EnCLOD guidelines on effective Open Data usage for territorial governance: key findings from five pilot actions



EnCLOD Deliverable D3.3.1: link

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The guidelines were built from a structured survey of all five pilot areas



1 Test in five pilots

Olomouc, Nova Gorica, Debrecen, Vicenza and Zilina, 2024-2026

2 Survey all pilots

All pilot partners answered the same structured questions

3 Compare answers

Results compared theme by theme across all five pilots

4 Consolidate

Common patterns became the final guidelines in D3.3.1

EIGHT THEMES COMPARED ACROSS ALL PILOTS

Pilot overview	IoT and data infrastructure	Open data outputs	Governance and policy
Stakeholder engagement	Results and impact	Challenges	Recommendations

Based on the state of the art (D1.1.1, D1.2.1) and preliminary guidelines (D1.3.1). Source: EnCLOD Deliverable D3.3.1, sections 1 and 7

WHO THIS TARGETS

The guidelines target four groups, one at each governance level



POLITICAL LEVEL

Policymakers

Local and regional leaders and representatives

WHAT THEY GET

A long-term open data and IoT strategy



TECHNICAL LEVEL

Technicians

IT specialists, IoT providers, technical teams

WHAT THEY GET

Standards for reliable, interoperable data



EXPERT LEVEL

Experts

Planners, environmental experts, analysts

WHAT THEY GET

Holistic designs for climate and traffic



ORGANISATIONAL LEVEL

Data users

Citizens, businesses and researchers

WHAT THEY GET

Open data for services, apps and research

One reference for local and regional administrations that introduce or strengthen open IoT data

Source: EnCLOD Deliverable D3.3.1, sections 1 and 3.3

Five pilots turned the EnCLOD guidelines into a playbook any municipality can reuse

1	**Design before hardware**	Map the city by microzoning before buying a single sensor
2	**Standardise the outputs**	Same data formats and 15-minute interval in all five pilots
3	**Anchor in institutions**	Plans, operators and contracts keep sensor networks alive
4	**Engage with real data**	Hackathons on the pilots' own data produced usable prototypes

Source: EnCLOD Deliverable D3.3.1

The approach rests on three pillars and a holistic microzoning foundation

Data governance

Clear ownership, operation and continuity, embedded in existing city plans

Data accessibility

CSV, JSON and API with metadata, open licences and 15-minute intervals

Engagement

Workshops, outreach to sensor hosts and at least one hackathon per pilot

FOUNDATION **Microzoning:** plan the whole sensor network as one model before any hardware

Source: EnCLOD Deliverable D3.3.1, section 4.1

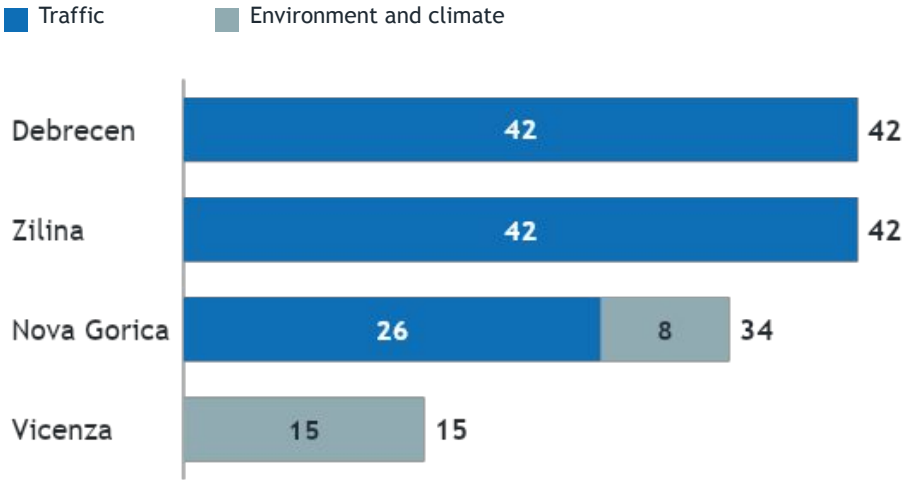
Each pilot tested the framework on its own policy question and fed a concrete decision

PILOT	POLICY FOCUS	DECISION INFORMED
Olomouc Czech Republic	Heat islands and parking	**Parking reform and a digital twin tender**
Nova Gorica Slovenia	Mobility and air quality	**Municipal Air Quality Plan**
Debrecen Hungary	Mobility and public transport	**New bus routes around industrial parks**
Vicenza Italy (Province)	Road safety in winter	**Review of winter salt spreading**
Zilina Slovakia	Mobility and traffic safety	**Planned Traffic Safety Index**

Source: EnCLOD Deliverable D3.3.1, sections 7.1, 7.4 and 7.6

The pilots deployed well over 150 sensors, and two designs are already scaling up

Devices deployed in the pilot phase[1], number



SCALING UP

90

traffic monitoring points in Zilina, combining EnCLOD with earlier projects

226 + 68

traffic lanes and climate sensors in Olomouc's digital twin procurement

1. Olomouc pilot sensors are not itemised in D3.3.1; Nova Gorica includes one reference air-quality station. Source: EnCLOD Deliverable D3.3.1, section 7.2

All pilots publish open data to one standard, but only two reach regional or national portals

COMMON STANDARD IN ALL FIVE PILOTS

5/5	Near-real-time data streams
5/5	15-minute aggregation
5/5	CSV, JSON and API publication

ON A REGIONAL OR NATIONAL PORTAL

2/5



Guideline: publish on established portals, not only on project dashboards, so the data stays discoverable.

Source: EnCLOD Deliverable D3.3.1, sections 7.2 and 7.3

Networks survive when anchored in plans, operators or contracts, not in project funding

HOW EACH PILOT SECURED CONTINUITY

Contract	Olomouc	Digital twin tender with 5 years of operation
Operator	Vicenza	Road manager Vi.abilita keeps the stations running
City systems	Debrecen	Data feed the city's environmental monitoring system
Policy	Zilina	KRIT concept backs automated open data publication
Strategic plan	Nova Gorica	Municipality committed to adopt an Air Quality Plan

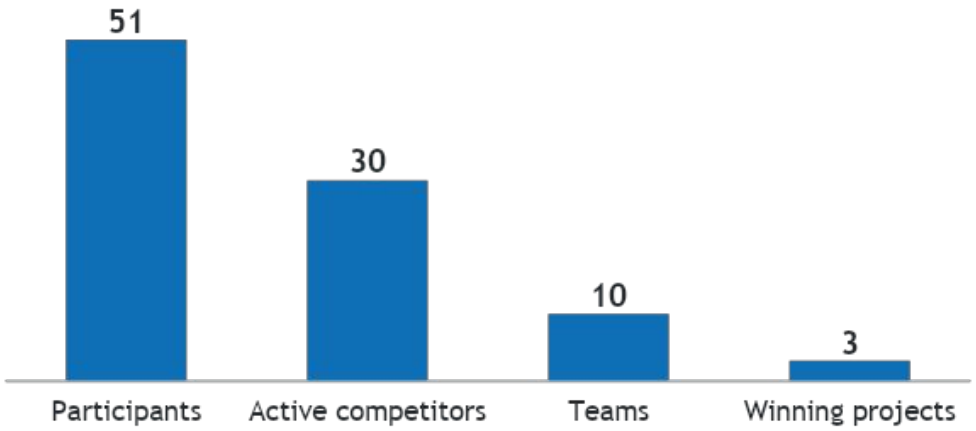
Before deploying, answer three questions

1. Who owns the data?
2. Who operates and publishes it?
3. Who pays after the project ends?

Source: EnCLOD Deliverable D3.3.1, section 7.4

Hackathons on the pilots' own data turned participation into prototypes

Olomouc hackathon, number



WHAT MADE IT WORK

1. Using the pilot's own open data was compulsory
2. A preparatory workshop ran three weeks before
3. A local university co-organised and hosted it

Hackathons also ran or were scheduled in Nova Gorica, Zilina, Debrecen and Vicenza. Source: EnCLOD Deliverable D3.3.1, section 7.5

Any municipality can replicate the approach in eight steps, four of them before buying sensors

PREPARE: NO HARDWARE YET

1 Choose a policy entry point

2 Map the city by microzoning

3 Run a gap analysis

4 Define data governance

DEPLOY AND SCALE

5 Procure data as a service

6 Publish from day one

7 Engage stakeholders

8 Measure with KPIs

Where to start: traffic and climate data involve no personal data and serve several city agendas at once.

Source: EnCLOD Deliverable D3.3.1, sections 4.2 and 7.7

Six recommendations make the approach replicable in any municipality

Data governance

Declare sensor data a public good in a binding framework

Sensor deployment

Design the whole network on microzones first

Procurement

Buy data as a service, with open formats mandatory

Engagement

Run data-compulsory hackathons with prepared participants

Training

Train staff on real needs, with local universities

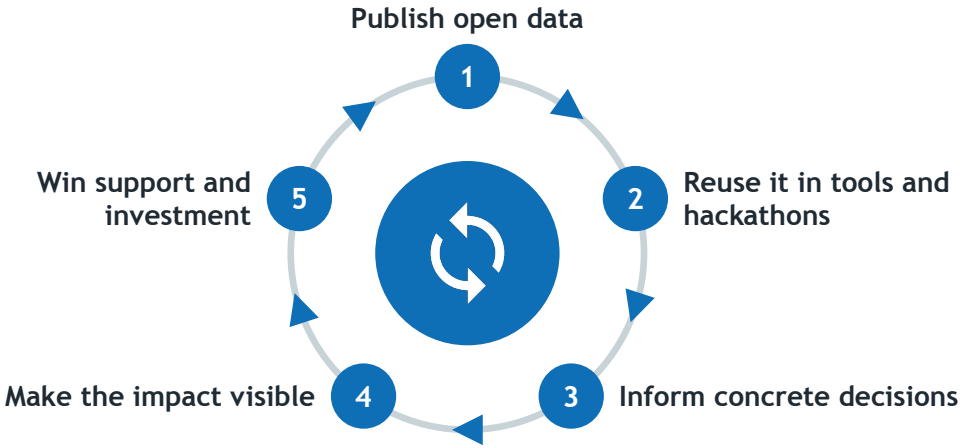
Replication

Reuse existing infrastructure; align with national agendas

Source: EnCLOD Deliverable D3.3.1, section 7.7

A self-reinforcing loop keeps open data alive, and the work continues beyond EnCLOD

THE LOOP



CONTINUATION

What continues after EnCLOD

- Olomouc's digital twin runs for five years, with open data and hackathons
- Annual hackathons with universities outlast single projects
- Council-adopted rules survive project cycles and new leadership
- Next horizon: digital governance, AI analytics, Green Deal goals

Source: EnCLOD Deliverable D3.3.1, sections 6, 7.5, 7.6 and 7.7

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Read the full text of the guidelines at: Link

Discover more about the EnCLOD project at:
www.interreg-central.eu/projects/enclod