



ITA TUNNELLING  
AWARDS 2017



# City line – Station Stockholm City The Norrström tunnel

A tunnel engineering collaborative success story



**ITA TUNNELLING  
AWARDS 2017**



# City line – Station Stockholm City The Norrström tunnel

**Sofia Edoff**

**Production Manager**

The Norrström tunnel  
NCC Infrastructure

**Kjell-Åke Averstad**

**Project Director**

City Line project  
Swedish transportation Administration







ITA TUNNELLING  
AWARDS 2017



# Stakeholders

**NCC Infrastructure** - contractor

in collaboration with

**Swedish Transport Administration** – client

**WSP** - designer

## OWNERS

Swedish Transport Administration

Stockholm Municipality

Stockholm County Council





ITA TUNNELLING  
AWARDS 2017



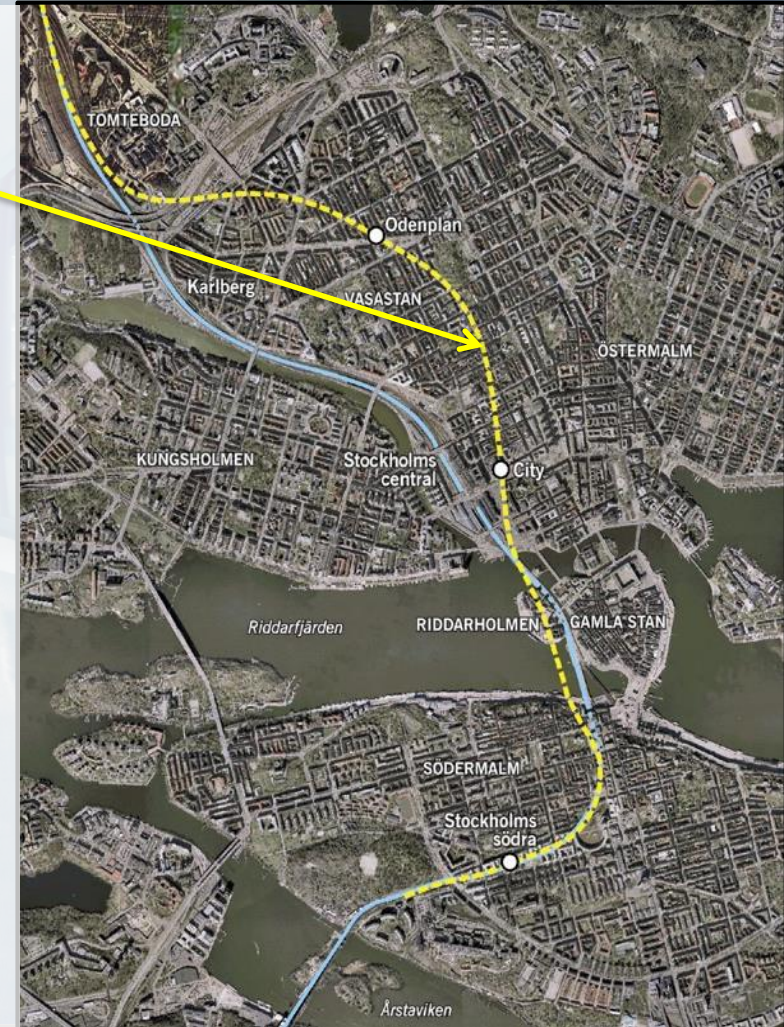
# Stockholm City Line Project

6 km railway tunnel

2 new stations

2 tracks

1,4 km railway bridge







ITA TUNNELLING  
AWARDS 2017



# Tunneling works in the heart of Stockholm

## Noise

- Restricted working hours
- 3 pre-defined blasting occasions per day

## Vibrations

- Blasting close to and inside existing metro station
- Optimized vibration restrictions

## Public transportation

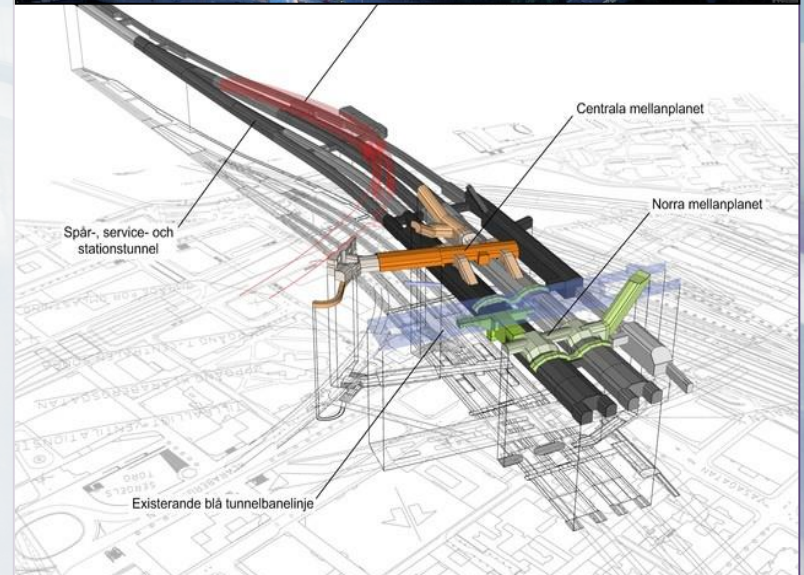
- No unintended disruptions allowed
- > 300 000 passengers/day at T-Centralen metro station
- 3 “summer-stops” closing existing metro

## Cultural och historical values

- Riddarholmen – 13th century buildings

## Stakeholder communication

- An absolute prerequisite ensuring project progress and public trust and acceptance during construction





ITA TUNNELLING  
AWARDS 2017



## Collaborative contract conditions

ECI - Early contractor involvement

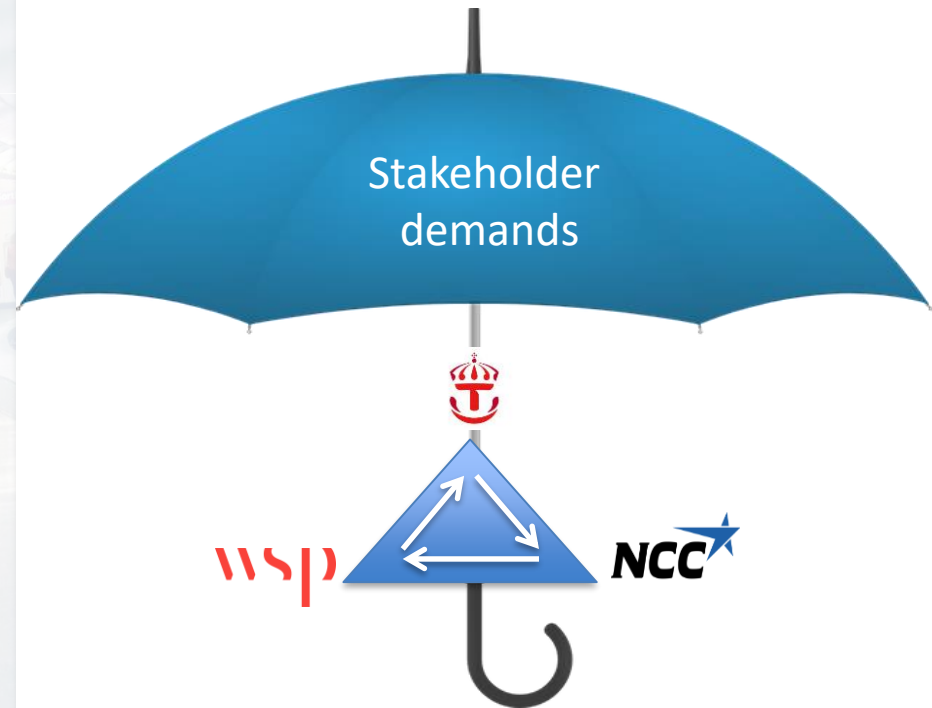
Active collaboration

Common objectives

Design supporting construction productivity and project progress

Project delivery on time, within budget and high quality

Communication







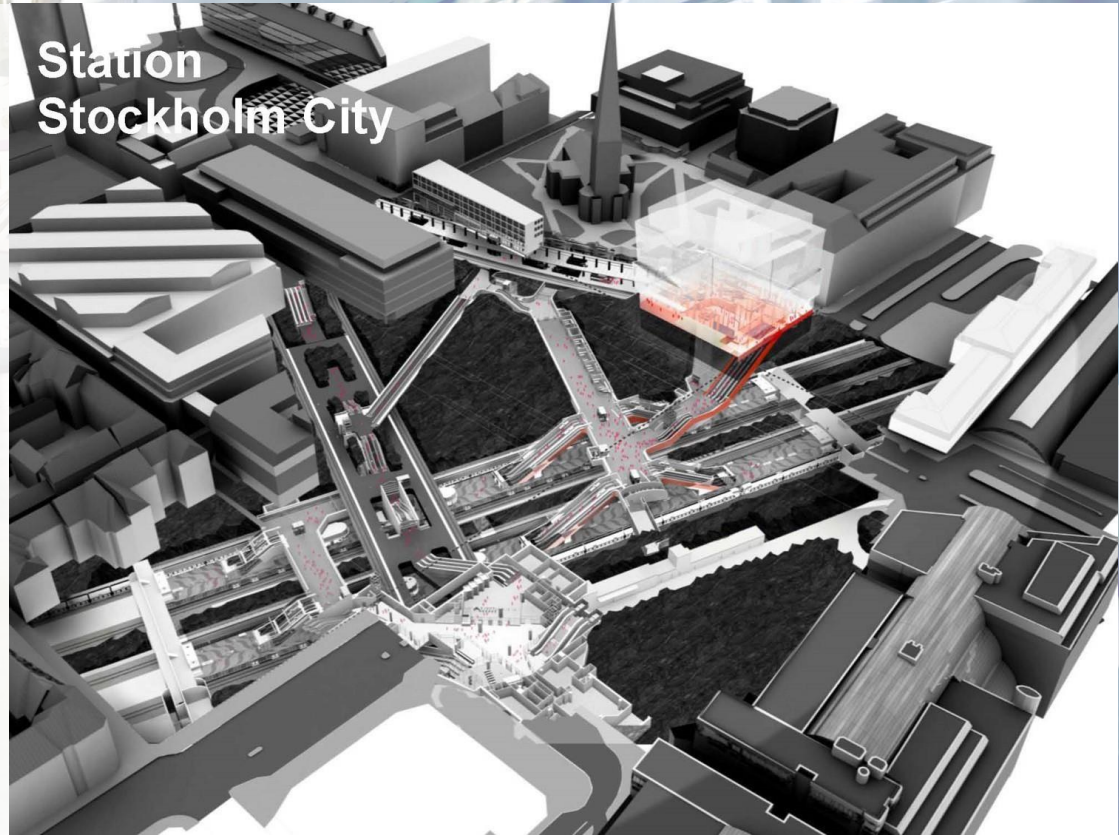
ITA TUNNELLING  
AWARDS 2017



## The Norrström tunnel

- Contract value 220 MEUR
- Tunnel length 1 km incl 2 platforms and 4 tracks
- 2 station tunnels 255 m long 27 m wide and 11 m high
- 1 service- and rescue tunnel
- 2 entrances to surface
- Escalator- and elevator shafts
- 480 000 m<sup>3</sup> excavated rock
- 2 – 45 m rock over burden

## Station Stockholm City





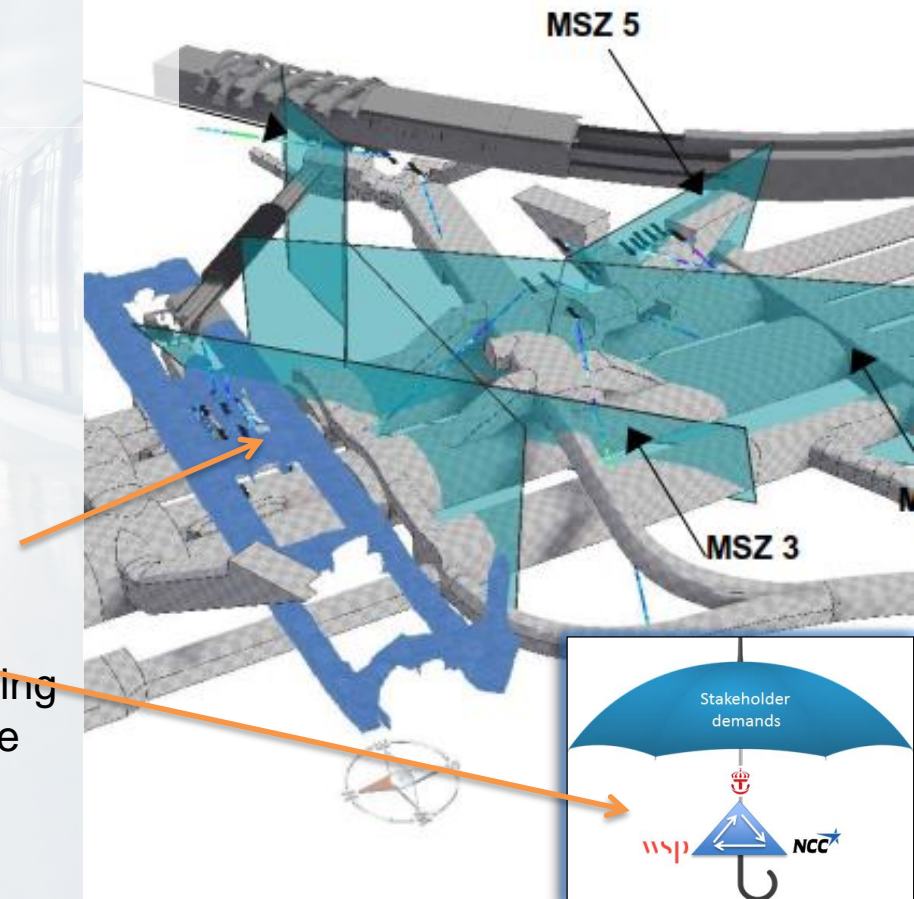
ITA TUNNELLING  
AWARDS 2017



## The rock design process

A successful combination of rock engineering design and production optimization

- Proactive design concepts for different geological scenarios in critical areas
- Effective decision-making-process involving client, designer and contractor saves time and money







ITA TUNNELLING  
AWARDS 2017



## Break through between new City Line and existing Metro Blue Line

### Critical factors

- Time schedule with strict milestones
- Geological conditions and stability
- Restrictions considering the metro above

### Proactive design measures

- Active design
- Observational method geological mapping
- Tollgates
- Visual 3D models
- Use of a variety of rock excavation methods







ITA TUNNELLING  
AWARDS 2017



# A tunnel engineering collaborative success story

“Station Stockholm City” is recognized as the most complicated but also the most successful part of the City Line project.

A general contract with open books and close collaboration resulted in the most cost efficient delivery of all the contracts on the Stockholm City Line and helped bring the construction industry forward.







ITA TUNNELLING  
AWARDS 2017

PROJECT  
OF THE YEAR  
- BETWEEN €50 MILLION AND €500  
MILLION -

