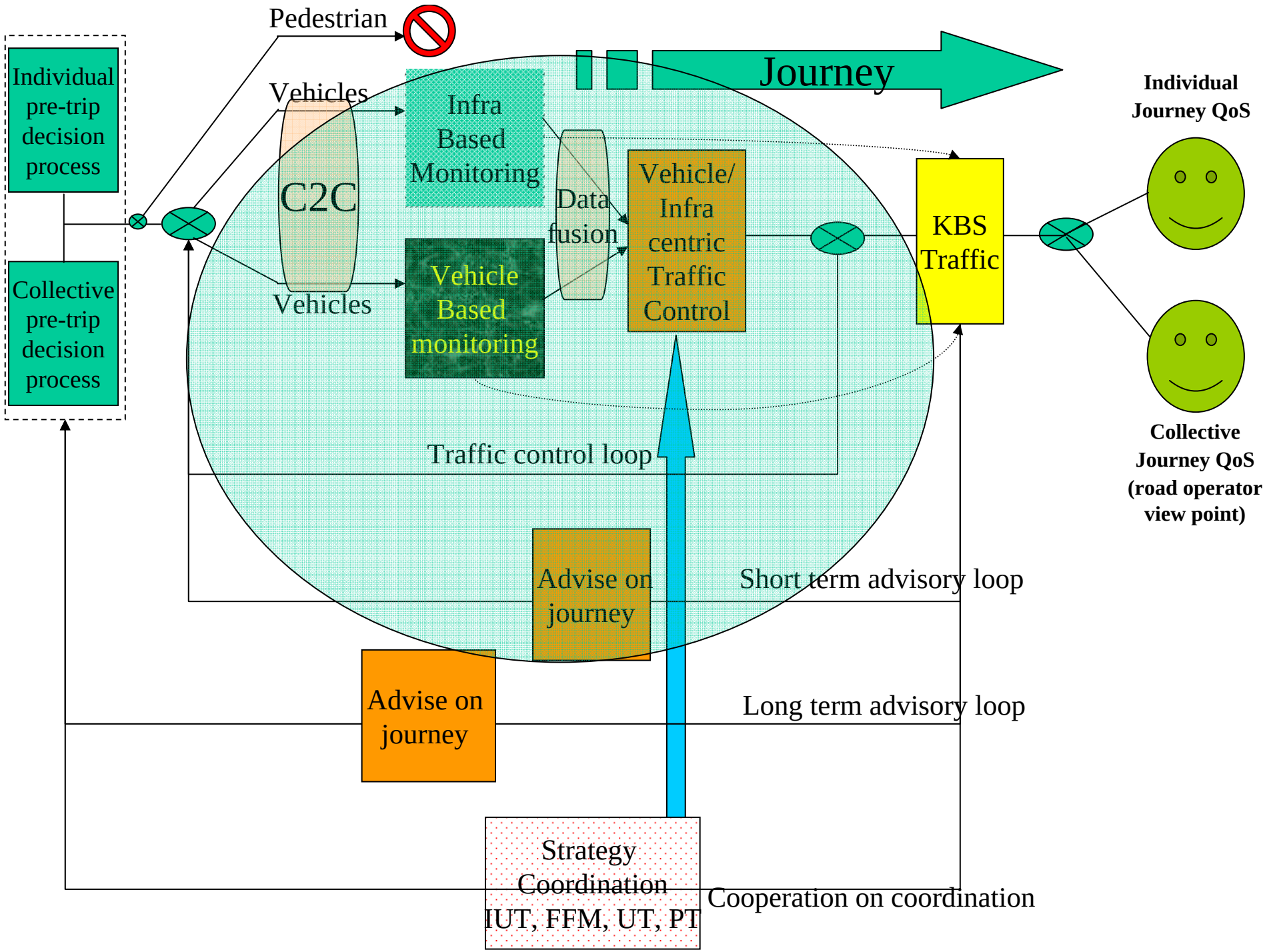
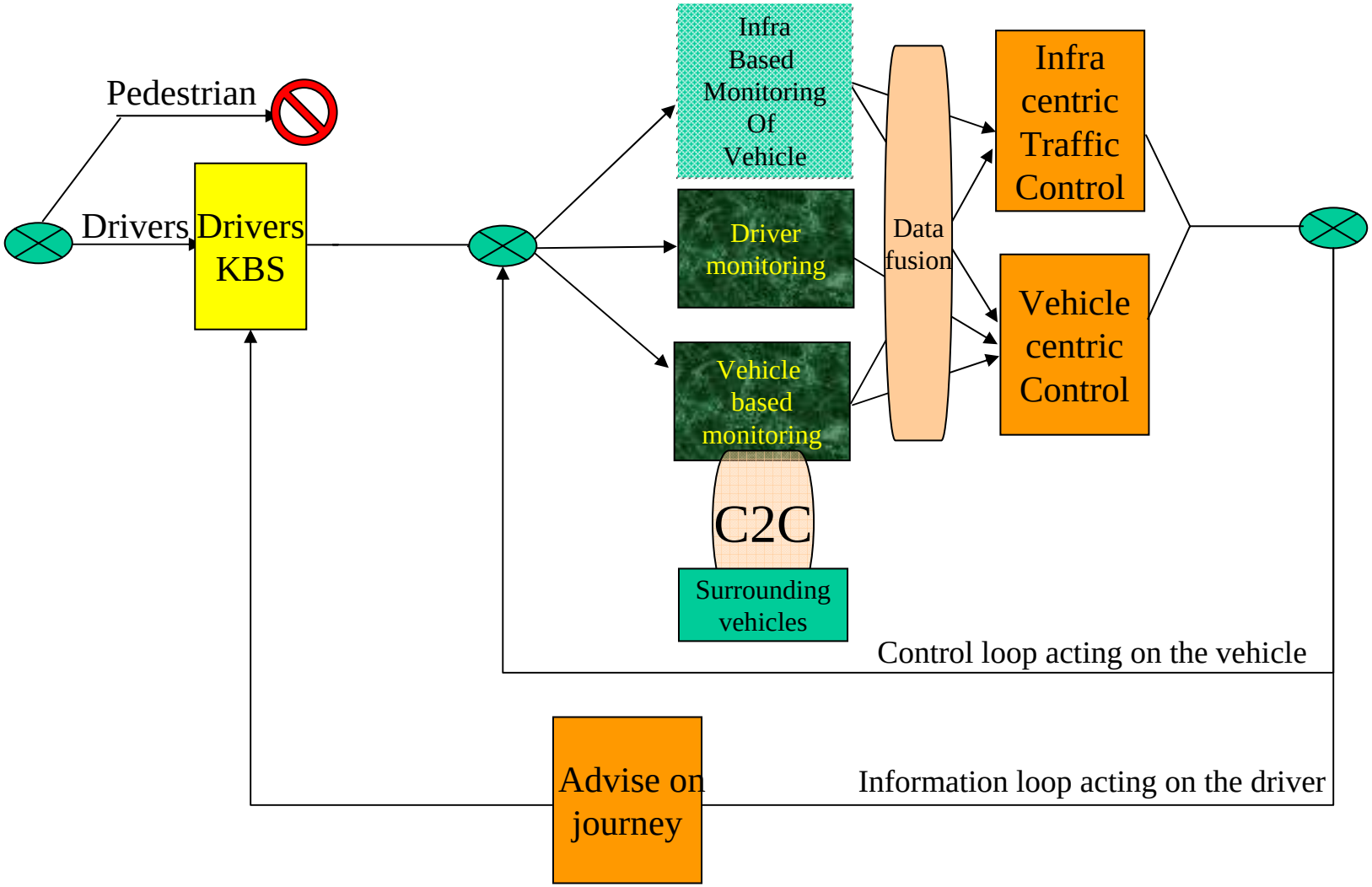
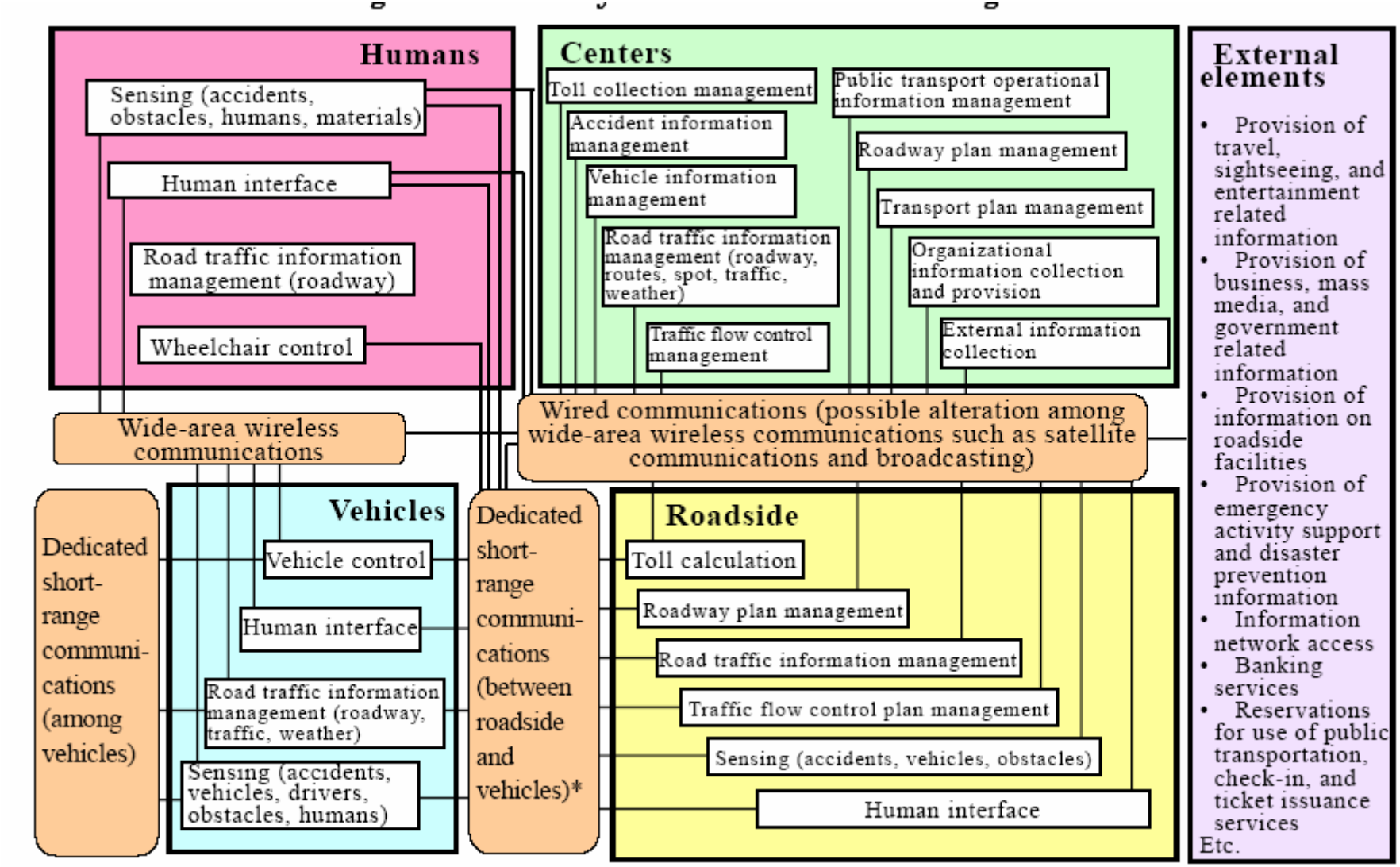
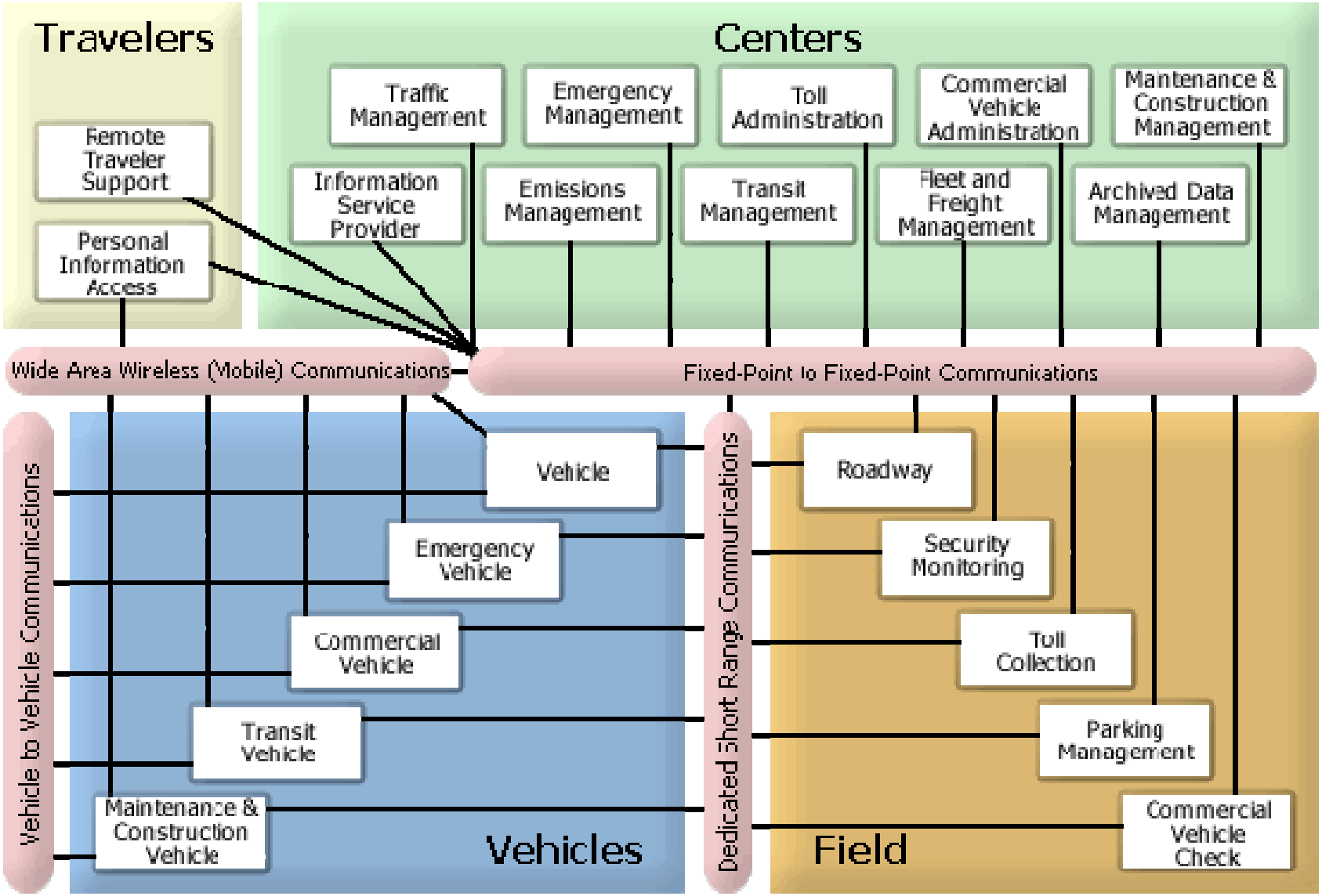

Pedestrian
Vehicles
Vehicles
Journey
Individual pre-trip decision process
Collective pre-trip decision process
C2C
Infra Based Monitoring
Vehicle Based monitoring
Data fusion
Vehicle/ Infra centric Traffic Control
KBS Traffic
Individual Journey QoS
Collective Journey QoS (road operator view point)
Traffic control loop
Advise on journey
Short term advisory loop
Advise on journey
Long term advisory loop
Strategy Coordination IUT, FFM, UT, PT
Cooperation on coordination


Pedestrian
Drivers
Drivers KBS
Infra Based Monitoring Of Vehicle
Driver monitoring
Vehicle based monitoring
C2C
Surrounding vehicles
Data fusion
Infra centric Traffic Control
Vehicle centric Control
Control loop acting on the vehicle
Advise on journey
Information loop acting on the driver

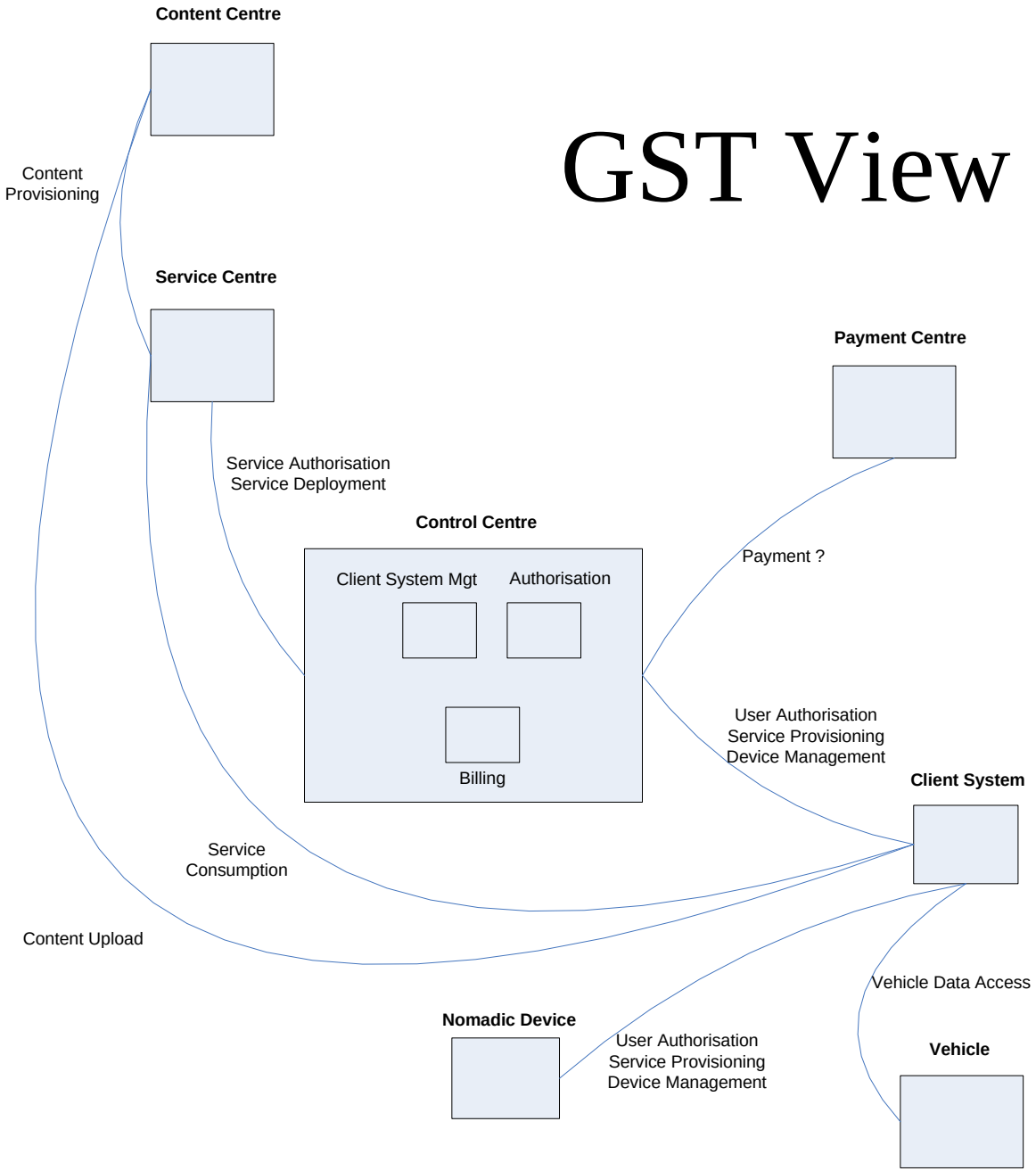
US Architecture

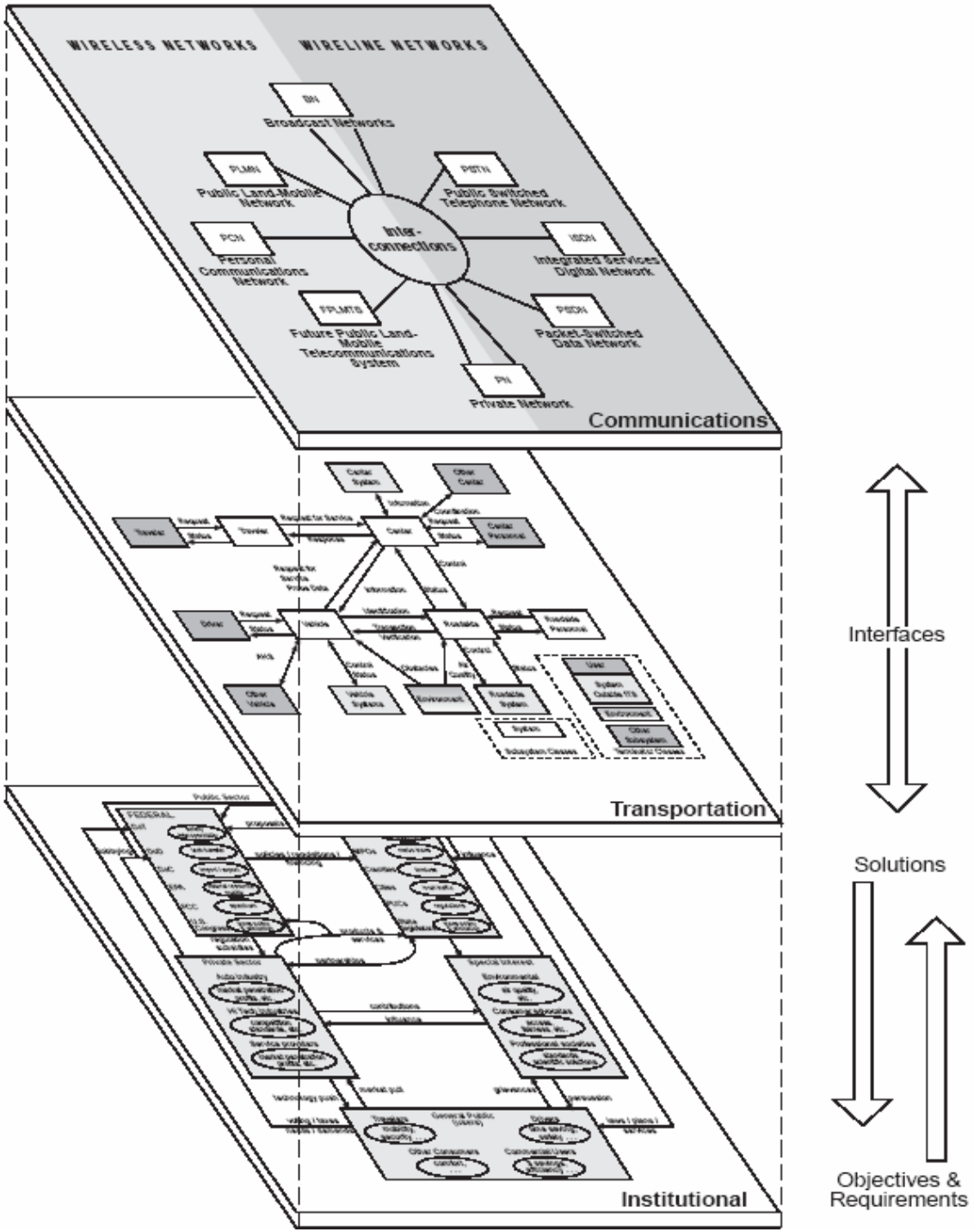


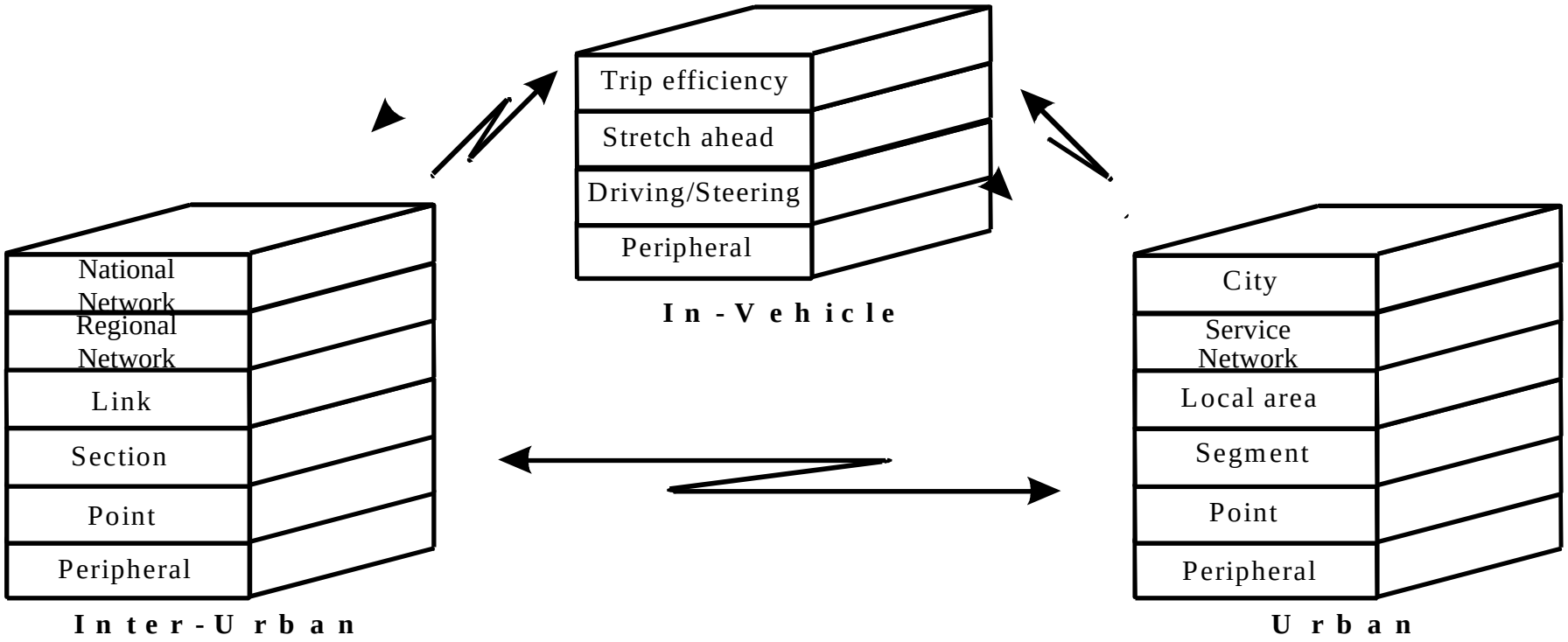
Japan Architecture



GST View

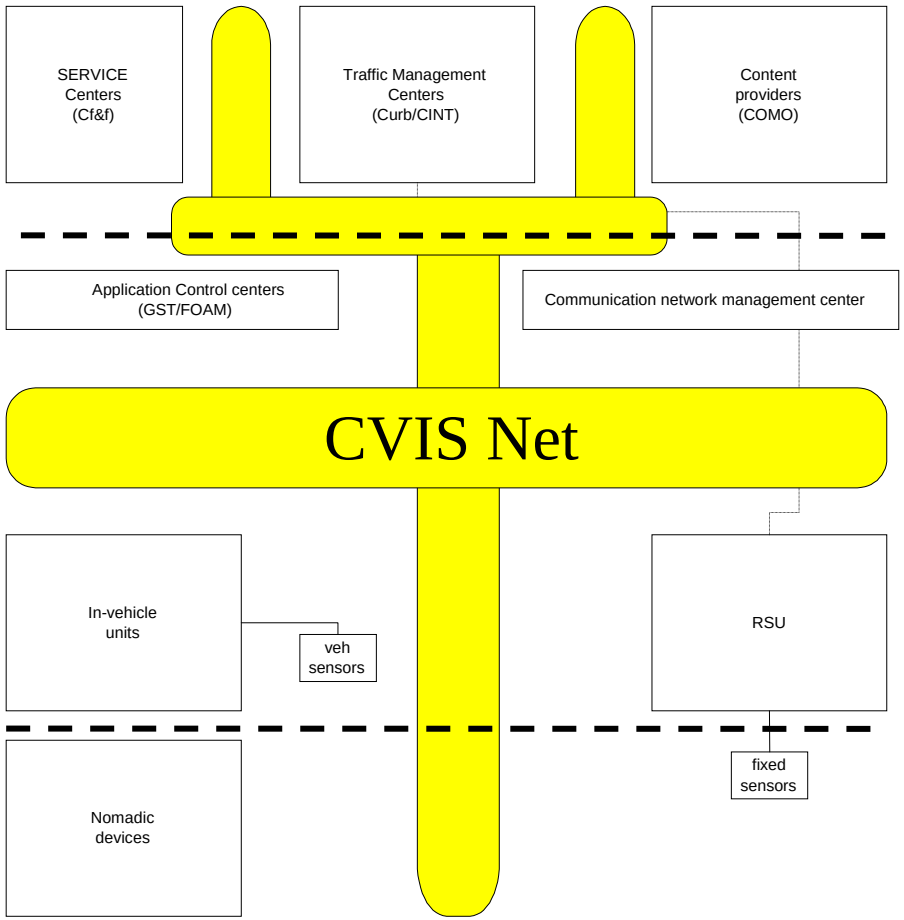

Content Centre
Content Provisioning
Service Centre
Payment Centre
Service Authorisation
Service Deployment
Control Centre
Client System Mgt
Authorisation
Billing
Payment ?
User Authorisation
Service Provisioning
Device Management
Client System
Service Consumption
Content Upload
Vehicle Data Access
Nomadic Device
User Authorisation
Service Provisioning
Device Management
Vehicle


WIRELESS NETWORKS
WIRELINE NETWORKS
BN
Broadcast Networks
PLMN
Public Land-Mobile Network.
PSTN
Public Switched Telephone Network.
PCN
Personal Communications Network.
Inter-connections
ISDN
Integrated Services Digital Network.
FPLMTS
Future Public Land-Mobile Telecommunications System
PSDN
Packet-Switched Data Network.
PN
Private Network.
Communications
Transportation
Institutional
Interfaces
Solutions
Objectives & Requirements

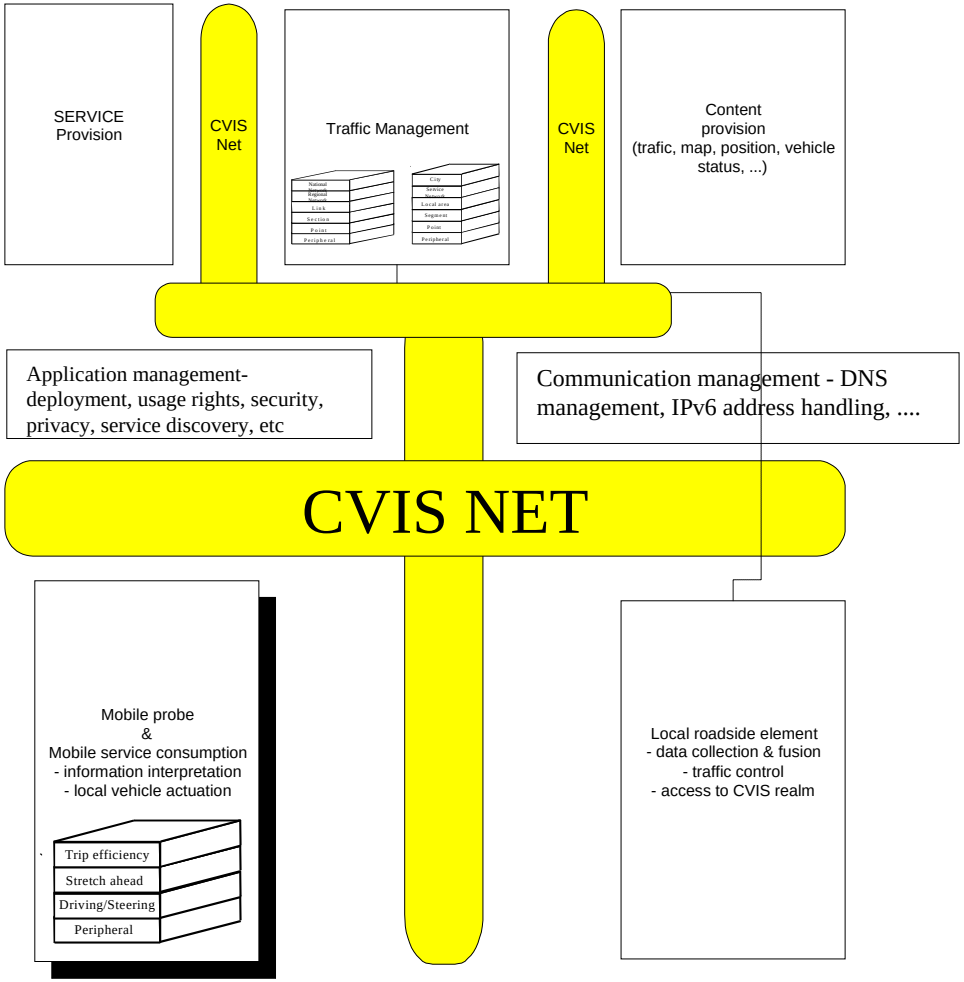

Trip efficiency
Stretch ahead
Driving/Steering
Peripheral
In-Vehicle
National Network
Regional Network
Link
Section
Point
Peripheral
Inter-Urban
City
Service Network
Local area
Segment
Point
Peripheral
Urban

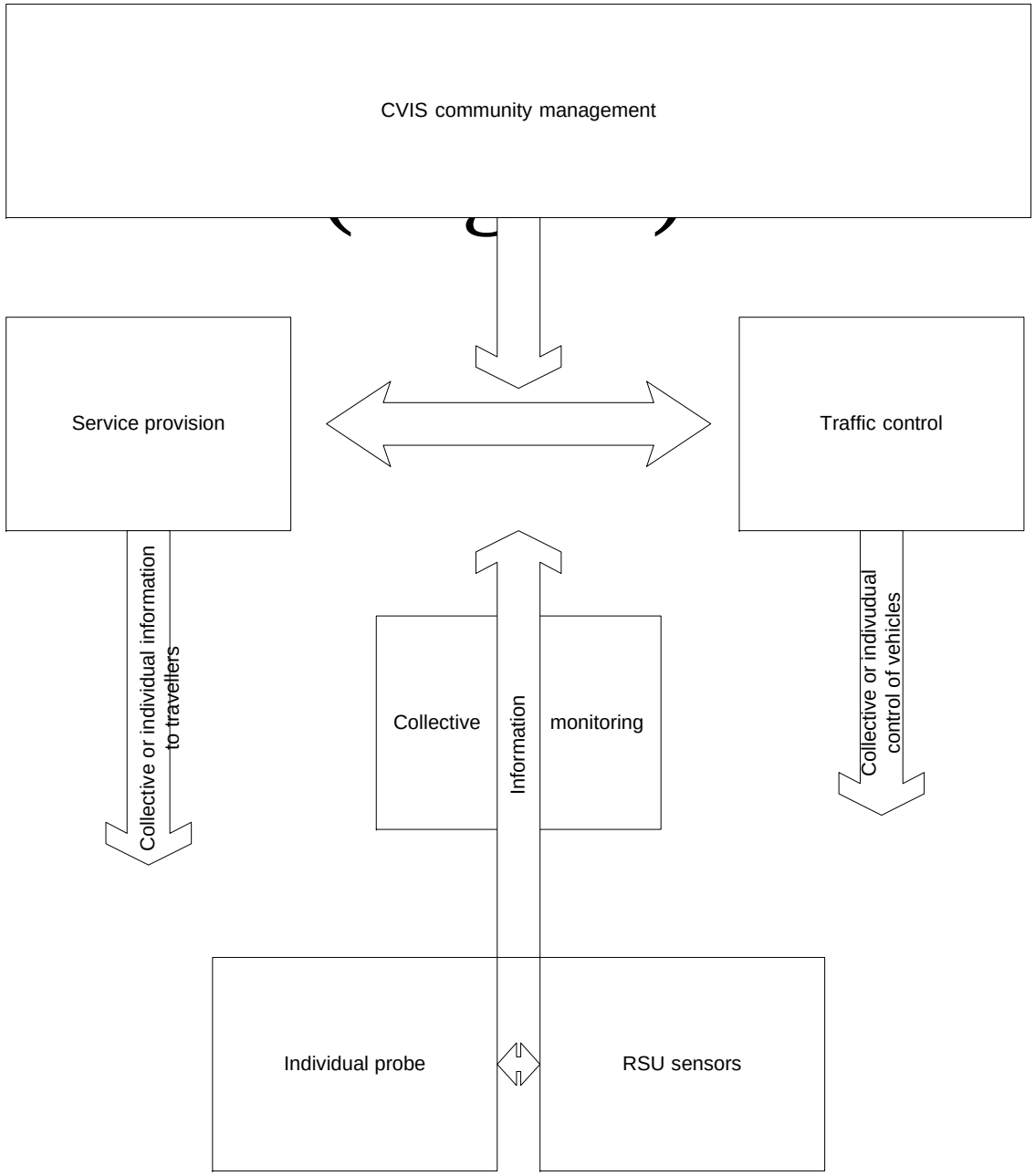
	Scope of Control	Objective	Example of Services
6	Super Regional Network	Network Efficiency	Network Control Hazardous goods Transit Management
5	Regional Network	Traffic flow & Incident Management	Traveller Information Services Network Monitoring Services Re-routeing Control Services Route Guidance Incident Management Services Hazardous Goods Monitoring
4	Motorway Link	Throughput Optimisation	Link Traffic Monitoring Incident Verification Speed Harmonisation Lane Closure Management Co-ordinated Ramp Metering
3	Section	Traffic Safety Management	Driver Awareness Warning Services Section Traffic Monitoring Services
2	Point	Logical contact with road and traffic	Local Ramp Control Services Local Lane Control Services Local Traffic Monitoring Services Local Monitoring of Road Conditions Local Traffic Surveillance Services Enforcement Services
1	Peripheral	Physical contact with road & traffic	Actuator Device Control Sensor Device Control Vehicle Flagging Services

Physical High-level



Functional High-level




CVIS community management
Service provision
Traffic control
Collective or individual information to travellers
Collective
monitoring
Information
Collective or indivudual control of vehicles
Individual probe
RSU sensors

Possible European top level Architecture

- **There is a lot of work and good thinking behind the US and Japanese architecture**
- **Europe should build on this, and introduce new understanding and new technology to improve it**
- **The greatest impact from European ITS projects are:**
  - **co-operative services**
  - **networked communications.**
  - **personal, handheld devices in ITS**
- **The diagram on the following page tries to map this recent thinking on top of the existing architecture**
- **Diagram shows four entities that are connected via a common network. Each of the four entities have multiple instances that can link directly with each other, or with any other entity.**
- **This means for instance that one handheld can set up services with other handhelds, or with services in-car, or with roadside/local services, or of course directly to service centres.**
- **The "CVIS network" consist of a normal IPv6 network that is supported with basic CALM protocols in all devices. The bearer technology is of less importance – this may be wired technology or any combination of wireless bearers. The important point is that there is full routing capability between all entities.**
- **Service access needs to follow new standards based on GST with CVIS extension to achieve full functionality**
- **Non-IPv6 networks and real-time (safety critical) links will also be supported via gateways and built-in protocol converters – this is already state-of-the-art in modern electronic devices**

Possible European Architecture
(needs more work & redrawing!)