Convergence
Mobility and Location Based Services

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Convergence Market Drivers

Demand: New market needs

- Increasing number of "**mobile**" **people** (commuting to work, leisure and back home)
- Increasing volume of **goods travelling**
- **Congestion** of airports and roads
- Need for **efficiency and speed**
- Expectation of getting **the same technologies in business** as **in private life**
- Change from looking for content on DVD or hard disk to looking for **up-to-date content online**
- **User groups** and peers **share information**

Supply: New technologies

- **Wireless**: data acquisition, communication, sensing and positioning via ubiquitous access to networks and data-carrying systems
- **Broadband**: transmission of more information in a given amount of time
- **Real-time video-streaming**: real-time distribution of audio, video and multimedia on the internet
- **Geolocation**: automatic determination of real world geographic location via satellite, internet, mobile devices…
- **Data mining**: analysis of data for relationships that have not previously been discovered

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Useful Location Based Services or Flushing with Random Information?

- Always on
- Anytime, anywhere, in any form
- Voice and multimedia
- Self service, intuitive
- Simple for the end user
- Secure, trusted and reliable

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Mobility Added Value Chain

- Get position from GPS
- Calculate with accurate representation of the world
- Get new Location Based Services & capacities

HUMAN MOBILITY

- Navigation (car & pedestrian)
- Child fencing
- Track & tracing
- M commerce
- …

PLATFORM MOBILITY

- Aircraft all weather flying capabilities
- Synthetic ILS
- UAVs monitoring
- Container track & tracing
- …

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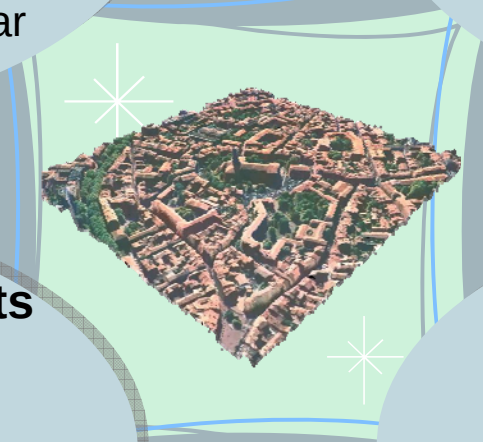
Positioning and Real World Representation is Key

Positioning

- GPS/Galileo
- Dead Reckoning (gyro, barometric and odometer sensors)
- Additional devices (RFID tags, pseudolites, GSM, WIFI, Bluetooth, Passive Radar etc.)

Real World Modelling

- 2 and 3 D vectorised maps
- Satellite/aerial imagery
- Incorporation of all existing mapping/cartographic data bases
- Enrichment with geocoded information
- near real time updating



Application Developments & Platforms

- Navigation systems
- Fleet management
- Location based services
- Packages that handle the other pillars to provide LBS required

Communication

- Exchange of data between fixed and mobile devices/client server etc. by standardized interface
- by Satellite (Iridium, Globalstar, Orbcom etc.)
- by GSM, GPRS, UMTS etc.
- by RFID, WLAN, Bluetooth etc.

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Application: Intelligent Route Planning and Navigation

- Up-to-date maps by user group online map update
- TMC (Radio Signal) content generated by
  - information of the police and automobilist clubs
  - information of road charging operators
  - traffic jam sensors (e.g. fixed on German motorway bridges)
  - induction loops
  - Floating Car Model (car fleet members permanently transmit their position and speed multiplex anonymised - http://www.cityrouter.net)
  - Net Floating Car Data (Mobile operator reveal number of mobile phones within a cell plus fluctuation of the cell)
- Data base update
  - with radar positions
  - Point of Interest information
- Track & Tracing of Buddy List members via GSM
- Geo-fencing for Buddy List members via PDA and Desktop
  - for limitation of time, date, area of own device or others
  - e.g. children, elderly, handicapped, etc.

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Application: Flight Navigation System Demonstrator

- Flying an aircraft in all weather conditions is possible by using an advisory system, allowing:
  - a very accurate positioning information of the aircraft (GPS/Galileo/Inertial Navigation System)
  - a true and accurate representation of the real world around the aircraft
  - no need for assistance from ground based equipment
  - only a few additional dedicated sensors required to complete the modelled picture of the environment
  - safe ground taxiing for large aircraft
  - enhanced anti-collision on airports

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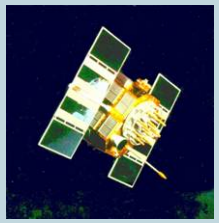
Application: Fleet Management



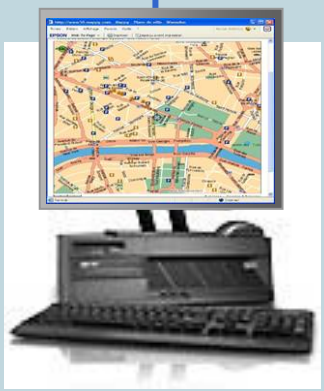
GPS

Radio & Telecom

Map Database Servers

Application Servers

Application Terminals



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Application: Container Security

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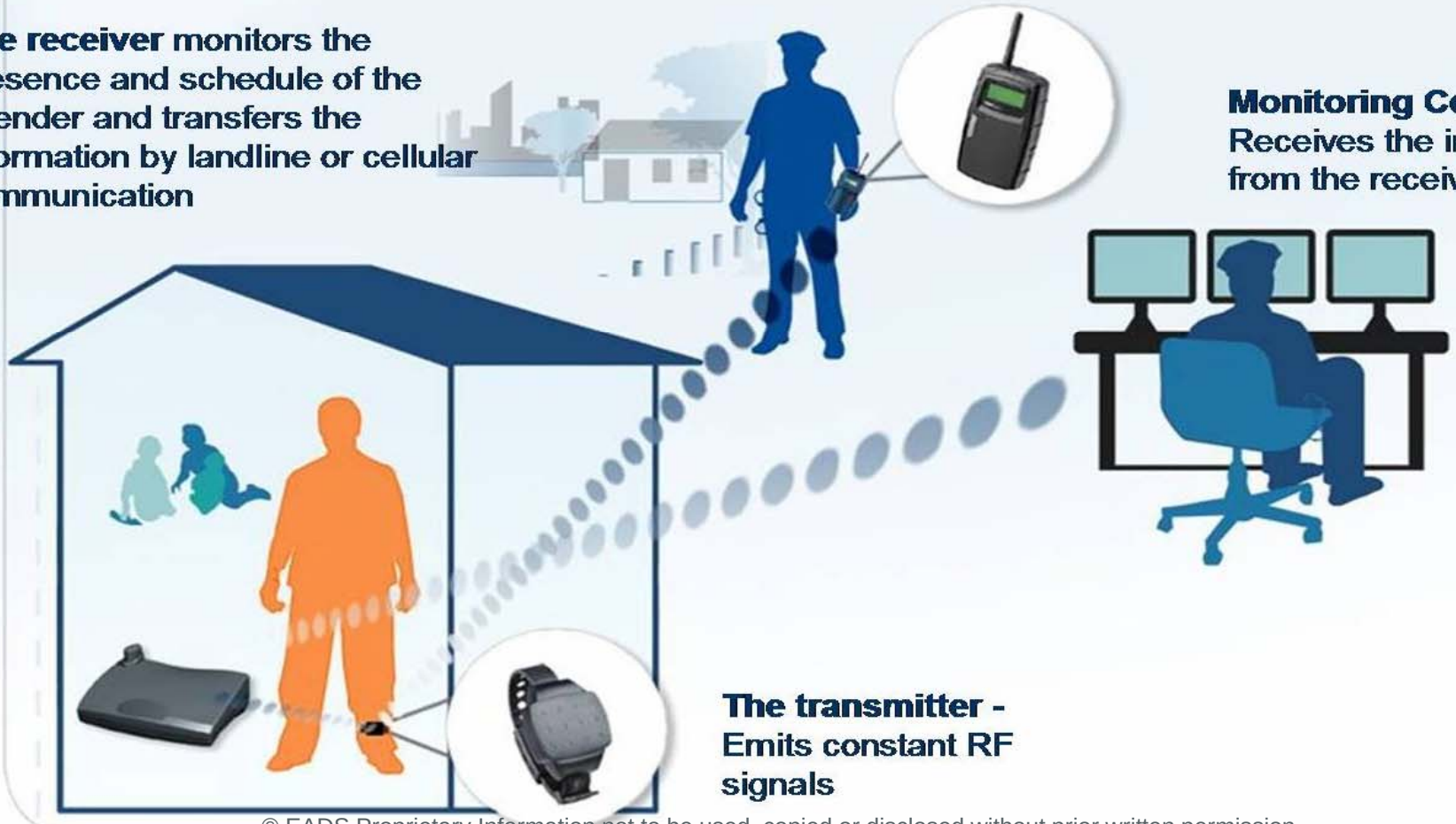
Application: Home Custody

A Mobile Unit- allows the remote monitoring of the offenders

The receiver monitors the presence and schedule of the offender and transfers the information by landline or cellular communication



Monitoring Center – Receives the information from the receivers

The transmitter - Emits constant RF signals

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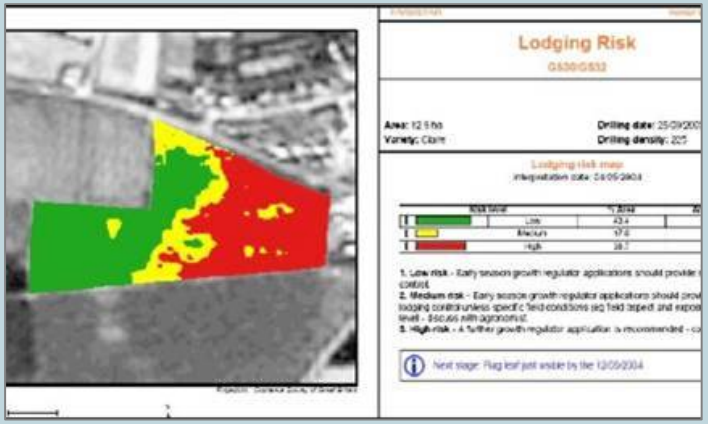
Application: Agriculture

- Crop Management Services/Precision Farming
  - Using Satellite data, Desktop and PDA applications,
  - Recommendations for crop monitoring at critical growth stages
  - Application based on GPS
  - Annual subscription per parcel and per type of crop



Information derived from satellite and/or aerial imagery analysis, combined with sophisticated agronomical models and meteorological data

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Thank you very much for your attention.

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