



The New Line Copenhagen-Ringsted

Bentleyusers.dk – 14 November 2011

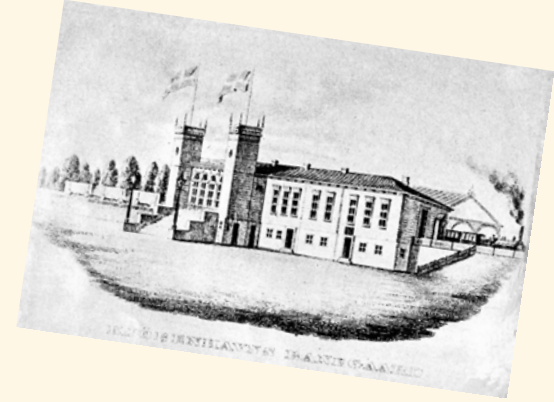


Samfinansieret af EU
Det transeuropæiske transportnet (TEN-T)

banedanmark



Rail transport in Denmark



- The **history of rail transport in Denmark** began in 1847 with the opening of a railway line between Copenhagen and Roskilde
- Larger newer projects: Fixed links, Metro
- The history now continues with the construction of the first high speed railway line between Ny Ellebjerg (Copenhagen) and Ringsted with grand opening in 2018



The Danish Railway Network



Banedanmark responsibility

- Trains per day
 - 1400 intercity- and regional trains
 - 1100 city trains (S-tog)
 - 170 freight trains
- = almost 1 mill trains per year
- 38,000 arrivals and departures per day
- More than 170 mill passengers a year
- Total length 2,132 km
- 3,240 km tracks
- 2,342 bridges
- Area of 5,500 ha to maintain

High speed Copenhagen-Ringsted at end 2018

first phase of "The one-hour target"



- New railway
- Existing railway
- New station
- Existing station





Valby-Hvidovre



Greve



Along M-west



Long bridge over M-way



Køge Nord Station – architecture competition?

Key figures

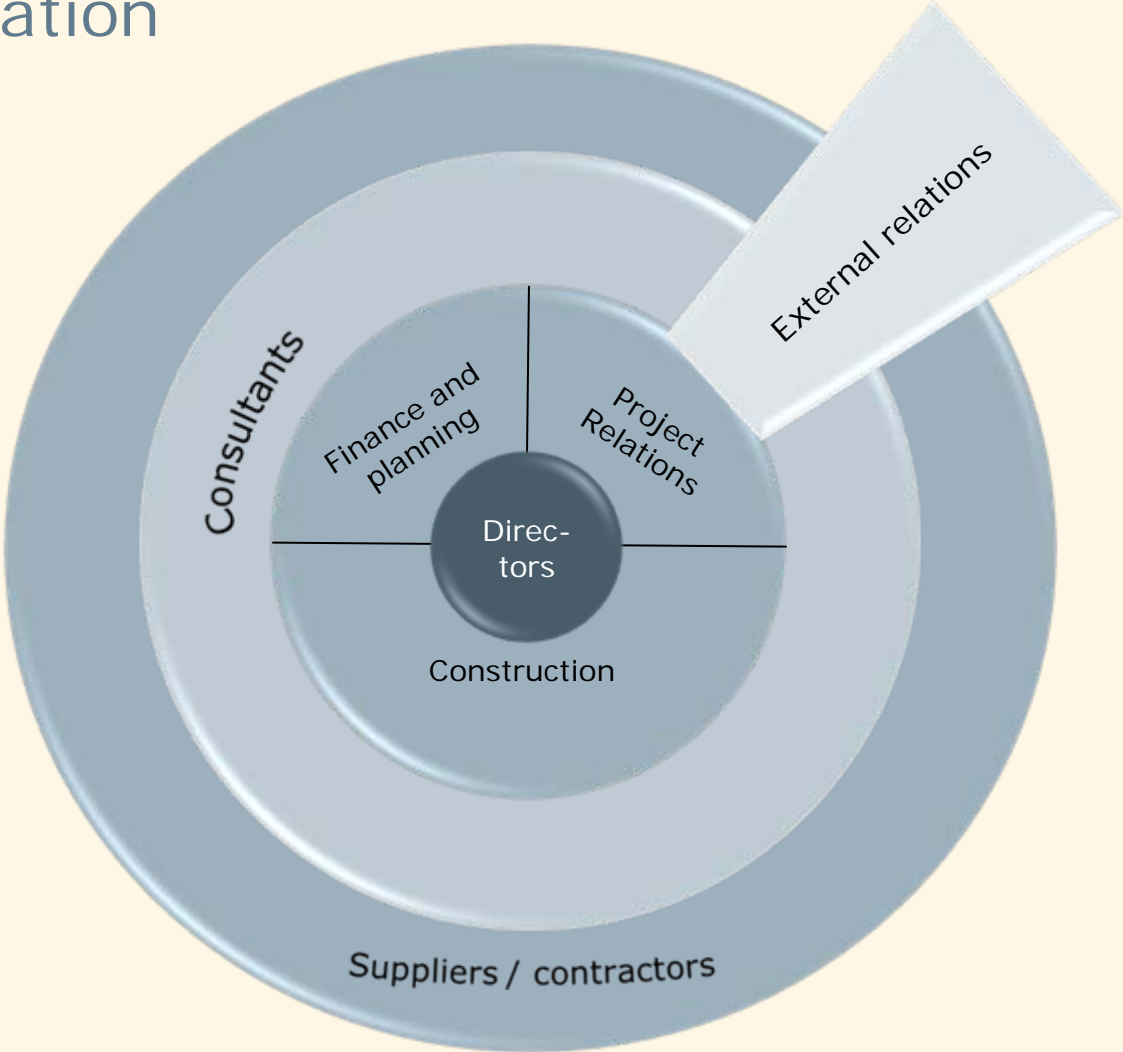
- Dual track electrified railway line designed for up to 250 kph
- Approx. 56 km
- Max axle load 25 tons
- 4 tunnels – approx. 1750 m in total
- 88 bridges
- 3.300.000 m³ dug earth
- Expropriation of 290 ha (approx. 200 buildings)
- Approx. 60 overall agreements with utility owners that include more that 600 relocations
- Approx. 9 overall agreements with municipalities that include approx 500 items in total to be agreed on

Project vision

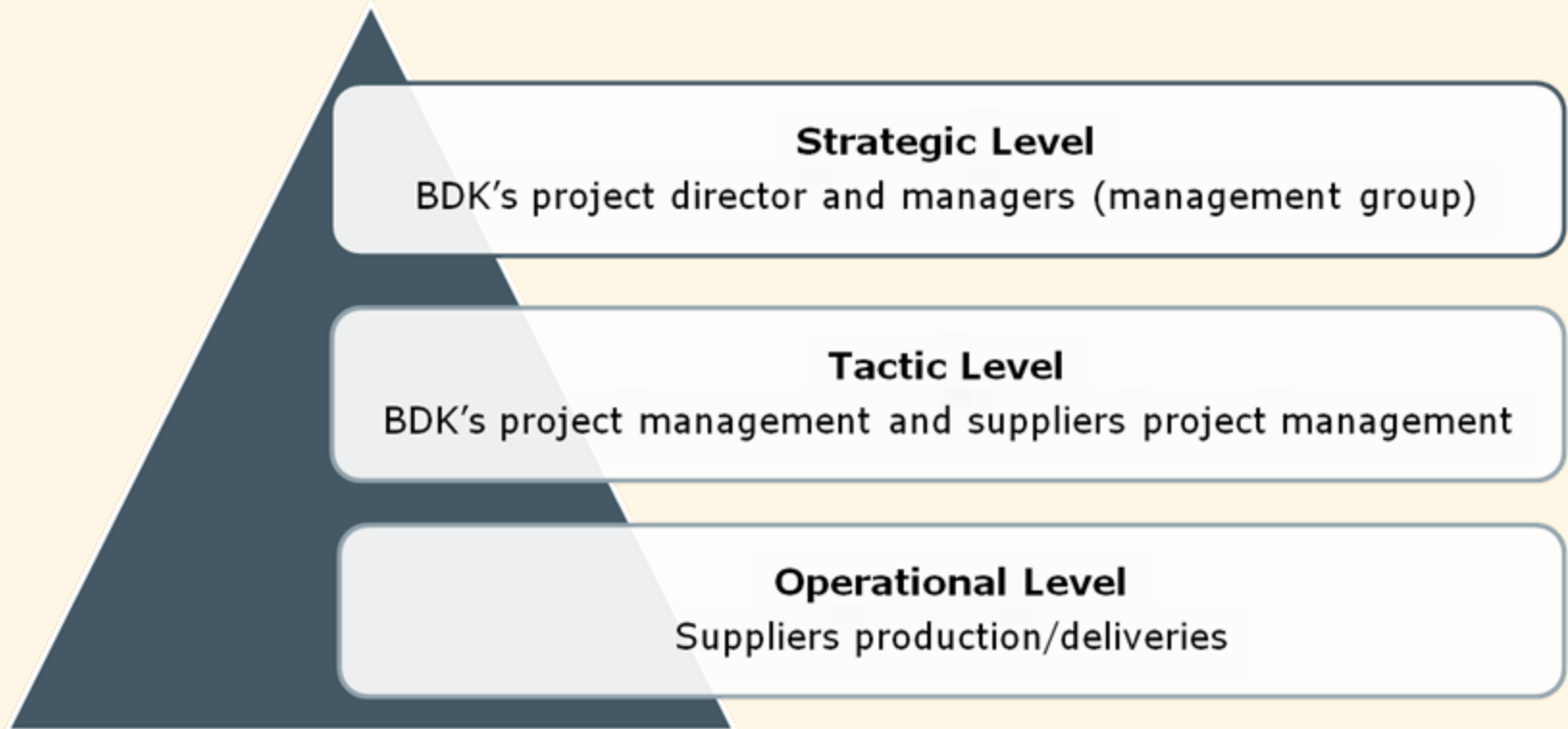
- *Learning how it was done best!*

"We want to construct the New Line
Copenhagen-Ringsted European best-in-class
by purchasing in competing markets,
economy of scale and
using state-of-the art technology"

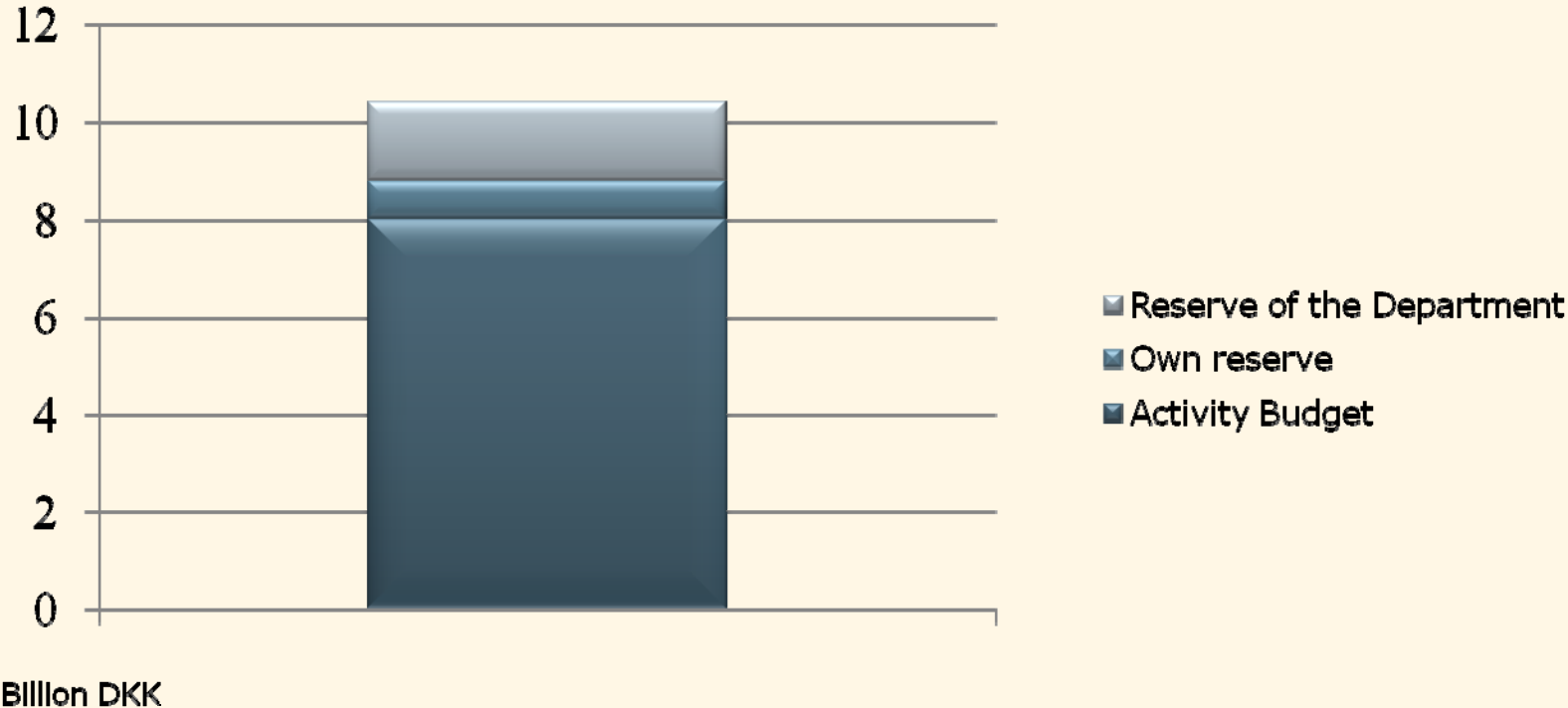
Co-operation



Project Levels



Compliance of Economy



Project levels



Preparatory works

- To be carried out before alignment works begin

- Surveying finalized
- Geotechnical/Hydrogeological investigations: Finalized August/September
- Land acquisition commences late 2011, finalized early 2013
- Utility replacements protocolled summer 2011, finalized early 2014 (600 installations, 55 owners)
- Archaeology excavations finalized spring 2013
- Authority approvals (typically municipalities) mid/late 2012 (6-700 items to be clarified)

Rolling out

- *Sequentially commissioning*

- Ny Ellebjerg station 2013
- Bridges/tunnels 2013-16
- Earthworks and drainage 2014-16
- Køge Nord station 2016-18
- Tracks 2017
- Catenary and power supply 2017-18
- Signalling and telecom 2017-18

Other ongoing and future projects

- Renewals (e.g. bridges)
- Signaling Programme (Banedanmark)
- Femern Hinterland (Banedanmark)
- Femern Coast-coast (Femern A/S)
- Electrification?
- Upgrading 200 kph?

Krav til 3D modellering - Baggrund

Ambition:

Best in Class

Krav:

Bygbarhed
Sporbarhed

Metode:

Stille krav til 3D modellering

Udgangspunkt:

Erfaringer fra byggebranchen
Erfaringer i anlægsbranchen
Erfaringer fra andre lande

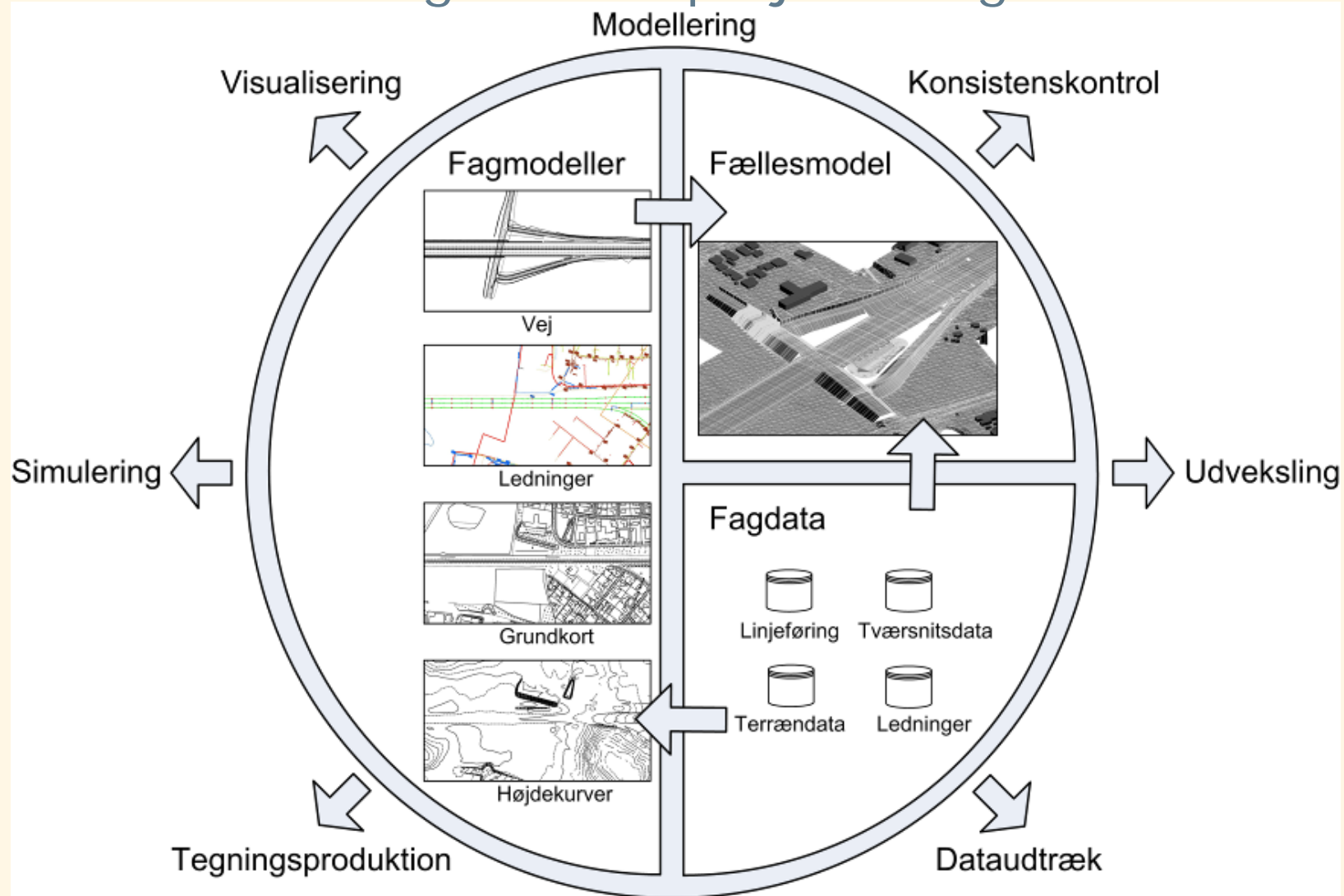
Et ny medlem af bygherregruppe - 3D modelkoordinator

Modelkoordinatorens opgaver

- Indsamling af erfaringer
- Definere krav til 3D modellerne i tæt dialog med BDK's ledelse og de involverede kontrakter
- Definere retningslinier vedr. udveksling af modeller og interval for udveksling
- Udføre test og tilpasning af kravene
- Kontrol af kollision og sammenfald mellem modellerne og generere rapporter til projektledelsen

- Kravene gælder alle involverede, også entreprenører

Sammenhæng mellem projekteringsdata



Krav til 3D modeller

Helt overordnet bliver der defineret:

- Hvad skal modelleres i 3D
- 3D modellernes struktur og visuelle egenskaber
- Krav til udtræk af afsætningsdata
- Krav til udtræk af mængder
- Krav til udveksling af 3D modeller
- Retningslinier for kontrol af sammenfald og kollision mellem modellerne

3D modellernes anvendelse

Output fra 3D modeller skal bruges til:

- Generere tegninger
- Generere visualiseringer
- Generere simuleringer
- Kontrollere kollisioner
- Generere afsætningsdata
- Mængdeberegninger

Status

- Indsamling stort set på plads ved udgangen af november
- Teststrækning er aftalt
- Testen handler i første omgang om geometri
- Krav og leverancer til Design & Build kontrakter under udarbejdelse
- Endelige krav ved udgangen af februar