

ETCS Implementation

ÖBB

14.09.2021

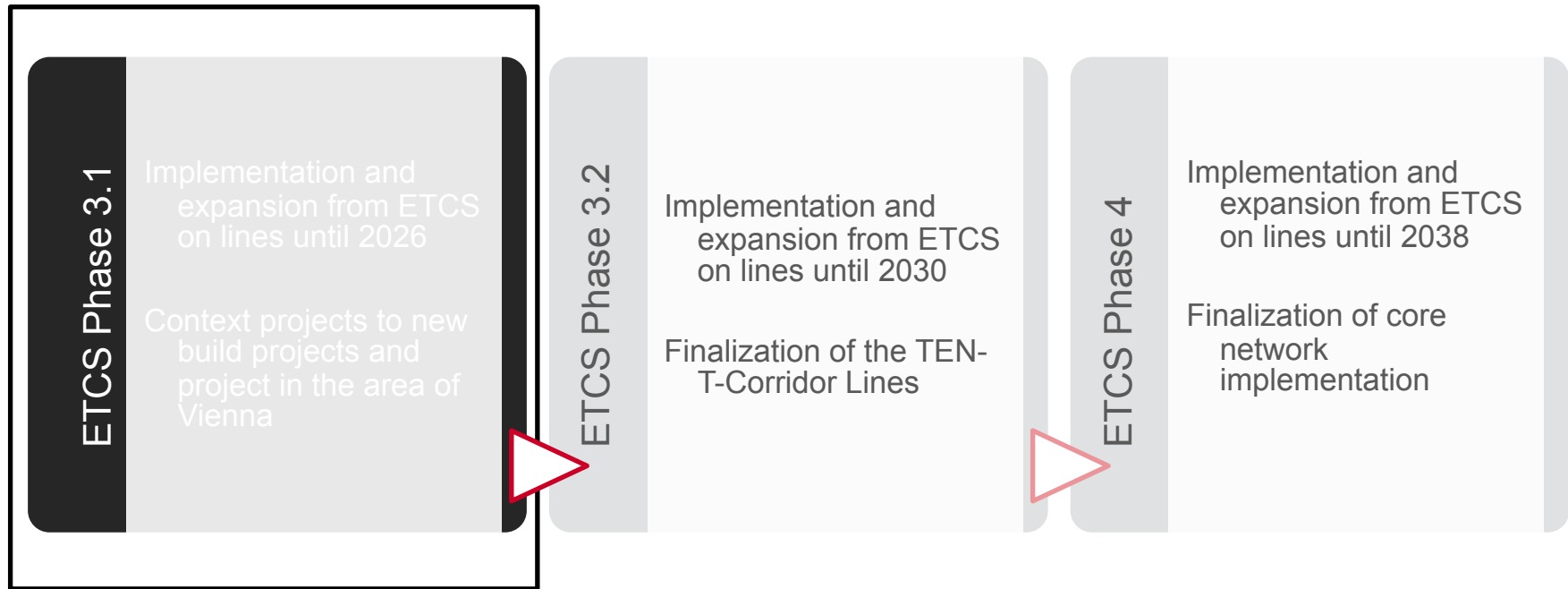
Current status of ETCS Implementation

ETCS LEVEL 1		ETCS LEVEL 2	
BS ATTNANG – SALZBURG	75 KM	NBS WIEN – ST.PÖLTEN	70 KM
BS WELS – PASSAU	80 KM	NBS KUNDL – BAUMKIRCHEN	40 KM
SUMME ETCS L1:	155 KM	ES KUPSTEIN – BRENNER	108 KM
		ES WIEN – BERNHARDSTHAL	87 KM
		NBS GZU	24 KM
		SUMME ETCS L2:	329 KM



ETCS Migrationplan

- The ETCS-Migrationplan describes the Roll-Out from ETCS Level 2 on the ÖBB core net
- ETCS-Migrationplan is divided in three phases:



- PHASE 3.1 is being implemented at the moment

Implementation ETCS-Migrationsplan 2038+ ETCS Phase 3.1 (bis 2026)

Ende
ETCS
Phase 3.1
(bis 2026)

PNA

Achse

ab 2026



Westachse



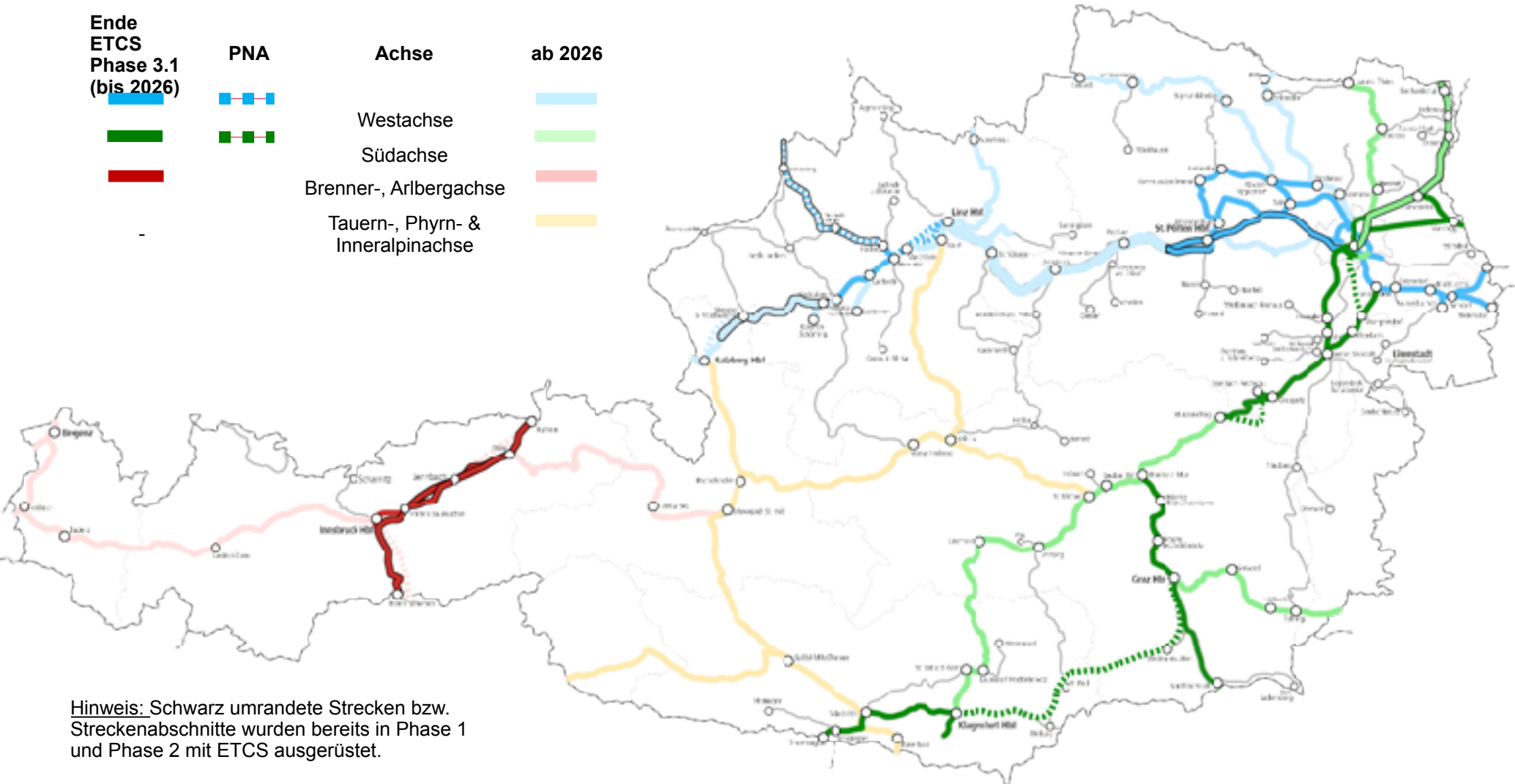
Südachse



Brenner-, Arlbergachse



Tauern-, Phyrn- &
Inneralpinachse



Hinweis: Schwarz umrandete Strecken bzw. Streckenabschnitte wurden bereits in Phase 1 und Phase 2 mit ETCS ausgerüstet.

Implementation ETCS-Migrationsplan 2038+ ETCS Phase 3.2 (bis 2030)

Ende
ETCS
Phase 3.2
(bis 2030)

PNA

Achse

ab 2030



Westachse



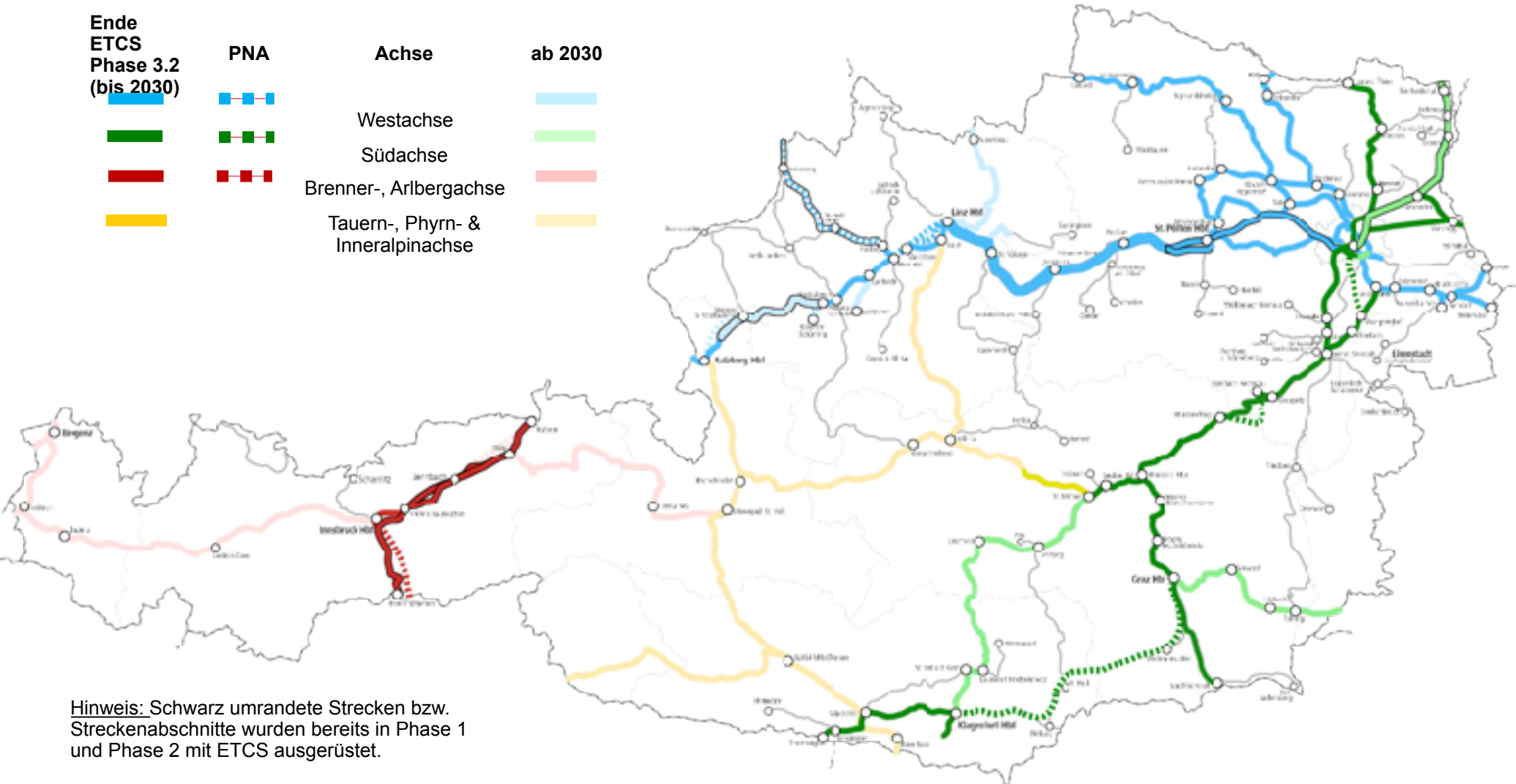
Südachse



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Implementation ETCS-Migrationsplan 2038+

ETCS Phase 4 (bis 2038)

Ende
ETCS
Phase 4
(bis 2038)

PNA

Achse



Westachse



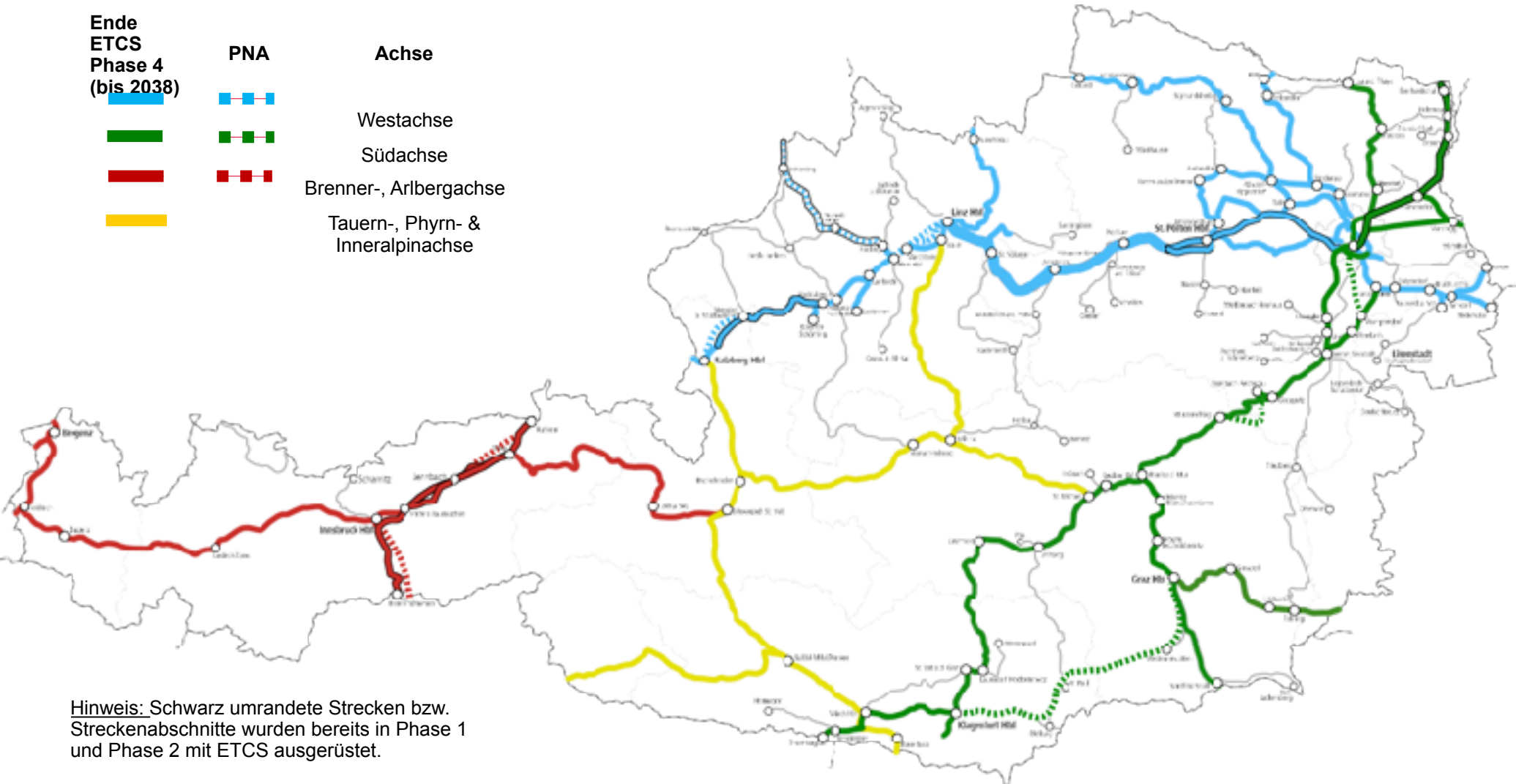
Südachse



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Procurement Strategy

ETCS Procurement

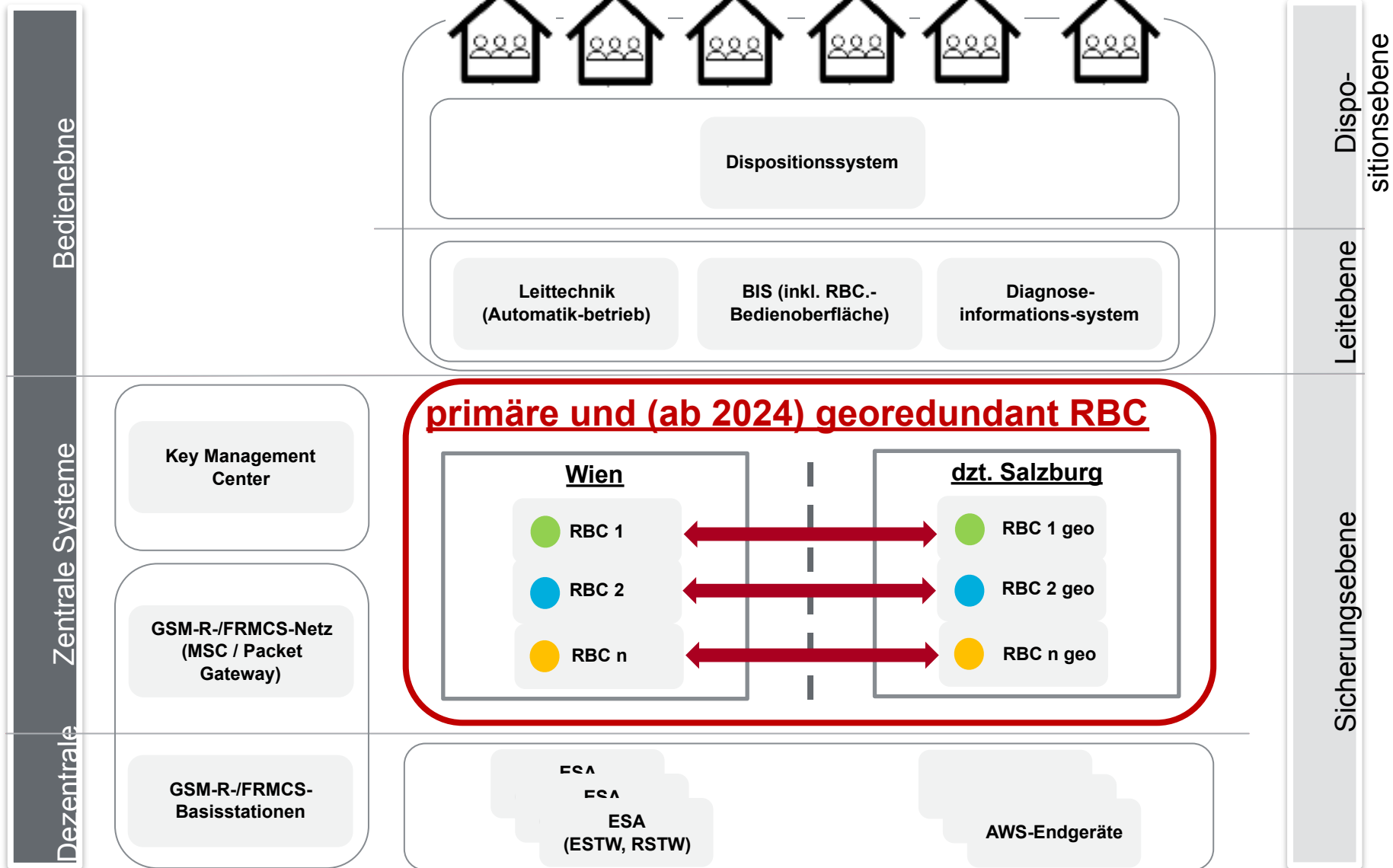
- Subject of service:
 - Specification and delivering of the generic system ETCS L2 after FRS of the ÖBB
 - Rollout ETCS L2 including of a pilotline according to the ETCS Migrationplan 2038+ with the ÖBB georedundancy approach
 - Service and maintenance for 25 years lifetime of the RBC (until 2063)
 - Adaption (Track and Function) for 25 years lifetime of the RBC (until 2063)

- ÖBB made a decision to procure a single system strategy with a frame contract with two contractors
- The contract was signed with Siemens Mobility Austria GmbH as primarily implementer
- The second contractor Thales Austria is just a fall back solution when first supplier didn't perform as expected
- Due to the public procurement the acquisition costs were reduced significantly

System and Implementation Architecture

- Implementation of ETCS Level 2 – Generic: Baseline 3 MR2, FRS of ÖBB
- The ETCS Migrationplan is divided into 21 RBC
- Interfaces to the electronic IXL via RASTA and to some newer relay IXL with a protocol converter also via RASTA interface
- The operator for the ETCS System are mainly located in the five Austrian OCC, exempted some local operation IXL
- The RBC are located in two of the five OCC (Salzburg and Vienna)
 - Full redundancy on both location (Georedundancy)
 - Means that when a location failed for, e.g. fire or terrorism, the other can take over the operation
 - System architecture with the RASTA IP-Interface enables a hot-standby capability (switching time less than 5 minutes)

System and Implementation Architecture



Functional Requirement

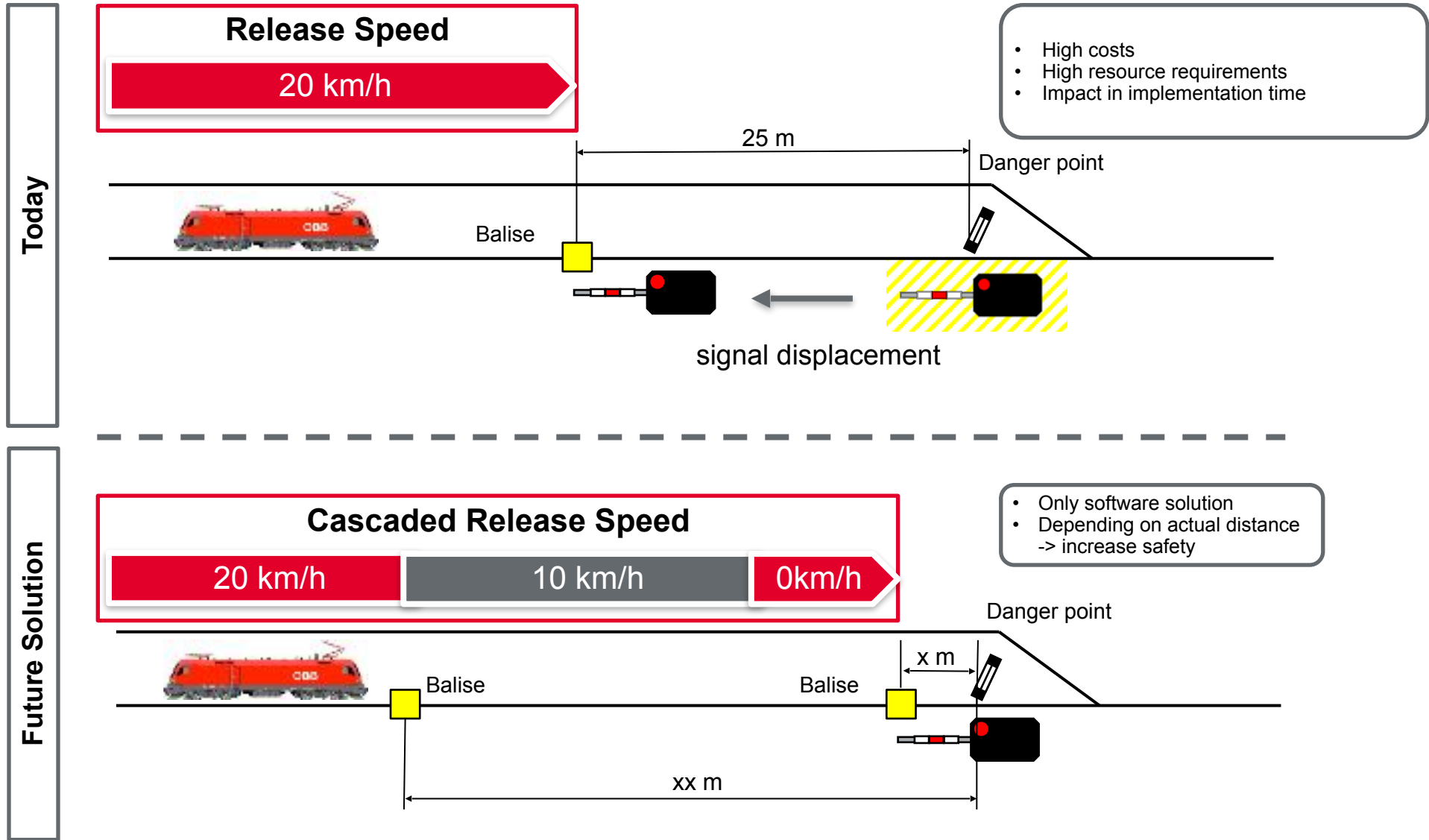
- After the nearly 10 years of operation of ETCS we decided
 - ETCS Level 1 is no longer an option because of the cost for the implementation, operating and functional requirements
 - We started with SRS 2.3.0d and the functional settings are mostly sufficient for our belonging
 - For future stability with the TSI, we switch to the newest version of the SRS 3.6.0, with the use of only some new function, e.g. the railroad crossing function
 - All existing ETCS implementation become upgrade timely to the new baseline -> goal of one system

- Implementation of regional lines
 - The existing ETCS Migrationplan do focus only the core net
 - The deployment of the train control system on regional lines are in investigation in a separate program, where all belongings of regional technics are analysed.
 - An important issue of this programm is to avoid any new requirements for the vehicle side, witch means that the ETCS on-board equipment can be used as it is.
 - What kind of ETCS together with the IXL solution is still open, but in our ETCS frame contract is an option to implement ETCS like the mainline as well

Functional Requirement

- Release speed
 - Historically, Austria has short distance to the danger points
 - But we must use the release speed to reach the signal
 - Until now this distance were extended with adaption of the signal location, for safety reason
 - But this is not an acceptable solution for the entire rollout
 - So we developed a software solution, called “cascaded release speed”
 - With this solution is no longer necessary to change the signal place with high efforts and also the benefit of additional gain of safety

Release Speed – current and future solution



Functional Timeline

Development to Baseline 3

- Today the functionality according SRS 2.3.0d is necessary for a accepted ETCS vehicle in Austria
- Implementation of the first new RBC 2023 is done according SRS 3.6.0 using the ETCS system version 1.1 for the downwards compatibility
- After 2025 we want to use the new Baseline 3 features (e.g. railroad crossing), therefore all vehicle must be upgraded by that time.

Decommissioning of the legacy train control system PZB (& LZB)

- At the moment only one 24 km short freight line are ETCS only (without conventional signalling)
- The new main lines Koralmbahn (with Koralmbasestunnel), Semmering Basestunnel going into operation after 2025, will be ETCS only from the beginning
- On the existing lines ETCS will be used first as an additional system
- ETCS only and decommissioning on the west and south axis are planned for 2030



Advantages and Benefits of ETCS

Safety

- Improving safety despite increased traffic
- Basis for Europe-wide safety standard
- Reduction of complex operating regulations and increase of safety of action

Capacity

- Increased capacity due to the possibility of condensing train sequences
- Higher system availability due to lower probability of faults

Automation

- Potential for increasing the degree of automation and basis for digitalisation
- Precondition for the use of Automatic Train Operation (ATO) via ETCS

Cost efficiency

- Increased cost efficiency by reducing maintenance costs through the dismantling of national backup systems and ending parallel operation.
- Centralisation of operational management and reduction of facilities in the area
- Easier and cost-optimised access to the rail system
- Strengthening of the rail system by improving interoperability

Thank you for your attention

