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.

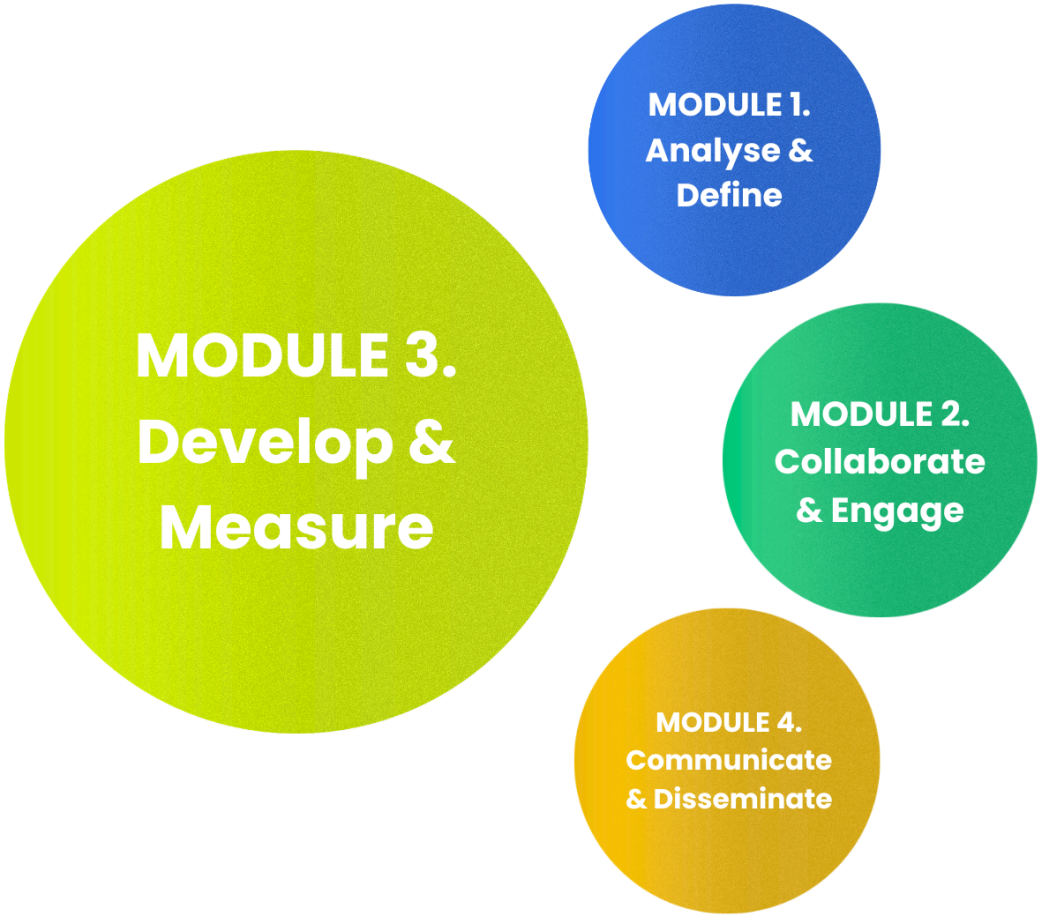
The Toolkit does not prescribe a single governance model or policy solution. Instead, it offers a flexible and adaptable framework that can be tailored to different metropolitan realities, capacities, and priorities.

The use of the Toolkit follows four simple steps:

- **Identify the metropolitan challenge or question** - Start from a concrete issue, barrier, or planning need (e.g. governance coordination, stakeholder engagement, implementation, or monitoring).
- **Locate the question in the Toolkit navigation table** - Use the navigation table below (Table 1) to find the question that best matches your challenge.
- **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.
- **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 3.
Develop & Measure



Understanding the Module

Module 3 is the core operational stage of the Toolkit, where metropolitan areas move from analysis and cooperation-building to the creation of concrete transition strategies and roadmaps. While previous modules focus on understanding territory, governance, stakeholders, and needs, this module explains how to translate that knowledge into coherent, actionable, and measurable transition pathways.

The module guides metropolitan areas through three interconnected processes. First, they co-develop a shared metropolitan vision and strategy, aligning municipalities and key actors around common priorities, long-term ambitions, and guiding principles for climate and digital transitions. Second, they develop transition roadmaps that translate strategic priorities into concrete actions, responsibilities, timelines, and resources. The Toolkit recommends separate but interconnected Climate and Digital Roadmaps, structured around priority themes and measurable outcomes. Third, the module introduces implementation and monitoring mechanisms, including coordination structures, funding models, capacity-building approaches, and monitoring frameworks with indicators and reporting routines.

Overall, Module 3 supports metropolitan actors in turning strategic intent into tangible, measurable improvements across the metropolitan area.



List of Topics

Topic 3.1 Structuring the Metropolitan Transition Roadmap

Topic 3.2 Develop Twin transition components (climate and digital)

Topic 3.3 Implementation mechanisms

Topic 3.4 Progress & Impact Assessment

Topic 3.5 Prototyping & testing

Topic 3.1 Structuring the Metropolitan Transition Roadmap

CHALLENGE

Metropolitan areas often have multiple strategies, action plans, and sectoral roadmaps related to climate, digitalisation, mobility, energy, or social inclusion. While these documents contain valuable objectives, they are frequently fragmented, use different structures, and are not designed to function together as a single operational roadmap. As a result, metropolitan authorities face difficulties in organising transition actions into a coherent structure that shows how strategic priorities translate into concrete actions, who is responsible, how actions are financed, and how progress will be monitored. Without a clear and shared roadmap structure, transition efforts risk becoming inconsistent, overloaded, or disconnected from implementation.

BENEFITS OF THE ACTION

A clearly structured metropolitan transition roadmap provides a shared operational framework for all municipalities and key actors, clarifying how strategic priorities translate into concrete actions. It strengthens coherence across climate, digital, and sectoral policies by organising them within a single roadmap structure, reducing fragmentation and duplication. A common structure improves transparency regarding responsibilities, sequencing, and resource needs, supporting coordination and joint decision-making. It also facilitates monitoring, learning, and updating over time, as progress can be tracked consistently across sections. Finally, a well-defined roadmap structure enhances communication, political ownership, and replicability, making the transition process more robust and credible.

SOLUTIONS/TOOLS

The **Metropolitan Transition Roadmap Structure Tool** supports metropolitan actors in defining a common structure for their transition roadmap and clarifies how different types of content are organised within it. The tool translates key inputs from Module 1 (territorial definition, governance mapping, metropolitan challenges and needs, and funding orientations) and the collaboration and engagement approaches of Module 2 into a coherent roadmap outline.

Metropolitan actors are encouraged to organise their roadmap around the following **core sections**:

Common Vision & Strategic Directions	Climate Transition Component	Digital Transition Component	Implementation Mechanisms	Monitoring & Evaluation	Prototyping & Testing
Shared long-term ambitions and a limited set of priority directions for action derived from metropolitan challenges and needs	Priority climate themes, actions, sequencing, and targets.	Priority digital themes, actions, sequencing, and targets, including digital enablers for climate action.	Governance, coordination, funding, and capacity arrangements that enable delivery.	Indicators, targets, reporting routines, and learning processes.	Planned pilots, Living Lab activities, and experimentation pathways feeding into roadmap refinement and scaling.

Guiding questions

- What main sections should our metropolitan transition roadmap include to cover vision, climate and digital components, implementation, monitoring, and experimentation in a coherent way?

- How can we organise outputs from Modules 1 and 2 within these sections so that analysis and co-creation clearly feed into the roadmap?
- What level of detail is needed in each section at this stage to ensure the roadmap is both strategic and actionable?

Step-by-step process

Step 1: Consolidate inputs from Modules 1 and 2. Gather the key outputs from Module 1 (territorial definition, governance mapping, metropolitan challenges/needs, funding orientations) and the agreed collaboration and engagement set-up from Module 2 (who is involved, how decisions are made, how input is collected).

Step 2: Confirm the roadmap scope and format. Agree whether you will develop (a) a Climate Roadmap and a Digital Roadmap as separate but coordinated documents, or (b) one combined roadmap document with two components. Confirm the time horizon (e.g. 2030/2040) and the level of detail expected at this stage.

Step 3: Agree on the core roadmap sections. Adopt a shared roadmap structure and confirm the sections to be included (Vision & Strategic Directions; Climate Component; Digital Component; Implementation Mechanisms; Monitoring & Evaluation; Prototyping & Testing). Adapt section titles only if needed for local terminology.

Step 4: Define what goes into each section. For each section, agree the minimum content requirements (e.g. what must be included, what remains optional) and define what information will be carried over from Module 1 and what will be co-produced through Module 2 processes.

Step 5: Assign section ownership and a drafting workflow. Assign a responsible lead (institution/unit) for each roadmap section and define a simple drafting workflow (inputs needed, contributors, review points, and how comments are handled).

Step 6: Validate the structure with key stakeholders. Test the roadmap structure in a short validation session with municipalities and key actors to confirm usability and completeness. Lock the structure as the common "backbone" for developing Topics 3.2–3.5.

How Modules 1 & 2 Feed into the Metropolitan Transition Roadmap

Roadmap section	Inputs from Module 1 (Analyse & Define)	Inputs from Module 2 (Collaborate & Engage)
Common Vision & Strategic Directions	Metropolitan climate & digital challenges and needs (Topic 1.3); territorial priorities (Topic 1.1); governance constraints and opportunities (Topic 1.2)	Co-created vision statements; stakeholder priorities; agreed guiding principles
Climate Transition Component	Identified climate challenges and priority needs (Topic 1.3); territorial risk patterns (Topic 1.1)	Co-created climate priorities; feedback from thematic working groups
Digital Transition Component	Identified digital challenges and priority needs (Topic 1.3); digital readiness snapshot (Topic 1.5)	Co-created digital priorities; inputs from digital stakeholders and service providers
Implementation Mechanisms	Governance mapping (Topic 1.2); funding orientations and gaps (Topic 1.5)	Agreed cooperation models; roles and responsibilities; partnership arrangements

Monitoring & Evaluation	Existing indicators in local strategies; identified data availability and gaps	Agreed success criteria; participatory definition of indicators
Prototyping & Testing	Priority challenge areas suitable for experimentation (Topic 1.3)	Living Lab ideas; pilot proposals; co-design outcomes

ILLUSTRATIONS

Aligning metropolitan strategies into a transition roadmap (Barcelona Metropolitan Area – AMB, Spain)

The Barcelona Metropolitan Area illustrates how a Metropolitan Transition Roadmap can be assembled by aligning existing metropolitan strategies and investment frameworks rather than starting from scratch. AMB's climate, mobility, spatial planning and digital programmes provide a shared long-term direction, which is then translated into priority action packages, multi-annual investments and distributed implementation responsibilities across metropolitan services, municipalities and sectoral agencies. Monitoring arrangements help track progress and support updates over time.

- ***Steps illustrated:*** *1, 2, 4, 5.*
- ***Lesson:*** *A Metropolitan Transition Roadmap can be built by coherently aligning existing strategies, investment plans and governance arrangements, even when no single standalone roadmap document exists.*

Structuring a metropolitan climate roadmap from evidence to action (Grand Lyon, France)

Lyon's Climate, Air and Energy Territorial Plan illustrates how a metropolitan roadmap can move from a consolidated evidence base to a clear operational structure. High-level objectives are organised into a shared strategic backbone and then translated into a coherent set of actions across sectors such as energy, buildings, mobility and air quality. The co-development process with municipalities and key stakeholders also helps validate the structure and responsibilities before it becomes a common metropolitan reference.

- ***Steps illustrated:*** *1, 2, 3, 6.*
- ***Lesson:*** *A Metropolitan Transition Roadmap is strengthened when strategic objectives are organised into a shared structure and translated into clearly defined, co-developed actions with assigned responsibilities.*

Making the roadmap operational through a flagship mobility project (Guadalajara, Mexico)

The Metro Line 3 case illustrates how a roadmap becomes actionable when it is linked to a concrete metropolitan intervention. The project shows how technical studies, institutional coordination and regulatory arrangements can be translated into a clear scope, phased timeline and delivery logic. It also provides a practical example of how to define minimum roadmap content, including sequencing, responsibilities, resource implications and milestones for implementation and monitoring.

- ***Steps illustrated:*** *3, 4, 5.*
- ***Lesson:*** *A Metropolitan Transition Roadmap becomes operational when it specifies concrete scope, sequencing, responsibilities, resources and milestones to guide implementation and monitoring.*

Topic 3.2 Develop transition components

CHALLENGE

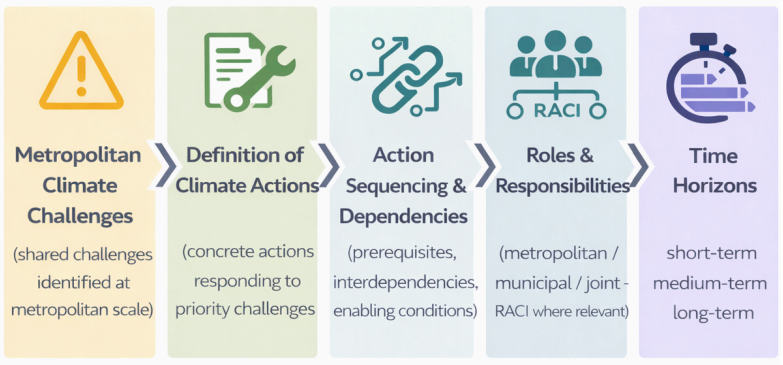
Metropolitan authorities often enter the roadmap development phase with a clear understanding of their priority climate and digital challenges, strategic objectives and desired outcomes, as established through diagnostic and co-planning processes. However, they frequently struggle to translate these agreed priorities into a structured and operational roadmap architecture. While cities may have clarity on what needs to change, difficulties arise in organising actions into coherent Climate and Digital Transition Components, defining their internal logic, and ensuring alignment and sequencing across the twin transition. Without a clear structuring approach, roadmaps risk becoming lists of disconnected actions rather than a coordinated delivery framework that reflects strategic intent and metropolitan-level priorities.

BENEFITS OF THE ACTION

Developing structured Climate and Digital Transition Components enables metropolitan authorities to convert strategic priorities into an operational roadmap framework. It provides a clear logic for grouping actions, defining internal coherence within each component, and clarifying how climate and digital actions reinforce one another within the twin transition. This approach supports realistic sequencing, facilitates coordination across municipalities and departments, and improves transparency regarding implementation responsibilities. By structuring actions into components rather than isolated measures, metropolitan roadmaps become more actionable, easier to communicate, and better suited to guide implementation, monitoring and future scaling.

SOLUTIONS/TOOLS

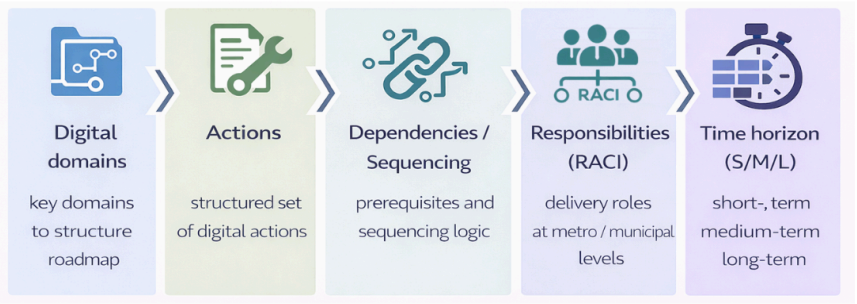
Climate Component



The Climate Component structures metropolitan climate action by translating existing climate objectives and policies into sequenced and implementable actions. It focuses on how actions are prioritised, coordinated and prepared for delivery across the metropolitan territory, rather than restating strategic ambitions. Climate actions are organised across key domains (e.g. energy, buildings, mobility, land use, environmental quality and resilience) as a structuring lens. The core function of the component is to support action sequencing based on dependencies, readiness and implementation constraints.

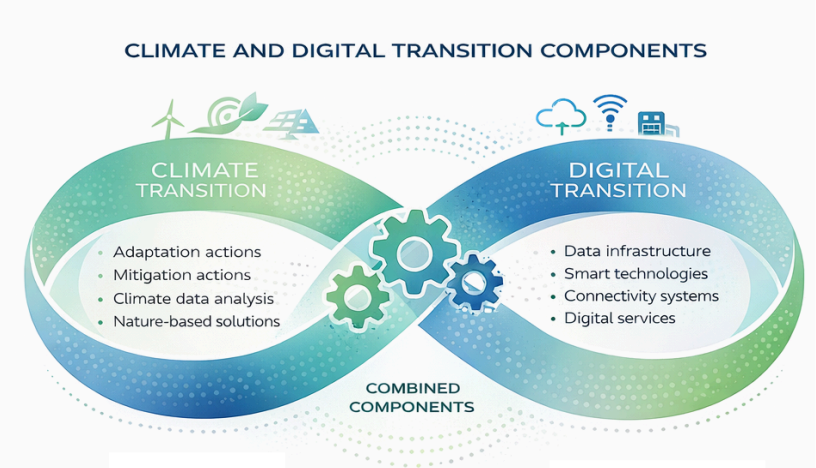
The Climate Component follows a common pathway: identification of priority challenges, definition of actions, sequencing based on interdependencies, indicative responsibility allocation and assignment of short-, medium- and long-term horizons. Actions include placeholders for roles, timelines, resources, monitoring indicators and risks, supporting early feasibility checks. Alignment with existing frameworks is ensured, while coordination with the Digital Component is addressed through the Twin Transition logic.

Digital Component



The Digital Component translates digital transition needs and priorities into structured and sequenced actions, taking into account differences in municipal capacity and readiness. Digital actions follow the same common pathway as the Climate Component and are organised across key digital domains (e.g. connectivity, data governance, platforms, cybersecurity, skills and digital public services). The pathway distinguishes enabling, deployment and longer-term transformation actions, while clarifying responsibilities, timelines and implementation constraints. Digital actions that support climate objectives are explicitly linked to the Climate Component.

Twin transition – coordination and alignment logic



The Twin Transition logic ensures coordination between climate and digital roadmaps developed as distinct but aligned instruments. It requires explicit identification of interdependencies, recognising that climate action often depends on digital capabilities, while digital investments must support sustainability and public value. This approach helps avoid duplication and misaligned sequencing, reduces implementation risks and supports coherent metropolitan transition planning.

Guiding questions

- Which climate and digital actions need to be coordinated and sequenced at metropolitan level to ensure inclusive implementation across municipalities?
- Which actions act as prerequisites or enablers for others and therefore need to be implemented first?
- What enabling conditions must be in place so that all municipalities can participate effectively in the roadmap delivery?

Step-by-step process

Step 1: Review agreed metropolitan transition objectives – Review existing climate and/or digital objectives to ensure they are sufficiently specific to guide action development. Clarify the roadmap scope (comprehensive or thematic) and translate high-level objectives into a limited number of actionable priority areas (See Annex 6)

Step 2: Map actions to transition components – Assign each defined action to one primary transition component (Climate, Digital or Integrated) based on its main contribution, providing a clear structural backbone for the roadmap.

Step 3: Identify dependencies and interlinkages – Analyse key functional, temporal and governance-related dependencies between climate and digital components to support coordinated sequencing and avoid fragmented implementation.

Step 4: Check readiness and capacity – Assess governance arrangements, technical and digital capacities, skills and organisational readiness to identify constraints that may affect implementation and sequencing.

Step 5: Assign indicative responsibilities – Allocate indicative responsibility for each transition component and action at metropolitan, municipal or joint level to clarify ownership and coordination needs. Could be merged with the Step 6.

Step 6: Indicate time horizons – Assign short-, medium- or long-term horizons to actions based on readiness, dependencies and strategic importance, supporting logical sequencing without defining detailed implementation plans.

ILLUSTRATIONS

Sequencing climate actions into a metropolitan roadmap (Grenoble, France)

The Grenoble 2030 Energy Master Plan illustrates how climate objectives can be translated into structured transition components with clearly sequenced actions. The roadmap organises measures by thematic areas and places them across indicative time horizons, making visible the progression from enabling actions to more advanced implementation stages. This helps clarify dependencies between actions and operationalise long-term climate objectives through phased and coordinated planning.

- ***Steps illustrated:*** *1, 2, 3, 6.*
- ***Lesson:*** *Climate transition components become more actionable when objectives are organised by theme, sequenced over time and linked to dependencies between actions.*

Action-oriented circular economy roadmap (Helsinki, Finland)

Helsinki's Roadmap for Circular and Sharing Economy illustrates how roadmap actions can be structured with clear responsibilities and indicative timeframes. Actions are organised across short-, medium- and long-term horizons, supporting sequencing and feasibility assessment. The roadmap also shows how responsibilities can be clarified early in the development phase, while leaving detailed implementation planning to a later stage.

- ***Steps illustrated:*** *2, 5, 6.*
- ***Lesson:*** *Assigning actions to responsible actors and time horizons helps turn transition components into a practical structure for implementation, monitoring and future updates.*

Topic 3.3 Implementation mechanisms

CHALLENGE

Agreeing on priorities and designing transition roadmaps does not guarantee effective implementation. Metropolitan areas often struggle to translate plans into coordinated action due to fragmented competences, uneven municipal capacities, misaligned budgets and the absence of stable delivery routines. Actions may lack clear owners, decision-making pathways or operational support, while monitoring and risk management are weakly connected to day-to-day delivery. Smaller municipalities frequently face capacity constraints that limit their ability to participate fully. Without dedicated implementation mechanisms, metropolitan roadmaps risk remaining aspirational documents, with coordination breaking down at the point of delivery and trust between partners gradually eroding.

BENEFITS OF THE ACTION

Clear implementation mechanisms turn metropolitan roadmaps into functioning delivery systems. They provide clarity on roles, responsibilities and decision-making, support coordination across municipalities and sectors, and link actions to budgets, staff and timelines. Stable routines help maintain momentum beyond political cycles, enable early identification of bottlenecks and support adaptive management. By embedding monitoring and risk awareness into everyday work, implementation mechanisms improve transparency, accountability and credibility, ensuring that strategic ambitions are realised through coordinated and measurable action.

SOLUTIONS/TOOLS

The **Implementation Mechanisms tool** helps metropolitan areas organise how agreed transition actions are delivered in practice. While Topic 3.2 defines *what* actions are developed, this tool focuses on *when*, *how*, *by whom* and *under which operational conditions* actions are implemented. The tool supports the establishment of delivery structures (e.g. coordination units, steering groups, thematic leads), the assignment of clear action ownership and partner roles, and the alignment of implementation with available capacities and resources. It promotes predictable routines for coordination, reporting and problem-solving, ensuring that delivery does not depend on ad hoc arrangements or individual actors.

Implementation mechanisms also integrate basic risk awareness and adjustment procedures, enabling metropolitan actors to respond to delays, capacity constraints or external changes. The aim is not to create heavy bureaucracy, but to provide **light, reliable and scalable operational arrangements** that sustain coordinated action across the metropolitan area.



Guiding questions

- Who is responsible for delivering each action, and how are roles shared between metropolitan and municipal levels?
- What operational structures and routines are needed to support coordinated delivery over time?
- How can implementation remain flexible while ensuring accountability and continuity?

Step-by-step process

Step 1: Define implementation leadership and coordination. Designate or confirm the body responsible for coordinating delivery of the agreed roadmap actions, building on cooperation arrangements established in Module 2. This step does not create new cooperation structures; it clarifies implementation leadership, escalation pathways and coordination roles for delivery (e.g. secretariat, lead municipality, steering group).

Step 2: Assign action ownership and roles. For each roadmap action, designate an **Action Owner** and identify accountable and responsible actors at metropolitan and municipal levels. Where relevant, apply a **RASCI logic** (Responsible-Accountable-Supportive-Consulted-Informed) to clarify partner and support roles and avoid overlaps or gaps in delivery. Validate capacity and adjust roles where needed.

Step 3: Align resources and operational capacities. Identify staff needs, expertise gaps and support requirements, especially for lower-capacity municipalities. Link actions to available funding mechanisms and align with municipal budgeting cycles.

Step 4: Develop implementation timelines. Sequence actions with clear milestones and deadlines. Synchronise metropolitan and municipal planning calendars where possible and specify dependencies between actions.

Step 5: Establish delivery and reporting routines. Agree on coordination routines (meetings, agendas, decision logs), reporting templates and review frequencies. Use shared tools or platforms to support transparency and continuity.

Step 6: Integrate basic risk management. Identify key political, financial, technical and capacity-related risks. Define mitigation measures and simple early-warning signals to trigger corrective support.

Step 7: Review and adapt implementation arrangements. Conduct periodic reviews to assess whether structures, roles and routines remain fit for purpose. Adjust responsibilities, timelines or support measures based on evidence and experience.

ILLUSTRATIONS

Combining formal planning and Living Labs for climate neutrality (European cities - 2ISECAP)

The 2ISECAP project illustrates how Living Labs can support the implementation of climate neutrality pathways by connecting formal spatial planning processes with bottom-up stakeholder engagement. Through collaborative work with municipalities, local and regional authorities, and stakeholders, the project strengthened governance arrangements, built implementation capacity and created practical tools for cities and regions working on the energy transition. The project's booklet documents the methodology, results and experiences of six pioneering municipalities across Europe.

- ***Steps illustrated:*** *1, 2, 3, 5, 7.*
- ***Lesson:*** *Implementation mechanisms are stronger when formal planning structures are combined with participatory Living Lab processes, capacity building and continuous learning.*

Topic 3.4 Progress and impact assessment

CHALLENGE

Metropolitan transition pathways cannot be managed effectively without systematic insight into whether actions are progressing as planned and delivering meaningful results. Many metropolitan areas implement climate and digital actions without a shared framework to track progress, compare performance across municipalities, or

understand emerging risks. Data is often fragmented, indicators inconsistent, and reporting routines weakly connected to decision-making. Impact assessment is particularly demanding, as it requires baselines, analytical capacity and longitudinal data to understand whether actions contribute to broader transition objectives. When monitoring is treated as an administrative obligation rather than a governance tool, strategies become static, learning is limited, and metropolitan authorities lose the ability to adapt actions to changing conditions or demonstrated outcomes.

BENEFITS OF THE ACTION

A structured progress and impact assessment system provides metropolitan authorities with continuous visibility over implementation and results. It supports adaptive decision-making by linking evidence to roadmap updates, investment choices and coordination mechanisms. A shared monitoring framework improves comparability across municipalities, strengthens accountability and enables mutual learning. Transparent reporting enhances legitimacy by demonstrating tangible results to political leaders, residents and funders. Impact assessment further strengthens the case for continued or scaled investment by showing how actions contribute to climate objectives, digital inclusion, resilience or service accessibility.

SOLUTIONS / TOOLS

The **Progress & Impact Assessment tool** enables metropolitan areas to systematically track implementation progress and evaluate the results of their transition actions over time. This tool focuses on **what is achieved, how performance evolves, and how evidence informs adjustment**. The tool supports metropolitan actors in defining indicators, baselines and targets linked directly to roadmap actions and transition components. It promotes harmonised data collection across municipalities and sectors, proportionate to available capacity, and encourages the use of shared dashboards or reporting templates. Importantly, assessment is framed as a **learning and steering mechanism** rather than a compliance exercise.



By combining progress monitoring (Are actions on track?) with impact-oriented reflection (Are actions making a difference?), the tool helps identify delays, bottlenecks and unintended effects early. It also supports the identification of effective practices that merit scaling. The ultimate purpose is to ensure that metropolitan transition pathways remain evidence-based, adaptive and credible over time.

Guiding questions

- How can progress and results of transition actions be measured consistently across the metropolitan area?
- How will monitoring results inform adjustments to actions, priorities or timelines?
- How can evidence on impact strengthen learning, accountability and legitimacy?

Step-by-step proces

Step 1: Define the assessment scope. Clarify which elements will be monitored: actions, outputs, outcomes and selected impacts with the theory of change. Ensure alignment with transition components and roadmaps.

Step 2: Develop a metropolitan indicator framework. Agree on a limited set of indicators linked to roadmap actions and cross-cutting objectives (e.g. emissions, accessibility, digital inclusion). Define baselines and indicative targets.

Step 3: Assign data ownership and collection routines. Identify data holders and agree on formats, frequency and responsibilities. Keep requirements proportionate to municipal capacities. Ensure that FAIR principles and GDPR are followed.

Step 4: Set up progress reporting routines. Establish regular reporting cycles (e.g. quarterly or annual) using standard templates or dashboards.

Step 5: Review progress and assess impact. Analyse implementation status and emerging results across municipalities. Use both quantitative data and qualitative insights to understand effects and unintended consequences. Organise retrospective workshops with stakeholders.

Step 6: Enable adaptive management. Use assessment results to adjust actions, timelines, coordination mechanisms or targets. Feed conclusions into planning and budgeting cycles.

Step 7: Communicate progress transparently. Share selected results through public summaries or dashboards to strengthen trust and accountability.

ILLUSTRATIONS

Participatory climate monitoring informing metropolitan alignment (Winterthur / Zurich Metropolitan Region, Switzerland)

Winterthur illustrates how a city-level monitoring and co-planning tool can generate structured inputs for wider metropolitan roadmap development. Through the Klima-Cockpit Winterthur, the city consolidates data, targets and measures across sectors such as energy, mobility and buildings, making them accessible to administrations, stakeholders and the public. These insights support local climate planning while also contributing evidence, priorities and tested approaches to discussions within the Zurich Metropolitan Region.

- ***Steps illustrated:*** *2, 4, 5, 7.*
- ***Lesson:*** *Local monitoring platforms can support metropolitan alignment when data, targets and lessons learned are made transparent and used to inform wider roadmap discussions.*

Progress and impact assessment enabling adaptive management (São Paulo, Brazil)

São Paulo illustrates how progress and impact assessment can support adaptive governance. Through the SMAE system, the city tracks implementation progress and indicators linked to the PlanClima strategy, covering 43 concrete actions across municipal departments. The system provides visibility on delays and performance trends, helping responsible units identify bottlenecks early. In parallel, the Participe+ platform gives public access to results and channels citizen feedback, allowing monitoring evidence to inform adjustments to timelines, responsibilities and implementation methods.

- ***Steps illustrated:*** *4, 5, 6, 7.*
- ***Lesson:*** *Integrated monitoring systems strengthen learning and enable timely adjustment of transition actions based on evidence and public feedback.*

Topic 3.5 Prototyping and Testing

CHALLENGE

Metropolitan areas are under pressure to deliver effective climate and digital actions, yet many proposed solutions remain untested in real local conditions. Traditional planning approaches often move directly from design to implementation, leaving little room to test assumptions, adapt to operational realities, or involve stakeholders early. This increases the risk of deploying solutions that are technically sound but poorly aligned with local needs, capacities, or political contexts. Solutions also perform unevenly across metropolitan territories. Measures suited to dense urban cores may not work in peri-urban or smaller municipalities with different infrastructures and socio-economic profiles, potentially reinforcing inequalities or creating unsustainable costs.

BENEFITS OF THE ACTION

Integrating prototyping and testing into metropolitan climate and digital transitions bridges the gap between strategy and delivery. By validating solutions in real-life contexts before large-scale deployment, metropolitan authorities reduce risks, avoid costly mistakes, and increase the likelihood that actions perform as intended. Testing across diverse municipalities reveals how local conditions affect feasibility, supporting adaptable and equitable transition pathways. Structured experimentation also improves integration between climate and digital measures by identifying technical, organisational, and behavioural interdependencies early. From a financial perspective, small-scale pilots generate concrete evidence on costs, impacts, and scalability, strengthening investment decisions. Early stakeholder involvement enhances acceptance, trust, and long-term legitimacy of metropolitan transition governance.

SOLUTIONS/TOOLS

The **Prototyping & Testing tool** supports metropolitan areas in designing and implementing structured experimentation processes that validate climate and digital solutions before full-scale deployment. It provides a practical framework for translating roadmap objectives into testable prototypes, pilots, or demonstrators that can be assessed under real operational, social, and governance conditions.

The tool encourages metropolitan authorities to treat prototyping as an integral part of transition governance, rather than as an isolated innovation activity. Prototypes can take multiple forms, ranging from technical pilots (e.g. sensor networks, data platforms, digital services) to organisational or policy experiments (e.g. new governance arrangements, service delivery models, incentive schemes, or participation formats).

Regardless of form, each prototype is designed with a clear learning objective, defined scope, and measurable success criteria.

By embedding prototyping within the broader roadmap and monitoring framework, the tool ensures that experimentation feeds directly into metropolitan decision-making. Evidence generated through testing supports informed choices on sequencing, investment, standardisation, and replication, while reducing the risk of technological lock-ins or inequitable outcomes.

Guiding questions

- Which roadmap actions would benefit most from prototyping or testing before large-scale deployment, and which key assumptions (technical, organisational, behavioural, financial) must be tested to reduce risk before large-scale deployment?
- Where and with whom should prototyping take place to reflect metropolitan diversity and ensure inclusive participation across different municipal contexts and user groups?
- How will the prototype be evaluated, integrated, and used to inform decisions on adaptation, scaling, or discontinuation within metropolitan climate and digital transition roadmaps?

Step-by-step process

Step 1: Identify actions suitable for prototyping. Review the climate and digital transition roadmaps to identify actions that involve uncertainty, innovation, strong interdependencies, or significant investment risks. Prioritise actions where assumptions need to be tested before scaling, such as new technologies, service models, governance arrangements, or behaviour-dependent measures.

Step 2: Define the prototype objectives and learning questions. For each selected action, clearly define what the prototype aims to test. Translate strategic intentions into testable hypotheses (e.g. technical feasibility, user uptake, interoperability, cost-efficiency, governance viability). Specify success and failure criteria to guide evaluation. Define indicators, data sources, and monitoring methods to assess prototype performance

Step 3: Select testing sites and contexts. Choose representative municipalities, neighbourhoods, or facilities that reflect the diversity of the metropolitan territory. Ensure inclusion of different urban forms, capacity levels, and socio-economic contexts, including smaller or peri-urban municipalities where feasible.

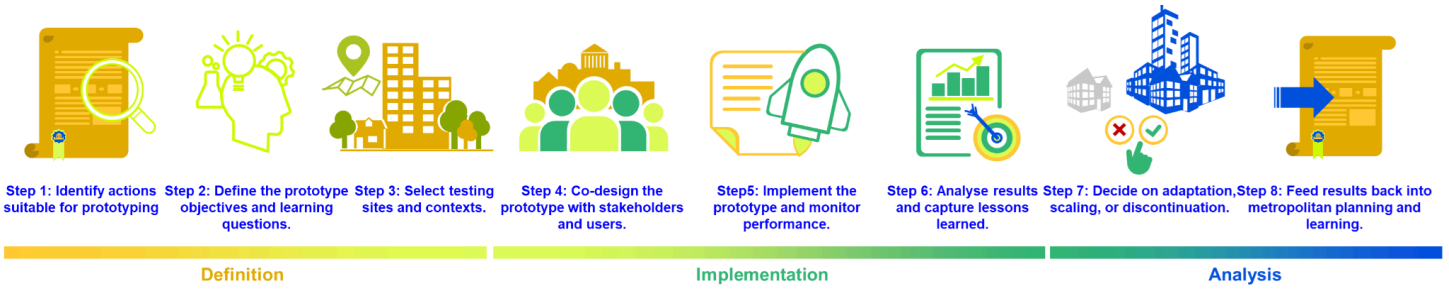
Step 4: Co-design the prototype with stakeholders and users. Engage relevant stakeholders, technical teams, service providers, and end-users in refining the prototype design. Address usability, accessibility, operational constraints, and governance implications early. Ensure inclusive participation and clear communication of roles and expectations.

Step 5: Implement the prototype and monitor performance. Deploy the prototype under real-life conditions for a defined testing period. Monitor technical performance, user experience, costs, maintenance needs, governance challenges, and unintended effects. Document issues, adaptations, and contextual factors throughout the testing phase.

Step 6: Analyse results and capture lessons learned. Assess prototype results against predefined criteria. Identify what worked, what did not, and why. Pay particular attention to differences across testing sites and municipal contexts, as well as implications for equity, scalability, and interoperability.

Step 7: Decide on adaptation, scaling, or discontinuation. Based on evidence, decide whether the prototype should be adapted, scaled up, replicated in other contexts, integrated into the roadmap, or discontinued. Define the conditions, resources, and governance arrangements required for next steps.

Step 8: Feed results back into metropolitan planning and learning. Integrate lessons learned into transition roadmaps, implementation mechanisms, and monitoring frameworks. Share results across municipalities and stakeholders to support learning, capacity-building, and replication.



ILLUSTRATIONS

<u>Testing a digital participation platform with communities</u> (Galle, Sri Lanka)

The e-Sabha App illustrates how prototyping can be used to test a digital participation platform before wider deployment. The platform was developed to improve communication between local authorities and residents, and was first implemented in a limited number of local contexts. This allowed authorities to test usability, citizen uptake and institutional responsiveness, while identifying technical and organisational constraints. Stakeholders and end-users were involved early, enabling iterative refinement and informing decisions on further roll-out.

- ***Steps illustrated:*** *2, 3, 4, 5, 6, 7.*
- ***Lesson:*** *Digital participation tools should be tested with users and institutions before scaling, so that usability, uptake and governance constraints can be addressed early.*

<u>Testing digital public service delivery tools</u> (Siddharthanagar, Nepal)

Siddharthanagar illustrates how prototyping can translate digital governance ambitions into testable public service models. Digital service delivery tools were implemented on a small scale to improve administrative efficiency and citizen access. The pilot tested technical feasibility, staff capacity and user acceptance, while monitoring operational challenges, costs and skills needs. Lessons from the testing phase informed adjustments and decisions on whether and how to extend digital services more broadly.

- ***Steps illustrated:*** *2, 3, 5, 6, 7.*
- ***Lesson:*** *Small-scale testing helps public authorities assess whether digital services are feasible, usable and institutionally manageable before wider implementation.*

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