

U400 – Strong Safety and Availability Constraints

Metro line = Critical Infrastructure

- up to 1 Million passengers a day
- no accident, no delays

Project Organisation = Many Stakeholders

- large industrial teams, numerous domains
- complex environment: track, trains, operators

Signaling Project = Major Stakes

- cost 10 to 1000 Million Euros
- duration from 2 to 10 years

Functions depend on Physical Deployment

- need to protect and operate homogenously everywhere on the line

URBALIS™ – Features Developed & Modernized in 4 Steps

1989 Paris RER-A

↓

SACEM ATC
pre CBTC

- + ATO, ATB, PSD
- + hot-standby, ISA
- + overlay migration

1996
Hong-Kong,
Santiago, Istanbul
Mexico

URBALIS 200
pre CBTC

System approach
Modernised
core components
Eurobalise
Cenelec

2004...
Delhi, Shanghai,
Daegu , Santiago,
Seoul , Madrid,
Incheon, Cairo,
Jaipur, Bangalore

URBALIS 300
Radio CBTC

- + Moving Block
- + Driverless
- + Radio 2.4 GHz

2003...
Singapore NEL
Singapore CCL
Lausanne m2

URBALIS 400
Networked Radio CBTC

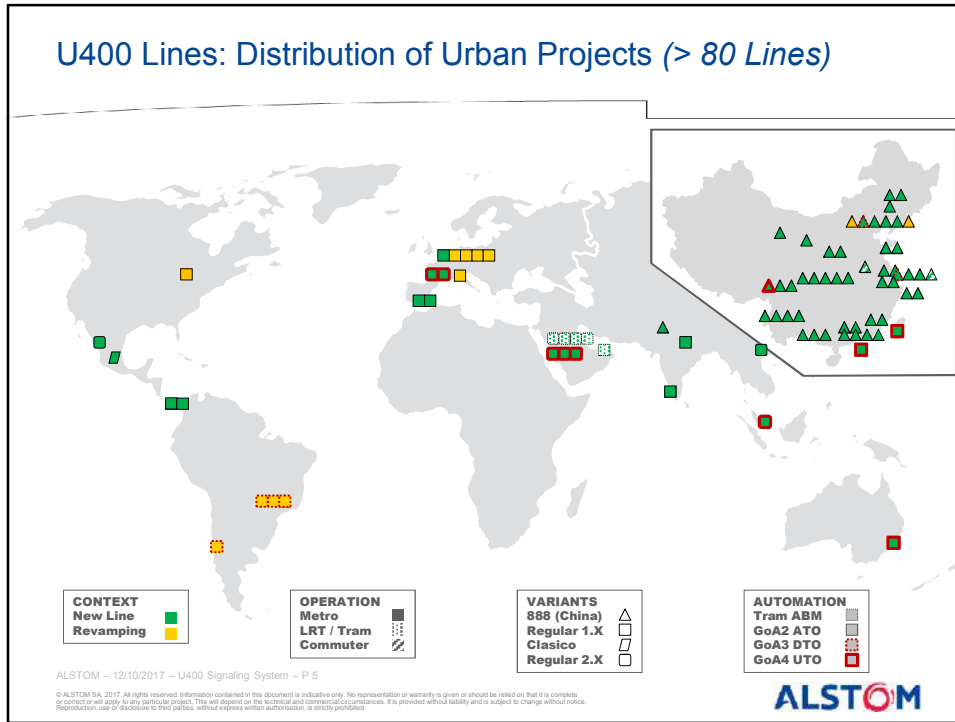
System Deployment
Industrialisation
Standard DCS

2008...
> 80 lines

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U400 Platforming – Lessons Learned

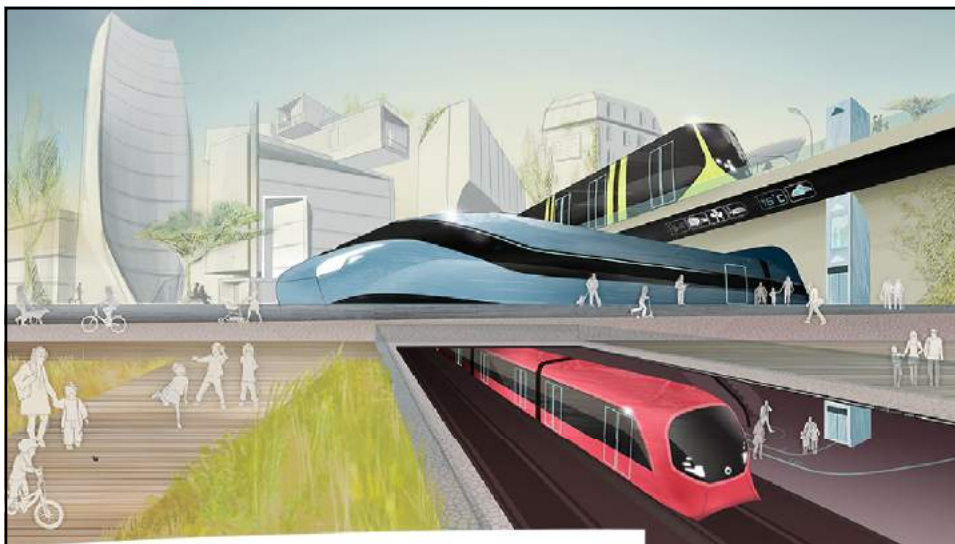
- Recurring successes made possible via engineering industrialization
 - concentration of key competences in core team
 - factorization brings reduced lead time and development costs
 - increased system quality and easier sustaining

- Tight synchronization with projects is a key process
 - harmonization of project deadlines and platform delivery plan

- Defining what is common and what is project specific is not trivial
 - what should be configurable and how? who does what?
 - trial and error process with long learning curve

No other ways to deliver so many projects in such a short time frame

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