



Evaluation and validation of connected
mobility in real open systems beyond
5GS

Project deliverable D7.2

Business models for sustainable 5G adv./6G CAM service provisioning

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Project executive summary

ENVELOPE aims to advance and open the reference 5G advanced architecture and transform it into a vertical-oriented one. It proposes a novel open and easy-to-use 5G-advanced architecture to enable a tighter integration of the network and the service information domains by

- exposing network capabilities to verticals,
- providing vertical information to the network; and
- enabling verticals to dynamically request and modify key network aspects,

all performed in an open, transparent, and easy-to-use, semi-automated way.

ENVELOPE will build Application Programming Interface (APIs) that act as an intermediate abstraction layer that translates the complicated 5GS interfaces and services into easy to consume services accessible by the vertical domain. The project will deliver an experimentation framework that will facilitate vertical services in accessing a series of innovations developed in the project, namely: edge computing with service continuity support (federation/migration), zero-touch management, multi-connectivity, dynamic slicing and predictive QoS.

ENVELOPE will deliver 3 large scale Beyond 5G (B5G) trial sites in Italy, Netherlands and Greece supporting novel vertical services, with advanced exposure capabilities and new functionalities tailored to the services' needs. Although focused on the Connected and Automation Mobility (CAM) vertical, the developments resulting from the use cases (UC) will be reusable by any vertical. The ENVELOPE architecture will serve as an envelope that can cover, accommodate, and support any type of vertical services. The applicability of ENVELOPE will be demonstrated and validated via the project CAM UCs and via several 3rd parties that will have the opportunity to conduct funded research and test their innovative solutions over ENVELOPE.

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Deliverable executive summary

This deliverable presents the results of Task 7.2, focusing on the development of sustainable business models for Connected, Cooperative and Automated Mobility (CCAM) services enabled by advanced 5G and future 6G capabilities within the ENVELOPE project. Building on the ecosystem and value network analysis developed in Deliverable D7.1, the report examines how innovative network exposure capabilities and programmable network APIs can support commercially viable and scalable mobility services.

The deliverable proposes a structured methodology consisting of three main stages: (i) development of a generic ENVELOPE value network, (ii) adaptation of the reference model to each trial-site use case(s), and (iii) design of business models using the Value Proposition Canvas and Lean Business Model Canvas frameworks. These activities establish the foundation for the techno-economic assessment to be performed in Deliverable D7.3.

The analysis covers the three ENVELOPE trial sites:

- **Italian Trial Site:** Two use cases are analysed. The first focuses on accident-scene reconstruction through rapid collection and processing of vehicle sensor data to support emergency responders, insurers, and public authorities. The second addresses dynamic HD-map updating using crowdsourced vehicle data to improve automated driving safety and road infrastructure management.
- **Greek Trial Site:** The use case demonstrates service continuity in inter-PLMN mobility (roaming) scenarios facilitating smooth operation of CCAM applications across heterogeneous 5G infrastructures while leveraging network exposure APIs and edge-cloud capabilities.
- **Dutch Trial Site:** Several Digital Twin-oriented use cases are examined, including periodic vehicle data collection, mixed-reality vehicle testing, and advanced teleoperation scenarios. These use cases demonstrate how programmable connectivity, QoS-on-Demand mechanisms, and V2X service layers can support emerging mobility services.

For each use case, the deliverable identifies stakeholders, roles, service flows, revenue streams, value propositions, customer segments, key resources, and potential monetisation mechanisms. Particular attention is given to the role of network exposure and programmability through APIs, and corresponding technical enablers (e.g., Quality-on-Demand, Device Location, Edge Cloud, orchestration), that foster new business opportunities.

The report concludes that advanced network exposure and edge-enabled service provisioning can create significant value for mobility operators, public authorities, vehicle manufacturers, telecom operators, application providers, and service developers. The proposed business models demonstrate how ENVELOPE technologies can support sustainable service ecosystems while accelerating the adoption of 5G Advanced and future 6G capabilities in the CCAM domain. The findings provide the basis for the forthcoming techno-economic evaluation and sustainability assessment of the identified business opportunities.

