

# Light Rail on Ring 3

*New light rail in the suburbs of Copenhagen*

September 10<sup>th</sup> 2019 / Lars Forsting

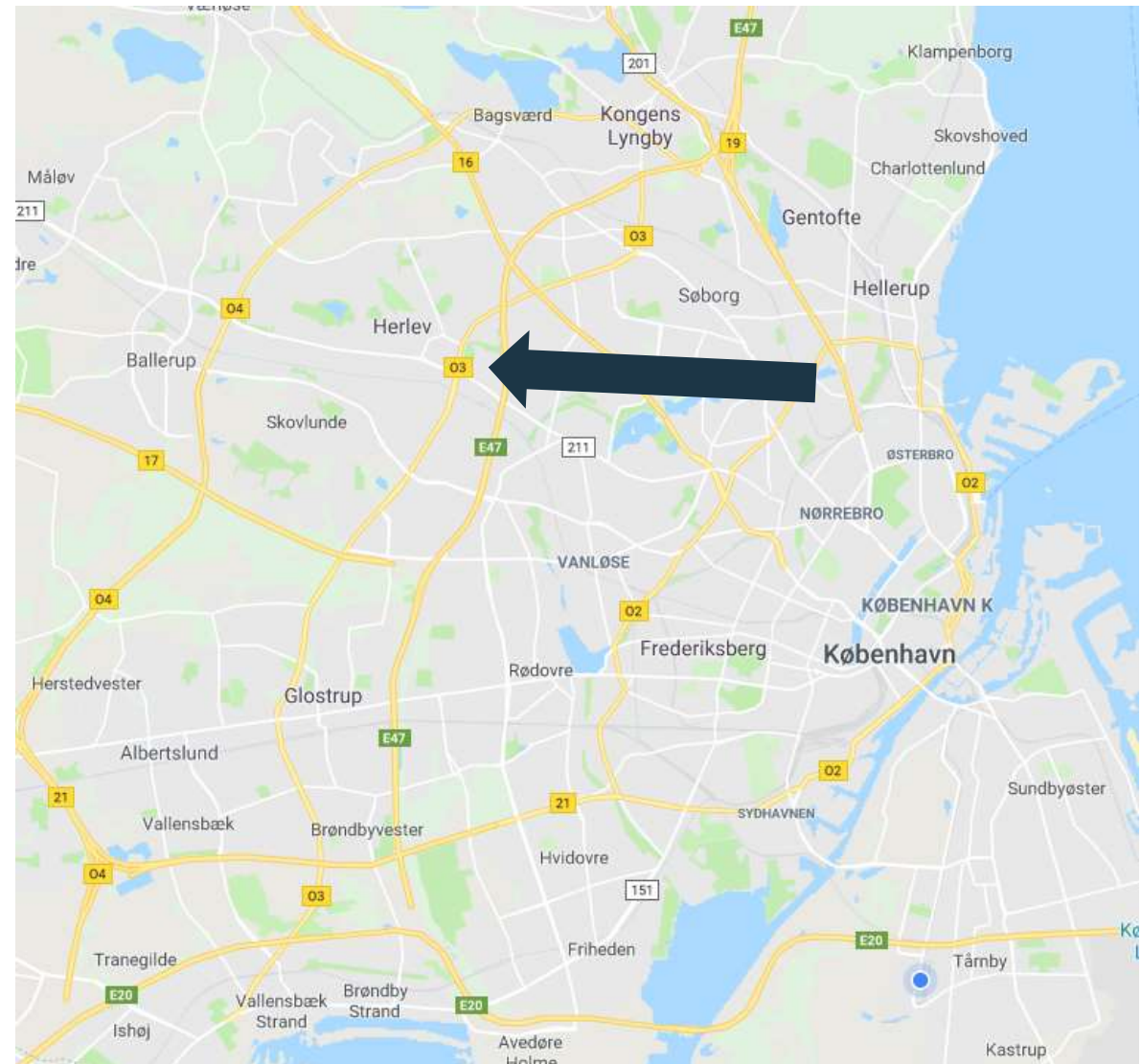
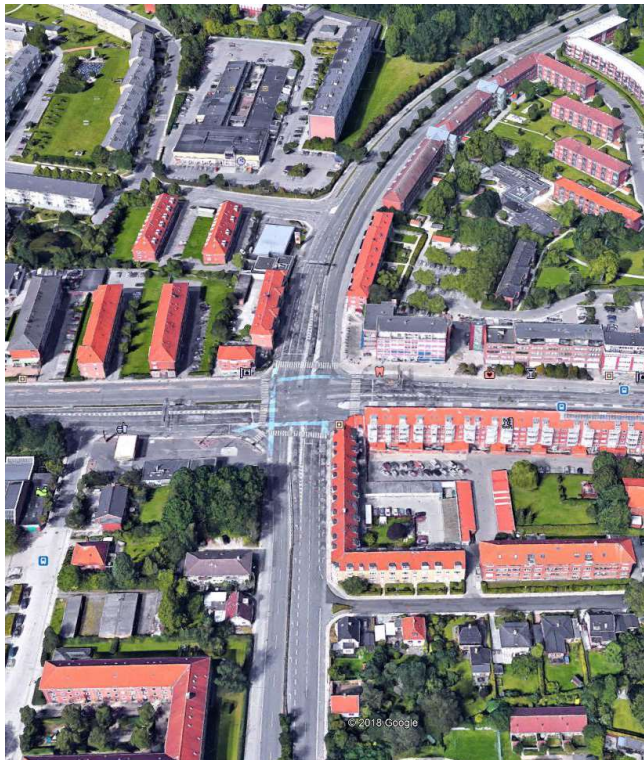
# Agenda

- The Light Rail on Ring 3
  - General info & Project facts
  - Contractual setup
  - Time schedule
  - Etc.
  
- Status of the project
  
- Safety
  - Authority approval(s)
  - Pedestrians and bicycles
  
- Questions and discussion

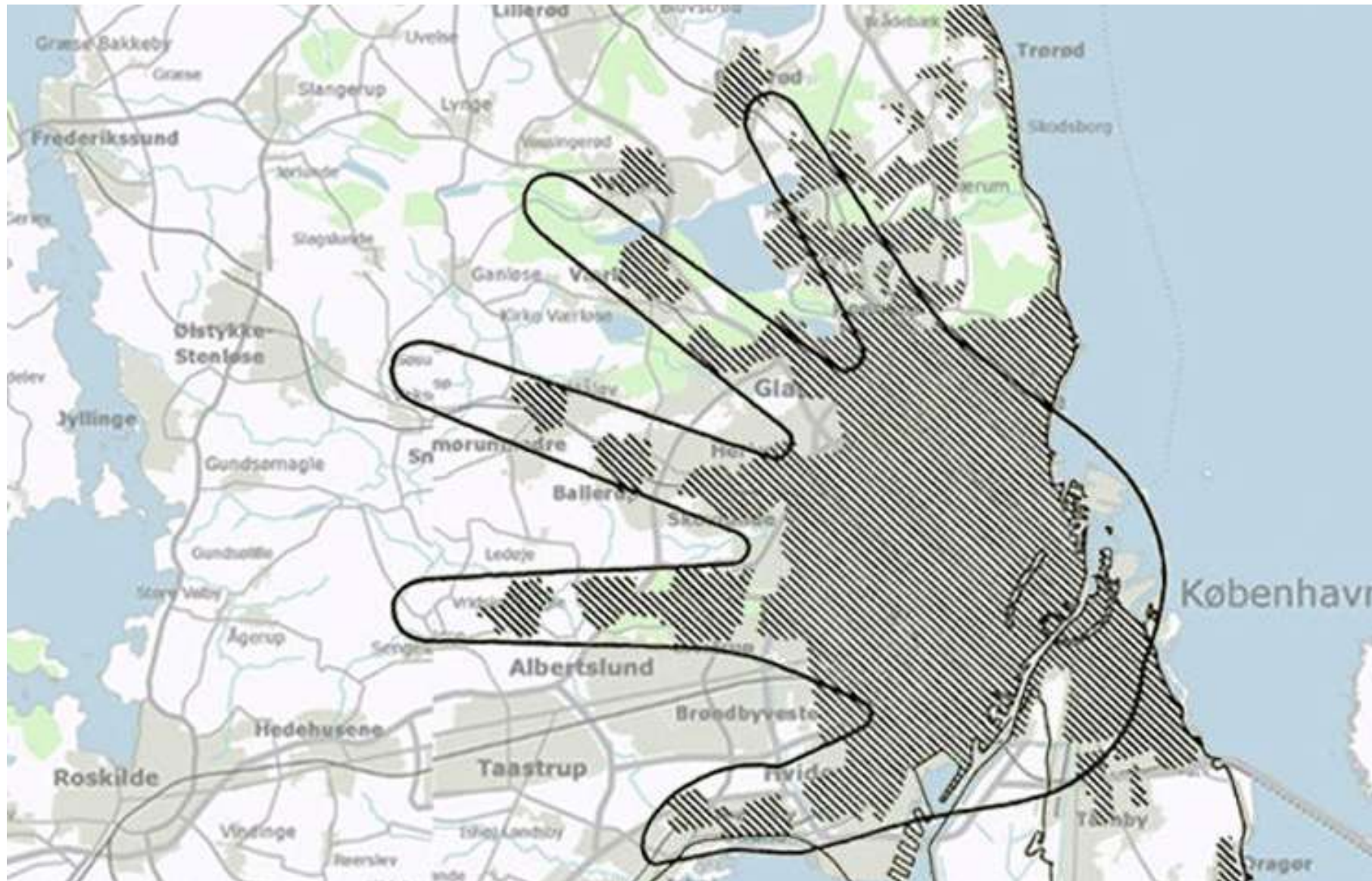
## What is Ring 3?

Ring 3 (or O3) is one of four traffic arterials inside and in the suburbs of Copenhagen.

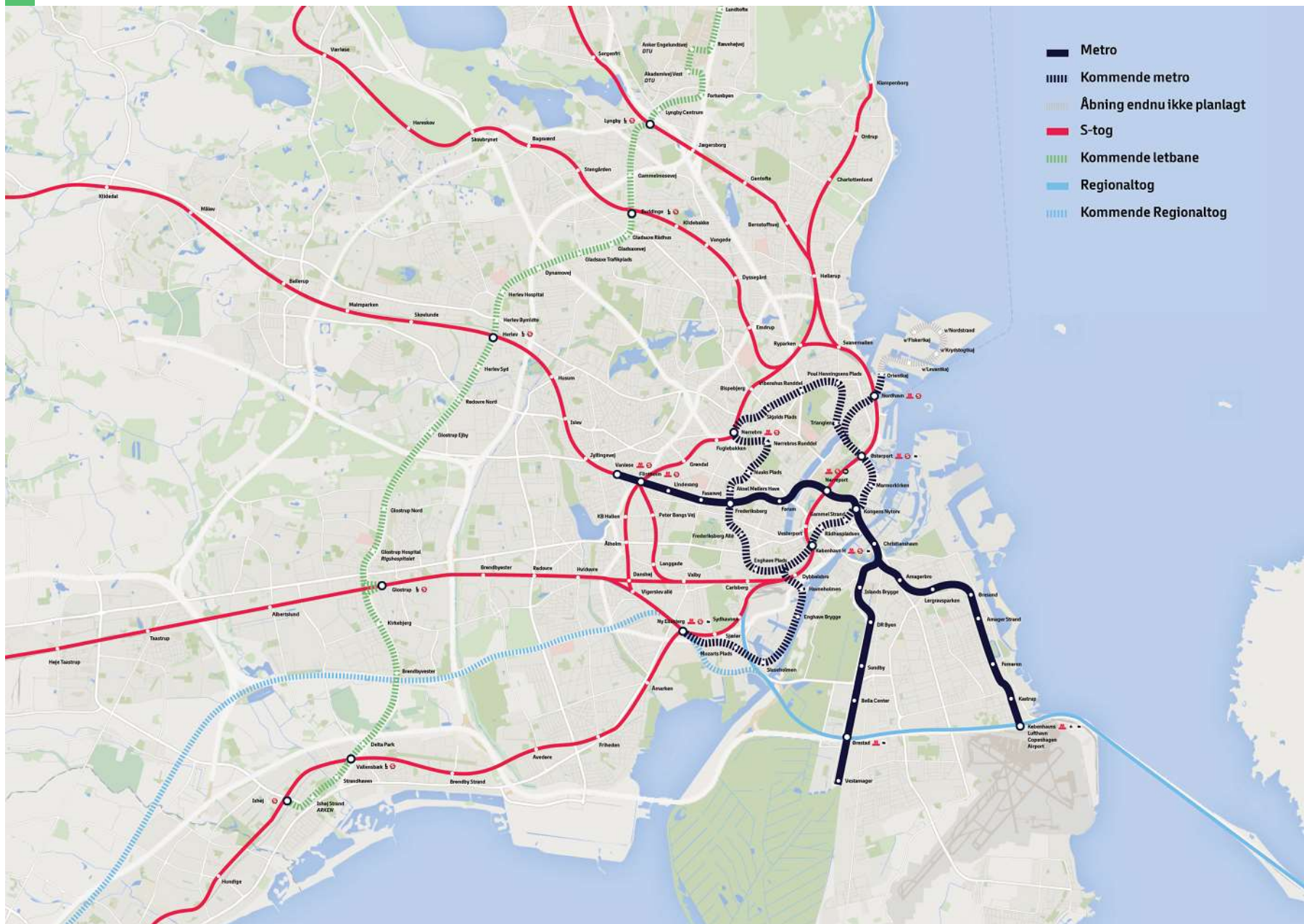
It's actually not a complete ring.











## Why a Light Rail?

- Towards 2030 the population in Copenhagen is expected to grow by **200.000** citizens (reaching 750.000)
- Congestions costs for road users are **9 mil. hours/year** costing society **268 mill. €/year**
- By 2025 time and cost will have doubled

In 2013 the “Anti-congestion-Commission” recommended to construct light rails to reduce traffic congestion – in Copenhagen as well as in the suburbs.



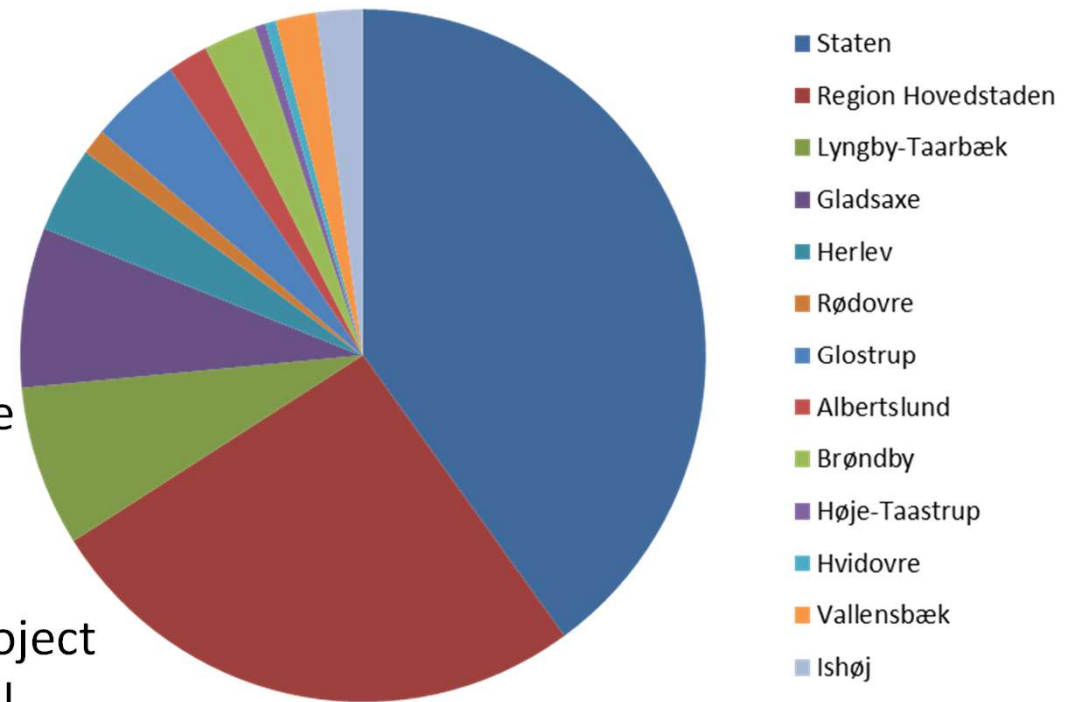
## General Information

➤ The group of owners is large

- 11 municipalities
- The Region
- (The State/Government)

Consequently, making decisions and changes to the project is a complex process

➤ Strong local support to the project (investors already started local development)



*The group of owners*

## Goals for the Light Rail on Ring 3

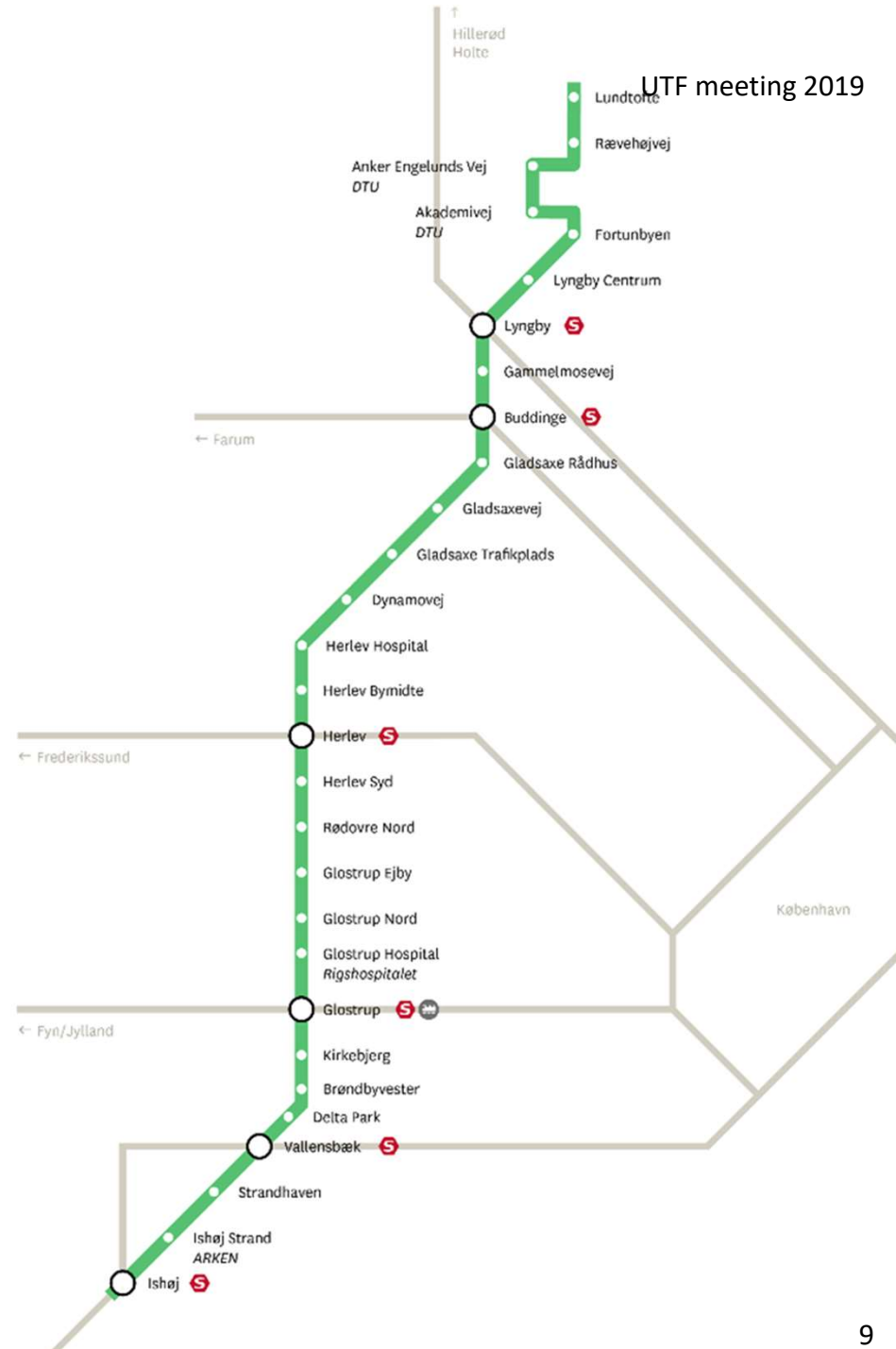
- To improve and enhance the public transport across the "fingers"
- To boost the urban development along the light rail
- Obtain a safe performance during construction and operation – create a legacy that we can be proud of
  - Safety Academy for everyone employed at the project
- Plan, design, construct and operate within cost and time



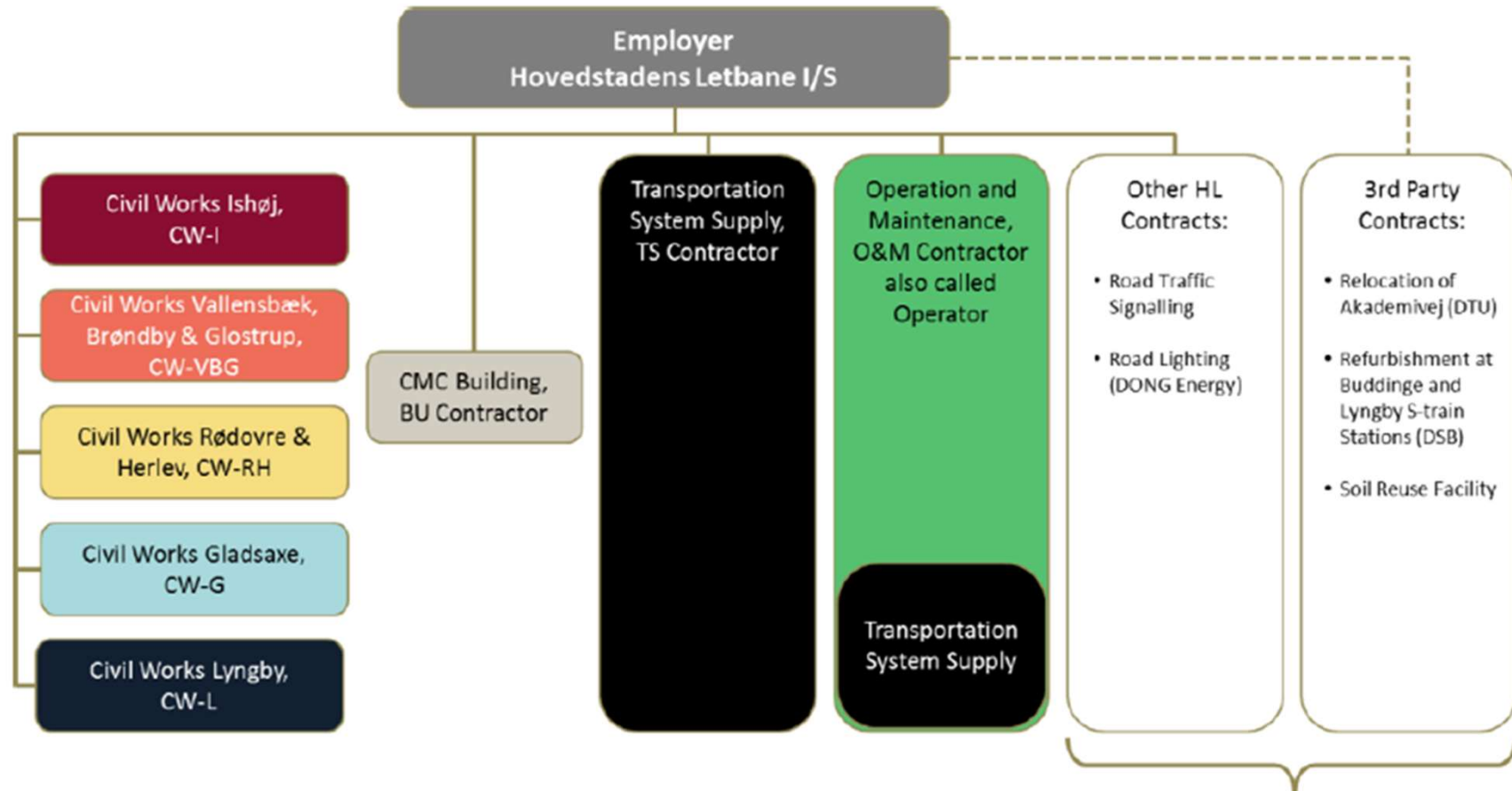


## Facts

- 28 km double track electrified by OHL
- 29 trams (bi-directional)
- 29 stations
  
- 44.000 daily passengers
  - 13-14 mil./year
  - 17-18 mil./year when city development is complete
  
- Opening year 2025
  
- 5 min. headway
  - Weekdays 6am-7pm
  - Saturdays 8am-5pm
  - Otherwise 10 min.
  - No operation during 1-5am
  
- Drive on sight



# Contract setup, Design & Build contracts

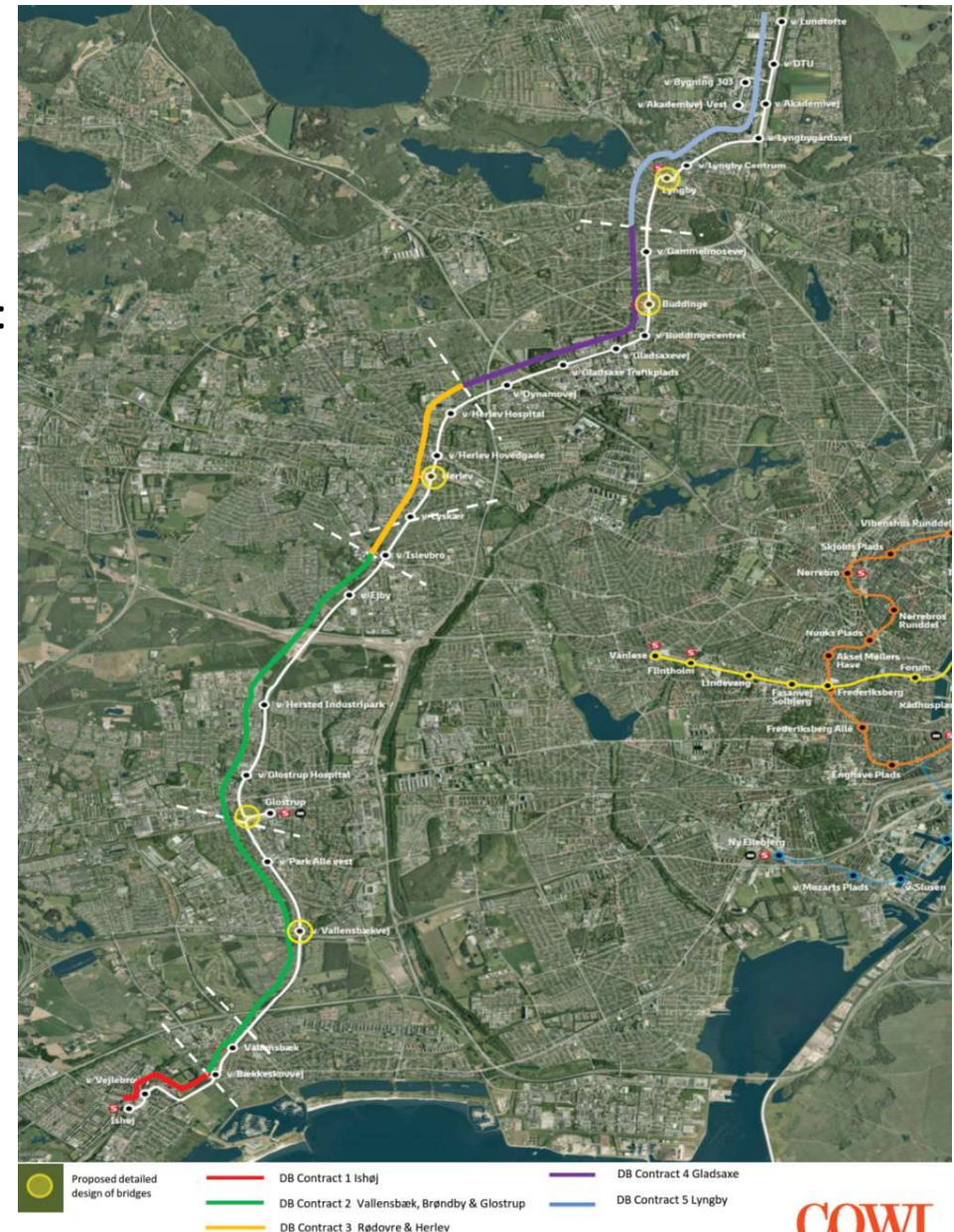


Contracts planned to be tendered out later.

The contracts listed are the ones known of at the time of tendering; other contracts may be entered into at a later stage.

## Contracts

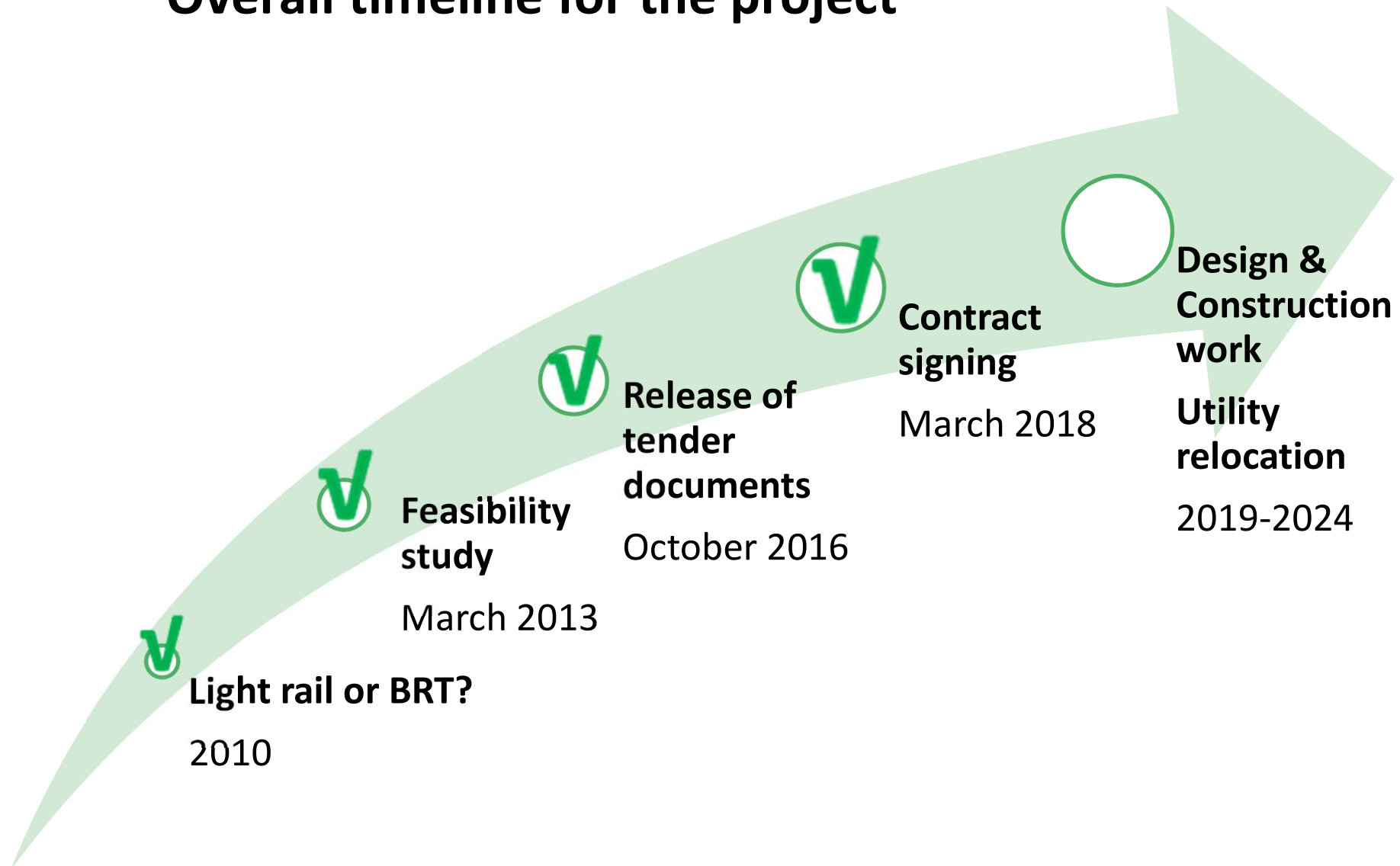
- 5 CW-contracts
  - **Ishøj**: MJ Eriksson
  - **Vallensbæk/Brøndby/Glostrup**: Aarsleff
  - **Rødovre/Herlev**: CG Jensen
  - **Gladsaxe**: CG Jensen
  - **Lyngby**: Aarsleff
  
- **Transportation system**:  
Siemens Aarsleff Rail Consortium
  
- **CMC**:  
CG Jensen
  
- **Operation & Maintenance**:  
Metro Service



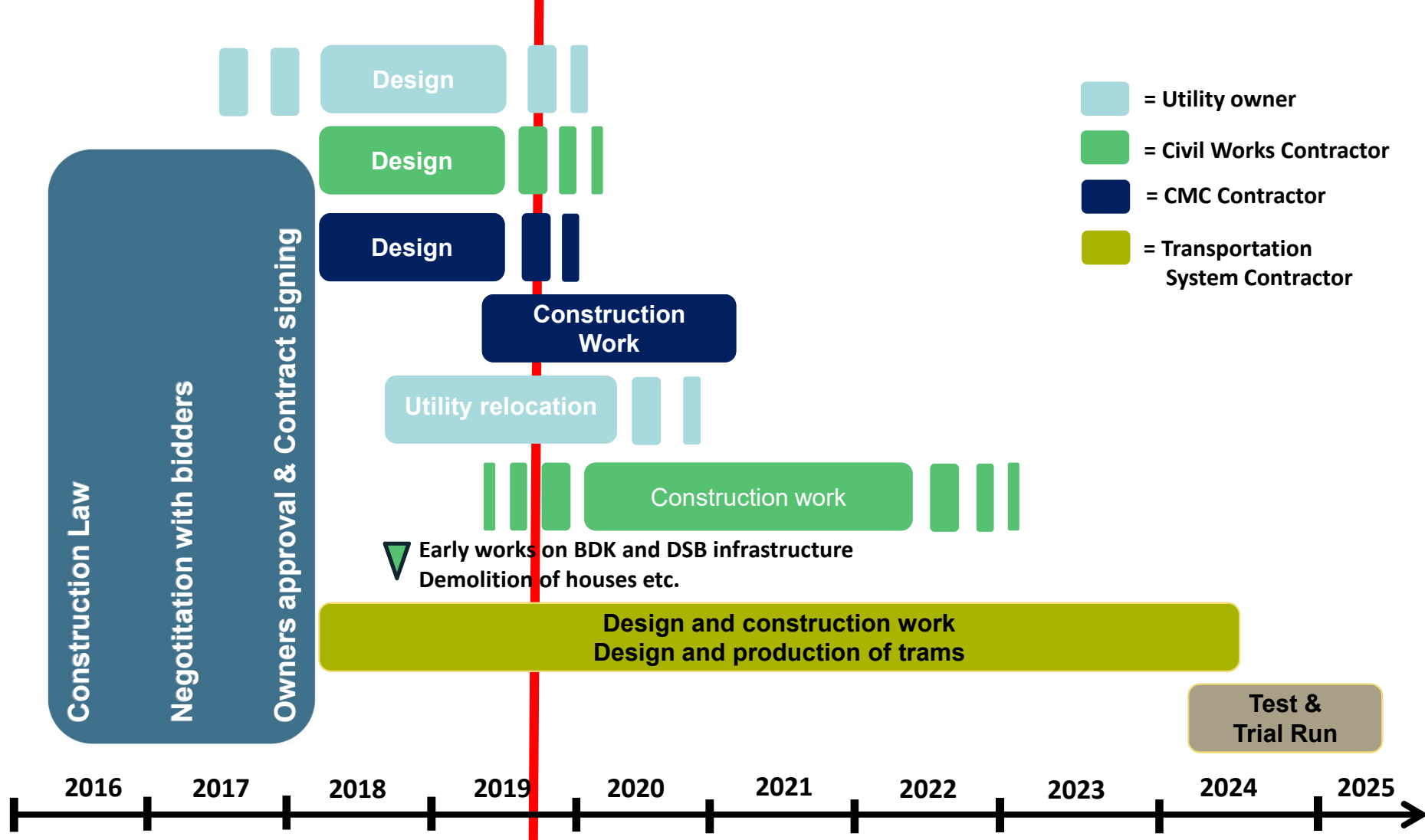
13/07/2015



## Overall timeline for the project



# Overall Time Schedule



# Status of the project



## Status as per August 2019

- Detailed design for infrastructure works is being finalized
  - 20 smaller packages due to synchronization with utility relocation
- Interior and exterior design for trams is almost fixed
- Utility relocation is ongoing
- Demolishing of buildings is ongoing
- Construction work is ongoing

## Demolition of building in Glostrup





## Location for Control and Maintenance Centre





# Control and Maintenance Centre





# Control and Maintenance Centre





## Buddinge station, interchange to S-train





## New underpass for tram in Lyngby





## New underpass for tram in Lyngby



# New bridge for pedestrians and bicycles Crossing of railway line Copenhagen - Ringsted



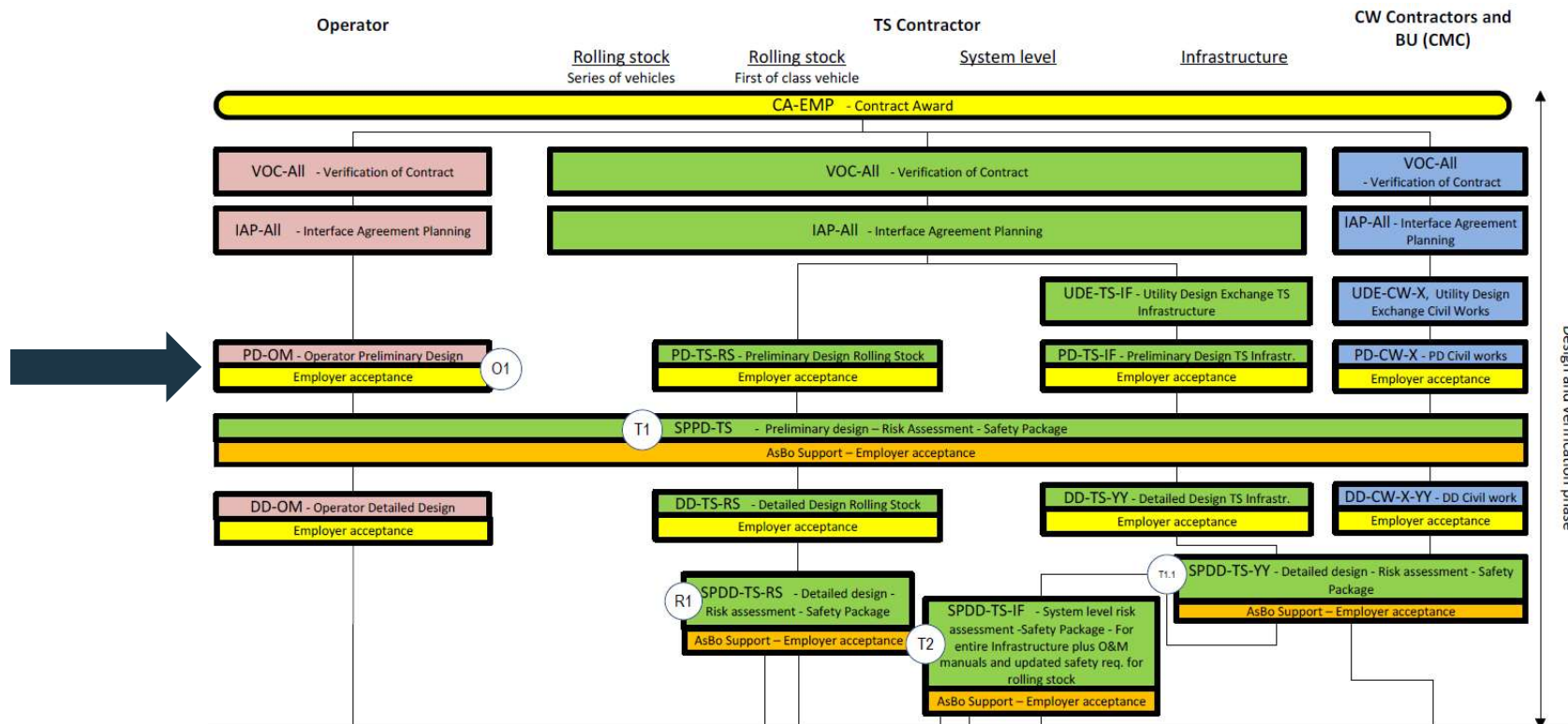
# Safety

*Approvals and design*

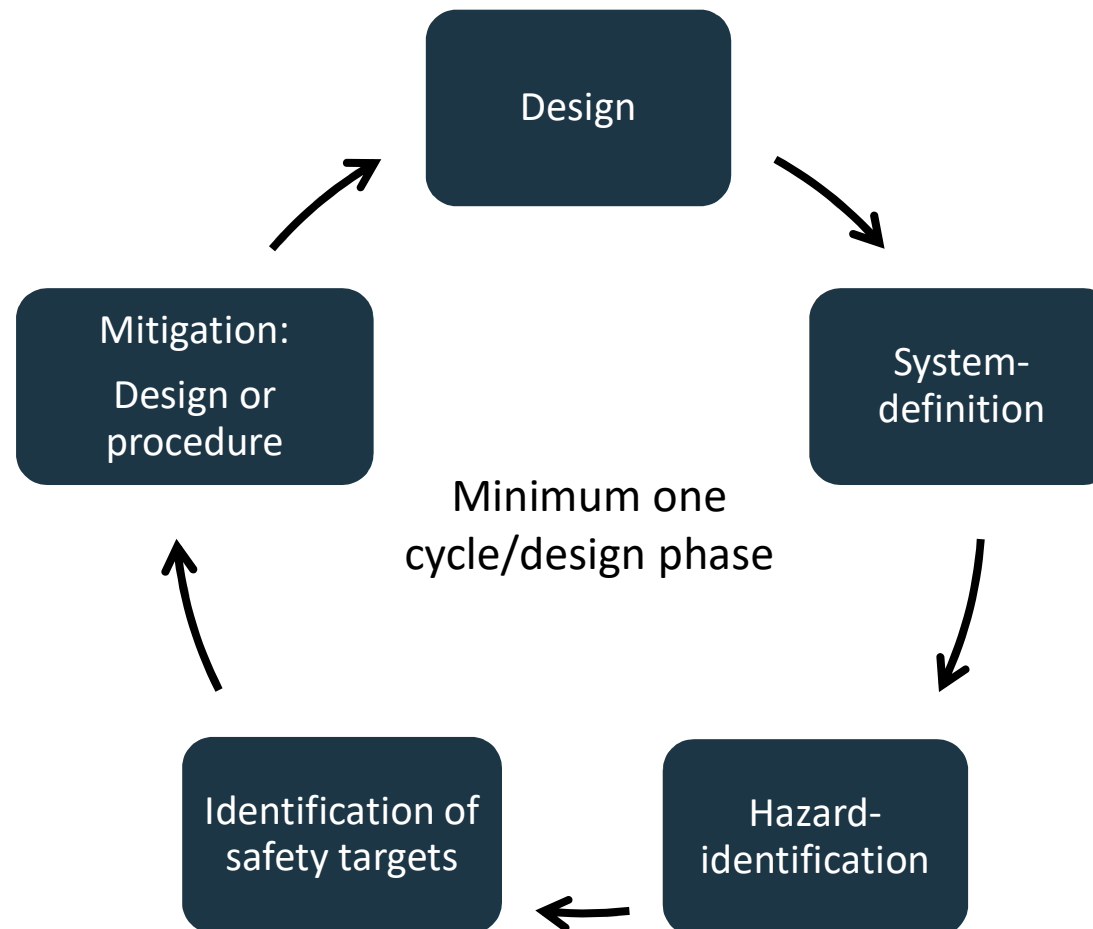


# Infrastructure, tram and operator – coordination

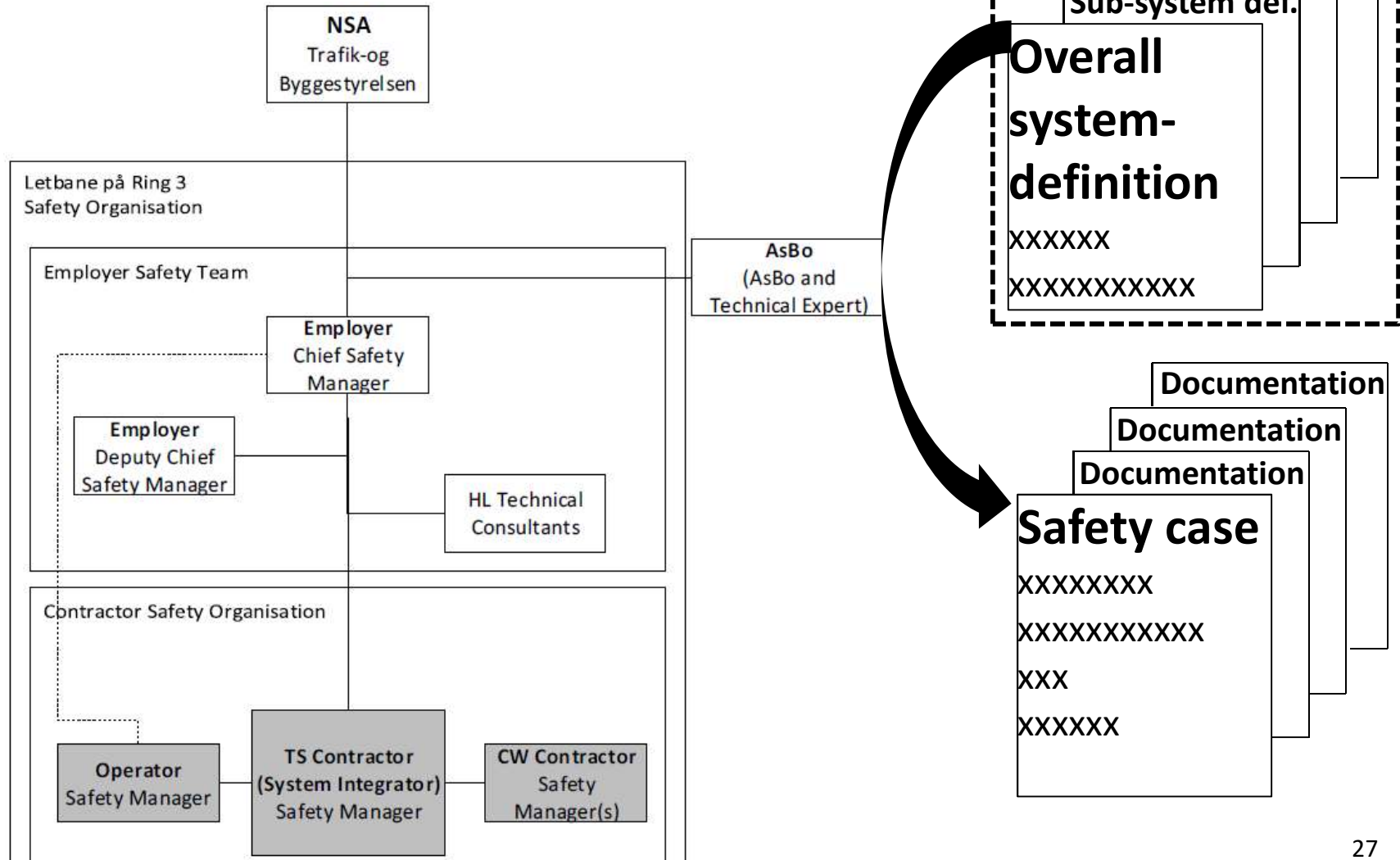
- All are following the same Stage-gate model
- Common time schedule until Preliminary design is complete
- Special safety-milestones for infrastructure, tram and operator



## CSM-RA process is applicable in Denmark (also for tram/light rail)



# Safety-organisation, until the Operator has been approved as Infrastructure Manager





## Assessment Body (AsBo)

- Early involvement
  - Conceptual Design
  - Commenting on Pre-System Definition and Safety Plans
- Monthly meetings: Hovedstadens Letbane (HL) + AsBo
- Monthly meetings: HL + AsBo + all contractors and operator
- Quarterly meetings (infrastructure + trams): National Safety Authority + HL + AsBo + System Integrator
- Start up meetings in 2021: National Safety Authority + HL + AsBo + **Operator**



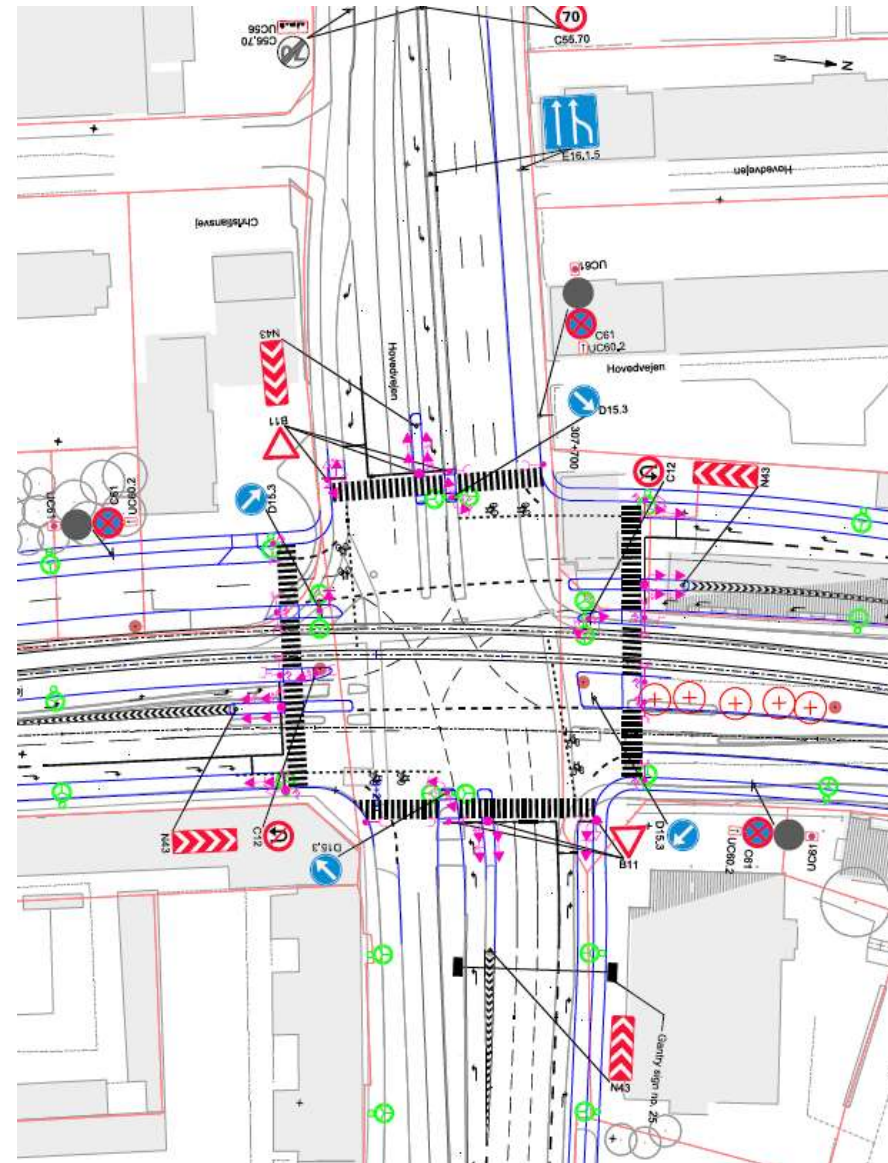
## Road authorities (9 different)

### Design phase(s)

- Tender Design
  - Approved design principles
- Detailed Design
  - Final approvals

### Construction phase (non-safety approvals)

- Coordinating digging permits
- Coordinating road usage
  - Reduction of speed
  - Closure of car lanes
  - Temporarily re-configuration of junctions



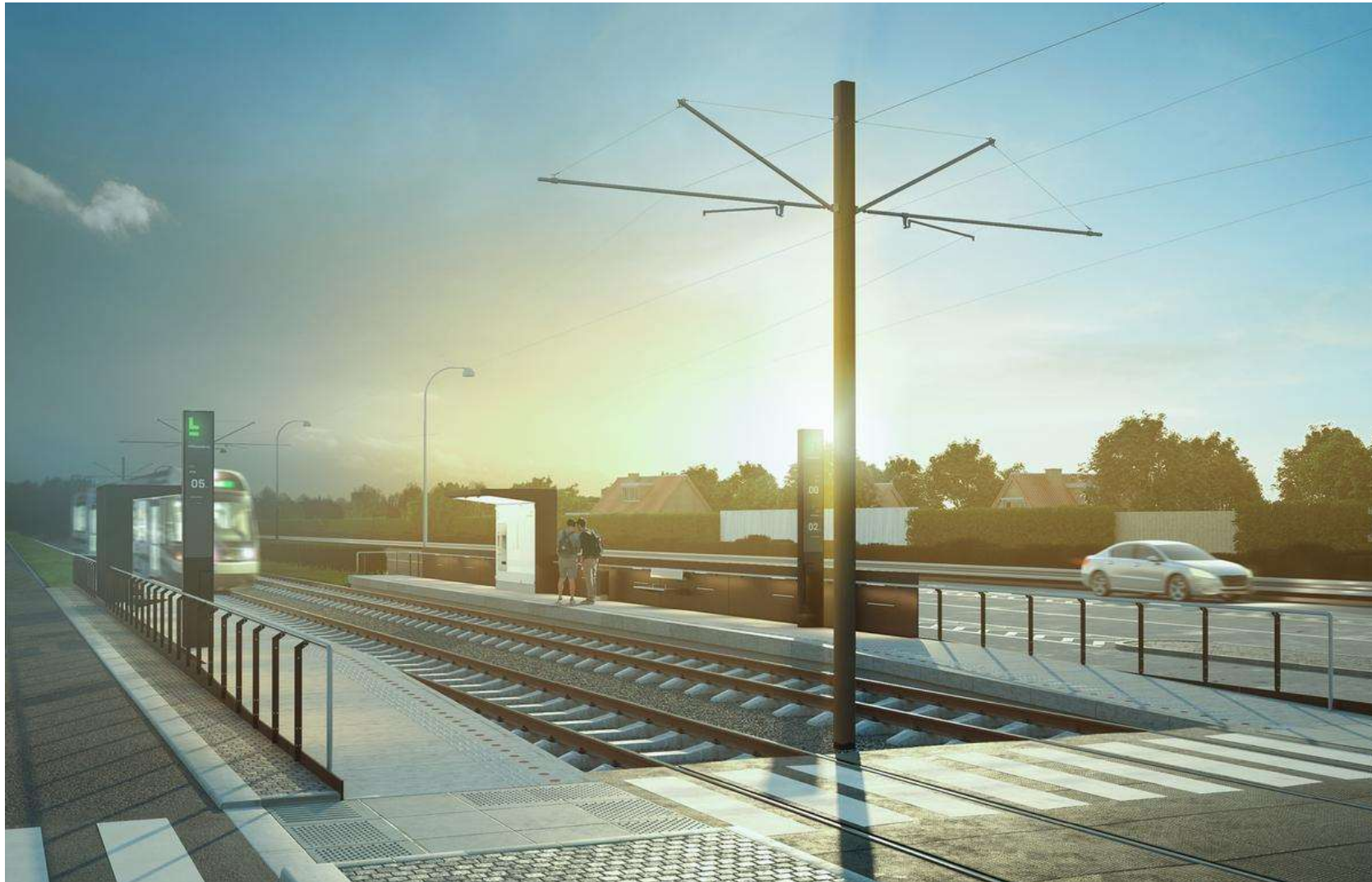
## Railway authority approvals

- Authorisation for Placing Into Service (APIS) for infrastructure
  - Functional section
  - Remaining infrastructure
  
- APIS for trams
  - First tram
  - Type approval
  - Approve update of series of vehicles
  - Updated APIS and type approval
  
- Approval for Test running
  
- Approve Operator as
  - Infrastructure Manager
  - Railway Undertaker
  - Operator





## Easy and safe access to all stations



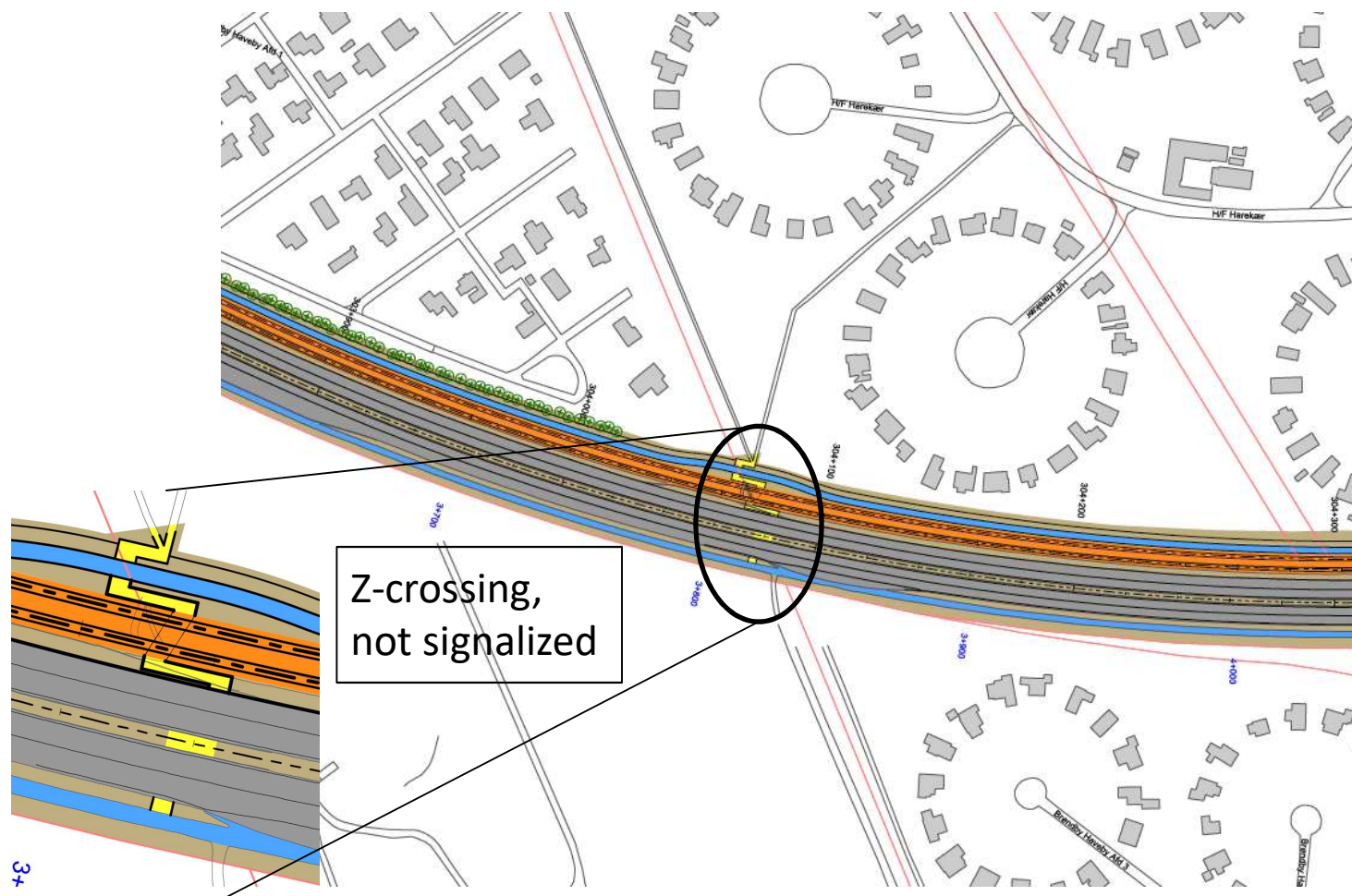
## Station placed in the middle of the road





# Pedestrian crossing, not signaled

## Linking two recreational areas



## The Avenio tram for Copenhagen (design is not final)





## Bicycles are allowed in Multi Purpose Areas





Hovedstadens  
Letbane

[www.dinletbane.dk](http://www.dinletbane.dk)

[info@dinletbane.dk](mailto:info@dinletbane.dk)