«Workshop on Bridge Maintenance – 9. april 2021»

BRIDGE MANAGEMENT IN A COUNTY MUNICIPALITY

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Nordland FYLKESKOMMUNE

BRIDGE MANAGEMENT IN A COUNTY MUNICIPALITY

- Presentation of me and my work (3 min)
- Funding and management strategy (2 min)
- Inspections (5 min)
- SMART city management and technology now and in the future (10 min)

Head of bridge management in Nordland county municipality

Responsible for all bridge and quay related management

Planning safe and cost efficient management activities based on: law, guidelines, budget, contract management, inspection program and planning, risk management and materials investigations etc.

BRIDGE

What is a bridge?

All kinds of bridge constructions and structures with a accumulated spans or total length equals or exceeds

s ≥ 2,5 meter

and which shall carry a load

Including culverts, pipes and vaults in fills with (Ø ≥ 2,5 meter)

Funding and management strategy

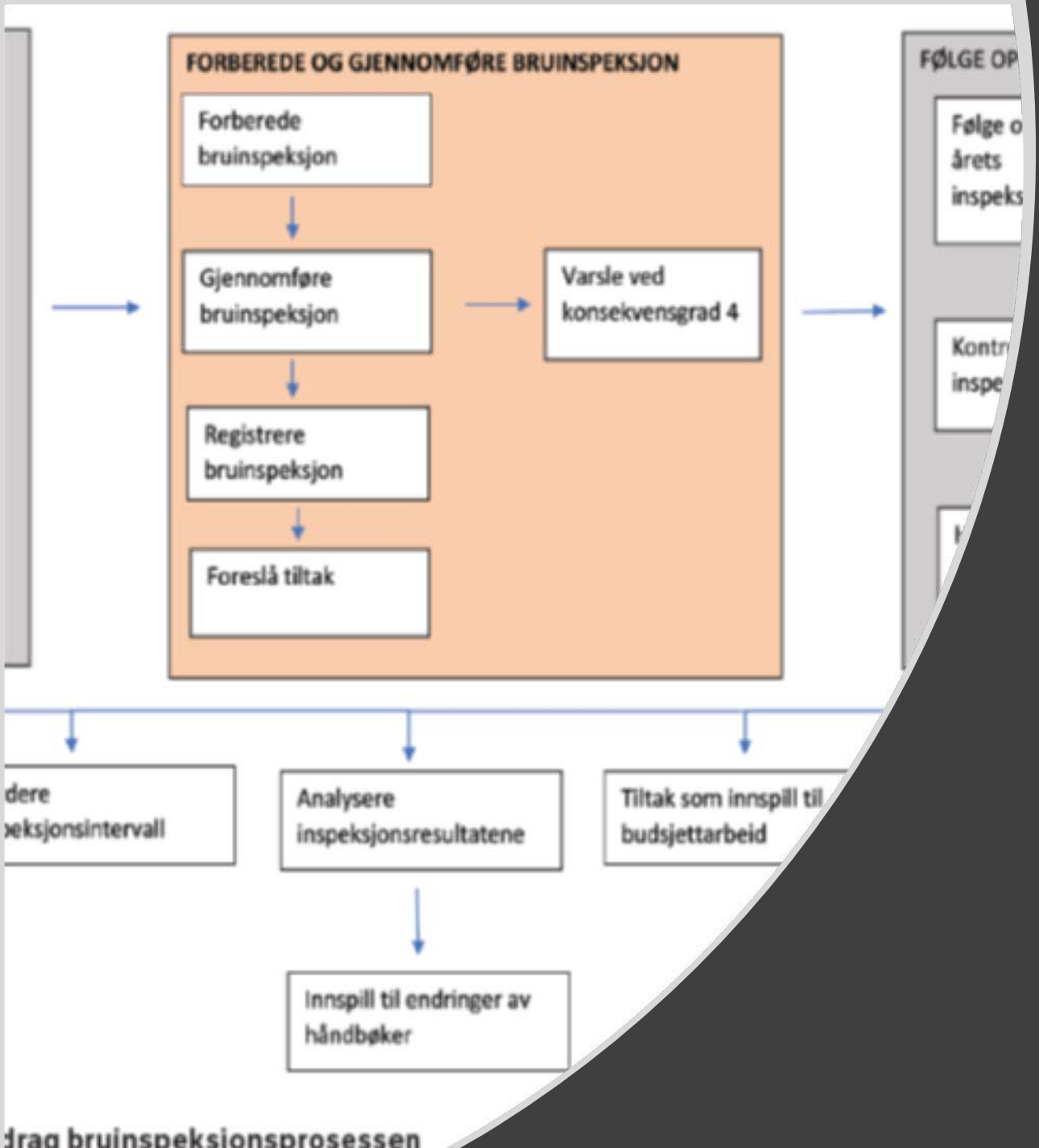
Fundings comes from a annual national and county budget

Investment, maintenance and management budgets are the main sections

We use risk- and vulnerability analysis to prioritize our objects for inspections and use of our budget for investment, maintence and management (input to inspection program)

Red zone – Must act
Yellow zone – Possible act (input to budget renewal etc.)
Green zone – No need to act now

Konsekvensgrad					
	4	4	8	12	16
	3	3	6	9	12
	2	2	4	6	8
	1	1	2	3	4
Prioritet		1	2	3	4
		Skadegrad			


FORBEREDE OG GJENNOMFØRE BRUINSPEKSJON
Forberede bruinspeksjon
Gjennomføre bruinspeksjon
Varsle ved konsekvensgrad 4
Registrere bruinspeksjon
Foreslå tiltak
FØLGE OP
Følge o årets inspeks
Kontr inspe
dere peksjonsintervall
Analysere inspeksjonsresultatene
Tiltak som innspill til budsjettarbeid
Innspill til endringer av håndbøker
drag bruinspeksjonsprosessen

Inspection

Main inspections objects

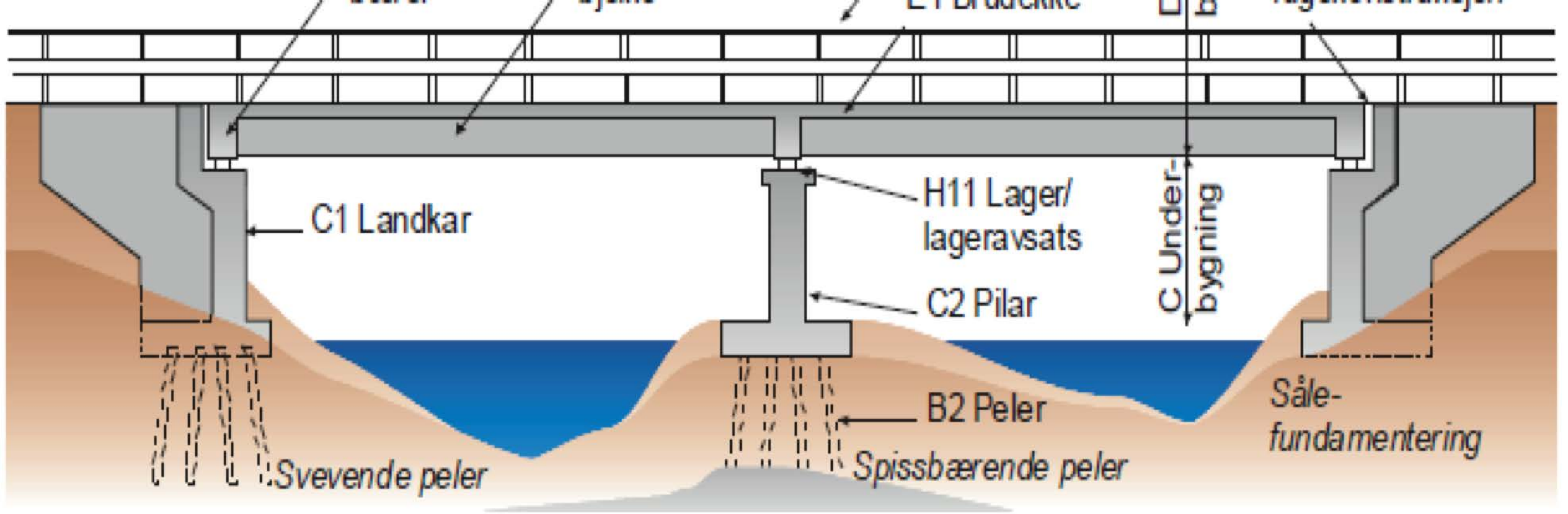
We have a total of approximately **990** main inspection objects (bridges, quays, culverts and vaults) in our county

Number of main inspections per year:

Approximately: 250

Number of visual and simple inspections per year:

Approximately: 400

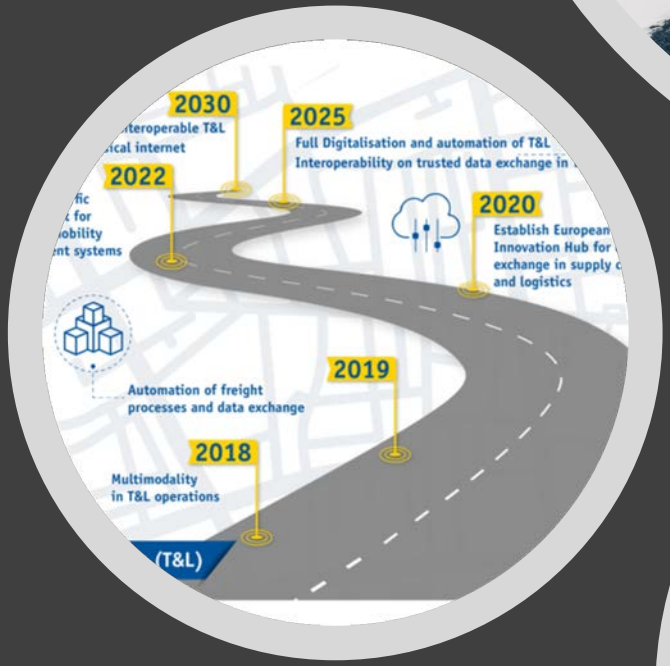


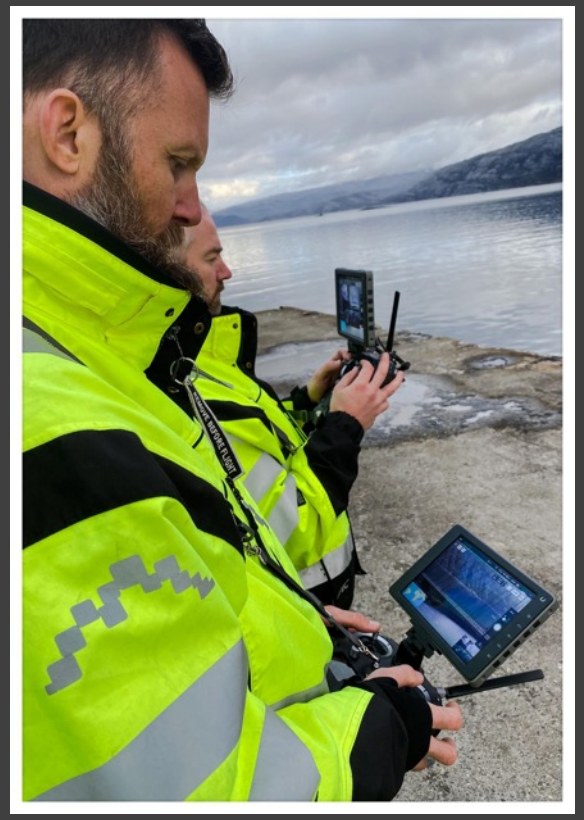
Inspection – bridge and quay

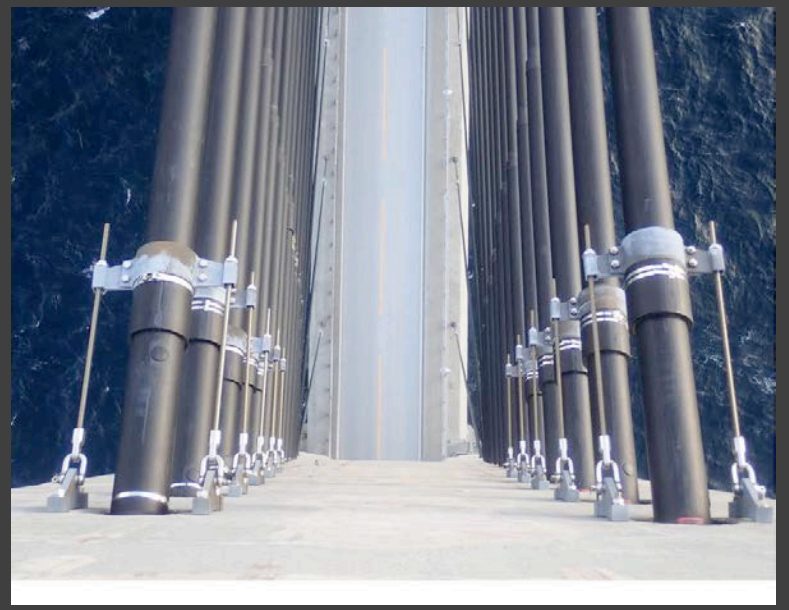
PLAN – ACT – FOLLOW UP – LEARN - DEVELOP

Management with use of "Smart City – technology"

- Monitoring
  "Structual health monitoring"
- New management applications (Project with use of new software/hardware)
- Inspection methods with use of Unmaned aerial systems, ground penetrating radar etc.
- Measurement and analysis with use of sensor technology
- Information and view of objects in real-time
- ITS (Intelligent traffic system)
- AI
- PhD program, SMART maintenance, IM-SAFE, Concrete cluster (N3C) in Norway etc. (Knowledge clusters)







“Helgelandsbrua” – Drone inspection 13.10.2020

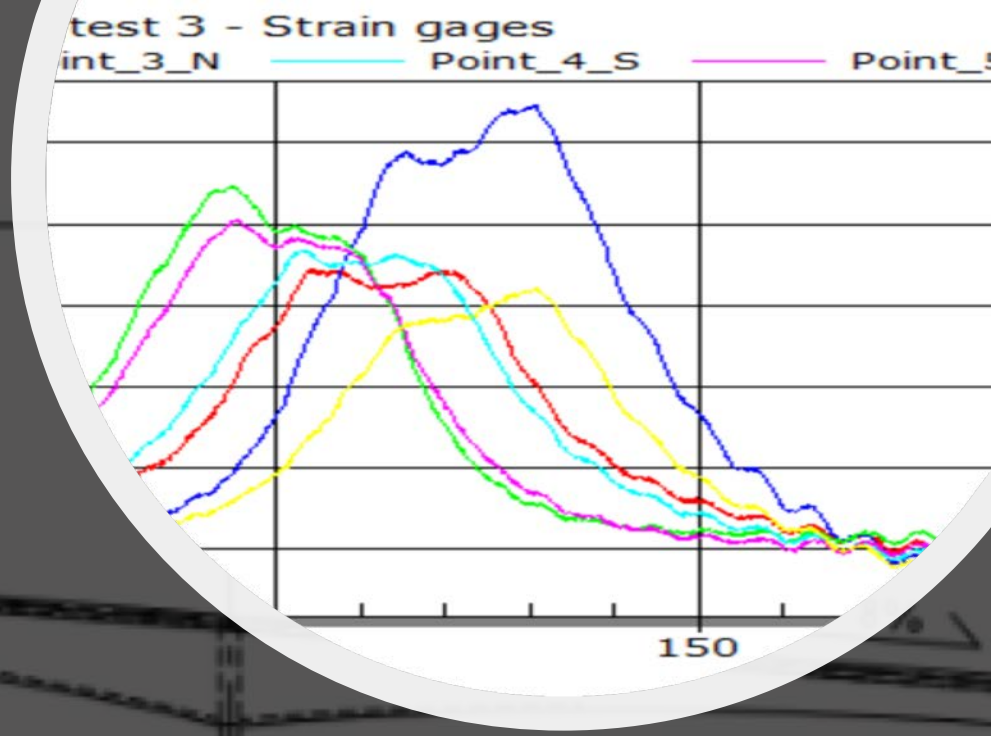
Herøysundet bridge

- Strain gages and sensors have been installed to measure the strain (elongation compression).

- Purpose: The sensors monitor the cracks propagation in the structure ("Structual health monitoring")

Herøysundet bridge

- Structural health monitoring - Uninterrupted monitoring
- All the sensors (9 sensors) on the bridge are connected inside a cabinet.
- Periode of monitoring: September 2020 – June 2023
  Monthly reports first quarter in 2020
- NEW BRIDGE: 2023/2024



SMART management in the future

- New guidelines
- SMART technology
- AI (Artificial intelligence)
- Advanced Engineering Informatics

Prøvebelasting på første Sand bru i Malangen 1907.

Mosjøen – My hometown in Nordland, Norway

Thank you for your time ☺