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# Nordic + Estonia Digital Twins – role of the NMCA and existing initiatives

Final reporting

“Ad hoc group” under Nordic+ Co-operation umbrella 2024-2025

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# The ”Ad hoc group” work

- From Concept Note late 2023 to Final Report (ready in the spring 2025, accepted Autumn 2025).

- Main work done 2024; a questionnaire and benchmarking (+ lessons learned from the EuroSDR 3D workshop 2025!)

# Why digital twins matter for public governance

Digital twins support planning, resilience, climate adaptation, and decision-making.

Increasingly used across urban, environmental, transport, and infrastructure domains.

Wicked problems

 Pictures: NASA Science and NOAA

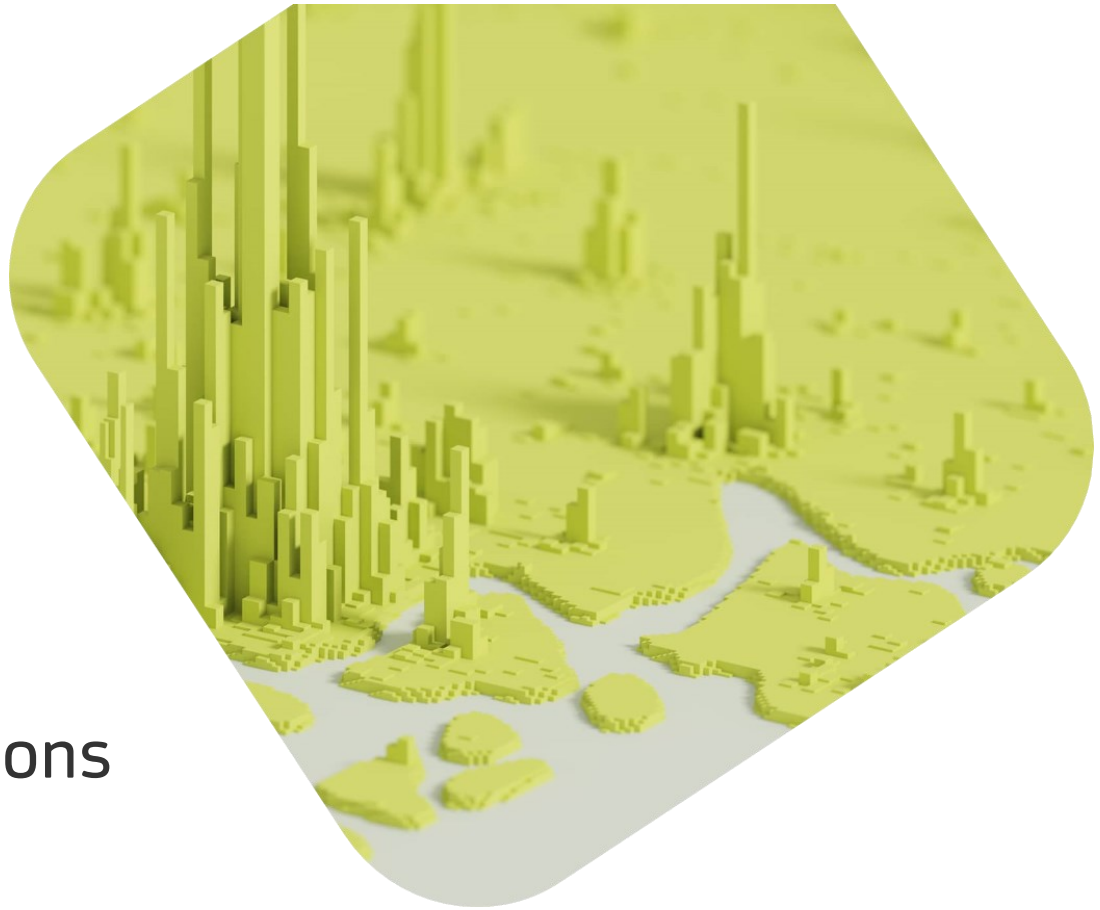
# The crucial questions

- What is the role of geospatial in the digital twin concept(s)?
- What is the role of the Nordic/Baltic NMA’s in the (nationwide) digital twin concept(s)?

Focus: common patterns, national differences, and future direction

# No single definition, but shared core elements

No agreed international definition of a “digital twin”.



In practice, DTs combine:

- Georeferenced spatial data
- Thematic and sectoral data
- Visualization, analysis, and simulations

NMAs rarely define DTs — but enable them.

# From map making to ecosystem enablers

Changing role of National Mapping Agencies – towards “digital infrastructure stewardship”?

NMAs act as:

- Providers of authoritative base data
- Coordinators of interoperability
- Anchors of spatial reference and trust

What you would probably need for a (nationwide) Digital Twin (?)

Less focus on applications, more on **foundations**

# Countries with nationwide digital twin ambitions

**Denmark**:

- Active nationwide DT as a public basic dataset
- Strong coordination and openness

**Estonia**:

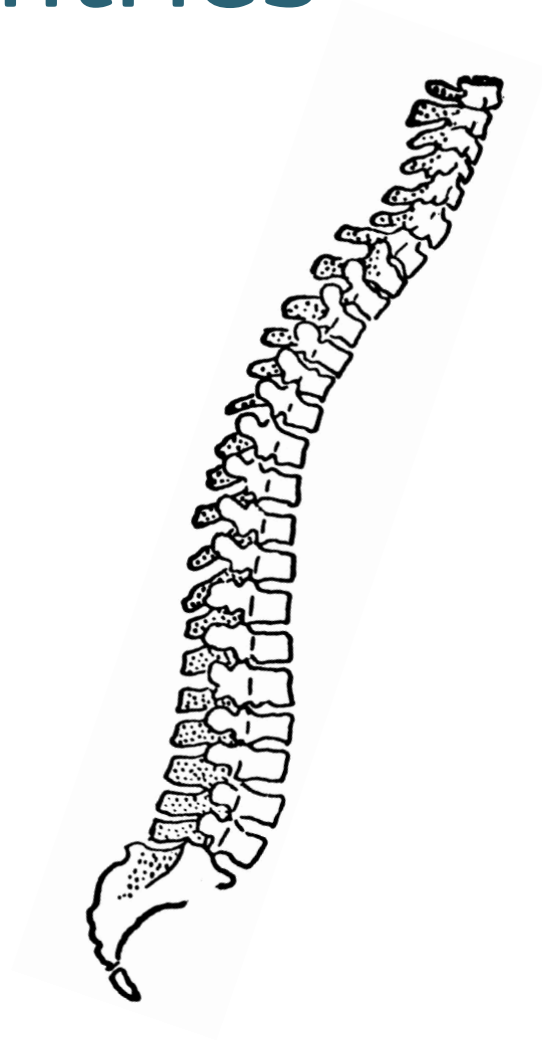
- Existing national DTs moving toward data integration

**Common factors**: (more or less) policy backing + central coordination

# “Foundational data first” countries

**Finland, Sweden, Norway & Iceland**

- No single nationwide DT mandate
- Emphasis on:
  - High-quality national base geodata
  - Enabling multiple thematic DTs
- NMAs position themselves as neutral enablers, not DT operators



# What all countries have in common

- Many DT initiatives already ongoing, usually sector-specific
  - Cities and buildings
  - Transport networks
  - Water, forests, environment

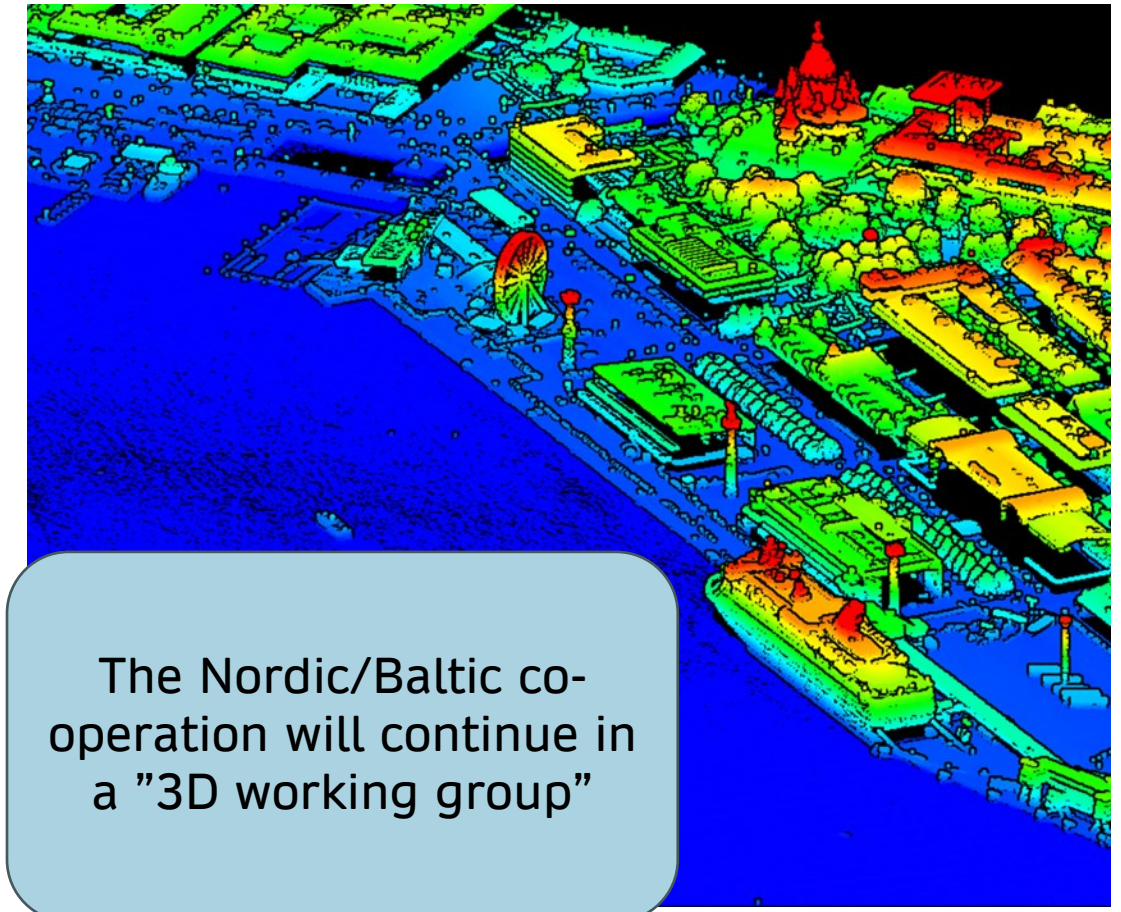
- NMA data sets seen as ”essential glue between fragmented digital twins”

- A nationwide Digital Twin should emerge as networks of (already existing or “to be”) Digital Twins.
  - Interoperability is the biggest shared challenge

# Key conclusions for NMAs

- NMAs are indispensable for digital twin development
- Greatest value lies in:
  - Authoritative base data
  - Interoperability and standards
  - Trust, continuity, and national coverage

- Future DTs will be connected ecosystems, not single systems
- Cross-border and EU-level cooperation will be increasingly important



The Nordic/Baltic co-operation will continue in a ”3D working group”

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