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Connectivity in motion.™

Icomera – *Connectivity in Motion*

Leading provider of cellular broadband gateways

- Established 1999, headquartered in Sweden
- Acquired Moovera Networks in August 2008
- Designing rugged technology that bridges cellular networks with Wi-Fi, Ethernet and GPS
- Delivering Internet access for rail, road and sea

Experience

6,281,986

Wi-Fi sessions at Icomera hotspots on trains – until mid November 2009

Reliable Communication

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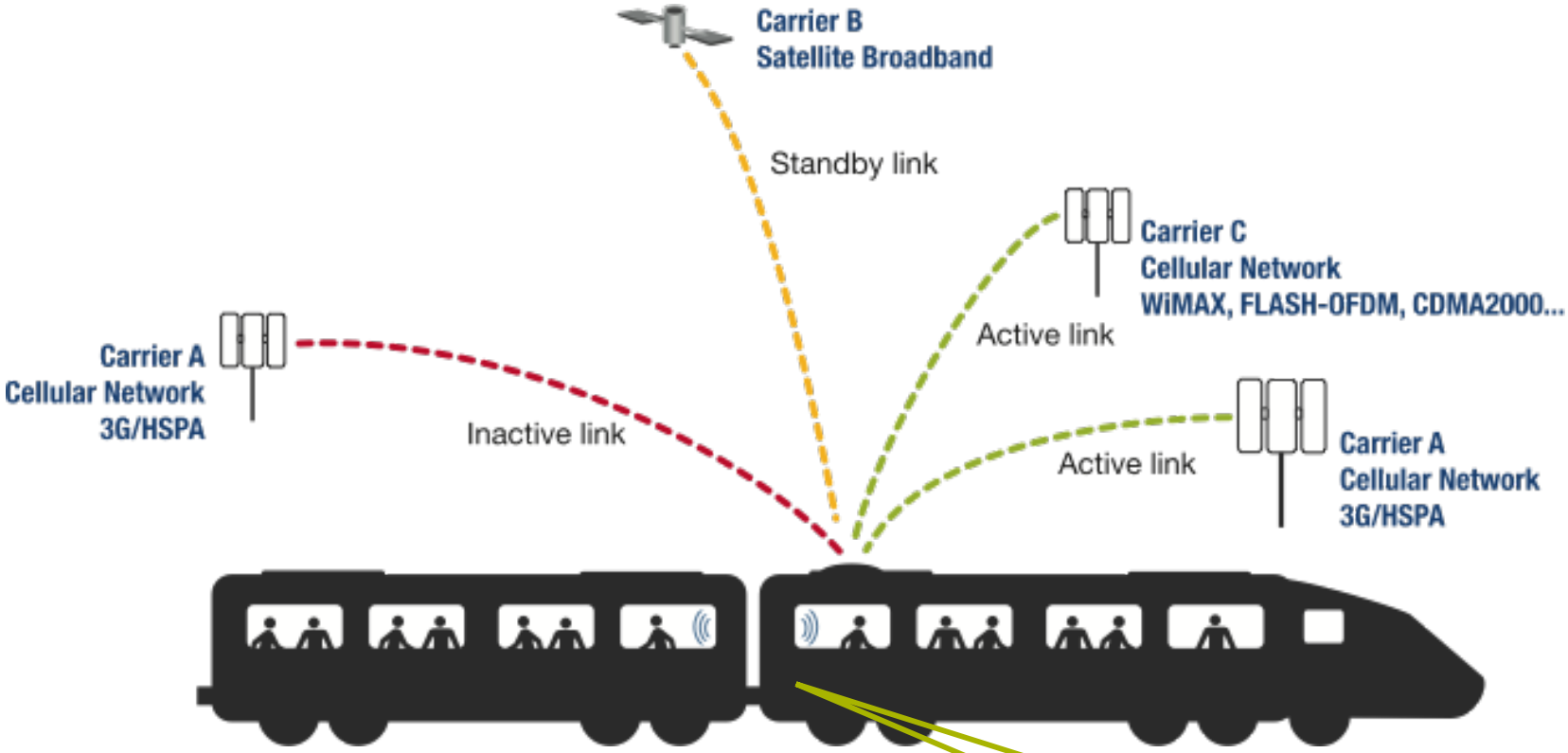

- The systems should be technology agnostic
- Choose best available connection
- Seamless handover with no interruption in service
- Aggregate and load balances multiple connections

The Moovbox
Multiple WAN radios for always-on connectivity

4G WiMAX Has Arrived

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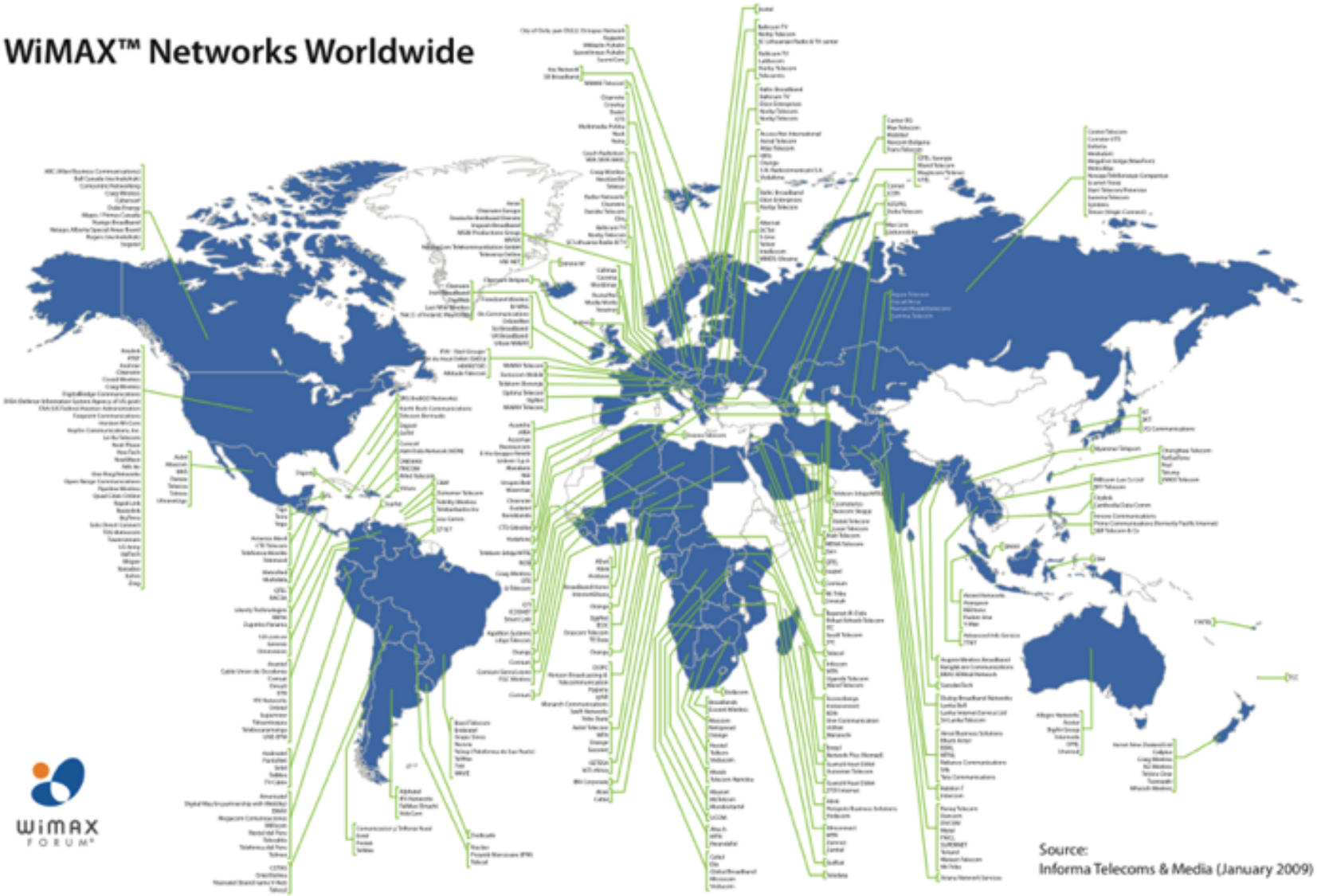

4G WiMAX Key Facts

- 502 networks deployed in over 145 countries
- Mostly 3.5GHz spectrum worldwide but U.S. + few others use 2.5GHz
- Fixed (802.16d) and Mobile (802.16e) versions
- 802.16e deployments ~2 years ahead of LTE
- Faster than HSPA and EV-DO
- IP e2e network for data and voice
- Majority of early adopters offering mobile broadband only
- WiMAX operators looking increasingly at B2B, M2M opportunities

Transportation market offers significant revenue potential for WiMAX providers

4G WiMAX Evolutionary Timeline

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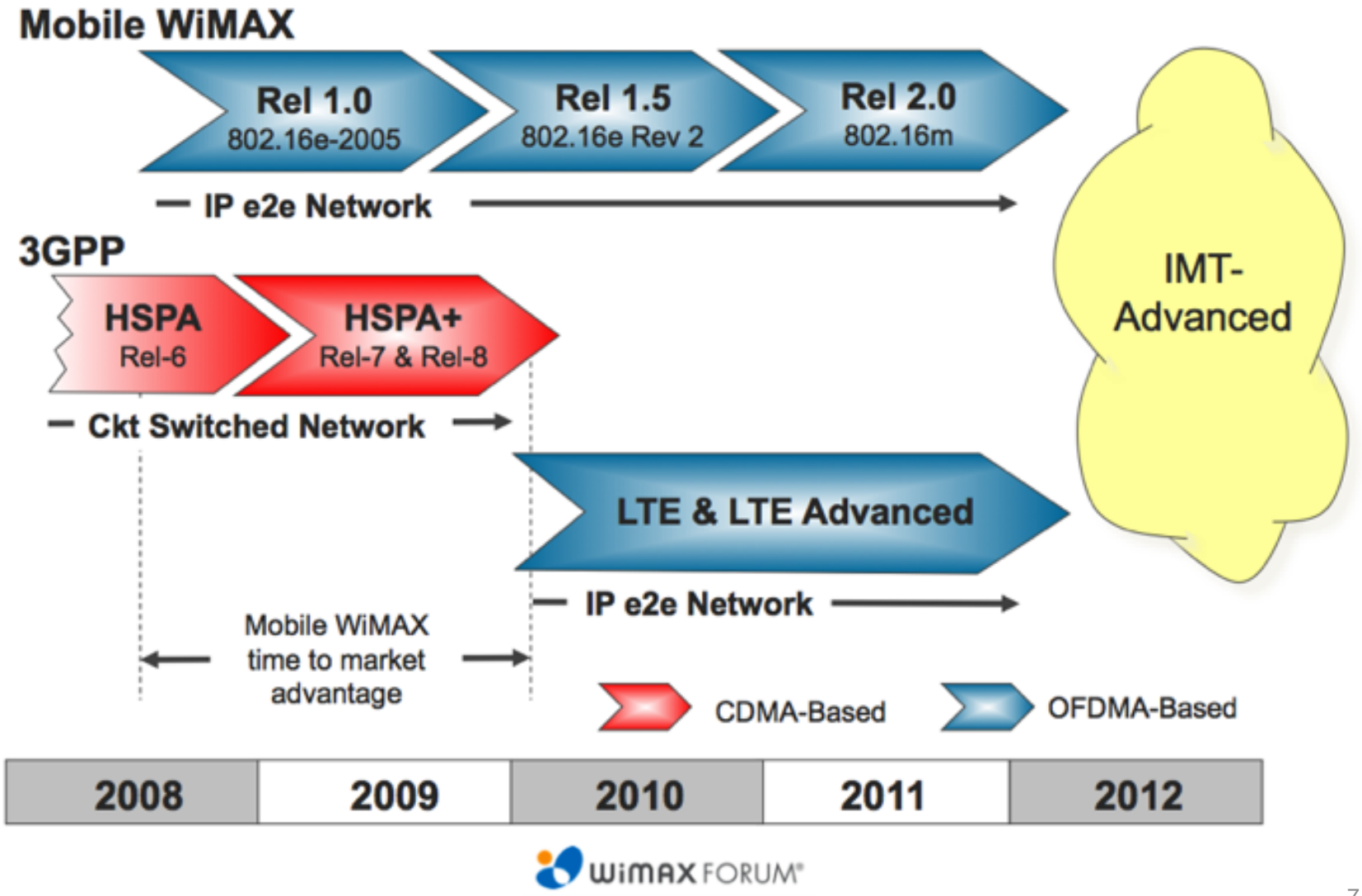
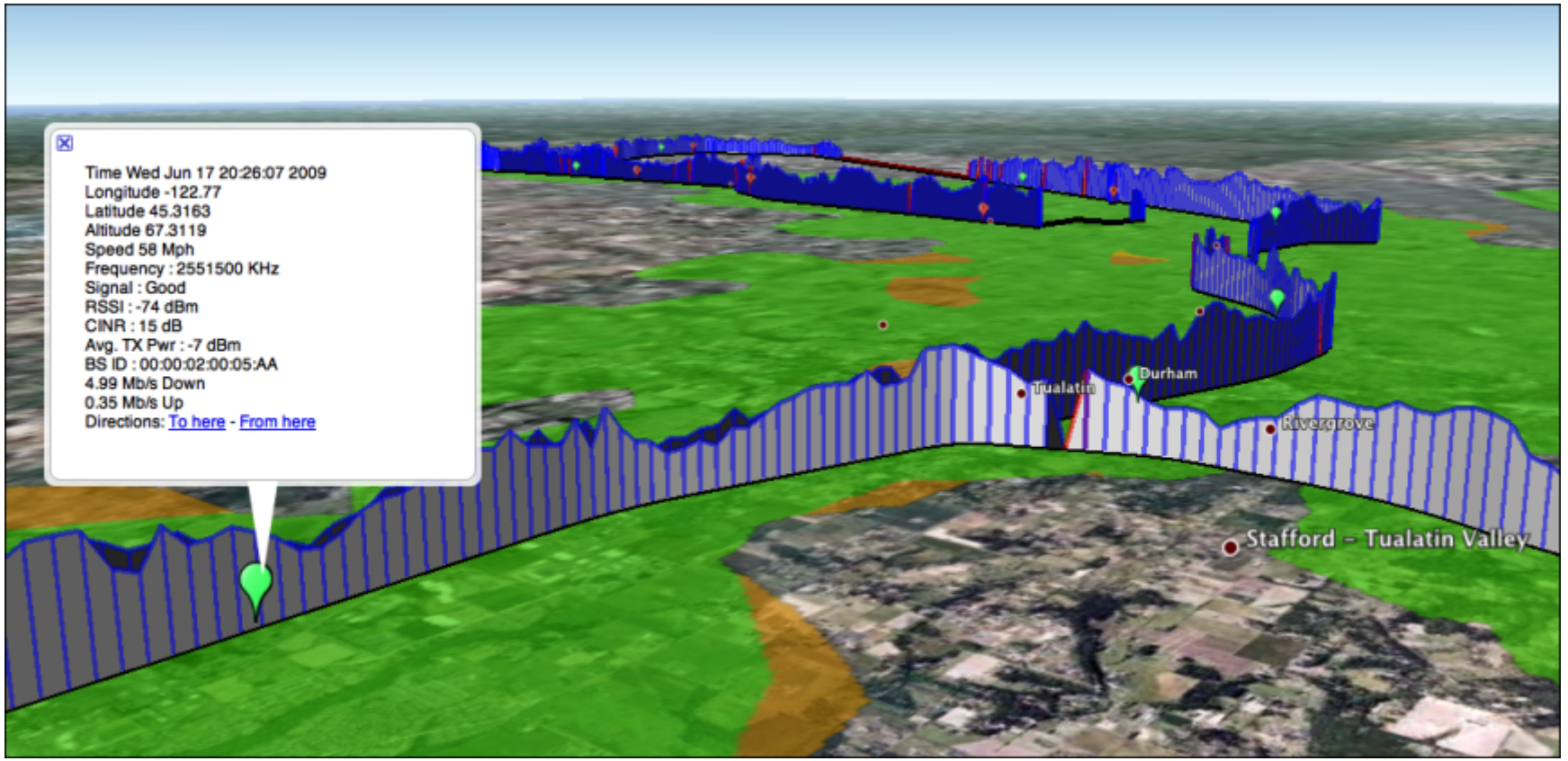


WiMAX FORUM®

WiMAX Real World Moovbox Testing



- Testing on Clearwire network in Portland Oregon using consumer account
- 5 Mbps downlink at 60 MPH (97 KPH) – Uplink throttled to <500 Kbps
- Excellent performance overall proved WiMAX capabilities for transport applications

New technologies = more possibilities

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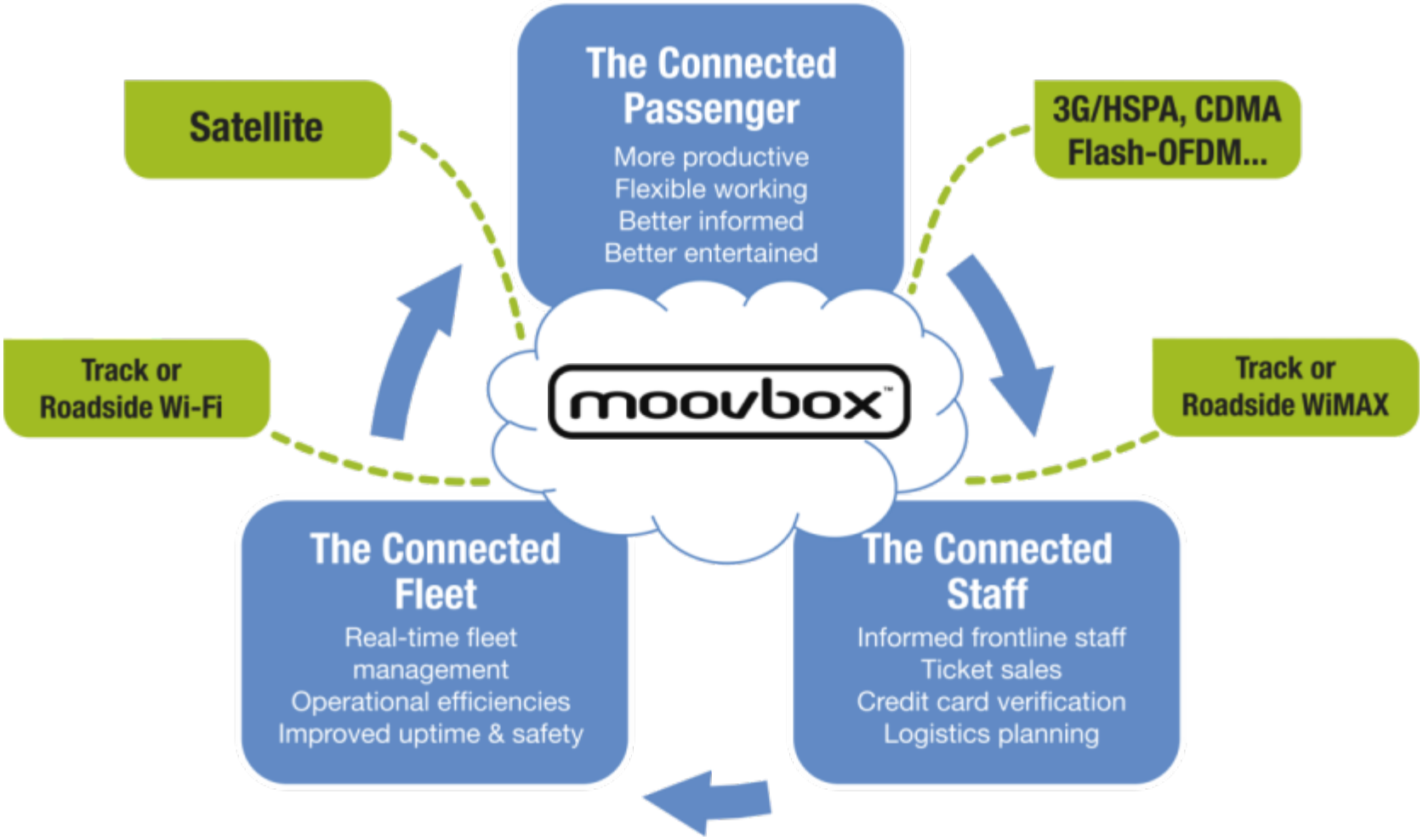
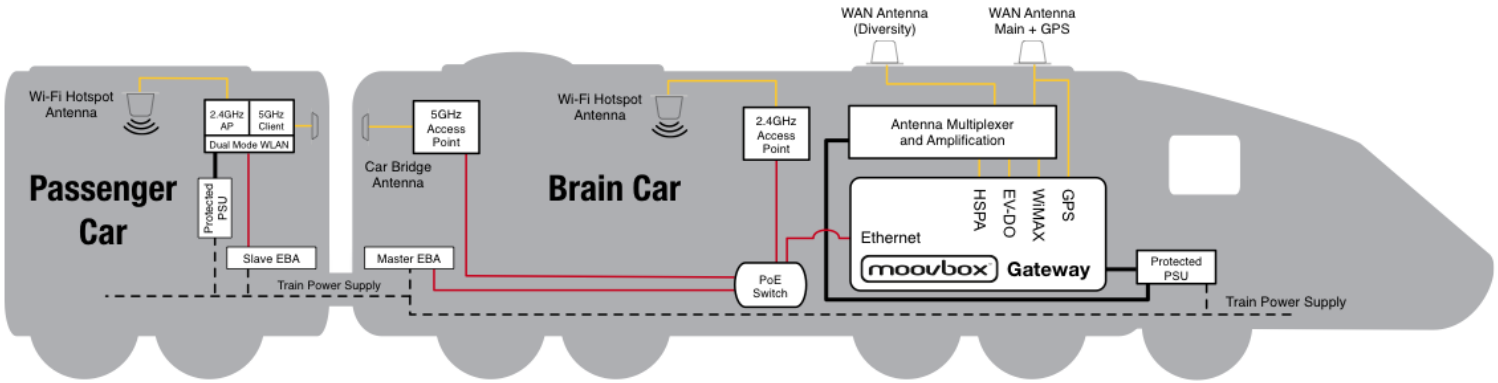


Additional requirements on the train



- Increased capacity to the train will lead to increased requirements on the train
- Onboard networks need to handle CCTV, streaming movies, etc.

- Opens for new possible solutions for the infrastructure onboard – the better communication/reliability the more data and applications can be stored “off the train”

And the hardware is of course important..!

The communication is important..!

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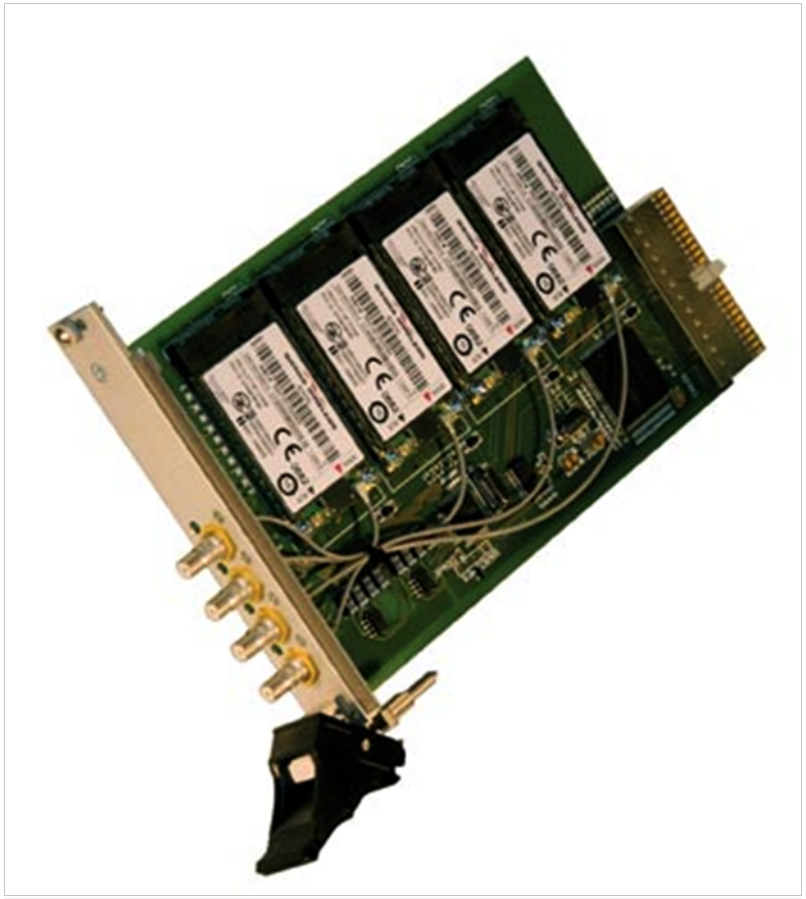
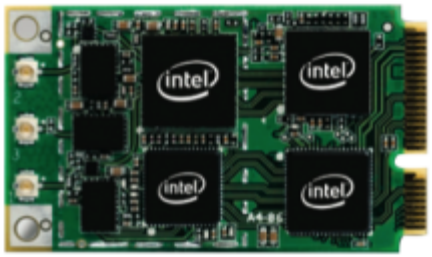
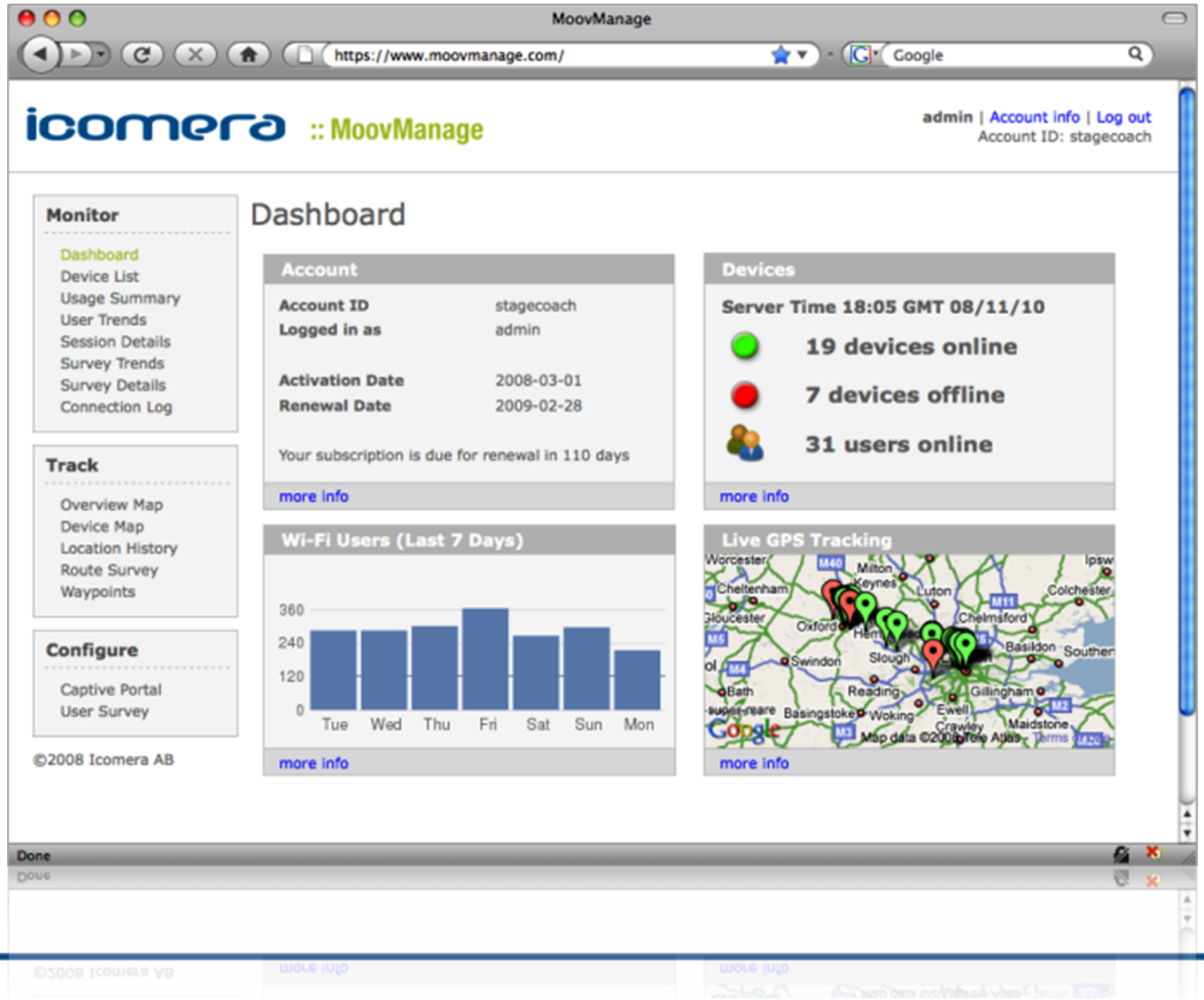
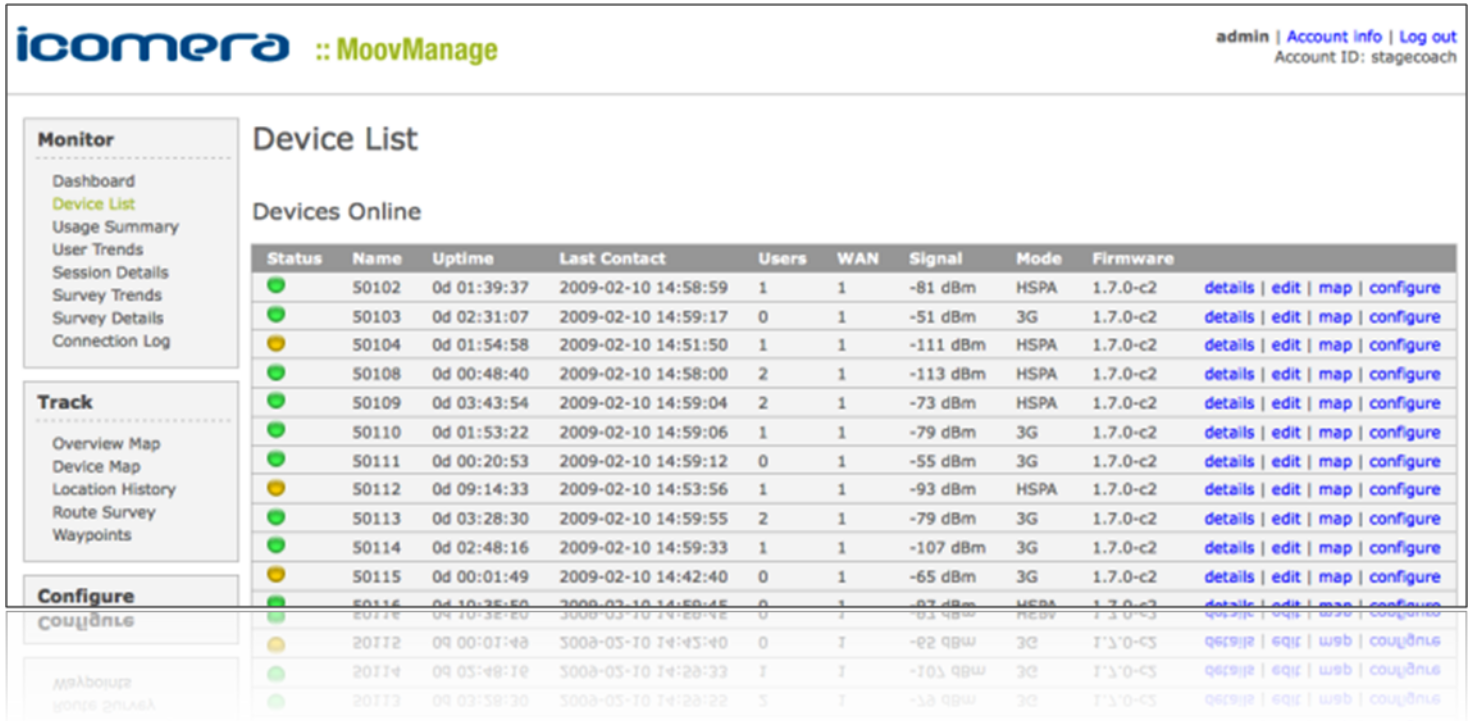




... But not as important as management

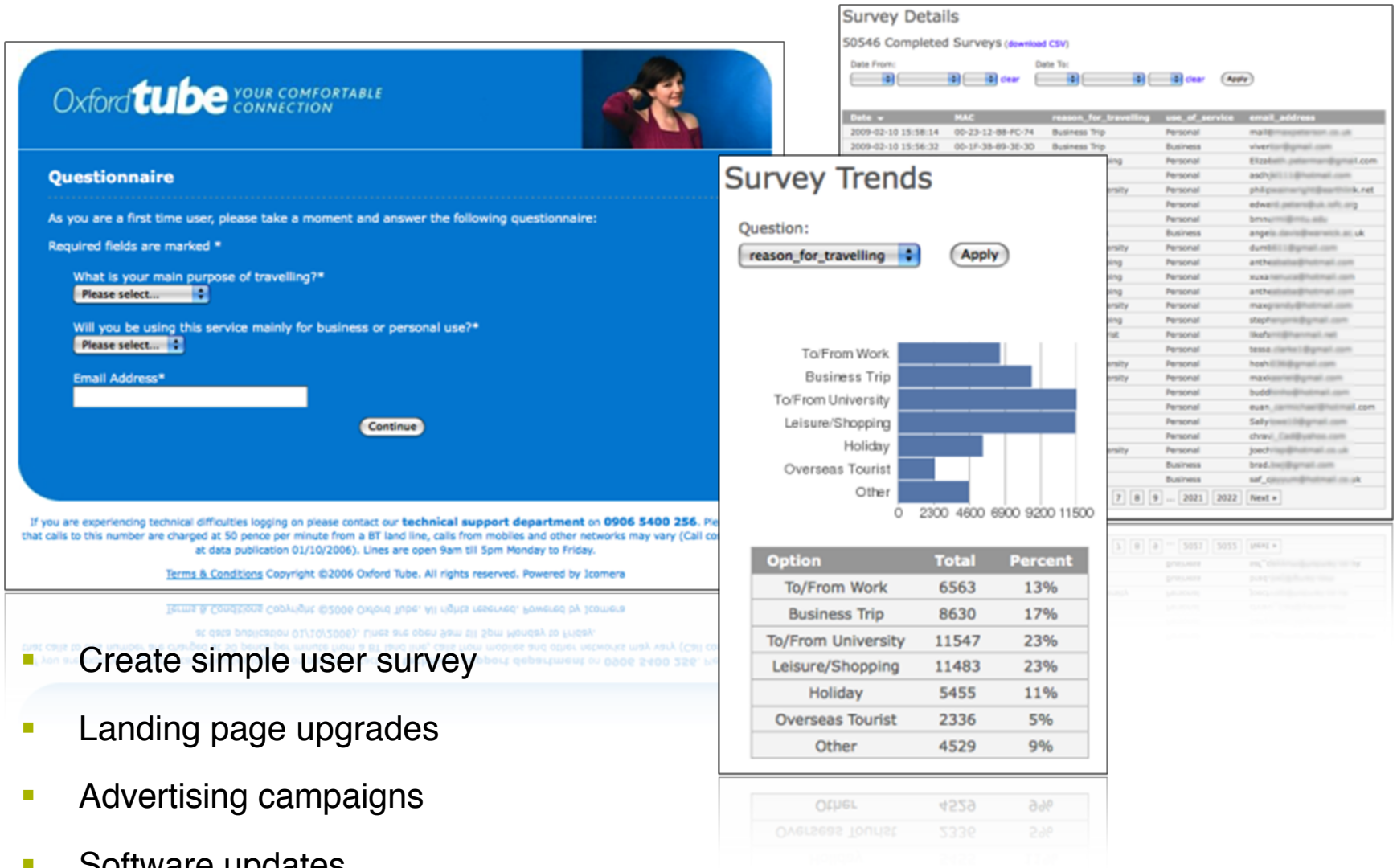


Remote Management and…



- 'Traffic light' status display with uptime and last contact information
- Shows number of Wi-Fi users connected to any given device
- Displays signal strength and WAN mode (e.g. HSPA, 3G or EDGE)
- Links to drill down to deeper levels of monitoring and control

Control is key



- Create simple user survey
- Landing page upgrades
- Advertising campaigns
- Software updates

Will technology change the offering?

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Bus & Coach

Light Rail

All with different needs and purposes

Regional Trains

Long Distance Trains

No – But new technology will...

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- Improve bandwidth and enhance current services
- Enable support for more and new types of applications
- Less focus on communication and more focus on back-end, management, communication intelligence and QoS

- The main reasons for connecting trains remains the same!

To Win Customers

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Greyhound

To Keep Customers

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Stagecoach

"Many of our passengers are commuters and students, and we have had an enormous amount of positive feedback about the Wi-Fi service. It puts Stagecoach at the forefront of offering next-generation on-board services."

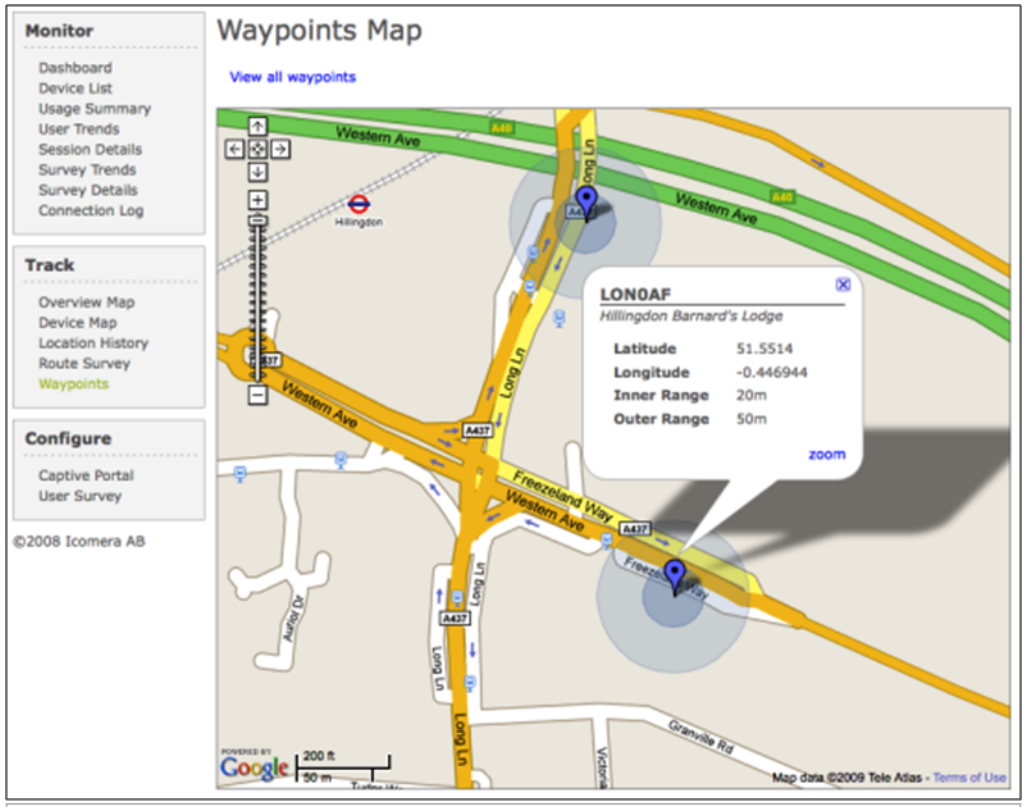
Brian Souter

CEO, Stagecoach Group

To Gain Operational Efficiency

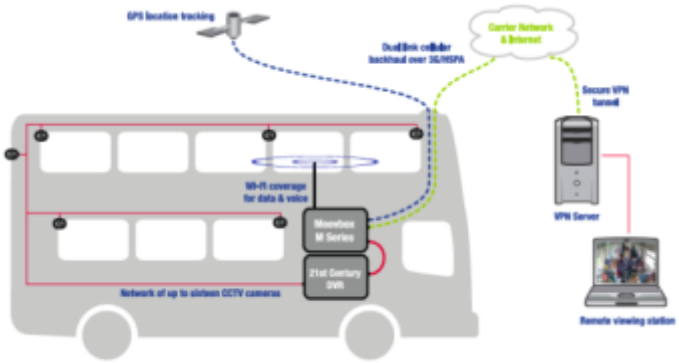
- On-line ticketing
- Real-time sale and validation of tickets
- Passenger Information

Tracking and Measurements



- Set up specific points on route at which to record entry/exit data
- Record frequency and time of device arriving and departing specific waypoint

To Enhance Security



- 21 double-decker buses equipped with live CCTV
- Moovbox M200 + digital video recorder and cameras
- Video streamed over HSPA network to headquarters
- GPS tracking, telematics including braking
- Six-month trial to assess impact on lowering crime rate

Transport for London

How to handle new technologies

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Do not...

- Invest in solutions that can not be easily upgraded
- Wait until next generation technology – By then the customers will have chosen other means of transportation – use technologies available today and make sure your system is future proof
- Expect anyone else to solve your problem

Do

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- Use multiple networks to gain advantages – And grow/enhance when needed
- Make sure that the service can be launched when you want – use technologies and business models existing today!
- Control the business model – Change with the times, free WiFi, dongles etc
- Use the infrastructure for multiple things

Conclusion

- New technologies will not change the case – they will improve it!
- Make sure you have **flexibility** for the future – Capacity, Technology etc.
- Maintain **control** – Business model, Applications etc.
- Look at *connectivity* from a company perspective – **operational savings** AND **additional revenues**
- Communication technology should be agnostic

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