

ENJOY 1

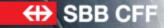
Stepwise approach towards ERTMS deployment.

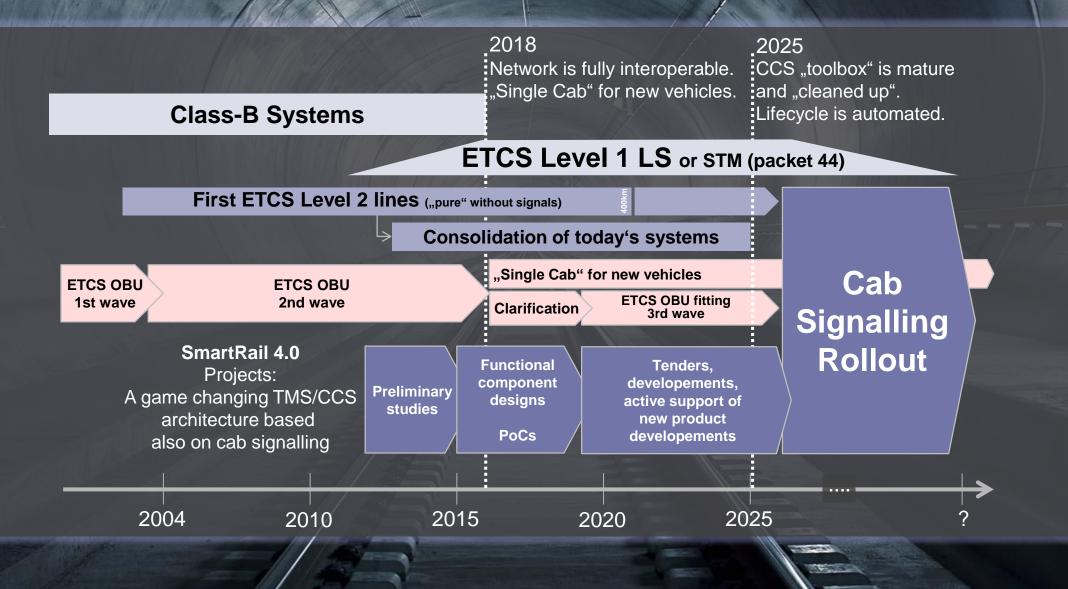
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The swiss strategy.

Steffen Schmidt (SBB) CCRCC 16.11.2017

The stepwise approach to ERTMS





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ERTMS in 2020

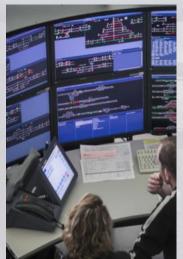
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Legende = ETCS Level 2 Strecken = ETCS Level 1 Limited Supervision

www.velostation-aarau.ch

Consolidation - Examples



DMI: bad dearness of display → no safety. And new safety requirements multiply the cost. Systematic cryptokey change only when

ERTMS-

suitable online keymanagement systems are available

Becoming mature means especially being automated. Compatible usable products Lifecycle processes (LCP) **Increase the** grade of LCP automation! စိုးရှိစိုးရှိစိုးရှိစိုးရှိစိုးရှိစိ **ዾ**ጞ**ዸዾ**፟፟፟፟፟ዾዾዾዾዾዾዾዾዾ

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Clarification of the future onboard architecture (examples)

• FRMCS

(Future Rail Mobile Communication System)

- TIMS, safe length and train-end-device (Train integrity monitoring systems)
- Updateability, maintainability, substitutability and exchangeability!

The Concept of SmartRail 4.0 A game changing TMS/CCS architecture.

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SOL SUDOSTBAH

	Auton Traffic Mai Schedule, Dispo		 Highly automated (re)scheduling & control High integration of planning functions, planning, disposition and control in one system Precise realtime control ("meters and seconds") 		
	"Pure" ERTMS-based geometric interlocking for cab signalling			 Safe for every operational process or asset-layor Interlocking and RBC in one system Smallest possible amount of SIL4 functions Fast and cheap migration in large steps Can control every mix of L2/HL3/L3/"L3++" 	
Smart wayside objects	Mobile locali- sation	Safe Mobile enddevices	ΑΤΟ		This architecture allows on the long run
pen interface dependent ecycle Plug & Rail" owerfull	 & object. Efficient train detection especially for L3 Field force management- 		Lower ener consumption	rgy	the reduction of the amount of trackside assets down to 30%.

- degraded modes

automation

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VÖV UTP

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Thanks for your attention