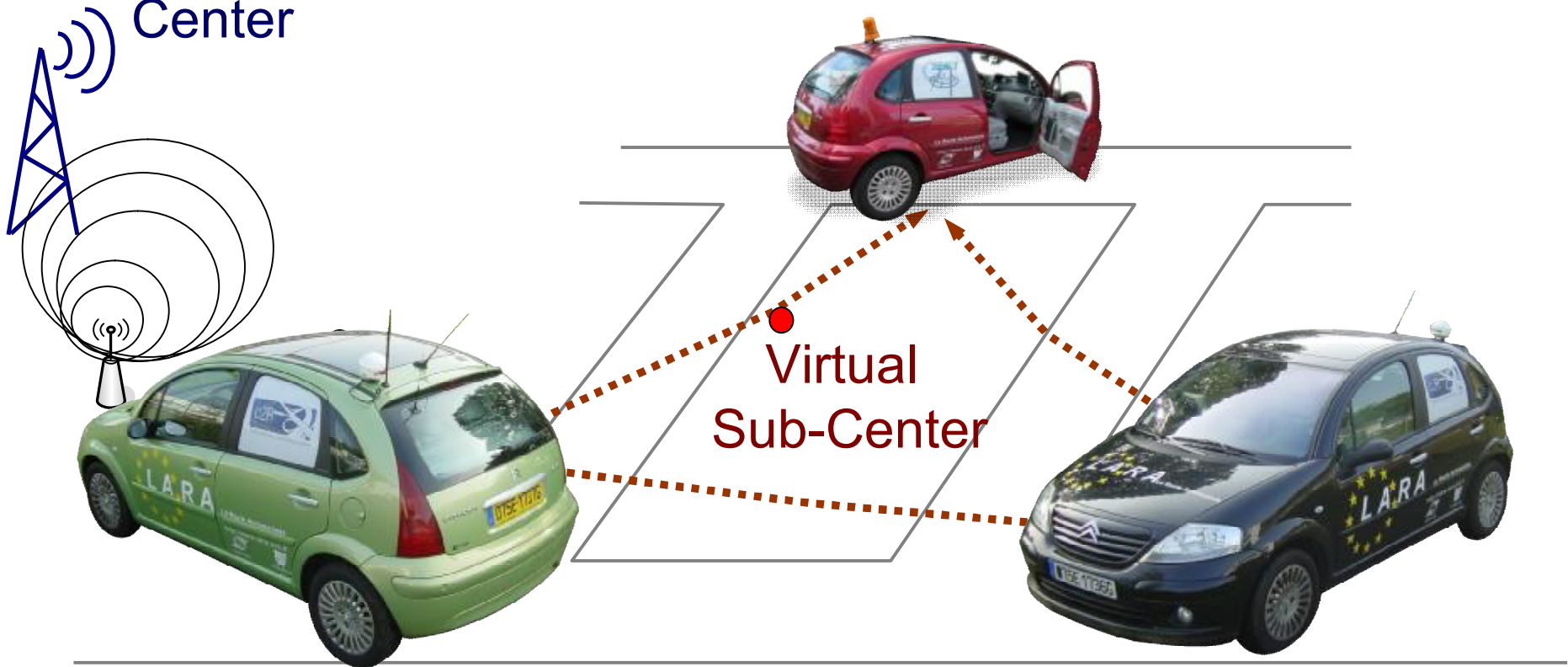*By 2010, Muni-Wi-Fi networks will cover 126,000 sq. mi.*

Seamless Mobility Challenge

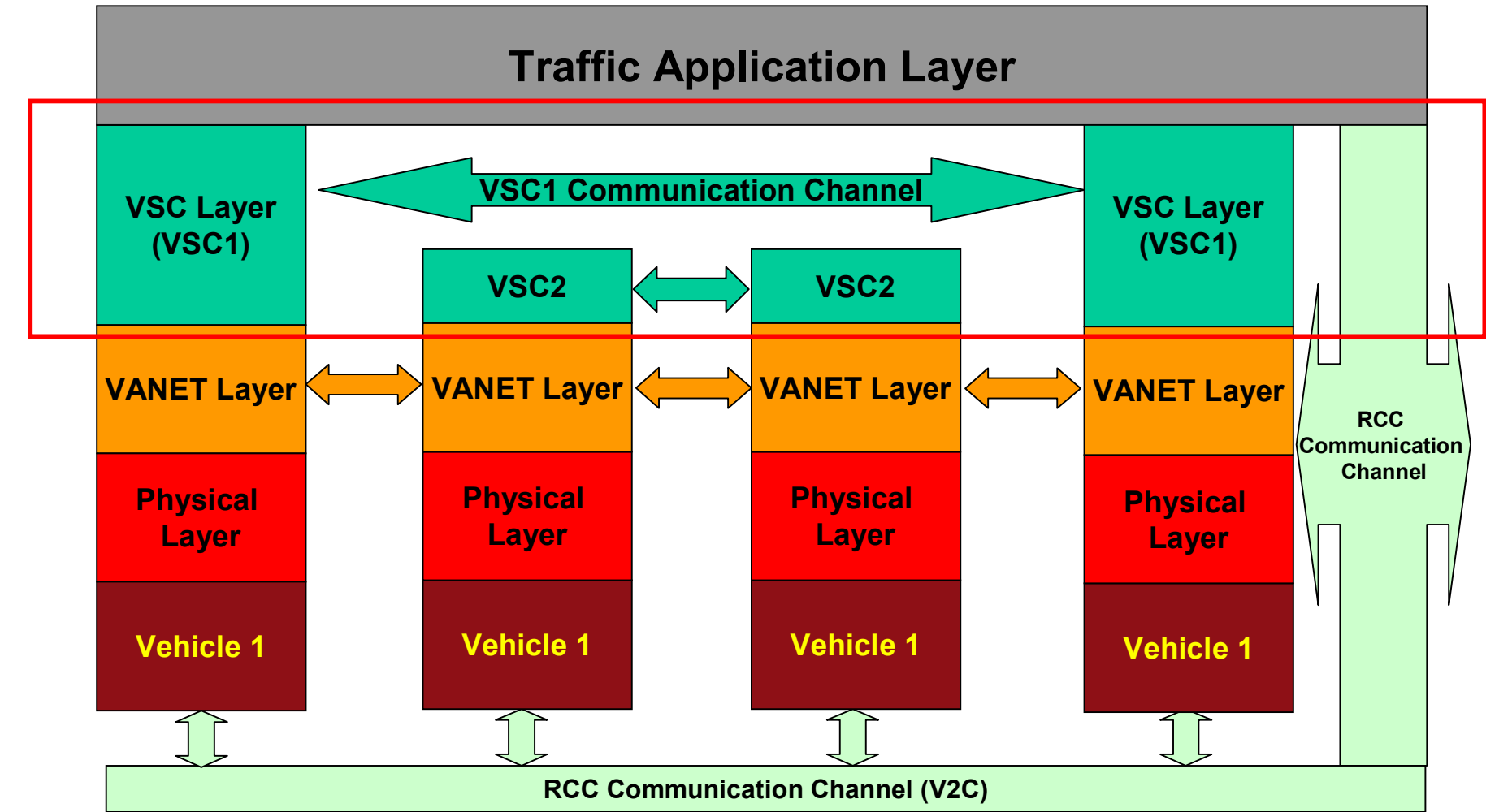**COM2REACT**
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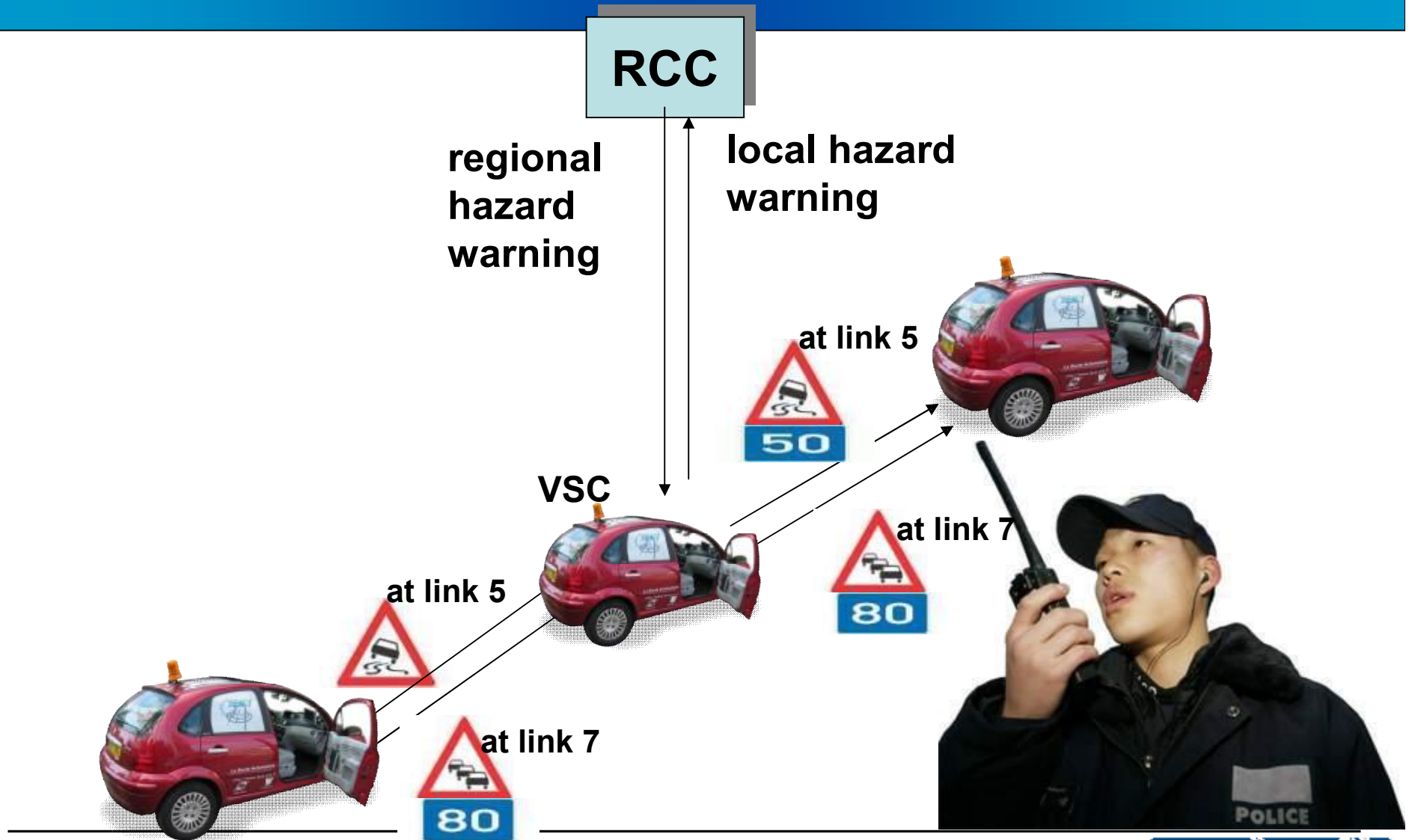Traffic efficiency and safety system

VSC – Virtual Sub-Center

Regional Control Center

Virtual Sub-Center

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C2R System Layers

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Traffic flow Control

RCC

regional hazard warning

local hazard warning

at link 5

50

VSC

at link 5

at link 7

80

at link 7

80

POLICE

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Collision warning

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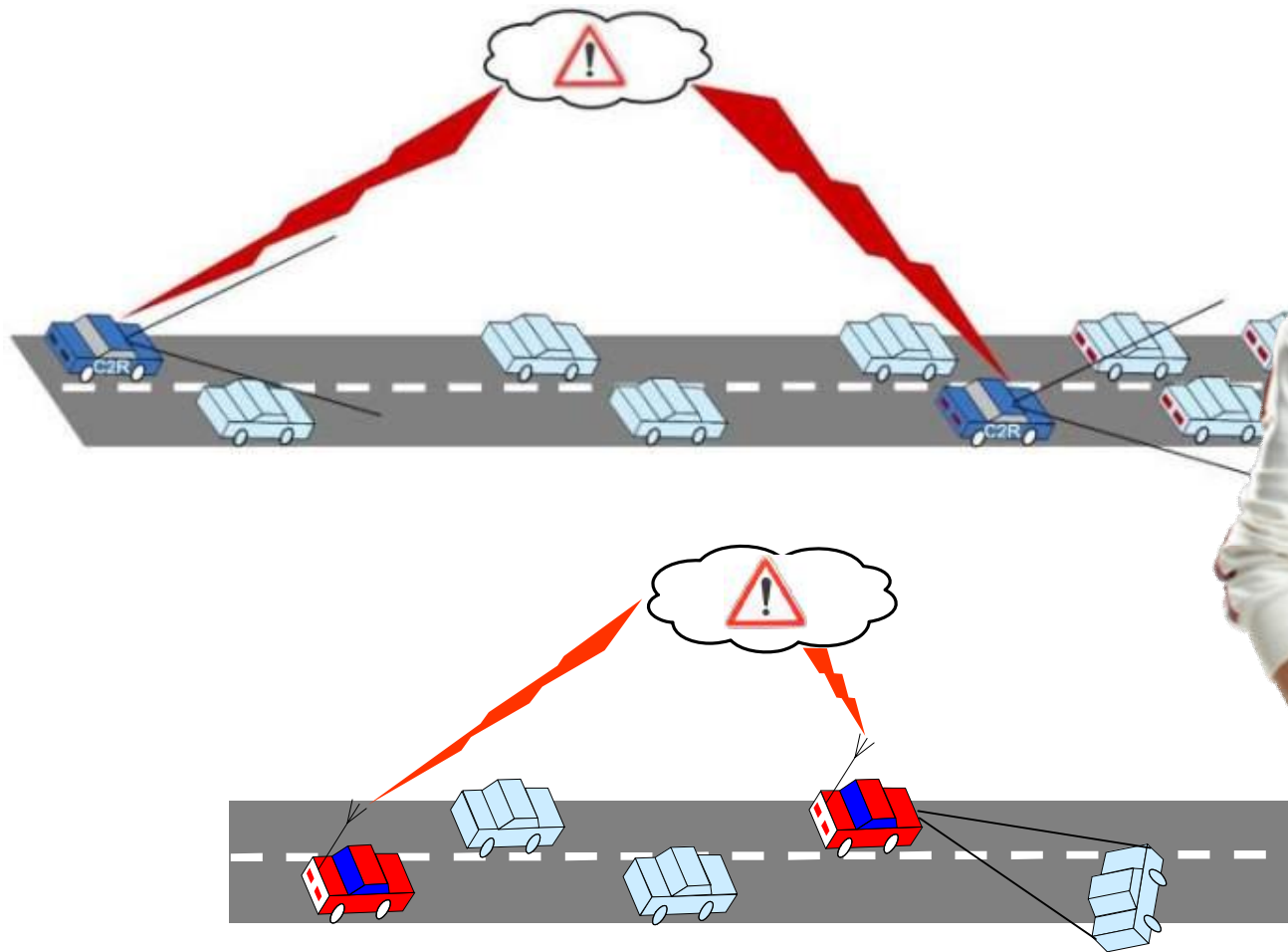
V2V + V2C:
Environmental monitoring & prediction
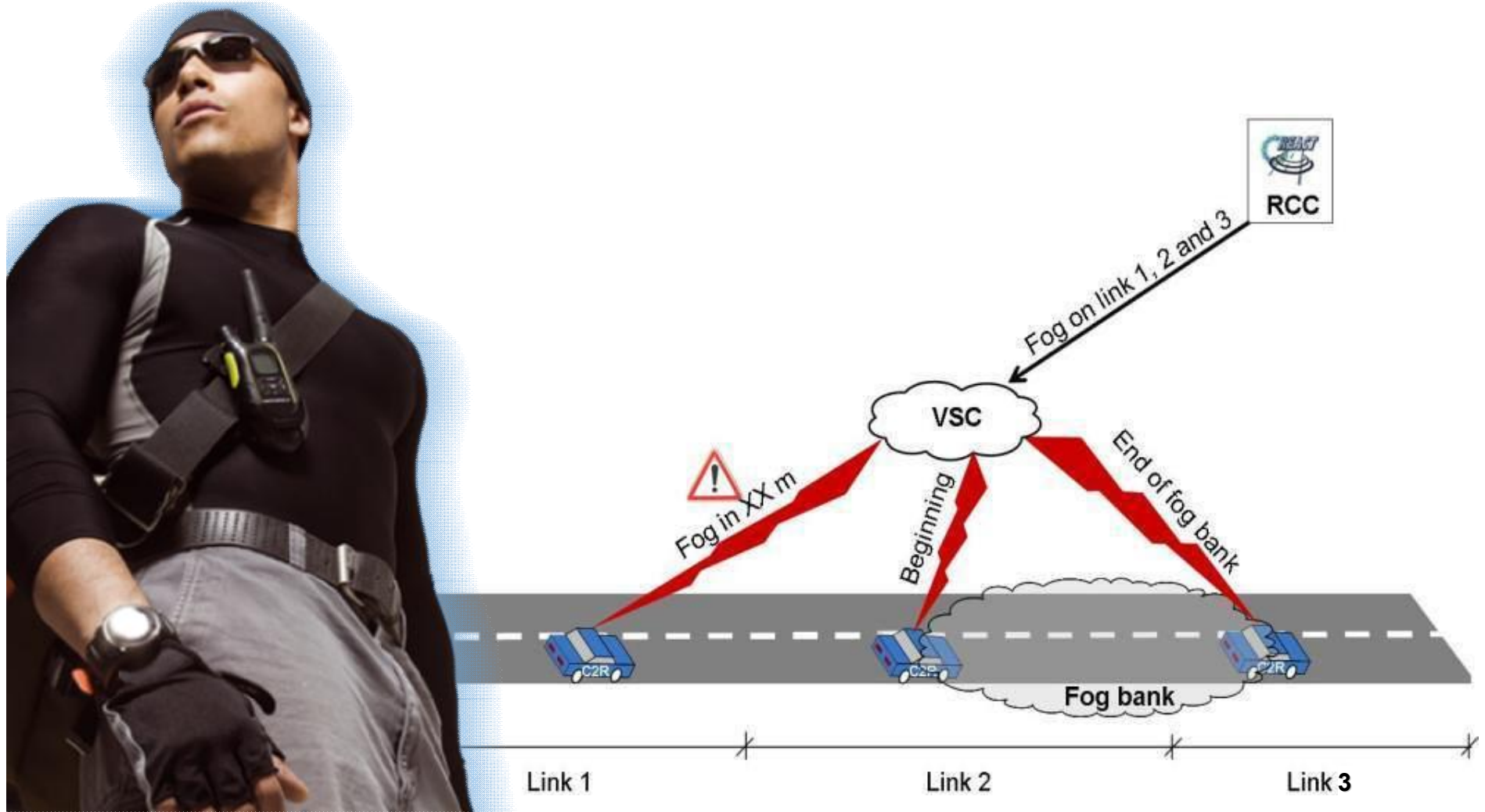
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Agenda

09:30 – 09:45	Dr. Arnaud de La Fortelle - Welcome/Greetings
09:45 – 10:00	Dr. Chanan Gabay - Project overview
10:00 – 10:20	**Dr. Eleonora Mincheva – VSC concept**
10:20 – 10:40	Dr. Arnaud de La Fortelle – VSC technology
10:40 – 11:00	Prof. Fritz Busch - VSC traffic efficiency & safety impact
11:00 – 11:15	Prof. Claude Laurgeau - Technological achievements
11:15 – 11:30	Cesar Moro – C2R Business model
11:30 – 13:00	On-site Exhibition demonstration & Refreshments

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