Introduce outcome of Research work in 3GPP SA1

Overview of SA1 WoW and how Research work is adopted to standardization

Daniel Lönnblad

Ericsson

2025-03-27

Outline

Introduction of SA1

Example use case form Hexa-X-II

Take aways

Introduction of SA1

3GPP
A GLOBAL INITIATIVE

Background

Project Coordination Group (PCG)

TSG RAN, **CT** and **SA plenary** meet four times a year

Each TSG has a number of working groups and…

3GPP SA1 is one of the working groups in **TSG SA** with responsibility for service requirements for the whole 3GPP system

TSG RAN
Radio Access Network

- RAN1 – Radio Layer 1
- RAN2 – Radio Layer 2 spec, Radio Layer 3 RR spec
- RAN3 – RAN architecture and interfaces
- RAN4 – Radio Performance Protocol aspects
- RAN5 – Mobile Terminal Conformance Testing
- RAN6 – GSM UTRAN Radio Access Network

TSG CT
Core Network & Terminals (Protocol and interface details)

- CT1 – Mobile - Network (Iu)
- CT3 – Interworking with external networks
- CT4 – Protocol and interfaces in Core Network
- CT6 – Smart Card Application Aspects

TSG SA
Service & Systems Aspects (3GPP System wide aspects)

- SA1 – Service Requirements
- SA2 – Architecture
- SA3 – Security
- SA4 – Media and Codec
- SA5 – Telecom Management
- SA6 – Mission-critical applications

3GPP SA1 + new verticals = TRUE

Background

ERICSSON

- 3GPP SA1 creates **service requirements,** often derived from use cases.
- The SA1 group focuses on new services and enhancing existing services.
  – SA1 is always one release ahead of all the other 3GPP working groups, including RAN WGs!
  – SA1 is the appointed entry point for new verticals
  – SA1 changes "vertical" requirements into "3GPP language" so they can be (re-)used in 3GPP by other verticals.
  – The SA1 service requirements cover the whole network, including both **core** and **radio**!

- SA1 has traditionally worked with operator services and are now also getting input form verticals.

SA1 WoW: Use case->Potential requirement -> Requirement

ERICSSON

- SA1 studies are structured around identifying service requirement through jointly agreed use cases
- Potential new requirements needed to support the use case in a **TR** (Technical Report)
  - Typically, enablers and KPI's

↓

- Consolidated potential requirement (consolidated with similar requirements and made more general) in the same **TR**

↓

- In a Work item these consolidated requirement are considered and the agreed ones goes to Requirements in a **TS** (Technical Specification)

Example use case from Hexa-X-II

PHYSICAL AWARENESS


AI-generated image (Dall-E)

Physical Awareness use cases build on beyond-communication capabilities in networks: sensing, positioning, compute, and AI. By gathering 3D data about physical scenarios and situations, efficiency and safety can be improved.

Use Cases

Network Assisted 3D Mobility | Network Physical Data Exposure | Wide-area surveillance/Smart Crowd Monitoring | Environmental Radio Sensing

Network-Assisted 3D Mobility

Physical Awareness

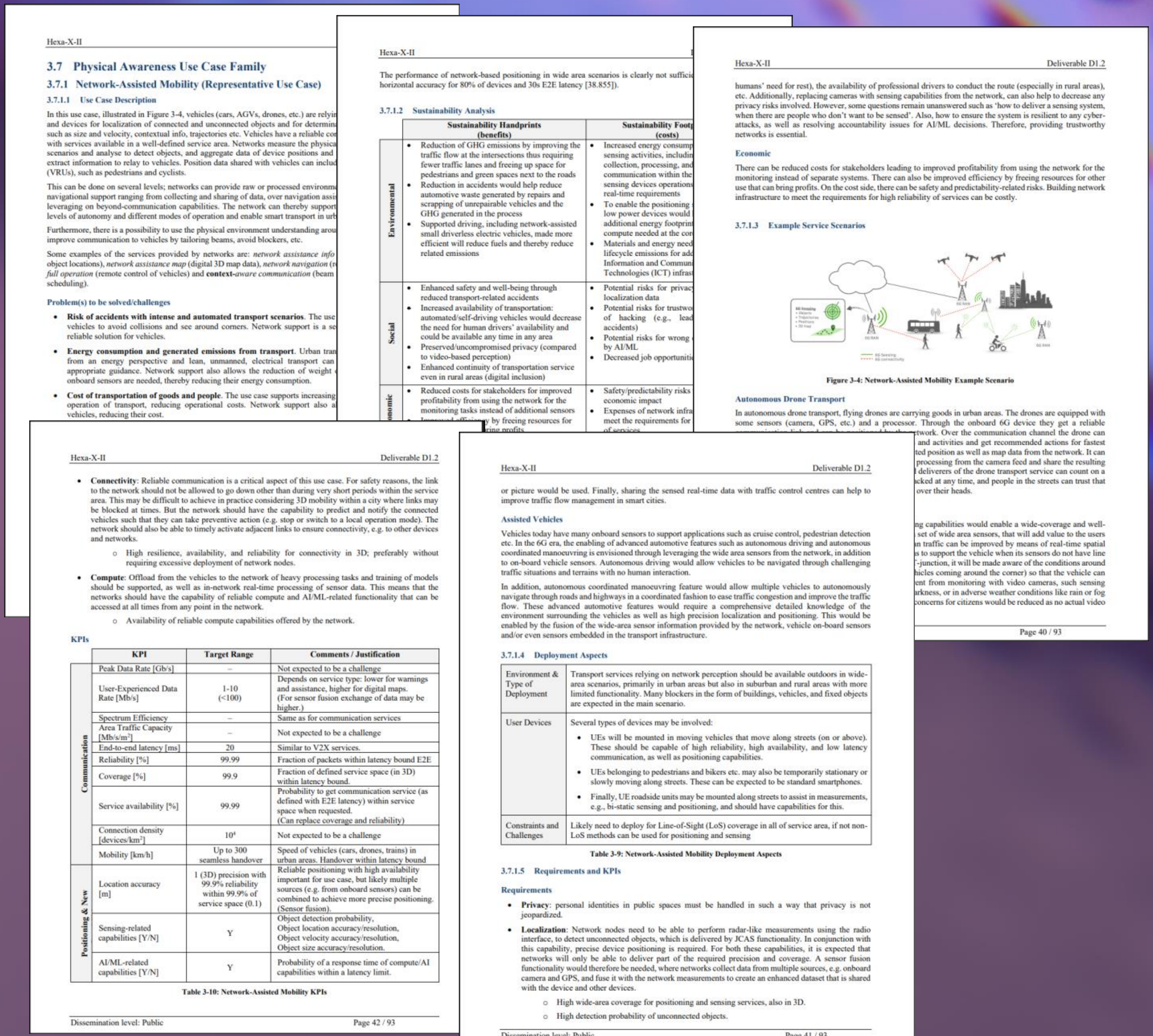
Functional Requirements

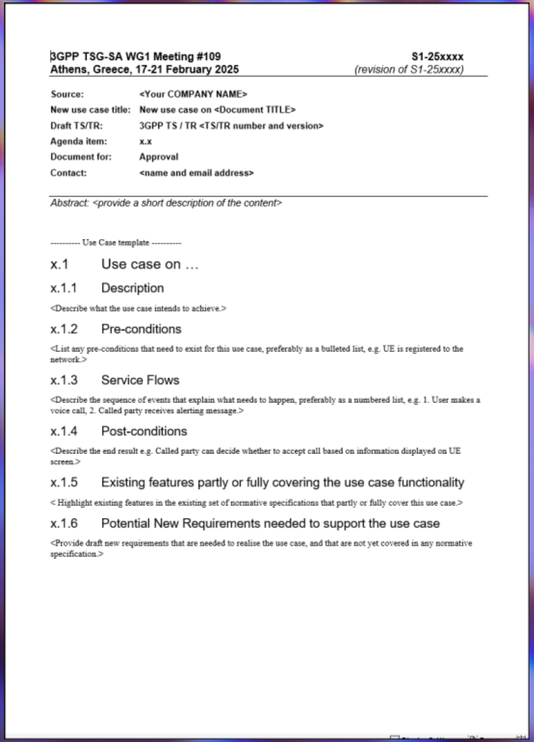
- Reliability
- Sensing
- Positioning
- Privacy & Security
- AI/ML/Compute

KPIs

KPI	Value	Description
Data rates [Mb/s]	1-10	Depends on service type
Location accuracy [m]	1m	Reliable 3D positioning with high availability
Mobility [km/h]	Up to 300	Speed of vehicles (cars, drones, trains) in urban areas
E2E Latency [ms]	1-20	Similar to V2X services.
Reliability [%]	99.99%	Fraction of packets within latency bound E2E
Coverage [%]	99.9%	Fraction of defined 3D service space
Availability [%]	99.99%	Probability to get communication service when requested

SA1 WoW: Hexa-X-II -> 3GPP SA1





3GPP TSG-SA WG1 Meeting #109 **S1-25xxxx**
Athens, Greece, 17-21 February 2025 *(revision of S1-25xxxx)*

Source:	**<Your COMPANY NAME>**
New use case title:	**New use case on <Document TITLE>**
Draft TS/TR:	**3GPP TS / TR <TS/TR number and version>**
Agenda item:	**x.x**
Document for:	**Approval**
Contact:	**<name and email address>**

Abstract: <provide a short description of the content>

---------- Use Case template ----------

x.1 Use case on …

x.1.1 Description

<Describe what the use case intends to achieve.>

x.1.2 Pre-conditions

<List any pre-conditions that need to exist for this use case, preferably as a bulleted list, e.g. UE is registered to the network.>

x.1.3 Service Flows

<Describe the sequence of events that explain what needs to happen, preferably as a numbered list, e.g. 1. User makes a voice call, 2. Called party receives alerting message.>

x.1.4 Post-conditions

<Describe the end result e.g. Called party can decide whether to accept call based on information displayed on UE screen.>

x.1.5 Existing features partly or fully covering the use case functionality

< Highlight existing features in the existing set of normative specifications that partly or fully cover this use case.>

x.1.6 Potential New Requirements needed to support the use case

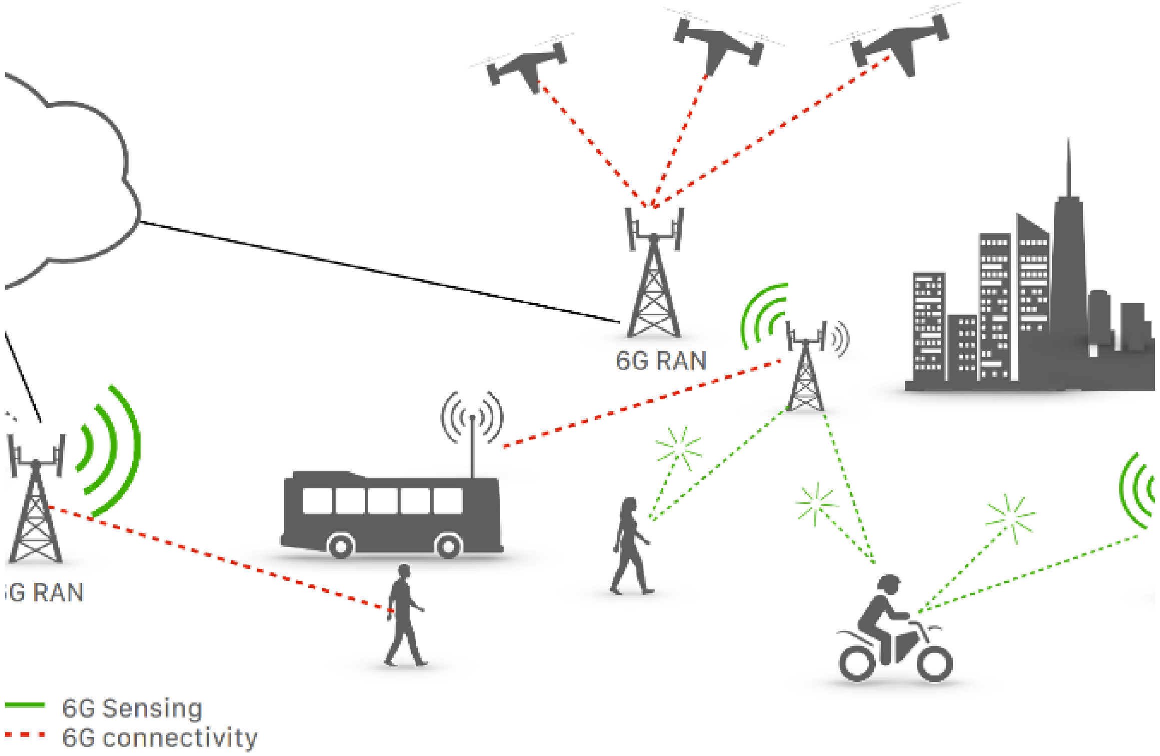
<Provide draft new requirements that are needed to realise the use case, and that are not yet covered in any normative specification.>

Example: Network assisted 3D mobility
Still under discussion

x.y.6 **Potential new requirements needed to support the use case**

Based on national/ regional regulation and operator policy and the 6G system shall support Network assisted 3D mobility service by ensuring the following KPIs for communication, location and sensing are **fulfilled simultaneously.**

- For the communication part:
    - User experienced data rate in the range of [1-10Mb/s], depending on use case. Lower for sending warnings and assistance and higher for digital maps.
    - Round trip latency in the range of [40ms].
    - Service availability for communication 99.99% within service volume.
    - Connection density in the range of 10^4 devices/km^2 (all served vehicles on ground and in the air).
- For the spatial data part:
    - Location accuracy in 3D, [1m] with 90% probability and within 99% of the service volume
    - Sensing of objects in line with category 2 or 3 in Table 6.2-1 in 3GPP TS 22.137 [6], within 99% of the service volume.



Take aways

Take aways

ERICSSON

- Research work are important as it lays the foundation for the standardization work
  - SNS JU research projects like Hexa-X-II is used as **input** and as **motivation** for the 3GPP work
  - Alignment between companies is important, co sourcing will make the difference.

- 3GPP definitions and Ways of Working needs to be understood
- Gap analysis is very important in the standard work
- New enablers and KPI's are the important part in use cases for SA1

ERICSSON