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Data for All

Data for All
Data-driven Public Service Delivery in the North Sea Region

Municipal and Regional Data Usage

Policy Brief

Part 1: Technical Infrastructure & Digital Commons
Part 2: Governance & Implementation
Part 3: Ethics, Rights & Regulatory Framework

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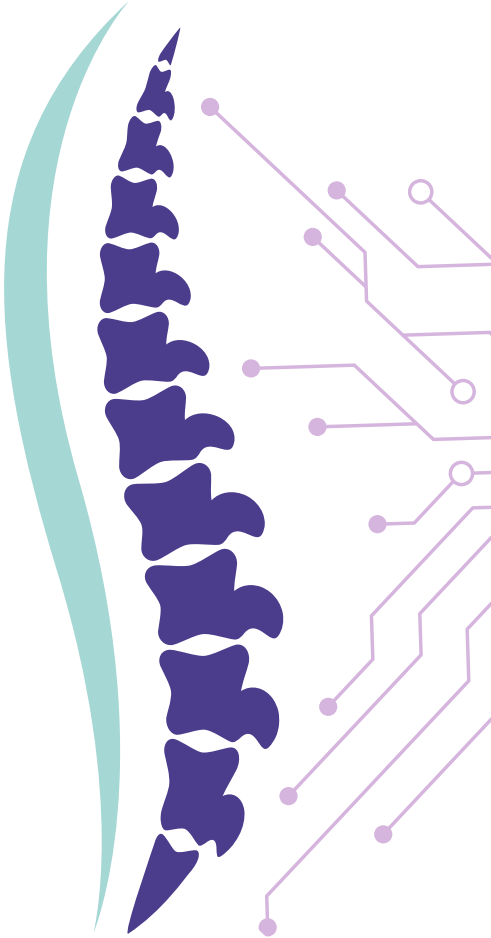
Technical Infrastructure & Digital Commons

Why It Matters

Digital technologies form the backbone of modern municipal services.



They present unprecedented opportunities for:

- **improving citizen services**
- **optimizing resource allocation**
- **enhancing decision-making**
- **building resilient communities**

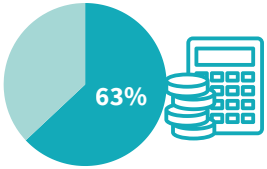
Strategic technology choices today **enable municipalities to maintain autonomy** over their digital infrastructure while participating in a global ecosystem of innovation. Digital commons, open standards, and community-controlled infrastructure provide pathways for municipalities to build **sustainable, interoperable systems** that can adapt to future technological developments while **serving local needs**. This approach enables long-term flexibility and reduces dependency on single providers while fostering innovation that **benefits the entire community**.

Core Technical Infrastructure

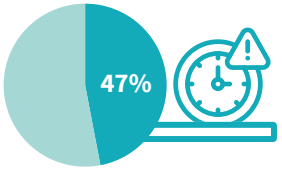
Digital Commons as Public Infrastructure

- **Treat digital resources like physical infrastructure:** Build transparent, open, widely accessible digital systems under municipal public control, similar to bridges and roads
- **Three-layer approach:** Implement foundation-supported initiatives, community-business collaborations and community cooperative models
- **Municipal digital commons examples:** Deploy open-source cloud solutions, platform cooperatives for local services, and collaborative data pools for community benefit
- **Establish collaborative governance ecosystems:** Define stakeholder relationships, roles, and decision-making frameworks first, then design structural governance rules and processes, before implementing technical systems. This ensures community members, administrators, and users are meaningfully included throughout the entire development process

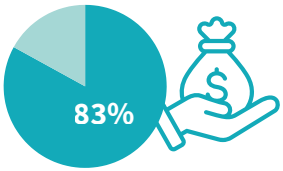
Key infrastructure Challenges
(EIB Survey 2024-2025)



Municipalities cite financing difficulties

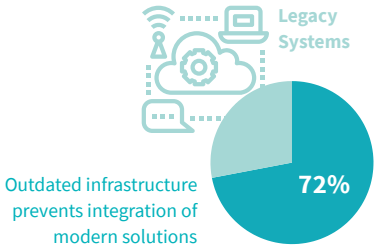


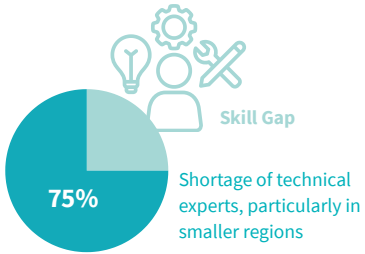
Report regulatory delays as obstacle

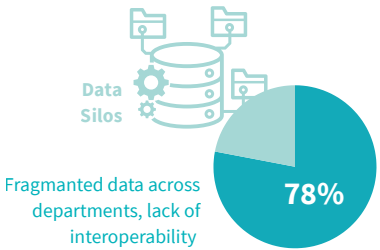


Rely on EU grants for investments

Plan investment increases (2025)







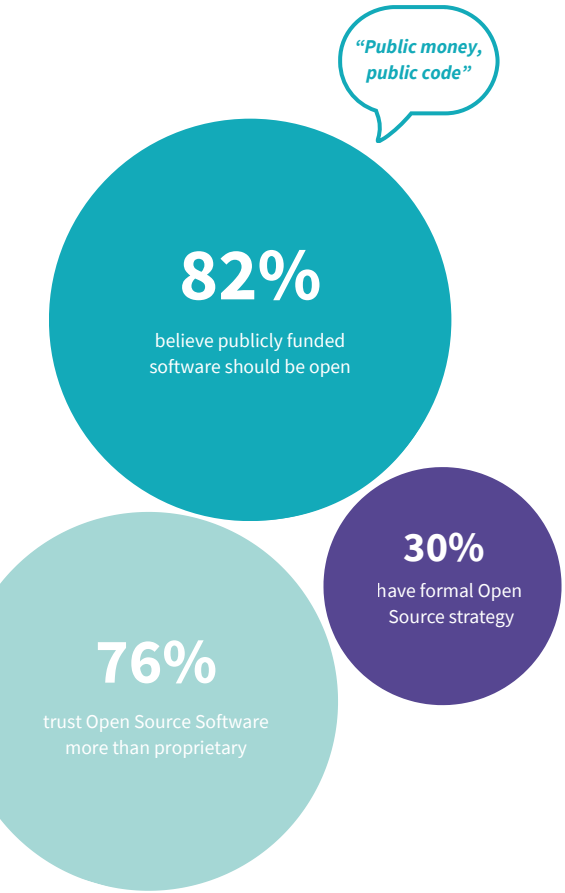
Data Architecture & Standards

- **Use state-of-the-art data management methodology:** Apply proven approaches for planning, designing, implementing, deploying, and maintaining transparent and scalable municipal data systems that ensure long-term sustainability and accountability
- **Layered data processing:** Establish input, transformation, entity, and output layers with automated quality checks, well-documented semantics, and secure API access to ensure data actually means what users think it does
- **Interoperability first:** Maintain consistent workflows while enabling technology switching through open standards
- **Data portability:** Ensure citizens and organizations can easily transfer their data between different municipal systems and service providers, enhancing user freedom and preventing vendor lock-in
- **Democratic standard-setting:** Engage stakeholders in collaborative standard development rather than top-down implementation

Cloud Infrastructure & Data Sovereignty

- **Strategic cloud adoption:** Leverage hybrid approaches that reduce capital investment while maintaining control over sensitive municipal data through certified providers with transparent service agreements
- **Future-proof security:** Protect sensitive data against evolving technological capabilities through advanced encryption and data protection methods that can adapt to new security challenges
- **Municipal data control:** Give municipalities greater control over data generated/collected in their territory while balancing free data flow with confidentiality requirements
- **Create regulatory standards for decentralized dataspaces:** Enable secure data sharing while preserving corporate data control through clear frameworks that facilitate interoperability without requiring centralized data storage

Source: Linux Foundation Europe "Open Source Maturity in Europe 2024"; Interoperable Europe (Signalen case study)



Innovation Ecosystems & Community Media

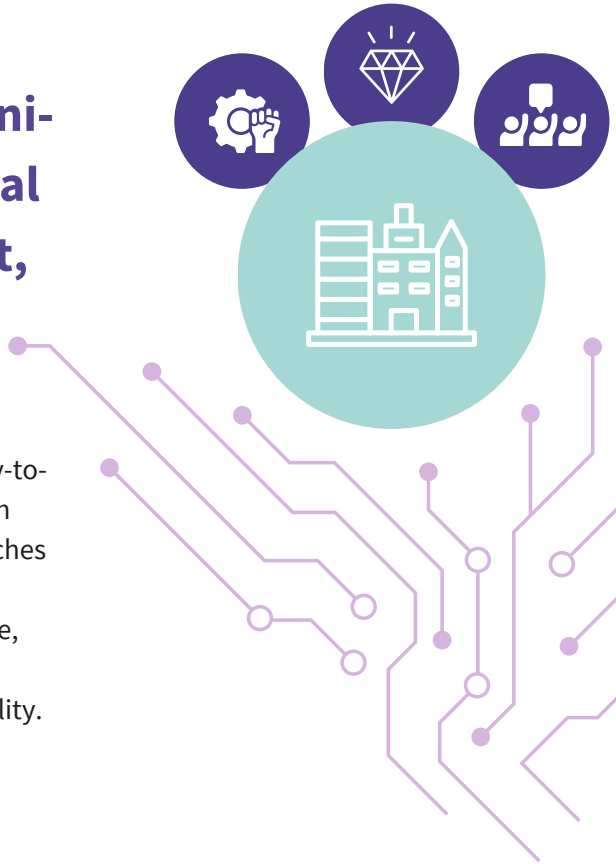
- **Support local innovation:** Provide open data access to all interested parties. Complement this with targeted capacity-building programs, procurement preferences, and technical assistance specifically for cooperatives, social enterprises, and steward-owned businesses to help them effectively utilize the data
- **Reduce technological lock-ins:** Establish input, transformation, entity, and output layers with automated quality checks, well-documented semantics, and secure API access to ensure data actually means what users think it does
- **Use Open Source Software:** Prioritize open-source solutions over proprietary software from large tech companies that are subject to non-EU control
- **Strengthen local information ecosystems:** Support and strengthen community-based information networks, local media initiatives, and citizen journalism to enhance information resilience
- **Two-way innovation:** Learn from global Digital Public Goods while contributing municipal innovations to international networks

2

Governance & Implementation

Why It Matters

Effective data governance enables municipalities to maximize value from digital transformation while building resilient, community-responsive systems.



Establishing a clear data **strategy** and data **governance framework** is essential for enabling operational data management that supports day-to-day municipal functions while maintaining strategic alignment. Modern municipal challenges require sophisticated data management approaches that can balance **transparency, efficiency, and citizen participation**. Community-controlled data stewardship, multistakeholder governance, and regional collaboration provide frameworks for municipalities to harness data effectively while maintaining public trust and accountability. These approaches enable municipalities to build **sustainable digital capabilities** that adapt to changing needs and technologies while ensuring all residents can participate in and benefit from digital innovation.

Democratic Data Governance

Data Cooperatives & Community Stewardship

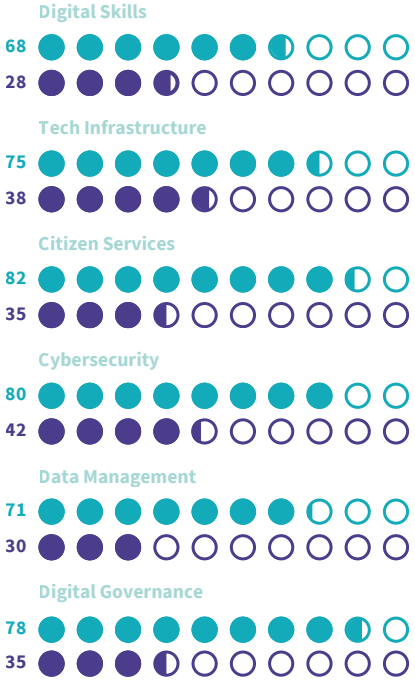
- **Establish municipal data cooperatives:** Create associations where community members collectively steward data in their interests through democratic governance, replacing complex individual consent with trusted community representatives
- **Implement community data trusts:** Deploy entities with fiduciary obligations to represent community interests, enabling pooled data rights with participatory governance structures. This requires ecosystem data governance as multiple stakeholders (citizens, service providers, municipal agencies, and community organizations) are involved and need coordinated decision-making frameworks
- **Five criteria for trustworthy stewardship:** (1) Independence and neutrality, (2) organizational and technical capacity, (3) professional knowledge, (4) control and sanctions mechanisms, (5) meaningful community participation
- **Address the trust paradox:** Bridge gap between citizens' desire to contribute to common good and their mistrust of data sharing by providing both individual control over personal data and genuine community control rather than corporate extraction
- **Long-term community relationships:** Enable ongoing data stewardship decisions rather than requiring individual consent for each use case

Digital Infrastructure Maturity Assessment

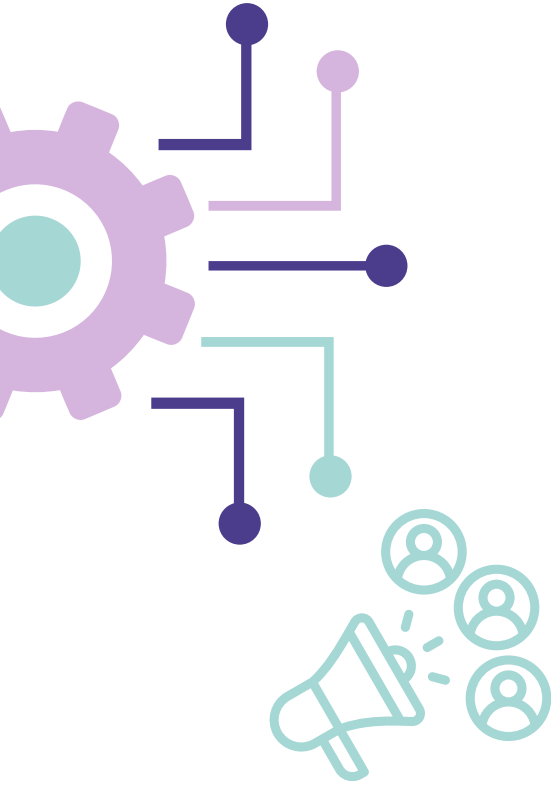
Sources: LORDIMAS Digital Maturity Assessment Tool 2024, European Committee of Regions, Data Public Observatory

Large cities
score ø 40 points higher than small municipalities!

Small municipalities
score below 42 in all dimensions!



Multistakeholder Implementation Strategy

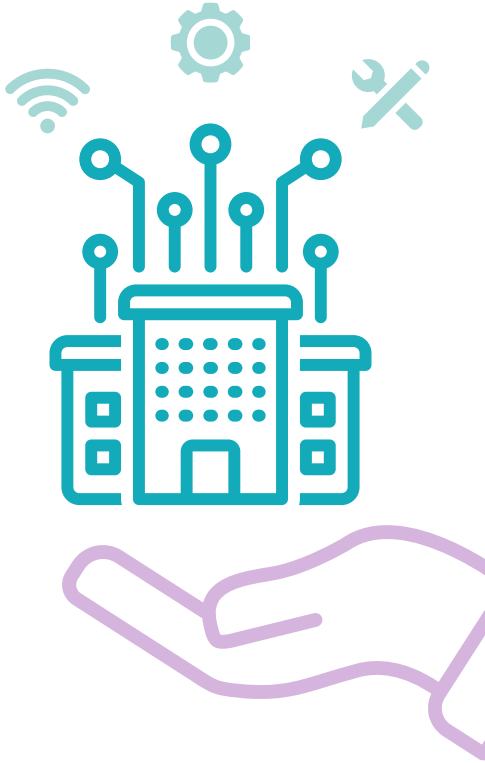


Stimulate Digital Commons Development

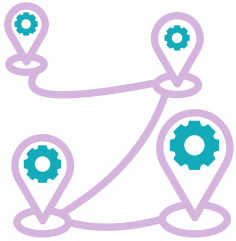
- **Municipal procurement as market creation:** Use coordinated procurement policies with other municipalities to create regional demand for democratic digital alternatives
- **Community education:** Launch awareness campaigns about risks of closed systems and benefits of digital independence with practical guidance
- **Long-term funding:** Provide sustained support for user-friendly, democratically grounded alternatives to commercial platforms
- **Maintain community alignment:** Ensure digital commons initiatives remain aligned with public interests through robust licensing and community ownership structures

Adopt Community-Controlled Systems

- **Replace Big Tech dependencies:** Municipal agencies should adopt democratic alternatives like open-source operating systems and community-controlled cloud storage
- **Provide free public internet:** Ensure free Wi-Fi in all municipal buildings, libraries, and community centers as essential public service
- **Skills for economic opportunity:** Focus digital literacy training on local economic opportunities rather than generic computer skills
- **Support institutional transitions:** Provide hands-on guidance and training to help schools, libraries, and municipal services transition to digital commons
- **Data Sovereignty:** Keep citizen data under municipal control through local infrastructure and open standards, preventing dependency on external platforms
- **Develop in-house open-source expertise:** Unlike proprietary software with vendor dependency, open-source requires municipalities to understand and maintain their own systems. This enables customization to local needs, active participation in open-source communities, and genuine technological independence while reducing long-term costs



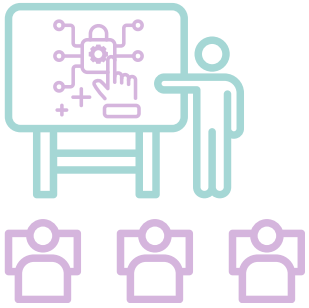
Regional Collaboration



- **Establish local nodes networks:** Support maintenance, development, and scaling of digital commons for municipal infrastructures
- **Share systems and infrastructures:** Collaborate on shared municipal digital systems rather than developing isolated solutions

Capacity Building & Skills Development

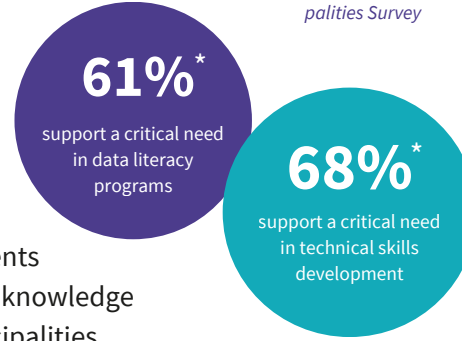
Note: Skills development should follow strategic planning: First establish a data strategy, then implement data governance frameworks, which then reveal specific data literacy requirements that inform targeted training programs.



Municipal Staff Development

- **Data literacy training:** Provide foundational data concepts training to municipal staff across departments
- **Professional exchange:** Create forums for technical knowledge sharing and best practice development across municipalities
- **Democratic governance skills:** Train staff in collaborative decision-making and community engagement for digital systems

Capacity Building Priorities
Source: Eurocities Governance Report 2024; EIB Municipalities Survey



**of the municipalities surveyed*

Digital Divide in Europe: Percentage of people with narrow digital competencies

Source: Eurofound (2025); Data based on EU-SILC & Eurostat Digital Skills Indicators (2023-2024)

43%
of the people with disabilities

61%
of the Senior Citizens

39%
of the people with a migration background

55%
of the people with low educational attainment

48%
of the people with low income

Community Engagement & Democratic Participation

- **Digital rights education:** Implement programs to educate residents about digital rights, data privacy, and online safety.
- **Participatory technology design:** Enable systematic inclusion of diverse community groups in municipal technology decisions
- **Local election protection:** Implement municipal measures addressing deepfakes and AI-generated content in local elections with transparency rules for political advertisements
- **Community content standards:** Create local content moderation standards reflecting community values rather than corporate algorithms
- **Vulnerable group protection:** Apply intersectional analysis to ensure women, minorities, immigrants, and marginalized groups have equal access to digital protection and participation

ø27%
of the total population have low/narrow digital competencies

3

Ethics, Rights & Regulatory Framework

Why It Matters

Modern municipalities need robust ethical frameworks that can adapt to emerging technologies.

Municipal data usage operates within rapidly evolving regulatory and technological landscapes that require forward-thinking approaches to remain effective and compliant. Digital transformation presents significant opportunities for municipalities **to improve service delivery, enhance citizen engagement, and build more sustainable communities**.

A human-centric framework enables municipalities to harness these opportunities while **maintaining public trust and democratic accounta-bility**. Modern municipalities need **robust ethical frameworks** that can adapt to emerging technologies while ensuring digital initiatives serve community wellbeing, environmental sustainability, and democratic participation. This proactive approach helps municipalities build resilient digital capabilities that can evolve with changing needs and technologies.

Human-Centric Ethical Framework

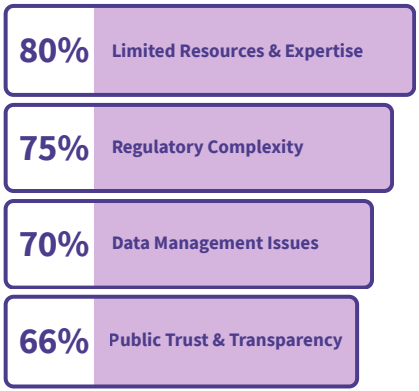
Core Human-Centric Principles

- **Community self-determination:** Enable citizens and communities to be stewards of their own data through fair and secure sharing architectures rather than being subject to external control
- **Transparency and accountability:** Make data processing methods understandable and accessible for external assessment by community members and civil society organizations

Municipal AI Governance & Community Oversight

- **Local AI databases:** Create municipal AI training datasets reflecting local demographics and contexts to prevent algorithmic bias against community members
- **Community AI oversight:** Require meaningful community participation in all municipal AI system decisions before deployment, ensuring residents shape how technology affects their lives
- **Transparent AI standards:** Establish clear curation standards and terminology for municipal AI systems with public accountability mechanisms
- **Prohibit discriminatory AI:** Prevent AI systems from reinforcing discrimination against individuals or groups within the municipality

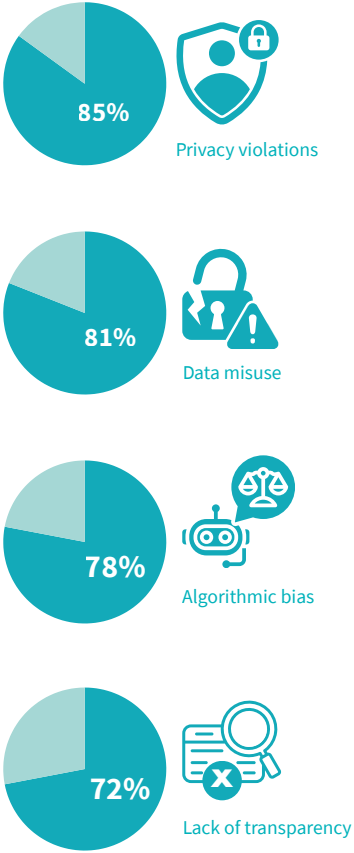
European Municipalities 2024-2025 facing these AI implementation barriers:



Sources: European Committee of Regions (2025); Trilateral Research Study (2025)

Ethical Concerns in Municipal Data Usage: Severity rating by stakeholders (0-100 scale)

Source: EU Agency for Fundamental Rights "GDPR in Practice" 2024; Eurocities Ethical AI Framework



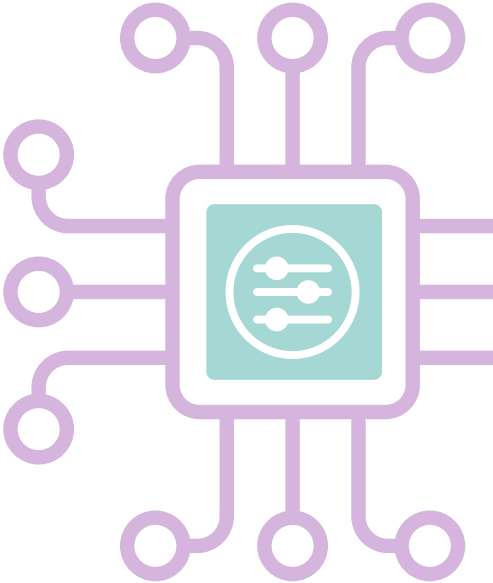
Digital Rights Protection & Municipal Safeguards

- **Safeguard freedom of expression:** Municipal authorities ensure protection against censorship, internet shutdowns, and restrictions on democratic discourse in local digital spaces
- **Prevent harmful AI surveillance:** Municipal policies prohibit biometric identification in public spaces and predictive policing systems that threaten community privacy and democratic participation
- **Limit surveillance expansion:** Municipal oversight prevents broad surveillance powers that undermine private communication and restricts facial recognition technologies
- **Address digital violence:** Municipal services provide support for gender-based digital violence, cyberbullying, and targeted harassment affecting vulnerable communities
- **Support transparency:** Municipal frameworks protect whistleblowers and journalists who contribute to public accountability

Legal & Regulatory Compliance

Municipal Regulatory Approach

- **Extend European standards locally:** Build upon European and national legislation as baseline, developing additional local policies for specific community needs while maintaining regulatory competitiveness through uniform standards
- **Implement precautionary principles:** Assess potential harms of new technologies before deployment, particularly impacts on vulnerable groups
- **Enable community accountability:** Create mechanisms for citizens to understand and influence municipal technology decisions without technical barriers
- **Develop adaptive frameworks:** Build regulatory approaches that can evolve with technological advancement while maintaining core democratic values
- **Foster regulatory innovation:** Create municipal testing environments for new data governance models while ensuring citizen protection



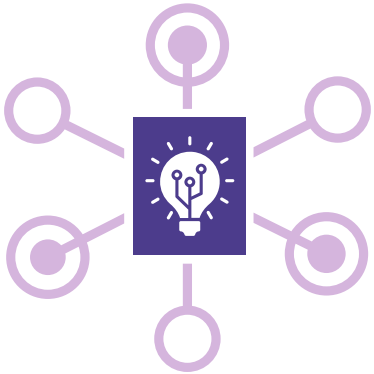
Sustainable Digital Transformation & Systemic Risk Management

Environmental & Circular Economy Principles

- **Environmental responsibility:** Implement environmental impact assessments for energy-intensive municipal AI systems and digital infrastructure, addressing carbon footprint, water use, and rare mineral demand
- **AI impact research funds:** Establish municipal funds for independent research on AI social, economic, and environmental impacts on local communities
- **Democratic protection:** Assess and mitigate threats to local democratic processes from AI and automated systems
- **Circular cities integration:** Develop municipal policies supporting device longevity, reducing electronic waste, and promoting circular economy principles in urban digital infrastructure
- **Sustainable procurement:** Use digital product passports and lifecycle assessments for municipal digital devices

Global Responsibility & Cooperation

- **Share municipal innovations:** Contribute local digital solutions to global networks while learning from international best practices
- **Support inclusive development:** Use municipal digital resources to address global challenges like climate change through collaborative, community-controlled approaches
- **Promote equitable partnerships:** Ensure municipal digital cooperation creates mutual benefit rather than extractive relationships



Implementation Priority

Establish **municipal digital commons as public infrastructure** through integrated approach combining technical infrastructure, democratic governance, and human-centric ethics. **Prioritize community stewardship** over individual consent models, **regional collaboration** over isolated municipal solutions, and **democratic alternatives** over Big Tech dependencies. Focus on building **data cooperatives and participatory governance** that distribute decision-making power among community members rather than centralizing control in municipal hierarchies or external corporations. **Address environmental impact** while using technology to advance sustainability and democratic participation through community-controlled systems that serve local needs and contribute to global democratic digital governance.

About This Policy Brief

This policy brief was developed through the Data for All project, in partnership with all project partners. The recommendations presented here emerged from the cited sources, academic literature, EU policy frameworks, and hands-on implementation experience across participating municipalities. While grounded in documented research and verified data, these recommendations represent our synthesized understanding of how municipalities can successfully navigate digital transformation while maintaining democratic control, technological sovereignty, and ethical standards in data governance.

Sources

- Bria, F. et al. (2024): "Time to Build a European Digital Ecosystem" (FEPS Policy Study)
- C20 Working Group 7 (2024): "Digitalization & Technology Policy Brief"
- Digital Autonomy Hub (2020): "Data Trusts: Self-Determined Sharing of Personal Data - Is That Possible?"
- EU Data Strategy & Data Governance Act frameworks
- European Commission & Swedish Roadmap: Data governance and management strategies
- Expert Interview: Data Management Implementation (David Lingier, June 2025)
- Gstrein, O.J. (2023): "Data Autonomy: Recalibrating Strategic Autonomy and Digital Sovereignty" (including expert interview, June 2025)
- Muscat, S. (2024): "A Green Compass for Human-Centric International Digital Policy" (Heinrich Böll Foundation)
- Open Government Data Culture (data.gv.at)

Data for All

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Data for All

Contact:
Heinrich-Böll-Stiftung Schleswig-Holstein e.V.
On behalf of the lead partners of the project Data for All:
Intercommunale Leideal & aconium GmbH

+49 431 301 475 70
manthey@boell-sh.de