Preparing the Future
Support for Operations Enhancements

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Paris, Sept 11th 2013
Agenda

1. A question of Perspective
2. Current R&D Programme
3. Challenges
4. Conclusions
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One way of looking at things

1. In the current frame of mind

Critical Voice

Critical low rate data for ETCS I2
Another way of looking at things

- Passenger services
  - Internet on board?
- Ubiquitous Internet
- Critical low rate data
  - for ETCS I2
- Security/Video
  - Applications (on-board, Driver look ahead…)
- Critical Voice
- Operational
  - Applications (M2M, Remote maintenance)
- Operational Data (PA/PIS)
Or even…

- Passenger services
  - Internet on board?

- Security/Video
  - Applications (on-board, Driver look ahead...)

- Operational
  - Applications (M2M, Remote maintenance)

- Critical Voice
  - Critical low rate Data for ETCS I2

- Service Providers

- Emergency Services

- Advertisers

- Metro Signalling CTBC
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Current R&D Programme – SysTUF

• Funded by the French National Fund for a Digital Society (Fonds national pour la Société Numérique)

• Manpower : 412 person x months
• Start date : June 2012
• Duration : 36 months
• Project Coordinator : Bell Labs Alcatel-Lucent
How did the idea come up?
Comparing industry trends

Data explosion
Video everywhere
4G/LTE for dense urban areas
“Monetize” data

More capacity
Tight budgets
Safety
Passenger experience

CBTC / ETCSL3
Greener trains
All IP networks
Deliver the full promise of LTE
Objectives of the study

1. **New communication system based on a single open and standardized technology for urban guided transportation**
   1. Replace all proprietary communication technologies used today by urban transport operators
   2. Meet the requirements of critical and non-critical applications used today in urban transport operators
   3. Enable innovative services for “smart mobility” and “environment-friendly” transports
   4. Share network resources with multiple organizations (police, service and content providers, infrastructure operators...)

2. **Multiservice and broadband end-to-end communication system based on LTE**
   1. Meet the RAMS requirements of critical applications (as CBTC)
   2. Offer satisfactory QoS and QoE for both critical and non-critical applications used today in urban transport
   3. Open for the development of new services and applications
Several LTE network options
Multiple use cases, roles and actors

Onboard advertising

Signaling
Passenger Info
Operation support

Video surveillance

Voice and data Services

Maintenance

SYSTUF aims at a converged Critical Communication System
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Not as easy as it sounds... but workable

VALIDATION
• Willingness of Unisig?
• Leadership in a fragmented industry
• ETCS and CBTC
• Break link between technology and function
• Interoperability with public networks
• Risk of diverging Standards

SPECTRUM
• Re-farm GSM-R?
• Access to new ?
• Individual countries vs EU wide
• Availability vs Suitability

BUSINESS MODEL-
• Private vs Public Network
• Co-sharing with MNOs
• PPP Investment
• Licensing issues to potentially act as an MNO

COST
• Depends on the frequency
• Reuse of civil infra ?
• Economies of scales if commercial product is used
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## Conclusions

1. There is a need to look beyond the direct needs of ERTMS.

2. Achieving the industry cost saving targets will only be met by doing things differently.

3. Urban Rail has clearly understood the opportunity – what about Mainline Rail?

4. Validation of the technology is lengthy and choices need to be made now.

5. Opportunity for R&D Project in the context of FRMCS?

6. European Countries must align on key issues if ERTMS is to remain a global standard that evolves.

7. Multiple stakeholders are to benefit, not only the infrastructure manager or the Rail operators.
AT THE SPEED OF IDEAS