



Jornada Técnica

Conducción Automática en
Ferrocarriles.
ATO sobre ERTMS N2

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Beneficios principales

Potencialmente alcanzables según cada caso



Viajeros

Beneficios directos

- Mejora de la **puntualidad**
- Mejora del confort
- Reducción tiempo trayecto

Beneficios indirectos

- Mayor frecuencia
- Menor coste billete



Operadores

- Menor consumo de **energía**
- Mayor oferta plazas
- Mayor demanda viajeros

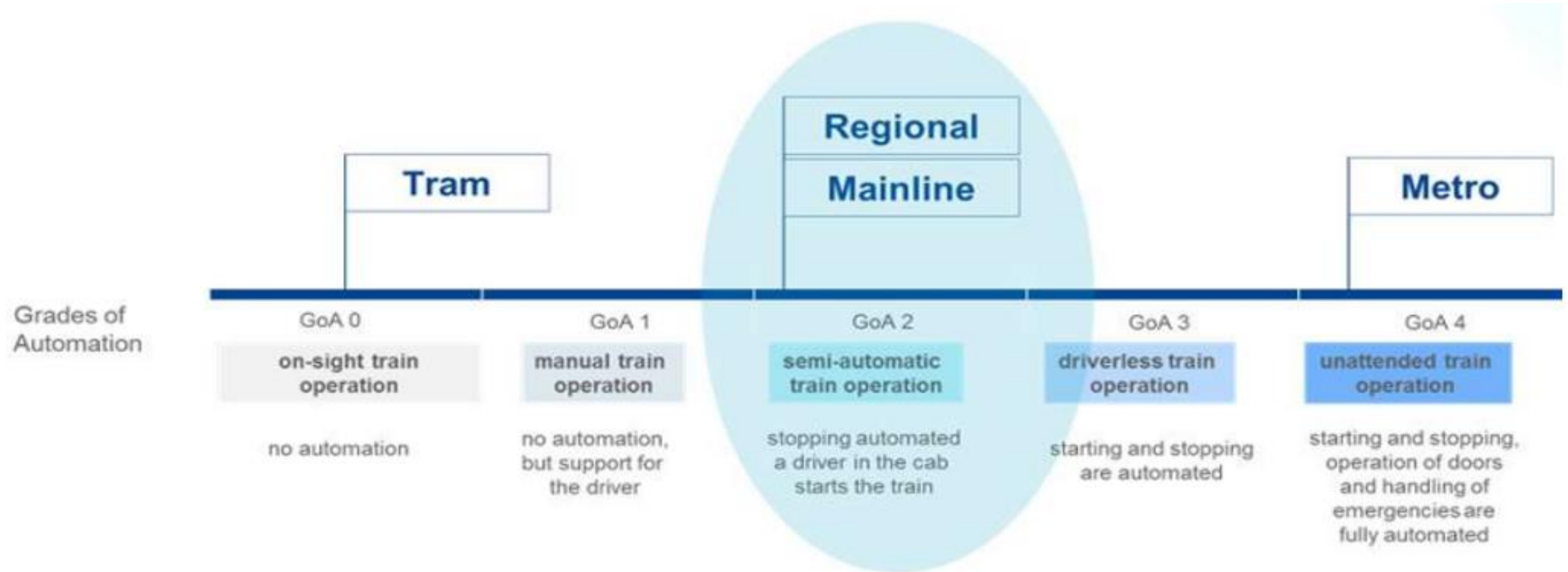


Gestores de infraestructura

- Incremento de la **capacidad**
- Mayor oferta de surcos
- Mayor demanda servicios



Grado de Automatización



Proyectos



■ Main requirements

- 8 corridors have been identified in master plan , Out of that 3 corridors namely Delhi-Meerut, Delhi-Panipat and Delhi- Alwar will be executed on priority
- 661 km of lines / 339 trains
- All trains in ATO mode shall stop within 300 mm for 99.98% of station stops

■ Solution/Platform

- Full System Solution / ATO Onboard and ATO Trackside
- ATO On Board BSL 1.3.0, EVC3 configuration



■ Main requirements

- ETCS Bsl3 R2 (L1LS/L2/L NTC)
- PZB I60R or LZB80E or PZB EBICAB600
- PZB or PZB/LZB stand alone mode
- ATO On board : Loss adhesion value with more granularity
- +/- 2m stopping accuracy with a probability of 99,99%
- Interface with TCMS .

■ Solution/Platform

- BR423 x2 (+58)
- BR430 x4 (+151)
- ATO On Board BSL 1.3.0, EVC3 configuration



■ Customer's targets

- Replacing old fleet
- Passengers transportation in Belgium, Luxemburg and France

■ Main requirements

- 22 trains 3c (max 82 m – 325 seats; 2 WC) **(66 cars)**
- 12 trains 6c (max 160,6 m - 674 seats; 4 WC) **(72 cars)**
- Vmax = 160 km/h
- ETCS BSL 3 - TBL1+ - WIFI.

■ Solution/Platform

- Coradia Stream extended to Coradia Stream HC (mixed concept)
- ATO On Board BSL 1.3.0, external configuration

Foto global

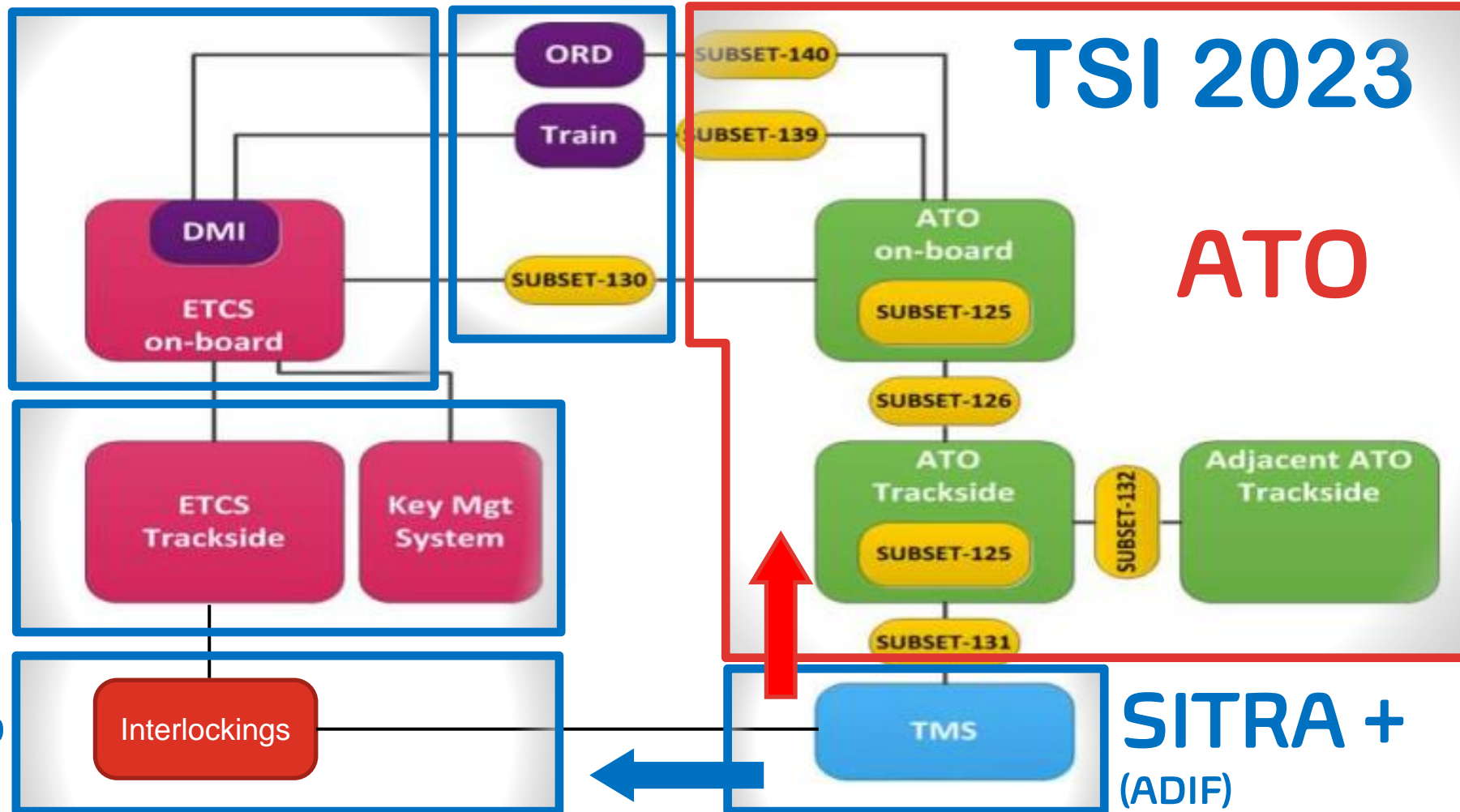


Tren

ETCS

ERTMS

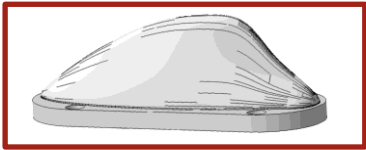
Enclavamiento



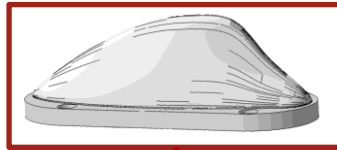


Implementación – ATO interno

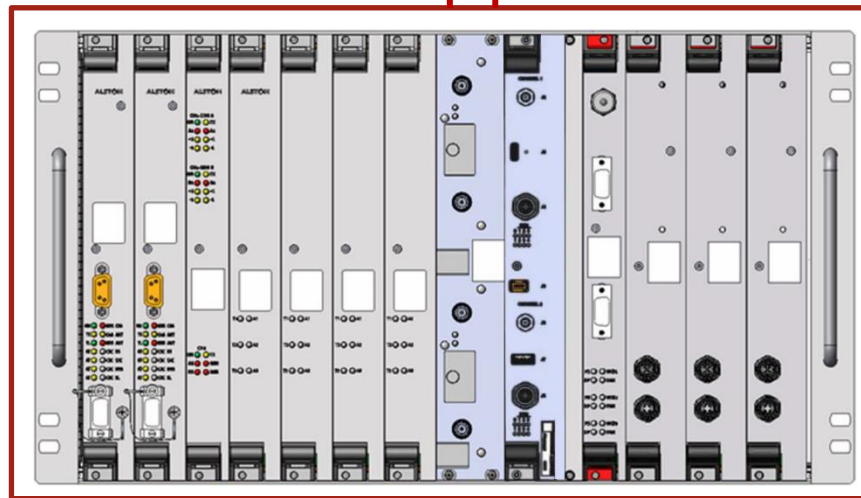
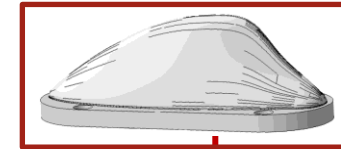
ERTMS/ETCS antena 1



ERTMS/ETCS antena 2



ERTMS/ATO antena
4G/5G/LTE



EVC3: ETCS + ATO

Ethernet TCP/IP

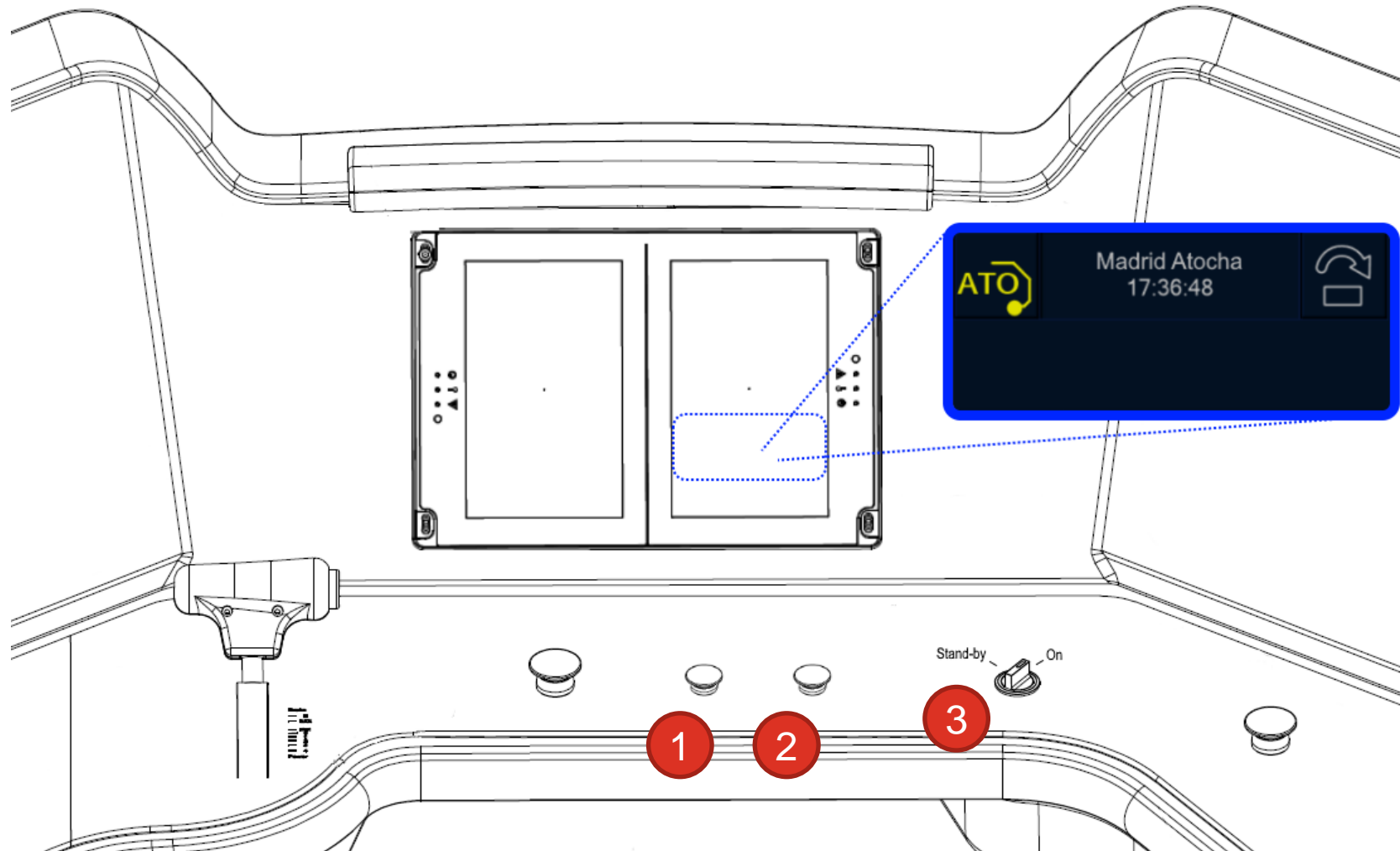


Otros sistemas

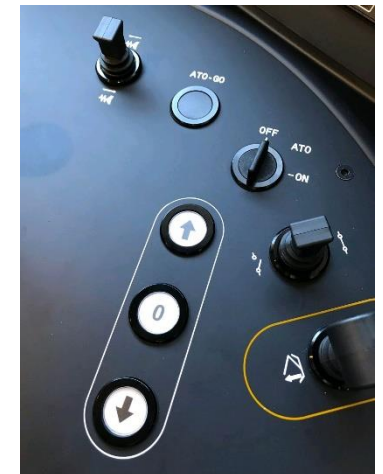


NETBOX

Implementación - Pupitre



- 1 ATO Engage/
ATO Disengage
- 2 Saltarse próxima parada/
Anular la petición
- 3 ATO selector



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su atención

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