MICAD

Metropolitan Inclusivity in Climate and Digital Transitions

Toolkit prototype for local authorities on how to do digital and climate transition with a metropolitan inclusive perspective

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Disclaimer

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Glossary

Actions - Concrete measures included in a metropolitan transition roadmap. Actions translate strategic priorities into implementable activities, with assigned responsibilities, resources, timelines, indicators and risks.

Diagnostic baseline - The shared starting point for the roadmap. It summarises the metropolitan territory, governance arrangements, climate and digital challenges, gaps, needs and available capacities.

Co-creation – A collaborative process through which metropolitan actors jointly define challenges, priorities, solutions and actions, ensuring that the roadmap reflects diverse knowledge, needs and capacities.

Hard governance spaces - Formal governance arrangements with legal mandates, defined competences, stable resources and decision-making powers, such as statutory metropolitan authorities or formal inter-municipal bodies.

Implementation mechanisms – The governance, coordination, funding, capacity and reporting arrangements that allow roadmap actions to be delivered in practice.

Living Labs - Structured co-creation processes where public authorities, stakeholders and users jointly test, refine and learn from solutions in real-life settings.

Metropolitan area - A functional urban territory made up of multiple municipalities connected through daily mobility, economic activity, services, infrastructure, environmental systems and shared challenges.

Metropolitan governance - The way metropolitan actors coordinate decisions, responsibilities, resources and actions across municipal and sectoral boundaries.

Metropolitan transition roadmap – A practical planning document that translates shared metropolitan priorities into coordinated climate and/or digital transition actions, including responsibilities, timelines, resources, monitoring arrangements and implementation mechanisms.

Soft governance spaces - Flexible cooperation arrangements based on voluntary participation, working groups, projects, networks or thematic partnerships. They can support coordination even when no formal metropolitan authority exists.

Stakeholder engagement – The structured involvement of public authorities, civil society, private actors, academia and communities throughout the roadmap process, from diagnosis to implementation and learning.

Strategic orientations – High-level directions agreed after the diagnostic phase, used to guide the structure of the roadmap and the selection of priority actions.

Twin transition – The coordinated development of climate and digital transitions, ensuring that digital tools support climate action and that digital transformation is guided by sustainability, inclusion and public value.

Introduction

This document is part of the **MICAD Toolkit**, developed under the MICAD project to support local and metropolitan authorities in designing and implementing inclusive climate and digital transition processes at metropolitan scale.

The Toolkit is composed of four interlinked modules that together guide metropolitan actors through the process of developing inclusive climate and digital transition roadmaps:

- **Module 1 – Analyse & Define**: establishes the territorial, governance, needs, and funding baseline for metropolitan transition planning.
- **Module 2 – Collaborate & Engage**: supports cooperation, stakeholder engagement, social inclusion, open innovation, and Living Lab processes.
- **Module 3 – Develop & Measure**: guides the development of transition roadmap components, implementation mechanisms, monitoring, and testing.
- **Module 4 – Communicate & Disseminate**: supports communication, dissemination, replication, scaling, and advocacy.

Each module can be used independently, depending on the specific needs and challenges faced by a metropolitan area. However, the modules are designed to be complementary. Together, they provide a coherent methodological pathway from diagnosis and cooperation to roadmap development, implementation, learning, and dissemination.

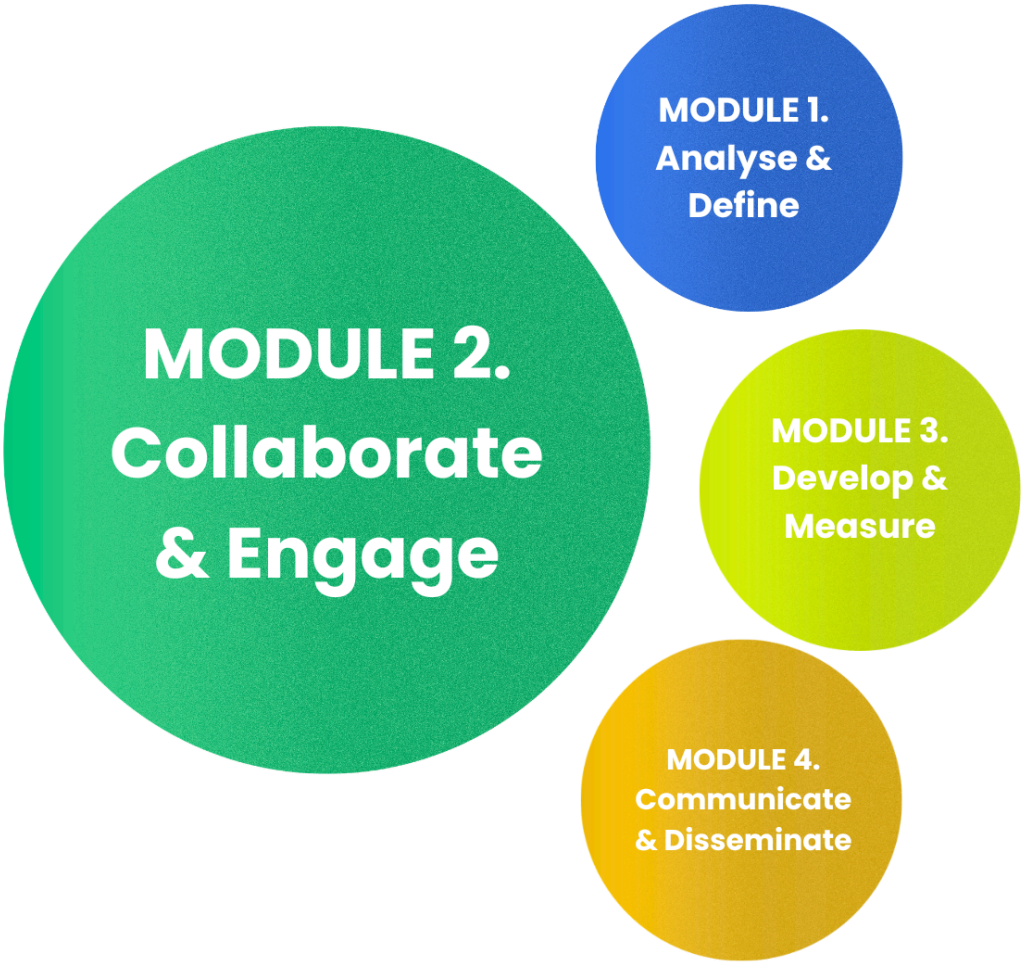
The Toolkit does not prescribe a single governance model or policy solution. Instead, it offers a flexible and adaptable framework that can be tailored to different metropolitan realities, capacities, and priorities.

The use of the Toolkit follows four simple steps:

1. **Identify the metropolitan challenge or question** - Start from a concrete issue, barrier, or planning need (e.g. governance coordination, stakeholder engagement, implementation, or monitoring).
2. **Locate the question in the Toolkit navigation table** - Use the navigation table below (Table 1) to find the question that best matches your challenge.
3. **Identify the corresponding module and topic** - Each question is linked to a specific module and topic within the Toolkit, guiding you to the most relevant section.
4. **Follow the step-by-step methodological guidance provided in the tool** - Each topic includes a structured tool with guiding questions, implementation steps, and practical examples to support action.

Questions that can emerge in the process of developing a roadmap	Where to find guidance
• Which metropolitan perimeter should serve as the shared spatial baseline for designing and delivering the roadmap?	Topic 1.1 (module 1)
• How are roles, responsibilities, and decision-making organised across the metropolitan area to deliver this roadmap?	Topic 1.2 (module 1)
• What are the priority metropolitan challenges and needs that this roadmap must address?	Topic 1.3 (module 1)
• How will this roadmap be financed in a coordinated and sustainable way?	Topic 1.4 (module 1)
• How will metropolitan actors cooperate in practice to co-create and deliver this roadmap?	Topic 2.1 (module 2)
• How can this roadmap be co-designed through open, inclusive, and transparent innovation processes?	Topic 2.2 (module 2)
• How can social inclusion be embedded into the design and implementation of this roadmap?	Topic 2.3 (module 2)
• How can Living Labs structure and anchor the co-creation of this roadmap?	Topic 2.4 (module 2)
• How should stakeholders be strategically engaged throughout the co-creation of this roadmap?	Topic 2.5 (module 2)
• How should the roadmap plan be structured to translate strategy into coordinated and actionable components?	Topic 3.1 (module 3)
• How can agreed objectives be translated into coordinated, sequenced and operational roadmap components?	Topic 3.2 (module 3)
• How will this roadmap be implemented in a coordinated, accountable and sustainable way?	Topic 3.3 (module 3)
• How will progress and impact of this roadmap be measured and used to inform adaptive decision-making?	Topic 3.4 (module 3)
• Which actions of the roadmap should be tested before full-scale implementation, and how?	Topic 3.5 (module 3)
• How should this roadmap be communicated to ensure trust, clarity and engagement?	Topic 4.1 (module 4)
• How can roadmap outputs be translated into reusable assets for peer metropolitan areas and professional ecosystems?	Topic 4.2 (module 4)
• Which roadmap actions are intended for scaling, and under what conditions can they be replicated across municipalities?	Topic 4.3 (module 4)
• How can this metropolitan roadmap be strategically advocated to influence policies, resources and institutional support across governance levels?	Topic 4.4 (module 4)

MODULE 2.
Collaborate & Engage



Understanding the Module

Metropolitan climate and digital transitions cannot be delivered by single institutions. They require cooperation across municipalities, metropolitan bodies, regional/national authorities, utilities, civil society, academia, businesses, and local communities.

Because metropolitan governance is multi-layered, coordination is complex–but also a strength when managed well: it enables pooling resources, aligning priorities, and combining knowledge.

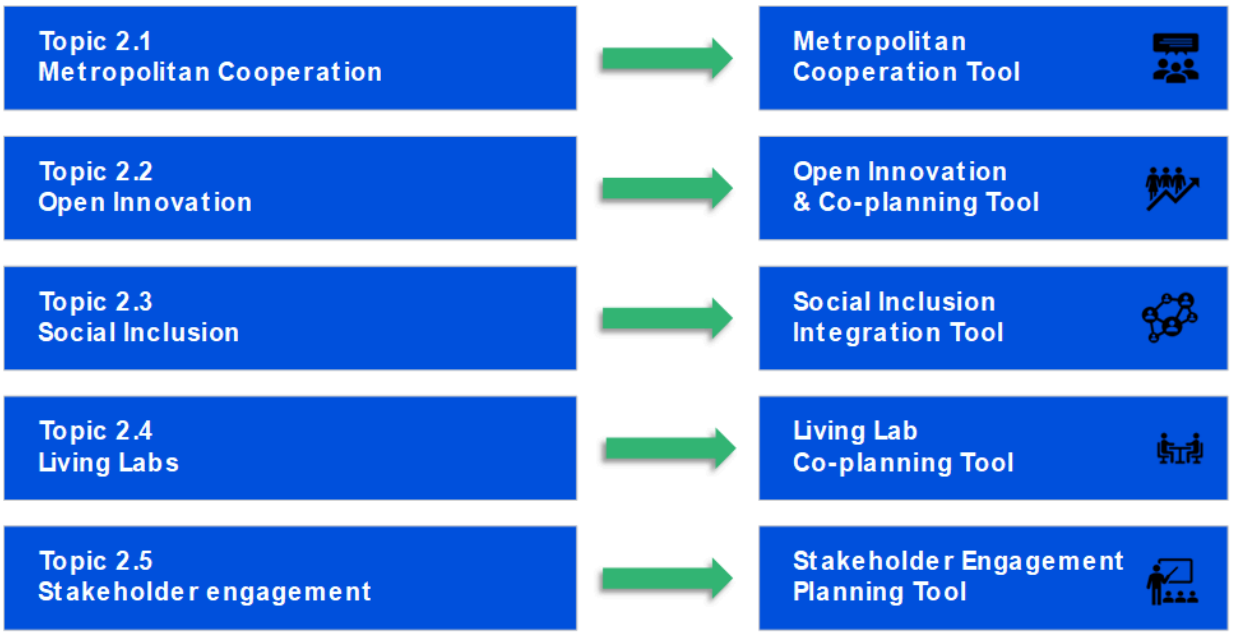
Collaboration does not happen automatically. It needs intentional structures, dedicated spaces, and routines that support co-planning, joint decision-making, experimentation, and shared accountability. Engagement goes beyond consultation: it includes iterative, participatory processes that build trust, mutual learning, and legitimacy.

Metropolitan authorities play a key enabling role by creating the conditions for municipalities and stakeholders to work together and co-own roadmaps that are context-specific, inclusive, and adaptive.

In this module, metropolitan cooperation (Topic 2.1) provides the foundation; open innovation (Topic 2.2) defines the principles and tools for opening planning processes; Living Labs (Topic 2.3) structure collective sense-making and prioritisation; stakeholder engagement (Topic 2.4) organises participation over time; and social inclusion (Topic 2.5) ensures that roadmap choices do not reproduce long-term inequalities.

List of Topics

Topic 2.1 Metropolitan cooperation
Topic 2.2 Open innovation
Topic 2.3 Social inclusion
Topic 2.4 Living Labs as drivers of local innovations
Topic 2.5 Stakeholders engagement



Topic 2.1. Metropolitan cooperation

CHALLENGE

Metropolitan areas consist of multiple municipalities, agencies and sectoral actors that share functional interdependencies but often lack stable and structured cooperation. Climate adaptation, digital innovation, mobility or housing challenges cannot be addressed effectively through isolated municipal action, yet collaboration is frequently fragmented, project-based or dependent on political cycles. Typical barriers include uneven engagement between core cities and smaller municipalities, competition for resources, weak cross-sectoral alignment, limited trust and information-sharing, unequal capacities, and situations where municipalities or stakeholders do not fully align on priorities. Digital tools and data are often fragmented or inaccessible across the metropolitan area.

BENEFITS OF THE ACTION

Strengthened metropolitan cooperation turns governance arrangements into operational practice by enabling coordinated planning, resource pooling and joint responses to shared challenges. It improves coherence across municipal borders, enhances financial and technical capacity, and supports interoperable digital solutions. Stable cooperation mechanisms build trust, transparency and legitimacy, while ensuring continuity beyond individual projects or political cycles. Flexible and inclusive cooperation formats allow metropolitan areas to respond to functional needs without over-institutionalisation, while creating a foundation for learning, long-term coordination and future institutional development where appropriate.

TOOLS/SOLUTIONS

The **Metropolitan Cooperation Tool** helps metropolitan areas design, strengthen and stabilise cooperation mechanisms that match functional needs and governance realities. Rather than promoting a single institutional model, the tool supports a continuum of cooperation formats**,** ranging from informal thematic networks to more formalised joint bodies.

The focus is on making cooperation operational by establishing clear coordination routines, shared incentives and inclusive participation. The tool supports authorities in mapping existing cooperation structures, identifying gaps and designing mechanisms for joint planning, investment and learning. Particular attention is given to ensuring the engagement of smaller or lower-capacity municipalities and to the use of shared digital tools and data platforms that facilitate collaboration. The objective is not institutional expansion per se, but the creation of reliable, trusted and durable cooperation practices that enable metropolitan actors to act collectively where joint solutions add value. These mechanisms form a critical enabling layer for subsequent topics on joint implementation and action delivery.

Guiding questions

- Which cooperation mechanisms already exist, and where do coordination gaps persist?
- Which forms of cooperation are realistic, inclusive and scalable in the metropolitan context?
- How can continuity and trust be ensured beyond individual projects or political cycles?

Step-by-step process

Step 1: Map existing actors and cooperation mechanisms. Identify formal and informal structures, including associations, ITI frameworks, working groups, agencies and project-based networks. Example of tools to map actors: quadruple helix (see topic 2.3 from module 2)

Step 2: Identify cooperation gaps and asymmetries. Assess where coordination is missing or duplicated, which policy areas lack joint working, and which municipalities or actors are under-represented (often due to capacity constraints).

Step 3: Select appropriate cooperation formats. Choose formats suited to the metropolitan context (e.g. thematic working groups, joint committees, shared service units, ad hoc task forces, rotating leadership platforms). Define mandate, membership and decision mode for each format.

Step 4: Strengthen incentives and support for collaboration. Combine incentives (joint calls and pooled budgets; co-financing bonuses; shared procurement; prioritised access to metropolitan services) with support measures (shared technical assistance team; template agreements; facilitation/mediation; capacity-building, peer-mentoring, exchange of best practices; shared digital tools and data access). Ensure incentives are transparent and benefit both larger and smaller municipalities.

Step 5: Establish cooperation routines. Set meeting frequency, agendas, communication protocols, decision-making steps, and data-sharing rules. Use shared calendars and short minutes to ensure continuity.

Step 6: Embed cooperation in metropolitan planning and delivery. Link cooperation formats between: (a) the metropolitan coordination unit/secretariat, (b) municipal administrations (larger and smaller municipalities), (c) key sectoral agencies/utilities, (d) stakeholder platforms. Align joint work with the metropolitan roadmap and reflect agreed priorities in municipal plans and annual work programmes.

Step 7: Monitor and adapt cooperation mechanisms. Review cooperation at set intervals (e.g. every 6-12 months) using simple indicators such as: participation rate by municipality/agency; continuity of attendance; number of joint decisions/actions delivered; uptake of shared services/tools; timeliness of agreed outputs; perceived trust and usefulness (short pulse survey); and support from peer-mentoring, number of peer-exchange. Use findings to adjust formats, membership, routines or incentive.

ILLUSTRATIONS

Institutionalised cooperation with democratic legitimacy (Verband Region Stuttgart, Germany)

The Stuttgart Region illustrates how formalised metropolitan cooperation can support long-term coordination. It operates through a long-standing metropolitan body with directly elected representatives, providing democratic legitimacy and continuity. This structure enables coordinated action in mobility, spatial planning and large-scale development, while thematic partnerships allow cooperation to be adapted to specific policy areas.

- ***Steps illustrated:*** *3, 5, 6.*
- ***Lesson:*** *Formalised cooperation with democratic legitimacy can ensure continuity, policy integration and stable metropolitan coordination.*

Cooperation through shared services (Upper Silesian-Zagłębie Metropolis - GZM, Poland)

GZM illustrates how metropolitan cooperation can be strengthened through concrete shared services. Its formal governance structure is complemented by practical cooperation in areas such as joint transport services, shared investments and thematic working groups. Financial contributions and visible service benefits, especially through integrated public transport, create incentives for municipalities to participate and remain engaged.

- ***Steps illustrated:*** *3, 4, 6.*
- ***Lesson:*** *Cooperation works best when it is anchored in concrete services that deliver visible value for participating municipalities.*

Voluntary but structured cooperation (Warsaw Metropolitan Association, Poland)

The Warsaw functional area illustrates how voluntary cooperation can remain effective when supported by stable structures and routines. Although there is no statutory metropolitan authority, coordination is organised through committees, working groups and EU-funded projects. Shared priorities and continuous dialogue help maintain cooperation across municipalities despite the absence of binding metropolitan powers.

- ***Steps illustrated:*** *1, 3, 5, 7.*
- ***Lesson:*** *Voluntary cooperation can be effective when it is supported by stable structures, clear routines and continuous dialogue.*

Topic 2.2 Open innovation

CHALLENGE

Digital and climate transition roadmaps are often co-designed with a limited set of institutional actors, while citizens, smaller municipalities, civil society, and local innovators remain marginally involved. Open innovation is frequently applied downstream through pilots or technical solutions, instead of being used upstream to structure inclusive and transparent co-planning of metropolitan roadmaps. At the same time, digital transformation risks reinforcing inequalities when participation relies on closed tools, opaque processes, or unequal access to data and decision-making.

Without open, inclusive, and transparent co-planning mechanisms, metropolitan roadmaps lack ownership, fail to reflect diverse needs, and reproduce power asymmetries. The challenge is to use open innovation and open-source approaches to democratise planning, enable meaningful participation, and empower actors to shape shared transition pathways.

BENEFITS OF THE ACTION

Applying open innovation to roadmap co-design strengthens inclusion, transparency, and shared ownership. It empowers municipalities, stakeholders, and citizens to contribute knowledge, priorities, and concerns in structured ways to the metropolitan roadmap. Open-source tools and participatory methods lower barriers to engagement,

enable traceability of inputs, and support accountability. By opening planning processes upstream, metropolitan authorities build trust, reduce resistance, and create roadmaps that reflect social diversity, territorial realities, and digital equity. Open innovation thus becomes a driver of democratic digital transformation, not only a method for innovation.

SOLUTIONS/TOOLS

The **Open Innovation Co-planning Tool** helps metropolitan authorities open the roadmap development process to municipalities, stakeholders, citizens and local innovators in a structured and transparent way. Its purpose is not only to collect ideas, but to ensure that contributions are documented, discussed, translated into roadmap priorities, and connected to implementation.

The tool combines:

- **Shared principles and participation rules**, such as a community manifesto or participation charter.
- **Governance and openness arrangements**, including roles, data-sharing rules, privacy provisions, licences and reuse conditions.
- **Participatory channels and platforms**, such as Decidim, Participa AMB, workshops, forums or local meetings.
- **Co-design and prioritisation formats**, such as thematic labs, Climathons, open discussions or participatory budgeting.
- **Feedback mechanisms**, showing how inputs are used in roadmap decisions.
- **Capacity support**, ensuring that smaller municipalities, civil society actors and underrepresented groups can participate meaningfully.

This tool helps ensure that open innovation is embedded upstream in the roadmap process, rather than limited to isolated pilots or technical solutions.

Guiding questions

- Which open-source or participatory tools can lower barriers, fluidify exchanges and increase transparency?
- How are contributions reflected in roadmap priorities and decisions?
- Does the roadplan contribute to the commons economy?

Step-by-step process

Step 1: Establish a shared vision and principles. Create a common basis for inclusive, transparent, and collaborative planning. Co-develop a Community Manifesto or similar reference document with municipalities and key stakeholders, defining shared values such as openness, transparency, inclusiveness, accessibility, and co-ownership.

Step 2: Map the ecosystem and open the process early. Identify relevant actors across the quadruple helix: public authorities, academia, private sector, and civil society. Pay particular attention to underrepresented groups, such as small municipalities, vulnerable populations, and small businesses. Involve stakeholders from the start to define challenges as well as possible solutions.

Step 3: Set governance, legal, and openness frameworks. Put in place the rules that will structure collaboration. This may include Memoranda of Understanding, participation agreements, data-sharing rules, privacy provisions, and intellectual property arrangements such as Creative Commons licences.

Step 4: Deploy open-source and participatory tools. Use open-source participation platforms such as Decidim or Participa AMB to collect ideas, host debates, document contributions, and share feedback. Combine digital tools with in-person formats such as workshops and public forums, and ensure accessibility in terms of language, usability, and digital skills.

Step 5: Co-design roadmap priorities through open innovation. Organise co-creation activities such as workshops, open discussions, or Climathons to identify priorities, discuss possible trade-offs, and develop solutions. Participatory budgeting can also help test and prioritise actions. This step should result in roadmap priorities grounded in diverse needs and territorial realities. Practical co-design and prioritisation methods can be supported by resources such as the Energy Living Lab Toolbox

Step 6: Build capacities for open innovation. Strengthen the ability of municipalities and key stakeholders to participate effectively. This includes supporting smaller municipalities and civil society actors, while also fostering a culture of openness, collaboration, and experimentation within public administrations. Capacity-building activities can be complemented with learning resources such as the SWEET Lantern Learning Hub.

Step 7: Integrate open innovation into implementation and scaling. Apply open innovation principles beyond planning by using them in pilot projects, Living Labs, and experimental initiatives. Share results openly, encourage peer learning, and support replication across municipalities.

Step 8: Institutionalise open innovation in metropolitan governance. Embed open innovation into policies, procedures, and monitoring systems so that it becomes a lasting governance practice rather than a one-off exercise. This may involve creating permanent structures such as innovation councils, participation platforms, or metropolitan Living Labs.

ILLUSTRATIONS

Open digital platform for co-designing metropolitan priorities (Metropolitan Area of Barcelona, Spain)

Participa AMB illustrates how a metropolitan participation platform can support open and transparent co-planning. The platform is used to collect inputs, debate priorities and validate strategic orientations across municipalities during planning processes. By making contributions visible and linking them to planning discussions, it helps structure participation beyond one-off consultation.

- ***Steps illustrated:*** *4, 5.*
- ***Lesson:*** *Open digital tools can support inclusive co-planning when they are clearly connected to roadmap priorities and decision points.*

Innovation marathon for urban climate challenges (Górnośląsko-Zagłębiowska Metropolia, Poland)

GZM Climathon 2024 illustrates how open innovation formats can mobilise young people, academia and local actors around metropolitan climate challenges. The annual 24-hour innovation marathon engaged students in developing creative solutions for urban climate challenges, with the 2024 edition focused on urban greenery. The event took place on 13-14 November 2024 at the Academy of Fine Arts in Katowice and resulted in four prize-winning projects.

- ***Steps illustrated:*** *2, 5, 6.*
- ***Lesson:*** *Short, challenge-based innovation formats can help metropolitan areas engage new actors, generate practical ideas and build capacity for climate action and green urban design.*

Citizens' Observatories for public accountability (Bogotá, Colombia)

Bogotá's Citizens' Observatories illustrate how open innovation can be applied to public accountability and collaborative governance. Since 2012, citizens have voluntarily participated in monitoring district and local administration through the District and Local Administration Follow-up Tool. The process combines evidence review, roundtable discussions, indicator-based assessment and follow-up meetings, allowing citizens and public authorities to discuss performance, identify priorities and formulate recommendations for improving public management.

- ***Steps illustrated:*** *2, 3, 4, 5, 8.*
- ***Lesson:*** *Open innovation can strengthen metropolitan governance when citizens are not only consulted, but given structured spaces, evidence and tools to monitor public action and co-produce institutional learning.*

Topic 2.3 Social inclusion

CHALLENGE

Metropolitan areas concentrate overlapping social, spatial, economic, and digital inequalities that shape unequal exposure to climate risks and unequal access to digital services. Without explicit inclusion criteria, roadmaps risk reinforcing dominant paradigms and existing inequalities. The challenge for metropolitan authorities is to ensure that inclusion is deliberately embedded in roadmap priorities, sequencing, and governance, so that transition pathways remain adaptable, equitable, and socially sustainable.

BENEFITS OF THE ACTION

Embedding social inclusion by default into roadmap development enables: early identification of exclusion risks and blind spots; fairer distribution of climate and digital transition benefits; reduced exposure of vulnerable groups to climate and digital risks; stronger legitimacy and public trust in metropolitan strategies; more effective and context-sensitive transition pathways; improved social cohesion across metropolitan territories; increased long-term resilience and sustainability of transitions.

SOLUTIONS/TOOLS

The **Social Inclusion Integration Tool** integrates social inclusion criteria directly into the development of metropolitan climate and digital transition roadmaps. Rather than adding inclusion as a parallel policy layer, it ensures that equity considerations shape priorities. Combining vulnerability mapping, equity impact analysis, and cross-departmental coordination helps to assess how transition options affect different population groups and territories over time. Based on this analysis, metropolitan authorities can adjust roadmap priorities, identify where targeted measures are required, and align transition actions with social policies.

The tool supports the definition of inclusion-related objectives and indicators within the roadmap, clarifies responsibilities across departments, and strengthens accountability. By embedding inclusion into strategic planning, metropolitan authorities ensure that climate and digital transitions reduce inequalities rather than locking in exclusionary patterns through long-lasting infrastructural and governance choices.

Guiding questions

- Which population groups and territories are most exposed to exclusion risks through the roadmap choices?
- How do roadmap priorities and sequencing reflect (or challenge) dominant planning paradigms and assumptions?
- How can inclusion objectives be translated into concrete targets, indicators, and governance mechanisms within the roadmap?

Step-by-step process

Step 1: Identify vulnerability patterns. Analyse social, spatial, economic, and digital inequalities across the metropolitan area using quantitative data, territorial diagnostics, and inputs from social inclusion and social affairs departments. This step establishes where and for whom transition impacts may be uneven.

Step 2: Assess paradigm and lock-in effects. Examine how existing planning assumptions, norms, and governance models shape long-term impact. In collaboration with social policy experts and frontline services, assess who benefits, who is excluded, and which effects may persist over time if left unchallenged.

Step 3: Define inclusion objectives for the roadmap. Co-define clear inclusion objectives that the roadmap must achieve (e.g. access to services, protection from climate risks, opportunity creation). Ensure alignment between transition ambitions and existing social policy priorities.

Step 4: Integrate social departments into prioritisation. Formally involve social inclusion departments in prioritising roadmap actions. This ensures that sequencing, territorial focus, and investment choices reflect vulnerability patterns and not only technical or economic criteria.

Step 5: Align policies and departments. Coordinate climate, digital, housing, mobility, and social policies to avoid contradictory measures and siloed implementation. This step strengthens coherence at metropolitan scale.

Step 6: Design targeted and proportionate measures. Translate inclusion objectives into roadmap actions addressing high-risk groups or territories, drawing on the operational knowledge of social services, NGOs, and care organisations.

Step 7: Define indicators and shared responsibilities. Integrate social inclusion indicators into the roadmap and assign shared accountability between transition leads and social inclusion departments.

Step 8: Monitor inclusion impacts over time. Track social impacts using quantitative data and qualitative feedback from social services and affected communities to detect unintended effects early.

Step 9: Institutionalise inclusive redesign. Embed the systematic involvement of social inclusion departments in roadmap reviews and updates to prevent long-term lock-in of exclusionary planning choices.

ILLUSTRATIONS

Institutionalising social inclusion in metropolitan planning (Greater Geneva Region, Switzerland/France)

The Greater Geneva Region illustrates how social inclusion can be embedded upstream in metropolitan planning through interdisciplinary research and territorial analysis. CITÉ, a laboratory hosted by HES-SO Geneva, supports regional planning by combining social work, architecture, business and engineering perspectives. Through its *Territoire en recherche* programme, it brings lived experience, vulnerability analysis and social equity into planning discussions, particularly in neighbourhoods undergoing transition pressures such as social housing retrofitting.

- ***Steps illustrated:*** *1, 2, 3, 4, 5.*
- ***Lesson:*** *Social inclusion becomes more effective when vulnerability analysis and lived experience are integrated early into metropolitan planning, rather than added after priorities have already been defined.*

Social inclusion informing energy transition co-planning (Pamplona, Spain)

Pamplona's oPEN Lab Living Lab in the Rochapea neighbourhood illustrates how neighbourhood-level evidence can inform broader energy and climate planning. The Living Lab generated insights on residents' needs, affordability constraints, accessibility issues and governance gaps, which were then discussed with municipal departments. This helped adjust planning assumptions, prioritisation criteria and stakeholder coordination mechanisms for future energy transition actions.

- ***Steps illustrated:*** *1, 2, 4, 5, 8.*
- ***Lesson:*** *Local experimentation can help metropolitan authorities identify exclusion risks early and adapt transition planning to residents' real needs, capacities and constraints.*

Topic 2.4. Living Labs as drivers of local innovations

CHALLENGE

Despite their potential, Living Labs are often implemented as isolated, time-bound pilot projects, disconnected from metropolitan governance structures and strategic planning. Their results are not systematically translated into policy decisions, roadmaps, or long-term institutional learning. For metropolitan authorities, the challenge is to move from experimentation as an action to Living Labs as orchestrators. This requires coordination across municipalities and departments, capacity building for participatory processes, and evaluation frameworks that transform local experimentation into shared metropolitan learning.

BENEFITS OF THE ACTION

When embedded into metropolitan transition strategies, Living Labs provide: stronger cross-sectoral learning and coordination; increased trust and legitimacy through participatory processes; evidence-based decision-making grounded in real-life experimentation; higher social acceptance of transition measures; improved capacity to scale and replicate successful initiatives; greater institutional agility through continuous feedback loops.

SOLUTIONS/TOOLS

The **Living Lab Co-planning Tool** provides a structured participatory process for the joint development of metropolitan climate and digital transition roadmaps. Its main purpose is to support how collective analysis, stakeholder input, and strategic choices are translated into a shared metropolitan roadmap.

Based on the Living Lab Integrative Process (LLIP), the tool organises iterative phases of diagnosis, collective sense-making, prioritisation, and alignment. These phases enable metropolitan authorities, municipalities, and other relevant stakeholders to jointly examine challenges, reflect on trade-offs, and progressively converge on common strategic directions. Through facilitated working sessions, the tool helps consolidate diverse perspectives, local knowledge, institutional constraints, and sectoral inputs into coherent planning decisions. It supports the definition of roadmap priorities, sequencing, responsibilities, and timelines, while strengthening legitimacy and shared ownership. The Living Lab Co-planning Tool therefore functions as a planning engine that helps produce a coherent, adaptable, and collectively supported metropolitan roadmap.

Guiding questions

- Which strategic priorities and trade-offs must be jointly addressed to co-plan a coherent metropolitan roadmap for digital and climate transitions?
- Which public authorities, stakeholders, and communities need to be involved to ensure legitimacy, coordination, and shared ownership of the roadmap?
- How will inputs from participatory Living Lab processes be translated into concrete roadmap decisions, responsibilities, and timelines?

Step-by-step process

Step 1: Empathise - Analyse practices and impacts. Analyse existing metropolitan strategies, data, and planning practices shaping climate and digital transitions. Identify 1-3 dominant practices or assumptions with strong long-term impacts (positive or negative), focusing on root causes rather than symptoms (e.g. sectoral silos, technical-first planning, exclusion of social perspectives).

Step 2: Define - Frame the roadmap challenge. Define the core roadmap challenge emerging from the analysis and decide the Living Lab scope (thematic or territorial). Clarify what the roadmap must change in current planning practices and how success will be measured at planning level. Confirm the hosting entity responsible for coordination of co-planning.

Step 3: Ideate - Co-planning with stakeholders. Map stakeholders influencing the roadmap using a power-interest matrix. Interview key actors to validate assumptions and identify barriers and levers. Organise co-planning sessions to build a shared vision, identify priorities, and discuss trade-offs across municipalities and sectors.

Step 4: Prototype - Draft the roadmap. Translate co-planning outcomes into a first roadmap version (priorities, sequencing, responsibilities, timelines). Use visualisation tools (roadmaps, timelines, system maps) to make assumptions and dependencies explicit.

Step 5: Test - Create feedback loops. Submit the roadmap draft to stakeholders through validation workshops and retrospectives. Collect feedback on coherence, feasibility, and inclusiveness, and revise accordingly.

Step 6: Implement - Anchor the roadmap. Support integration of the roadmap into metropolitan planning routines, aligning departments, municipalities, and mandates. Maintain dialogue during early implementation (see topic 2.1).

Step 7: Scale up and scale out. Monitor implementation to identify learning points, adjust priorities where needed, and strengthen metropolitan co-planning capacity over time. Document methods, visual tools, and lessons learned, and share them through peer-learning and open resources to inspire other metropolitan areas to replicate the co-planning process rather than specific solutions.

Step 8: - Institutionalisation. Transition the Living Lab from a one-off co-planning initiative in a project into a permanent metropolitan capability. Embed the co-planning process, roles, and learning routines into metropolitan planning cycles, governance practices, and strategic reviews. Formalise responsibilities, ensure continuity of facilitation and resources, and integrate periodic reflection to revisit assumptions and update the roadmap over time. This institutionalisation enables sustained learning, prevents planning lock-in, and supports knowledge transfer and inspiration for other metropolitan areas. For more details, see topic 3.3 Implementation mechanisms.

ILLUSTRATIONS

Co-planning the climate neutrality pathway (Padua, Italy)

The Padova 2030 Living Lab illustrates how a Living Lab can structure co-planning for climate neutrality. Established by the Municipality of Padua, it brought together municipal departments, universities, businesses, NGOs, neighbourhood councils and citizens to jointly analyse priorities and define commitments aligned with the Sustainable Energy and Climate Action Plan and the EU Climate City Contract. Workshops, consultations and an online platform supported broad participation, including stakeholder mapping through the quadruple helix and influence-interest matrix.

- ***Steps illustrated:*** *2, 3, 4, 5, 6, 8.*
- ***Lesson:*** *Living Labs can help translate stakeholder commitments into strategic planning instruments when participation is structured, validated and connected to formal climate neutrality pathways.*

Aligning local insights with city-wide energy planning (Amsterdam, Netherlands)

Energy Lab Zuidoost illustrates how a Living Lab can connect neighbourhood-level initiatives with broader energy planning. The Lab supports Amsterdam's energy-neutral ambition by acting as a knowledge hub where residents, companies, knowledge institutions and public authorities engage in continuous dialogue. Through regular workshops and cross-lab exchanges, local experiences are translated into strategic insights that inform municipal energy planning.

- ***Steps illustrated:*** *3, 5, 6, 7, 8.*
- ***Lesson****: Living Labs can act as coordination and learning mechanisms when they connect local experimentation with wider planning processes and institutional decision-making.*

Topic 2.5 Stakeholder engagement

CHALLENGE

Stakeholder engagement is essential for metropolitan roadmap co-planning, yet it is often fragmented, short-term, or uneven. Even when stakeholders are already identified and mapped, engagement practices tend to be siloed across departments or municipalities, leading to duplication, inconsistent messages, and stakeholder fatigue. Participation is frequently dominated by well-organised actors, while vulnerable or less visible groups remain underrepresented. Metropolitan authorities also face difficulties in maintaining engagement over time, as stakeholders disengage when participation lacks clarity, continuity, or visible impact. Limited internal capacity to facilitate dialogue, manage conflicts, and integrate inputs into strategic planning further exacerbates the problem. Without structured engagement processes and feedback loops, participation risks being perceived as tokenistic, undermining trust, legitimacy, and long-term

ownership of climate and digital transition roadmaps. This topic focuses on sustaining engagement once stakeholders are identified and cooperation structures are in place.

BENEFITS OF THE ACTION

A structured stakeholder engagement approach enables: clearer roles and expectations for stakeholders; reduced engagement fatigue through targeted participation; stronger and more consistent involvement over time; improved alignment between roadmap priorities and stakeholder interests; increased legitimacy and shared ownership of decisions; better anticipation of conflicts and missing voices; stronger cross-sectoral cooperation; higher acceptance and implementability of roadmap outcomes.

SOLUTIONS/TOOLS

Stakeholder Engagement Planning Tool builds on stakeholder mapping to define how, when, and for what purpose each stakeholder group is involved in the roadmap co-planning process. The tool helps metropolitan authorities move from ad-hoc consultation to intentional, role-based and time-bound engagement, reducing fatigue and improving commitment.

Engagement formats (e.g. workshops, panels, bilateral dialogues, digital platforms) are selected according to stakeholders' influence, interests, availability, and capacities. The approach emphasises continuity without overload, ensuring that stakeholders are mobilised only when their contribution is meaningful. Clear feedback loops are built in so participants understand how their inputs influence roadmap decisions, which is critical to maintaining motivation over time. Rather than maximising participation at all stages, the tool supports right-sized engagement, strengthening legitimacy, sustaining trust, and improving the quality of collective decision-making throughout the roadmap development cycle.

Guiding questions

- Which stakeholders should be engaged at each roadmap co-planning stage, and how intensively?
- How can engagement be structured to avoid fatigue while sustaining long-term participation?
- How will stakeholder contributions be reflected back to participants to maintain trust and motivation?

Step-by-step process

Step 1: Define engagement objectives. Clarify when stakeholder input is required, for which roadmap decisions, and at what level of intensity.

Step 2: Define stakeholder roles. Assign clear, differentiated roles (inform, consult, co-plan, validate) to avoid unnecessary participation.

Step 3: Select engagement formats. Choose formats adapted to stakeholder profiles and capacities, combining online and in-person options.

Step 4: Plan engagement over time. Develop a phased engagement plan aligned with roadmap milestones, balancing continuity and workload.

Step 5: Facilitate dialogue and interaction. Moderate discussions, manage power imbalances, and ensure equitable participation. Organize co-design sessions and participatory workshops to bring diverse stakeholders together and co-create the transition roadmaps, integrating multiple perspectives and fostering shared ownership of the process.

Step 6: Integrate inputs into planning. Translate stakeholder contributions into concrete roadmap priorities, actions, and responsibilities.

Step 7: Provide feedback and transparency. Communicate decisions, explain trade-offs, and show clearly how inputs were used. Organize regular reflexive monitoring sessions that bring together key stakeholders to jointly evaluate the results of past activities (retrospective sessions) and plan future actions (prospective sessions).

Step 8: Monitor engagement quality. Assess participation levels and satisfaction, representation, and fatigue signals; adjust formats and frequency accordingly.

Step 9: Sustain long-term engagement. Embed engagement routines into governance structures to support continued collaboration beyond the roadmap phase.

ILLUSTRATIONS

Quadruple-helix governance for stakeholder co-design (Medellín, Colombia)

Medellín illustrates how a quadruple-helix governance model can structure stakeholder roles and support dialogue between government, academia, industry and citizens. Through innovation spaces such as Ruta N and FutuMed, the city creates real-world environments for co-designing solutions with universities, grassroots organisations and local actors. This helps ensure that stakeholder inputs are connected to strategic planning and long-term ownership.

- ***Steps illustrated:*** *2, 5, 6.*
- ***Lesson:*** *Quadruple-helix governance can strengthen stakeholder engagement when roles are clear, dialogue is structured and inputs are linked to strategic planning.*

Reflexive monitoring for adaptive engagement (Genk, Belgium)

Genk illustrates how reflexive monitoring can help sustain stakeholder engagement over time. In the oPEN Lab project, a retrospective session after 1.5 years of community involvement combined timeline exercises and facilitated dialogue with municipal services, local organisations and residents. The session assessed what worked, where engagement declined and how stakeholder inputs influenced decisions, helping adapt engagement formats and reinforce trust.

- ***Steps illustrated:*** *4, 5, 7, 8, 9.*
- ***Lesson:*** *Reflexive monitoring helps maintain long-term engagement by creating feedback loops, identifying fatigue and adapting participation formats over time.*

Participatory workshops with neighbourhood councils (Padua, Italy)

Padua illustrates how existing neighbourhood governance structures can be used to support climate transition co-planning. Through the 2ISECAP project, participatory workshops with neighbourhood councils enabled citizens to discuss priorities, trade-offs and local impacts linked to the Climate Neutrality Mission. This helped connect local perspectives with strategic planning and ensured broader representation in the transition process.

- ***Steps illustrated:*** *3, 5, 6, 9.*
- ***Lesson:*** *Participatory workshops are more effective when they build on existing local governance structures and create a clear link between citizen input and strategic planning.*

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