

Transport, Mobility and Logistics input to *Requirements FI-PPP Experimentation Platform*

wim.vandenberghe@intec.ugent.be

piet.demeester@intec.ugent.be

www.ibcn.intec.ugent.be

INTEC Broadband Communication Networks (IBCN)

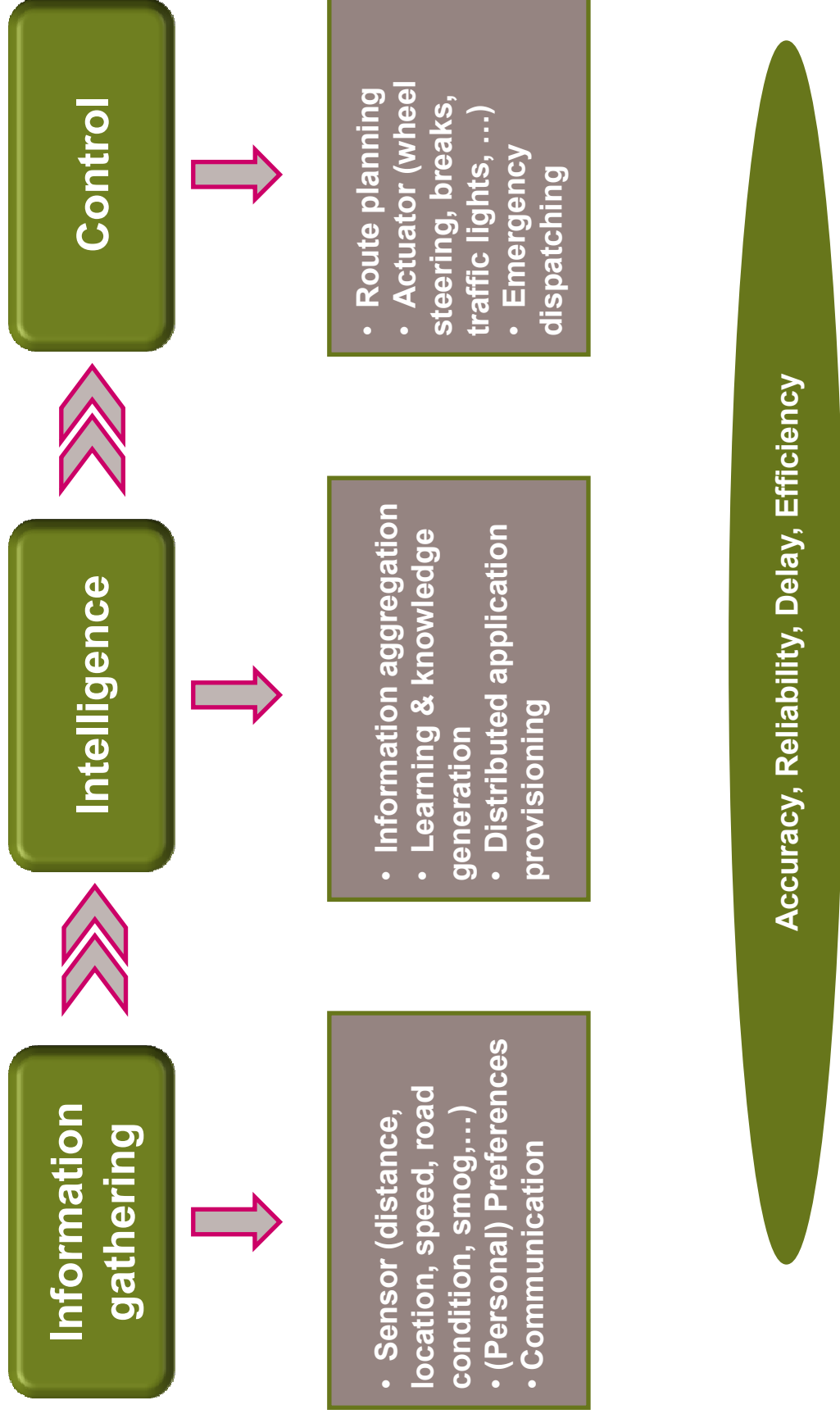
Department of Information Technology (INTEC)

Ghent University - IBBT

Where do the requirements come from ?

- Two-sided research approach
- Very close collaboration with industrial partners
 - Telecom industry: Belgacom group, Alcatel-Lucent, Siemens, Nortel Networks, ...
 - Electronics manufacturers: NXP Semiconductors, Q-Free, Alstom Transport S.A., Televic, Bombardier, ...
 - Content providers: Be-Mobile, Tele Atlas
 - Non-profit organizations: ITS Belgium, Flemish traffic center, ...
- Academic driven research
 - Collaboration with other prominent research institutes: IMEC, TNO, DLR, SINTEF, ...
 - Fundamental research: scalability and energy efficiency in VANET, experimentation environments, ...

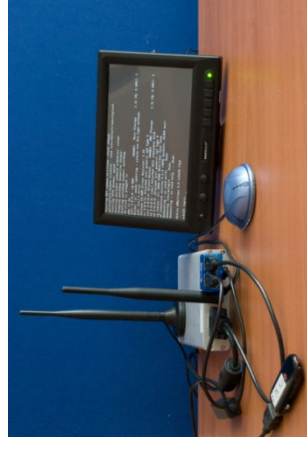
Use Cases Requirements



Information gathering



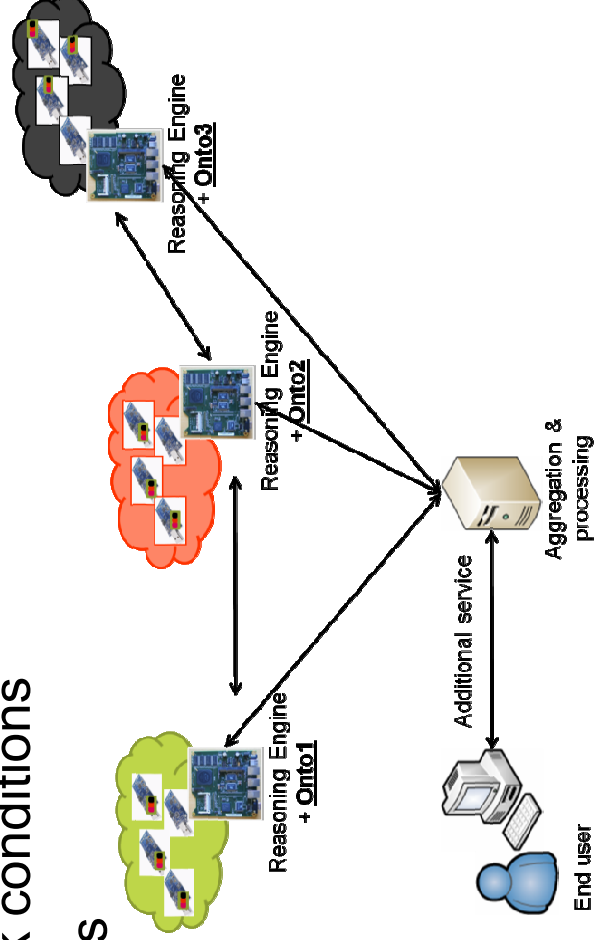
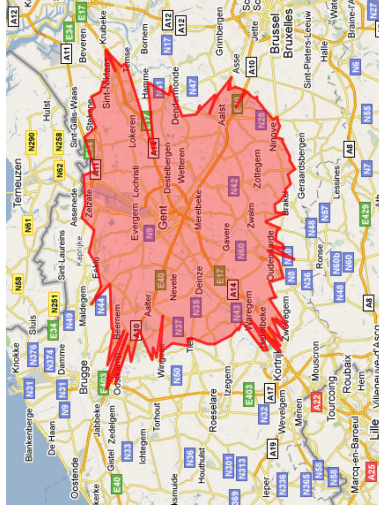
- Main components
 - Sensors
 - On Board & Road Side Units
 - Communication interfaces
 - GPS receiver
 - CALM architecture
 - IPv6 enabled mobile access & core network
- Technological challenges
 - VANET: rapid topology changes, fragmentation, scalability, energy efficiency, security, ...
 - M2M load on mobile data network
 - OBU cost & installation procedures



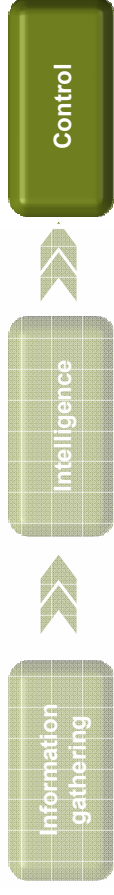
Intelligence



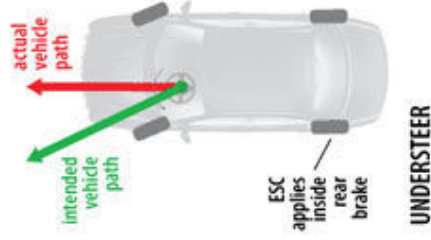
- Main components
 - Software agents & provisioning services
 - Floating Car Data aggregation & processing
 - Human-Machine Interfaces
- Technological challenges
 - Design choice: distributed vs centralized
 - Heterogeneous agent platforms
 - Handling unreliable network conditions
 - Reliability of agent decisions
 - Efficient FCD algorithms
 - Non-intrusive HMI



Control



- Main components
 - In-vehicle actuators
 - Roadside infrastructure
 - Control rooms & operators
- Technological challenges
 - Reuse of existing vehicle safety actuators
 - Integration of stakeholders legacy control systems



Testing environments

- Simulators:
 - Network, traffic & application simulators
 - 3D driving simulator
- Testbeds
 - lab environment → controlled & repeatable experiments
 - Small scale: implementation tool
 - Large scale: thorough component testing
- Field Operational Tests
 - Real vehicles → testing in realistic conditions
 - Small scale: implementation tool
 - Large scale: system validation & end user perception

