

# Network wide renewal of signalling and traffic management systems

Banedanmark has undertaken the unprecedented move of replacing all signalling assets of the entire network at once, introducing advanced traffic management processes at the same time. This has resulted in the largest signalling project ever. The project execution is characterised by a high complexity with a large number of participants and stakeholders and the challenges caused by implementing the new signalling system in the changing railway environment within a time frame of 10 years. The consultancy provided by Emch+Berger (E+B) in the frame of a larger joint venture has allowed the customer to identify in an early stage all whereabouts of and all risks associated with such an undertaking, as well as the right ways of addressing them. Based on E+B's experience in tendering large railway projects, it has been possible to produce tender documents encompassing more than 1000 pages within a year, and to run through the tendering process within two years. During the design phases, E+B staff brought to fruition its long-standing experience in running complex projects involving a large number of participants and disciplines over several years. E+B provided top-class expertise in several disciplines like railway business in general, considering management, operation, construction and maintenance, advanced traffic management and timetabling techniques, ETCS level 2, setting up a testing programme.

## banedanmark



#### Client

Banedanmark (DK, Kopenhagen)

**Period:** 2006 - 2021

#### Delivered services

- Within the Rambøll-Atkins-Emch+Berger-Parsons joint venture, Emch+Berger has provided the following main services:
- Feasibility study: leading the technical and safety work stream; provide input to many key findings on how to achieve such a large migration within a reasonable time frame without disturbing daily operations; setting up a model counting the new signalling assets as a basis for the budget
- Procurement phase: Technical project management of the elaboration of the tender documents and the bid assessment, providing contents for several disciplines, writing of the bid assessment reports
- Design phase: Key contribution to management of design and development; discipline leadership in traffic management, automated dispatching, timetabling, signalling design to capacity, development of use cases covering the entire railway operation, ETCS level 2, testing; management of project controls; key inputs to the identification of business changes within Banedanmark

#### Specifications

- Total length of the migrated railway lines: Over 2000 km
- Total investment: Ca. 20 billions DKK
- Total number of programme staff involved: Over 100 (customer and consultants)
- Duration of the programme: 2007 - 2021