

PROFESSIONAL GUIDANCE SERIES

EVIDENCE-BASED

A holistic framework for applying simulation, qualitative, and quantitative research to shape better places!

DESIGN & POLICY

GUIDE

METHOD 01

Simulation Studies

METHOD 02

Qualitative Studies

METHOD 03

Quantitative Studies



MESO SPACE
DESIGN WITH EVIDENCE

Landscape Architects | Planners
Urban Designers | Researchers

INTRODUCTION

Design with Evidence. Build with Confidence.

Good design is never a guess. At Meso Space, every project — from neighbourhood parks and public squares to strategic master plans and policy frameworks — is anchored in research. This guide distils our evidence-based methodology into a practical resource for councils, planners, and designers.

WHY EVIDENCE MATTERS

Too often, decisions about the built environment are made on intuition, precedent, or political preference alone. The consequences — misallocated public resources, underused spaces, social disconnection, climate vulnerability — are felt for decades.

Evidence-based design (EBD) draws on the best available research, data, and analytical methods to inform each decision. It does not replace creativity or cultural sensitivity; it sharpens them. The result is spaces that perform — ecologically, socially, and economically.

We go beyond design — we prototype, test, and co-create with communities to shape environments that are resilient, equitable, and deeply connected to place.

WHO THIS GUIDE IS FOR

This guide is written for city councils, government agencies, and designers seeking practical tools to create sustainable and liveable design and planning outcomes. It is also intended for landscape architects, urban designers, and planners navigating complex, multi-stakeholder projects, as well as policy teams requiring clear evidence trails to support planning decisions and funding submissions.

25+

Years of evidence-based built environment practice across Australia and globally

3

Core research methodologies integrated into every project phase

THE THREE-METHOD FRAMEWORK

Meso Space structures evidence-based design around three complementary research methodologies. Used together, they create a complete picture — predicting what will happen (simulation), understanding why people act the way they do (qualitative), and measuring what is happening (quantitative).

METHOD 01

Simulation Studies

Computational modelling and digital twins to predict performance before construction.

METHOD 02

Qualitative Studies

Community consultation, interviews, and ethnographic methods to understand people and place.

METHOD 03

Quantitative Studies

Measurable data, spatial analysis, and statistical methods to validate design decisions.

Simulation Studies

Predictive computational modelling to test design performance before a single shovel hits the ground.

WHAT IS IT?

Simulation studies use computational tools to model the behaviour of built environments under a range of conditions — from microclimate and solar access to pedestrian movement, hydrology, and structural performance. Rather than designing then testing, simulation enables designers to test while designing.

At Meso Space, simulation is not an afterthought — it is embedded in our design process from concept stage. This allows us to demonstrate performance to councils and communities with transparency, and to resolve critical design and planning requirements before regulatory submissions.

Simulation gives communities the right to see the future of their space before they commit to it.

WHY IT MATTERS FOR POLICY

Policy decisions must be defensible. Simulation provides councils with quantified evidence of outcomes — thermal comfort projections, flood modelling, biodiversity connectivity analysis — that can be referenced in planning documents, design guidelines, and environmental assessments.

CORE SIMULATION METHODS

- **Microclimate & Thermal Comfort Simulation** — Analysis of solar radiation, wind patterns, shading, and surface temperatures to optimise outdoor comfort.
- **Hydrological & Drainage Modelling** — Stormwater flow simulation, WSUD performance testing, and flood risk analysis using site-specific topographic data.
- **Parametric & Generative Design** — Computational (Land) form-finding using algorithmic tools (e.g. AI, Grasshopper, Rhino) to optimise spatial layout, structure, and material performance.
- **Pedestrian & Crowd Flow Modelling** — Agent-based simulation to test movement patterns, accessibility, emergency egress, and activation zones.
- **Digital Twins & BIM Integration** — Linked 3D building information models that simulate asset performance over the full project lifecycle.
- **Ecological Connectivity & Bush Fire Modelling** — Habitat mapping and green corridor simulation to guide biodiversity strategies and urban greening plans.

APPLICATION AREAS

<p>Water-Sensitive Design</p> <p>Simulate WSUD swale performance, retention basin capacity, and downstream flood impacts for council infrastructure decisions.</p>	<p>Urban Heat Island</p> <p>Model canopy cover, reflective surfaces, and green infrastructure to inform heat mitigation policy for future climate scenarios.</p>	<p>Urban Regeneration</p> <p>Test development envelope, view corridors, solar access, and wind tunnelling in brownfield and infill contexts.</p>
<p>Biodiversity Planning</p> <p>Model habitat patch size, corridor width, and species range to support ecological design requirements in planning permits.</p>	<p>Cemetery Design and Planning</p> <p>Simulate grave space capacity over 50–100 year horizons and model financial sustainability scenarios for trust governance.</p>	<p>Coastal & Waterside</p> <p>Sea-level rise projections, tidal inundation modelling, and coastal resilience scenario testing for long-term planning.</p>

POLICY TIP FOR COUNCILS

Require simulation-based evidence as part of design briefs and planning permits. This builds an audit trail, reduces approval risk, and demonstrates due diligence to communities. Meso Space can prepare simulation reports formatted for planning submissions and environmental assessments.

Qualitative Studies

Human-centred research methods that reveal how communities experience, value, and use their spaces.

WHAT IS IT?

Qualitative research explores the meanings, values, and lived experiences that people attach to places. Unlike quantitative data, which counts and measures, qualitative methods ask why and how — uncovering the social, cultural, and psychological dimensions of the built environment that numbers alone cannot reveal.

At Meso Space, community inclusion is not a checkbox — it is a design input. Including local communities in the design and research process not only reveals local knowledge and expectations; it imparts ownership and long-term care for the outcomes.

No two design outcomes can be the same if they are developed from an essential understanding of place and its exceptionality.

WHY IT MATTERS FOR POLICY

Effective policy must reflect community values. Qualitative evidence — from structured interviews, focus groups, and participatory mapping — provides the social legitimacy that quantitative data cannot. It grounds policy in real human experience and helps councils demonstrate community engagement in planning processes.

CORE QUALITATIVE METHODS

- **In-Depth Interviews & Focus Groups** — Structured and semi-structured conversations with community members, stakeholders, and subject experts to capture nuanced perspectives.
- **Participatory Design Workshops** — Co-design sessions that invite communities to shape spatial outcomes, test design options, and build shared ownership of the project.
- **Ethnographic & Behavioural Observation** — Direct field observation of how people use spaces — movement patterns, dwell times, social interactions — to inform spatial programming.
- **Cultural & Heritage Mapping** — Documentation of cultural significance, intangible heritage, and place-based identity to guide sensitive design responses.
- **Case Study Analysis** — Systematic review of analogous projects and precedents to extract lessons applicable to the local context.
- **Policy & Document Review** — Critical analysis of existing planning policies, strategies, and regulatory frameworks to identify opportunities and constraints.

ENGAGEMENT PRINCIPLES

Intercultural Dialogue

Design processes must actively include diverse voices — culturally, linguistically, and socioeconomically — to avoid outcomes that inadvertently exclude.

Transactive Planning

Stakeholder engagement should be iterative, not consultative-in-name-only. Communities inform, challenge, and refine design decisions throughout the project.

Right to the City

Councils must aim to democratise urban spaces — ensuring every community member has a voice in shaping the places they inhabit.

Local Knowledge as Data

Residents and regular users hold irreplaceable contextual knowledge. Qualitative methods surface this knowledge and treat it as valid design evidence.

Memorial & Cemetery Design

Cultural consultation with diverse communities to respect grief practices, religious traditions, and memorialisation needs.

Housing & Neighbourhoods

Participatory processes to ensure affordable and social housing design reflects the values and aspirations of future residents.

Quantitative Studies

Measurable data, spatial analysis, and statistical methods to validate design decisions with rigour.

WHAT IS IT?

Quantitative research produces numerical data that can be measured, compared, and statistically analysed. In the context of built environment design and policy, it provides the empirical baseline — existing conditions, performance benchmarks, economic projections, and post-occupancy evaluations — that makes evidence genuinely defensible.

Meso Space applies quantitative methods across feasibility analysis, environmental performance monitoring, spatial data analysis, and life cycle costing. This approach resolves what we call the Net Present Value (NPV) challenge — ensuring that ambitious visions are also financially achievable.

Data-driven and context-led design can shape meaningful outcomes with confidence.

WHY IT MATTERS FOR POLICY

Funding submissions, planning permits, and council reports all require evidence that is replicable and verifiable. Quantitative data provides exactly this — measurable, comparative, and communicable to decision-makers, auditors, and communities alike.

CORE QUANTITATIVE METHODS

- **Spatial Data Analysis & GIS Mapping** — Overlaying demographic, ecological, infrastructure, and land-use datasets to identify patterns, constraints, and opportunities at site and precinct scale.
- **Construction Feasibility & Cost Modelling** — Quantified assessment of construction methods, embodied carbon, cost, soil, programme risk, and procurement strategy — including life cycle cost analysis over 30–100 year horizons.
- **Environmental Performance Measurement** — Monitoring of post-occupancy outcomes including stormwater quality, urban heat, biodiversity indices, sense of place and material durability.
- **Surveys & Statistical Analysis** — Structured community surveys with statistically valid sample sizes, analysed to produce generalisable findings for policy and brief development.
- **Traffic, Pedestrian & Usage Counts** — Direct measurement of space activation, pedestrian volumes, and traffic patterns to inform open space programming and road design.
- **Social Return on Investment (SROI) and Circular Economy** — Financial modelling of social, environmental, and economic value generated by public space investment relative to project cost.

QUANTITATIVE TOOLS IN PRACTICE

<p>Life Cycle Costing</p> <p>Used in cemetery and open space management to project 30–100 year maintenance, upgrade, and replacement costs for asset-planning decisions.</p>	<p>GIS & Spatial Analysis</p> <p>Mapping biodiversity, demographics, infrastructure gaps, and land value to identify priority intervention zones and equity gaps.</p>	<p>WSUD Monitoring</p> <p>Post-construction water quality sampling, infiltration rates, and runoff volume tracking to validate WSUD design assumptions.</p>
<p>Feasibility Studies</p> <p>Construction cost modelling, NPV analysis, and procurement strategy to bridge the gap between design ambition and fiscal reality.</p>	<p>Activation Metrics</p> <p>Time-lapse observation, pedestrian counts, and dwell time measurement to assess space use before and after design intervention.</p>	<p>Biodiversity Indices</p> <p>Species richness and habitat quality scoring before and after ecological design interventions, supporting biodiversity net gain reporting.</p>

Choosing the Right Method

The three methods are complementary, not competing. Most rigorous projects use all three in combination — each method compensating for the limitations of the others. Use this matrix as a starting point for scoping your research approach.

DIMENSION	01 · SIMULATION	02 · QUALITATIVE	03 · QUANTITATIVE
Core Question	What will happen if we design it this way?	Why do people use or value this space?	How much, how often, and at what cost?
Data Type	3D models, algorithmic outputs, scenario projections	Interviews, observations, narratives, cultural knowledge	Numbers, measurements, spatial data, statistics
Best For	Predicting performance and testing options before construction	Understanding meaning, social dynamics, and cultural needs	Benchmarking, justifying investment, monitoring outcomes
Council Use	Planning submissions, environmental assessments, design guidelines	Community engagement reports, cultural impact statements	Business cases, funding submissions, post-occupancy reviews
Limitation	Depends on model accuracy and input data quality	Not generalisable without broader data support	Can miss social nuance and cultural meaning
Key Tools	Rhino, Grasshopper, BIM, GIS, Radiance, SWMM	Interviews, workshops, observation, case studies	GIS, SPSS, Excel, cost models, traffic counters

EVIDENCE-BASED POLICY PROCESS

From Brief to Built: The Policy Pathway

- 1 Define Vision & Context**
 Establish project goals, site constraints, community aspirations, and regulatory context. Review existing policy frameworks and identify knowledge gaps.

- 2 Research & Data Gathering**
 Deploy all three methods in parallel: run baseline simulations, conduct community interviews, and collect quantitative site data as well as all relevant feasibility studies. Cross-validate findings across methods.

- 3 Synthesis & Brief Development**
 Integrate research findings into a design brief and policy position. Use evidence to resolve competing priorities and establish measurable design criteria.

- 4 Design with Evidence**
 Develop design options tested iteratively against simulation outputs and qualitative findings. Quantify and compare performance of each option.

- 5 Policy Documentation & Approvals**
 Prepare evidence-based planning submissions, environmental impact statements, and design guidelines with simulation and data documentation appended.

- 6 Post-Occupancy Evaluation**
 Monitor constructed outcomes against design targets using quantitative measurement and qualitative feedback. Feed findings back into future policy cycles.

POLICY CHECKLIST FOR COUNCILS & GOVERNMENT AGENCIES

- ✓ Evidence brief and all feasibility studies prepared before design commences
 - ✓ Simulation report included in planning submissions
 - ✓ Community consultation structured and documented
 - ✓ Quantitative baselines measured before construction
 - ✓ Life cycle cost analysis completed for major assets
 - ✓ Measurable design criteria stated in the brief
 - ✓ Cultural significance assessment completed
 - ✓ Post-occupancy evaluation scheduled and budgeted
 - ✓ Findings published for community transparency
 - ✓ Findings fed back into council policy review cycle
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COMMON PITFALLS TO AVOID

- ✗ Commissioning design before research and feasibility studies are complete
 - ✗ Treating consultation as a tick-box after decisions are made
 - ✗ Using only one method type in isolation
 - ✗ No post-occupancy monitoring budget allocated
 - ✗ Selecting design precedents without contextual analysis
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Evidence in Action

The following examples from Meso Space practice demonstrate how simulation, qualitative, and quantitative methods combine to create better places.

SIMULATION · WSUD

Water Retention Lake, VIC

Hydrological simulation of a community retention lake integrated with active open space. Drainage modelling validated the WSUD strategy, DDA Accessibility nodes, tree canopy; urban heat all informed council approval.

QUALITATIVE · MEMORIAL

Council planning and Policy Development

Deep cultural and community consultation shaped a policy design that speaks to shared values of communities, their collective memory, and civic identity across diverse social groups.

QUANTITATIVE · CEMETERY

Cemeteries of Tomorrow Financial Sustainability

Life cycle costing and grave-space capacity modelling over 50–100 year horizons, providing cemetery trusts with quantified financial scenarios for governance decisions.

ALL THREE METHODS · URBAN REGENERATION

Brownfield Revitalisation, Industrial Sites VIC/SA

Site simulation of contamination and microclimate; community consultation on activation; and cost modelling for staged delivery — all three methods combined.

FURTHER LEARNING

[Evidence-Based Methodology](#)

Watch how Meso Space applies EBD across projects

[Online Courses & Webinars](#)

Join structured learning programs on evidence-based design

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Download guides and frameworks for councils and designers

Ready to Design with Evidence?

[Book a free 15-minute consultation](#) with our team to discuss your project and how evidence-based design can shape better outcomes.

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