CVIS - Architecture

Slide collection for presentation at Budapest SeVeCom meeting

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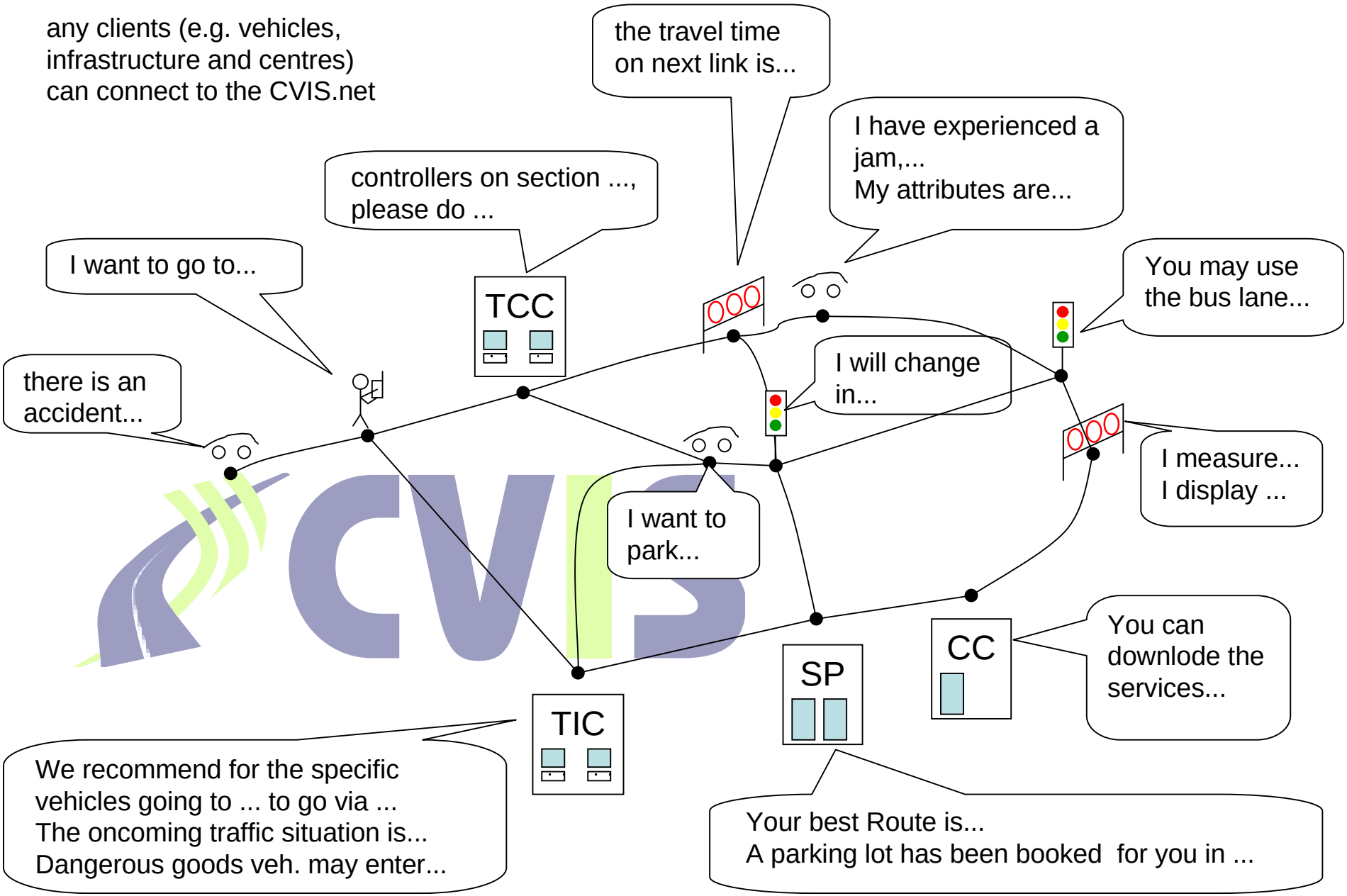
CVIS – the mobile network for transportation

a ***community*** is required to make it live...

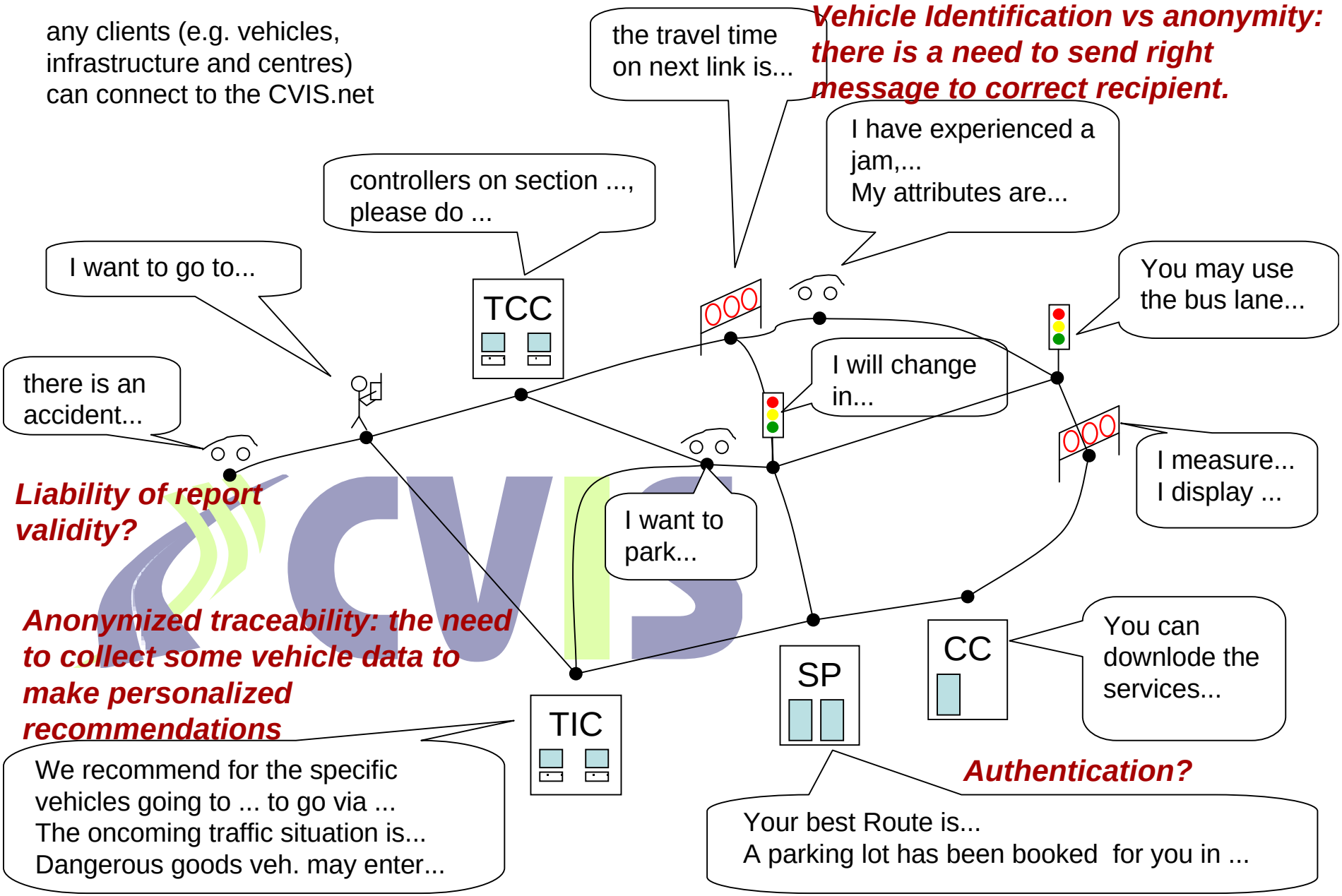
any clients (e.g. vehicles, infrastructure and centres) can connect to the CVIS.net



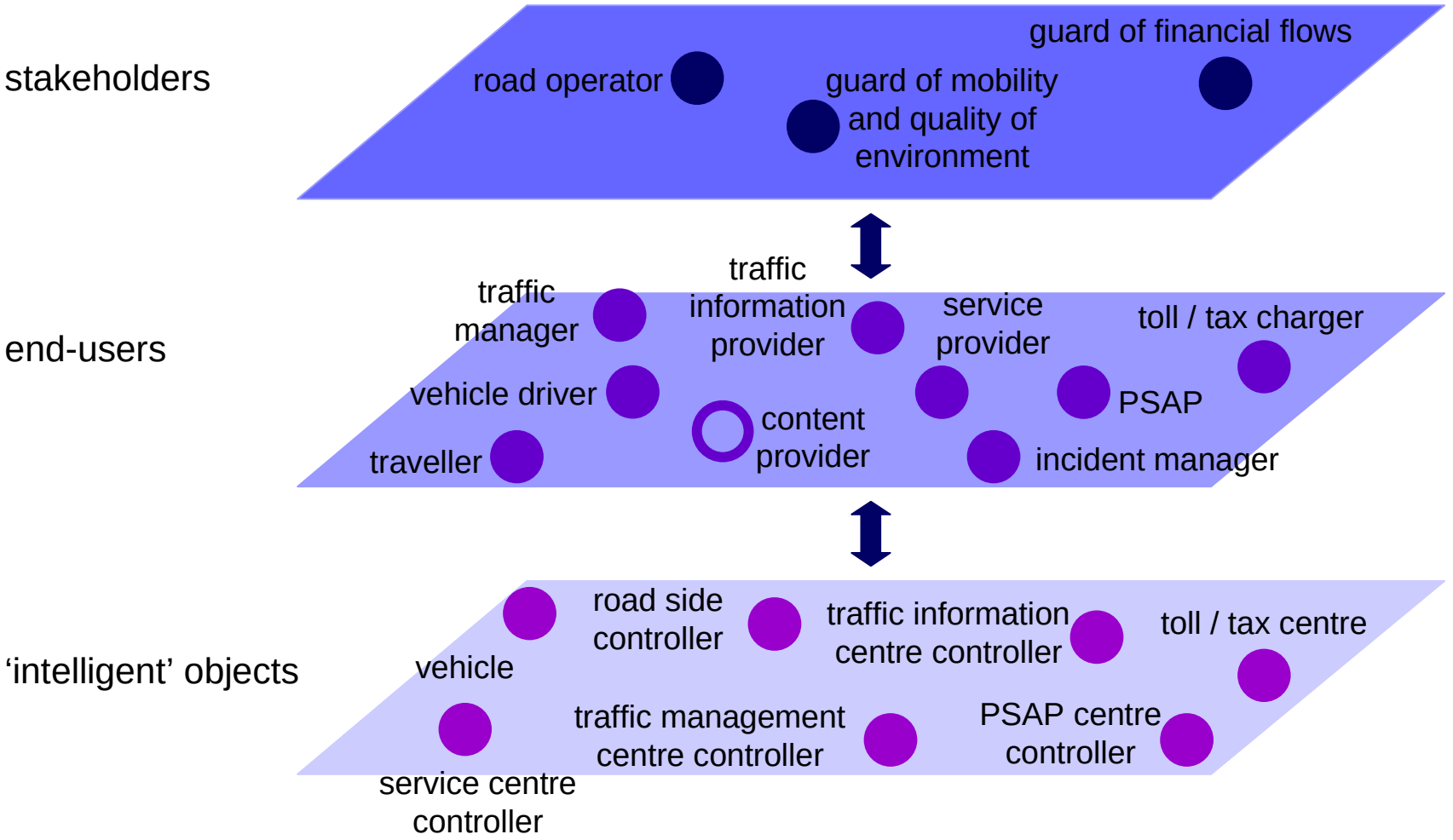
CVIS – the mobile network for transportation

Security Aspects

any clients (e.g. vehicles, infrastructure and centres) can connect to the CVIS.net



How to classify communicating parties? - Three levels of (Actors)

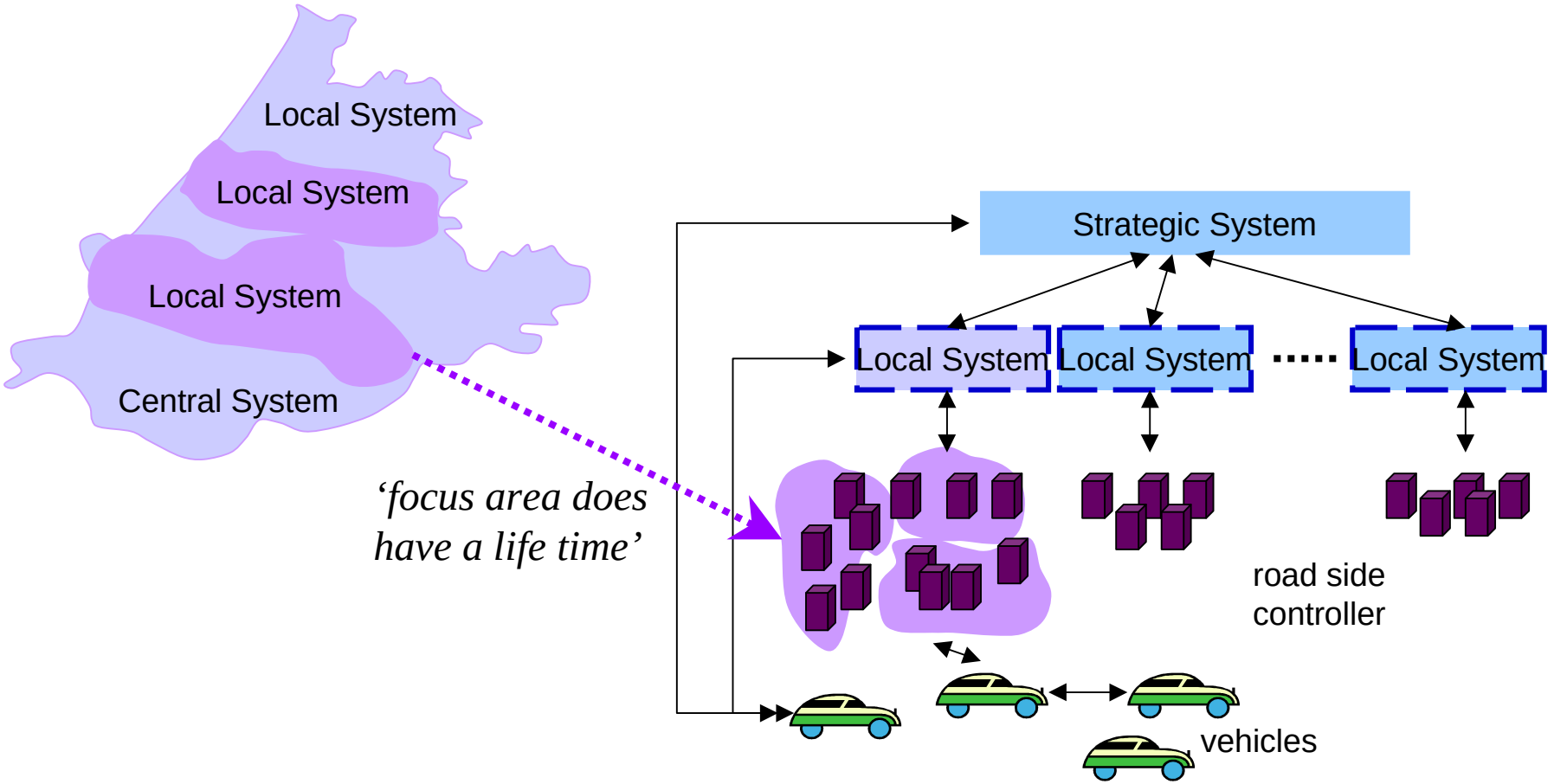


CVIS – Selected Use Case Illustrations

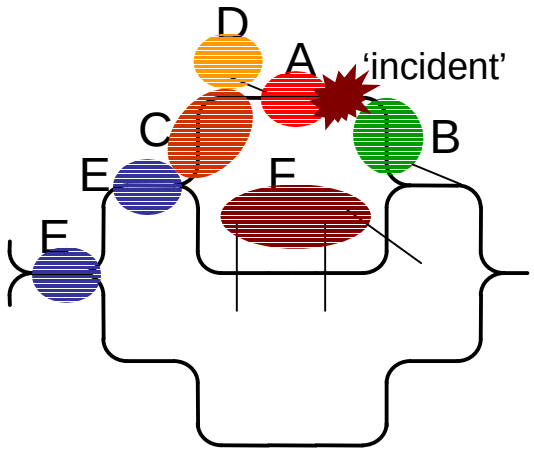
The selected illustrations show the potentially large number of involved actors and dynamic nature of use cases.

The ‘CVIS Use Cases and Requirements’ document will be available at the end of September for identifying related security issues.

CINT: Dynamic georeferencing within areas of local systems → dynamic creating of focus areas (ad-hoc networking)



CINT: Dynamic georeferencing to enable collaborations managing together ‘incidents’



A = ‘We can help by keeping the vehicle flowing even when they have to merge’

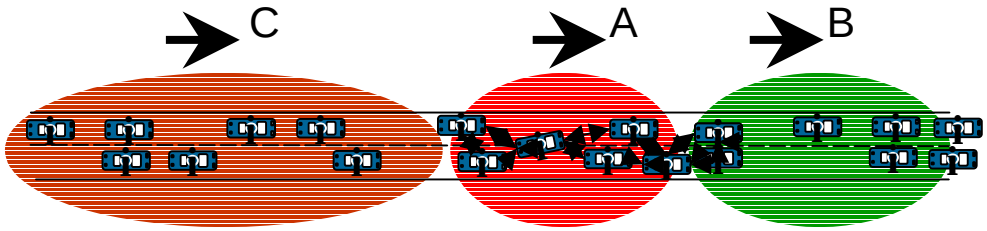
B = ‘We can help by increasing the outflow of vehicles and not forming any blockage at the front side of the incident location’

C = ‘We can help by tempering the inflow of vehicles to the segment with traffic jam’

D = ‘We can help by tempering the inflow of vehicles to the segment with traffic jam’

E = ‘We can help by diverting (a part of) the vehicles to an alternative route’

F = ‘We can help by bringing the vehicles to the inter-urban network via alternative entrance lanes’

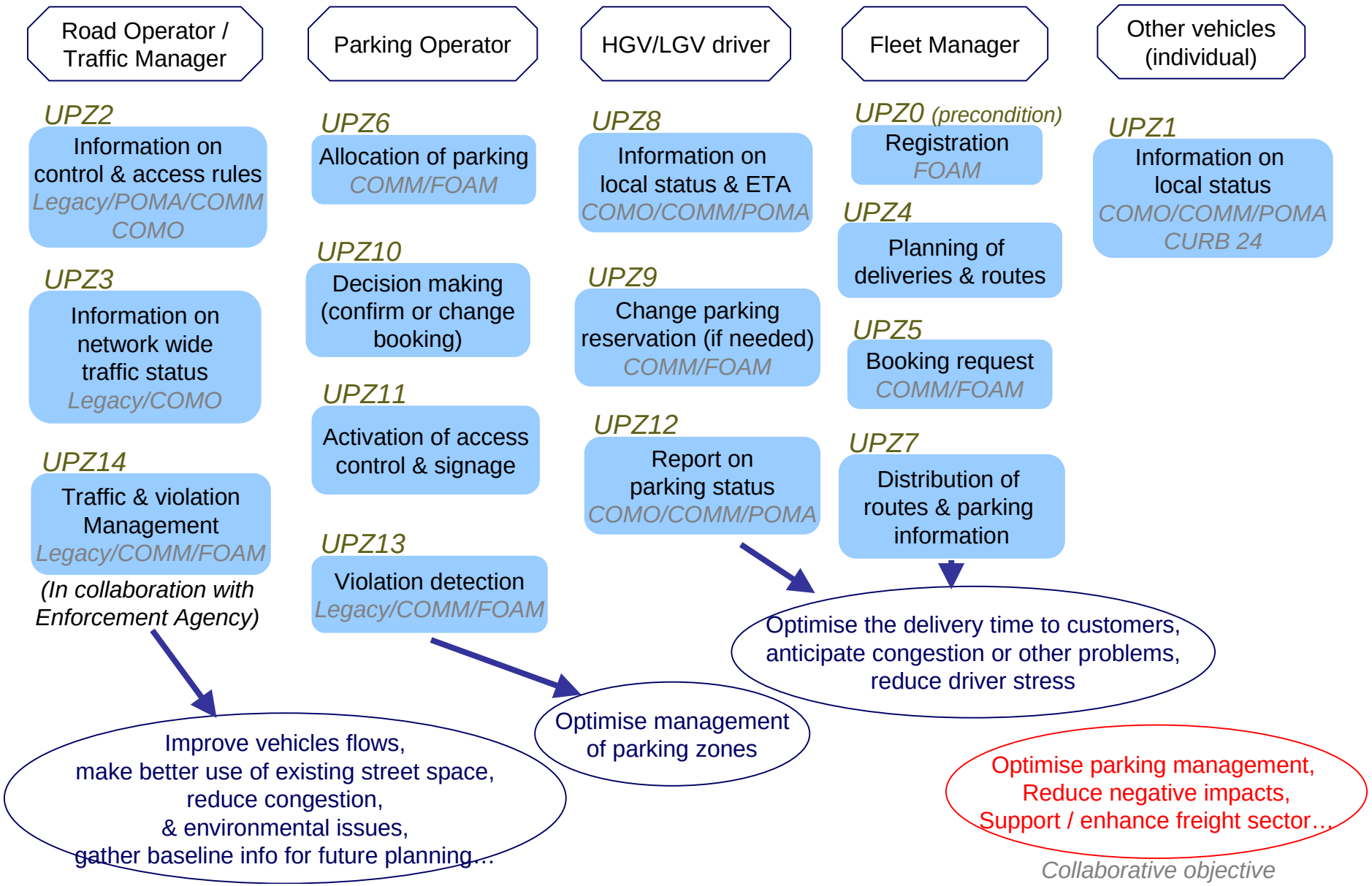


Cooperate to decrease the inflow

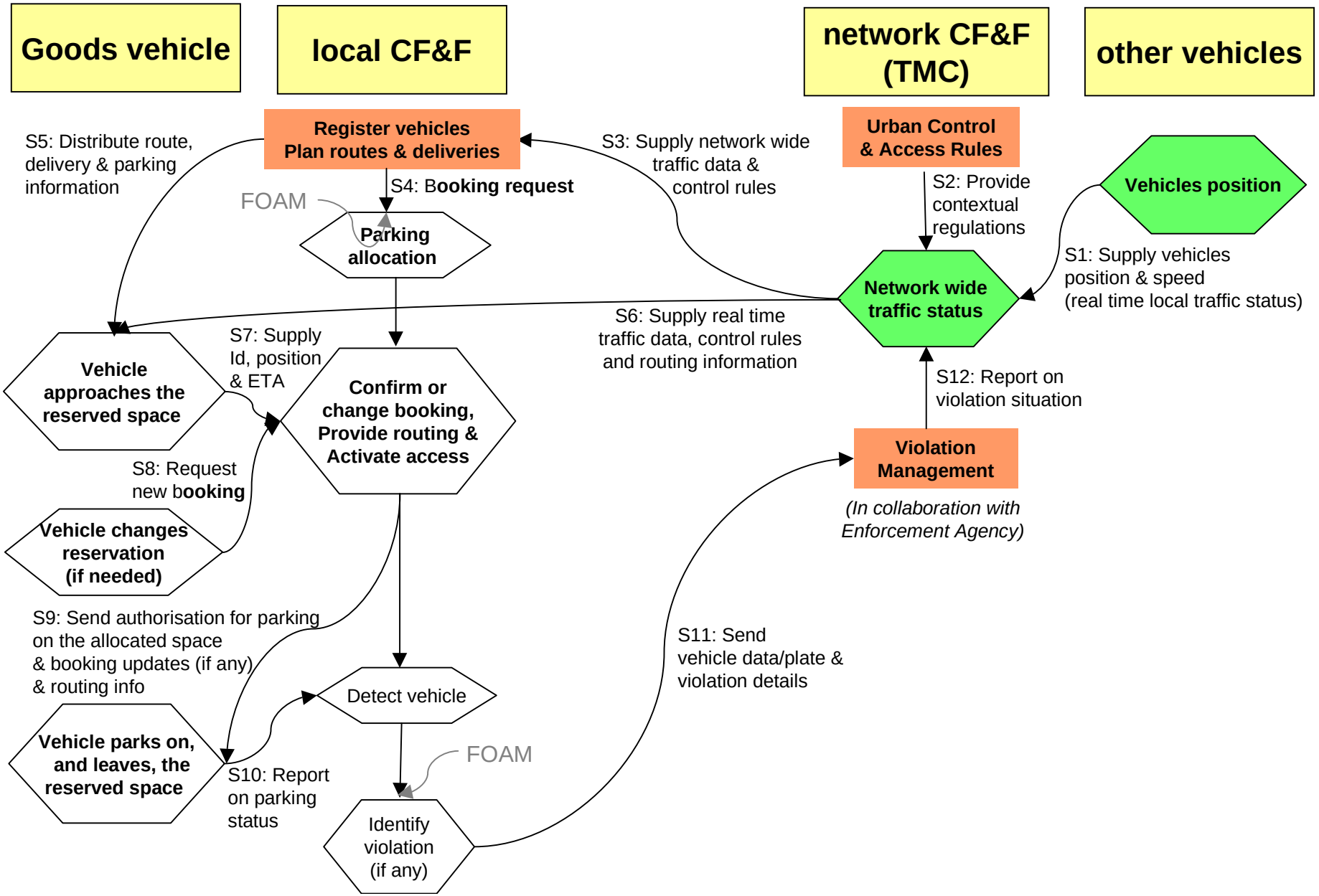
Cooperate to keep on flowing

Cooperate to increase the outflow

Actor View
Urban Parking Zones / CV-UC-SP3.3-0201

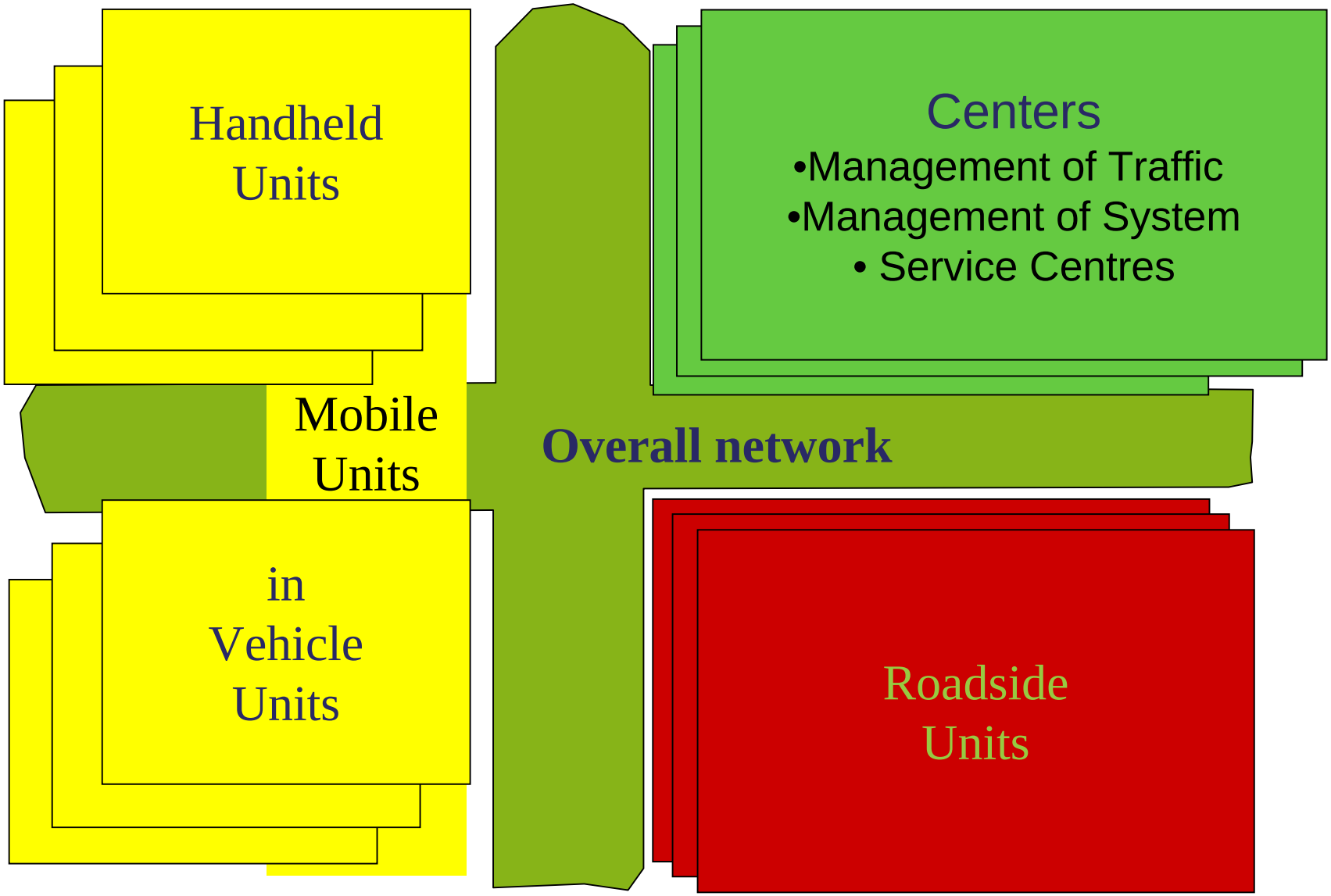


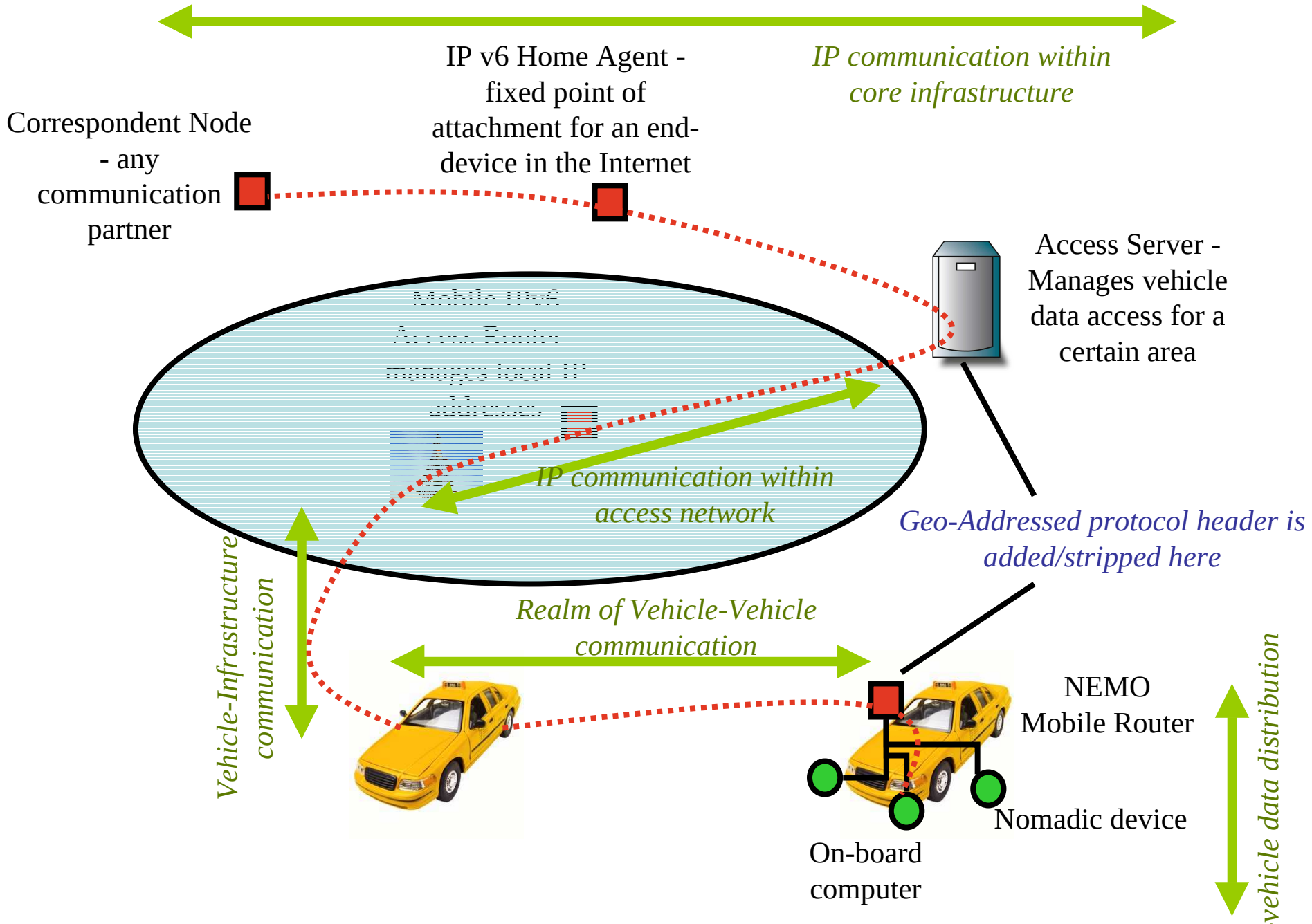
Flowchart View
Urban Parking Zones / CV-UC-SP3.3-0201



European Cooperative Architecture

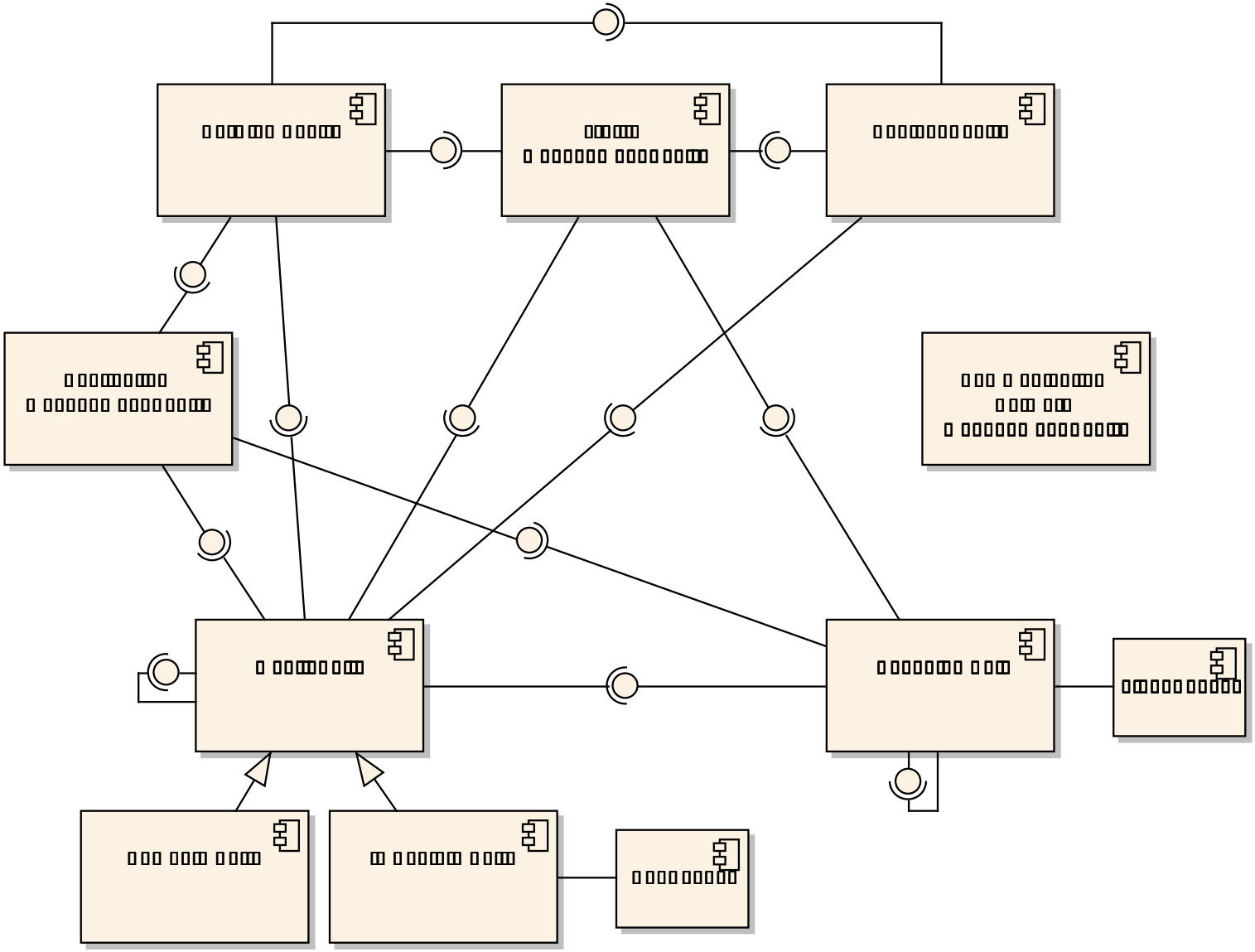
Main Techical Entities





Cooperative Communication Architecture

CVIS – Entities in detail



CVIS – Entities in detail

Mobile Units

- … are entities which can move around in the (road) network.
- Being an In Vehicle Unit this corresponds with the “Vehicle Subsystem” as introduced above. These Mobile Units have Vehicle sensor access.
- Also other Nomadic Units can be a specialization of Mobile Units (e.g. PDAs,…). These units shall also be able to “log in” to the CVIS wireless communication network but being independent from vehicles no VehSensor can be contacted.
- Mobile Units communicate among each other for direct information exchange (e.g. V2V), with road side units (e.g.V2I) or with Centres (e.g. V2C).

Road Side Units

- … are entities which are fixed (nor moving) installed as a road side equipment. These Entities shall be able to access road side sensors. Roadside Units correspond with the Roadside Subsystem as described above.
- Roadside Units communicate among each other for direct information exchange (e.g. I2I), with Mobile Units (e.g.V2I) or with Centres (e.g. I2C).

CVIS – Entities in detail

Centre Entities

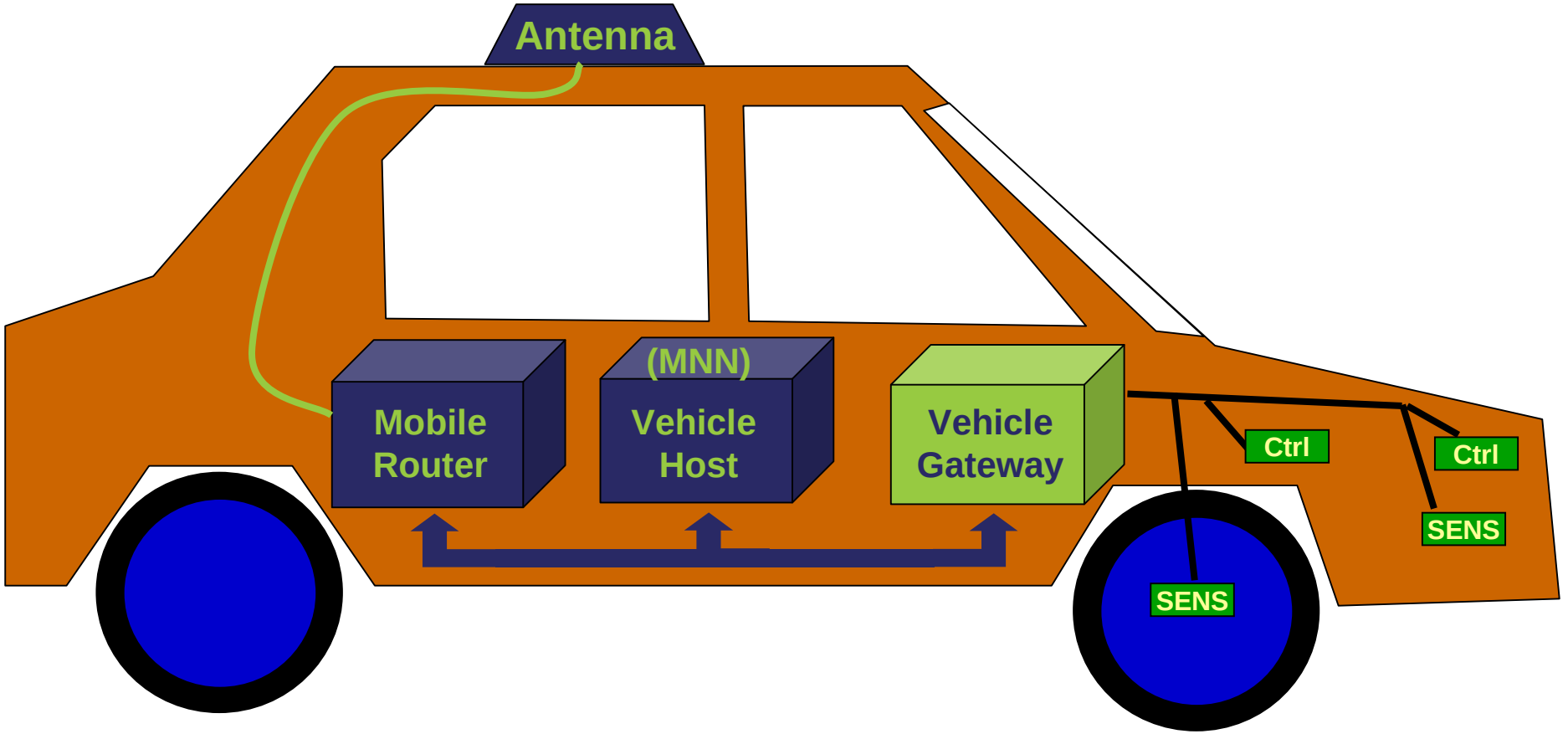
In a CVIS cooperative system several “centres” appear

- ***Service Centres*** support different End user Services. They communicate with Roadside or Mobile Units when delivering a service. They shall get the content, which is needed for a service, from Content Centres. They shall cooperate with Traffic Management Centres to align their services with the goals of traffic managers. Finally they shall cooperate with Application Management Centres to support remote download and configuration of service applications on Mobile- or Roadside Units
- ***Application Management Centres*** support the remote management (download, configure…) of applications in Mobile- or Roadside Units
- ***Traffic Management Centres*** are Entities well known and existing in the ITS world. These centres are operated by institutions/authorities responsible for managing the traffic on a specific road network in a dedicated area.
- ***Content Centres*** fulfil the function to provide any (raw/pre-processed) transportation relevant content to other centres. Typically Service Centres process content from different content centres and create value added services. In CVIS also traffic Management Centres and Mobile Units shall be able to directly exploit information provided by a content centre.
- ***Communication Network Management Centres*** are needed for organising the mobile wireless CVIS IPv6 Network.

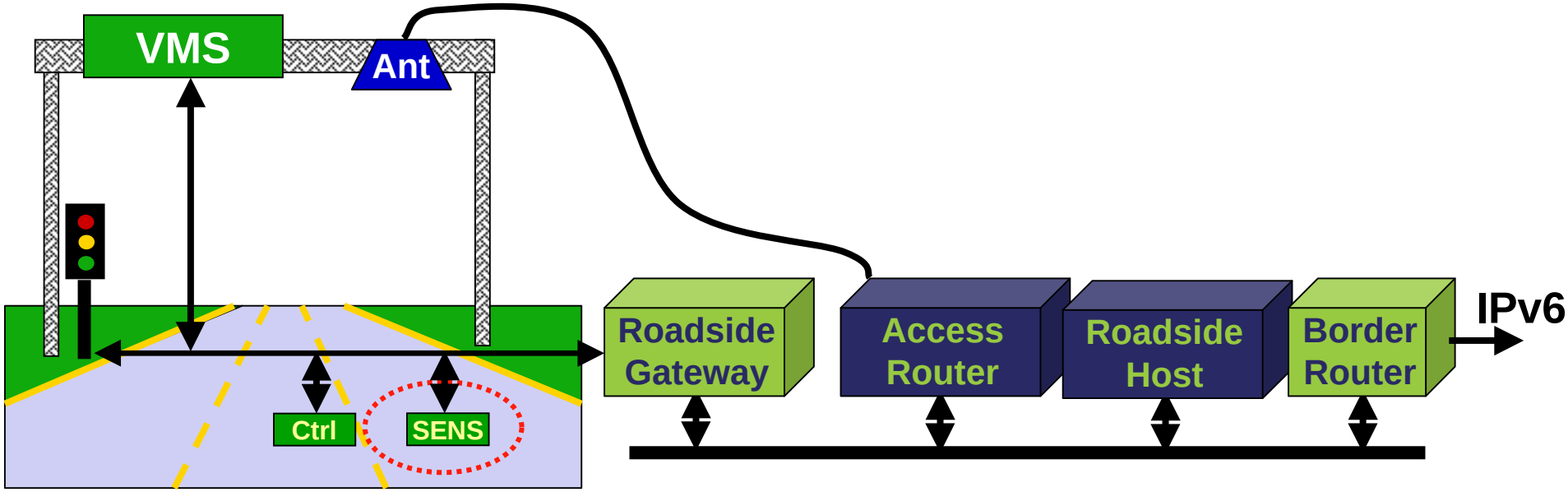
CVIS – Technical Architecture

- Vehicle system
- Roadside system
- Centre System

CVIS vehicle system

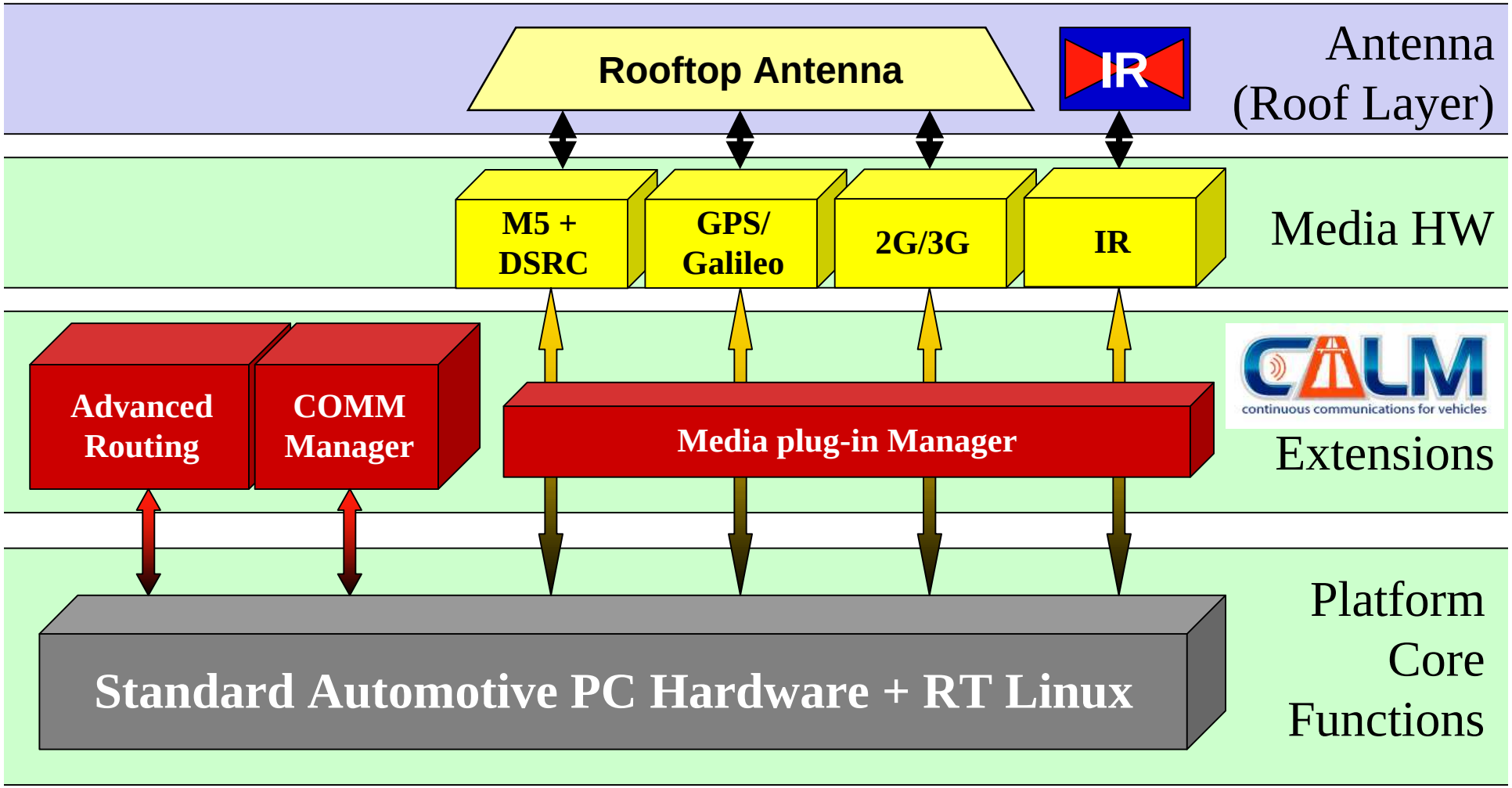


CVIS roadside system



CVIS technical architecture

Router Platform



CVIS technical architecture

Host Platform