HACKING: FIELD NOTES FOR ADAPTIVE URBAN PLANNING IN UNCERTAIN TIMES

Abstract

Planning systems rely on an element of certainty and can sometimes be ill-equipped to creatively adapt to increasingly complex system trajectories. We analyse how designers and planners deal creatively with a statutory planning system that is increasingly being challenged by the progressive complexity of the broader social-ecological system in which it operates. Taking Sydney, Australia, as a case study, and drawing from six interviews with senior planners and designers, we explore planning barriers and the strategies used to address these barriers. While many of the strategies are useful and appropriate what seemed more significant were some of the creative methods employed to repurpose strategies in relatively modest but more adaptive ways. We propose to refer to this as 'hacking' and discuss how planners and designers might successfully hack the planning system within its current (legal) boundaries.

Keywords

Strategic planning; Complexity; Resilience; Adaptive Planning; Hacking

1 Introduction

In early 2019, during the Australian summer, the city of Penrith in Sydney's far west was named the hottest place on earth with 48.9 degrees Celsius (McPhee, 2020). The region's geomorphology —a floodplain at the edge of the Nepean River where the shallow bowl of the Cumberland Plain slips beneath the escarpment of the Blue Mountains (Figure 1) — creates a depression which traps hot air (Rachwani, 2021). Current predictions indicate that Western Sydney will experience more extreme heat in the coming years (Whetton et al.,

2012). Yet according to Sydney's planners, an extra three million people will need to be housed in this region by 2056 (ResilientSydney, 2018).

<Figure 1 near here – map of metropolitan Sydney, Cumberland Plain, Penrith, floodplain>

Sydney's western floodplain has always been a complex and contested landscape (Goodall and Cadzow, 2009, Perry, 1963, Ruoso, 2018). In the late eighteenth and early nineteenth centuries, colonial settlers desperate for fertile land claimed the river and its floodplain in a series of bloody battles with local tribes, inadvertently destroying any chance of learning to live with the land (Clark, 1963). Instead, they clear-felled forests, and established grazing pastures and market gardens to provide food for Sydney's growing population. Since escarpments and national parks physically prevent expansion to the northwest and south, the Cumberland Plain is one of the last pieces of land left in Sydney where the physical act of development remains relatively easy. The contest in the twenty first century, it appears, is now between urban sprawl, peri-urban agriculture (Ruoso and Plant, 2018) and the floodplain's fragile and threatened terrestrial and water ecologies (Plant et al., 2012).

Rural lands lie unproductive as many landholders speculate on their development value (Day, 1995), the region's biophysical infrastructures steadily decline and threatened endemic ecological communities such as the Cumberland Plain Woodland are traded or offset as the city undergoes massive urban transformation (Goodall and Cadzow, 2009) (Dupont, 2017, Perry and Primrose, 2015). As settlement extends across the Cumberland Plain and the heat island heats up, population centres like Penrith will risk quickly becoming Sydney's most unliveable and vulnerable urban settlements. This socio-environmental challenge is a global concern, with tensions and conflict over urban and peri-urban lands likely to accelerate

dramatically as climate change escalates and the earth's population expands and shifts around the globe (Adams, 2015).

Sydney has faced something like this challenge before with the release in 1947 of its first attempt at regional planning, the Cumberland Plan, designed to counter its ad hoc planning past and address the need for post-war reconstruction. A new planning body, the Cumberland County Council, was established to manage the Plan's implementation. It failed spectacularly and the Council was ultimately disbanded, because of lengthy delays, land ownership battles, political infighting, lack of funds and a cumbersome planning system (Winston, 1957). Nothing much has changed since 1947, but global pressures from neoliberalism (MacDonald, 2018) and climate change are now in the mix and are exacerbating and exposing the planning system's fundamental, systemic flaws.

These constraints have remained a thorn in the side of Sydney's planners. Exponential urban growth and a rapidly changing climate in a market-driven neoliberal economy cause unprecedented complexities, risks and uncertainties when it comes to securing the liveability, health and safety of cities (Holemans, 2017). Density of residential development, poor provision of open/green space, urban heat island effects, biodiversity loss and flood and bushfire risks are all receiving increasing attention from urbanists, planners and landscape architects.

Planning and design disciplines are making increasing efforts to overcome the intractable nature of this complex condition. In some jurisdictions, particularly in Europe, there has been a move towards complementing, and sometimes even side-lining, formal planning instruments by informal instruments such as thematic strategies and project-oriented approaches (Mantysalo et al., 2015, Hogstrom et al., 2021, Hogstrom et al., 2018). Typically, these efforts use practical, non-statutory strategies to adapt to increasingly uncertain conditions. In Australia the City of Sydney through its Greening Sydney Strategy, plans to

cover 40% of the city in greenery by 2050. Part of this plan includes a Greening Sydney fund within the existing statutory framework (City of Sydney, 2021). However, while policies of this nature are necessary and significant, in Sydney they are often hampered by structural planning issues which prevent effective implementation (Macintosh 2015)

This essay examines the challenges that emerge when a neoliberal economic paradigm and an authoritarian urban planning and governance regime are confronted with a rapidly changing social-ecological system, that is, a city conceived as a complex adaptive system of humans interacting with their physical environments. Such systems are highly contingent, rendering 'solutionism' (Evgeny, 2013) untimely and inadequate. What planning and design strategies might conceivably be employed to address complexity and contingency? As formal reform processes can exacerbate rather than defuse conflict over metropolitan development (MacDonald, 2015), we explore ways of thinking and doing that work right here, right now, to create change pending structural and formal reform of the planning systems and its tools of governance.

The first part of the essay (Section 2) examines planning and design in the face of contingency and complexity, highlighting strategies that have so far been proposed.

Using Metropolitan Sydney as an empirical lens, the second part of the essay reveals how creative planners and designers in Sydney have found a way forward in the current planning system. Section 3 describes our data collection and analysis approach. Section 4 interprets barriers around four themes, based on direct quotes from interviewees. Section 5 analyses how planners and designers have been able to negotiate the current planning system to their advantage, to progress planning and design ideas towards implementation.

Section 6 discusses how, in an existing planning system planners and designers might operate in creative and adaptive ways to achieve effective, adaptive outcomes , using the tools at hand. We introduce the notion of 'hacking' to characterise these strategies.

2 Planning, Design, Contingency, Complexity

2.1. The city as a contingent environment

Since the late twentieth century there has been a growing sense, at least among academics, that the city is a constantly shifting, complex and contingent environment (Kwinter, 1998). More recently, many of us have witnessed first-hand how this complexity magnifies exponentially in the face of a rapidly changing climate. The challenges we face, framed as the Intergovernmental Panel on Climate Change suggests (IPCC 2021) are of a magnitude and complexity we have not seen before, requiring a suite of innovative planning and governance responses.

There has been robust discussion about the nature of this complexity, together with a range of suggestions about how it might be addressed. While the strategies are various, most writers agree that the specific nature of *urban* complexity, while related to and made more urgent by increasing climate uncertainty (Sidle et al., 2017, Xiang, 2016), is deeply connected to the nature of governance and planning, the social culture in which planning is embedded (Kempenaar et al., 2016), and the way in which alternatives are framed (McEvoy et al., 2013). It seems that the current instruments of governance and planning exacerbate rather than resolve, complexity.

For example, the core assumption of the discipline of planning is the possibility of 'prediction, stability and risk reduction' (Rauws, 2017, Steele and Ruming, 2012). Such assumptions foster the adoption of rational comprehensive planning systems (Faludi and Van Der Valk, 1994) characterised by imbalances of power, centralised administration, enforcement of rules, and a preference for efficiency metrics rather than values (Head and Xiang, 2016). From the perspective of governance there are the demands of the 3–4-year political cycle (Tainter, 2000, Bendell, 2018, Ahern, 2011, Jim et al., 2015), which engrains path-dependent agency responsibilities, institutionalised land-use conflicts, and the

incompatibility of economic and environmental developments (Mann et al., 2018). And from a social or human behaviour perspective, the culture of siloes in governance and the built environment sector present often unsurmountable challenges to transdisciplinary collaboration (Matthews et al., 2015).

Underscoring these challenges, complicating them, are those governments, be they liberal, authoritarian, liberal, modernist socialist, Marxist, who believe that 'complex life can be simplified and potentially known by governing power' (Chandler, 2014).

2.2. Strategies for navigating complexity

There is evidence in the planning and design disciplines of increasing efforts to overcome, or simply work around, the intractable nature of this condition. These efforts use practical strategies to adapt to increasingly uncertain urban conditions. They sit on a continuum between the comprehensive and the ad hoc; between the utopian and the anarchic; between the top-down and bottom-up.

At one end of the continuum, Head and Xiang (2016) argue that an *adaptive, participatory, and transdisciplinary* (APT) approach based on shared values and goals can help practitioners interact across spatial scales and policy areas to develop more appropriate policy responses. APT promotes *local experimentation* where "[i]nnovation is more likely in … a no-blame political culture, which provides some protection for experimentation and adaptation" (Head and Xiang, 2016, p.6). Kempenaar et al. (2016), drawing from Dutch regional planning practice, use case studies to describe the benefits of using design as an adjunct to planning as it triggers discussion, creates insights, builds support and engagement, enables joint conceptualising, accelerates development and improves collaboration and networking. In the same vein Ahern et al. (2014), while supporting design, caution against a masterplan approach, suggesting that when dealing with uncertainty, a looser and more adaptable framework may be more suitable.

The other end of the continuum is characterised by strategies that are so place and time specific (Rauws, 2017) they can barely be given a name, and are more usefully described through case studies or simply as *ways* of operating. Building on the adaptive urban planning approach described above, Alfasi and Portugali (2004) describe a case study in Turkey where adaptive feedback loops were created between physical conditions, urban codes and urban development. In Australia, in the face of the unpredictable impacts of climate change for which no specific policies exist, planners layered existing policies to suit specific conditions (Macintosh et al., 2015). 'Anticipatory governance has been proposed as a more generic approach for facing the challenges of climate adaptation (Serrao-Neumann et al., 2013). Then, at the more local and human scale, there is the fine-grained approach of small iterations rather than planned physical change (Hamdi, 2004); ecologically inspired improvisation in political and social arenas (Xiang, 2016); and automation or citizen science which has the potential to disrupt the status quo by opening up new spaces of contestation and activism (Gulsrud et al., 2018).

This brief overview suggests that when urban environments are increasingly volatile, shaped by mounting tensions between spatial planning processes, physical outcomes and the intractable institutional and political constraints that get in the way, the challenges for urban planning and governance, at least for practitioners working in the field, become less about attacking things head on, and more about recognising the barriers. Then the challenge becomes finding other points of entry, either by slipping in sideways, developing parallel logics, attempting guerrilla tactics or working quietly, unnoticed on the side lines. They seem less about what to *do*, and more about how to *act*. We will return to this critical distinction after taking a closer look at the barriers described by Sydney planners and designers, policy makers and academics. We first describe our data collection process.

3 Materials and methods

Using a case study of Western Sydney, we conducted seven in-depth, semi-structured interviews with experienced senior experts, policy makers and academics (< Table 1 near here – Interviewee details >

) whose expertise and experience jointly cover the major aspects of the theory and practice of design and planning in the context of Sydney's metropolitan area. We do not claim that the selection of these seven individuals guarantees, *a priori*, a complete view of initiatives and ways of hacking. Rather, by carefully selecting people with diverse professional expertise, but all with similarly profound experience in the NSW planning system, we aimed to establish a robust basis from which to infer our stories and, ultimately, our proposed ways of hacking.

< Table 1 near here – Interviewee details >

Informed by a preliminary literature review, our interviews were designed to probe current barriers to innovation and adaptive planning and design in more depth. Our interview questions were open-ended to allow further insight to emerge. Interviewees were pre-selected based on their public profile. All interviews were conducted by at least one of the authors, and all interviews were audio-recorded and transcribed for further analysis. Iterative, qualitative coding of the interview transcripts was subsequently undertaken to infer intermediate and final themes. From this process, four key themes emerged that account for Sydney's ongoing planning problems: *i*) structure and politics, *ii*) economics, *iii*) land ownership and *iv*) disciplinary or operational compartmentalisation. In Section 4 below, we interpret each theme, supporting our interpretations with direct quotes from interviewees. Using the interpretative vehicle of story (Crowther et al., 2017), Section 5 elicits how

planners and designers have been able to negotiate the current planning system to their advantage, to progress planning and design ideas towards implementation.

Our analytical process classifies as interpretive research (Yanow and Schwartz-Shea, 2014), in the sense that it followed an open, abductive approach without pre-fixed analytical structures. As such, we acknowledge that the robustness of our interpretations and findings depend on our positionality regarding our subjects of inquiry, as well as on the systematicity of our data analysis. In so doing, we accept the 'double hermeneutic' at play in our research process (Alvesson and Sköldberg, 2000) and offer transparent descriptions of the interpretations of our research phenomena embedded in our data sources (interviewees, respondents, and literary sources (first-order hermeneutics), and the effects of our interpretive analytical framework (second-order hermeneutics).

4 The interview results: barriers in Sydney's planning system

4.1. The NSW Planning System

Australia has three levels of government: a federal Parliament which makes laws for the whole of Australia; six state and two mainland territory parliaments which make laws for their respective states and territories; and over 500 local councils which make by-laws for their respective regions and districts. Australia's states have primary responsibility for land use and strategic spatial planning.

The NSW planning system consists of a complex and dynamic array of legislation, policy and public authorities. It has two broad remits: land use planning and development control. Land use planning sets strategic objectives for an area by means of environmental planning instruments, strategic plans and subregional planning processes. Development control is achieved through assessment and approval, undertaken by the relevant planning authority in accordance with established approval pathways.

4.2 Structure and politics of Sydney's planning system

Sydney has always struggled with a lack of communication, trust and accountability between its federal, state and local governments. "The relationship is extremely fraught" (P4). Decision making is "locked down… with very little debate, most of it constrained to a very small number of high-level bureaucrats answerable to a set of political figureheads that have more or less understanding of planning. There isn't much opportunity to meaningfully generate ideas from the grassroots" (P4). Premiers' priorities shift according to political cycles and strategies are poorly integrated and out of sync, like "15 mechanical clocks working at the same time, overlapping at differential speeds with different milestones. When you have a policy idea, try selling it to another level of government and it's a case of, *your timing is all wrong"* (P1).

Although Sydney's planning history is distinctly spatial, sometime around the 1970s there was an emphatic shift from spatial to statutory planning and the now "surprisingly authoritarian" (P4) planning environment in Sydney is focused primarily on regulation and compliance. In a State where the system is weighted towards compliance with an emphasis on rules to control behaviour and each tier of government has its own suite of policies and legislation, "you need an enormous population of skilled people to administer and interpret them" (P6). While there is room for nuance in the system, local governments, where much of the work is done, don't have enough money to attract talent nor the time to focus on nuance or strategy and are instead forced to adopt a 'one size fits all' approach to compliance. And while the State issues directions, "there isn't necessarily a lot of support, and there's a lot of punishment" (P4).

4.3 Political Economy of government revenue

One of the city's biggest challenges is money, and the planning system – in particular 'sin taxes' – are seen as vital sources of revenue. The conflation of planning and economics in an

authoritarian government — where “planning is a revenue generating mechanism ….and the state frames itself as an active profiting partner” — will make any government “closed to new ideas” and open to corruption (P4). For Sydney it leads to decision-making based on private investment opportunities rather than good planning. With the decline of extraction industries and in the absence of manufacturing, the city’s economic strategy is based on accumulation and growth: on human bodies and the infrastructure and buildings required to house them. Infrastructure is seen as a good investment and the most recent infrastructure projects, funded by public-private partnerships, have tried to forge connections between the uncontrolled growth of the central and middle ring of suburbs and new suburbs in the west by slicing through or tunnelling under the existing urban fabric at great expense. Very little money from these revenue streams filters down to local government.

There is also a marked disparity of power and influence between wealthy inner city councils such as the City of Sydney, which is “much more capable of standing up to state government” (P4), and poorer ones in the western parts of Sydney, where problematic urban expansion and some of Sydney’s most significant climate challenges occur. Where wealthier local government areas (LGAs) can collect land tax from commercial as well as residential properties, many peripheral local governments without a solid tax base are left “spinning their wheels just to keep the lights on” (P4). These are the places that also struggle with inappropriate development on floodplains and habitat preservation. Clearly, they have quality of life and infrastructure congestion issues.

4.4 Land Ownership, green space and the decline of the greater good

Money is important in a different way when it comes to establishing connected green space. “If you think about [growing a city] through a patchwork of green pieces, through the natural systems of the city instead of through the train lines or the highways of the city, you can densify in a more sensible way” (P5). However, connected ecologies and urban

developments operate according to different spatial logics, and fragmented land ownership and the increasing costs of land required for conservation or offsetting prevent the land acquisition necessary for adequate ecological connectivity particularly in Western Sydney where a large proportion of land is privately owned.

Although green space is desperately needed in Western Sydney (Brunner and Cozens, 2013), most urgently for urban cooling, councils appear to actively discourage it in new housing developments. “If acquisition is the biggest hurdle, the next will be finding a new model of investment in green space” (P5): in the human-centric world of planning for open space, trees are classified as expenses rather than (natural) assets and in some contexts, councils are forced to cut down trees because they cannot afford to maintain them. “They encourage developers not to invest in open space because they know they're going to inherit it afterwards. They don't want to have to maintain anything complicated so won't approve anything beyond the bare minimum. So, you get a few concrete paths, and that's it - a fitness station every now and again, and no trees” (P5). This problematic state of acquisition and investment points to an underlying issue: existing waterways, ecologies and green space are rarely valued except selectively as an ecological ‘service’ or ‘ecosystem service’ — the anthropocentric model again — and therefore easy to be abandoned if end users of such services lose interest or are unwilling to pay for them.

Another manifestation of the decline of the greater good is the impact of the new NSW biodiversity offsetting rules, especially in Metropolitan Western Sydney where much of Sydney’s development pressure on greenfields is manifest. The new offsetting rules encourage – perhaps by design – the wholesale destruction of vegetation to create a tabula rasa for new development. “It's a regulatory barrier and a ridiculous idea that you can clear huge areas and offset them against areas further and further out. In one particular development zone in Western Sydney every tree has been certified for removal except for the

riparian zone. Yet we're trying to create a parkland city with five million trees. It discourages the pressure of having to address wrapping habitat through development" (P5).

Exacerbating the destruction of native vegetation in Western Sydney is the trend for bigger houses supporting fewer people on smaller lots with minimal setbacks. This means large houses are built to the edge of the lot, with no room for significant vegetation. Planning levies and fees for development encourage developers to cut corners to make a profit (P7). The lots are all hard surfaces, the interface between riparian corridors and people is poorly managed and the massive increase in stormwater runoff destroys the delicate ephemeral waterways so characteristic of the Cumberland Plain.

4.5 Disciplinary silos

The legal, economic, political and environmental complexities highlighted above make the navigation of Sydney's planning issues extremely difficult. The translation of territorial-scale plans (GSC, 2018) to the local scale requires multidisciplinary planning teams using an integrated, holistic approach to confront complex issues associated with place-based infrastructure, liveability, productivity and resilience (McGregor et al., 2021). Despite a clear and present need for a holistic approach based on strong, collaborative stakeholder relationships, "planning has been seen until recently —with the recognition of design-led planning—as something that splits uses and zones in a non-spatial way (P5). Much of the work of translation is therefore prone to falling between the cracks that exist between siloed disciplines. The dominant linear planning process does not easily accommodate collaboration, and engineered infrastructure continues to be designed and implemented as a series of separate, closed, monofunctional, and therefore disjointed (sub)systems. "There's no way of seeing the overlap and relationship between them, having them on the spreadsheet and costing them and sequencing them in a useful way" (P5). Decision making is further compartmentalised with different languages and rules. This often compromises

communication across institutions and disciplinary boundaries. In this environment it is difficult for innovative ideas to be progressed or implemented. The Greater Sydney Commission (GSC) is, on paper, well placed to coordinate these tensions, however they lack resources, and the challenge is essentially left to local government (P4).

5 Adaptive planning: an opportunistic approach

Having outlined a variety of barriers in Sydney's planning system, we now identify how planners and designers have managed to negotiate the current planning system to their advantage, progressing planning and design ideas towards implementation in a way that makes a difference with respect to Sydney's challenges. We do so through the vehicle of stories.

5.1 Grassroots opportunism

Twenty years ago, a rural planner began working at a strategic level in Sydney's southwest, one of the few remaining rural/agricultural LGAs left on the Cumberland Plain. Under pressure from the State government to subdivide for rural residential development and manage simmering conflicts between agricultural and residential land uses, he established a local government working party— circumventing the State policy directive to go straight to elected councillors— and began a yearlong survey of the district to investigate the value of agriculture. He found that 12.5% of Australia's agriculture came from this region.

In order to strike a balance between agriculture and residential land use, and so as not to "hide behind the policy vacuum", he developed a lengthy consultative approach of "information forums" with the community, working for months with local residents, setting up in the Rural Fire Service shed so locals could drop in for a chat after picking up their children from school. His methodology, unusual at the time, addressed *agricultural value*, not just land use, and included lot sizes (the cadastre), soils and proximity to markets. He

proposed rezoning land to protect agriculture while at the same time allowing for adjacent residential development. He has implemented this across a number of local councils in the Sydney Metropolitan Area, ultimately securing at least a small portion of existing fertile lands to enhance Sydney's food security and provide other public-good benefits.

Although change has been slow— the product of tough small wins and many committed people working on the issue— he was and continues to be successful because of his grassroots approach. "If you have a good idea", he says, "it needs to be shared in an open and transparent way with community and local council and supported with 'detailed assessments …. you need to be across the data" (P2). He used that shared vision to "drive innovative solutions at the local level, rather than waiting for it to filter down from the top" (P2).

5.2 The power of narrative

"There was an era of less rapid change" says a senior planner frustrated by Sydney's lack of strategic focus, "when the perception was that you could control everything via a top-down regulatory model. The thinking was: we'll control behaviours, we'll separate uses, we'll separate incompatibilities, and we'll do it by having rules" (P3). Now the world is much more complex. A one size fits all rules-based planning system, where everything is based on the standard classification of land, is constraining rather than enabling. The lack of strategic thinking at every level of government means that everything is decided on an issue-by-issue basis resulting in "much time, much angst and many contested conversations" (P3). It drains resources, is time consuming and hampers innovation.

This senior planner's solution is to adapt to this system rather than change it, by shifting the focus from regulation to narrative. There can be rules, he says, but rules that act as a "fluid conversation piece" rather than a constraint. The 'conversation' should start with a strategic storytelling exercise, developed "in a collaborative way with people about a place, about where that place has come from, what its history might be, where that place is at the

moment and most importantly, the values of the people who live there, followed by strategic visioning: the vision of the community of this place in the context of a changing world." That story should be generated at the local level and drive everything that happens in the area.

In a statutory planning environment, storytelling is a startling —almost naïve, yet effective — adaptive mechanism. Rather than changing the system it focuses on layering over and between disparate rules and regulations, weaving them together and in a way making sense of them all. It creates a hierarchy of values to which the rules adhere. The values create a framework for interpretation and in doing so make space for uncertainty. The stories enable and ennoble local communities, but they are just as important at the regional and state levels and most powerful when they resonate with one another across all levels. The introduction of the Greater Sydney Commission (GSC) in 2015 was intended to act as an important steppingstone in that cross-scale narrative. However, because Commissioners were appointed by the State and were hasty in setting up their respective Regional Plans, the GSC has been criticised for a lack of comprehensive community consultation.

The planner emphasised the flexible nature of strategic planning: "It means you're flying ", he said, "and watching things as they move around and materialise. You're communicating with politicians. It's not one size fits all. You have to build slack around uncertainty". He works from the ground up and the top down to fragment the siloed approach so characteristic of Sydney planning. As a way of illustrating this strategic narrative approach, our interview began and ended with his vision for Sydney captured in a handful of simple principles flexible enough to guide Sydney towards the future.

5.3 Exploiting loopholes

The jurisdictional prerequisites for consent in Sydney's planning system operate in three tiers that can be thought of as graduating from soft to hard control mechanisms. The softest control, the third tier, is that something should at least be *considered*: nice to have but not

mandatory. At the second tier the consent authority must be *satisfied*. *Satisfaction* operates at a higher threshold than *considered*. The most binding prerequisite, the one that the Courts deal with, is that a consent authority *must not grant approval unless* a particular condition is met.

An architect working in the first tier as a Commissioner in the NSW Land and Environment Court - where one would expect the legal system to be particularly inflexible - looks for creative strategies to relieve pressure on the legal system. His idea is to find ways within the existing system for planners and designers to "work more up front…where the biggest impact and cost in legal fees and litigation can be avoided" (P1). Referring to the Cumberland Plans, he suggests that a particularly useful strategy is to prepare simple spatial plans, so "you don't need to go to Clause 4.2 Part B, sub-roman numeral three, to understand what might have been meant by a sentence in a legislative draft" (P1).

Surprisingly though, he has found another opportunity in the Land and Environment Court, a place that typically deals in legal facts and precedents, not matters of aesthetics, form and function. Design decisions and qualitative measures are typically the realm of Design Review Panels, which assess projects before they are submitted to council for approval. However, if a proposal is rejected because it contravenes the Local Environment Plan (LEP), the developer can appeal to the Land and Environment Court, and this is where a second opportunity emerges. Before a hearing there is a mandatory threshold process of Conciliation led by a Commissioner who is an expert in planning and design and granted by the Court the authority to manage the proceedings. Once in Conciliation the Rules of Court do not apply, and all parties enter what is called a 'Zone of Possible Agreement'. It is in 'the Zone' that design decisions are discussed, qualitative and quantitative measures are traded, and a deal struck that satisfies everyone. Once all parties agree, the Commissioner manages transparency and accountability by covering all the relevant jurisdictional issues and prepares

a 4.6 variation to the LEP. (Clause 4.6 of the LEP (NSW Government, 2006) provides flexibility in the application of development standards, allowing consent authorities to approve a variation to development standards). The Court grants consent and a hearing is avoided.

By effectively linking the Design Review Panel, a second-tier, softer prerequisite, with the Court, a much harder first-tier control, Conciliation in the Zone of Possible Agreement becomes a little pocket of space in Sydney's legislative framework that is neither one nor the other, but both: a space of overlapping systems and logics. Not a legal loophole but rather like a *systemic* loophole, it creates a slightly ambiguous space to allow the existing planning system to breathe, a space as the architect describes, 'enormously rich with potential' (P1).

5.4 Subverting the planning system

A Development Control Plan (DCP) is typically prepared at the local government level to provide detailed planning and design guidelines in support of local environment planning controls (LEP). The DCP is intended to act as a second-tier guideline to ensure design excellence, however it is often enforced as a first-tier mandatory requirement. DCPs are rarely evaluated against conflicted spatial constraints, and therefore often contradict each other and as such have the potential to constrain rather than promote innovation. In the words of an architect working on both sides of the DCP approvals process, "innovation and risk work hand in hand. To promote innovation, councils need to approve 10% of projects that they know are risky. Or is every single project only considered any good if it can survive the process being applied for?". "The only way to innovate", he suggests, "is to subvert" (P6).

When proposing an innovative scheme to a reluctant authority, he subverts the approvals process into one of "case building rather than criminal defence. Knowing from the outset" he says, "that anything I propose will be opposed" he gathers around him a "community of interest", opinions of respected professionals and neighbours, and he compiles these, together

with precedents and the reasoning behind the proposal, into a frontispiece in order to "shift the interest onto the project and away from the authorship….to try and have people develop an interest in what is really at hand in the scheme" (P6). And with that weight of evidence behind him he negotiates with the approval authorities in order to have what is really at stake and what is in fact innovative, approved.

Paradoxically, he faces these challenges because DCPs are so variable. They rely on the skills of planners at individual local councils who prepare and then interpret them on a case-by-case basis. If DCPs were standardised, sensible, conservative and simple, he suggests, the approvals process might actually be more, not less flexible. Despite the counterclaim that DCPs capture local visions of place and articulate uniqueness, he suggests that individually tailored detail makes the DCP cumbersome, time consuming to administer and subject to the aesthetic preferences and sometimes incompetence of the planners who prepare and administer them.

What the architect seems to be suggesting is that in order to navigate the system, it is necessary to *prepare the ground* with ample evidence, not 'armed to defend' so much as 'disarming' in order to neutralise the territory. The subversion here — from an adversarial approach to one that is collaborative —is subtle but potentially has enormous impacts.

6 Discussion

6.1 Pragmatic strategies

The barriers the interviewees face in Western Sydney are strikingly similar to those encountered elsewhere: complicated governance structures (Serrao-Neumann et al., 2013), post-political instrumental rationality in policy and planning practices (MacDonald, 2015), entrenched land use conflicts (Goodman and Douglas, 2017), the incompatibility of economic and environmental developments (Twill and Christensen, 2018), the disciplinary and

compartmentalised approach to problem solving and the challenges of collaboration were all raised by the interviewees.

They are similar because they arise not from a particular place — which would make them idiosyncratic and impossible to replicate — but as the *generic* product of political and ideological regimes, common throughout the western world. These regimes take a top-down approach to governance that is hierarchical and heavily weighted with bureaucracy. The discipline of planning, developed as an instrument to support governance, has followed much the same course.

The differences tend to be place-specific, arising primarily from underlying environmental conditions and the localised uncertainties of climate change and its impacts. There are cultural differences too, for example some would argue that because of its colonial beginnings, Sydney has always been corrupt, and that the current situation is just an extension of that history. One interviewee noted that the government in Sydney was particularly authoritarian, comparing it unfavourable with governments in Canada and the US.

In their telling, however, our interviewees' stories show something more subtle at play. The first interviewee, for example, works at a *grassroots* level: gathering a community of interest; operating in a completely transparent way; refusing to blindly acknowledge state policy directives without first gathering evidence and making recommendations based on that evidence. The second, acknowledging that the rules are often unresponsive to the needs of the people they are designed to serve, counters this with simple strategic narratives that remind people why the rules existed in the first place. He uses narrative to make sense of the system rather than trying to crack it open. The third looks for ambiguity: entirely legal but where the constraints of law might bend enough to be more singular, less abstract and therefore more

relevant. The fourth subverts and disarms, subtly upending mindsets of those who administer the law so they feel comfortable and empowered to take risks.

6.2 Hacking the planning system

While offering strategies, suggesting *what* one might do, or *where* to target the planning and governance system, the stories are interesting because they suggest *how* one might operate in such complex, entrenched legislative environments. To make a difference, our results suggests, you have to operate —in the words of US academic Keller Easterling (2017): "[..] less like a Utopian who knows the one and only thing to do and more like a pool player who knows what to do *next* or how to play for *longer* and add more information to the table. How to shape agreements not just as master plan declarations or policy solutions but as bargains, chain reactions or ratchets?"

Easterling's suggestion is a classic description of effective adaptive behaviour in a complex system where the focus is not on changing a system, nor on defending against it but on *changing the way one operates within* it. Although each move is relatively modest, each interviewee is operating *against* the legislative grain but entirely *within* its boundaries. There is a sense of an active, creative engagement born often out of frustration but also grounded in a depth of experience and a clear understanding of how the legislative and planning systems work. The word that perhaps best captures our interviewees' successful operations is 'hacking'.

Recent scholarship describes hacking as a useful tool for adaptive governance as its 'open and experimental' nature 'enables the recomposing or repurposing of aspects and relations as the basis for further incremental changes and possibilities'. This approach is because it offers an alternative to modernist discourses of governance which assume 'that risks or problems can be solved, prevented or removed through technological or engineering approaches'. In the context of planning, hacking's modus operandi of 'working with' rather 'struggling

against', returns "the human subject to the world, not as the controlling goal-directed subject of modern forms of governance, but as an experimenting, compositional and playful subject, fully aware of its lack of causal knowledge and at home with contingency and the unexpected" (Chandler, 2018, p.142).

Our findings, based on the modest collection of interviews in this essay, and inspired by recent transdisciplinary scholarship in complexity and adaptation, suggest that hacking as a mode of planning and governance:

1. Responds to existing conditions on an 'as needs' basis and is therefore, of necessity, place and time specific. What demands focus here is how hacking emerges from the collision between specific local conditions and the governance and planning system, often in response to an urgent need, and out of a frustration with the planning system's incapacity to meet those needs. The hacker responds *creatively* to those limitations which, in turn, are catalysts for creativity. Hacking, in this situation, balances traditional planning and governance systems in space and time: while planning is typically abstract and planning initiatives relatively slow to take effect, hacking is local and immediate.

2. Relies not on a comprehensive knowledge of everything but an intuitive sense of how a system works and a creative approach to how it might be refashioned to leverage impact. In this sense it is opportunistic: it makes use of what is at hand. The creative aspect of hacking exists at the level of one or a few individuals who see 'the unseen potentials which exist in recomposing relations' (Chandler, 2018, p.182), and can connect disparate things and ideas to create new productive networks between people, places and things. Just as Claude Lévi-Strauss' *bricoleur* makes do with whatever is available (Lévi-Strauss, 1962), the hacker, rather than wishing things were different, relies on an intuitive sense of how a system works and how it might be refashioned to leverage impact.

3. Works against the planning and governance grain, testing the boundaries of the legal system by seeking out and exploiting ambiguities and loopholes in the system. When the planning and governance system is congested and its operations become counter-productive, the response of the hacker is not to change the system but to look for weaknesses where there is light and air; an opening where the rules, while still there, are more flexible. Like the DCP interviewee, who uses sleight of hand to flip the focus away from the rules towards what is really at stake, the successful hacker is subversive, turning "ground into figure, even if only temporarily" (Bogost, 2016, p.111). This kind of behaviour leans toward a proclivity for expanded thinking, the will to move beyond the rules; to boldly and patiently improvise; to identify what is at stake and to target that, letting everything else shift, reorganise and come to rest around it.

4. Negotiates complexity with narrative. At the local level and without the backing of authority which simplifies by working in the abstract and making rules, the socio-political environment is particularly complex and daunting. Story telling carves spaces through that complexity, drawing together disparate strands, making them cohere so that a story emerges. Stories are powerful ways to innovate and transform and the hacker uses them to empower communities, supporting them to take collective action through a series of iterative adaptations: in their own space and their own time.

6.3 Implications

We are not proposing a solution in this essay. Nor do we suggest that hacking might dramatically change existing planning systems. We are simply identifying what emerged from the interviews. While looking for a solution to what seemed to be an intractable problem, we found something significant happening on the margins. This caused our focus to shift from 'fixing a problem' to working with what was already there. Our stories are place-

specific examples; however the *generic challenge* that they address – that of inertia of the planning system in the face of increasing complexity – have wider, if not global, significance.

6.4 Concluding remarks

While the strategies described in Section 2 address the barriers to innovation and adaptation in complex and uncertain urban environments, all require approvals, policies or infrastructures for their implementation: design-led planning to break down silos; new financial models to create and manage critical infrastructures and large areas of open space; leveraging off global trends to influence community aspirations; establishing data-gathering prototypes to create feedback loops in the planning process; standardisation of the DCP process; and more effective consultation, transparency and accountability at all levels of the planning system. These are all good ideas but because they tell us *what to do*, the danger is that they fall prey to those very barriers that we and others have identified.

The 'anarchic' strategies harnessed by our interviewees do not prescribe *what to do* but rather offer examples of *how to act*. The stories lay bare how planners and designers might operate in order to tackle the thorny relationship between politics and planning. As an approach, hacking does not rely on anything being different, it accepts what is and works with that. It's not defeatist, just realistic, responsive and ultimately empowering.

Acknowledgments

< removed for blind peer review >

Declaration of interest statement

< removed for blind peer review >

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Figures

<provided in a separate file>

Figure 1: Growth of Sydney's urban boundary. Note that all undeveloped land in this image is undevelopable: either floodplain or sandstone escarpments (Source: City of Cities – A Plan for Sydney's Future, Department of Planning, 2005.)

Tables

Table 1: Interviewee details.

Participant Code	**Position(s)**	**Affiliation(s)**
P1	Architect, Commissioner, Land & Environment Court of NSW	Private sector/State Government
P2	Principal Planning Consultant	Private sector
P3	Chief Planner, Strategic Planning Advisor	State Government
P4	Professor of Urban Planning	Academic
P5	Landscape Architect Practice Director	Academic/Private sector
P6	Architect Partner, Private Consultancy	Private Sector
P7	Urban TaskForce	Private Sector (Peak Body)