

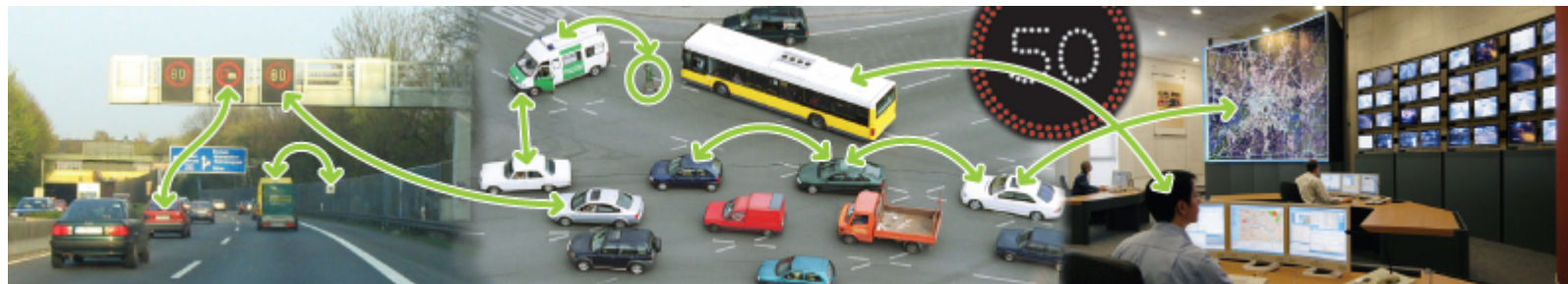


**VOLVO**

# Cooperative Vehicle-Infrastructure Systems - the CVIS project

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Volvo Technology

**CVIS**





# Cooperative Systems Development



Coordinator: **ERTICO**  
Total budget: € 41 Million  
EC contribution: € 22 Million  
Consortium: 60 partners - 12 countries

Core Technologies



Coordinator: **Fiat Research Centre**  
Total budget: € 38 Million  
EC contribution: € 20,5 Million  
Consortium: 51 partners - 12 countries

Car-Makers View



Coordinator: **AustriaTech**  
Total budget: € 16,8 Million  
EC contribution: € 9,6 Million  
Consortium: 37 partners - 14 countries

Road-Operators View

Cooperation links to: **SISTER, SeVeCom, COMeSafety, Car-2-Car Communications Consortium (C2C-CC), Network on Wheels (NoW), INVENT, ACTIV (Germany), CVHS (UK), IVSS (Sweden)**





# CVIS Vision



“Create a wireless network between vehicles & infrastructure”

“Increase efficiency & safety through vehicle-infrastructure cooperation”



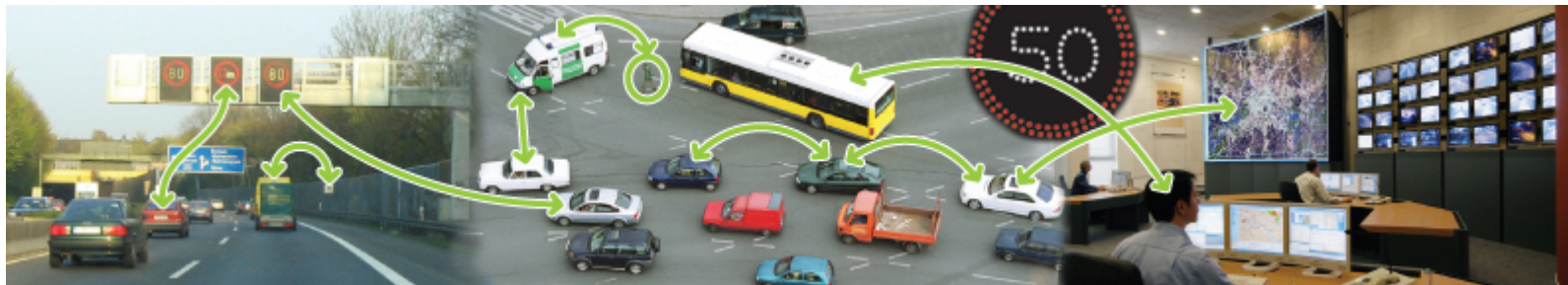
# CVIS Project Objectives



- **Create pre-requisite conditions for widespread take-up of cooperative vehicle-infrastructure systems & services**
  - open, standards-based communications/ positioning/networking platform for both in-vehicle and RSU
  - use all suitable comms infrastructure (existing & new)
  - continuous (IP) connection V2V, V2I
  - harmonised core application/service software
  - range of attractive services - safety, efficiency, user
  - positive business case for authorities, operators, service providers, manufacturers - and for user
  - sustainable deployment road-map, no show-stoppers



# CVIS Applications





# Cooperative Urban Applications

CURB focuses on the urban area, three applications can be distinguished:

## 1) Traffic Control

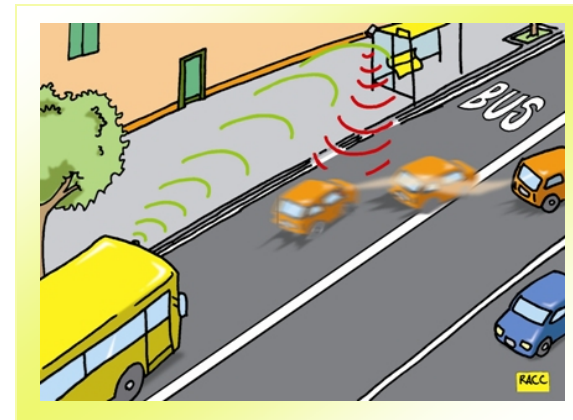
- Priority Mechanism (e.g. emergency vehicles)
- Intersection Speed Recommendations and Green Demands

## 2) Traffic Management

- Strategic traffic management with dynamic routing services

## 3) Public transport

- Interaction of private vehicles with PT (esp. lane sharing).





# Cooperative Inter-Urban Applications

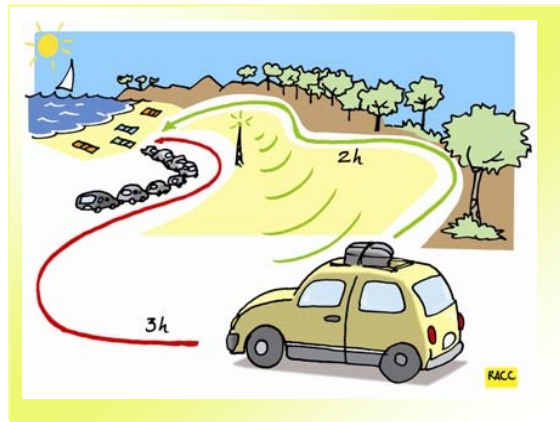
CINT focuses on the interurban environment, two applications can be distinguished:

1) Co-operative Traveller Assistance (CTA)

- Provision of traffic information and rerouting advices to end users
- Strategy planning and implementation for traffic managers and road operators

2) Enhanced Driver Awareness (EDA)

- Provision of safety relevant traffic information to the end user

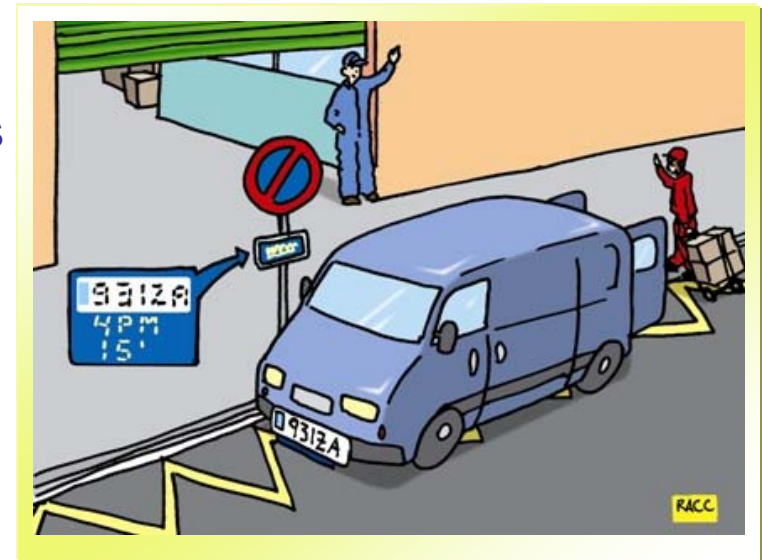




# Cooperative Freight & Fleet Applications

CF&F is focussing on HGV and DGV transports, three application areas can be distinguished here:

- 1) **Dangerous Goods (DG) Application**
  - Route guidance and network management for dangerous goods vehicles
  
- 2) **Parking Zone Application**
  - Booking of urban parking zones and interurban resting areas
  
- 3) **Access Control Application**
  - Access Control for defined sensitive areas on basis of vehicle characteristics

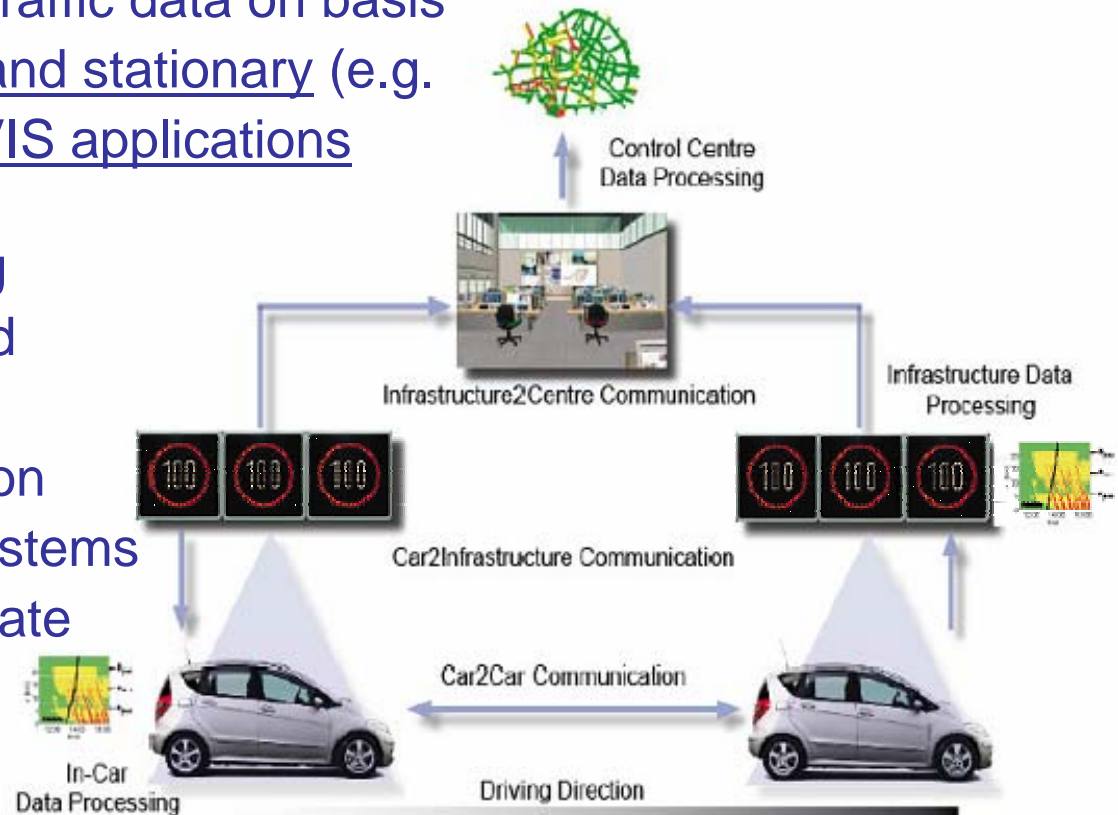




# Cooperative Monitoring

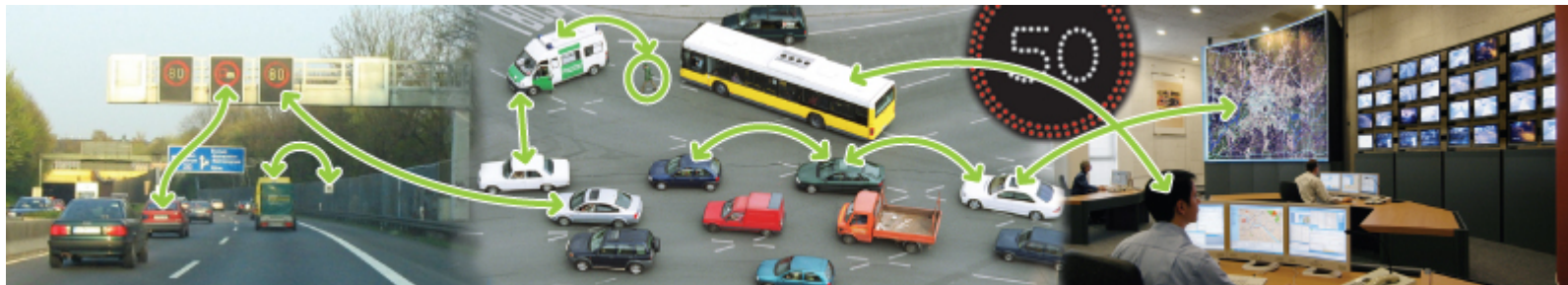
COMO provides merged traffic data on basis of mobile (XFCD/EFCD) and stationary (e.g. loops) detectors for all CVIS applications

- Network monitoring
- Incident and hazard detection
- Virtual loop detection for traffic control systems
- Local/area traffic state

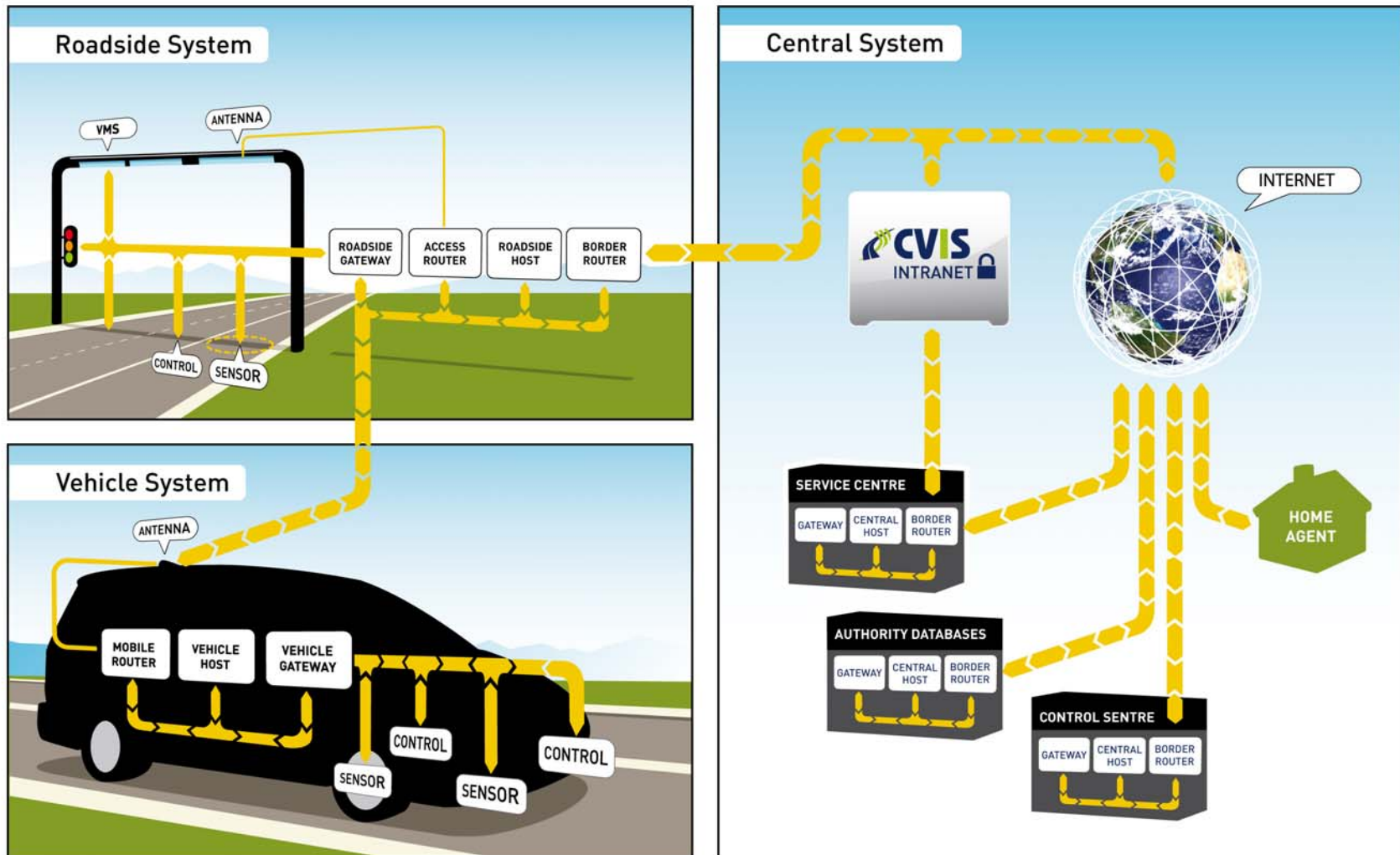


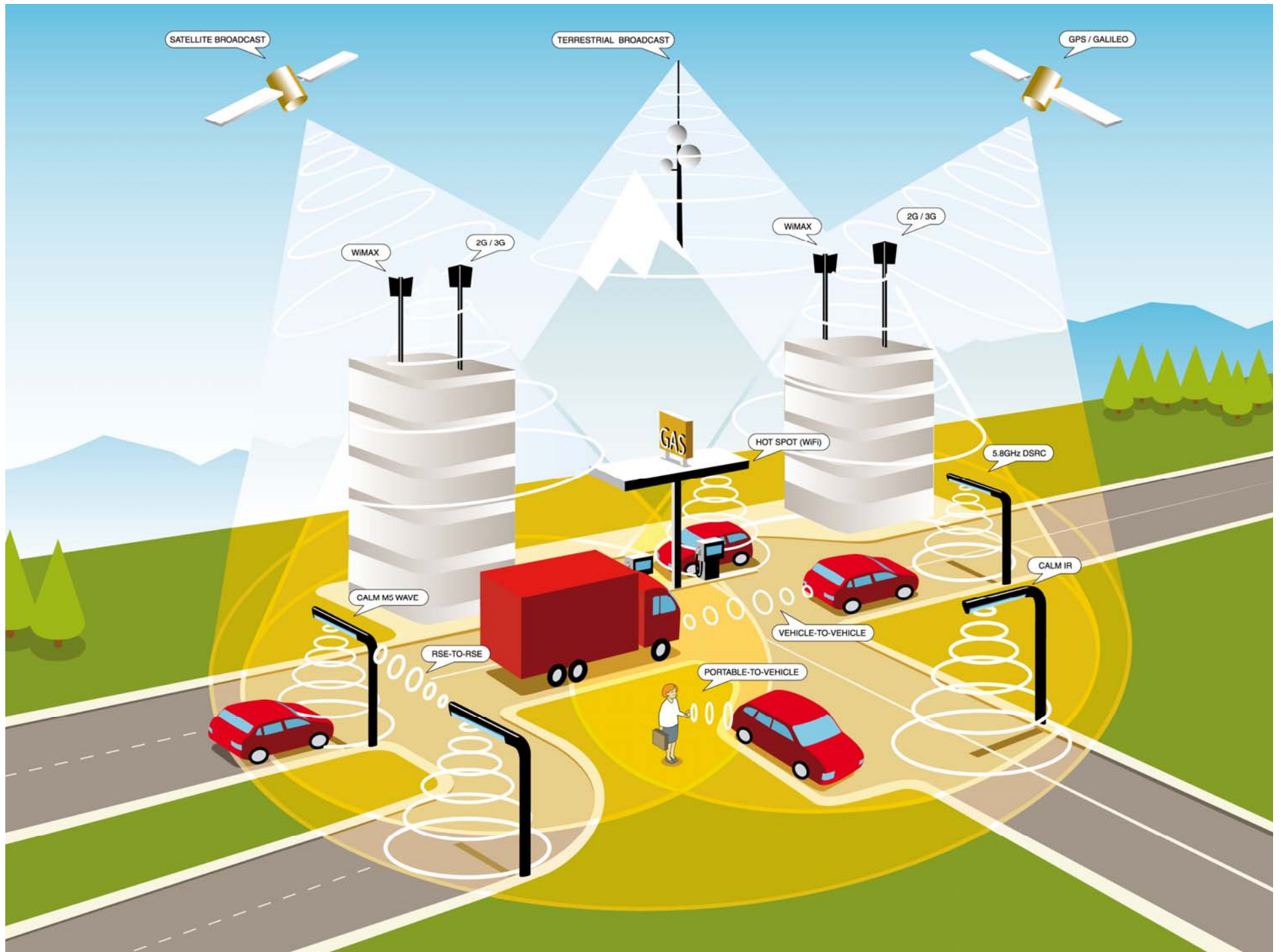


# CVIS Architecture



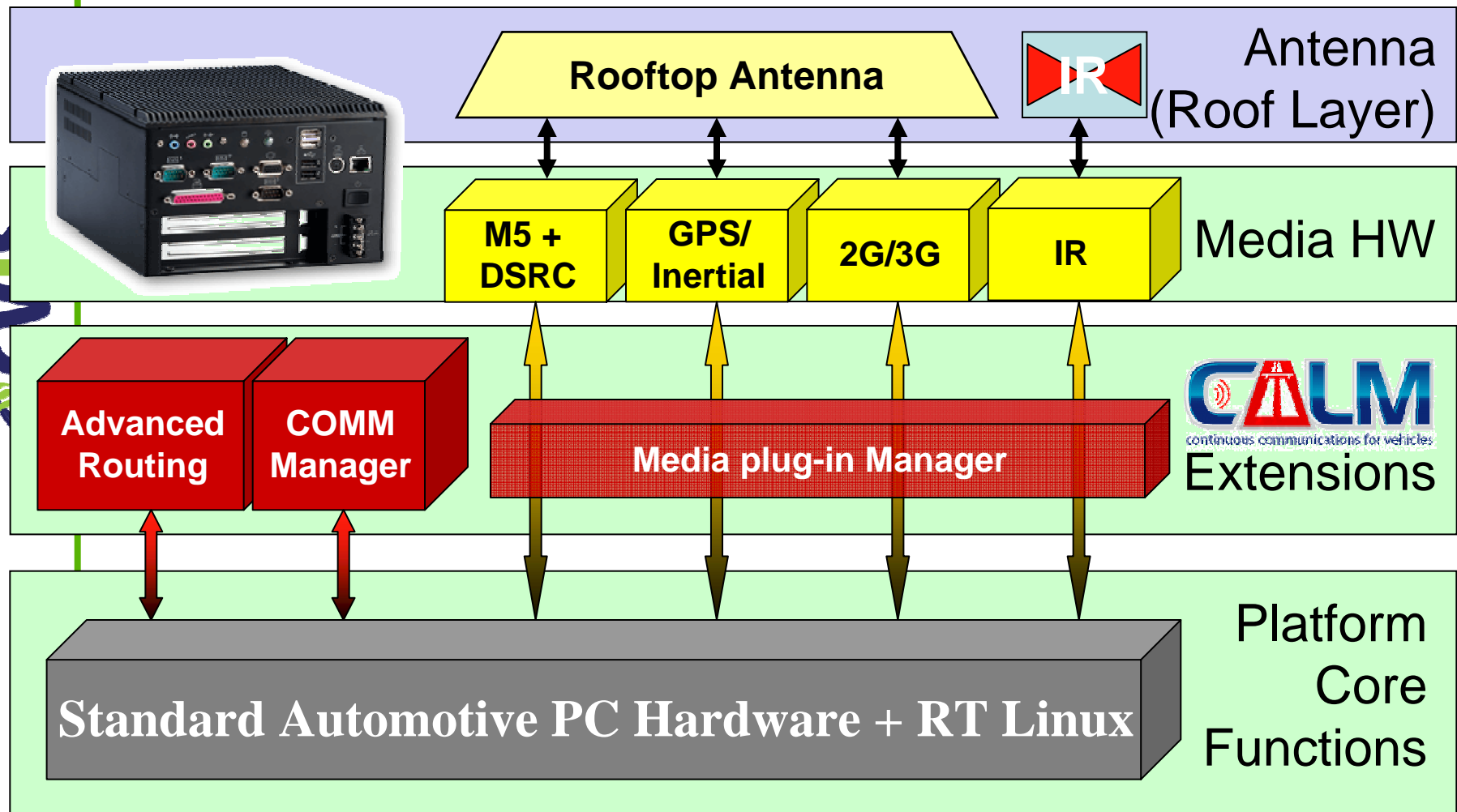
# CVIS Top level Architecture





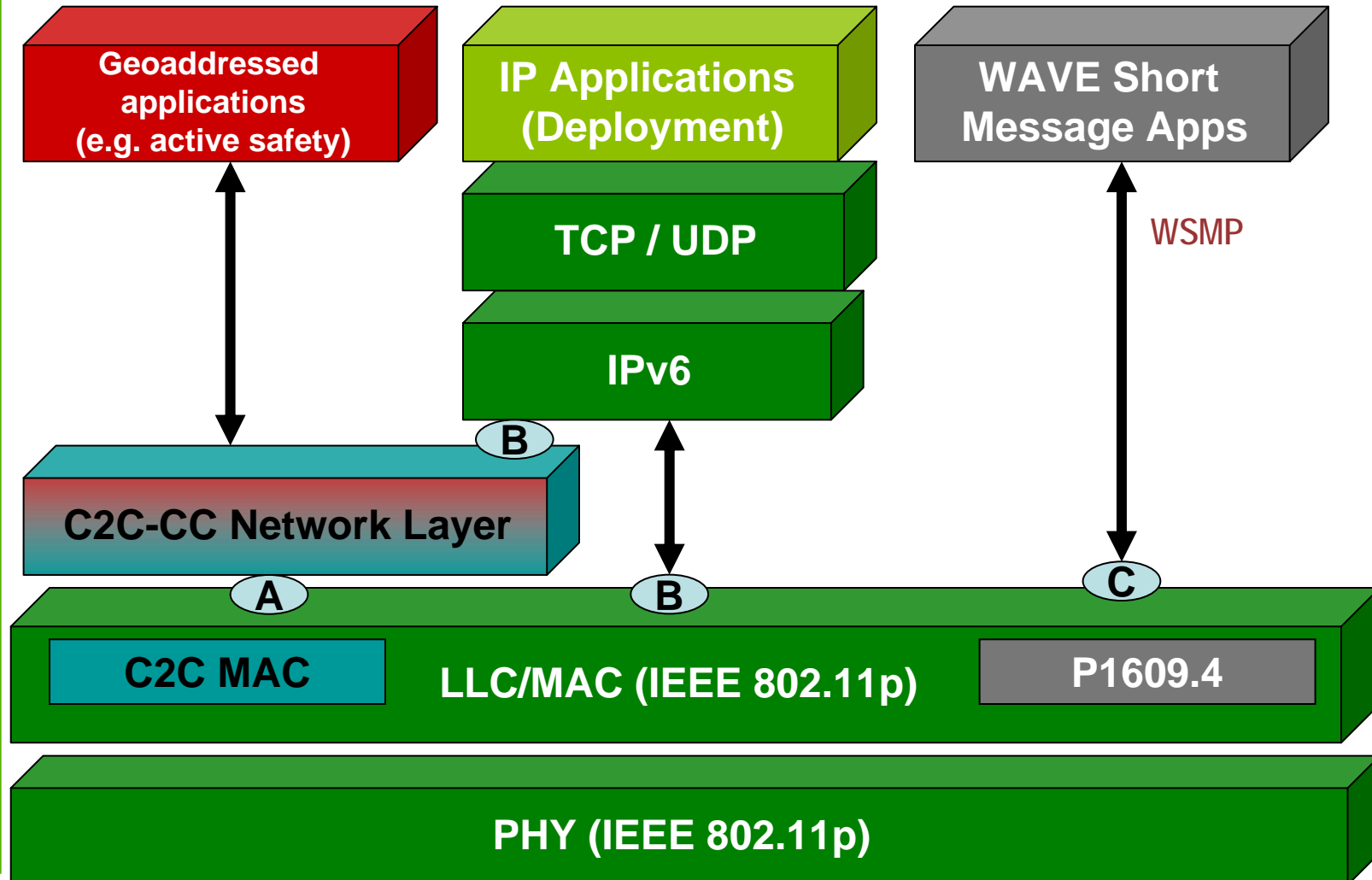


# CVIS Router Platform Layers



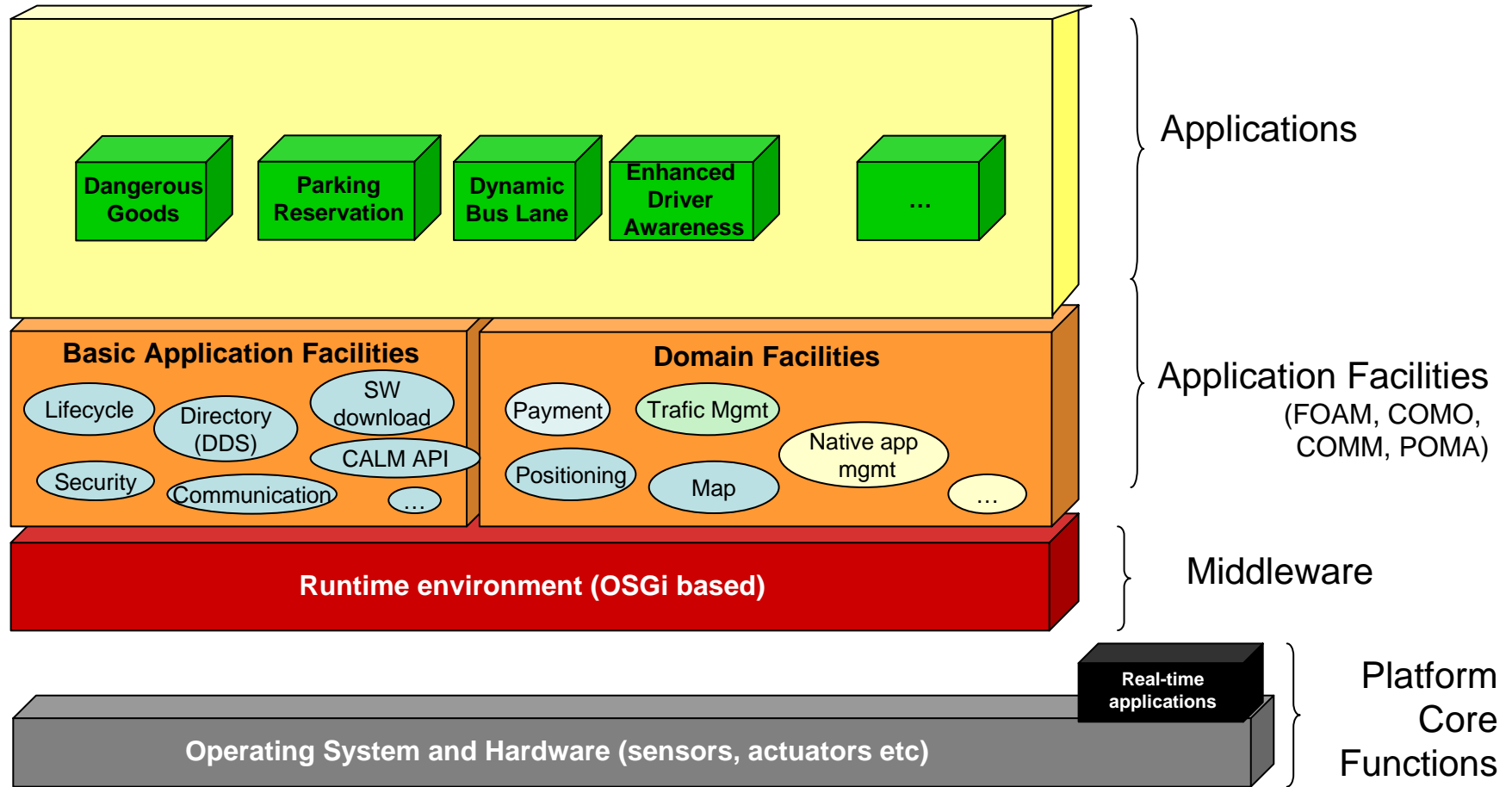


# CALM M5: C2C-CC & WAVE

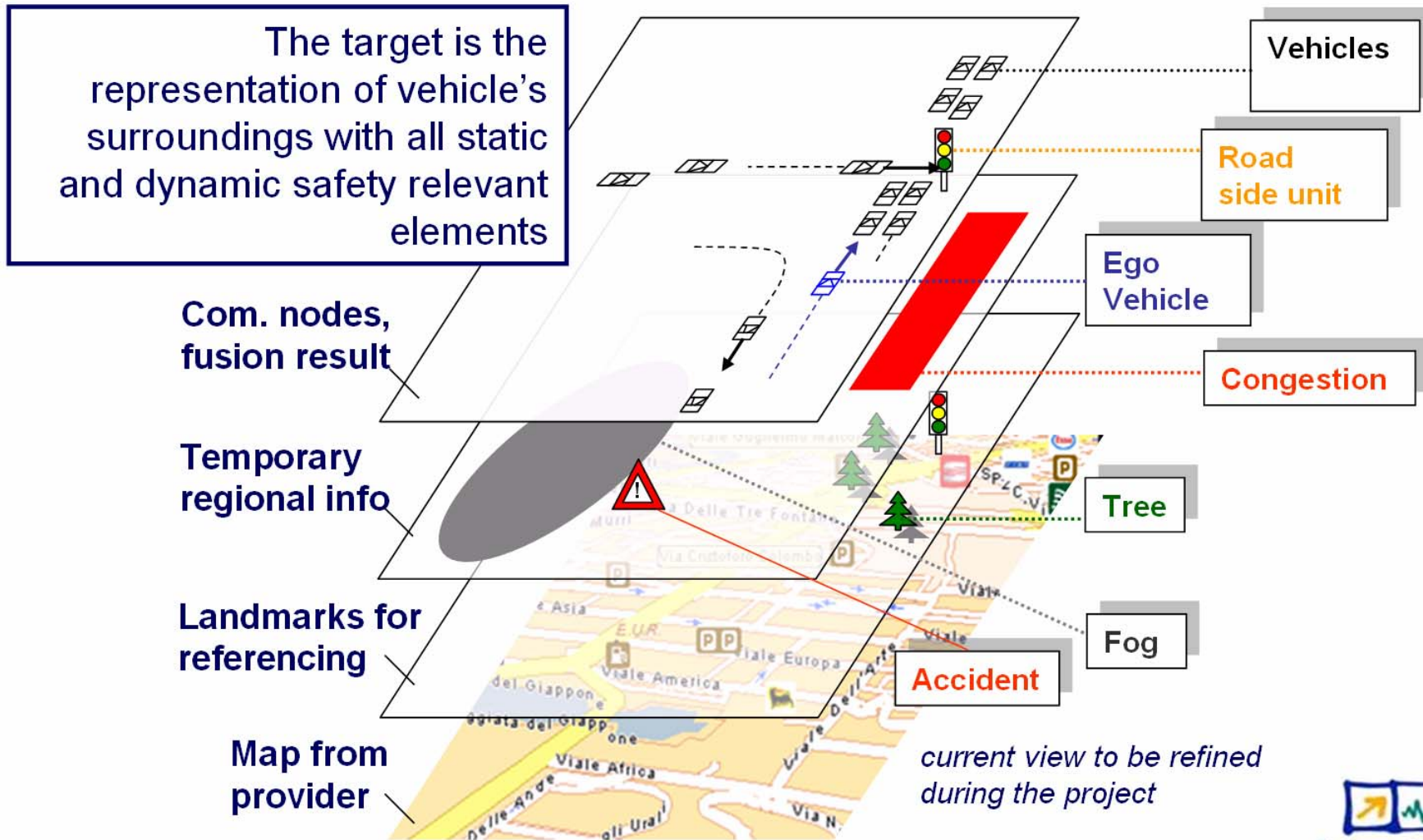




# CVIS Host platform Layers

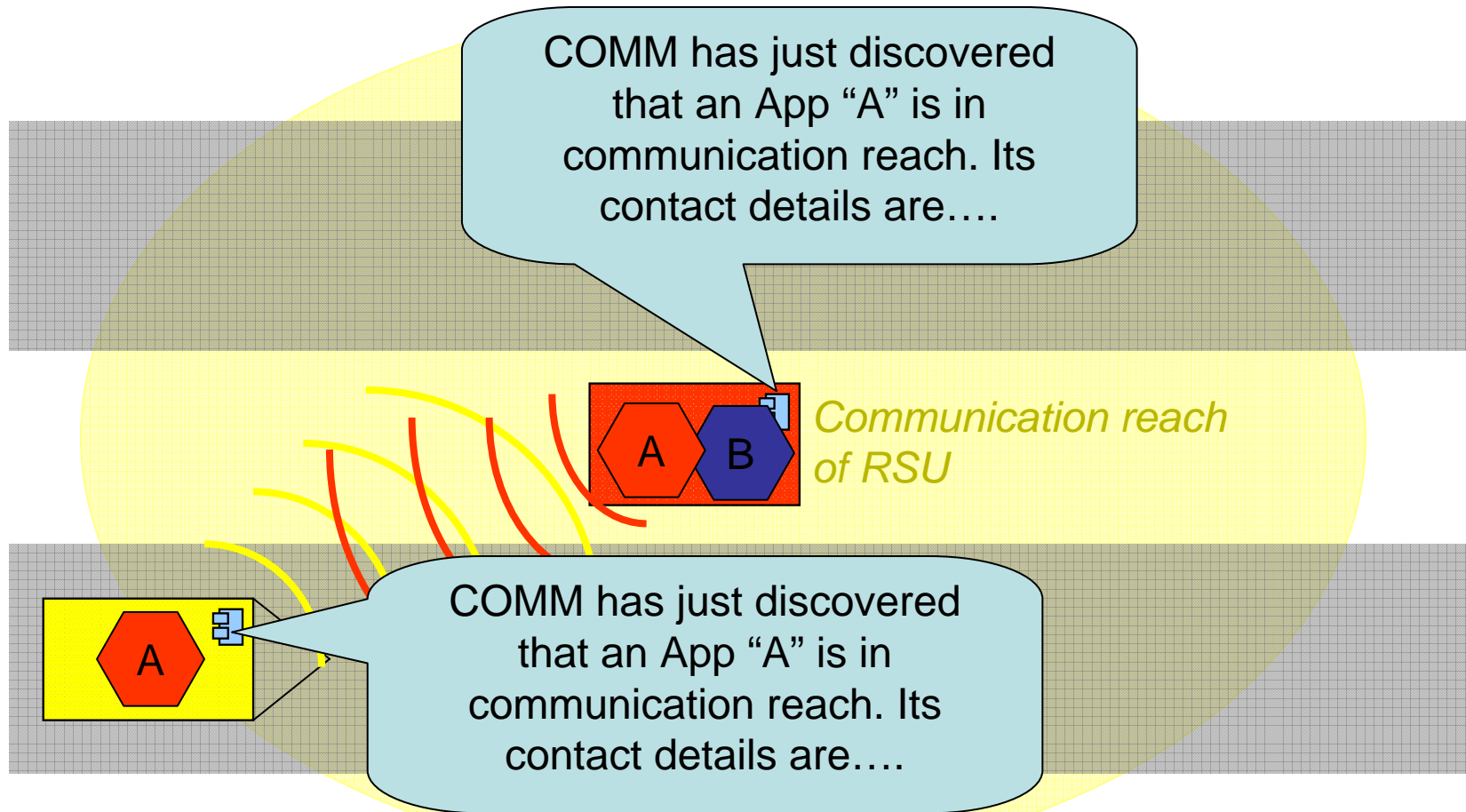


# LOCAL DYNAMIC MAP





# Service Data 'realtime' Discovery





# CVIS Communication



- CVIS Router enables seamless IPv6 connectivity over multiple carriers and WAVE short message protocol
- IPv6 sessions for services
- WAVE short messages for
  - Heartbeat broadcast
  - Critical Safety Message broadcasts
  - Service Announcement broadcasts



**VOLVO**

Thanks for your attention...

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