Broadband Needs Narrowband

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Public Safety Communication (PSC) Europe Forum
Madrid 28th to 29th November 2017

PSCEurope
Public Safety Communication Europe

of …

- e*Message Wireless Information Services Europe
- European Mobile Messaging Association (EMMA)
- Competence Centre for critical Infrastructre (KKI e.V.)
- Forum “Future in Public Safety” (ZOES e.V.)

I. Narrowband

- < 64 kbps
- „Dispatch“ Services by MPT1327, TETRA
- Alert Services by NP2M (a.o. Paging)
- Internet of Things (IoT) SigFox, LORA, NBIoT (3GPP, LTE)

II. Broadband

- Higher Bandwith
- More and lower Sites
- Challenging Coverage
- High Costs per m²

III. Assessment of (NB/BB) - Technologies

Fashion or Hype

And or Or

Economy or Need

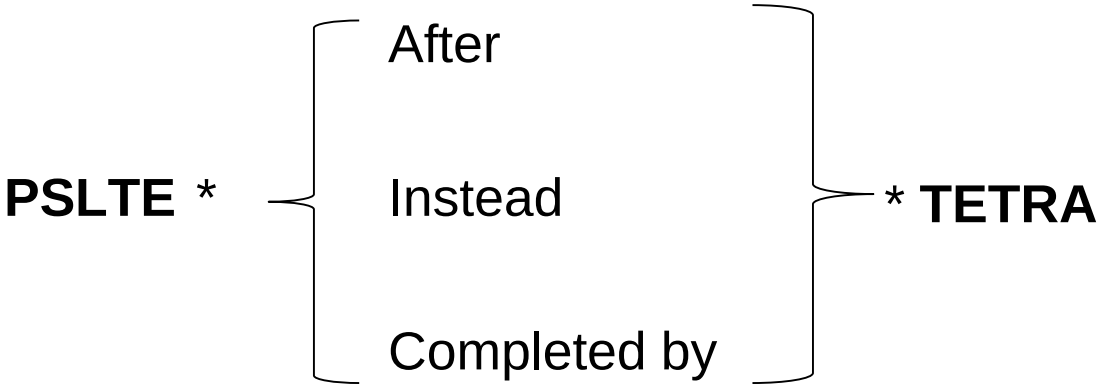
… or …

Old Fashion?

- Analogue
- Skirt
- Electronical car **1839 R. Anderson**
- Bicycle **1817 K. Drais**
- Wood
- Narrowband **2018 NBIoT**
- SMS **1996**

New Fashion?

- Digital
- Trousers
- Fuel Car **1886 C. Benz**
- Zeppelin **1898 F. von Zeppelin**
- Plastic
- Broadband **2008 LTE**
- Paging **Strompager 2014**



Matter to think about. See approaches OFCOM (UK), BDBOS (GER)

Rebirth of Narrowband?

✱ 2009	SigFox	
✱ 2013	CEPT	NP2M
✱ 2013	LORA	(2008 US)
✱ 201X	3GPP	NBIoT

Narrowband partially more actual than Broadband

Paging and Narrowband Point-2-Multipoint

2010	ETSI EMTEL	A2C
2012	ETSI SRDoc	nP2M
2013	CEPT Decisions WgFM	NP2M

One of the youngest wireless Activities
(Part of NP2M is Paging)

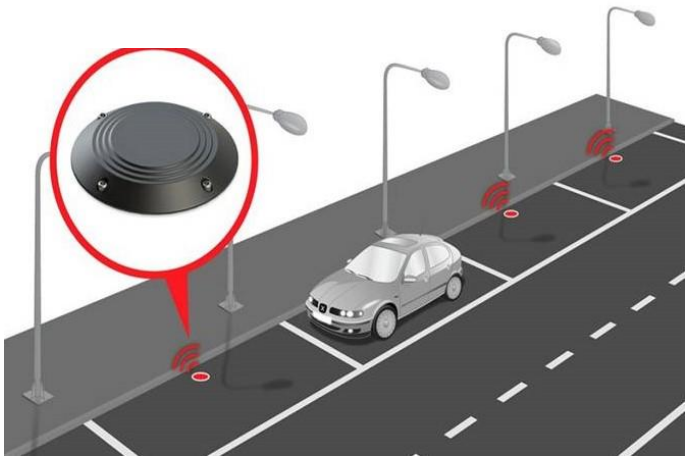
Criteria for Choosing Band

- Need → Not there yet
- Implementable → Technically
- Fashion → Hype
- Economy → Yes
- Safety → And Security

Embedded Implemented

	NP2M	IoT
Application	Alarm. Alert. Warning. Downlink	Smart Home, Smart Safety
Possible Replacement	How? Which costs?	Yes, but costs?
Doable	Implemantable, embeddebale	Terminals: yes. Networks: hopefully.
Fashion Factor	Zero	Hype (decreasing?)
Economy	Low Frequency. 1250 sites GER/FRA, best coverage	Not fully clear, yet.
Safety	ONE-2-many (not All IP)	See #PSCEMadrid


12:38
UHRZEIT
HEUTE
DATUM
24. 7.
NACHMITTAG
29°C
20°C
28.3°C
45%
Di
28°C
19°C
Mi
25°C
13°C
Do
30°C
22°C



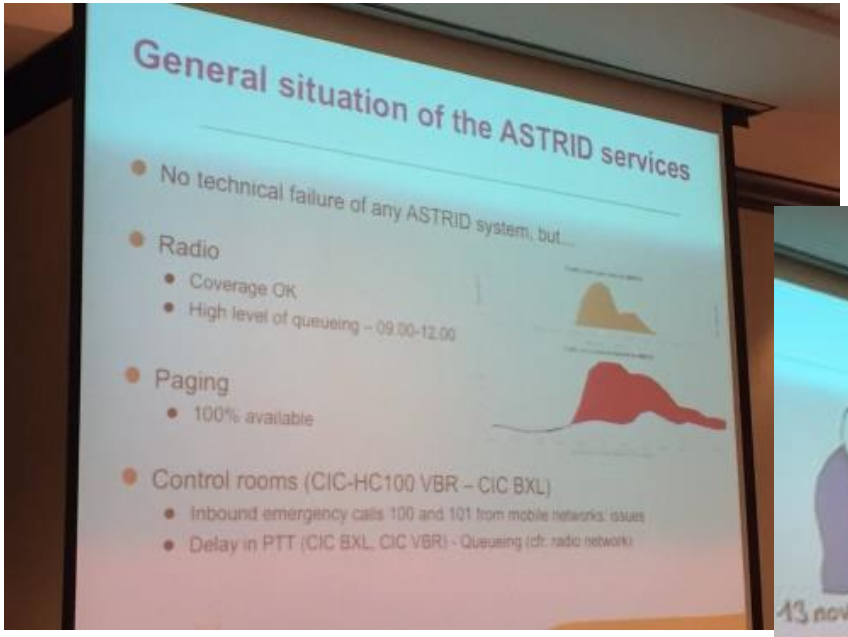
Infrastructure and Economy – Some Pieces

- Revenue T-Mobile Germany 8.000 Mio Euro p.a. (43 Mio User
  - Basis for running costs and investments including for Broadband and possible NBIoT vs. Tetra25 PubSafety Network User Nb << 1 Million
- Building special 2nd Infrastructure (e.g. Railways) can kill economy
- Careful with renewal intervals of infrastructure (see Railways)
- Promise x.000 Mio Euro cost to get okay from financing minister and being after n times more expensive will not solve the problem

Means

- Use existing infrastructures, combining and developing them almost only realistical way of high functionality everywhere network

IV. More Arguments for Narrowband and 2ndInfra

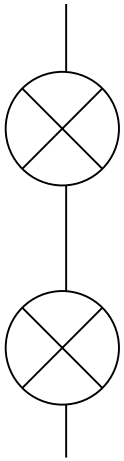


Only NP2M (Paging) w/o
Problems all 9 am – 5 pm

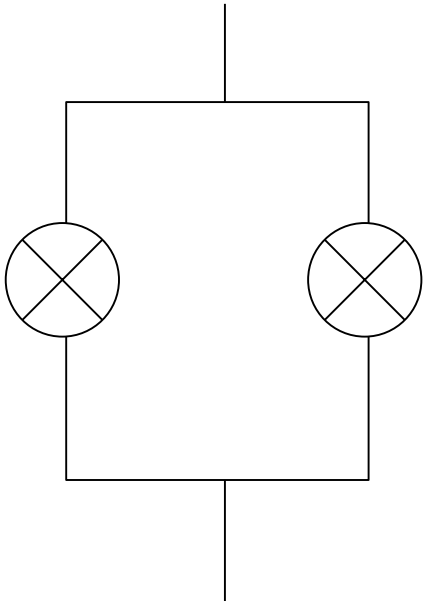
Brussels Attacks 16/03/22

More Arguments for Narrowband and 2ndInfra

Same Infrastructure

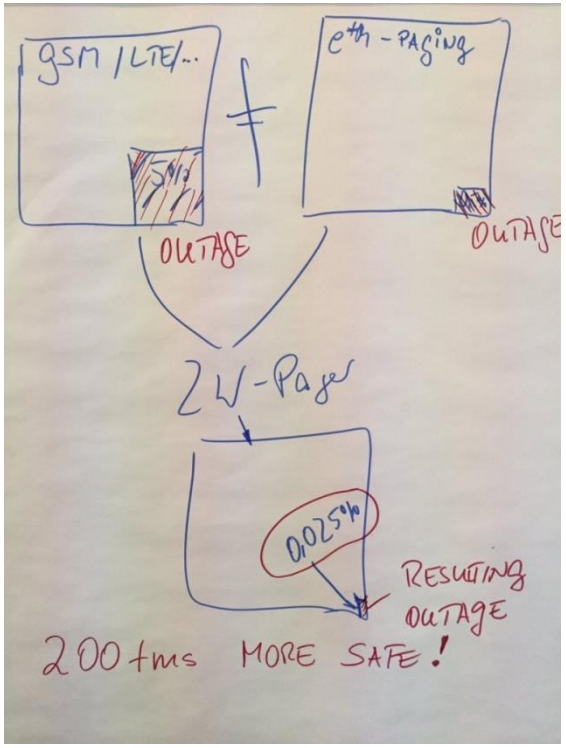


Different Infrastructure



X % ← Lack of Availability → $\frac{X\%}{100+}$

More Arguments for Narrowband and 2ndInfra



V. Conclusions

- No economy of broadband if not narrowband
- No high functionality if not narrowband, see Firemen Alert by Paging and IoT Safety Applications
- Less coverage if not narrowband
- Not financable if not narrowband (safety seen as entirety)
- Less reliability if not narrowband
- Less trust in readynes of publicsafety and more question how to realise in the future if not narrowband
- Complementary usage of narrwoband and broadband is reality, see embedded IoT/NP2M-solutions and LTE+(PSLTE)+Tetra+Paging (e.g. in Belgium)

Conclusions

- It seems easier to explain that the future is new and everything should be (e.g.) broadband
- It seems diffifult to explain that 2nd Infrastructure makes composed solution 100 tms more reliable
- It seems easier replacing concrete (difficult, technical, probabilistical, …) explainations by hyping claims
- „It seems“ is not „It is“
- More examples, demonstrations, cooperations, socialmedia for „Combining NB AND BB“ and against „One thing will solve all“ (or- as somebody says „Single point of failure“)

Broadband Needs Narrowband

Follow and Discuss in Social Media

@CMA_Europe	critical messaging
@InfoZoes	future public safety
@e_Message_de	alternative wireless NP2M
@2ndInfra	2nd alternative infrastructure
@PSC_E	OUR association
and many more	

PSCEurope
Public Safety Communication Europe

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Thank you

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(18th April 2018 Sarlat SW of France)

Appendix

Difficult to convince?

ONE (improved) infrastructure vs. TWO (independent) infrastructures

Comparison of the Availability

I. Only one mobile network

P_{RV}

data preparation
acces systems
other risks

Transmission A

$P_{ÜA}$

II. Two of them (#2wayS)

P_{RV}

data preparation
access systems
other risks

Transmission A

Transmission B

$P_{ÜAB}$

Comparison of the Availability

Comparision of availability I. + II.

I. Outage $_{I.}$ = P_{RV} * $P_{ÜA}$

II. Outage $_{II.}$ = P_{RV} * $P_{ÜA}$ * $P_{ÜB}$

$$\frac{Outage_{II}}{Outage_{I}} = \frac{P_{RV} * P_{ÜA} * P_{ÜB}}{P_{RV} * P_{ÜA}} = P_{ÜB}$$

Comparison of the Availability

- The probability of outage will be less if you add another independent mobile network.
- It doesn´t matter how the probability was before.

Comparison of the Availability

Means:

Add Narrowband to Broadband. Build #2wayS solution. The outage probability of resulting solution is 100+ times lower.

Mathematics only. No sales. No politics.

Main Point. Repeat: 2nd way, not 2way. #2wayS, not #2way