HyPos

Kartverket

Telia

ERICSSON

SINTEF

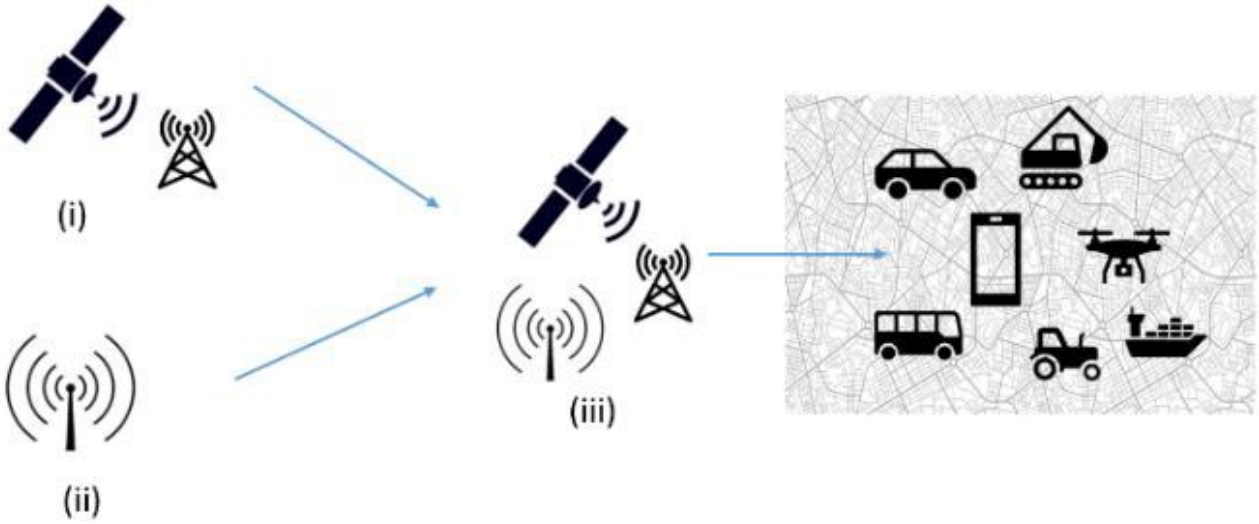
National Hybrid Positioning service for the future digital and autonomous society

- Innovation project in the Public sector, Enabling Technologies
- Financed by the Research Council of Norway
- Project period from March 2022 to February 2026
- Collaboration between The Norwegian Mapping Authorities, Telia, Ericsson and SINTEF

Innovation idea

Develop an accurate, scalable real-time positioning service with a larger coverage and higher redundancy than todays services.

- (i) Develop a new scalable method for the distribution of GNSS correction data
- (ii) Use telecoms 5G as a standalone positioning service
- (iii) Develop a new hybrid positioning service where GNSS correction data distribution (i) and 5G (ii) is combined

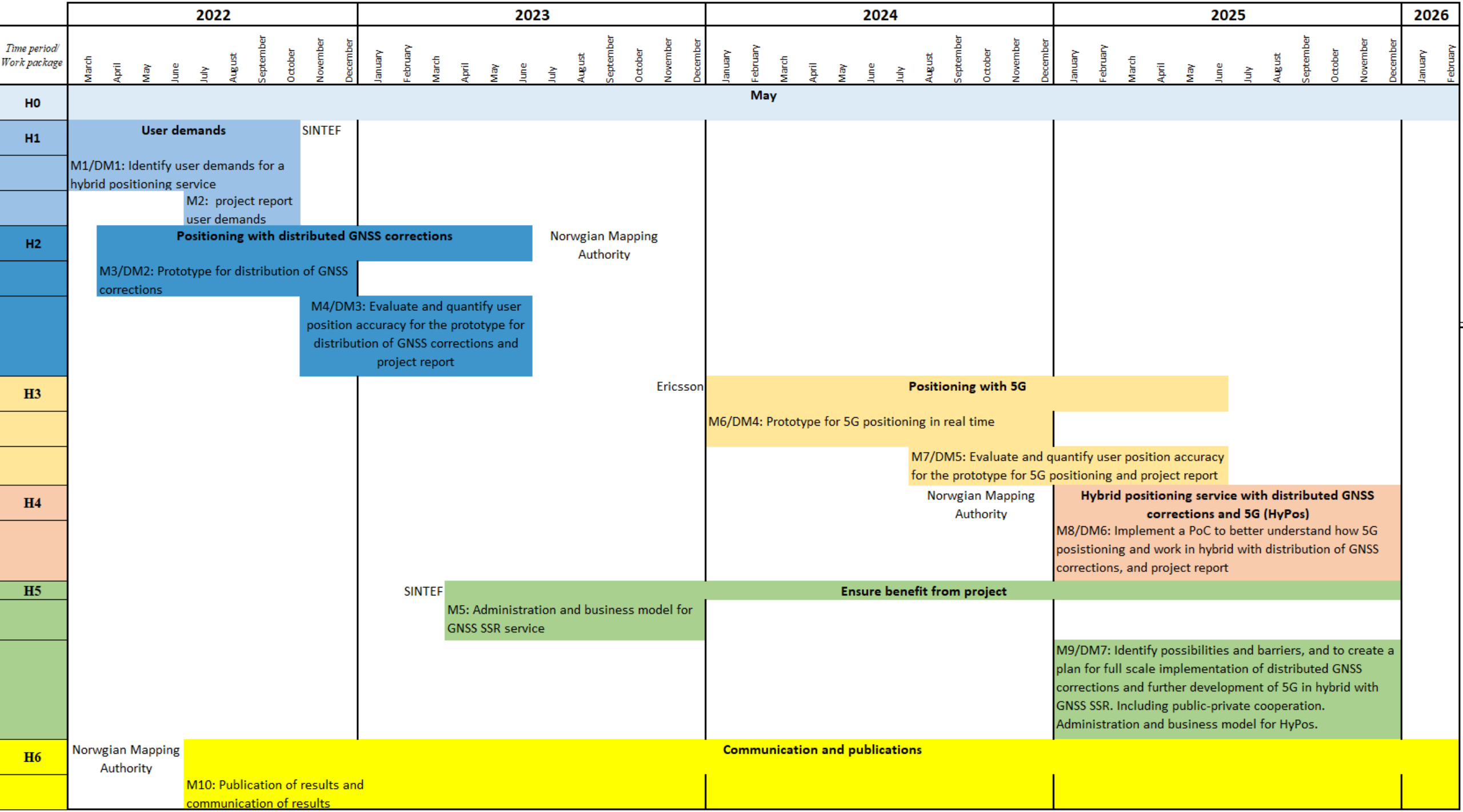


Future requirements for positioning services

- Increasing need for a high prescison position
  - Vehicles, transportation, robotics, IoT, crowdsourcing
- Mass marked
  - Cheaper receivers, high precision position are no longer only for professionals
- Indoor – outdoor and redundancy
  - Positioning service that works indoor – outdoor, and redundancy with two different technologies
- HyPos is focused towards the transport sector
  - ITS - Intelligent Transport System
  - Autonomous vehicles

Todays situation and innovation

Situation today	Innovation for the future
Todays positioning services are dependent on two-way communication for GNSS corrections and todays services are not scalable to the mass marked.	Broadcast of GNSS correction that are scalable to the mass marked.
Todays positioning services are don’t have good enough accuracy when GNSS signal is lost or disturbed.	5G will be used as a complementary technology to acheive accuracy with GNSS position is not available or inaccurate, and as a position redundancy.
Todays positioning services demands high-end user equipment and technical competence.	Mass marked equipment (like smartphones) will most likely in the near future be able to use GNSS corrections and 5G as a positioning service.
Increasing number of GNSS reference stations (about 300 today) to support the user demands for accuracy. Yearly operation cost about 15 million NOK, establishment cost 300 000 NOK per reference station.	Reduction in growth of reference stations where user demands for accuracy is still fulfilled. Lower yearly operating and maintenance cost.
The Norwegian Mapping Authority offer data from reference stations to private companices which serve positioning services	An hybrid positioning service demands a public-private cooperation between the public owned GNSS and private owned 5G infrastructure. Hybrid positioning service will create business development in both sectors.
Apart from the Mapping Authority's services, the market is dominated by third-party foreign service providers who rely on two-way communication or broadcasting with lower accuracy.	A Norwegian public-private service will reduce dependence on foreign actors, and provide better control, and reduced vulnerability, over services used in safety-critical social functions (emergency services etc.)


2022
2023
2024
2025
2026
Time period/ Work package
March April May June July August September October November December
January February March April May June July August September October November December
January February March April May June July August September October November December
January February March April May June July August September October November December
January February
H0
May
H1
User demands
SINTEF
M1/DM1: Identify user demands for a hybrid positioning service
M2: project report user demands
H2
Positioning with distributed GNSS corrections
Norwgian Mapping Authority
M3/DM2: Prototype for distribution of GNSS corrections
M4/DM3: Evaluate and quantify user position accuracy for the prototype for distribution of GNSS corrections and project report
H3
Ericsson
Positioning with 5G
M6/DM4: Prototype for 5G positioning in real time
M7/DM5: Evaluate and quantify user position accuracy for the prototype for 5G positioning and project report
H4
Norwgian Mapping Authority
Hybrid positioning service with distributed GNSS corrections and 5G (HyPos)
M8/DM6: Implement a PoC to better understand how 5G posistioning and work in hybrid with distribution of GNSS corrections, and project report
H5
SINTEF
Ensure benefit from project
M5: Administration and business model for GNSS SSR service
M9/DM7: Identify possibilities and barriers, and to create a plan for full scale implementation of distributed GNSS corrections and further development of 5G in hybrid with GNSS SSR. Including public-private cooperation. Administration and business model for HyPos.
H6
Norwgian Mapping Authority
Communication and publications
M10: Publication of results and communication of results