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Urban design as a specialised, evidence-based, coordinated educational and professional endeavour

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1 **Abstract**

2 Urban environments are complex, impacting on climate change, social justice and health both globally and
3 locally. Their spatial, social, economic, environmental dimensions are interlinked *and ought to be studied from*
4 *a complexity viewpoint*. Yet, whilst *complexity* has successfully entered urban scholarship and practice in many
5 fields, *urban form*, a key component of urban environments, is not yet studied in these terms. As such they
6 *are not yet designed as complex*. We argue that urban design can set a new way to understand and design urban
7 environments as places of *organised complexity*, and this can make it the profession best placed to manage a
8 useful global overview to sustainable placemaking. We do so by tracing urban design's historical
9 relationships and attitudes towards complexity and city evolution, contrasting definitions of complexity in
10 science, in CIAM and modernist design. We then look at urban design's relationship with other design
11 professions in the UK and suggest its lack of clarity and efficiency is an enduring consequence of this
12 historic trajectory. Finally, we propose urban design as the discipline concerned with the understanding
13 and design *of complex-adaptive urban environments* and we advocate its establishment as an independent
14 *profession*.

15 **1. From the Modernist Legacy of Urban Design to Placemaking**

16 Urban design is still today, certainly in the UK but arguably everywhere, widely interpreted, not least by
17 those who practice it. Some don't see it is a separate discipline but rather a sub-discipline of architecture,
18 planning, landscape architecture and in part transport engineering; in fact, it doesn't have a legally
19 protected professional association. The two – lack of clarity and a blurred remit - are linked. Resolving
20 these two points is timely, given the importance being attached to urban design and placemaking by
21 governments, local authorities, professional institutions, private sector organisations and communities
22 worldwide. In this paper, we propose urban design as combination of art and science of making places by
23 providing the physical framework and guidance for their successful development by the hand of different
24 actors over time. Before a solution though, we need to understand how urban design has become what
25 it is today, and we will do so by tracing its approach to the city, highlighting in particular how it has dealt
26 with issues of *complexity* and *time* since its modern establishment, including how this has influenced past
27 and current practice. We will then highlight important criticism which has taken urban design, at least
28 partly, along a different path over the last 50 years. Both these very different interpretations are active
29 today, but not appropriate to address current and forthcoming urban challenges. We will clarify why in
30 the last section of this Introduction.

31 **1.1 The Traits of the Modernist legacy: taming chaos and designing to fix**

32 Urban design's historic roots since the 19th Century draw back to the “municipal engineering” tradition in
33 the context of the emergence of the “housing question” in rapidly urbanising European cities
34 ([Riboldazzi, 2010](#)). At the same time, the middle of the 19th Century, the social medicine approach to
35 health for the new urban masses in Germany ([Taylor R, 1985](#)) and the first “Public Health Act” in
36 England ([Rosen, 2015](#)) had also emerged. Without major distinctions between them, urban planning

1 and design accompanied this process and developed as the branch of public health dealing with the design
2 of healthier cities for the new industrial age. Yet, this history of municipal engineering goes hand in hand
3 with the emergence of another, competitive tradition in the 1920s: Modernism, represented by the
4 Congrès Internationaux d'Architecture Moderne (CIAM).

5 These two traditions could not be more different. Municipal engineers concerned themselves with *updating*
6 the traditional city with technological, sanitary and transport advancements, while remaining fully rooted
7 into the traditional city model. Whereas the CIAM nouvelle vague adopted an agenda of radical
8 innovation and an expansive repertoire of new “scientific” disciplines, spanning from sociology to
9 ecology, statistical mathematics and modelling. According to Le Corbusier, co-founder of CIAM with
10 Sigfried Gideon, “modern society is in full renovation; everything is turned upside down by the machine;
11 evolution has followed a fiery rhythm in a hundred years; a curtain fell, it rejected forever what belonged
12 to our habits, our means, our jobs; an immense expanse opens up before us, and the whole world has
13 rushed into it.” ([Corbusier, 1973](#) in [Cherri, P, 1973](#)). Certainly CIAM’s visual impact was revolutionary
14 and relegated the municipal engineering tradition to the attic of history, so much so that by the late 1940s
15 most traces of it even in the historical accounts had been cancelled ([Riboldazzi, 2010](#)). The urban boom
16 of the 1950s – 1970s, which produced most of the built environment that we still see today, the whole
17 cultural and technical infrastructure of planning systems, regulations and procedures, public
18 administrations bodies and officers, university staff and programs and the new professional practices that
19 followed, all have been fundamentally an expression of the CIAM’s design culture monopoly, at
20 international level. What we know today as “urban design” is one such product, in fact the result of the
21 CIAM’s radicalism in architecture, scaled up to the urban level.

22 Even though CIAM itself developed through a variety of different approaches, and some are keen to
23 distinguish rather antithetical attitudes within ([Mumford, 2009](#)), their views shared something
24 fundamental which characterised this discipline from its inception: the intention to rationalise chaos,
25 where chaos was considered the inescapable result of a lack of centralised design. The good city was seen
26 as “a rational body of social structures integrated with new technologies”, as “a metropolitan *organism* in
27 biological harmony” (ibid., p14) where statistical understanding could help amend the city form into
28 configurations in a stable state of equilibrium, to re-engineer the natural environments with disciplined
29 organisational, recreational and even ethical structures.

30 Despite all its radicalism, CIAM’s *relation with nature* has remained, quite conventionally, of a *metaphorical*
31 kind, predominantly visual, symbolical at times, often mediated by conceptual mimicry and entirely
32 contained in the realm of aesthetics ([Aldrich, 1968](#)). And whilst the organic metaphor is evident at the
33 architectural scale, it is at the urban scale that it dominates the structure itself of CIAM’s intellectual
34 proposition, as apparent in Jose Luis Sert’s “Can Our Cities Survive” ([Sert, 1942](#)). Published in 1942,
35 when he was chair of CIAM, this book represents a collective effort of the CIAM élite to define and test
36 how the modern city should look and function, and what principles modern designers should obey to for
37 its making. As explained by Sigfried Giedion in the introduction, “in Europe in 1928 housing for the
38 lower income classes was in the foreground” (ibid, p.ix), and so it was for CIAM, which linked to it the
39 problem of designing the modern city *as a whole*. The Association worked systematically on this problem

1 for 12 years through five consecutive congresses, until the War cancelled the sixth in 1939. As early as in
2 1930, at the third congress in Bruxelles, “city and regional planning, which from the first had been
3 considered indispensable for any real solution of architectural problems, now became the centre of
4 interest” (ibid, p.ix). Three years later in 1933, the flagship theme of the fourth congress was “The
5 functional city”; that was the congress held on the Paris II steamship on a return route from Marseille to
6 Athens where the “Charter of Athens” was famously laid out.

7 “It has become necessary to resort to all the means of research at our disposal, both old and new, in order
8 to know our cities thoroughly. This knowledge should not be sought in the manner of the past, ignoring
9 the mobility, the changing structure, and the future possibilities of cities, but *by considering cities as living*
10 *organisms* [italic is original]; as things that are born, and which develop, disintegrate and die” (ibid, p.3-4). It
11 is here that we see the foundations of the continuous referencing to the city as the “organism”, the
12 neighbourhood as the “cell”, the road network as the “circulatory system” and so on. As inadvertently
13 manifested in this whole statement though, the organic metaphor betrays the evolutionary approach just
14 as soon as it declares it, revealing no proper understanding of the role of uncertainty in change, nor actual
15 reference to the city as the temporary result of its evolution at any point in time: rather, “the city” itself is
16 seen as the individual organism subjected to a closed cycle of birth, development to adulthood, decay and
17 death, whereby the scope of design is to determine the form of its healthy adulthood and keep it enduring
18 as long as possible by continuously taking care of any “illness” that may occur. The whole picture is
19 *developmental* rather than *evolutionary*, missing the difference between the two: developmental change
20 happens within a one generation timeframe to the *individual* organism, while evolutionary change happens
21 across generations to a *population* of organisms. The former is a closed cycle, the latter is open. Cities, as a
22 matter of fact, never die (unless under very rare and special circumstances). The CIAM vision of the city
23 as a living organism stands to evolution in the same way the Lamarckian theory stands to Darwin’s: a
24 fascinating early mistake of science.

25 This vision brings with it a whole array of consequences and flaws straight into every aspect of design and
26 of the position of designers themselves. The most important of which is the assumption that, had we the
27 resources to analyse the city *enough*, we would *know it all* by knowing every single aspect of it. This does not
28 acknowledge the reality of our fundamental ignorance of the subject and, which is more important, of *the*
29 *role of time in it*. “Only on a *town-planning scale* [italic is original] can our housing problems be solved. For the
30 roots of these problems are deep-seated, originating where the problems of our cities usually do – in their
31 spontaneous and unplanned development” Sert argues (ibid p., 41). A vision of nature as something for
32 which “spontaneous change” brings nothing but chaos is essentially still very close to the Newtonian
33 clockwork, with the planner considering her/himself as the clockmaker. This is a vision that brings Le
34 Corbusier’s assertion that “the donkey traced the plan of all European cities” ([Corbusier, 1929](#)), closer
35 to Descartes’ one nearly three centuries earlier, that “we don’t find so much perfection in the realizations
36 made of different parts and by different persons than in those realized by a single man” ([Descartes,](#)
37 [1637](#)), rather than to anything resembling Warren Weaver’s “Science and Complexity” paper published
38 just 6 years later.

1.2 A Long Legacy, and the First Seeds of Doubt

2 This vision, founded on a naïve design approach to the complexity of the urban problem, shaped the new
3 emerging professions of urban planning and design right to the core, and delivered the reconstruction of
4 the European cities after the end of the war. Here is how.

5 Sert's remarkable book in 1942 can be identified as the date of birth of the *term* urban design, but it still
6 took about a decade for this vision to be fully flashed out. It is not by chance that it was with Sert himself
7 as Dean of the School of Architecture that the first conference on urban design was held at the Harvard
8 Graduate School of Design, in 1956. The mission of the conference was to bring together the architect,
9 planner and landscape architect into the composite new field of urban design ([Gosling, 2002](#)) and to
10 make cities, the economy and society better and more efficient through the manipulation of urban forms.
11 But a party always takes the tone of the guests that attend it, and the participation to the Conference was
12 quite revealing of the view of form and beauty advocated: to this regard, Gosling and Mumford go to
13 great lengths to trace the participants' professional work in the first half of the century (*ibid.*). The
14 common denominator of their work was the determination to comprehensively account for all relevant
15 aspects of how cities function, and to streamline them through design, transport modelling, economic and
16 land-use planning, social and technical engineering or a combination of the above. This was, effectively,
17 also an efficient professional machine, in which roles and competencies were clear and specific: to justify,
18 to zone, to design: every established profession had its role, apart from, ironically, urban design.

19 Yet, the conference, the very first official outing of urban design already contained the seeds of its most
20 important criticism, or at least planted the first seeds of doubts: in the form of Jane Jacobs – attending as
21 editor of *The Architectural Forum* – and Louis Mumford, both warning of the dangers of the reductionist
22 nature of rational-comprehensive planning over the city's intimate, constantly changing and largely
23 unpredictable social and relational structures. In particular, Jane Jacobs famously pointed out that urban
24 design mistook “the kind of problem a city is” ([Jacobs, 1961](#)), referring to Warren Weaver's “Science
25 and Complexity” article published in 1948 in “*The American Scientist*” in which he suggested that cities
26 are complex problems and need a completely different approach to deal with them. This criticism was
27 soon followed by Kevin Lynch, who saw the physical pillars of city-building stemming from more
28 complex citizens' perceptions rather than the other way around; by Christopher Alexander, who warned in
29 his ‘the City if not a Tree’ ([Alexander, 1965](#)) against the mechanistic nature of modernist hierarchical
30 structures as inherently incapable of respecting the profoundly complex network of relations that only
31 give life to organic, evolving cities; by Jacobs and Appleyard ([1987](#)) who framed a more socially oriented
32 urban design manifesto where form would best respond and adapt to the many requirements of life rather
33 than attempting to dominate it. Since these initial powerful seeds of doubt, entire bodies of knowledge in
34 environment-behaviour studies, environmental psychology, and human geography have built precious
35 evidence of how the human spirit of cities finds its best and worst expressions in certain spatial forms,
36 with significant impact on practice and education. In the 1990s this critique led to a reconceptualization of
37 urban design's principles. In the UK this was led by a group of academics and practitioners at Oxford
38 Brookes University who took the writings of Lynch and Cullen and created a set of principles set out in

1 the book *Responsive Environments. A Manual for Designers* ([Bentley, 1985](#)). It included ideas as
2 permeability, variety, legibility, robustness and richness that arguably have formed the basis for all urban
3 design since. The aim was not to make urban environments more efficient but to create the conditions for
4 good places to be created. The principles set were taken up initially by organisations like The Prince's
5 Foundation in the UK and the Congress for New Urbanism in the US. Many, especially in architecture,
6 regarded these urban design principles as traditionalist and in opposition to the notion of modernism; this
7 perception still persists, with New Urbanism still being associated with traditional architecture in the US.
8 However in the UK the movement has transcended these stylistic connotations, initially through the
9 backing of the Urban Task Force in 1999 ([Urban Task Force, 1999](#)), under its chair the architect Sir
10 Richard Rogers. This continued through the government body CABE in England and A&DS in Scotland,
11 to the point that some of the principles of urban design promoted in *Responsive Environments* have
12 become mainstream, with the backing of government policy.

13 These are, no doubt, remarkable achievements, but not enough unless supported by an approach that
14 recognises and seeks to manage complexity. The need for some form of change in this direction has been
15 promoted by many key figures over the past decades, even if not explicitly: Lang's ([2005](#)) classification of
16 urban design types for example – total, all-of-a-piece; piece-by-piece; plug-in – doesn't yet see this
17 approach but leaves space for it acknowledging that some change will happen, will be transdisciplinary and
18 attempt to manage increasing conflict and diversity. In 2016, {Marshall} put forward the case for urban
19 design as a functional, collective art where urban designers create the ground for participation, and place
20 making is transient ([Marshall, 2016](#)). This implies a notion of urban environments as complex.

21 Reviewing past and current approaches to urban design, Loukaitou-Sideris called for a shift in the 21st
22 Century towards an alternative vision, centred around issues of sustainability, resilience and justice, where
23 design is participatory, bottom-up and integrated across people and scales. Again, we are talking of a
24 complex system of both parts, actors and interests ([Loukaitou-Sideris, 2020](#)).

25 It is therefore important we take these ideas further and tackle the issue of organised complexity in a way
26 which is agreed upon, shared and operative. There is in fact a growing level of dissatisfaction that these
27 widely-accepted principles of urban design are so often ignored or not comprehensively embedded in new
28 development, and that the discipline of urban design is yet to rise to the expectations placed on its
29 shoulders. The time is right therefore to be much clearer about the scope and core expertise of the urban
30 designer as a professional.

31 *Fig 1 about here – Urban Design and Distinctiveness. Extracts of figure grounds of Mumbai, Tokyo, Manchester, Shanghai, Los*
32 *Angeles, Lagos. Traditional urbanism has taken centuries to give cities across the world diverse but familiar character, through*
33 *evolution; modernist urbanism took just a few decades, designing its recognisable character straight away.*

34 **1.3 The Enduring Challenge of Designing Complex Places**

35 Since the events and debates described above, many say the intrinsic complexity of urban environments
36 has grown fast, especially over the past few decades, following unprecedented expansion and profound

1 qualitative innovations. Others question this, but suggest that we have, at least, finally started looking at
2 places from a complexity point of view ([Lang, 2005](#)).

3 One way or the other, it is a fact that in Western countries (with a special focus on the UK, as this is
4 where the authors operate), current macro-economic (recessions), social (inequality), and broadly
5 environmental (climate-health) conditions are the context in which urban environments are planned,
6 designed and managed, and planning, architecture, landscape architecture, engineering and urban design
7 are called to operate, at a time when stakeholders are increasingly engaged in decisions affecting where
8 they live, work, and prosper. At the same time, market conditions and the availability of investment are
9 uncertain, and policies are distinctly linked to the philosophy of the powers in government and therefore
10 often in contradiction with each other. This very context is also marked by under-investment in, and poor
11 achievement of, quality design by the construction industry ([CIC, 2012](#), [CIC, 2016](#), [Gulliver and
12 Tolson, 2013](#)); by capital markets with short planning horizons, that make it extremely difficult for
13 businesses to engage in the long-term planning necessary for investment that is fundamental for effective
14 good quality design (Carmona, 2010), whose time scales may stretch to 10 or 20 years and beyond. As a
15 consequence, a low-quality built environment (buildings, streets and public spaces, and neighbourhoods)
16 has often become the accepted market standard for both public and private sectors ([Cooper and
17 AlWaer, 2017](#), [AlWear and Illsley, 2017](#)). In fast developing countries on the other hand,
18 urbanization offers a lose-lose alternative for the emerging middle class between unsustainable and place-
19 insensitive business-as-usual developments and rare small realizations of high quality, all the rest being
20 extensive informal settlements for those who don't find their way into mainstream society
21 ([Cheapelianskaia, 2019](#)). In both contexts, increasingly multi-cultural societies challenge built
22 environments and their spaces with contradictory if not opposing demands ([Lang, 2005](#)).

23 The challenge is how, given these constraints, differences and conflicts, is it possible to put in place
24 processes of change that add value to places *in time and for all their users, to account for the big threats to cities and
25 all types of settlements and their residents, such as climate change and social justice* ([Loukaitou-Sideris, 2020](#)), and
26 what role urban design in particular should play in such processes across the local, national and even
27 global scale. Understanding and supporting the *city and urban environments as organised complexity*, the
28 approach that Weaver described in 1948 ([Weaver, 1948](#)), is the response we put forward to this
29 challenge. It is important to clarify that we are not arguing for an overhaul of the precious principles and
30 theories that we have produced until today; rather, that the processes of change and the figures to
31 accompany them ought to adopt new ways of approaching them, the cities' and settlements' constituent
32 parts, their interrelations and dependence. But before we tackle this, it is necessary to reflect on the state
33 of urban design education, policy and practice; we do so with a focus on the UK which is where the
34 authors are based. Because here urban design is not an accredited profession which stipulates how to train
35 and develop its workforce, we start from education as the main source of training of urban design skills.
36 And here, we immediately encounter an issue.

37 *Fig 2 about here. Urban Design is a Global issue.*

1 *With more than half of the world's population now living in urban areas and with the rapid urbanisation of many countries, the*
2 *design of settlements of crucial importance to the wellbeing of people, the health of economies and the future of the planet. The most*
3 *urbanized areas are often those where planning systems are less developed and where informality is the main engine of growth. But all*
4 *areas are now interconnected, impacting on global issues of climate change, justice and health.*

5 **2 Issues with Urban Design Education, Policy and Practice**

6 **2.1 Education**

7 Whilst many have long highlighted the fragmentation of education in urban design, including Vernez-
8 Moudon (1992), Cuthbert ([2001](#), [2007](#)), Inam (2002), consensus on how it should be taught or what an
9 urban design curriculum should include is still lacking. Much urban design's terminology is also contested
10 ([Dovey, 2019](#)). Urban design is generally a post graduate taught (PGT) specialism in schools of
11 architecture, planning (especially in Europe) and landscape architecture (especially in North America)
12 ([Palazzo, 2014](#)). Sometimes it is taught through modules in undergraduate courses, often combined with
13 other subjects. Many of the PGT courses are a year in duration, occasionally two. Given the scale of the
14 knowledge base that urban designers need to be aware of, this time is very limited and often comes too
15 late in the curriculum, once other disciplinary imprinting has happened and dominated.

16 The *range* of urban design courses is also quite wide: comprising those with a focus on critical theory and
17 policy, real estate and urban development, spatial planning, political engagement, place assessment and
18 appreciation, place design, and strategic design. There is a general agreement on some theoretical
19 principles as delivered in theoretical/historical modules, as expressed through the literature of reference
20 (although even these vary greatly and some even question whether these theories are actually being
21 confused with practices), but less so on practical design principles (i.e. hands-on projects), how and to
22 what extent these might be taught. Markets and processes tend to be reliably included in their curricula,
23 but less so shared practices on how these relate to form and delivery. Design is central for some, less for
24 others which emphasise more social, economic and market issues and processes. Urban morphology as a
25 specialist body of knowledge for example is rarely made part of the curriculum, nor is the art of
26 subdividing land in independent parcels, despite its crucial relevance to the future adaptability of the
27 spatial structure. The result is that often these courses hardly overlap, covering a full spectrum between
28 urbanism and urban design. "... if you do a university course in 'urban design', exactly what you learn will
29 depend on which university you choose, and the particular emphasis of the course" (Urban Design
30 Group, 2022). And what has been for years a generally dominant Western outlook, is recently being
31 questioned following an internationalisation of education, as no longer relevant or sufficient for students
32 from developing countries and the East ([Palazzo, 2014](#)). Here we see the demand for greater emphasis
33 on local distinctiveness in both understanding and shaping places, to counteract the risk of globalisation of
34 theories and practices (inevitably from the countries with longer established traditions in urban design);
35 great progress is being achieved, where in some instances urban design is managing to 'positively'
36 disentangle itself from architectural and planning education, finding space to experiment on the balance
37 between domestic and international viewpoints ([Tang and Hack, 2017](#)).

1 Furthermore, not all urban design courses are accredited by professional bodies, and when they are they
2 are generally subsumed within the accreditation systems of other professions. Hence, urban design courses
3 are accredited not so much because of what or how they teach but because they sit within a department or
4 school that is accredited for its core teaching in planning, landscape architecture or architecture.

5 Whilst benefits might derive from this professional freedom this comes at a price too.

6 In general, all professional bodies are founded on and maintained by three requirements, which when in
7 place give clarity, a remit, credence, standards, protection and relevance to their members. These
8 requirements respond to specific *motivations* and are delivered through specific *methodologies* (Cole, 1990):

- 9 • Education –accredited institutions award degrees provided they meet requirements and attributes
10 set by the accrediting professional body. CPD maintains upskilling within the same framework;
- 11 • Experience – through application of principles learned in practice;
- 12 • Examination (for registration with a jurisdiction) – of knowledge and professional parameters.

13 Without an accredited profession which stipulates these requirements, those who teach (and practice)
14 urban design are hostages to fortune, lacking certainties, established practices, and the accountability and
15 credibility that they both can give. They lack a confraternity that reliably supports each other and validates
16 but, and this is important as well, that also holds accountable our work. When urban design courses seek
17 specialist accreditation from other accredited professions they need to meet the requirements set for
18 *different motivations* and through *different methodologies* (even when only few are required compared to those to
19 be met by the courses of recognised professions); the equivalence can never be perfect.

20 Therefore, without accreditation or accredited by other professions, urban design courses are *secondary* by
21 definition, with benefits (less scrutiny) and disadvantages (less support, investment, influence) and the risk
22 of being pulled in directions that do not necessarily engage with urban design’s true essence and purpose.

23 **2.2 Issues with Policy and Practice**

24 Similar limitations extend to practice. Development (especially in western countries) is a dynamic and fluid
25 process, needing to be constantly adaptive to the interactions between ‘People, Place and Capital flows’
26 which might now originate from anywhere in the world ([Hill et al., 2013, p.16](#)). This fluidity puts built
27 environment professionals under pressure as they have to help mediate the tensions between local and
28 extra-local priorities and imperatives and broader policies and goals; it is a flexibility that requires special
29 skills that few possess in the amount and type needed.

30 To compound this, these environments are increasing and experienced people that can deliver them are in
31 growing demand. Whilst there are a relatively small number of specialist urban design practices, most
32 work in the private sector is done by architects and the output is generally masterplans. Sometimes these
33 practices have specialist urban design teams, but very often urban design is seen as *something that architects or*
34 *landscape architects can do*. In the public sector, by contrast, most urban design is practiced by planners
35 (private sector planning is very rarely involved in urban design); their outputs tend to be policy and
36 guidance, often constrained by lack of influence over key transport issues which are seen as strategically
37 dominant and therefore leading the design process. These two types of urban designers are trained

1 following the specific professional standards of their respective disciplines, although some may have
2 achieved an urban design qualification or at least undergone some form of teaching on the subject (this is
3 not generally a requirement). The practice of urban design therefore owes its success mostly to personal
4 experience, growth, interest and individual talent, rather than on established practices passed on through
5 education and continued professional development.

6 In the UK and North America, organisations such as the Urban Design Group (UDG), the Academy of
7 Urbanism (AoU) and the Congress for New Urbanism, respectively, provide a forum for the discussion of
8 issues relating to urban design and a place where urban designers and others can share experience. The
9 UDG has a Recognised Practitioner scheme by which urban designers can apply to have their experience
10 recognised. The AoU has Academician status which again is subject to a vetting process and comes with
11 the right to use AoU after your name. Both were developed in response to a call for professional
12 accreditation but both fall far short of providing this. The enthusiasm demonstrated by the members of
13 these groups and their increasing range of initiatives shows a growing appetite for and awareness of the
14 potential that urban design offers. And yet, recent important reports on design quality have highlighted
15 the lack of skills as major contributor to a still widespread low quality ([Building Better-Building](#)
16 [Beautiful Commission, 2020](#), [Carmona et al., 2020](#), [Carmona and Giordano, 2017](#), [Carmona](#)
17 [and Giordano, 2021](#)). The HoL ([2016](#)), and Royal Town Planning Institute ([2019](#)) have also
18 conducted regular surveys of urban design skills of those in planning and architecture to conclude that
19 urban design education, whilst widespread is still shallow; skills are still very low in local authorities, with
20 the consequence that urban design plays a little role in decision making overall; skills have diminished over
21 time and any urban design guidance is interpreted with much variation. Over the last 10 years, the
22 situation has worsened due to recession, austerity and cuts in resources and funds to support urban design
23 skills (at least in the case of public sectors) ([Carmona and Giordano, 2021](#)).

24 How can we expect that the principles of (good) urban design are upheld if they do not filter through
25 those who practice it in both the public and private sectors? The failure of urban design to create and
26 promote good places, and its lack of clarity and identity as a discipline are connected, and both are at odds
27 with the growing demand of urbanised space. We should streamline theories and practices around a
28 shared common denominator of an agreed identity of urban design as a legitimately distinct discipline.
29 This will help tackle the education of those who will then practice, make policies based on, and teach in
30 this area, without having to rely mostly on goodwill and talent. And it will help drive research towards
31 new, focussed and useful questions. Much is now done in the remit of urban design, and rigour,
32 accountability, streamlining practices are necessary to benchmark and do consistently better. Without this
33 we risk further generations of substandard development, which we cannot afford.

34 From all the above, we argue that urban design should be:

- 35 • *1. More reliable.* We need to be *more consistent, informed and accountable* in delivering quality places for all,
36 if society and the environment have to be able to endure dips, be resilient and prepared to address
37 climate change and health challenges which are of global scale. We will argue that those practising
38 and teaching urban design should rally internationally around an agreed definition and principles,
39 and to produce a shared knowledge base.

1 • 2. *More impactful.* Urban design must claim its own fundamental *spatial remit in the form of scales of*
2 *development large enough* to produce significant impact and benefits (districts and neighbourhoods). We
3 will argue that to this purpose, adaptive masterplans are the disciplinary competence of urban
4 design.

5 3 *More systematic.* The pursuit of efficient, responsive and sustainable places can only result from
6 founding urban design on an established, informed, rigorous and measurable knowledge base. We
7 will argue that effectively combining *Design Codes* with masterplans are critical to do so. To satisfy
8 these three needs, we need an urban design *discipline* that is *both distinct and new*.

9 3 A 'New' Urban Design Discipline

10 So far, we have traced the intellectual foundations of our current urban design, and highlighted a
11 fundamental issue: the definition and treatment of complexity and, with it, of evolutionary change. We
12 explained how this has subsequently impacted education, practice and policy. We now discuss the notion
13 of urban design as an independent discipline, and clarify why this is the fundamental condition for it to
14 establish positive transdisciplinary connections with established disciplines. We contextualise this view of
15 urban design in relation to the idea of *places as complex systems in evolution*. To do so, we clarify its object of
16 study, aim, and knowledge base and identify two key tools to deliver settlements as complex systems in
17 evolution. Together, these make urban design reliable, impactful and systematic. Finally, we reflect on
18 education and normative implications of this idea.

19 3.1 Defining Urban Design

20 All involved in urban design agree that several disciplines contribute to it, with ideas, principles, tools,
21 goals and objectives. This is a strength, but also creates confusion and can be an obstacle. Architecture,
22 urban planning, landscape architecture, social policy, and geography are multi and to a degree inter-
23 disciplinary, but also have their own object of study, principles and tools, which are specific and
24 appropriately distinctive. Whilst urban design benefits from and is enriched by them, the fuzziness around
25 a defined, distinctive territory in which it operates generates a 'fog of urban design generalities' ([Krieger,](#)
26 [2006, 2020](#)) which undermines its influence, accountability and impact. As we have seen above, whilst
27 urban design has emerged contextually with public-health and modern urban planning and architectural
28 design, it was architecture that took advantage of this ambiguity claiming influence as the lead design
29 discipline in the built environment, often together with inputs from transport planners/engineers and
30 landscape architects.

31 Concerns have been voiced for a while. Palmer et al ([Palmer, 1997](#)) saw confusion around core terms
32 and concepts in urban design, stemming from different value systems of the disciplines with a stake in
33 them, creating confusion in terminology, definitions, and interpretation. Cuthbert ([2007](#)) lamented its
34 fuzziness, lack of clarity and absence of clear connection to sociological issues. '*...there has been no concerted*
35 *attempt within the discipline (urban design) to link the material creation or 'designing' of urban space and form to*
36 *fundamental societal processes.'* (ibid, p.177). Many are rightfully adding issues that urban design should
37 deal with to an ever growing list, therefore expanding its competencies to include for example, health

1 ([Sepe, 2020](#)) and social justice ([Loukaitou-Sideris, 2020](#)) thus highlighting even more the issue of
2 disciplinary boundaries. Interdisciplinarity and transdisciplinarity, terms often used in regard to urban
3 design, are positive aspirations for it, but we argue they can only become reality when its own disciplinary
4 realm is clear ([Elshater and AlWaer, 2022](#)).

5 Whilst there is now a growing awareness that urban design should be founded on harmonising the
6 processes of change in the spatial system as related to all other relevant urban systems in time (Carmona
7 and Giordano, 2021), how to do so remains quite controversial ([AlWear and Illsley, 2017](#), [AlWaer et
8 al., 2014](#)). Many in the profession remain reluctant to define it as a discipline, arguing it deals with such a
9 complex field that its boundaries need to remain porous and its focus flexible. Lang ([2005](#)) wished for
10 urban design to remain a collaborative field of design rather than an independent discipline and
11 profession'. We are not of this opinion.

12 Cozzolino ([Cozzolino et al., 2020](#)) recently defined urban design with the help of twelve of the most
13 established urban designers in the UK and US, putting at its forefront that it deals with urban forms at
14 many spatial scales to manage a process that occurs in time.

15 We take this definition further to argue for urban design as *a design discipline is focussed both on the design and*
16 *post-design phase*. Its main purpose is to set, *by design*, the spatial and regulatory *conditions* that contribute to
17 the evolution of the urban system as a whole towards the direction of travel that the relevant community
18 of stakeholders defines as desirable. These spatial and regulatory conditions concern with what in
19 settlements is “structural”, hence *relatively* stable in time, with the *explicit mission of making such structures as*
20 *lean as possible*. Urban design must aim to *design less but design better*, and to *set rules to manage the contribution of*
21 *other disciplines in a way that contributes positively and coherently to the place system*. This way, the system will, in time
22 and as needed, be in the condition to shape place as fit, and continue to do so and adjust after design and
23 construction are over. Let's never forget that what we urban designers do *not* design will always be more
24 abundant and as, if not more, important than what we *do* design, because it is the former, rather than the
25 latter, that mostly expresses the culture of the places and the people we are designing for. Nevertheless,
26 our design decisions have a profound effect on the decisions taken by others in the future. By setting
27 urban design on these principles, we effectively advocate a different, perhaps a new, urban design
28 discipline, with a different *motivation* at its basis.

29 This new discipline requires to some degree different design tools and focus of investigation, i.e. *a different*
30 *design knowledge-base*, which is in itself a major area of innovation (*methodologies*). On top of that, it also
31 requires a different way of *relating its design tools with each other* and altogether with the non-design
32 knowledge-base, which implies important changes to urban design education, research, practice and
33 policy. We present a provisional framework for what these might become in the concluding section of this
34 paper. In the next sections, we go through the process of definition of this new discipline, which includes
35 three clarifications, or tests: a) its *object of study: urban form*; b) its *theoretical focus: urban adaptivity and resilience*;
36 and c) its *area of knowledge: urban morphology*. If it is *motivation* and *methodology* that distinguish professions, and
37 tie them (often too tightly) to specific interests ([Cooper and AlWaer, 2017](#)), then urban design defined
38 as we do, that is based on the knowledge of a system's evolution, loses any conspiracy connotation and

1 distinguishes itself from other specific professional interests, perhaps temporarily important but less so
2 across longer timescales.
3 We answer these three tests in steps, which together help overcome the issue of urban design's unique
4 "signature pedagogy": this is the unique identity that "implicitly defines what counts as knowledge in a
5 field and how things become known, how knowledge is analysed, criticized, accepted or discarded and the
6 functions of expertise in a field, the locus of authority, and the privileges of rank and standing"
7 ([Shulman, 2005](#)).

8 *Fig 3 about here. Urban design works over a long time period. A fundamental difference between urban design and*
9 *architecture is the passage of time. A masterplan creates a vision for an area that has to be translated into instructions (often called*
10 *a Design Code or Regulatory Plan) for future developers and their architects. The scheme is implemented over many years, often*
11 *without the involvement of the original urban designer. The key to success is therefore the clarity of the instructions, the balance of*
12 *fix and flexibility and the way in which they are enforced.*

13 **3.2 The Object of Study: Urban Form**

14 As a first step, it is important to define and reclaim this territory so that urban design's *necessity* and *capacity*
15 to work alongside other disciplines becomes a mark of true interdisciplinary character and expert
16 leadership rather than an ambivalent card which creates issues of responsibility and accountability.

17 The distinctive territory of urban design –its *object of study* – is the physical manifestation of the forces that
18 shape places. It includes all elements that constitute urban form - buildings, plots, streets, street edges,
19 blocks, districts and landscape, the relationships that link them and they way they can be used. This sum
20 of physical elements and their relationships is a *complex adaptive system* ([Holling, 1973](#), [Cooper and](#)
21 [AlWaer, 2017](#), [Felicciotti et al., 2018](#)) that interacts with other social, economic and environmental
22 complex adaptive systems ([Romice et al., 2020](#)) to form places within a larger complex adaptive system.
23 By nature, a complex adaptive system cannot be understood by looking at its parts only: any event internal
24 or external to the system will affect its parts differently, depending on where it occurs; its present
25 conditions and future developments are built on past ones ([AlWaer et al., 2014](#)); and finally, the
26 relationship between an event and its reaction is not linearly proportional ([Holling and Goldberg,](#)
27 [1971](#)). Urban form obeys the same principles and urban design ought to treat it accordingly. This is a
28 vantage point, because it helps understand in a practical way "the kind of problem a city is" and transform
29 into actionable reality Jane Jacobs famous idea, after Weaver, of the city as *organised complexity* ([Weaver,](#)
30 [1948](#)). This is in fact the fundamental turning point in our proposition: urban form is not large-scale
31 architecture, nor it is detailed planning, but rather a different way of looking at the urban space, one which
32 puts time first, and designs spatial relations between urban form components with the post-design in
33 mind.

Urban design uses a series of distinctive tools to achieve this which are quite different to those used by the other built environment professions. They include masterplanning, design coding, design guidance and plot passports. Together these constitute a strategy *intended as the design of complex-adaptive urban form*

system including a set of instructions for those that will implement the strategy almost certainly in the absence of the urban designer.

The masterplan ties upwards to the settlement and downward to the building. As a system of elements in a relationship, it contains all the spatial interfaces in between these two extreme spatial scales, through which it interacts with functional, societal and cultural systems, through its lifetime. The interplay of urban form and these other urban systems will occur as part of relatively independent and constantly interacting streams of change in each of them, including crucially the urban form system itself. In this form, the masterplan is missing from current mainstream architectural, planning or landscape architecture education, and even many urban design programs. Planning and design-based courses may require students to engage with delivery of masterplans at various scales. Too often these are conceived as abstracted visual patterns rather than anything that can be understood in terms of human experience ‘on the ground’, as well as deterministic and top-down driven devices of control rather than structural frameworks designed to enact and direct local change. Urban design must take charge of masterplans, teach and practice them as its core, so that they are no longer confused with scaled-up architecture, spatially neutral zoning or purely visual formations.

1 The combination of urban form components in constant evolution and their relations in space and time
2 across all scales, is responsible for the capacity of places to move in time adaptively and as such, is the
3 main object of study of urban design. This notion of adaptive behaviour leads to *resilience* which is a
4 fundamental property of complex adaptive systems ([Holling, 1973](#), [Feliciotti et al., 2018](#)) and should,
5 therefore, prominently be addressed in urban design practice.

6 *Fig 4 about here. Urban design works at different scales using a ‘kit of parts’ including street networks, plots, building typologies,*
7 *which it then assembles to make up places, street edges, blocks, masterplans for neighbourhoods, towns, cities, through regulations.*

8 **3.3 The Theoretical Focus: Urban Adaptivity and Resilience**

9 Resilience can be defined as the “bounded domain of stability in a system’s trajectory of change” ([Holling](#)
10 [and Goldberg, 1971](#)). Working under this perspective implies shifting the emphasis of intervening on
11 the system (design) “from maximizing the probability of success to minimizing the chance of disaster. [...]”
12 It shifts our interest from increased efficiency to the need for resilience. Most important, it focuses
13 attention on causes, not symptoms” (ibid, p. 226).-Seen in this light, urban design, whose task is to shape
14 urban form, becomes a moving target where there is neither a ‘state to be reached’ nor a ‘one-size- fits-all’
15 solution ([AlWear and Illsley, 2017](#)). Urban design is not about the beautification of spaces, or the
16 delivery of planning strategies, or even resolving social, environmental and economic issues, and it is not
17 about fitting architectural design in context. Rather, it fulfils all the above by designing urban form and
18 spaces that are adaptive in time.

19 One of the properties that characterise complex adaptive systems is their “historical quality”. This works
20 both ways, towards the past, and the future: first, by ensuring that everything we design builds upon and
21 values the existing (linking design with the pre-design phase); and second, by ensuring that everything we

1 design sets in space the conditions that allow continuity into the future (linking design with the post-
2 design phase). This property of urban form suggests a rule of continuity between the *analysis* of existing
3 and past urban forms and the *design* of places in the future.

4 *The Time Element of Resilience: Allometry in Urban Form*

5 Time is crucial to the practice of urban design because masterplans take many years to implement. During
6 that time circumstances change as well as the personnel, so that the designer is rarely around to see it
7 implemented. These changes affect all aspects related to urban design: contexts (climate, demographics,
8 economics, (im)migration, transportation modes, health, wellbeing, quality of life); the frameworks
9 employed for delivery and for quality control; perceptions and mindsets. The means to implement the
10 process of urban design also mutate: neighbourhood units, Radburn units, sustainable neighbourhoods,
11 resilient neighbourhoods, low carbon or carbon neutral neighbourhoods etc., have emerged successively
12 over the past decades to shape our settlements ([Carmona, 2010](#))-he limitation of many of these means
13 has been in not recognising that the pace of change among these elements is variable ([Thwaites et al.,
14 2007](#)): buildings, plots, street fronts, blocks, streets and districts, each change at their own pace. Certain
15 elements do so rather frequently, such as the internal arrangement or use of a building; others more slowly
16 and rarely, such as the layout of a street ([Berke and Vernez-Moudon, 2014](#))- Here, the natural law of
17 *allometry* applies: *the scale* of a component is linked to its pace of change, so that *smaller things change faster than
18 bigger ones*. In the same fashion, housing markets can change over a few months or years, while urban
19 regeneration can take decades to bring results.

20 *Fig 5. about here. Urban Design deals with varying rates of change. Urban design allows streets, plots, edges, blocks,
21 neighbourhoods, towns, cities to change as appropriate, at different paces, across different timescales, but maintains the whole they
22 create functional, efficient and beautiful.*

23 Many recognise the element of change ([David and Tiesdell, 2012p 74](#)). stressed that, whether the pace
24 of change is slow and almost unnoticed, or rapid and highly distributive, the design of our places needs to
25 be viewed as a production process that can shape, incorporate change, and reshape the built environment.
26 Urban design deals with the physical structures that exist in these variable political, economic and social
27 systems, but often live beyond them (social, political and economic systems change more frequently than
28 physical ones) and are maintained relevant by many, well beyond the design profession.

29 Urban design must enable places to function and support quality of life through these alterations and
30 adapt *in a parsimonious but responsive way*. Resilience is the “bandwidth” within which change occurs without
31 dissolving the system itself, therefore it does constitute the major element that urban design must consider
32 in contributing to both existing and new places, as well as its theoretical framework with regard to: 1) the
33 combination of physical elements and their relationships in time, and 2) its interaction with external
34 systems such as social, economic and political. Whilst urban form has an identity of its own which is
35 value-free in essence, it gets *consistently contextualised in time* by users and as such, *must be able to embed values*

1 that change over time. Similarly, urban form adopts the sustainable goals of the very time in which these
2 are set. What was sustainable yesterday (public transport pre Covid-19 for example) might not be today
3 (we were temporarily-encouraged to drive); the forms that support those values must be able to deal with
4 and perform across these transitions without losing functionality and quality. This is where the
5 multidisciplinary of urban design comes into play. Places are, indeed, ‘compromises in time’ ([Krieger,](#)
6 [2020](#)).

7 *The Spatial Elements of Resilience: the Panarchy of Urban Form*

8 As a system of physical parts, urban design operates from the scale of the plot to the scale of the region;
9 its field of action includes the plot, the building type, the street edge, the urban block, the street network
10 and the ecological system of connections and spaces, the normal and the special elements of what we
11 build. This does not mean it deals with an infinite number of ‘moving parts’. The way these individual
12 elements are and interact, their relationships, are precise and fairly consistent, shaping places which are at
13 the same time recognisable and unique in character. Thanks to good urban design, we see a familiar order
14 at a distance, and astounding variety close-up; we are reassured and rewarded.

15 This logic between scales coordinates densities and uses, modulates privacy and publicness, manages how
16 people move and what they see, how they meet and keeps them apart when incompatible. Urban design is
17 a *precise, defined and unique design field* in itself, which ties scales and the individual elements appropriate to
18 each scale, enhances single values combining efficiently what is related, and distributes benefits and
19 strengths through the proximity, interaction and combined effort of its individual elements. *Needless to say,*
20 *not every urban form system works this way to the same degree.*

21 *Fig 6 about here. Urban Design is more than just the design of built form.*

22 *Place is set in such a way that all its component accommodate life in ways that are efficient and responsive; they do so individually*
23 *and through organised complexity. Masterplanning in fact creates rounded places; from the layout and public realm to the massing*
24 *and urban scale, active ground floor uses, other land uses and roofscape. Each of these draws upon different professions and the*
25 *discipline of urban design involves marshalling this complex of layers*

26 *The Integrative Elements of Resilience: Informal Participation and Urban Form*

27 Good urban design allows the spatial scales to synchronise with social networks and economic patterns
28 and retain sustainability, efficiency and justice ([Ravetz, 2020](#)). This happens when the physical system is
29 coherent between its parts and the responsibility for their conception, delivery and management is
30 coherent with the competence, capacity and interests of the many different actors involved. Organised
31 complexity can be useful, democratic and efficient: sharing responsibility does not equate to chaos
32 ([Akbar, 1998](#)). Urban designers should acknowledge that the participation of individual citizens, families,
33 small-medium organizations and society at large to the continuous adaptation of the built environment
34 occurs *mostly at an informal level*. This *informal kind of participation* is the genius of places, it is what makes
35 them flourish and allows their very special kind of beauty to emerge in time. In this sense, urban design is
36 truly a functional art ([Marshall, 2016](#)). When that happens, it is because appropriate conditions are set

1 that maximise informal participation in any given community; part of those conditions are *purely spatial*,
2 and that part is what urban design should be about in the first place.

3 Once again, not every *urban form*, intended as a system, we have or had in place is able to work this way.
4 For example, when the appropriate links between scales are missing, the ability of informal participation to
5 emerge in all its subtle and unpredictable ways is likely to fail, and when that happens it is unlikely the
6 place will mature into something beautifully working and socially rich. Planning works at a large scale,
7 missing by necessity the intricacies of the local; it satisfies itself with identifying locations for development,
8 and remains often subjective to policies and set numerical targets. Architecture deals with the local but
9 doesn't engage with wider urban systems and even at local scale, it often does not recognise or adhere to
10 the subtle logic with its immediate scales. Landscape architecture focusses on the design of space at
11 variable scales but less on the built form that defines that space. Traffic engineering prioritises efficiency
12 and safety over quality of experience. All four disciplines address specific components of urban systems,
13 but miss out their overall complexity, and yet each treats urban design as an extension or sub-set of their
14 core. In dealing with the complexity between realms as both object and relationship, urban design allows
15 all others to play to their own strengths.

16 *Fig 7 about here. Elevation and occupation. Integration of material, spatial and social dimensions of urban streets conceptualised as*
17 *transitional edges. As socio-spatial urban forms, transitional edges need coherence and adaptability, spatial porosity and territorial*
18 *expression* ([Thwaites et al., 2020](#))

19 **3.4 The Base of Knowledge: Urban Morphology, Social Sciences and Urbanism**

20 Following on with our argument, the *knowledge base of urban design* should include the precise, critical
21 understanding of the individual elements of urban form and urbanism, how they impact/have impacted
22 on each other, interact/have interacted with each other both at scale and across scales in time, and their
23 implications on all other realms of urban life.

24 In effect, we want to move away from a notion of urban design as the design of 'outstanding', 'bold' new
25 design 'statements'. Exceptions and special places are necessary and ubiquitously present in all great places
26 in history, but the precondition for the exception to work as such is that it does stand out *on a tapestry of*
27 *ordinary*. This ordinary framework is what counts the most and is most disregarded, even though it makes
28 for nearly the totality of any city's built stock: it is the biggest portion of the enduring culture of place. It is
29 the backbone of urban design as art, and urban designers truly practice it as an art when they learn to read
30 the forms of places through their catalogue of states. Actually, because places are shaped by people in
31 time, urban design is in this sense collective art, where creativity is shared by the professional and users
32 ([Marshall, 2016](#)).

33 Therefore, before learning to "think out of the box", we need to develop a reliable understanding of how
34 the box works and what we as designers can do for it. To get this understanding, we need to focus on: 1)
35 what places share, and 2) what in them has remained recognizable through time and change ([Porta et al.,](#)
36 [2016](#)). Very simply, when we talk of places, what lasts matters – be this useful, beautiful, efficient or
37 logical and constitutes what urban design practice should seek to understand.

1 Designing for resilience needs this (different) type of knowledge. It is this dimension of the ordinary, the
2 recurrent patterns of its configuration across cases, the way these patterns change in time and how they
3 relate to non-spatial historical dynamics, that sit to the heart of the new discipline of urban design we are
4 advocating. *Urban morphology*, as the discipline that has studied the form of human settlements and their
5 changes in time, is a key source of this knowledge.

6 *Fig 8 about here. Urban form varies hugely. Three tissue plans of Todi (Italy), Paris, London. Developed at different times,*
7 *independently, by different cultures and needs, they share remarkable similarities, which they each made their own. This gives cities*
8 *around the world diversity and familiarity at the same time, a sense of discovery and comfort.*

9 Other fundamental areas of scholarship that have also made strides in acquiring aspects of this knowledge
10 and must help create the base of knowledge of urban design are environmental psychology, urban
11 economics, neuroscience and more. Yet, whilst we recognise their importance we still struggle to use them
12 to substantiate and help design: we generalise their findings to the point that design fails to make them
13 operative; we embrace them in policy and guidance in broad statements hard to deny but equally hard to
14 use to assess or support design; we disregard them as frustrating creativity; we even struggle to access and
15 interpret them. What is fundamentally missing to bridge the gap between what these fields are offering
16 and how to use them at best, is a consistent and systematic way to link all their own knowledge to urban
17 form that matters (here the distinction between scales in urban form and the relationship is fundamental,
18 because these studies refer to specific scales and their connections) and under the perspective of adaptivity
19 ([Venerandi et al., 2017](#), [Porta et al., 2012](#) [Romice et al., 2017](#)) Urban Morphology is advanced in
20 this as it studies the transformations of form across social, economic and cultural conditions, “and
21 conceptualises the concept of resilience.” ([Romice et al., 2020](#)). In this perspective, disciplines such as
22 social and urban geography and ecology, which are also versed in using evolutionary concepts are also
23 essential in interpreting the meaning of those interactions.

24 Overall, urban design needs to combine the work in these areas, building as well on recent advances in the
25 measurement and comparison of urban form (urban morphometrics) and analytics so that we can tie
26 abundant and precise knowledge in health, poverty, energy consumption to urban form and vice versa.
27 Whilst rich, the ‘actionable’ portion of this knowledge (what urban design needs to act) is manageable: the
28 range of physical elements that shapes urban form is relatively limited ([Kropf, 2017](#)), and so are their
29 possible combinations in recognisable urban form types. These then vary immensely in how they are
30 expressed on the ground in the places we experience on a daily basis, when they meet cultures, economies
31 and geographies. Design codes become essential then for urban design and masterplanning.

Design Codes are the key tool to inform masterplans with urban design knowledge. The main purpose of
a design code is to establish *a time/ space-related regulatory framework for the development of set areas*, to achieve
a range of set desirable outcomes in a managed way. If evolution is the co-presence of unity and change
(Savage, 1963), design codes recognise that masterplans must make a place successful *after the design*
phase. They must therefore put design in the condition to retain a *degree of control* in time while allowing
cross-scales influences, and thus avoid a patchwork of unrelated individual occurrences. In order to set
the spatial conditions for a long-lasting, ever regenerating and consistent standard of quality, design
codes work by instructing, regulating and advising on physical development. They aim to be both

efficient and effective: efficient because they establish development principles to be applied *to more than (beyond) a specific case* (although they can be adapted to respond to precise locations), meaning that they have a general applicability. *Effective* because they provide the mechanism to *guide, monitor and control* development, by setting the general goals to achieve. Their efficiency in application grows when they are based on an *equally efficient starting point*: an understanding of the range of links between urban form and social, environmental and economic performance. In other words, how other types of urban form have performed under similar circumstances as the ones needing implemented. This is the base of evidence that should be owned by urban design but is, in fact, a still largely unexplored avenue of scientific research.

Fig 9 about here. Design codes help places mature in ways which are coherent but flexible.

4 Applying the New Discipline in Urban Design Education Policy and Practice

We have argued so far the need to 1) find an agreement around the object of urban design; 2) clarify its purpose and 3) fund its knowledge base on what places share rather than what makes them unique, in terms of urban form. All these – object, purpose and substance – come from the essence of the place itself, and its life in time.

In regard to the first point, we proposed urban design as the study and design of *urban forms*, where each element exists in relation to all others across scales and in the context of all aspects of the urban environment or settlement. In a wonderful culturally rich narrative, ([Elshater, 2015](#)) argued for adding “urban design”, an umbrella term catching all human settlements to urban design in recognition of the fact that the latter, at least in Egypt, mainly deals with cities, thus leaving the multitude of culturally and artistically rich villages and settlements in the country outside its remit. Under our perspective, urban design is also urban design, as it deals with human settlements in their entirety. In regard to the second point, we see its goal as the *pursuit of adaptive change*, based on designing with *place resilience* in mind. This entails that the products of urban design are not only a designers’ responsibility, but a shared endeavour of those using them in the post-design phase, with deep implications, from conceptual to practical, for the design profession. In regard to the third point, we advocate the consolidation of an *urban morphology avenue* within the “new science of cities” advocated by Michael Batty (Batty, 2013) that by looking at observable patterns of change in cities creates a solid, efficient, evidence-based ground for urban design practice.

4.1 Implications for Education

We provide below a list of skills and principles that we believe should form the basis for urban design as a distinctive discipline to achieve all three points listed above. They have been prepared following discussions with urban design schools in the UK, together with members of UDG and AoU. They cover the knowledge base and skills required to practice urban design and are quite distinct from other built environment professions (although there is overlap of course). These are the essential areas that we believe need to be coherently agreed upon and taught in urban design courses and through continuing professional development.

A detailed understanding of:

1 1. *The physical form of places* and their historical and current development (structures and elements,
2 including streets networks.), the ability to identify them and appreciate their diversity,
3 relationships and behaviour in the urban systems. In short: urban morphology in a new
4 descriptive science of places.

5 2. *The social, economic and environmental functions and impact* of spatial systems at each of its scales (from
6 city to town to village, across their scales).

7 A detailed understanding of, and capacity to implement:

8 3. *The principles and design of adaptive places*, how they can be shaped and organised across scales, and
9 the ability to apply them in masterplanning, spatial frameworks, regeneration strategies, place
10 design.

11 4. *The processes* to establish and maintain synchronism between urban form and life, supporting
12 quality, efficiency, justice.

13 5. *The assessment of how places perform* as a combination of spatial components and their relationships
14 with non-spatial systems.

15 An appreciation of:

16 4. *The economic, social and environmental trends* that shape current and future cities and their relationship
17 with physical form;

18 5. *Development* and the workings of the property market, the role of other professions, viability and
19 property law.

20 6. *Stakeholders, communities (social capital) to include* the process of consultation, participation and co-
21 creation as appropriate to each scale of the spatial system;

22 7. *Regulations, Design Codes* and the workings of planning systems.

23 8. Need for the core professional (built environment) facilitators to address the very broad range of
24 *skills* (i.e. social competences like communication, problem-solving, creativity, adaptability, work
25 ethic....etc).

26 We propose that such a range of skills and principles is embedded in a framework of foundations for a
27 reformed urban design education. We take as a starting point the ethos of Jacobs and Appleyard's ([1987](#))
28 work undertaken with students from the University of California (Berkeley) which began to set out what
29 they hoped would become an emergent manifesto for urban design and then further developed by many
30 others. Their focus of attention was to give an intrinsically human and social emphasis to what places
31 ought to be. Theirs, and our socially oriented vision for urban design transcends the principal focus of
32 attention on material fabric and spatial organization characterized by other built environment disciplines,
33 and yet is made possible by treating the built environment as a physical system, which allows to account
34 for the holistic nature of the human-environment relationship. From a pedagogical viewpoint, our vision
35 relies on a combination of critical inquiry, process-based and social-constructs approaches, within flexible
36 and adaptive contexts, aims and outcomes ([Salama and Osborne Burton, 2022](#)). Furthermore, the
37 learning process will be cumulative across years: each learning experience becomes an element of the
38 following starting points, as part of learning process is in fact about adding to the knowledge base of
39 urban design.

1 Urban design education ought to be taught across a significant timescale, to account for the principles,
2 theories and tools listed above. A two-year post graduate course, provided it is preceded by a set of design
3 and theory prerequisites might suffice in the UK. This could for example be combined with a Part 1
4 ARB/RIBA accreditation. Undoubtedly, there is also a strong argument for urban design to be taught at
5 undergraduate level as a complete course, followed by specialisms for example in conservation, urban
6 analytics, planning, etc. In current courses of architecture and planning, urban design should be taught
7 throughout the course, from start to end, in the same way technology, design, cultural studies; and policy,
8 economics and geography are. The legacy of urban design is the longest we can leave. We must teach it as
9 if it matters.

10 **4.2 Implications for Policy and Practice**

11 A central concern for this emergent manifesto for urban design is *how to deliver its own aspirations*. This relies
12 on two specific yet related areas:

- 13 1. To conceive and shape urban environments as a mutually interdependent whole of their material,
14 spatial and social dimensions. This is necessary to overturn a prevailing professional culture that
15 detaches the shaping of materiality and space from the social dimensions of the human experience of
16 urban spaces, too often leading to a placeless urban fabric that is often sculptural and functional,
17 rather than ‘human’.
- 18 2. To develop a better balance of top-down and bottom-up agencies of change, and make them
19 operational at different levels of scale through specific roles. Currently, top-down and bottom-up
20 agencies of change exist in almost polar opposition and are in consequence often in conflict with one
21 another, with top-down being the dominant force in much of the delivery of urban environments. We
22 need to better define the specific roles that top-down and bottom-up actors play and the specific
23 scales they should be in charge of.

24 The first point is made possible by a form of plot-based urbanism, with a large base of plots that are small,
25 independent from each other but spatially linked up to the higher scales. Urban design distinguishes
26 between what should be ‘designed’ (top-down) and what should be left for emergent and evolutionary
27 processes of self-organisation (bottom-up), and *puts the former to the service of the latter*. We acknowledge to
28 this regard the important role that land ownership and market forces have on the applicability of this
29 distinction and that this impact cannot be overlooked. Development in the UK has been market-led since
30 the 1980s ([AlWear, 2013](#)) with the residential market dominated by volume housebuilders leading to the
31 build-out of high value homes on greenfield sites growth areas in single ownership, leaving rural areas and
32 regeneration sites behind ([Scottish Land Commission, 2021](#)). What Gulliver and Tolson ([2013](#)) noted
33 almost 10 years ago: “What often passes for “developments” these days is the rather placeless, single-use
34 housing development characterised by poor estate layout, over-engineered roads, dominant parking, poor
35 amenity space, lack of connectivity and bereft of planting and local facilities” (ibid. p. 3), Carmona has just
36 picked up again ([Carmona, 2020](#)). Tied into this picture are perennial issues with land value, as ([Rudlin
37 and Hemani, 2019](#)) reproach: “failure to deal with land value issues has created a structural flaw ...

1 planners are constantly fighting a losing battle against land interests, who have an economic interest in
2 dumbing down the quality of new development”. Since ownership and form can have distinct timescales
3 of change, we refer here to form only, assuming this will engage with a range of ownership types.

4 The second point resonates with the notion of “forms of submission” ([Akbar, 1998](#)) and “levels of
5 control” ([Habraken, 2000](#)), as characteristic of the ‘structure of the ordinary’. For Akbar, the extent of
6 responsibility (varying between ownership, use and control) enjoyed by parties who have a stake on the
7 environment affects its state: the more detached we are from it, the less responsible we feel towards it.
8 Similarly Habraken sees our environments as hierarchies of control, where we consistently try, by
9 occupation, to clarify *form* into *places* belonging to each level in this hierarchy through our experiences and
10 relationships (*understanding*). Accounting for this intrinsic need to assert individuality on our territory whilst
11 remaining reconciled with commonly accepted norms is fundamental for urban design, and replaces
12 deterministic view of places as material structures with a more humanistic emphasis on them as
13 expressions of different forms of territorial culture. From this perspective top-down agencies of change
14 should be understood as those that are about the delivery of *form*, *starting from above* the scale of the plot
15 that result in plot-based frameworks of urban fabric. They must be conducive to empowerment of
16 bottom-up agencies *starting from below* the scale of the plot: *understanding*. This way, the agencies of change
17 blend top-down processes from the urban to the plot scale with bottom-up processes that establish
18 localized, context specific expressions, where the meeting point between the two is somewhere in between
19 depending on local conditions. What is important in this scheme, is that *design*, which is inherently
20 concerned with fixed images of the future, does integrate a structural focus on longer-term and slowly
21 changing urban form with a mission to let the *informal participation* of families, small-medium organizations
22 and society at large self-organizing the actual expression of everything else. The resolution at the lower
23 scales is what then establishes the *sense of place*. In short, the ‘job’ of urban design is not to intervene
24 prescriptively at these latter scales, but instead to set the structural conditions (infrastructure, road and
25 green-blue networks and spaces, densities, location of key services) - that enable informal dynamics to step
26 in from the bottom up, and keep doing that in time, together with the ‘rules of engagement’ that
27 synchronise them. Local identity, diversity, adaptability, resilience etc all depend to an extent on localised
28 agencies of change to be welcome and empowered, rather than be dictated by external professional top-
29 down agencies. The knowledge base of urban design, which brings together the relationships between
30 urban form and social, cultural and economic systems, guides urban designers in setting the conditions for
31 localized agencies to act under the best possible conditions.

32 This gives urban design an *identity* which distinguishes it from other built environment disciplines in that
33 its core purpose lies with the design of conditions and opportunities rather than the prescription of
34 outcomes. One of the main features of this facilitating definition of urban design is understanding when
35 to stop intervening (limit to top-down) so that localised context specific decision making can take root
36 and grow (encouragement and empowerment of bottom-up), meaning that urban design deals
37 predominantly with adaptive and evolutionary *essence* rather than prescriptive *detail*. Crucially this requires
38 understanding, acceptance and operationalisation of material, spatial and social aspects of urban realm as

1 interdependent dimensions of an integrated *whole system* and cannot be properly understood as discrete
2 things.

3 **5 Conclusions**

4 The urban design “makeover” described requires a mind shift in theoretical development, education and
5 practice that emphasises the importance of:

- 6 • A more explicit and systematic understanding of the human-environment relationship as mutually
7 interdependent and mutually transforming at the heart of approaches to research, teaching and
8 practice. The study of urban form in time, i.e. urban morphology, should constitute the knowledge
9 base of a new master planning professionalism, and sits at the core of urban design’s signature
10 pedagogy. Disciplines such as environmental psychology, urban geography, economics must be
11 integrated with urban morphology, with the help of expanding urban analytics capabilities, to move
12 beyond anecdotal towards empirical large-scale evidence of how urban forms interact with life. Design
13 is then informed of by this combined knowledge.
- 14 • Recognition of the interdependency of urban form and social, political and economic processes, to
15 better inform integration of professional, top-down processes with community-led processes and,
16 crucially, across-scales dynamics of informal participation in urban place making, management and
17 adaptation.
- 18 • Emphasis on the need for accessible and inclusive forms of communication capable of overcoming
19 professional and community boundaries and discipline specific boundaries.
- 20 • Development of new readings of the urban realm more closely related to territorial functioning and in
21 particular the need for a better balance between professional intervention and occupant self-
22 organisation.
- 23 • Reorientation of practice and policy to include localised and context specific patterns (knowledge
24 base) emphasising the importance of longitudinal, time-sensitive partnership working ([Thwaites et
25 al., 2013](#)).

26 Our proposition has three potential implications:

27 First: the significance of urban form and its impacts on highly sensitive political goals of our age, suggests
28 that international coordination and clear accountability are priorities that cannot be further deferred. This
29 calls for a *concerted accreditation effort at national and international level*. Whilst for most built environment
30 discipline professional accreditation has generally preceded the development of academic programmes, in
31 the case of urban design, at least in the form proposed in this paper, the establishment of its own
32 profession is only now realistic and meaningful, as predicated on a knowledge base and motivation we
33 didn’t have or share before. But, establishing it now, would allow to align efficiently current academic
34 provisions globally, and contribute efficiently to the global dimension of climate change, social justice and
35 health ([Loukaitou-Sideris, 2020](#)).

36 Second: the relational nature of urban design suggests that, perhaps more than for any other design fields,
37 it can *engage a range of other disciplines* in the study of social, economic, health and environmental urban
38 processes on the ground. Urban design shares natural links with urban morphology and some of its

1 current developments in urban form analytics, such as urban morphometrics. These are providing
2 increasingly sophisticated platforms to expand the evidence-based knowledge that urban design needs;
3 they will generate new questions and new principles when urban form is studied in great detail as a system
4 itself and put in relation with others for which we already have sophisticated detailed knowledge at large
5 spatial and temporal scales. In this sense, urban design can be truly, innovatively trans-disciplinary.

6 Third, these together allow for a *more reliable study, monitoring and understanding of urban environments*, which is
7 essential if we are to deliver responsible and sustainable place and tackle issues that require global
8 coordination. This answers an important call, now 20 years old for “a globally integrated content linked to
9 a reflexive process [...] across all of our learning in order to meet the challenges that lie ahead”
10 ([Cuthbert, 2001](#)), and a more recent reminder for a better system of validation and critical assimilation
11 of scientific knowledge ([Marshall, 2012](#)).

12 Whilst this paper is a theoretical proposition, the authors are working in practice, policy and academia,
13 implementing these ideas on a daily base to demonstrate that it is indeed possible to apply this new
14 conceptualisation of urban design in both practice and policy. Our aim is to stimulate further debate and
15 collaborations with colleagues across the globe on these matters, especially with the aim of developing an
16 international set of principles for knowledge production, monitoring and implementation. As the
17 substance of what we advocate is evolutionary, so are our ideas, which will require much collaborative
18 efforts to be refined, shared and hopefully adopted.

19 *Fig 10 about here. The meeting of professions.*

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