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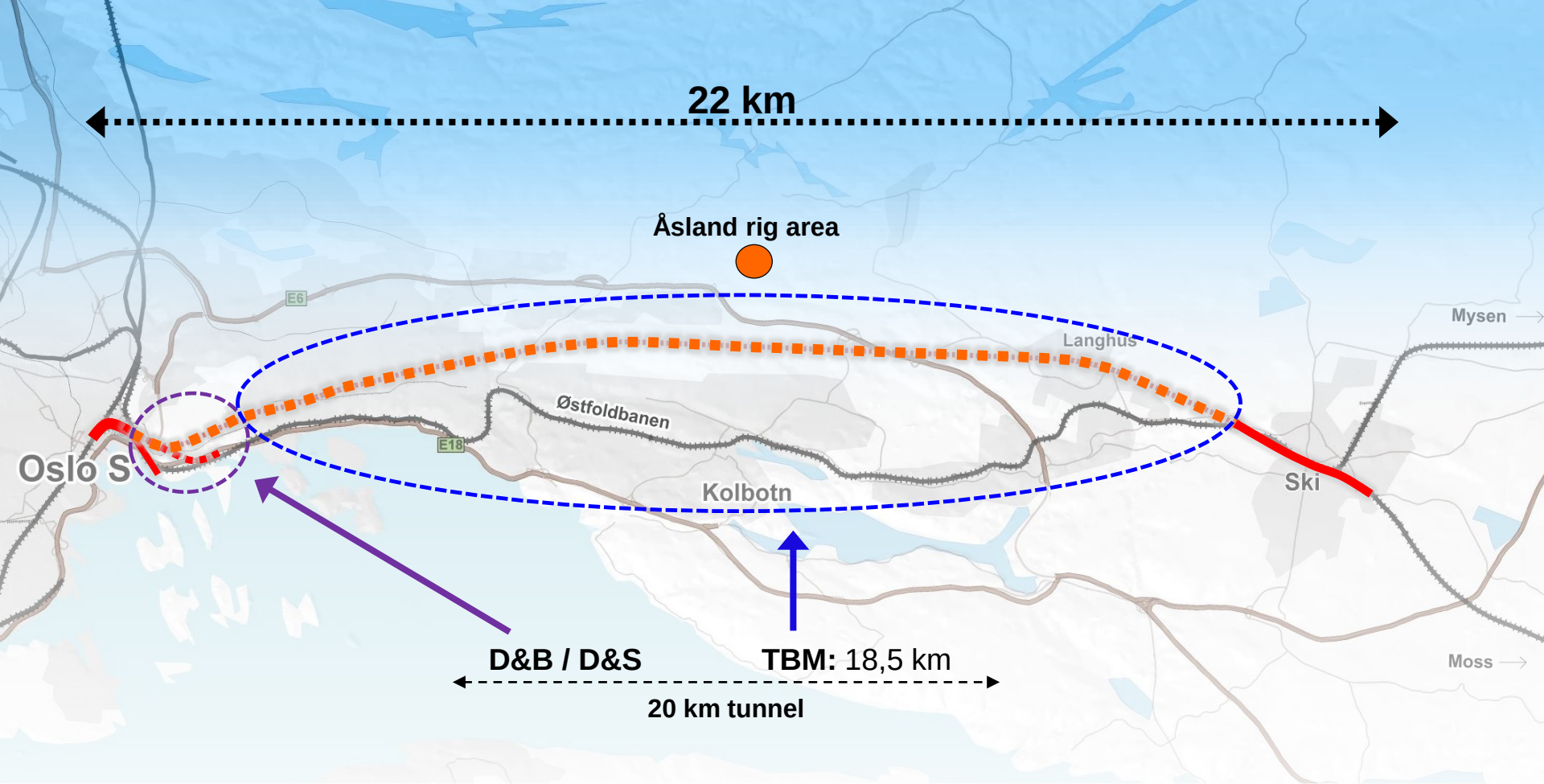
The Follo Line project

- An example of successful neighbor relations

Anne Kathrine Kalager – Project Manager



Two tunnel contracts – Different excavation methods

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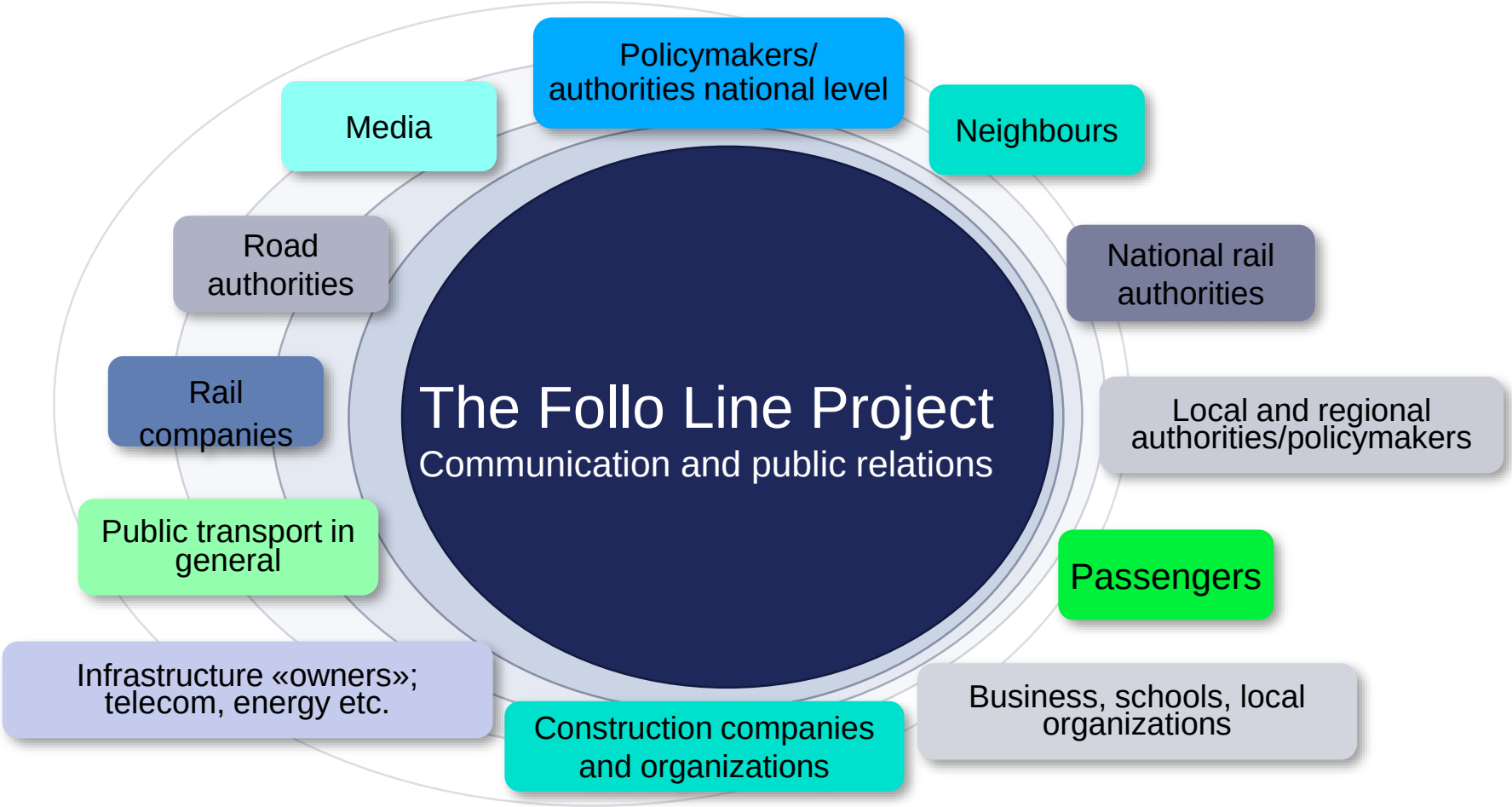
Policymakers/ authorities national level
Media
Neighbours
Road authorities
National rail authorities
Rail companies
The Follo Line Project
Communication and public relations
Local and regional authorities/policymakers
Public transport in general
Passengers
Infrastructure «owners»; telecom, energy etc.
Business, schools, local organizations
Construction companies and organizations

Neighbour information system

- Communication Strategy and Stake-holder Analysis
- Tunnel section divided into subzones based on different challenges
- Use of a prediction model
- Always accountable and relevant information

How did we perform the communication?

- Community meetings
- Newsletters and notification to neighbours
- Social media
- Web-site and daily updated map with TBM-locations
- Personal contact phone/e-mail
- Community information centre
- SMS-service

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Our goal

- Contribute to a confirmation of the project as an important, safe and environmental-friendly project for the future
- Reputation of Bane NOR as a competent and reliable performer of the project
- Achieve trust by always giving good and relevant information
- Achieve acceptance for the project and the disturbances during the construction period

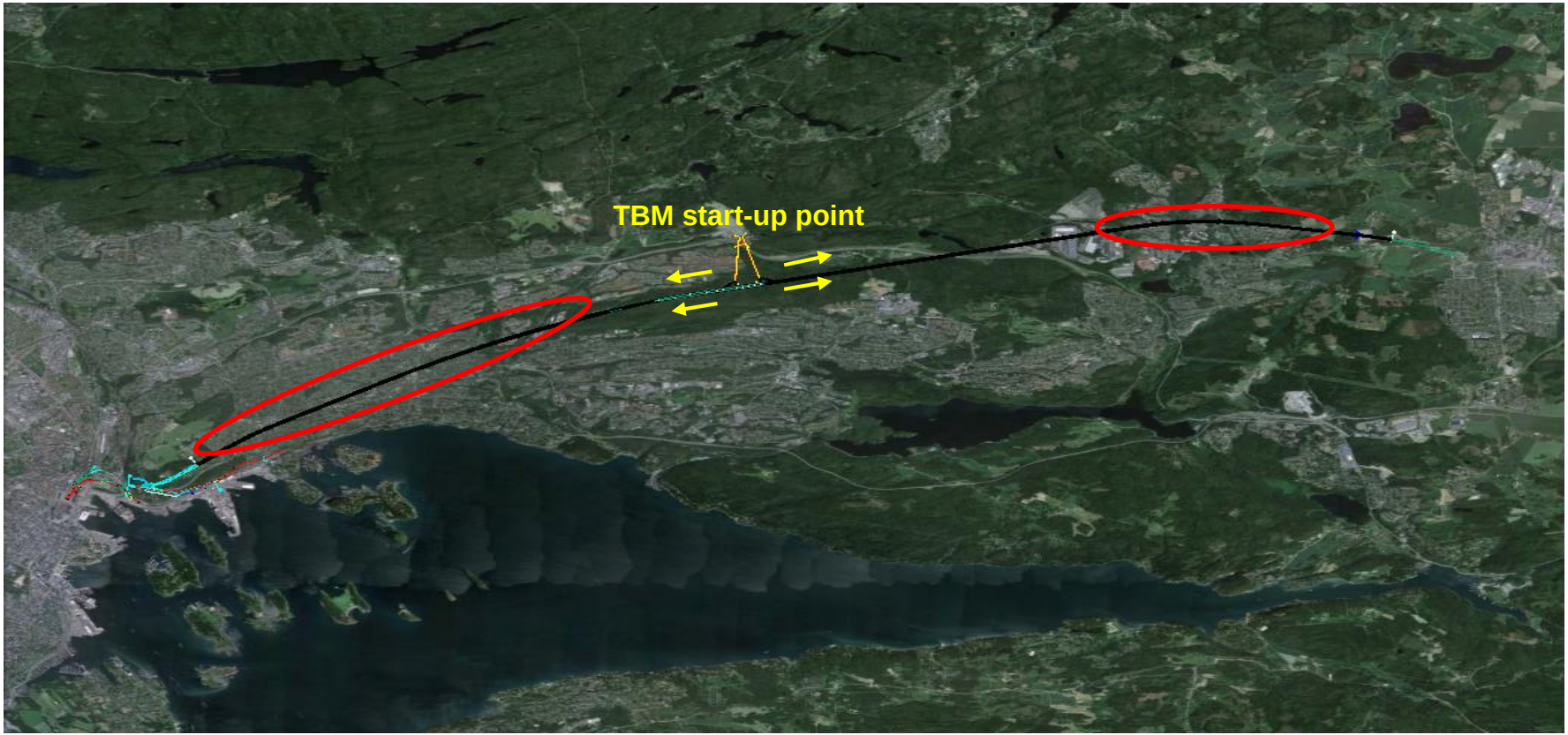
One main challenge and goal:

Achieve acceptance for 24/6 TBM-excavation under densely populated areas

Mitigation:

Offer alternative accommodation to neighbours affected by structural noise above accepted limits

Areas which might be affected by structural noise

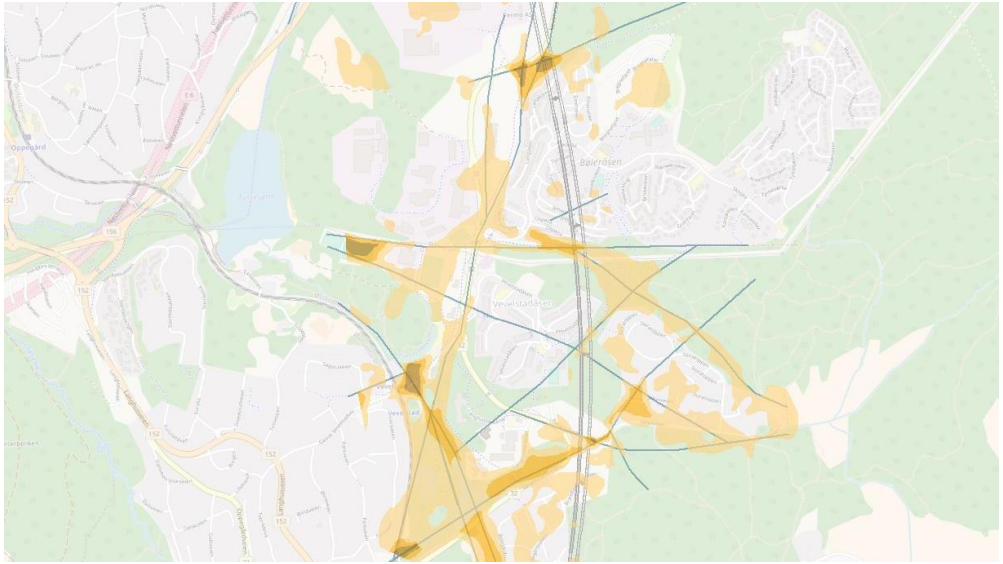


For the TBM-excavation: 24/6 - also under densely populated areas

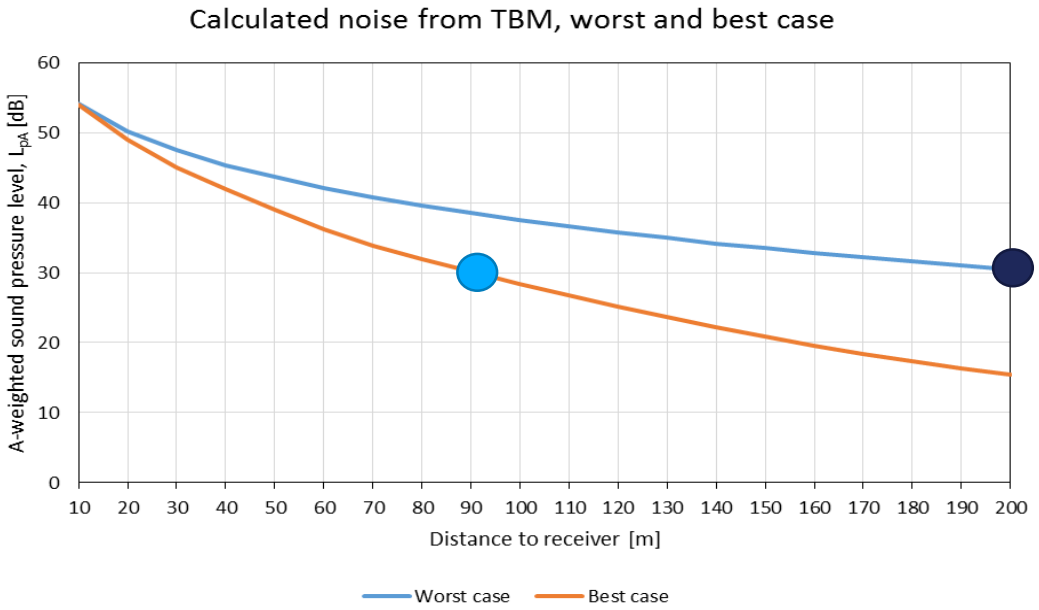
Planning and prediction challenges

Important factors:

1. TBM progress can only be *estimated.* Mechanical and geological factors can increase or decrease progress rate
2. Distance from the tunnel
3. Rock-/ soil-cover and fracture-zones influence noise dispersion
4. Building materials, foundation and the floor of the building have an impact



Estimated structural-noise levels based on data from other hard-rock TBM-projects



Limited relevant experiences available

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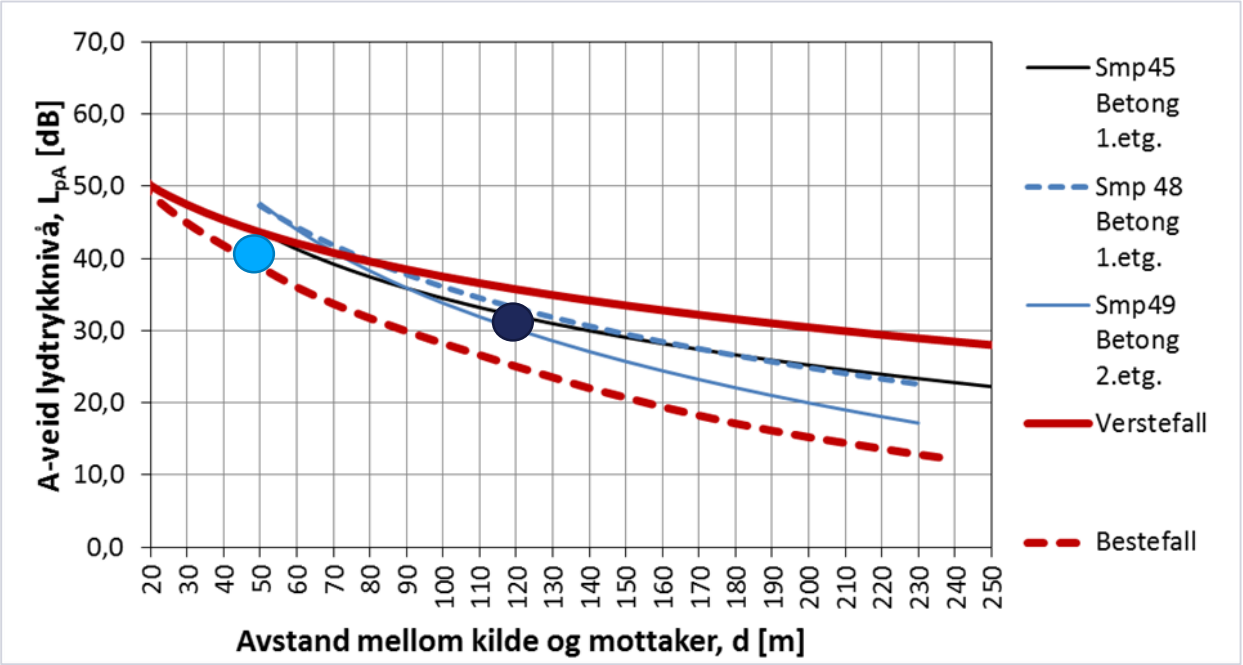
Real values from buildings above the tunnel compared with calculations



Measurements within different buildings made of concrete, where the basement were founded directly on the rock. – Worst case conditions. Measurements done in the ground floor and 1st floor

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The prediction model

Made by using GIS (Geographic Information Systems)

Based on public data:

- Terrain model
- Cadaster data
- Building types

- And, our collected data:

- Tunnel corridors
- Noise measurement results
- Overburden; rock or soil
- TBM progress
- Updated experiences

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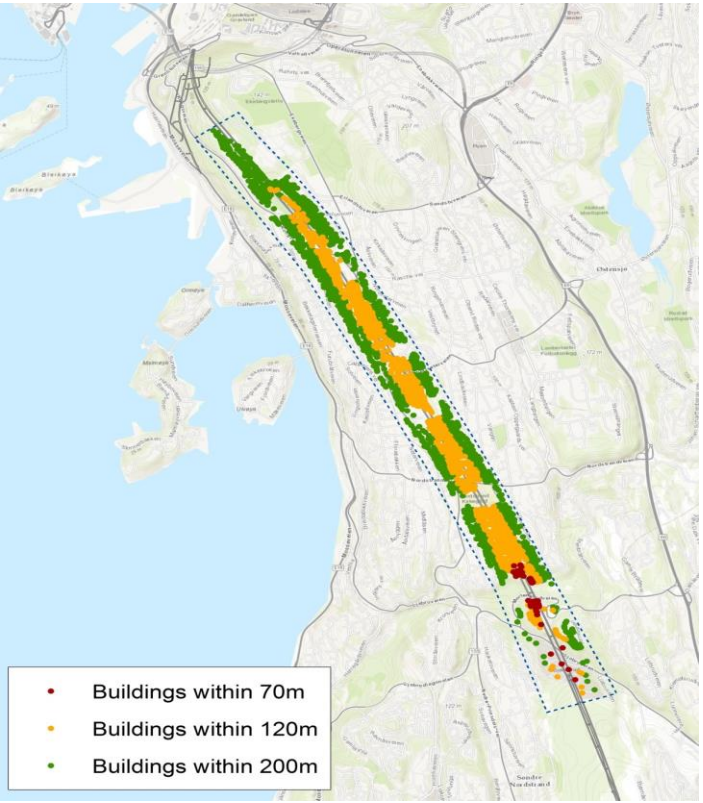
Densely populated area in the northern direction from rig-area Åsland and towards Oslo Central Station.



	Dwellings	Registered inhabitants
Within 70m	145	427
Within 120m	1 924	5 161
Within 200m	3 997	11 062
Total	**6 066**	**16 650**

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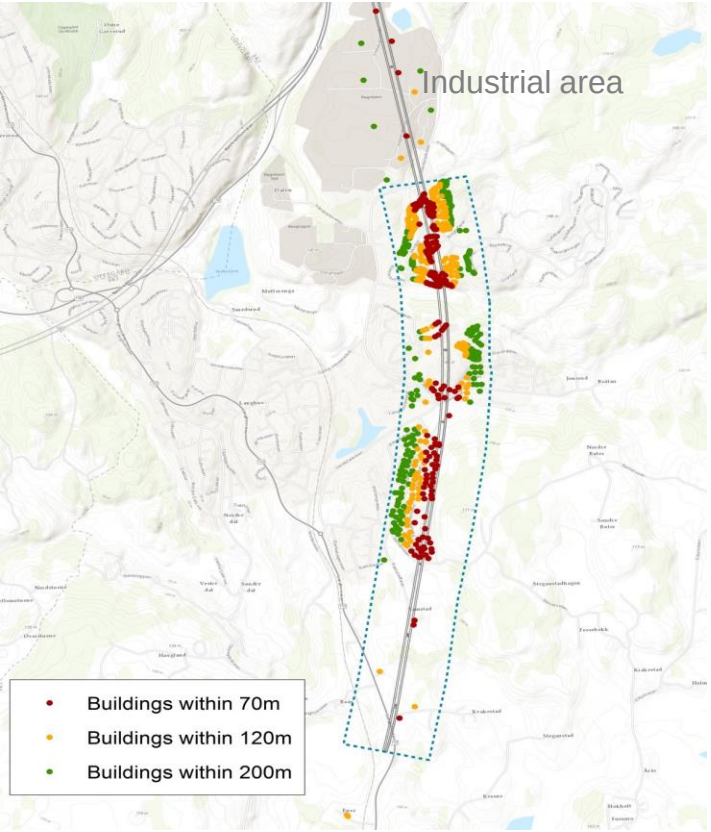
Scarcely populated pathway towards the south – except three residential areas with limited overburden



	Dwellings	Registered inhabitants
Within 70m	530	1 298
Within 120m	887	2 394
Within 200m	1 279	3 523
Total	**2 696**	**7 215**

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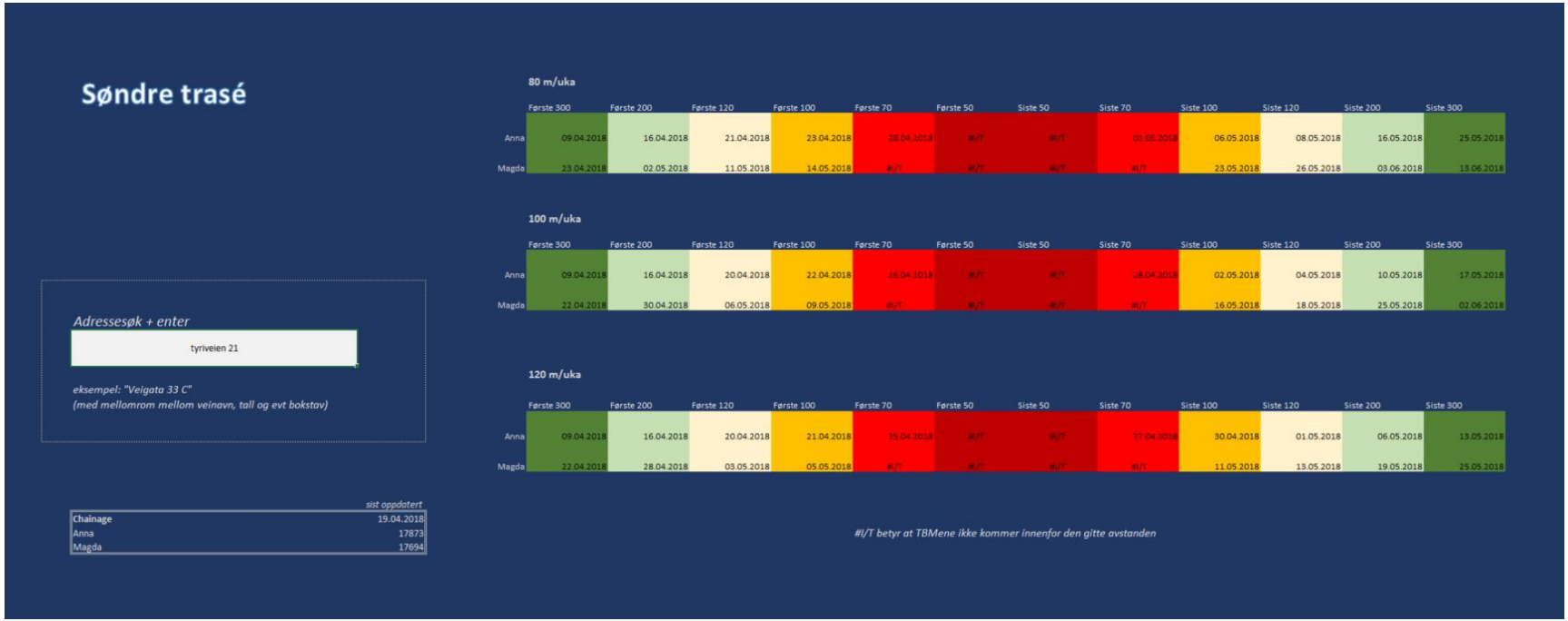
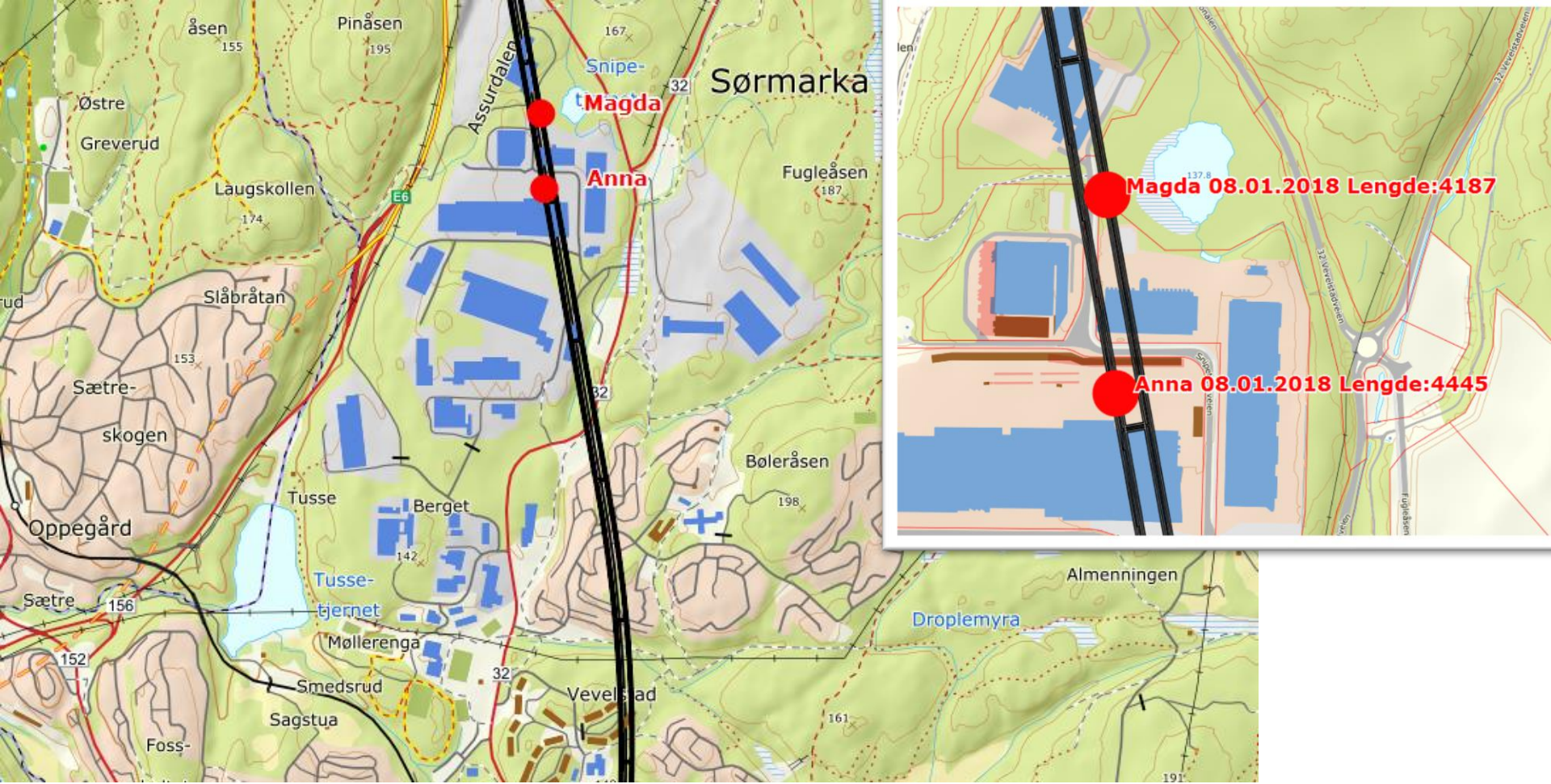


Example of output from the prediction model, which answers the question:

When will the TBMs be close to my house?



- http://webgis.no/follobanen - in average 166 visitors every day

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Our experience from the communication with the neighbours, and their feedback

- Early warning is a key to success!
- Information based on real facts and our understanding of their situation created trust and acceptance
- Close cooperation with the Municipality and the local Health-authority
- Neighbours living close to the tunnel were offered alternative accommodation – Positive ☺
- No negative front-pages in the newspapers
- The majority of the neighbours were satisfied by the way they were treated; Quest-back

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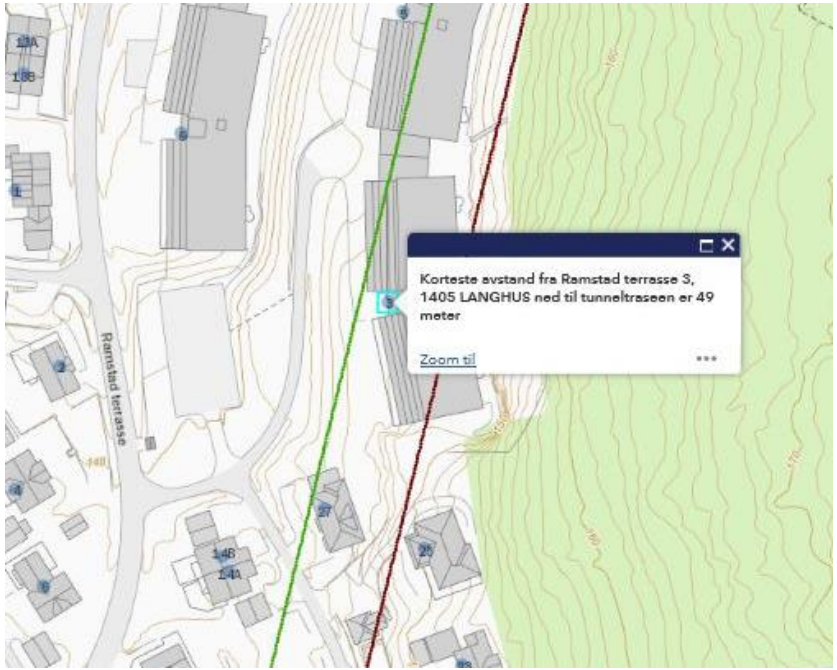
Experiences

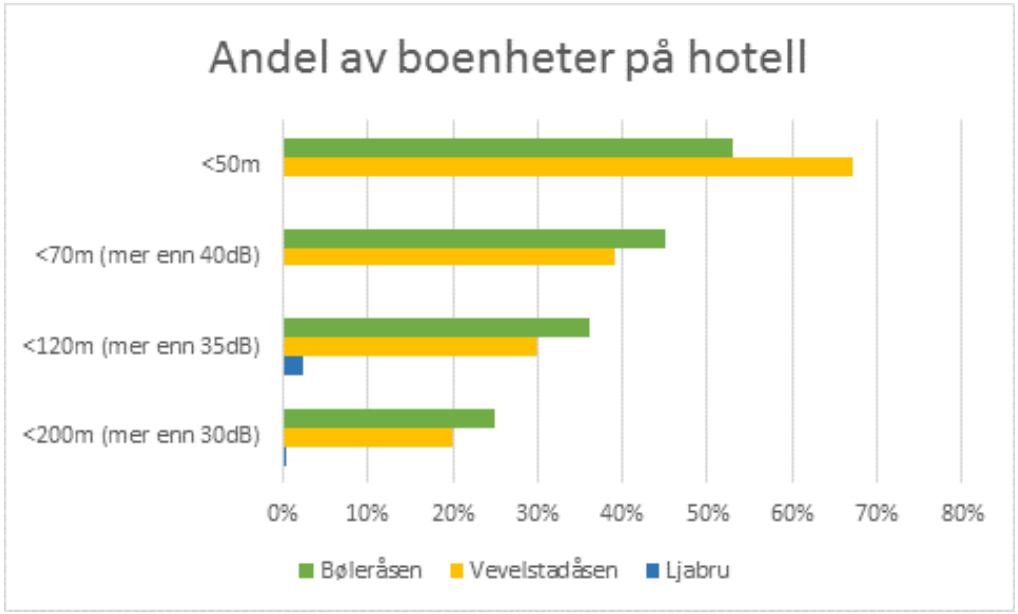
- Good correlation between early estimates of structural noise and measured values
- The location of the bed-room – an important factor
- Individual sensitivity regarding structural noise
- Good documentation regarding structural noise – An important key for the communication with the municipality and health-authority
- Online information about the progress of the TBMs and their distance to the specific buildings was a success



Organizing hotel bookings – Time consuming work

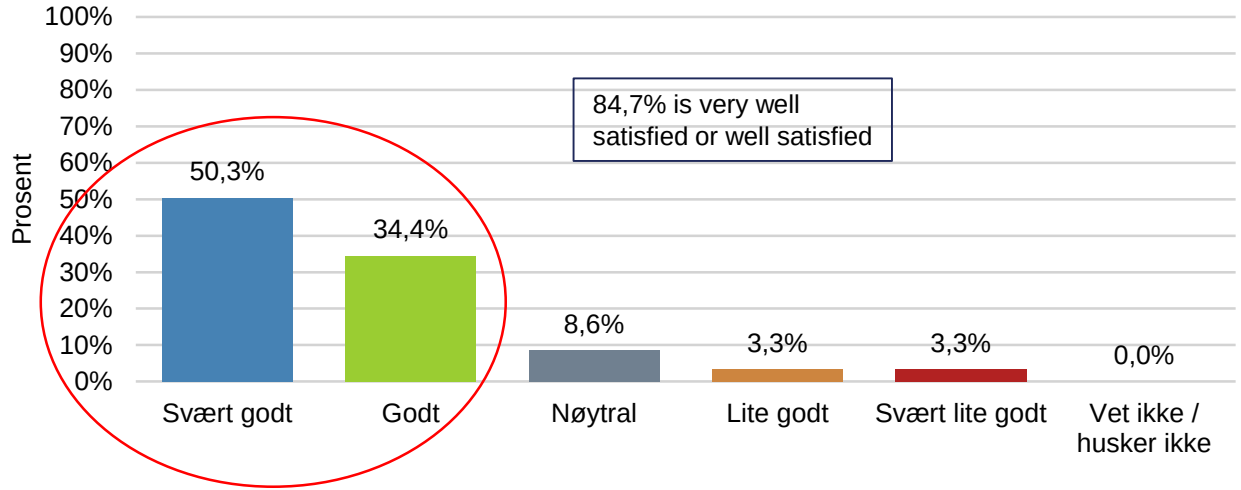
- The majority wanted to stay at home as long as possible
- Strategy; Immediate response when the neighbours wanted to leave their homes
- Close dialogue with the hotels - Pre-booking
- Uncertainty – Who wanted to stay at hotel and who wanted to stay at home?
- Prepared standard letters and standard e-mails
- The prediction model were used to estimate the length of the hotel-stay

Hotel-bookings for the different neighbourhoods – Huge variations



- Less than 5% in some neighbourhoods
- Nearly 70% in others
- Most of the neighbours wanted to stay at home
- Some people are more sensitive against noise than others
- Some stayed at home from Monday to Friday and spent the week-ends at hotel

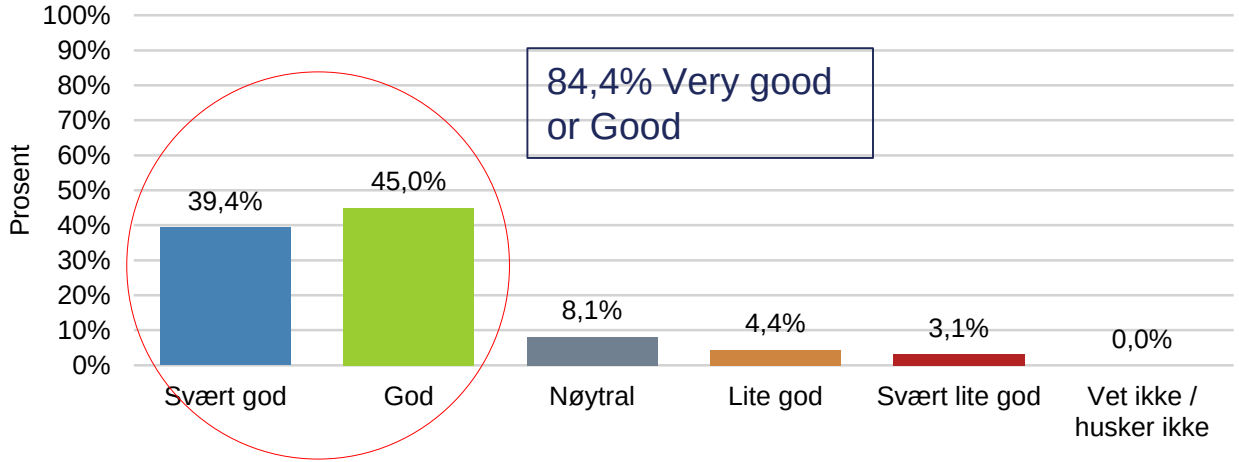
How will you evaluate the response from Bane NOR on your request?



Question	N	Average	Standard-deviation	Median
How will you evaluate the response on your request	151	1,75	0,98	1,00

Survey among the neighbors. 420 invited, and 159 answers.

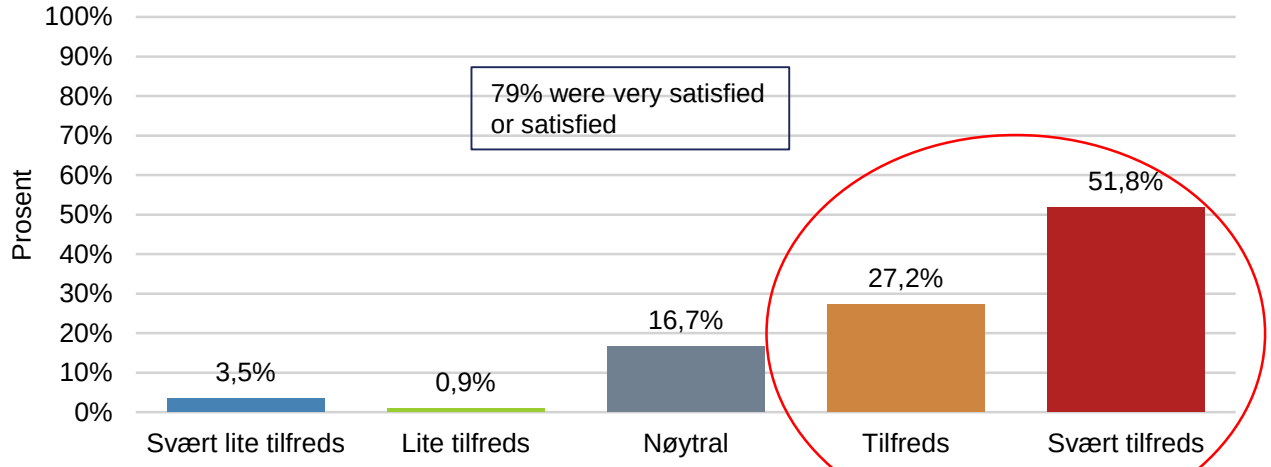
How will you evaluate the communication with Bane NOR during the construction of the tunnel?



Question	N	Average	Standard-deviation	Median
How will you evaluate the communication with Bane NOR during the construction of the tunnel?	160	1,87	0,96	2,00

Survey among the neighbors. 420 invited, and 159 answers.

How did you react to the offer of alternative accommodation?



Question	N	Average	Standard-deviation	Median
How did you react to the offer of alternative accommodation?	114	4,23	0,99	5,00

Survey among the neighbors. 420 invited, and 159 answers.

Two successful double break-throughs, within schedule, thanks to 24/6-excavation also under densely populated areas

More than 20 000 neighbours were affected by structural noise

– Few complains
– No negative front-pages

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Thank you for your kind attention!