

# TRAFICOM

Finnish Transport and Communications Agency

## Utilising satellite broadband technology to improve preparedness

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# Report on the utilisation of satellite broadband technology in security of supply organisations

- ▶ The report was prepared by Traficom and the National Emergency Supply Agency (NESAs) together with VTT.
- ▶ As the field is rapidly evolving, the report provides an overview and insights into the utilisation of satellite broadband technology in security of supply organisations.
- ▶ **Contents of the report**
  - ▶ Satellite broadband systems overview and standardisation
  - ▶ Distinctive characteristics regarding the use of satellite broadband in Finland
  - ▶ Available satellite broadband services
  - ▶ Equipment, performance, capacity
  - ▶ Examples of security of supply critical organisations' possible use cases and connectivity needs
  - ▶ Cybersecurity perspectives
  - ▶ Future development trends
  - ▶ Reference framework to support the assessment of satellite broadband utilisation

# Thoughts on the performance of the Starlink system

Location	Terminal	Median download speed	Median upload speed	Median latency
Helsinki	Standard	164 Mb/s	15 Mb/s	48 ms
Helsinki	High performance	222 Mb/s	17 Mb/s	48 ms
Enontekiö	Standard	200 Mb/s	17 Mb/s	66 ms
Enontekiö	High performance	217 Mb/s	18 Mb/s	66 ms

Taulukko 4. Starlinkin suorituskykymittauksia Helsingissä ja Enontekiöllä kesällä 2023<sup>32</sup>

# SWOT analysis of satellite broadband utilisation 1/2

## Strengths

- Due to the wide coverage area, connections are broadly available even in remote locations
- Connections are independent of terrestrial communication networks and operators
- Connections to mainland Europe are not dependent on cable connections
- Mobility of user terminals and connections from one location to another
- Rather easy and quick to deploy

## Weaknesses

- Largely non-standardised proprietary technology
- Higher latency compared to terrestrial networks
- Lower data transmission capacity than fiber connections, varying with the number of users
- Potential service blind spots and connection interruptions due to usage environment
- Satellite hardware failures are nearly impossible to repair, making it impossible to address hardware vulnerabilities
- LEO satellites have a short lifespan (approx. 5 years)
- Satellite ground stations and PoPs are mostly located outside of Finland

# SWOT analysis of satellite broadband utilisation 2/2

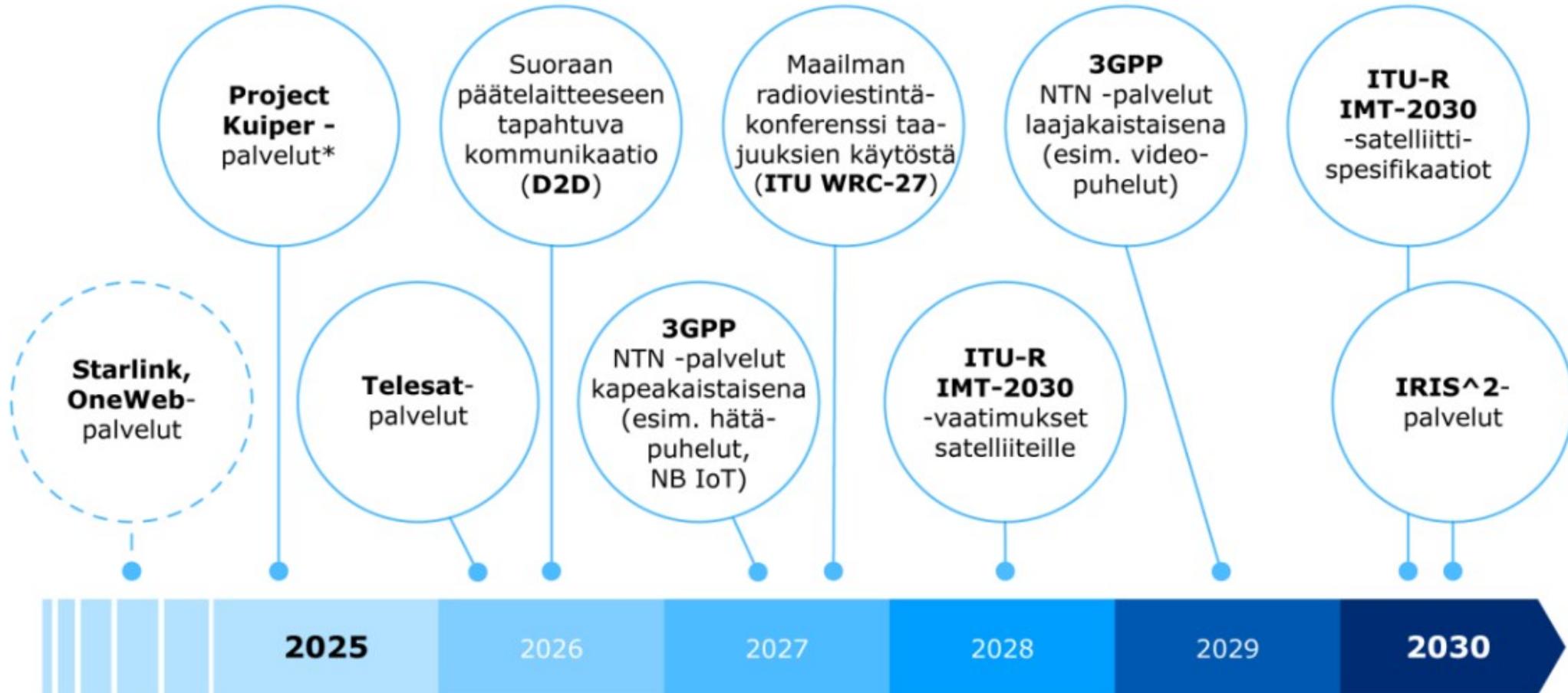
## Opportunities

- Implementing backup connections alongside optical cables and mobile networks, increasing independence from terrestrial network components
- Relocating a control center or other critical functions to another location or outside of Finland
- Maintaining connectivity to cloud services and the company's critical systems without relying on terrestrial networks
- Maintaining possibility to use modern IP-based communication applications (Teams etc.) during terrestrial network outages
- 3GPP NTN standards and, in the future, direct-to-device (D2D) communication and group call capabilities
- Reducing dependency on satellite-based positioning (GNSS) through internal positioning and synchronisation within the satellite broadband system
- Software updatability of satellites enables deployment of new features and updates directly to satellites in orbit, extending their lifespan and providing flexibility in service development

## Threats

- Currently a limited number of service providers and strong market dominance by a single provider
- Vendor lock-in
- Susceptibility to satellite-based positioning (GNSS) disruptions
- Vulnerability to cyber operations, satellite-specific attacks, threats targeting network infrastructure, software vulnerabilities (e.g. VPN), supply chain vulnerabilities, and physical threats
- The cybersecurity level of satellites may not always match that of terrestrial communication networks

# Some milestones of the future development



\*saatavuus voi olla aluksi rajattua Suomessa

# Framework to support organisations to evaluate utilisation of satellite broadband

Identification of the organisation's core processes and their communication network requirements



Utilisation of satellite broadband to ensure communication connections required by critical systems



Implementation and security considerations to take into account when using satellite broadband connections.



Thank you!

**TRAFICOM**  
Liikenne- ja viestintävirasto



## Satelliittilaajakaistateknologioiden ja -palvelujen hyödyntäminen varau- tumisessa



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<https://www.traficom.fi/sites/default/files/media/publication/Satelliittilaajakaistateknologioiden%20ja%20palvelujen%20hy%C3%B6dynt%C3%A4minen%20varautumisessa.pdf>