

## BANEDANMARK

# SIGNALLING PROGRAMME – FINANCIAL MANAGEMENT



Client	Banedanmark
Processing period	2007 - 2017
Project costs	CHF 3.1 billion

Banedanmark, the Danish railway infrastructure organisation, is planning a full replacement and reorganisation of safety technology throughout its entire network. The European signalling standard, ERTMS Level 2, is to be introduced across the entire area of the long-haul rail network. The Copenhagen S-Bane is to be equipped with a new CBTC signalling system, in line with the state of the art for suburban railways, which should also enable fully automated train operation at a later stage. The operational management will be brought together in three new traffic control centres; the interlocking technology will be entirely replaced and will also undergo further centralisation. The new organisation must be prepared and trained to implement and operate the Signalling Programme.

In 2007 - 2008, a pre-project was developed as the basis for the final political decision. Managing the investment and budgeting workstream, R+R developed the system definition for the cost estimate, compiled price catalogues, estimated the costs for the long-haul railway and S-Bane and compared them with previous cost estimates, calculated the annual appropriations for various migration strategies, and carried out strategic cost comparisons of technological alternatives.

From 2009 - 2012, R+R handled the commercial procurement of the main system contracts (S-Bane, Fjernbane East and West, Onboard), set up tender documents, evaluated offers and led negotiations with bidders. Additional procurement procedures followed, e.g. for train radio, interface systems and fixed telecommunications installations. In accordance with the awarded contracts, the budget was adjusted for two additional political milestones. From 2012 onwards, R+R tracked cost developments and led strategic studies on programme extensions. Among other things, R+R supervised the Business Case for (semi-) automatic train operation.