# ITS

# Intelligent Transport Systems
### *including support for sensor networks*
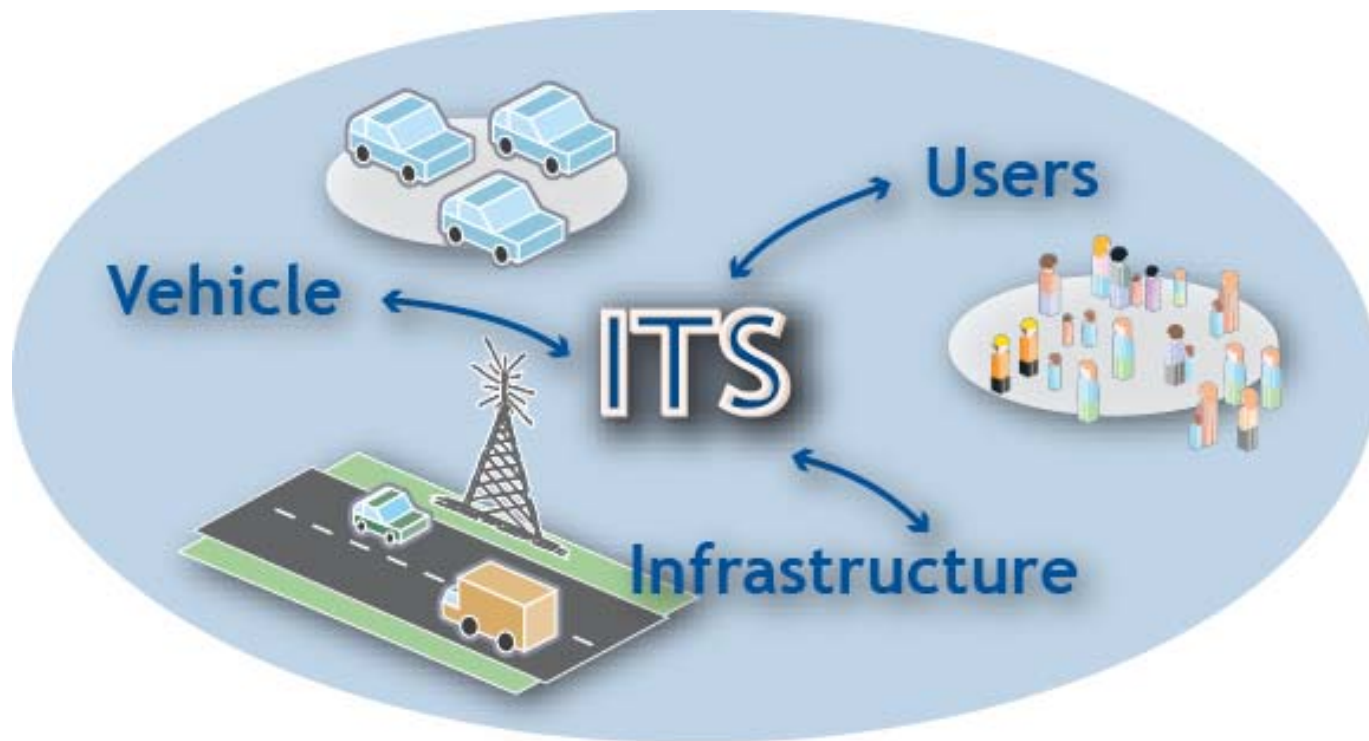
**Asbjørn Hovstø**

National expert

ITS
NORWAY

# ITS for multimodality



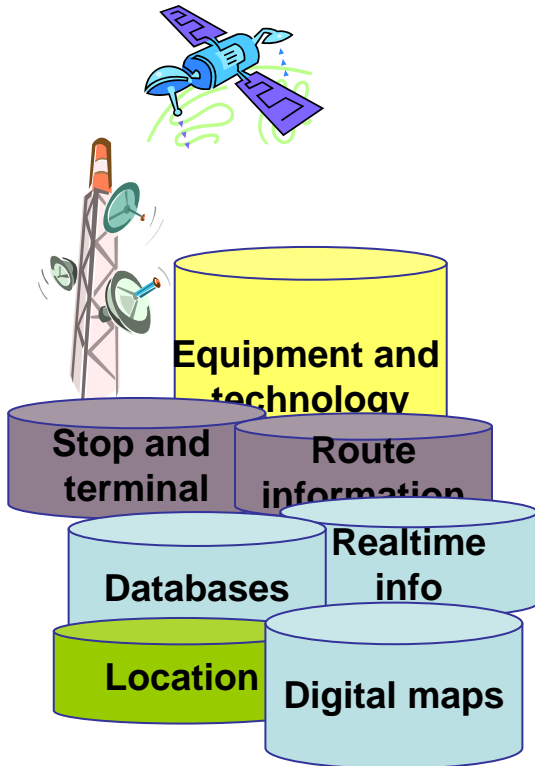Generic Communication Architecture based on the CALM concept

Transition to Portable Devices and Sensor Networks

# ITS connects
## vehicle – infrastructure – user



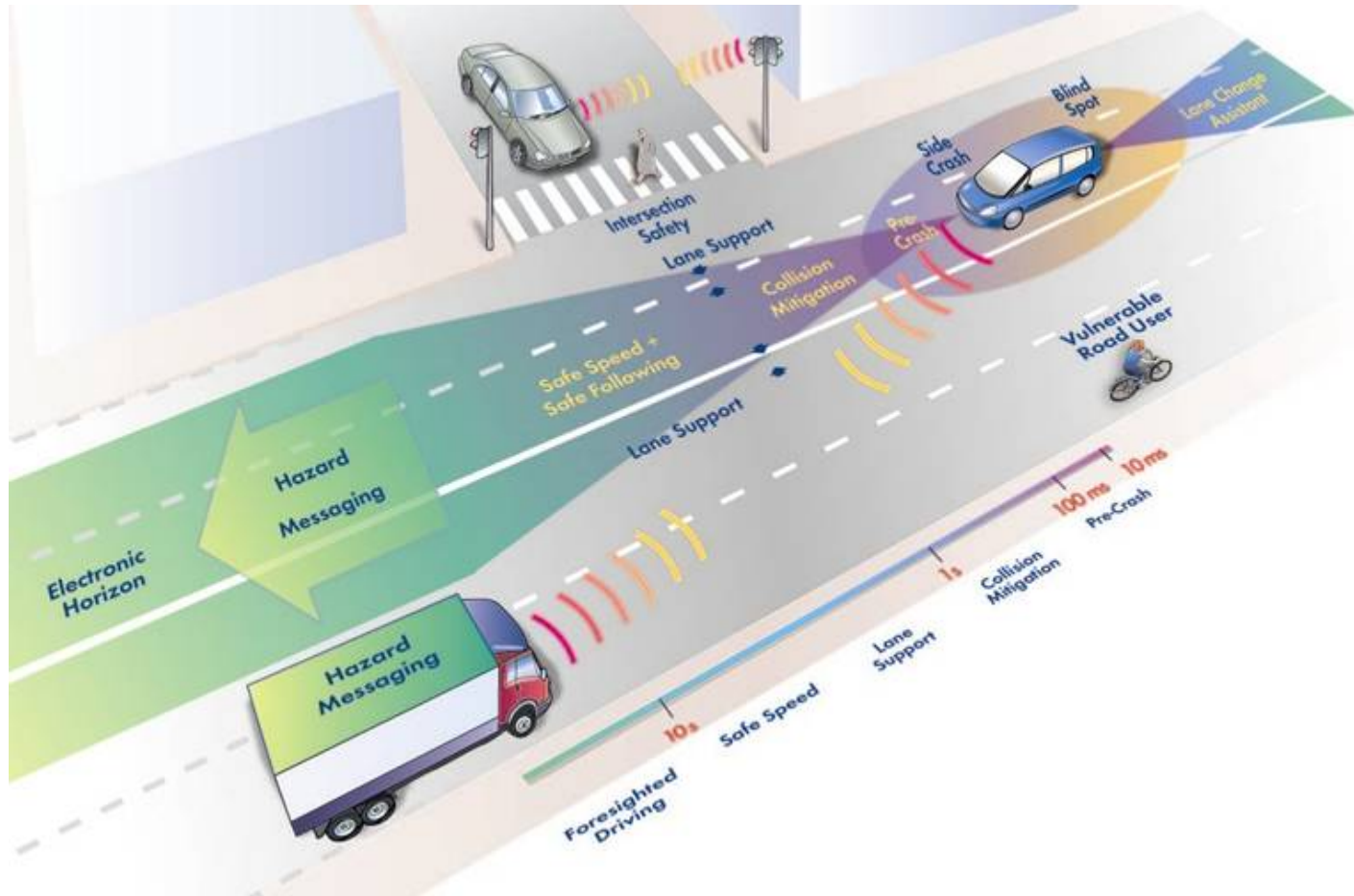Transition to Portable Devices and Sensor Networks

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# ITS



Commercial

Individual services for MY travel

"Kollektiv" services in gain for society

Public responsibility

**Equipment and technology**

**Stop and terminal**

**Route information**

**Databases**

**Realtime info**

**Location**

**Digital maps**

**ITS infrastructure**

Transition to Portable Devices and Sensor Networks
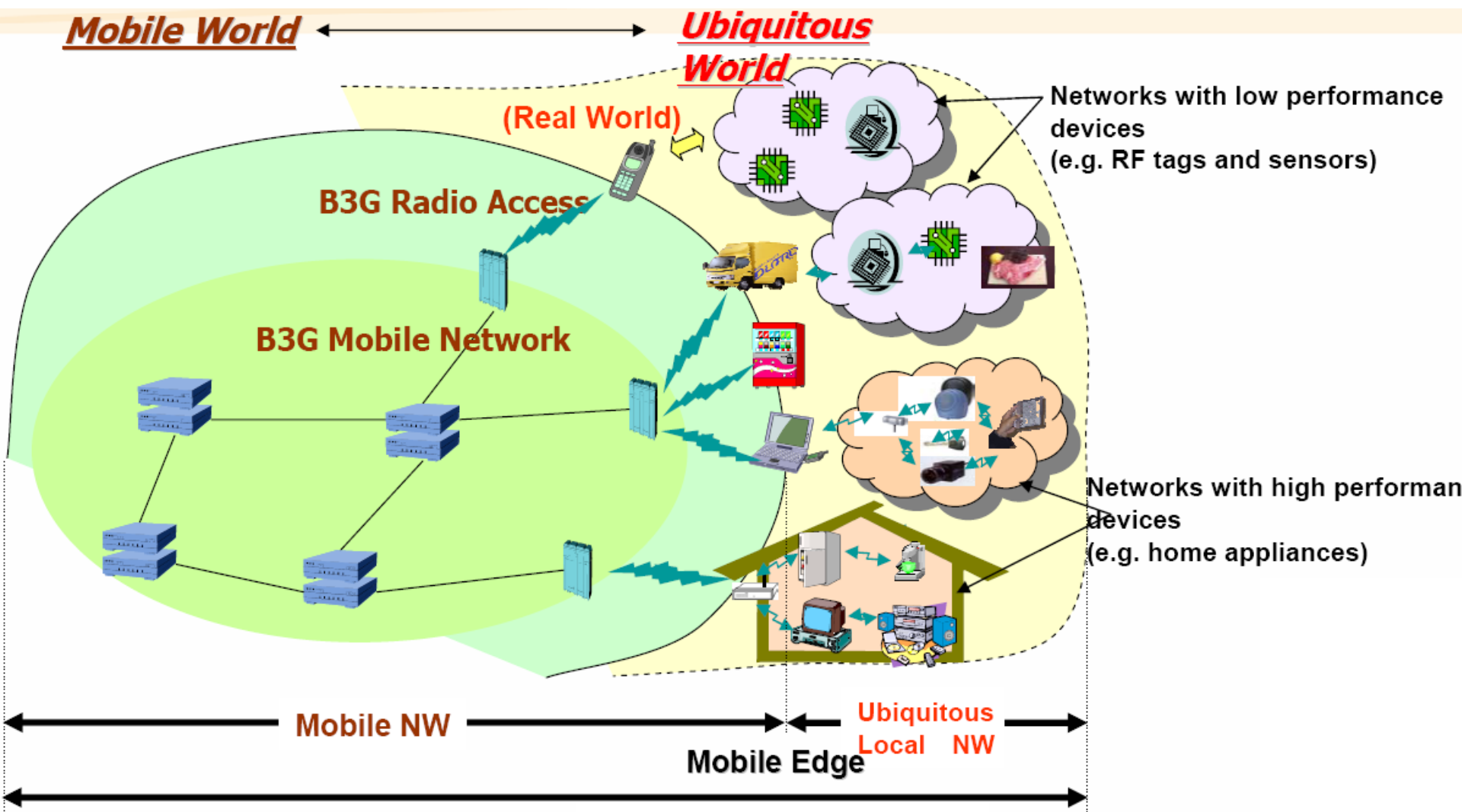
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# e-Security



Transition to Portable Devices and Sensor Networks

# Ubiquitous Sensor Networks



Transition to Portable Devices and Sensor Networks
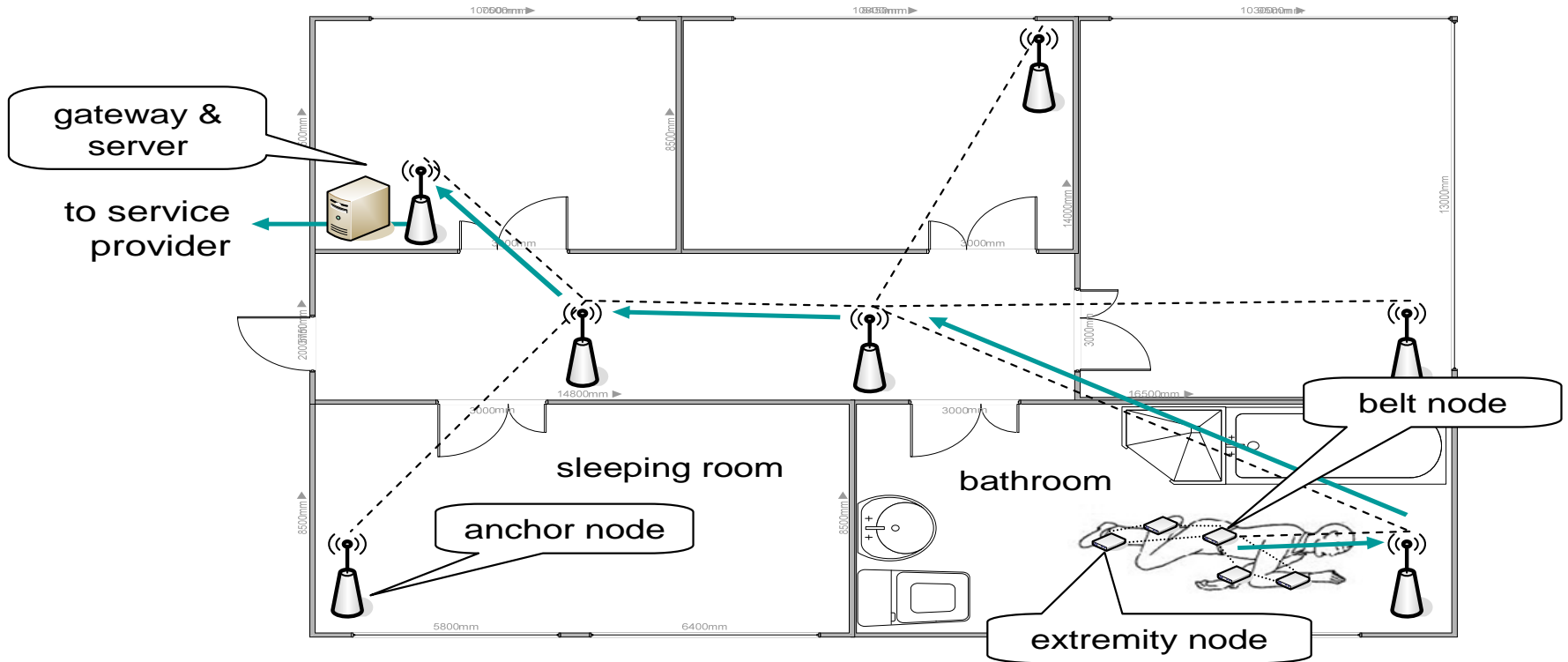
# Position and Posture Monitoring

**Elderly move into nursing home**
- **not able to stand up**
- **equipped with active sensors**
- **sensor tags detect uncommon body positions**
- **generate and transmit an alarm message**

Also for short-term patients recover from stroke, cancer, major surgeries, injury etc.

- Source: Study Group on Sensor Networks JTC1

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# Solution approach

# Functional system architecture

| Long range communication | Belt, anchor, gateway |
|---|---|
| Short range communication | Extremity, belt |
| Clustering service | Extremity, belt |
| Security service | Extremity, belt, anchor, gwy |
| Data storage service | Belt, anchor |
| Data processing service | Extremity, belt |
| Linkage service | Extremity, belt |
| Orientation detection service | Extremity |
| Self localization service | Extremity, belt |
| Monitor communication links | Extremity, belt, anchor, gwy |
| Data entry service | Belt |
| Indication service | Belt |

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# System requirements

| | |
|---|---|
| Latency time | Less than a few seconds |
| Throughput | Sensor data / alarm message |
| Lifetime | Up to a month without charge |
| Communication | Up to 10m house, GSM out |
| Clustering service | Clustering by Ids sufficient |
| Security service | Sustainability for years |
| Data storage service | Larger amount only in belt |
| Linkage service | Critical due to healthcare aps |
| Orientation detection service | Less than 5 degrees (angular) |
| Self localization service | Resolution on room level |
| Data entry service | One emergency button |
| Indication service | LED for system status |

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# Conclusions

- **Elderly and support personnell driving source**
- **Address identity management, health services**
- **Device (belt) substantially advantages from cards**
- **Security and privacy addressed**
- **Support technology trends**
- **Scenario benefits from sensors and devices**

- Source: Study Group on Sensor Networks JTC1

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# Thanks!

Questions or comments?

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