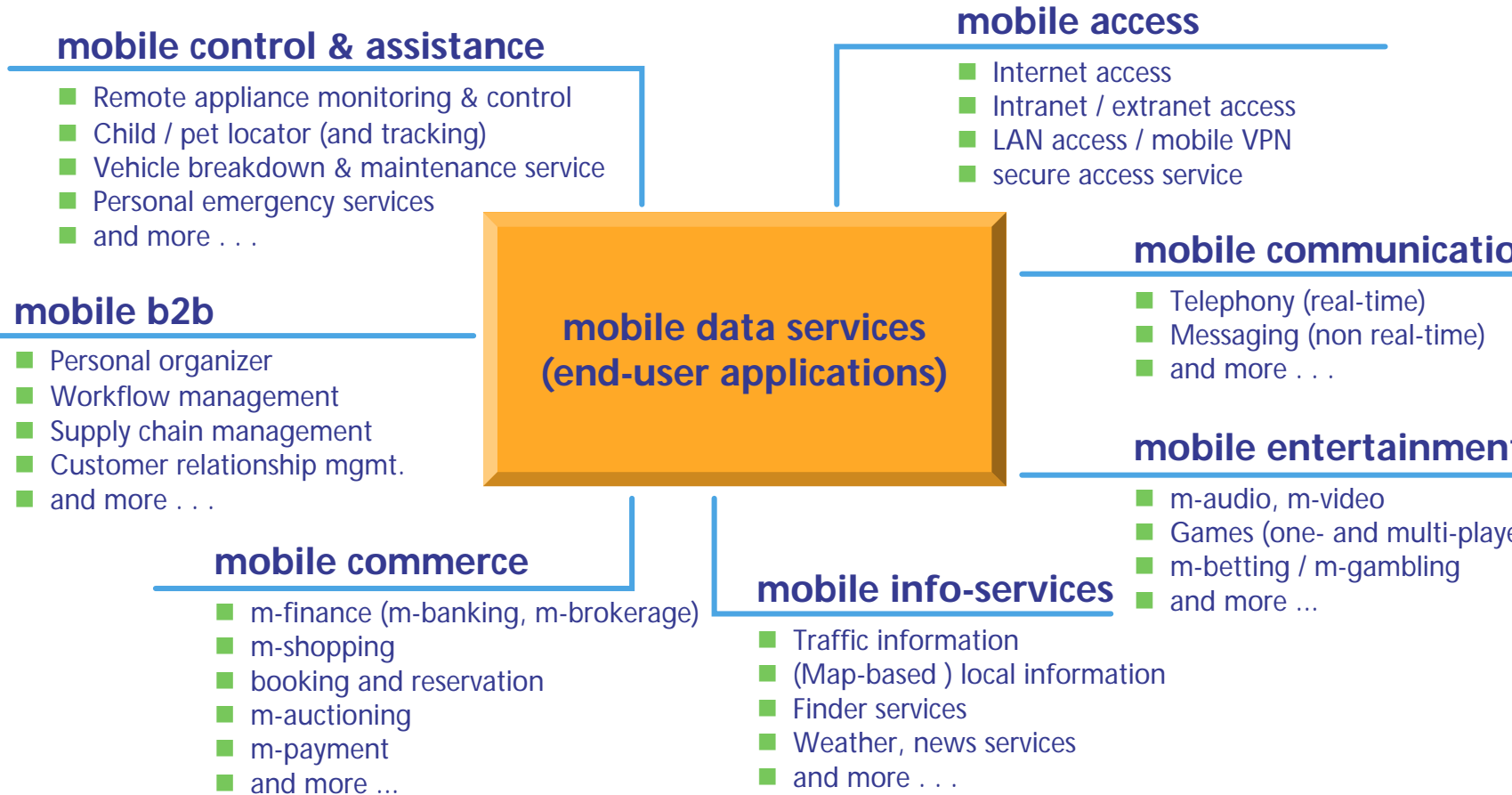**swisscom** **mobil**

Seamless Integration of Heterogeneous Wireless Network Technologies and
Services – Swisscom Mobile's Vision

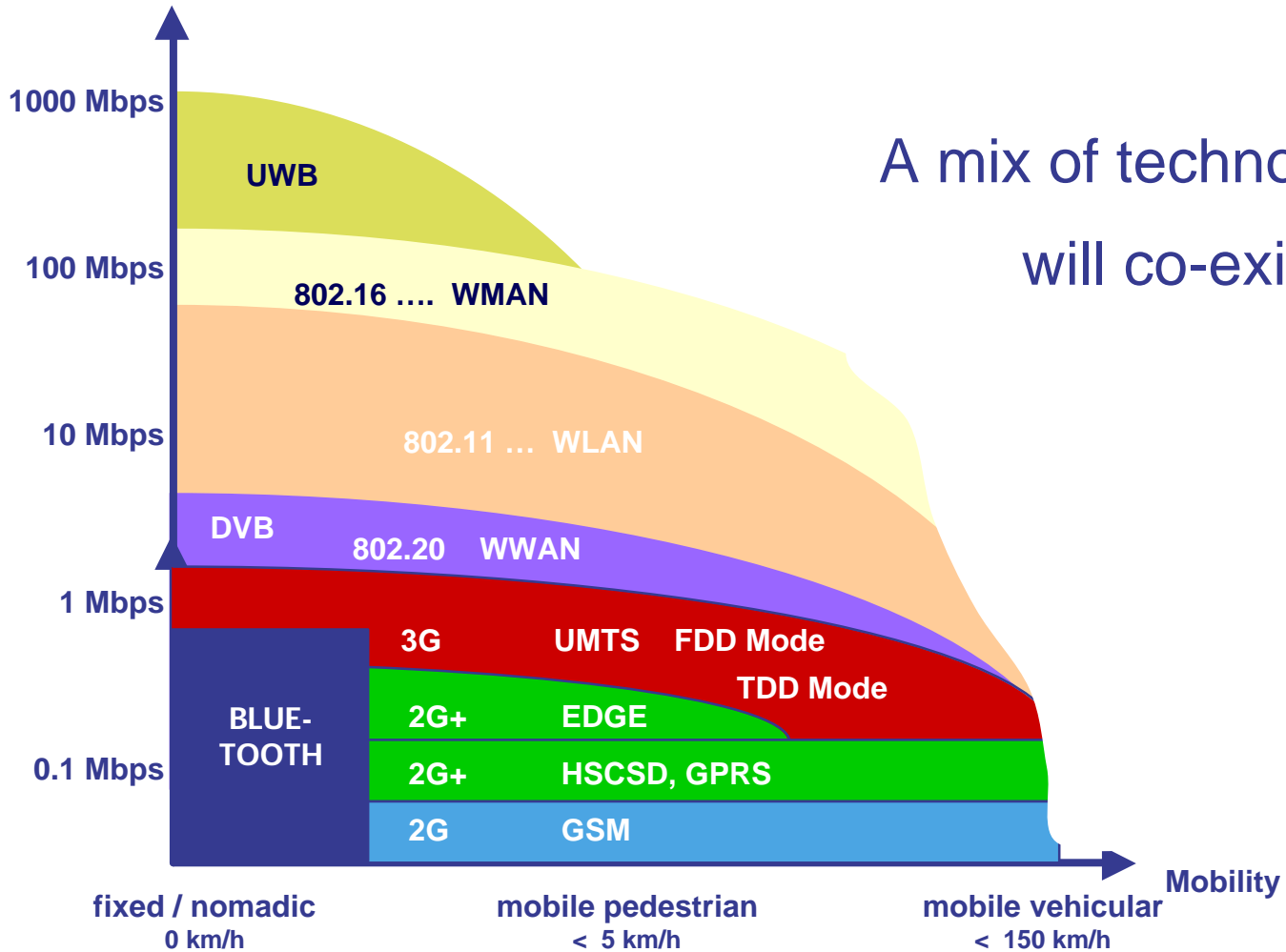Wolfgang Weber, Chief Technology Officier
Swisscom Mobile AG

Future Services to be supported

mobile control & assistance

- Remote appliance monitoring & control
- Child / pet locator (and tracking)
- Vehicle breakdown & maintenance service
- Personal emergency services
- and more . . .

mobile b2b

- Personal organizer
- Workflow management
- Supply chain management
- Customer relationship mgmt.
- and more . . .

mobile access

- Internet access
- Intranet / extranet access
- LAN access / mobile VPN
- secure access service

**mobile data services
(end-user applications)**

mobile communicatio

- Telephony (real-time)
- Messaging (non real-time)
- and more . . .

mobile entertainment

- m-audio, m-video
- Games (one- and multi-playe
- m-betting / m-gambling
- and more ...

mobile commerce

- m-finance (m-banking, m-brokerage)
- m-shopping
- booking and reservation
- m-auctioning
- m-payment
- and more ...

mobile info-services

- Traffic information
- (Map-based) local information
- Finder services
- Weather, news services
- and more . . .

Source: Siemens

7 categories will satisfy user needs

Wireless/Cellular Networks – Coexistence ?

A mix of technologies
will co-exist

1000 Mbps

UWB

100 Mbps

802.16 …. WMAN

10 Mbps

802.11 … WLAN

DVB

802.20   WWAN

1 Mbps

3G   UMTS   FDD Mode

TDD Mode

BLUE-
TOOTH

2G+   EDGE

0.1 Mbps

2G+   HSCSD, GPRS

2G   GSM

Mobility

fixed / nomadic
0 km/h

mobile pedestrian
< 5 km/h

mobile vehicular
< 150 km/h

Wireless/Cellular Networks – Coexistence ?

- Operators Networks (PWLAN, Cellular) serves as fallback access network outside coverage of private (WLAN, Bluetooth) networks
- Users will not have to worry about selecting an access technology. The end device will do it, depending on what is available
- WLAN are not (yet) designed to offer carrier grade quality and availability, but the will become better and better ….

Full Mobility and Seamless Access

GSM/GPRS

UMTS

WMAN

WLAN

WLAN

WLAN
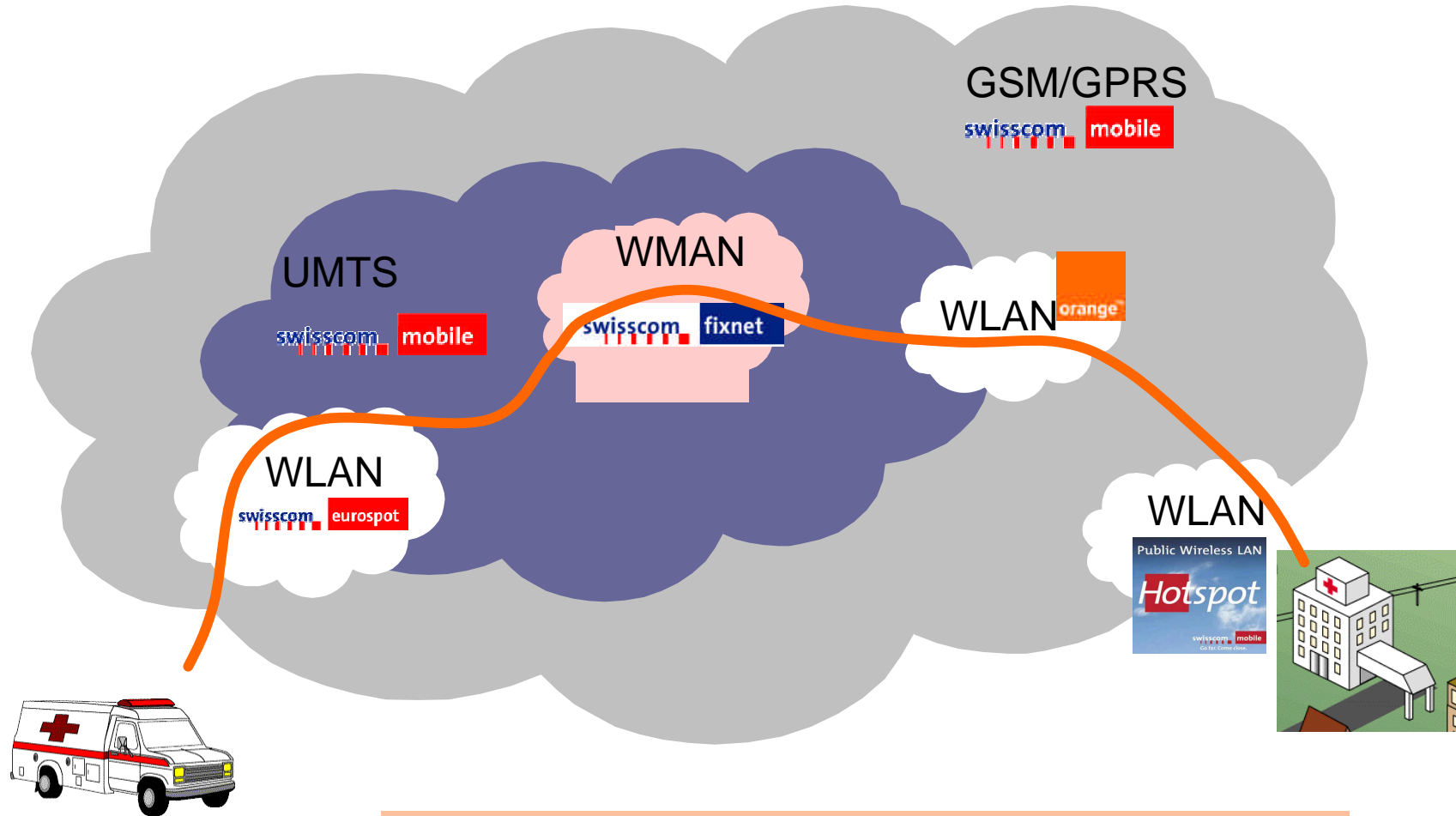
Seamless Handover will simplify users life and enable new services

What about QoS and Security in future Wireless Networks ?

- QoS:
  - (payed) Multi-media Services require QoS Support
  - QoS requires network management
  - Operators have full control of their network and can therefore guarantee QoS
- Security:
  - Cellular Networks have a long security tradition and therefore a high level of security
  - Operators are considered as trusted
  - Wireless networks are not (yet) inherently secure

Scenarios for Ad-Hoc Networks

- Multi-hop Access to base stations (less base stations, extended coverage)
- Mesh networking
  - Interconnection of Train coaches
  - Broadband to the home (WLL)
  - Hotspot deployment
- MNO provides interconnection of community mesh networks (backbone)

We are not interested in an ad-hoc world without operators, it's obvious

Seamless Service Integration – Does it ever happen ?

- People are more and more used to have mobile communication anytime anywhere, therefore there will be a high demand for seamless service integration
- Do Seamless Services require seamless network?

- …..

It is our vision that it will happen

From Vison ...

... **To Reality !**

The Mobile Office

Is Here !

Backup

Panel Discussion about ....

In the near future, we will have many different wireless communication technologies such as WPANs, WLANs, WMANs, 3GPPP, sensor networks, RFIDs etc. Will a seamless integration of networks and services ever happen or will network technologies evolve as stand-alone networks ? Envision a scenario of a user leaving the enterprise WLAN environment, passing through multiple WMAN / cellular data networks, and entering a WLAN environment at another site. Today, it would be very rare to expect a single device to operate in all of the wireless environments. Even in situations where a single device can establish basic connectivity in multiple wireless networks, users are faced with multiple and incompatible technologies for access control, signaling and data transport. Today's answer to this problem is to strive for greater and greater coverage of homogeneous technologies. Unfortunately, this approach is inherently limited and will fail to achieve the true anytime, anywhere, mobile connectivity envisioned. Which services and need to be supported in the future ? Are IP based, best-effort services sufficient or do we need better QoS support in future wireless networks environments ? Are mobile ad-hoc network really important for practical usage scenarios or is that just a nice playground for researchers ? What about security ? Can sufficient security be achieved across the different wireless network technologies ? How do we integrate technologies targeting human communciations and wireless communication technolgies for devices and machines such as sensors, cars, vending machines etc. ?

Key questions

- 1) What services and applications need to be supported in future cellular and wireless networks, including PANs, LANs, MANs?
- 2) What are some of the practical scenarios envisioned for mobile ad-hoc networks?
- 3) Are IP based, best-effort services sufficient or do we need better QoS support in future wireless networks environments?
- 4) Is security across different wireless network technologies needed? Can it be achieved?
- 5) Will future wireless/cellular networks evolve as stand-alone networks?
- 6) Will a seamless integration of wireless networks and services ever happen?