TWIN2EXPAND

Working Group Studio – C

Summary report

twinning towards
research excellence
in evidence-based planning
and urban design

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1. Session A – Thursday, May 15th – online event

Theme: Seamless theory and practice: adaptable, scalable and reproducible EBDP methods

Building on previous discussions about the gap between theoretical development and the practice of evidence-based planning and design, this panel seeks to explore communicable and interpretable EBDP methods. The goal is to facilitate a more seamless integration of theory and practice. These discussions will also examine the limitations of current methods and theories in urban planning and design.

1.1. Take outs from the seminar by **Matthew Carmona:**

1.1.1. Evidence, Data, and the Value of Place

In contemporary urban planning and design, one of the most persistent debates revolves around the difference between data-driven approaches and evidence-based approaches. At first glance, these terms may seem interchangeable, yet they carry very different implications for how we understand and shape cities. This discussion formed one of the central themes of the meeting, with Matthew Carmona and others emphasizing both the opportunities and dangers inherent in how professionals use data and evidence.

1.1.2. The Distinction Between Data and Evidence

Data-driven design typically begins with the raw materials of information—large datasets such as geospatial imagery, social media sentiment, or algorithmically derived aesthetic preferences. Proponents of this approach often argue that the sheer scale of data now available allows for more objective decision-making. However, Carmona and others warned that raw data can easily mislead. It is often partial, biased, and stripped of the social and cultural contexts that give meaning to place. By contrast, evidence-based design refers to conclusions drawn from structured, validated research. Evidence is built from multiple interrelated facts, tested hypotheses, and a consistent body of studies that point toward reliable findings. It is not simply about quantity of information, but about quality and interpretability.

1.1.3. The UK Government's Experiment with Design Codes

The UK government's attempt to introduce district-wide design codes provides a vivid example of the tension between these approaches. The policy was intended to standardize urban design quality across municipalities by using datasets to identify local character types and aesthetic preferences. In theory, this was meant to make planning more predictable and democratic. Yet Carmona argued that this approach was deeply flawed. By relying heavily on

online datasets—such as crowd-sourced image repositories or social media polls—the government risked embedding biases and oversimplifications at a large scale. If the data were skewed, the design outcomes for entire municipalities would also be skewed. What might be a minor misrepresentation at the scale of a single site becomes a systemic problem when codified across whole districts.

1.1.4. The Need for Contextual Engagement

Speakers repeatedly emphasized that urban design is not an abstract exercise. It is rooted in real places, inhabited by real people. Evidence-based design therefore requires immersive engagement with context—visiting sites, speaking to communities, observing patterns of use over time. Carmona warned against a trend he had noticed among students: replacing site visits with desk-based online research. While remote data sources such as 3D aerial photography or socioeconomic datasets are valuable, they cannot substitute for lived experience of a place. At best, data should complement and enrich firsthand knowledge; at worst, it can replace and distort it.

1.1.5. The Place Value Wiki and the Power of Aggregated Evidence

To demonstrate what evidence-based design can look like in practice, Carmona introduced the Place Value Wiki, a resource that compiles hundreds of empirical studies from across the world. This platform links qualities of place—such as connectivity, walkability, or green space—with measurable outcomes in four domains: economic value, social value, environmental performance, and health impacts. The accumulated evidence is striking.

Health: Well-designed environments reduce stress, depression, and anxiety. Access to greenery and psychologically restorative spaces has been repeatedly linked to better mental well-being.

Safety: Design features such as street connectivity and natural surveillance can reduce burglary and violent crime, while also lowering perceptions of fear.

Economic performance: High-quality design improves office values, reduces vacancy, and supports long-term asset appreciation. Factors such as walkability and architectural innovation play direct roles in economic vitality.

Environmental performance: Compact, mixed-use forms reduce energy consumption, greenhouse gas emissions, and dependence on private cars.

These findings reinforce that good design is not a luxury—it is an essential driver of societal well-being. In Carmona's words, the evidence makes clear that sprawling, car-dominated developments may deliver short-term profits for developers but undermine long-term value for communities and the planet.

1.1.6. The Elusiveness of Beauty

A particularly challenging topic in the discussion was beauty. Policymakers have increasingly invoked beauty as a goal of planning, yet defining or measuring it remains elusive. Beauty is subjective, culturally contingent, and historically variable—what one generation sees as dull or spiritless may later be prized as timeless heritage. Participants agreed that beauty is important, and research suggests it can have measurable benefits for health and social cohesion. Yet attempts to reduce beauty to datasets—such as ranking images in online games—risk trivializing its complexity. At best, data can point toward patterns of preference; it cannot substitute for creative judgment and cultural understanding.

1.1.7. The Way Forward

The consensus that emerged was not to reject data, but to place it in its proper role: as one tool among many. Evidence-based design should integrate robust datasets, empirical research, site-specific observation, and creative design processes. The challenge is how to make this integration feasible in practice, given the constraints faced by professionals—tight deadlines, limited budgets, and increasing reliance on digital tools. Carmona suggested that resources like the Place Value Wiki represent one step toward providing practitioners with accessible, usable evidence. Ultimately, the discussion highlighted a central paradox: we live in an era of unprecedented access to data, yet the greatest risk lies in mistaking data for evidence, or evidence for wisdom. Cities are not merely datasets to be optimized; they are lived spaces whose value emerges from the interplay of environment, community, and design. By grounding design in evidence while embracing creativity and context, planners can avoid the pitfalls of data reductionism and deliver places of enduring value

1.2. Take outs from the seminar by **Valentina Marin:**

1.2.1. Scaling Up Analytical Tools

Urban research and professional practice increasingly grapple with the question of *scale*. Tools developed to analyse and design small areas—such as individual buildings or neighbourhoods—are now being applied to entire cities and even regional systems. In this context, Valentina Marin highlighted both the potential and the pitfalls of scaling up methodologies, with a particular focus on space syntax.

1.2.2. Space Syntax and Its Evolution

Space syntax is an analytical method originally developed to study how spatial configurations influence movement patterns and social interactions within buildings and neighbourhoods. Over the past decades, it has been expanded to larger urban networks, helping

explain phenomena such as pedestrian flows, commercial activity, or even crime distribution. The challenge, however, is that patterns observed at one scale do not automatically replicate at another. A design intervention that fosters connectivity within a neighbourhood may not have the same effects when scaled up to an entire city. Scaling up requires both theoretical rigor and methodological adaptation.

1.2.3. The Problem of Validation

Marin emphasized the importance of validation. Analytical models can generate compelling maps and metrics, but without systematic comparison against real-world data, they risk becoming abstract exercises. For example, a simulation may predict high pedestrian flows along a proposed route, but unless validated with observational studies or transport data, its reliability is uncertain. The larger the scale, the higher the stakes: errors in regional-scale analysis can misguide major infrastructure investments, just as flawed municipal-scale design codes can distort urban form. Validation ensures that analytical tools remain grounded in reality, even as they grow in complexity.

1.2.4. Knowledge Management Across Projects

Another key point was the issue of *knowledge management*. Each project generates valuable insights—about which methods worked, which assumptions failed, and how stakeholders responded. Yet too often, these lessons remain siloed within individual projects or organizations. Marin argued for more systematic approaches to capturing and reusing knowledge. A cumulative body of practice allows for refinement over time, reducing the need to reinvent solutions and enabling more nuanced applications at scale. In this sense, knowledge management becomes as important as methodological development itself.

1.2.5. Bridging Academia and Practice

The feedback loop between academia and practice emerged as a recurring theme. Academics develop new analytical techniques, often pushing the boundaries of theory. Practitioners, however, operate under constraints of time, budget, and political feasibility. If methodologies remain too abstract or complex, they will not be adopted in practice. Conversely, practice generates empirical challenges that can stimulate academic innovation. Marin highlighted the need for stronger collaboration: researchers should focus not only on methodological sophistication but also on usability, while practitioners should feedback their experiences to refine academic models. This two-way exchange ensures that scaling up tools like space syntax remains both rigorous and relevant.

1.2.6. The Role of Communication

Perhaps the most critical insight was that analysis alone does not drive change. Evidence must be communicated effectively to decision-makers, clients, and communities. Technical outputs—such as maps of spatial integration or connectivity scores—may be meaningful to experts but opaque to non-specialists. Marin stressed that clear communication is essential: data must be translated into narratives, visualizations, and arguments that resonate with stakeholders' concerns. Without this, even the most robust analyses risk being ignored or misunderstood. Communication is not an afterthought; it is central to ensuring that analytical tools inform real decisions.

1.2.7. Scaling as a Cultural Challenge

Scaling up is not just a technical issue—it is also cultural. Larger scales involve more stakeholders, more disciplines, and more political pressures. An analytical tool that works neatly within the confines of an academic study may falter when applied to messy real-world contexts. Success requires not only methodological robustness but also institutional capacity, political will, and community engagement. In this sense, scaling up is as much about building cultures of collaboration and trust as it is about refining algorithms.

1.2.8. The Future of Scaled Analysis

Looking forward, the promise of scaling up lies in its ability to bridge the micro and the macro: linking the experience of individual streets to the functioning of entire metropolitan regions. When done carefully, it allows planners to understand how small design choices ripple through larger systems—how a new street layout may influence regional accessibility, or how densification in one area may affect mobility across the city. But the caution is clear: scaling up without validation, knowledge management, or communication risks producing sophisticated but meaningless outputs.

Marin's reflections underline that scaling up analytical tools is not simply about making them bigger. It is about making them more robust, communicable, and adaptable to the complexities of real urban systems. Only then can they truly serve as bridges between evidence and practice at every scale.

1.3. Take outs from the seminar by **Lawrie Robertson**:

1.3.1. Professional Practice and Global Perspectives

While much of the discussion focused on theory and methodology, Laurie Roberts offered a perspective rooted in professional practice. Drawing on experiences from projects across Detroit, London, Jakarta, Abu Dhabi, and other international contexts, Roberts highlighted how evidence-based planning operates in the complex realities of global urbanism.

1.3.2. The Realities of Global Practice

Each urban context brings its own challenges. In Detroit, evidence-based planning may focus on managing decline, vacancy, and regeneration. In Jakarta, it may address rapid expansion, flooding, and infrastructure strain. In Abu Dhabi, the emphasis may lie on designing for resilience in arid environments and fast-growing populations. Despite these differences, Roberts argued, the principles of evidence-based planning—rigorous analysis, contextual sensitivity, and clear communication—remain consistent. The task is to adapt the tools to local realities rather than applying them mechanically.

1.3.3. The Rise of Resilience Planning

One trend Robertson underscored was the growing importance of resilience. As climate change accelerates, cities everywhere face mounting risks: flooding, heatwaves, resource shortages, and socio-economic shocks. Resilience planning seeks to anticipate these challenges, designing urban forms that can absorb shocks, adapt, and recover. Evidence-based methods are central here, enabling planners to model risks, test scenarios, and identify interventions that reduce vulnerability. Resilience is no longer a peripheral concern—it is becoming a defining criterion of good planning, particularly in fast-growing urban regions where decisions made today will shape vulnerabilities for decades.

1.3.4. Integrating Academia and Practice

Another theme was the value of integrating academic insight into professional practice. Roberts noted that young professionals, often trained in research-oriented environments, bring fresh perspectives and analytical rigor into planning firms. Conversely, practice-based experience grounds academic methods in the realities of budgets, deadlines, and stakeholder dynamics. This two-way exchange keeps methodologies both innovative and realistic. In some cases, collaborative partnerships between universities and planning firms have produced pioneering approaches, demonstrating how academia and practice can mutually reinforce one another.

1.3.5. The Challenge of Communication

Roberts echoed Marin's point that analysis has limited impact without effective communication. In professional practice, the audience is often diverse: policymakers, investors, community groups, engineers, and the public. Each group has different priorities and levels of technical literacy. Complex analyses must therefore be distilled into forms that are accessible and persuasive. Diagrams, maps, and visualizations play a particularly important role here. They translate technical findings into intuitive representations, allowing stakeholders to grasp both problems and solutions. Good communication ensures that evidence is not confined to reports but actively shapes decisions.

1.3.6. Global Lessons and Local Adaptation

One of the striking insights from Roberts' examples was that while methodologies may travel globally, their application must be locally grounded. A tool developed in London may provide useful insights in Jakarta, but it must be adapted to local data availability, governance structures, and cultural expectations. Successful practice lies not in exporting solutions wholesale, but in translating evidence-based methods to fit local conditions. This adaptability ensures that planning remains relevant, sensitive, and effective across diverse contexts.

1.3.7. Resilience as a Unifying Theme

Across these global examples, resilience emerged as a unifying theme. Whether in shrinking cities like Detroit or rapidly expanding ones like Abu Dhabi, the core question is how to design urban environments that sustain long-term value and withstand shocks. Evidence-based planning contributes by identifying vulnerabilities, modelling outcomes, and guiding investments. Yet Roberts reminded the group that resilience is not just technical; it is also social and institutional. Community engagement, governance capacity, and political commitment are as crucial as technical design in achieving resilience.

1.3.8. The Role of Professional Practice in Shaping the Field

Finally, Robertson's reflections highlighted the broader role of professional practice in shaping the field of evidence-based planning. While academia generates theories and methods, practice provides the testing ground that determines their relevance. Global practice brings in a diversity of contexts that challenge assumptions, reveal limitations, and inspire innovation. By sharing experiences across projects and countries, practitioners contribute to the cumulative body of knowledge that strengthens the field as a whole.

1.3.9. Conclusion

Robertson's contribution grounded the discussion in the realities of global practice. Evidence-based planning is not a theoretical ideal but a living practice, constantly adapting to diverse contexts and evolving challenges. The emphasis on resilience reflects a shift in priorities toward long-term sustainability and adaptability. The integration of academia and practice ensures that methods remain both innovative and grounded. And the focus on communication underscores that the value of evidence lies not only in its rigor but also in its ability to shape decisions. Taken together, these insights remind us that the future of planning lies not in abstract models or rigid codes, but in adaptive, evidence-informed practices that respond to the complex realities of cities worldwide.

2. Session B – Friday, May 16th – Online event

Theme: A unified generation of tools and workflows

This discussion addresses the widening gap between the technical and theoretical aspects of evidence-based planning and design (EBDP). While tools and workflows develop through separate pathways, the increasing reliance on data in design and planning is shifting the process toward data and programming experts. This panel aims to bridge this divide by facilitating a conversation between spatial data and programming experts, exploring ways to integrate theoretical and technical dimensions of EBDP more cohesively.

2.1. Summary of the seminar by **Martin Fleischmann:**

2.1.1. Openness, Reproducibility, and the Urban Grammar AI Project

A central theme in the discussion revolved around the principles of openness and reproducibility in computational urban research, exemplified by the *Urban Grammar AI* project. The speaker (geopandasteam, working with Danny Eribas Bell) argued that too often, openness in research is treated as an afterthought—mandated by funders and only implemented at the end of projects. By contrast, their approach embraced "*open by default*," embedding transparency from the first step of research through to dissemination.

The philosophy rests on three rules. First, use and strengthen the existing open-source ecosystem. Rather than relying on proprietary software like ArcGIS or ArcPy—which impose high licensing costs and technical barriers—they built on open-source tools such as GeoPandas, Tobler, and MomPy. Whenever possible, code developed during projects was contributed upstream to existing packages. This ensured that improvements would be maintained over time and widely available to others, rather than decaying in obscure repositories.

Second, treat all research artifacts as open from day one. Draft code, intermediate datasets, and even work-in-progress papers were shared on GitHub long before formal publication. This encouraged early feedback, bug reports, and collaboration from colleagues across institutions. In practice, it mirrored the best academic conference experiences, where work-in-progress sparks debate and refinement. By contrast, releasing polished outputs after publication often comes "too late" for meaningful engagement.

Third, stay closed only when absolutely necessary. Situations such as handling personal census microdata or security-sensitive information justified restrictions. But in urban morphology and geography, there are usually few compelling reasons to withhold outputs. Even in cases involving sensitive datasets, anonymization and aggregation can allow much of the code and methodology to remain open.

The *Urban Grammar AI* project (2020–2023, funded by ESRC) embodied these principles. Its aim was to classify Great Britain's built environment into a set of *spatial signatures*, reflecting both form (morphology, density, connectivity) and function (land use, population,

workplace areas, accessibility). Thirteen of the sixteen identified classes were urban, offering a new lens to understand city structure at national scale.

Critically, the team opted for openness even when it meant compromising on technical perfection. Faced with a choice between Ordnance Survey MasterMap (accurate but proprietary) and OpenMap Local (less detailed but open and consistent), they chose the latter. This decision favoured reproducibility: anyone, not just universities with subscriptions, could download the data and replicate the analysis. The project demonstrated that reproducibility and accessibility sometimes outweigh the marginal gains of higher accuracy.

Methodologically, the project developed reusable tools for interpolation, clustering, and visualization. For example, improvements in census data interpolation were contributed to the open-source Tobler library, while a new package called Clustergram was created to enhance clustering analysis. These tools were packaged, documented, and released independently so they could be reused across projects and disciplines. The team also emphasized writing *readable code*, cleaning and documenting notebooks before release, and automatically rendering them into websites for easier exploration.

Outputs were disseminated broadly, not just through journal papers but also blogs, GitHub repositories, interactive maps, and explanatory websites. The spatial signatures dataset was deposited in multiple archives (ESRC data portal, Figshare, Zenodo), each with a DOI for long-term stability. Policymakers and non-experts were engaged through an interactive online map with accessible explanations, allowing them to explore the classification by neighbourhood and understand implications for planning.

The project thus exemplified a model of "radical openness" in computational urban research. It demonstrated that by prioritizing transparency, reproducibility, and reusability, research can extend its impact far beyond academia, reaching policymakers, practitioners, and the public. Importantly, this approach also helps bridge the gap between research and practice: by making tools and data openly available, the knowledge produced is not confined to universities but becomes part of a shared infrastructure for evidence-based planning.

2.2. Summary of recent Space Syntax research into urban health by **Prof. Ye Yu**

2.2.1. AI, Computational Urban Design, and Collaborative Futures

The second major theme of the meeting was the growing role of computational methods and artificial intelligence in reshaping urban design, alongside the importance of collaboration and knowledge exchange to sustain this transformation.

Traditionally, urban design has been driven by the experience and intuition of designers. While creativity remains indispensable, the emergence of big urban data, machine learning, and algorithmic tools is shifting the field toward computational design. Dr. Yu Ye (Tongji

University) described this as a paradigm change—from design as primarily artistic intuition to design as an iterative dialogue between human expertise and computational intelligence.

AI applications are already demonstrating their potential. Large language models (LLMs) have been trained to analyze architectural plans, classifying features or generating explanatory text. Generative adversarial networks (GANs) have been used to create floor plans and residential layouts tailored to Chinese urban contexts, while CLIP models evaluate "texture harmony," filtering generated outputs to align with designers' expectations. Yu's team developed an AI-assisted web platform where architects can upload sketches and rapidly test alternatives. The emphasis is not on producing perfect outputs but on enabling *fast iteration*—allowing designers to explore multiple options in seconds, refine them through feedback, and integrate computational suggestions into the creative process.

Such approaches underline a key principle: AI should not replace designers but augment their work, acting as a collaborator that extends human capability. Efficiency, adaptability, and control matter more than brute-force generation of endless alternatives. The goal is to produce usable, context-sensitive designs that can withstand professional scrutiny and support decision-making.

These technical shifts are inseparable from questions of collaboration and infrastructure. As several participants emphasized, open platforms are crucial. Just as QGIS has flourished as a community-driven alternative to proprietary GIS software, AI-assisted design tools and computational pipelines must be open to ensure accessibility, transparency, and broad adoption. This links back to the ethos of "open by default" discussed in relation to Urban Grammar AI, showing how openness underpins both methodological rigor and practical impact.

Collaboration across borders was another recurring theme. Opportunities for UK–China–EU research partnerships were highlighted, with participants suggesting joint projects to expand shared databases, test AI-assisted design tools, and develop new standards for computational urban design. The *Twinning Towards Research Excellence in Evidence-Based Planning and Design* project—bringing together universities in Cyprus, Chalmers, UCL, Torino, and industry partners like Space Syntax Ltd.—was cited as a model for such collaborations. By pooling resources and expertise, institutions can tackle global challenges while adapting solutions to local contexts.

At the heart of these collaborations is the recognition that computational tools alone cannot drive better design. Knowledge must be translated into forms that practitioners, policymakers, and communities can use. This requires not only technical innovation but also accessible outputs—interactive maps, visualizations, and explanatory reports that communicate findings in intuitive ways. The AI-driven design platforms described by Yu Ye are one example: they lower the threshold for engagement, allowing non-specialists to interact with design alternatives and understand the implications of different choices.

Taken together, these discussions portray a future where urban design is increasingly computational, collaborative, and open. AI and machine learning expand the possibilities of analysis and design, but their value lies in being embedded within transparent, reproducible frameworks. International partnerships extend both the scope of data and the applicability of methods, ensuring that innovations benefit diverse contexts. And the ultimate measure of success lies not in technical sophistication alone, but in whether these tools help create livable, resilient, and beautiful places that respond to the needs of people and communities.