



PROMOTING FUTURE-PROOF DIGITAL INFRASTRUCTURES

AG5 – Connectivity and Accessibility

Connecting people electronically and promoting accessibility to public services

Shaping future together

The following Policy Recommendations have been elaborated by the members of the Actions Groups of EUSALP, reflect the expertise of the AGs members and are meant for voluntary implementation by the decision makers when it comes to the Alpine Region.

EXECUTIVE SUMMARY

This policy document sets out a comprehensive strategy for advancing future-proof digital infrastructures across the Alpine region, with a particular focus on rural and mountain areas. The objective is to ensure reliable, secure, and inclusive high-speed connectivity, modern computing capacity, and trusted data use for citizens, businesses, and public services.

The document addresses the unique challenges faced by these territories, such as high costs for last-mile coverage, exposure to natural hazards, skills shortages, and cybersecurity risks. It emphasizes the need for cross-border backbone redundancy, municipal ownership models, resilient and low-carbon data centers and edge computing facilities, and secure communications tailored to the Alpine context. The recommendations include reinforcing fiber optic and 5G corridors, establishing smart region hubs, adopting resilient data center standards and edge computing facilities, supporting municipal IoT portfolios, piloting secure communications, and launching shared skills and AI-assisted operations programs. The anticipated impacts are improved economic conditions, environmental sustainability, and social well-being, achieved through fewer outages, better service reliability, reduced duplication, and enhanced cooperation. Implementation relies on coordinated multi-level governance, prioritizing cross-border interoperability, leveraging existing funding programs, and promoting shared infrastructure and capacity building. The document calls for collaboration among EU institutions, national and regional governments, local authorities, and community organizations to realize a secure, resilient, and inclusive digital future for the Alpine region.

The following is a summary list of the proposed policy recommendations:

- P1. Promote Cross-border high-speed connectivity**
- P2. Strengthen Smart Region hubs**
- P3. Build Resilient, low-carbon data centers and edge computing facilities**
- P4. Manage Municipal IoT portfolios & stewardship**
- P5. Implement Secure communications pilots**
- P6. Develop Skills & AI-assisted operations**

INTRODUCTION

Policy objective: deliver reliable, secure and inclusive high-speed connectivity (fiber optic and 5G), modern computing capacity (regional/edge data centers) and trusted data use so that citizens, SMEs and public services across the Alps can access better services and cooperate seamlessly across borders.

Challenge to be tackled: mountain and rural areas face higher costs for last-mile coverage and siting, exposure to floods and earthquakes, skills shortages and growing cybersecurity risks. Many infrastructures sit in the same risk basin and pilots often remain one-off without a route to scale.

Territorial dimension: infrastructure and services must work across valleys and borders. A “smart region” approach lets municipalities share solutions (e.g., water monitoring, civil protection localisation) while national/EU programmes provide scale and continuity.

Existing policy framework and need for intervention: these actions complement EU and national strategies and ongoing Alpine initiatives by focusing on cross-border backbone redundancy, municipal ownership models, resilient/low-carbon data centers and secure communications that are practical for the Alpine context.

POLICY RECOMMENDATIONS (LIST)

P1. Cross-border high-speed connectivity: complete and reinforce fiber optic backbones and 5G corridors on Alpine routes, adding diverse paths to avoid single points of failure; support shared neutral-host sites. Prioritise links that connect emergency services, hospitals, schools and logistics hubs.

P2. Smart Region hubs & digital twins: create regional hubs that provide shared tools, training and data platforms for municipalities (“smart region”/digital twin). Start with practical use cases: water tank telemetry in winter, civil-protection localisation, traffic counting, and sustainable tourism flows.

P3. Resilient, low-carbon data centers: adopt siting standards that avoid shared hazard zones; aim for energy-efficient designs (e.g., geo-cooled or underground) with clear targets on efficiency and renewable power. Require immutable backups and a small witness location to control failover.

P4. Municipal IoT portfolios & stewardship: support towns to deploy IoT portfolios (water, winter operations, mobility, tourism safety) on publicly-governed networks (fiber/LoRaWAN/5G). Approve a short charter that clarifies who owns the data, how it is shared and how fees from private users are reinvested.

P5. Secure communications pilots: pilot secure communications along critical corridors (e.g., ports/logistics, cross-border links) using today’s best practice encryption and, where feasible, pilots that prepare for next-generation secure links over existing dark fiber.

P6. Skills & AI-assisted operations: Stand up a shared Alpine skills programme and apply AI to network and security monitoring to help small public teams spot incidents early and run infrastructure more efficiently.

Impacts

The following table summarises the economic, environmental, and social impacts of each policy recommendation. These impacts are intended to provide decision-makers with a clear understanding of the potential benefits and trade-offs, helping to prioritise actions that maximise value creation, foster sustainability, and enhance community well-being across the EUSALP macro-region.

Alpine Space

Table 1 Impacts of promoting future-proof digital infrastructures in alpine areas

Recommendation	Economic Impacts	Environmental Impacts	Social Impacts
R1: Cross-border high-speed connectivity	Fewer outages; better conditions for SMEs and tourism; lower costs through shared sites.	Optimised routes reduce civil-works duplication; enable monitoring of rivers/landslides.	More reliable services for citizens; better access to education/health.
R2: Smart Region hubs & digital twins	Shared tools reduce duplicate spend; local companies build services on open data.	Targeted interventions (e.g., water leaks, traffic) reduce waste and emissions.	Quicker problem-solving; stronger cross-municipal cooperation.
R3: Resilient, low-carbon data centers	Lower downtime and recovery costs; energy savings over lifetime.	Low-carbon cooling and heat-reuse options; safer siting outside risk basins.	Continuity of public services even during shocks.
R4: Municipal IoT portfolios & stewardship	Efficiency gains in operations; new local services and jobs.	Reduced losses (water/energy); data to manage nature-based tourism.	Safer communities (alerts); clear rules increase trust.
R5: Secure communications pilots	Protects commerce and public services from costly disruptions.	Secure data exchange for environmental and infrastructure monitoring.	Higher trust in digital government and cross-border cooperation.
R6: Skills & AI-assisted operations	Faster incident detection reduces downtime; workforce productivity rises.	Better targeting of maintenance reduces unnecessary travel and waste.	Upskilling opportunities across the region; improved service quality.

Governance

The table below outlines the recommended roles and actions for each level of governance – European Union, national, regional, and local – in implementing the proposed measures. This multi-level approach ensures that responsibilities are clearly defined, facilitates effective coordination, and leverages the unique capacities of each governance tier to achieve shared objectives for the Alpine region.

Table 2 Governance to implement future-proof digital infrastructures in alpine areas

Recommendation	European Union Level (EC, EP, Council)	National Level (Government, Parliament)	Regional Level	Local Level
R1	Co-fund cross-border routes; common permit guidance; measure quality of service.	Right-of-way simplification; spectrum/5G corridor support; universal-service incentives.	Select corridors; coordinate builds; operate shared neutral-host sites.	Provide sites/ducts; ease local permits; publish planned works.

Alpine Space

Recommendation	European Union Level (EC, EP, Council)	National Level (Government, Parliament)	Regional Level	Local Level
R2	Fund digital innovation hubs and data spaces.	Integrate hubs with national strategies for tourism, water, mobility.	Run hubs; provide shared platforms and training; publish open data.	Co-create use cases; maintain local datasets; adopt tools.
R3	Issue guidance on siting/efficiency; support low-carbon designs.	Set resilience and security baselines; enable heat-reuse markets.	Plan regional capacity; enforce redundancy and backup policies.	Host micro-edge rooms where useful; follow backup routines.
R4	Model clauses for fair data use; funding for community IoT.	National templates for data charters; privacy guidance.	Procure shared platforms; training and support services.	Install/maintain sensors; adopt data charter; reinvest access fees.
R5	Support secure-communication pilots on strategic corridors.	Clarify lawful cross-border data exchange; certify solutions.	Deploy pilots on existing dark fiber; test with emergency/logistics	Participate in pilots; incorporate into operations.
R6	Fund cross-border skills programmes; common curricula.	Finance training vouchers; recognise qualifications.	Operate regional academies and operations centres.	Enroll staff; adopt AI-assisted monitoring tools.

IMPLEMENTATION

General implementation guidelines:

- **Adopt a multi-level governance approach:** ensure coordination between EU, national, regional, and local authorities to align funding, technical standards, and legal frameworks.
- **Prioritize cross-border interoperability:** apply common permitting guidance, shared data standards, and harmonized security requirements to enable seamless connectivity and service continuity across Alpine regions.
- **Leverage existing programs and instruments:** use EU schemes (e.g., Interreg, Digital Europe), national broadband and digitalization plans, and regional innovation funds to co-finance infrastructure, hubs, and skills initiatives.
- **Promote shared infrastructure and services:** encourage neutral-host models for fiber and 5G corridors, regional hubs for digital twins, and community IoT platforms to reduce costs and avoid duplication.
- **Integrate resilience and sustainability:** apply siting standards for data centers outside hazard zones, enforce energy-efficiency targets, and include backup and failover mechanisms in all critical systems.
- **Embed capacity building and trust:** combine technical deployment with training programs, AI-assisted monitoring tools, and clear data governance charters to ensure secure, ethical, and inclusive digital transformation.
- **Promote political dialogue with different levels of governance:** encourages political dialogue between different levels of governance through structured events within EUSALP (e.g. Roadshow) to promote policy adoption.

Alpine Space

Responsible actors: EU institutions, national and regional governments, local authorities, and community organizations.

Enablers: clear guidelines, funding opportunities, technical support, and partnerships across borders.

Resources: public investment, private sector collaboration, and training programs.

CONTACT PERSON(S)

Carlo Vigna, AG5 Leader

Regione Autonoma Valle d'Aosta/Région Autonome Vallée d'Aoste

eusalp.ag5@regione.vda.it

Paolo Perucci, AG5 Focal Point on Digital Infrastructures

Regione Autonoma Friuli Venezia Giulia

paolo.perucci@regione.fvg.it