

UK Framework for PNT Resilience and Innovation – AltPNT Strategy

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UK PNT Framework announced by HM Government on 18 Oct 2023



Department for
Science, Innovation
& Technology

Background

- The UK economy and society would suffer severe consequences from a major disruption to Global Navigation Satellite Systems (GNSS) providing PNT services. **Timing is the most critical element.**
- The PNT Office Concept Demonstrator Project was set-up in July 2022 to deepen understanding of the threats and risks, and to develop an appropriate policy response and actions.
- **We could not and did not do this alone.** Engagement with our European Allies, AUS/CAN/NZL/USA, Academia, Industry and NAVISP was essential.
- The project was crucially not driven by an objective to build an alternative technology. Instead, focusing on Critical National Infrastructure (CNI) PNT use cases, impacts, and solutions.
- The outcome is a System of Systems strategy closely integrating traditional and AltPNT capabilities - the framework that provides highest resilience and economic opportunity.

20/10/2023, 09:21 Critical services to be better protected from satellite data disruptions through new Position, Navigation and Timing framework...



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Press release

Critical services to be better protected from satellite data disruptions through new Position, Navigation and Timing framework

New Position, Navigation and Timing (PNT) measures set out, which include a crisis plan in the event current PNT services are unavailable.

From: [Department for Science, Innovation and Technology](#)

[\(/government/organisations/department-for-science-innovation-and-technology\)](#) and [George Freeman MP](#) [\(/government/people/george-freeman\)](#)

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The UK National PNT Resilience Framework (strategy!)

PNT Resilience

PNT (Positioning, Navigation and Timing), is a technology vital to the functioning of Critical National Infrastructure and underpins many everyday activities in modern society.

Why PNT matters

PNT underpins the safe operation of Critical National Infrastructure and many everyday activities in modern society including:

- Our travel - cars, trains and planes
- Our personal navigation - maps on mobile phones
- Our telecommunications - phones and TV
- Our finances - touch payments and mobile banking
- Our computers and internet
- Our emergency services - ambulance, police and fire



Why PNT is at risk

The UK's PNT is almost completely provided through Global Navigation Satellite Systems (GNSS), primarily the US Global Positioning System (GPS), which is operated by the US Space Force.

There are many potential major disruptions to GNSS provided PNT, including hazards like severe space weather and catastrophic technical failure, and threats like cyber and physical attacks.

What is PNT?



Positioning, the ability to determine location and orientation.



Navigation, the ability to determine current and desired position.



Timing, the ability to acquire and maintain accurate and precise time from a standard anywhere in the world.



HM Government

What will HMG do?

Strengthen the resilience of the PNT services on which our Critical National Infrastructure and economy depend by scoping a new Government Policy Framework for Greater PNT Resilience.

Government Policy Framework for Greater PNT Resilience will scope the proposals below

National PNT Office

Next Generation PNT

PNT Crisis Plan

PNT Growth Policy

National Timing Centre

PNT Skills

MoD Time

Satellite Based Augmentation System (SBAS)

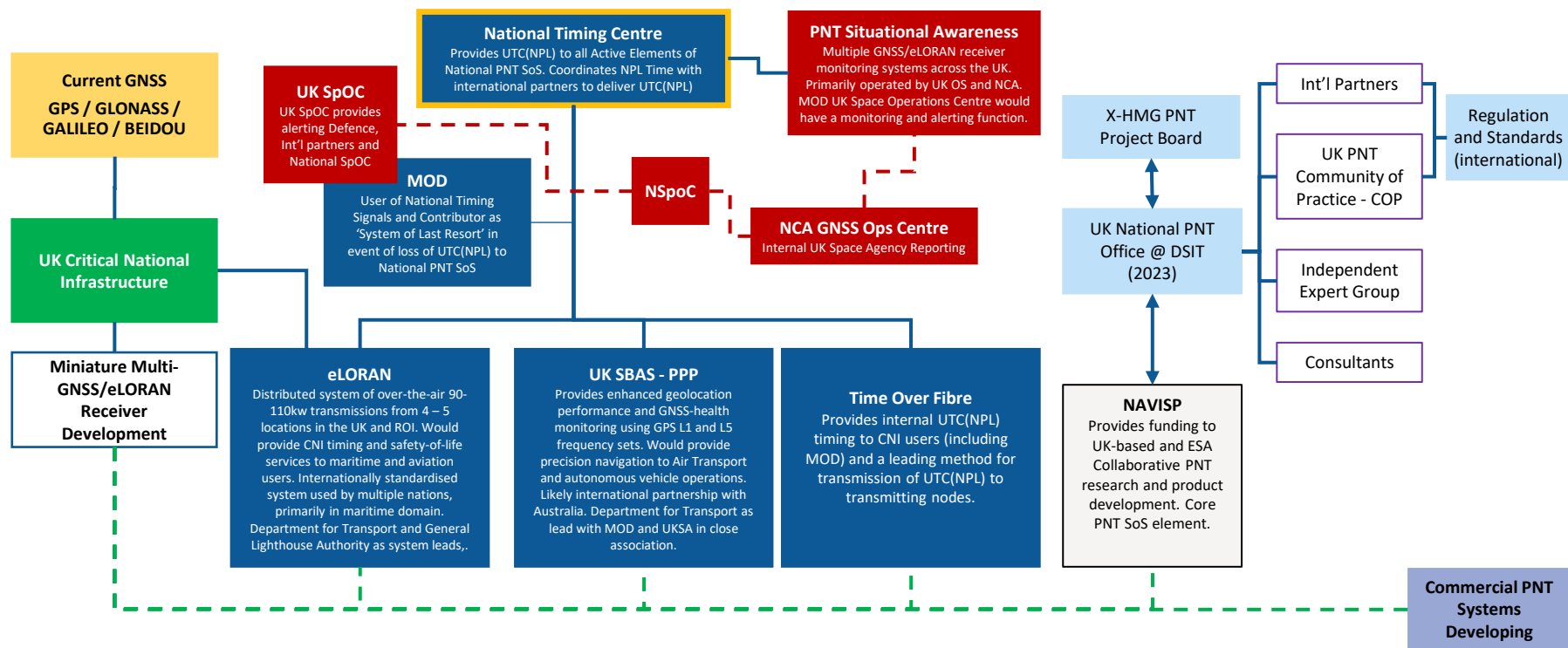
Enhanced Long Range Navigation (eLORAN)

Infrastructure Resilience

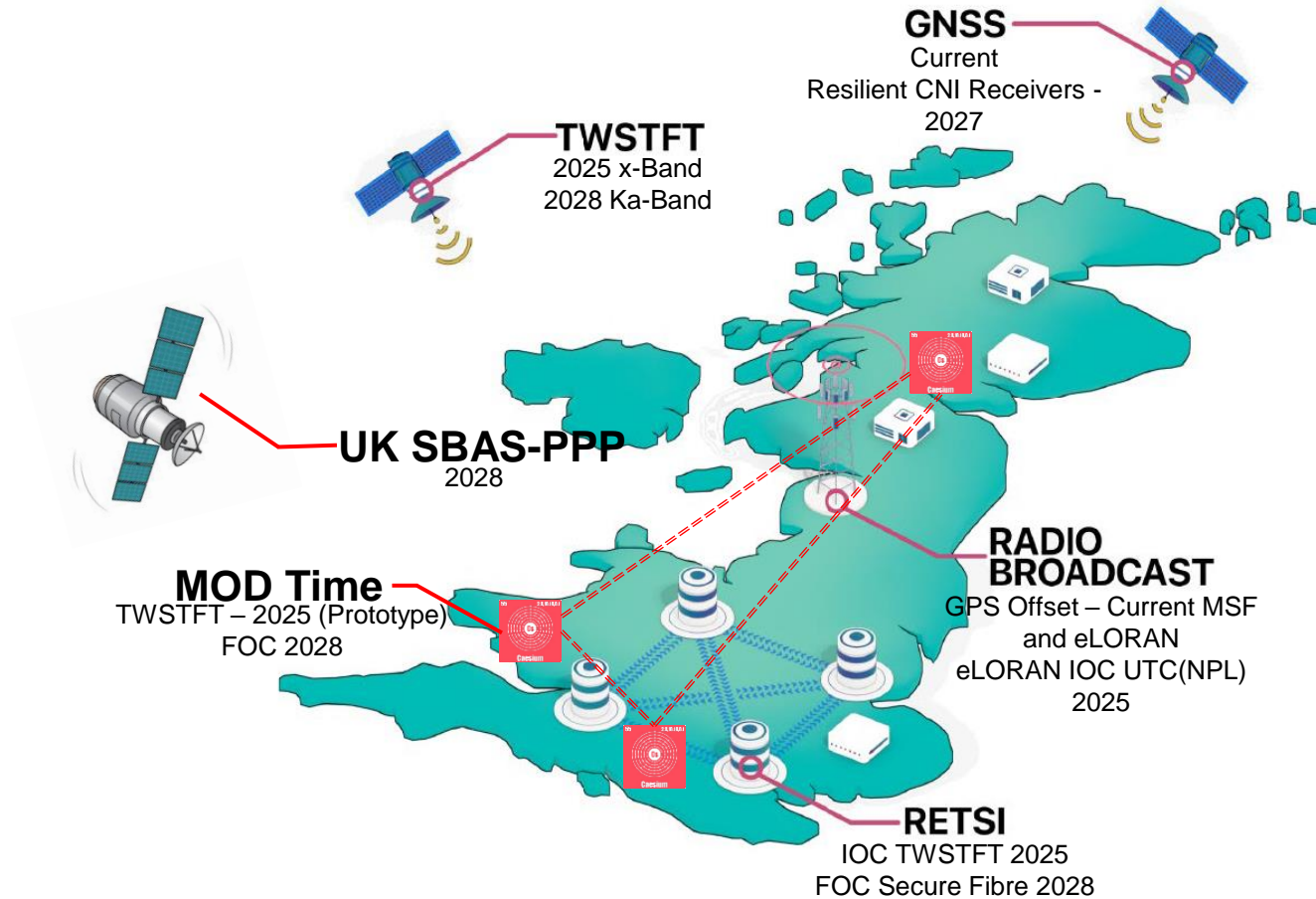


System of Systems: EPOCH 1 – The PNT Policy Framework would create a PNT System of Systems within the next few years

UK PNT System of Systems (SoS) Epoch 1 utilises current and proposed or partially funded capabilities. UK-sourced timing from NTC RETSI is provided by assured means to a UK Space-Based Augmentation Systems, a terrestrial broadcast eLORAN network, over fibre and to national GNSS interference monitoring systems. These systems compliment and ensure current GNSS services. Development of follow-on components for an Epoch 2 SoS is guided by a National PNT Office directly and through NAVISP.

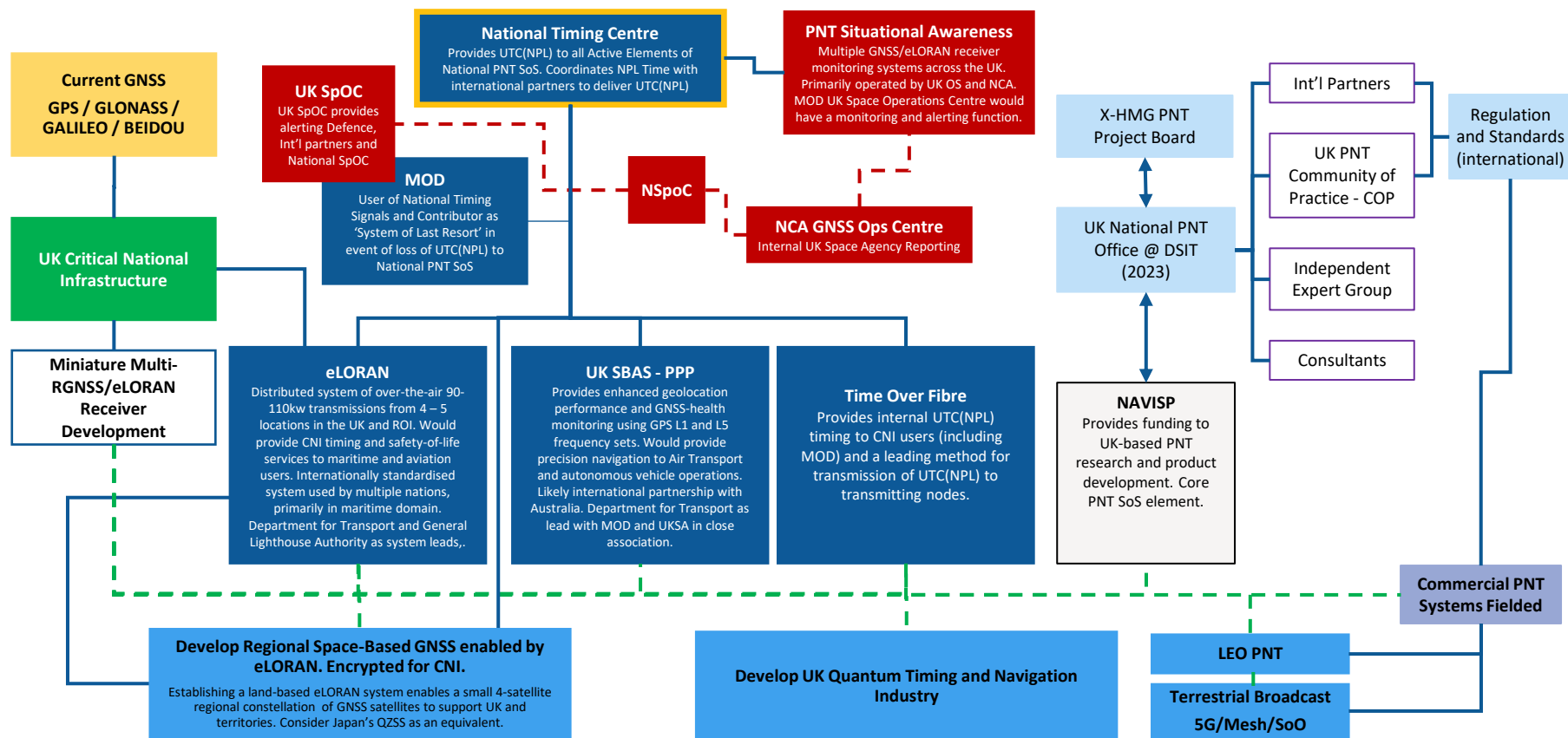


UK National Timing Resilience Mechanisms and Pathways



System of Systems: EPOCH 2 – Taken together the PNT policies proposed in this Policy Framework would create a PNT System of Systems, this diagram shows how the system develops in future years

UK PNT System of Systems (SoS) Epoch 2 utilises all elements of Epoch 1 current, planned-funded or partially funded capabilities. UK-sourced timing from NTC RETSI is provided by assured means to a UK Space-Based Augmentation Systems a terrestrial broadcast eLORAN network, over fibre, via TWSTFT and to national GNSS interference monitoring systems. These systems compliment and ensure current GNSS services. Development of follow-on components for an Epoch 2 SoS is guided by a National PNT Office directly and through NAVISP.



DISCUSSION



Image of a Trapped Ion Optical Clock made at the National Physical Laboratory