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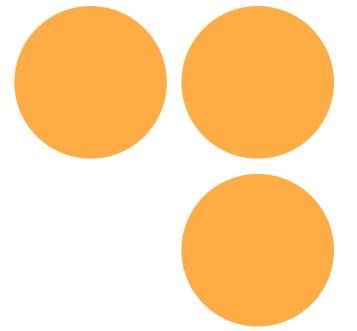


WHITE PAPER

A PATHWAY TO EVIDENCE-BASED POLICY APPROACHES TO OUR URBAN FUTURE

TWIN2EXPAND

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A PATHWAY TO EVIDENCE-BASED POLICY APPROACHES TO OUR URBAN FUTURE

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The White Paper presents Evidence-Based Design and Planning (EBDP) as a practical approach for strengthening transparency, accountability, and effectiveness in planning decision-making. Drawing on findings from the TWIN2EXPAND project, the paper identifies key structural barriers to evidence use, including fragmented data systems, limited analytical capacity, weak regulatory requirements, and insufficient monitoring. In response, it outlines a policy framework and a set of practical tools to support the integration of evidence into planning workflows. The paper argues that institutionalizing EBDP is essential to support more equitable, efficient, and climate-resilient urban development.

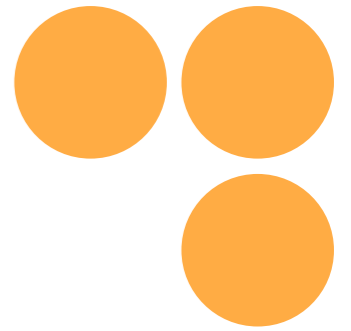
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EXECUTIVE SUMMARY

Cities are facing increasing pressures from climate change, demographic shifts, mobility challenges, uneven service provision, and widening spatial inequalities. Addressing these challenges requires planning systems capable of making decisions that are transparent, accountable, and grounded in evidence.

Yet planning policy often remains dominated by broad visions and strategic narratives that are only loosely connected to measurable conditions on the ground. While visions provide direction, they rarely include clear baselines, performance indicators, or mechanisms for evaluating whether planning decisions achieve their intended outcomes. The result is a persistent gap between planning ambition and spatial reality.

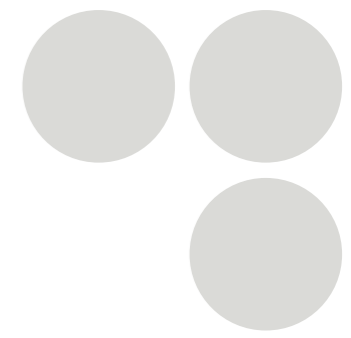
Evidence-Based Design and Planning (EBDP) offers a practical way to bridge this gap. By integrating spatial analytics, environmental data, socioeconomic information, and stakeholder insight, EBDP enables planning authorities to understand existing conditions more accurately, test planning assumptions, prioritize interventions, and monitor outcomes over time. Importantly, EBDP does not replace professional judgement or political decision-making; it strengthens both by making their foundations more transparent and open to evaluation.

Research undertaken through the [TWIN2EXPAND project](#) demonstrates the value of this approach. Evidence-based analyses conducted across several planning contexts, including service accessibility, urban green infrastructure, and spatial connectivity, revealed disparities and performance gaps that were not clearly visible in existing policy frameworks. These findings highlight the limitations of planning systems that rely primarily on vision and narrative without systematic evidence.

This White Paper advocates that Evidence-Based Design and Planning should become **a core principle of contemporary planning policy**. It outlines the structural barriers that currently limit the use of evidence, proposes a practical framework for embedding evidence into planning workflows, and identifies key policy actions that ministries and municipalities can take to support this transition.

Institutionalizing EBDP will enable planning systems to operate with greater clarity, fairness, efficiency, and resilience, ensuring that urban development decisions respond to real conditions and deliver measurable public value.





THE POLICY GAP: WHEN VISION OUTRUNS EVIDENCE

Planning policies frequently articulate ambitions for sustainability, accessibility, inclusion, and balanced development. These ambitions are essential for shaping long-term urban futures. However, they are often expressed in broad narrative terms without measurable baselines or systematic evaluation mechanisms.

As a result, planning systems may appear strategic while lacking the analytical tools required to test whether their assumptions reflect actual spatial conditions. Decisions are frequently justified through precedent, intuition, or political priorities rather than through transparent analysis of evidence.

This gap between aspiration and evidence creates several risks.

First, **inefficiencies in public investment** can arise when infrastructure, services, or development projects are located without clear understanding of spatial demand or accessibility patterns.

Second, **territorial inequalities** may persist or intensify when underserved communities are not identified through systematic analysis.

Third, **public trust in planning institutions** can weaken when decisions appear opaque or disconnected from lived experience.

Finally, planning systems struggle to **learn and adapt over time** when plans are not linked to measurable indicators or evaluation processes.

Vision remains essential in planning. Cities require direction, ambition, and collective imagination. However, vision without evidence is insufficient for addressing the complex spatial challenges facing contemporary urban environments.

Evidence-Based Design and Planning addresses this gap by linking planning ambitions to measurable spatial realities and by enabling planning systems to evaluate and improve their decisions over time.

WHAT EVIDENCE-BASED DESIGN AND PLANNING MEANS

Evidence-Based Design and Planning (EBDP) supports planning and design decisions through the systematic use of empirical evidence, spatial analysis, and stakeholder knowledge. By testing scenarios, comparing alternatives, and assessing potential impacts before implementation, EBDP helps planners and decision-makers reduce risks and improve the effectiveness of long-term investments in the built environment. It enables more informed visioning, structured evaluation of planning options, and transparent justification of decisions. Advances in spatial modelling and open data, such as those developed through [TWIN2EXPAND](#), make evidence-informed planning increasingly feasible even in data-constrained or resource-limited contexts.

- **Multiple sources of evidence**

Urban systems are complex and cannot be understood through a single dataset or metric. EBDP draws on diverse forms of evidence, including spatial analysis, environmental modelling, demographic trends, and community knowledge, to create a comprehensive understanding of urban conditions.

- **Iterative interpretation**

Evidence must be analyzed and interpreted within planning processes. Professional judgement remains central, but it is exercised within a structured framework that allows assumptions to be tested and refined as new information becomes available.

- **Transparent justification and evaluation**

Planning decisions should be traceable to the evidence that informed them. This transparency strengthens accountability and enables authorities to evaluate outcomes after implementation, closing the loop between planning intention and real-world impact.

Recent advances in spatial technologies -including Geographic Information Systems (GIS), network analysis, environmental modelling, and urban data platforms- have significantly expanded the tools available for EBDP. However, tools alone are not sufficient. Evidence must be embedded within institutional processes if it is to influence planning decisions consistently.

THE EVIDENCE–PRACTICE GAP IN URBAN PLANNING

Despite growing recognition of its importance, evidence remains unevenly integrated into planning practice. The reasons are largely structural.

One barrier is **fragmented data ecosystems**. Relevant datasets are often dispersed across ministries, municipalities, and agencies, stored in incompatible formats or updated at different intervals. This fragmentation makes it difficult to develop a coherent understanding of spatial conditions.

A second barrier is **limited analytical capacity** within public authorities. Many municipalities lack training, or resources to conduct spatial analysis routinely. Analytical work is therefore often outsourced or undertaken only in specific projects rather than embedded within everyday planning workflows.

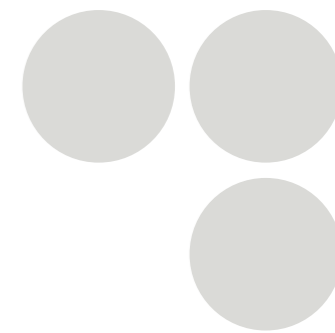
A third barrier lies in **regulatory frameworks that do not require evidence justification**. Planning procedures may encourage references to sustainability or accessibility without requiring authorities to demonstrate baseline conditions, define indicators, or evaluate outcomes.

A fourth barrier relates to **political incentives**. Visionary plans and strategic announcements are often more visible and politically attractive than analytical work that exposes constraints or trade-offs. Evidence can complicate narratives of progress by highlighting disparities or difficult choices.

Finally, planning systems frequently lack **monitoring and feedback mechanisms**. Plans are rarely revisited systematically once approved, limiting opportunities for institutions to learn from experience or adapt to changing conditions.

These structural barriers mean that evidence, even when available, often remains peripheral to policy decisions.





A POLICY FRAMEWORK FOR INSTITUTIONALISING EBDP

Embedding EBDP within planning systems requires coordinated institutional change. This White Paper proposes five mutually reinforcing principles.

- **Evidence justification**

Major planning decisions should be accompanied by concise evidence statements explaining what data and analyses were used, what patterns they revealed, and how they informed the final proposal.

- **Shared spatial data infrastructure**

Planning authorities require access to interoperable spatial datasets covering population distribution, land use, transport networks, environmental indicators, and service provision.

- **Indicator-based planning and monitoring**

Planning objectives should be linked to measurable indicators that track change over time and allow authorities to evaluate whether policies achieve their intended goals.

- **Participatory co-interpretation of evidence**

Stakeholder participation should extend beyond consultation on final proposals. Communities and organizations should engage in interpreting spatial evidence and identifying planning priorities.

- **Capacity building**

Municipalities and ministries require sustained investment in analytical skills, digital tools, and institutional learning to support EBDP practices.

Together, these principles create the institutional conditions necessary for evidence to become a routine component of planning practice.

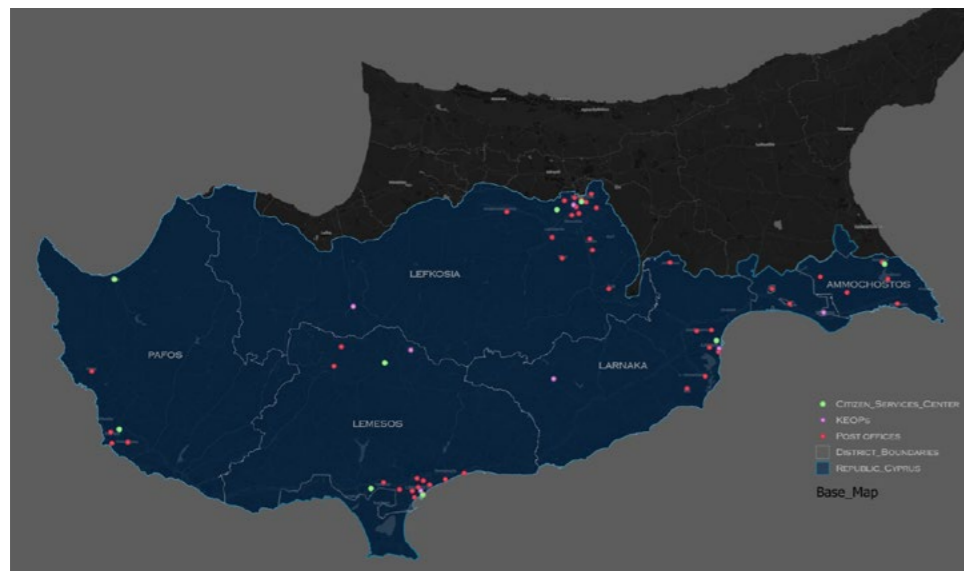


INSIGHTS FROM TWIN2EXPAND

The TWIN2EXPAND project highlights several lessons for advancing EBDP:

- Evidence-based planning is feasible even in **data-constrained contexts** when minimum data requirements and appropriate analytical workflows are defined.
- **Open and automated spatial models** can support transparent and cost-effective planning processes.
- **Institutional readiness is as important as technical capacity**, and diagnostic tools can help align analytical ambition with governance conditions.
- **Ecological indicators can be integrated into planning analysis**, enabling biodiversity and environmental performance to be considered alongside spatial and socioeconomic factors.

Further information on the tools, datasets, and methodological outputs developed through TWIN2EXPAND is available at: [TWIN2EXPAND project results](#)



TWIN2EXPAND analysed accessibility to Citizens' Service Centres and Citizens Centres across national, regional, and local scales to understand how location affects equitable access, regional cohesion, and climate-conscious planning in Cyprus. The results underpin the Policy Brief 2: Sustainable Location Strategies for Citizens' Services, which offers targeted, evidence-based recommendations.

Figure 1: Mapping the locations of existing CSC, CC and Post Offices in National scale



Figure 2: Covered area by services within 15 km in: (A) Nicosia, (B) Limassol, (C) Larnaca and (D) Pafos.

OPERATIONAL TOOLS DEVELOPED THROUGH TWIN2EXPAND

The TWIN2EXPAND project has produced several practical tools designed to support the implementation of EBDP across diverse planning contexts.

A **Minimum Data Model for EBDP** defines a core set of spatial datasets required to analyze accessibility, connectivity, spatial equity, and urban form. This model allows evidence-based planning to begin even in data-constrained environments.

The project also developed **validated automated spatial workflows** demonstrating how relatively lightweight analytical models can generate policy-relevant insights using open data and open-source tools.

These workflows are organized within the **SOAR framework** (Scalable, Open, Automated, Reproducible), which provides a transferable methodological structure for implementing evidence-based planning across different spatial scales and policy contexts.

To support decision-makers in evaluating when and how such approaches can be applied, TWIN2EXPAND introduced the **EBDP Applicability Matrix**. This diagnostic tool assesses both technical feasibility and institutional readiness, helping authorities align analytical ambition with available data, resources, and governance conditions.

The project also explored how social and ecological indicators can be integrated within planning analysis. An **integrated social-ecological analytical framework** links urban form with ecological performance, demonstrating how biodiversity indicators can be considered alongside socioeconomic metrics.

Together, these outputs demonstrate that EBDP is not only conceptually desirable but also methodologically feasible and transferable.



Figure 3: Operational Tools Developed through TWIN2EXPAND: Minimum Data Model for EBD (1), Validated automated spatial workflows (2), SOAR model (3), EBDP Applicability Matrix (4), integrated social-ecological analytical framework (5).

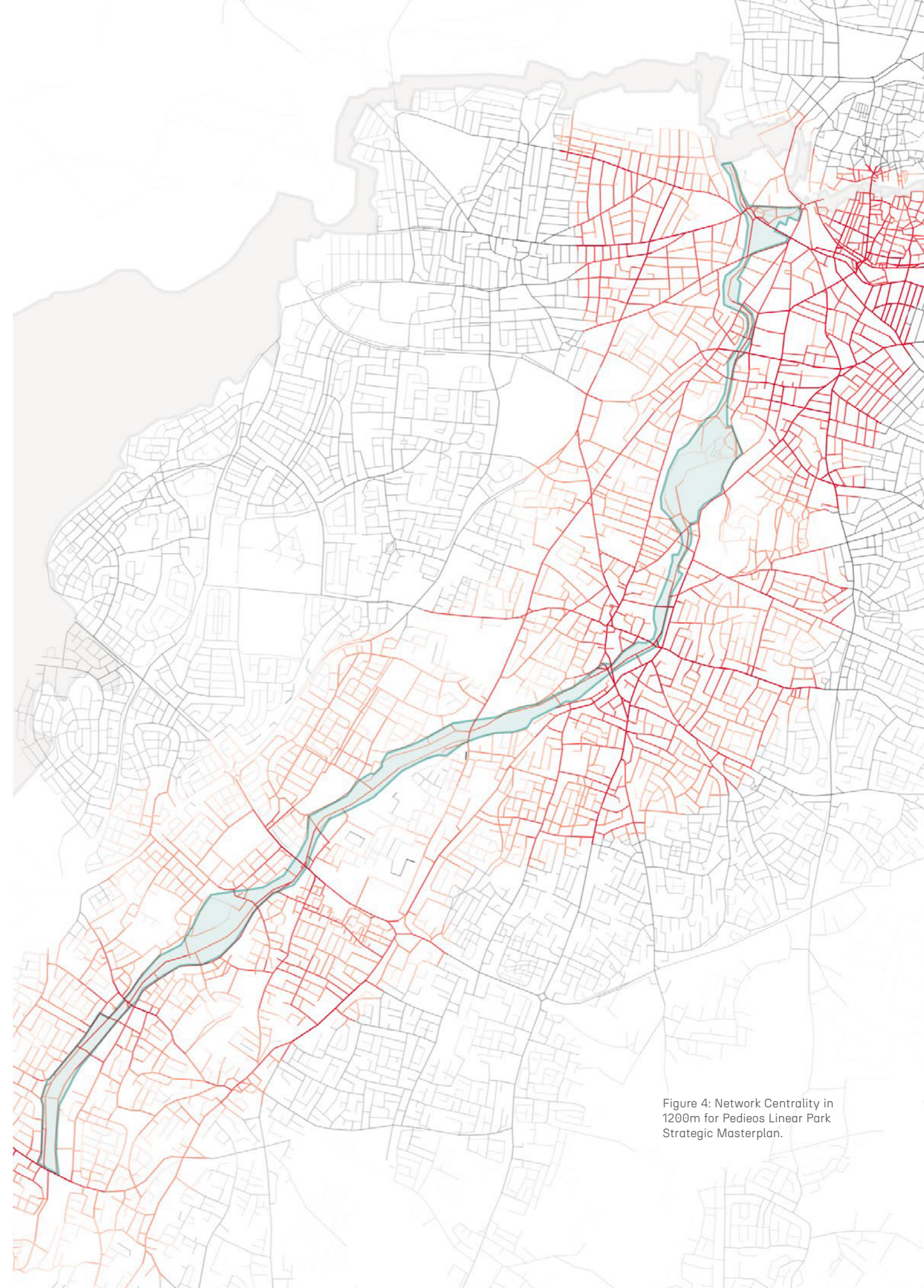


Figure 4: Network Centrality in 1200m for Pedieos Linear Park Strategic Masterplan.

THE EVIDENCE-BASED PLANNING WORKFLOW

TWIN2EXPAND proposes a structured workflow for applying EBDP within planning processes.

- [1] The workflow begins with **problem framing and baseline analysis**, where spatial data and stakeholder input are used to diagnose existing conditions and identify priority challenges.
- [2] The second stage involves **analytical modelling and scenario testing**, where spatial tools evaluate potential interventions and explore trade-offs between different planning options.
- [3] The third stage focuses on **co-interpretation and decision-making**, bringing together planners, stakeholders, and experts to translate analytical insights into planning strategies.
- [4] Finally, the process concludes with **monitoring and evaluation**, where indicators assess the outcomes of planning decisions and inform future iterations of the planning cycle.

By structuring the relationship between analysis, participation, and decision-making, this workflow enables planning systems to function as **continuous learning processes** rather than one-off exercises.



IMPLEMENTATION PRIORITIES

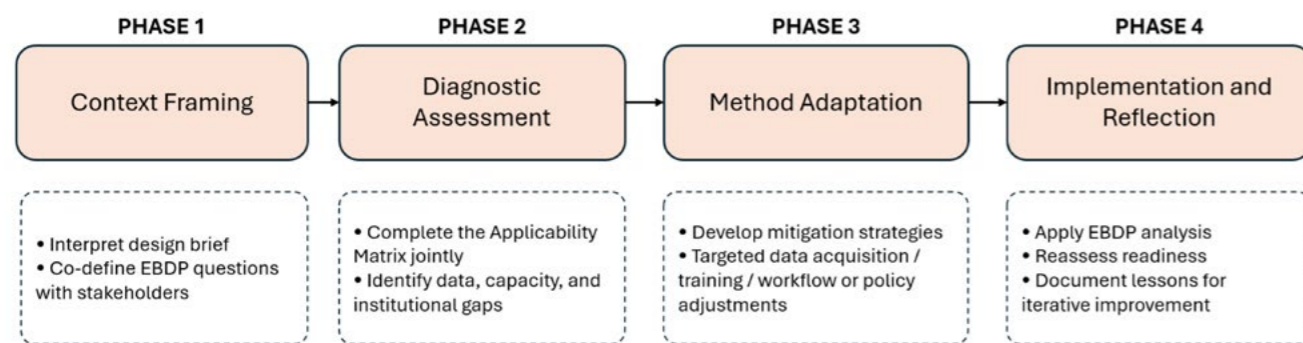
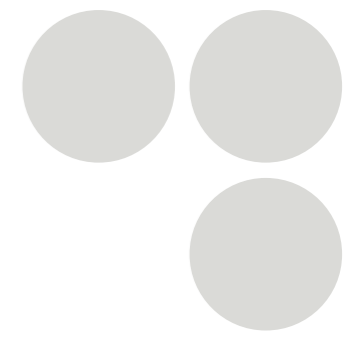


Figure 5: Four interative phases of Replication workflow of EBDP

Transitioning to Evidence-Based Design and Planning can be achieved through a phased approach.

- In the **short term**, governments should adopt guidance for evidence-based planning, establish interagency mechanisms for data coordination, and launch pilot projects demonstrating the value of EBDP in real planning contexts.
- In the **medium term**, planning procedures should incorporate formal requirements for baseline analysis, scenario testing, and monitoring indicators. Shared digital tools and spatial data infrastructures can support coordination across ministries and municipalities.
- In the **longer term**, evidence-based planning principles should be embedded within statutory planning frameworks. Planning legislation should require evidence justification, periodic review of plans, and post-implementation evaluation.



SYSTEMIC BENEFITS

Institutionalizing EBDP improves planning in several interconnected ways.

- It supports more **equitable planning decisions** by identifying underserved populations and spatial disparities.
- It improves **efficiency in public investment** by directing resources to interventions with clearer public value.
- It strengthens **climate resilience and environmental sustainability**, enabling authorities to link land-use decisions with mobility patterns, environmental exposure, and green infrastructure planning.
- Greater transparency in evidence use enhances **public trust**, while shared data systems would improve **coordination across government departments**.
- Most importantly, EBDP transforms planning into a **learning system**, where decisions are continually evaluated and improved over time.

CONCLUSION: FROM VISION TO EVIDENCE

Cities require ambition, direction, and collective imagination. However, vision alone is no longer sufficient for addressing the complex challenges facing contemporary urban environments.

Evidence-Based Design and Planning provides a framework for grounding those ambitions. By linking planning decisions to measurable conditions, transparent reasoning, and continuous evaluation, EBDP strengthens the capacity of institutions to deliver equitable and resilient urban futures.

The experience of the TWIN2EXPAND project demonstrates that such approaches are both feasible and valuable. What remains is the institutional commitment to integrate evidence systematically into planning practice. Moving from vision to evidence is therefore not simply a methodological improvement. It is a necessary step toward more effective, transparent, and resilient planning policy.

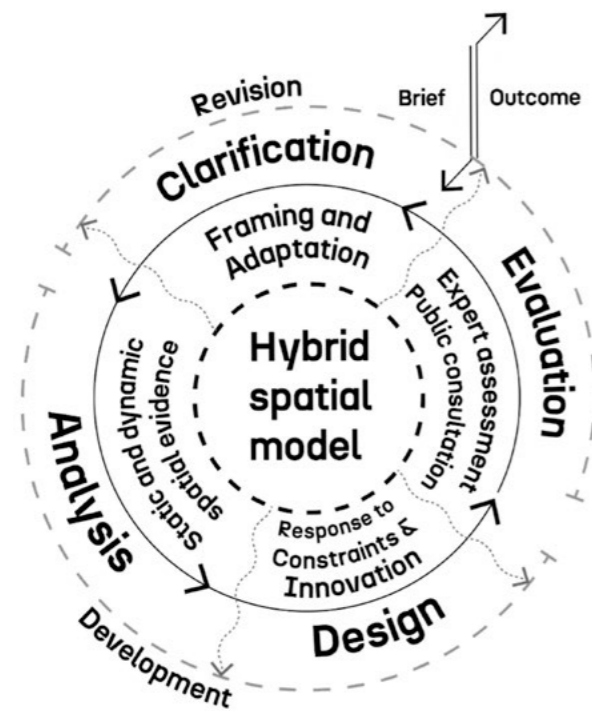


Figure 6: A possible scenario for an optimized feedback loop that incorporates different formats of evidence. (Karimi, et al 2025).



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ABOUT THE TWIN2EXPAND PROJECT

TWIN2EXPAND is a research project that aims to enhance the research excellence in the field of Evidence-Based Design and Planning (EBDP) at the University of Cyprus (UCY). The project seeks to address urban challenges and opportunities in Cyprus, which is a unique context for EBDP research due to its climate and history, while performing research and testing spatial models in diverse contexts. The project is coordinated by UCY and involves advanced partners from Europe with long-standing experience in EBDP: University College London (UCL), Chalmers University of Technology in Gothenburg, Politecnico di Torino (PoliTo) and Space Syntax Limited



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