

# Larisa/Greece, 28.02.2023, Athens–Thessaloniki (ETCS L1)



intelligence on wheels



(Foto: picture alliance / ANE / Eurokinissi)



# Transfer of a Success Story in Aeronautics

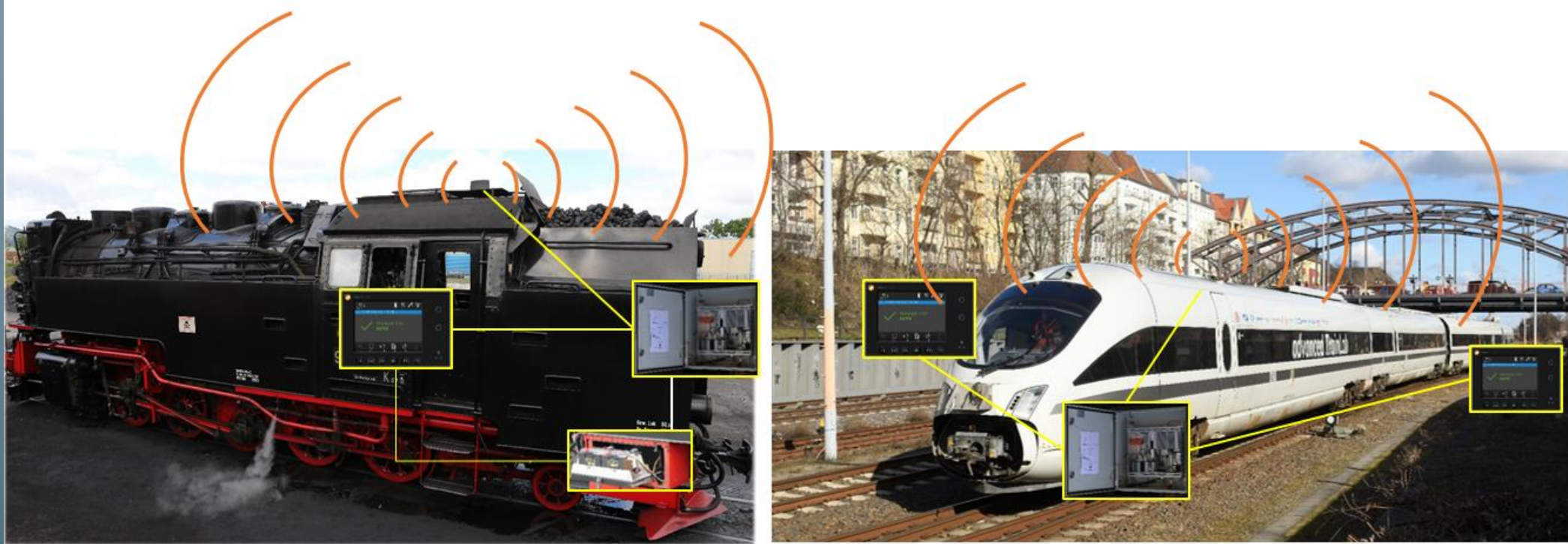


intelligence on wheels





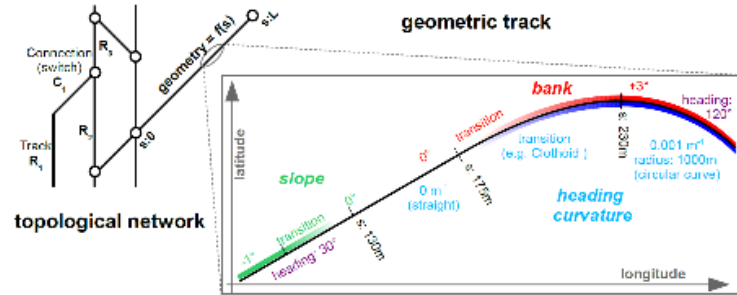
# Retrofit Assistance for Trains of any kind and age



## Key benefits:

- ✓ One onboard-unit per train and a driver interface. Costs scale only with number of trains, no longer track-km
- ✓ Formally, in most cases as add-on system no SIL2/4-qualification required
- ✓ **Most important: No installation along infrastructure required**

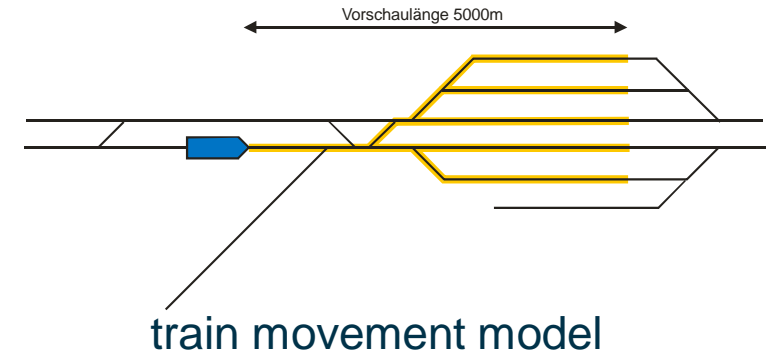
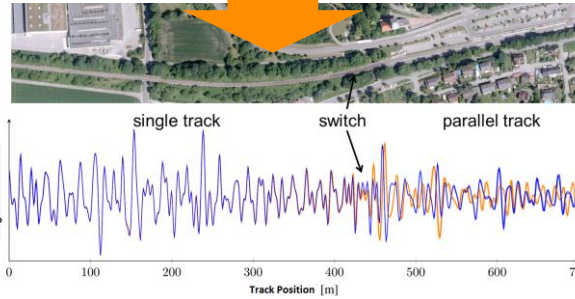
# Key technology: Track-Selective Onboard Localization



digital track data (map)



onboard sensors  
(Galileo/EGNOS, IMU, Mag, etc.)



Solution: Onboard multisensor  
train localization  
in relation to track



... even inside tunnel!



# Breakthrough in Localization within Difficult Railway Environments



intelligence on wheels

**GNSS:** Will not work in deep tunnels as satellites are not received

**MAG:** Using distortion of the Earth's magnetic field as signatures for positioning

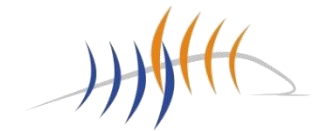
**IMU:** Becomes less accurate for localization over long distances



Video of changing tracks inside 10.5km tunnel with ICE  
<https://twitter.com/i/status/1369705272973930509>



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# Questions

