



AEROSPACE COMMUNICATIONS

6G Ubiquitous Connectivity & Assisted Air Space Management

From 3GPP TR 22.870 use cases to Türk Telekom's DRONaaS implementation



WWRF Huddle 2026 · mini-Huddle on Aerospace Communications

Türk Telekom Group · Innovation and R&D

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Boğaziçi University

B.S. (high honors), 2001

M.S., 2003

Ph.D., 2009 — Electrical & Electronics Eng.

Executive MBA, 2014

- **Telecommunications professional**, working in the R&D departments of leading companies on both research and business development
- **Assistant Professor** at Istanbul Rumeli University (2017 – ...)



Research interests

Wireless communications system design — enabling novel applications and services for 5G and beyond mobile networks

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The 6G backdrop: IMT-2030 usage scenarios



Integrated AI & Communication

AI natively embedded in the network fabric



Integrated Sensing & Communication

The network senses as well as connects (ISAC)

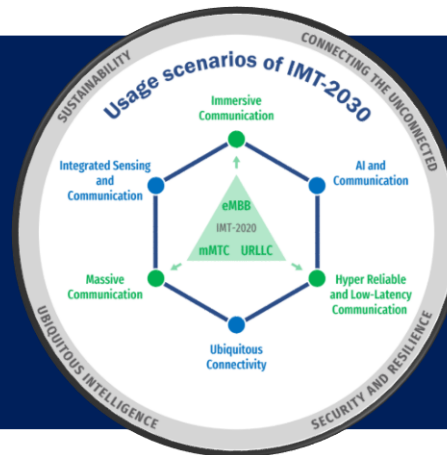


Ubiquitous Connectivity

Seamless coverage — including the sky

Also enhanced from 5G

- Immersive communication
- Hyper-reliable & low-latency communication
- Massive communication



IMT-2030 is the ITU's vision for 6G — the framework 3GPP is now translating into concrete use cases and requirements.

Recommendation ITU-R M.2160-0: Framework and overall objectives of the future development of IMT for 2030 and beyond (Nov. 2023).

3GPP TR 22.870: the first 6G use-case study



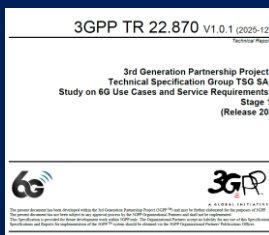
SA Work Group 1

TR 22.870

Comprehensive study of 6G use cases and their potential requirements — Phase 1 of 6G standardization.

20

ubiquitous-connectivity use cases on NTN platforms



What the report covers



Ubiquitous services via NTN: Connectivity, positioning, computing, and backhauling

20 use cases explicitly built on non-terrestrial network (satellite / HAPS) platforms.



Aircraft as a served terminal

Under industry & vertical use cases, aircraft receive service directly from the 6G network.



UAM, AAM & UAV applications

Urban air mobility, advanced air mobility and unmanned aerial vehicles benefit from 6G's advanced properties.

Part 1 — Connectivity service to aircraft

A layered coverage picture



NTN — Satellite & HAPS

Wide-area coverage where terrestrial reach ends



Aircraft as served terminal

UAM / AAM / UAV receive 6G service in flight



Terrestrial 5G/6G

Dense capacity over populated & low-altitude airspace

In this talk — Part 1

Overview of the 3GPP use cases

- 3GPP «ubiquitous-connectivity» use cases (NTN-based)
- Vertical-domain use cases delivering connectivity to aircraft
- The aircraft benefits from 6G's advanced properties in flight

→ Part 2 zooms into one use case: assisted air space management.

Assisted air space management of UAV & UAM aircraft

The mobile network operator gives full coverage across four service dimensions.

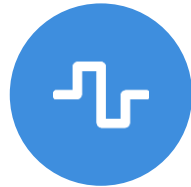
01



Communication services

Full-coverage connectivity to the aircraft

02



Sensing services

Flight trajectory tracing & collision prediction

03



High-accuracy positioning

Precise, continuous location of each aircraft

04



Edge computing & storage

Low-latency processing and data at the edge

Assisted air space management of UAV & UAM aircraft

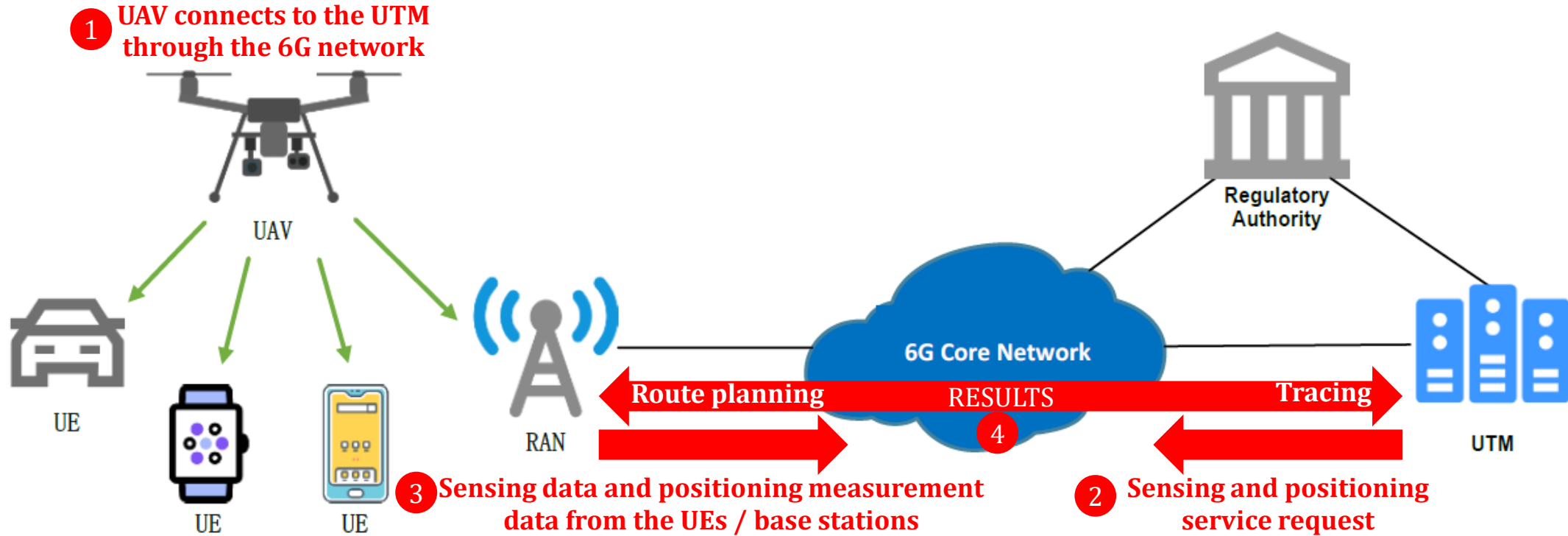


Figure 11.7.1-1: Assisted Airspace Management of UAVs and UAM Aircrafts

How the network enables safe shared airspace



High-accuracy positioning underpins every step

Precise, continuous location is what turns raw connectivity into trajectory tracing, collision prediction and coordinated airspace management.

Türk Telekom in Celtic-Next DRONaaS



Drones-as-a-Service

Celtic-Next collaborative R&D project

- Partially implements the assisted air space management use case
- Integrates 5G networks with UAV Traffic Management (UTM) services
- Türk Telekom provides the mobile-network foundation for the service

5G × UTM integration



5G network



UTM
services



Managed, safe low-altitude airspace

Connectivity, tracking and traffic management delivered as an operator service for drone operations.

From today's 5G pilot to the 6G use case

TODAY · 5G

DRONaaS in operation

- 5G integrated with UTM services
- Partial airspace-management implementation
- Türk Telekom as mobile-network provider



TOMORROW · 6G

Full assisted airspace management

- Standardized under TR 22.870 use cases
- Sensing + positioning + edge natively in-network (ISAC)
- NTN coverage for aircraft beyond terrestrial reach

Aerospace connectivity: standardized vision, operator reality



3GPP TR 22.870 puts aircraft on the 6G map

20 NTN ubiquitous-connectivity use cases plus UAM / AAM / UAV verticals.



Assisted airspace management is the anchor use case

Communication, sensing, high-accuracy positioning and edge — delivered by the operator.



DRONaaS makes it real on 5G today

Türk Telekom integrates 5G with UTM to implement the use case now — acting as a bridge to 6G.

Thank you · Questions welcome

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