

NAVISP Element 1 Innovation

*Element 1 Session: Innovation
NAVISP Industry Days
22-23 January 2020*

*Giorgio Solari
Head of NAVISP Element 1 Innovation Office*

NAVISP Phase II

Additional Element 1 Subscriptions

Participant States' Phase II E1 Subscriptions	
State	M€
UK	6
Italy	3
Switzerland	3
France	1
Hungary	1
Norway	1
Greece	0.9
Belgium	0.89
The Netherlands	0.5
Finland	0.4
Sweden	0.4
Denmark	0.25
Total	18.34

Element 1 budgetary increase
 from 13 M€ over 5 years initially for Phase I
 to 18 M€ over 3 years for Phase II

4 New Participant States in Element 1
 Greece, Hungary, Italy and Sweden

NAVISP Element 1 Objectives

- 1 • Perform feasibility studies and viability analysis for the emergence of new concepts in the PNT world
- 2 • Contributing to the formulation and implementation of PNT technology innovation
- 3 • Proof of Concept of promising PNT-based services

NAVISP Element 1

Work Areas



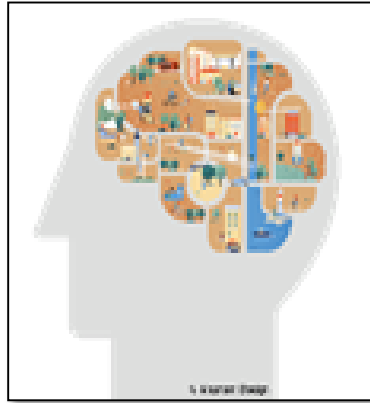
- *Timing techniques, clock technologies, quantum technologies and clocks*
- *Low-power technologies*
- *Autonomy*
- *Mobile devices*
- *PNT & 5G*
- *Resilience and trust*
- *PNT for environmental matters*
- *Role of GNSS for in-orbit servicing operations, hyper accurate in space positioning*
- *Complementary non-GNSS positioning*
- *PNT & Science*

NAVAC Recommendations

for Phase II of NAVISP Element 1

- Increasing activity portfolio addressing integration of space/non space sensors
- Strengthening link between use-cases and proposed solutions
- Accelerating schedule in Proof-of-Concept projects
- Cross linking of activities results

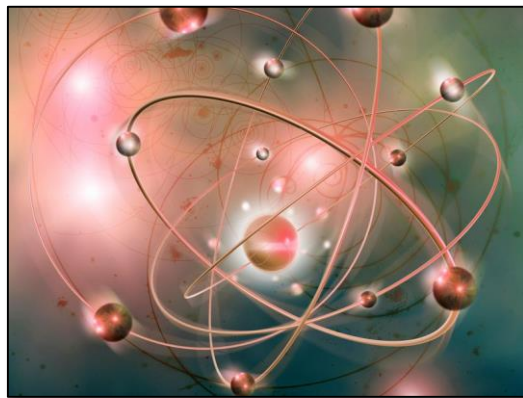
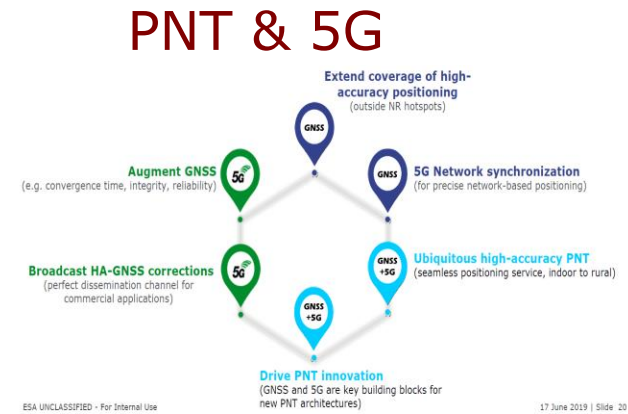
Element 1 Workplan 2020 addressing PNT Challenges



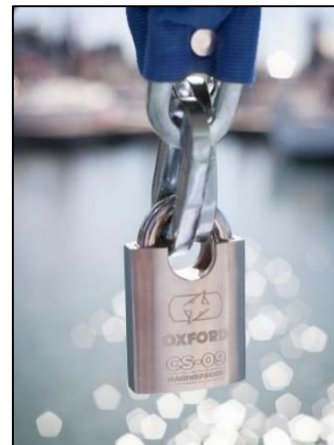
Artificial Intelligence PNT



PNT Innovations



Quantum PNT



Resilient PNT



PNT for Autonomy

*Courtesy of Prof Terry Moore
University of Nottingham*

2020 NAVISP Element 1 Work Plan

List of Approved Activities



Application of Machine Learning Technology for GNSS IoT Data Fusion

An innovative concept for the Risk Assessment of Geological Hazards using GNSS and Solid Earth tides modelling

Earth Moon GNSS spaceborne receiver for In Orbit Demonstration

Next Generation Network-assisted PNT Assurance

User antenna diversity algorithms for efficient multipath mitigation

Quantum metrology for secure PNT

Cooperative Positioning and Integrity Concept in Vehicle Platooning

Proof-of -concept of Hybrid 5G /GNSS positioning with local ad-hoc overlay

Next Generation motion sensor for hybrid GNSS/INS solutions in high-accuracy machine control applications

New concept for evolutive mitigation of RFI to GNSS

Interference Monitoring from Space

Hollow Corner Cube Retro-Reflectors for in-orbit PNT

Multi-layer PNT for SAR

Combining ELF signals with GNSS for improved PNT

