

Planning, ethics and infrastructural time

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Abstract

This paper shows how different properties of time and their ethical implications are reflected in the framing of debates around planning and the perceived problem of delay in the delivery of infrastructure. We examine the way in which plans can take the form of ‘time maps’ that are linear projections of a series of events. This can lead to assumptions that desired futures can only be achieved if the actions that constitute events are performed correctly often coupled with a moral imperative to such performances. It also reflects an orientation towards a more closed view of time that emphasises the significance of ordering such events within a series. This contrasts with a second, more open conception that emphasises the changing, flowing experience of time. Alfred Gell describes these interconnected perspectives as the A- and B-series qualities of time both

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of which are thick with ethical entanglements. Thus, we use these to set out a framework that applies deontological and consequentialist ethics to the A- and B-series and the tension between delivery and deliberation that exists in infrastructure planning policy to show how different perspectives on time raise different ethical questions.

Keywords

infrastructure, planning, delivery democracy dilemma, project management, Alfred Gell, A- & B-series

Introduction

As planning is a ‘future-oriented discipline’ (Connell, 2009) planning, and planners themselves, work on and with time in particular ways. These involve making plans that function as ‘time maps’ (Bear, 2014; Gell, 2001); linear representations of an ordered series of events constructed in an attempt to make knowable and ultimately govern an uncertain future. Yet, as Laura Bear (2014) notes, this is a process ‘thick with ethical problems’, a point rarely acknowledged so directly in the planning literature on time despite having been covered in some depth by anthropologists like Bear. In this paper, we seek to address this deficit in perceptions of planning by using concepts of time borrowed from anthropology that *do* acknowledge ethical problems inherent in modern capitalist time. Our motivation is to make explicit *implicitly* moral critiques of planning and the planning of infrastructure. These frame the processes of democratic deliberation that forms part of the planning process as problematic, a waste of time and an impediment to the delivery of infrastructures (Cowell and Devine-Wright, 2018). Moreover, planning is cast as an illegitimate constraint upon the realisation of specific visions of the future that shape certain types of infrastructure. We therefore seek to make the ethics of such critiques clear by setting out a framework for mapping a wider spectrum of ethical questions onto different conceptions of time. We argue this allows us to address more pressing concerns such as the power certain framings of planning have to govern the process by which such projects are implemented (Carter, 2019), control movement through a series of events and how events are constituted in ways that privilege some futures over others.

Our observations on the use of time made as part of a multi-disciplinary collaboration between planning scholars and engineers led us to pursue an abductive methodology in formulating the theoretical framework set out in this paper. In the original study of the timelines for major projects in London and Toronto, we adopted a broad definition of infrastructure as ‘key facilities, assets and physical

networks such as highways, roads, bridges, railroads, airports, telecommunications systems' with a particular focus on transport infrastructure (Saxe et al., 2021). This initial research led us to question notions of timeliness reflected in the framing of planning and deliberation as delaying necessary infrastructure. We found conventional time maps that acknowledge only certain key 'events' such as the formal planning or construction phases tell a partial story and there are often significant but overlooked pauses or breaks in the timeline where time takes on an altogether different character.

Our subsequent focus on the mapping of time that established the framework discussed below, has emerged from this abductive, iterative process of 'tacking back and forth' between the specificities of our empirical evidence and abstract theoretical formulations (Adams et al., 2009: 255). The empirical component included the analysis of the timelines for 26 major transport infrastructure projects in the two cities combined with an analysis of the way infrastructure is politicised in both. Evidence also includes the way this discourse of planning as a form of delay has shaped the planning system for major infrastructure in the UK (Marshall and Cowell, 2016). This has produced a process in which time is tightly controlled with the aim of reaching rapid decisions; something often viewed favourably in a Canadian context seen as more overtly politicised and thus inclined to delay or engage in interminable debates without reaching a decision. The theoretical component includes formulations from Alfred Gell's work on time and recent interpretations of it (Bear, 2014, 2016). Furthermore, we draw on the experience of finding ourselves 'vaguely dissatisfied with established conceptions of efficient causality' (Connolly, 2010: 169) reflected in the conventional framing of planning and delivering infrastructure as a means of attaining progress. Thus, the framework set out in the section below on time's ethical entanglements is not one that we claim is empirically verified by the data. Nor do we claim it to be an inductive product of analysis of that data. Rather it is a 'speculative but informed conjecture' (Unger, 2009), one that has explanatory value (Glynos and Howarth, 2007, 2018). Beyond this it offers a means of posing ethical questions about the different conceptions of time that manifest themselves in the ethics and planning of infrastructure.

In the following sections, we first discuss this relationship between planning and the future and how the association of time with money feeds an implicitly ethical critique of planning as an impediment to the perceived benefits of infrastructure. We then introduce Gell's (2001) concept of time as either A or B-series. Among the multiple temporalities inhabited by infrastructures and infrastructural imaginaries (Jasanoff and Kim, 2015), Gell's work explains how linear, B-series time maps have become powerful instruments of governmentality in the processes through which they are conceived and planned (Carter, 2019). These exhibit a 'closed' approach to decision-making (Stirling, 2008) that is often hostile to more 'open' interpretations of the planning process

(Hofmeister, 2002). And contrasts with those that argue infrastructure planning requires periodic pauses that allow 'time to breathe' (OMEGA Centre, 2011). More generally such pauses or opening up of spaces afford the opportunity different forms of planning that challenge or subvert dominant narratives (Cowell and Owens, 2006).

We suggest the dominance of the B-series rests, in this case on assumptions of causality between events, and produces a situation whereby the requirement to perform that series takes on a moral dimension. We then argue that this is an implicitly consequentialist ethical framing as it privileges the justice of the ends (infrastructure and its benefits) over deontological concerns with the means (whether or not the process of planning conforms to ethical norms). This situation calls for a framework to understand the full ethical implications of the different qualities of time. These can be arranged along a spectrum that takes in *both* consequentialist *and* procedural or deontological ethics (Campbell and Marshall, 2002) and relates to the perceived tension between democratic deliberation and the delivery of infrastructure (Cowell and Devine-Wright, 2018). We then identify the different first- and second-order ethical questions this requires for approaches to infrastructure planning that favour either an A or B-series conception of time. We conclude with a discussion of the importance of explicitly acknowledging the ethical implications implicit in the way time is perceived and framed within infrastructure planning.

Planning, infrastructure and the future

Given the longevity of most physical infrastructure, planning actively shapes the future by opening up some options whilst closing others down. Both plans (Abram and Weszkalnys, 2013) and infrastructures (Harvey and Knox, 2012) extend forward in time. The latter does so through the physical legacies they create. The former, by the way plans bring decisions about the future into the present thus offering a sense that the future can be managed (Connell, 2009). This can be seen in the 'promissory' nature of planning, the way it offers a 'compact between now and the future' (Abram and Weszkalnys, 2011: 8). Yet, in the face of an accelerating climate crisis and under the fraught conditions of late modernity (Beck, 1992; Giddens, 1994), the modernist promise of a controllable future that will be better than the past is becoming harder to fulfil. Nevertheless, the potential of new infrastructures to replicate the past benefits that mass transport, sanitation, accessible energy or communications have brought to many parts of the world remains seductive. This attractiveness is a key element of the technocratic 'modernist ideal' (Graham and Marvin, 2001) which has tended to privilege the utilitarian benefits of infrastructure over rights to participate in its design or the rights of those communities, species or places who are negatively affected by it.

The accelerating global patterns of mobility, and indeed the experience of time itself (Adam, 2001; Connell, 2009; Harvey, 1991; Laurian and Inch, 2019), has become intertwined with increasing production and resource consumption. The ‘great acceleration’ of the latter has ushered in a new and unpredictable era, the Anthropocene, fundamentally altering our relationship with our environment (McNeill and Engelke, 2016). The implications this has for the planning and construction of infrastructure are considerable raising deontological ethical questions about the rights of future generations and non-humans to shape the process. There are also key temporal implications that stand out. The first is a paradox: It is often the same infrastructure that has brought the benefits of modernity that now, by dint of the resources it consumes and lifestyles it enables, threatens our very existence. Infrastructure makes us aware of this through the global networks of technology and personnel that allow us to appreciate the extent of our impact upon the planet (Henke and Sims, 2020). The second implication is that new, less polluting infrastructure will be at least a part of the solution. Exactly how much is a matter of some debate and there is insufficient space here to get tangled up in arguments of ecomodernism versus degrowth economics (Hickel and Kallis, 2019). However, the common ground between the two competing approaches is that the time we have to achieve whatever form of transition is necessary to address the multiple crises of carbon emissions, biodiversity loss and unsustainable resource consumption is incredibly short. Yet, this urgency is of our own making. The speed at which the window for decarbonisation is shrinking is driven by a mix of historical and ongoing emissions. In that sense, there are parallels with the COVID pandemic, namely, that with exponential growth time can be ‘bought’ by early action to reduce the scale of the problem. Thus, there are powerful consequentialist arguments for rapid action on the infrastructure necessary to reduce emissions as the earlier we can reduce them, the more time we create for dealing with their consequences. Yet, a rush to deliver infrastructure that exacerbates the ecological crisis could prove disastrous.

Time is money

One key feature of modern capitalist time that reveals its ethical component (Bear, 2016) is the desire to command labour time as a means of achieving profit (Harvey, 1991). From E.P. Thompson’s (1967) discussion of the material basis of modernity, we seek to take the critical focus upon time as technology for disciplining society even critics concur is to be valued (Glennie and Thrift, 1996). Whilst Thompson’s simple distinction between ‘clock time’ and pre-modern task oriented time may not have stood up to empirical scrutiny he showed how among the various forms of time discipline that occur some conceptions, particularly those associated with the interests of capital (Birth, 2022)

dominate others. With planning emerging as a means of controlling time and the uncertain future of modernity (Connell, 2009), the effect of this disciplining of time becomes apparent. Whilst planning may establish a set of steps by which a range of benefits – including profit – can be achieved, the time spent engaged in planning might not in itself be, or be viewed as, productive. Thus, under the discipline imposed by contemporary capitalism time spent planning has to justify itself against calculated economic benefits.

The narrative of labour time and infrastructure as central to production generates a perspective so common it appears uncontentious, the belief that time is simply another resource. It is expressed in neoliberal space–time compression (Harvey, 1991) resulting in the speeding up of social processes such as planning and the reduction of decision-making horizons (Pike et al., 2019). The ‘veneration of speed’ (Adam, 2001) is combined with the disciplining of time to create the perception of something quantitative, divisible and, as with money, something that offers a universal category into which value can be dissolved. The manifestation of such ethics and value-laden approaches can be seen in common practices of cost–benefit analysis which, based on a consequentialist utilitarian framework, ascribe monetary value to the time apparently saved by transport infrastructure (Naess, 2006). As a result, the perceived capacity of schemes to deliver a profitable use of time has come to be seen as their pre-eminent benefit, thereby skewing appraisal processes and consequently infrastructures themselves towards this end. The further entanglement with relationships of debt and credit, and in particular the practices associated with interest-bearing loans, generate additional moral force (Graeber, 2013). All this is compounded by the age-old notion that time should be well spent and reflected in what has been described as ‘time-thrift’ (Thompson, 1967: 93). The larger corollary is that there is something almost unethical in time being wasted, perhaps reflecting capitalism’s Protestant ethical underpinnings. This belief can be seen in what are sometimes strategically framed as the waste of time in deliberation over infrastructure (Marshall and Cowell, 2016).

This disciplining of time has been a specific feature of infrastructure planning regimes in the UK and beyond (Marshall, 2013). Time ‘lost’ in planning (Marshall, 2002; Newman, 2009) has been used as a rhetorical stick with which to beat planners, thus forming a cornerstone of a long-running, deregulatory ‘attack’ (Lord and Tewdwr-Jones, 2012). This is part of a wider critique in which planning is framed as a constraint in the delivery of both housing and infrastructure (Barker, 2004; Eddington, 2006). Globally, the industry and professions that produce infrastructure lend weight to this idea by maintaining a constant narrative of deficiency and delay through such notions as ‘infrastructure gaps’ (ASCE, 2017; Woetzel et al., 2016). In the UK such narratives have been central to the justification of a streamlined planning regime for major infrastructure in which time, particularly in the examination phase, is rigidly governed

(Marshall and Cowell, 2016; Rydin et al., 2018). These narratives often frame planning as an unruly, uncertain stage in an otherwise orderly process whereby the ultimate benefits of infrastructure will be provided. The capacity to deliver can become seen as an end in itself, a justification for foreclosure on political deliberation (Legacy, 2017; Pike et al., 2019) and as a measure of bureaucratic and political success.

Mapping time

We now turn to Alfred Gell's use of J.M.E. McTaggart's (1908) two properties of time: a mutable A-series that reflects the qualities associated with change, one that is in flux and a constant state of becoming as it flows from past into future; and a static B-series that reflects the ordering of events in relation to each other. For Gell these were neither binary nor absolute they necessarily interact. Different societies however, or as we argue different processes, do display an orientation towards one or the other. The constitution of events within a B-series is entirely contingent and differs both within and between societies. In our case, it concerns the events or stages in the processes associated with infrastructure delivery. For Gell however, the events are of limited value in and of themselves as they can only be accessed, made meaningful and operationalised through our A-series cognitive resources (Gell, 2001: 160). In short, whilst we experience time as open, flowing from past to future, we structure our movement through it in terms of an ordered series of events. These series are projected backwards into the past; but more importantly, when they project forward into the future, events can become signifiers of attainment, often of quite nebulous and loosely connected objectives. For example, one project we analysed (London's Crossrail, discussed in the following section) sought in 2005 to establish itself as a means of securing London's role as a world city and European financial centre (ERM, 2005). This objective speaks to the considerable optimism both towards the capacity of such projects to manage a future that turned out to be much more uncertain and also the capacity of transport infrastructure to deliver that future.

A-series time

Gell applies the A- and B-series to a range of temporalities. We are, however, aided in their application to the political economy of infrastructure by his illustration of how in economics A-series time mythologises an entrepreneurial, individualist class prevalent in such economies as the UK and the US. The notion of time and the future reflected here is one in which decisions bring possible alternate futures into being – not through the causal linkages between events often assumed in B-series models but through the power of expectation. As such,

decisions are anticipatory. Yet, whilst they are taken without factual knowledge of their outcomes due to the inherent uncertainty of the future, they still seek to shape this future through the phenomenon of expectations becoming self-fulfilling if they are widely held. This anticipation is central to the technologically derived modernity we inhabit and governs present actions and decisions (Adams et al., 2009).

It is important, however, not to simply conflate the A-series with neoliberal conceptions of time. Gell also identifies elements of Keynes' theories as essentially A-series (2001: 183). Central to this view of time is the causal role of expectation. In Keynes' case, this is the confidence produced by state action. Thus, it is the individual entrepreneur or market-leading global consultancy, the charismatic or popular leader on the one hand or the consensus groups on the other, that have the capacity to shape the future through the power of expectation. Individuals are not situated within and performing a predefined (and what would appear to be a potentially knowable) B-series of events, they are actively producing them, opening the door to possible futures and, by implication, closing it to others. It is this anticipatory orientation towards an ultimately unknowable future that enables us to look beyond Gell's application of the concept to economics and to apply A-series time to planning. This entrepreneurial view of the future is not restricted to market actors. Indeed the futures on offer have, in terms of infrastructure, been inextricably linked to the state, technocracy and modernity (Scott, 1998). Such expectations enable particular visions of the future – and likewise the infrastructures through which they manifest themselves – to come into being. This can be seen, for example, in the way road transport infrastructure was constructed in anticipation of demand for it and the car-dependent societies it ultimately ended up creating (Leibowicz, 2018).

The experiential nature of time in the A-series allows skilled actors to manipulate the experience of it. For example, the way a salesperson will create a sense that time is running out in order to force a decision. This example highlights the need to scrutinise what is on offer in such situations, whether it is fair (i.e. conforms to ethical norms) and ultimately worth it (is valuable in consequentialist terms). When experienced as flowing, time can speed up or slow down, both of which can be experienced as negative or positive. Speeding up can be felt exhilarating or overwhelming. Slowing down in contrast can allow time to breathe and reflection on the myriad possible futures available. Yet it can also be associated with incapacity or inability to move forward and can be manipulated in other ways, playing on the negative association attached to situations where that flow is impeded. This can be portrayed as an illegitimate denial of future benefits as is the case with the criticism of planning discussed above. This in turn may create an imperative to move rapidly through a B-series chain of events but also it can see the framing of those events, such as meeting regulatory requirements, as barriers that need to be removed.

B-series time

As we found in the initial study the interaction of the A and B-series means the actual production of large transport infrastructures is insufficiently characterised as a strictly linear process, there are numerous gaps and pauses (Saxe et al, 2021). Those familiar with the day-to-day business of planning may recognise the entrepreneurial, open, A-series conception of time as something that may be present in essence, theory or in specific parts of the process, such as the early stages of plan-making. By contrast, the planning they are just as likely to recognise is shaped by, and often will operate within, tightly governed conceptions of time that are distinctly B-series in character. Despite any aspirations that may motivate such desires to act upon the future in a more open way, the actual complex technical endeavours modern infrastructure projects represent are only achievable through ordered processes. These include the everyday practices of contemporary planning, such as formal consenting regimes, which can be represented as linear projections akin to those of project management (see Figure 1(a) and (b) for examples of processes organised as a series of events along a linear pathway). Such time maps represent processes in which applicants, plans or projects must move from stage to stage in the correct order. This ordering of events is a clear B-series representation of time, and certainly in the UK, strict limits ensure time within these events is rigorously controlled, at least for the planners managing the process and participants within it. This, we argue, reflects a dominance of the B-series. When combined with the way movement between events is impelled by the ethics of time-thrift, this creates maps in which this order is directed towards a predetermined, morally framed end point. This allows limited scope for pauses and a more open A-series conception in which anticipatory beliefs can be formed, challenged and crucially altered to orient the flow of time in different directions.

We observed the dominance of the B-series in the construction of time maps for major infrastructure projects in London and Toronto, and in the general

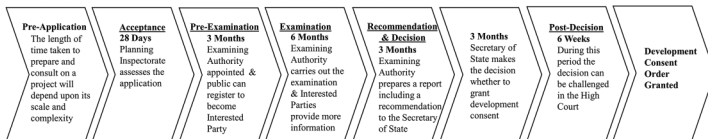


Figure 1. (A) The development consent order process for Nationally Significant Infrastructure Projects in England and Wales (source: Planning Inspectorate (2020) author’s reproduction). **(B)** The project lifecycle (Samset, 2008), another linear projection of events directed towards an end goal of the delivery of infrastructure.

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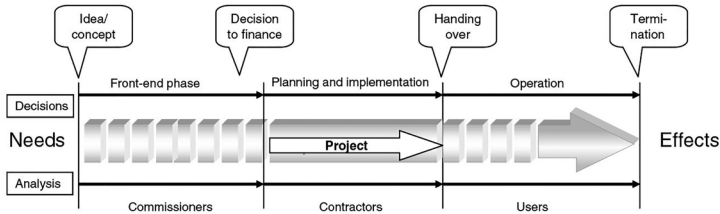


Figure 1. Continued.

observation that such linear constructions are a common features of planning, project management (Carter, 2019) and property development (Weber, 2016). At the same time, we found that in contrast to the regular, forward-focused B-series ordering of events along a linear pathway, the historical record reveals multiple pauses where the timeline is suspended, such as the gap between the initial proposals for Crossrail and the inception of the current construction project (see Figure 2). Furthermore, we found that what constitutes the events that punctuate the time map is far more amorphous than attempts to construct a linear order from them would suggest. Events such as the actual start date or key stages in the project lifecycle are often contested and overlapping, which appears to undermine the notion of projects as a series of stages with key events functioning as thresholds through which they pass enroute to the delivery of an infrastructural artefact.

Analysis of the timeline shows that the project lifecycle is messy when traced backwards containing numerous, unacknowledged pauses. Our attempts to plot this chain of events reveal gaps and discontinuities that reflect a less ordered process unfolding over time, dating all the way back to the origins of the Crossrail project in the 1940s. This initial conception phase is not empty. Outside of the formal timeline of its current iteration, it shows this ‘infrastructural imaginary’ (Jasanoff and Kim, 2015) gradually becoming more concrete. Not only does this phase involve considerable deliberation on the project, it also sees its formalisation from the point the term *Crossrail* was first used in a 1974 rail study, through to its gradual inclusion in strategic documents throughout the 1980s.

Formal B-series processes of delivery along the timeline were instigated and then abandoned more than once. This took the form of two failed attempts in 1991 and 1994 to move through the formal consenting stage within the initial phase of the project, both of which were abandoned owing to budgetary concerns and shifting priorities. These are events which, unless projects are viewed from an explicitly historical perspective (Hebbert, 2014), do not receive the same attention as delays in the later stages when deadlines for completion are missed. Through an analysis of the key stages of such projects as Crossrail,

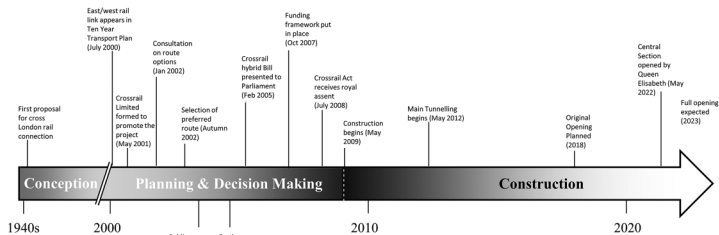


Figure 2. London's Crossrail.

we have found that these frequently overlap rather than forming distinct events within a series with thresholds between them. Allowing certain processes to run concurrently, such as the ongoing deliberation with affected publics about the impact of the project or the evolution of financing models, may be good practice in project delivery. This deliberate blurring of key stages or events does, however, raise questions as to the extent to which the forward momentum of such projects often illegitimately overrides and obscures failure to pass thresholds dictated by ethical norms. Indeed public controversies or questions over viability often fail to impose what may well be much needed pauses and valuable time to breathe. Even when such pauses are imposed the potential opportunities they generate are not always realised, for example here is often surprisingly little adaption over time. Indeed headlong rush to deliver infrastructure can deny projects the opportunities such spaces in the process offer to deliberate and reflect upon the problematic elements of proposals or even reconfigure or redirect them in a more widely acceptable direction (Salet et al., 2013).

Performing the B-series

Gell's use of the example of the agrarian, aristocratic capitalist who, he argued, saw themselves as situated within a B-series of events extending backward in time and assuming that events would extend in the same way into the future illustrates further the linkages between causality, morality and performance. Gell saw this agrarian capitalists as engaged in a process within which the production of capital is viewed as 'a spread of dated events linked by a network of *causal* relationships' (Gell, 2001: 180, italics added). As with the replication of the trick of infrastructure investment resulting in increased living standards performed by industrialisation and modernity, this view of a passage through time is essentially performative. Crucially, it is also framed in moral terms: All that is required to realise the production of capital through this logically ordered series of events,

linked by what are perceived as causal relationships, is to abstain from excessive consumption of the goods produced (i.e. greed, a moral deficit), thus depleting the store of capital. It is a conception of time and the economy in which intervention in what is presented as the natural (B-series) order of things is illegitimate and ill advised.

We have found similar B-series orientations in many projections used in the built environment such as the 'curvilinear' representations of property cycles (Weber, 2016), planning processes and the project lifecycle (Figure 1(a) and (b)). In understanding how such representations are constructed, shaped by technologies and performed by the actors involved, Weber (2016) describes a notion of time mapped out in cycles that appears to be profoundly B-series. First, there is the way they order and articulate time both as a signal for present-day speculative activities and as a means of making the future appear less threatening (Weber, 2016: 588). The authority of this ordering is derived from practices of visual representation of 'the cycle' (Weber, 2016: 591). Thus, (what we would describe as B-series) devices 'contain within them assumptions about the *appropriate timing* of investment, disinvestment, and reinvestment' (Weber, 2016: 588, italics added).

The question of appropriateness of timing is one that connects Gell's and Weber's work. Gell uses a further example of the farmer equipped with the knowledge that spring is the appropriate point in a B-series map of time to plant. Likewise, Weber's developers are fully cognisant of the fact that the bottom of the B-series building cycle is the time to invest. The question is, how do our own A-series cognitive resources, the experience of time in flux, tell us that now is the crucial point in the B-series that action has to be taken? The significance of this is a reflection of time's ethical entanglements (Bear, 2014) given that both ethical considerations, and also assumptions of causality, shape these decisions. The corraling of more open A-series conceptions of time into B-series forms of 'a continuous line or chain' (Ansell-Pearson, 2017) governed by mechanistic notions of causality leads us into the trap of ascribing causal relations to events that occur in succession (Bergson, 1950). The first risk of this is that the reification of cycles or series takes on a moral dimension. The second risk is that a set of normative beliefs develop around the cycle and that simply by performing it (i.e. implementing the same forms of infrastructure that have brought benefits in the past) similar benefits can be replicated in the future. This is despite growing evidence that in advanced economies the economic benefits of some forms of transport infrastructure are at best marginal (Jiwattanakulpaisarn et al., 2012) and appear to offer limited value when set against environmental costs.

If we consider the role of infrastructure in delivering the economic and other benefits of modernity, it is possible to retrospectively construct a B-series of events leading to the present. Such a series would include events like technological changes, the development of institutional frameworks and the availability and investment of political, environmental and economic resources. Likewise,

individual events would also contain within them the timelines for specific infrastructures such as underground railways, trams and roads in cities like London and Toronto. These infrastructures have clearly enabled beneficial forms of urban development and individual mobility. In linking these clear outputs to the more nebulous outcome of modernity benefits like rising prosperity, improved public health and increasing lifespans are often pulled into such idealised time maps. As we discuss above, our own research shows that the empirical reality is often anything but linear and ordered because it has to account for breaks and pauses in the timeline where the future is more open. It is not, however, the retrospective construction with which we take issue. Our sticking point is more the forward projection of such time maps, and the performance of the series based upon assumptions, often framed in moral terms, about its causal role in fulfilling the promissory nature of infrastructure.

Time's ethical entanglements

In trying to draw out the ethics that Bear (2016) argues lie hidden within capitalist time the previous sections point to the moral framing of time-thrift and how this has driven the dominance of a B-series view in infrastructure planning. This in turn informs the normative dimension to performativity of the links within the series almost like a rite or ritual intended to deliver the benefits of modernity. When combined with consequentialist ethics which are themselves a feature of infrastructural modernism (Scott, 1998; Graham and Marvin, 2001) and the utilitarian practices associated with planning (Moroni, 2006), decisions about transport infrastructure (Naess, 2006; Van Wee and Roeser, 2013; Wolff, 2006) are powerfully framed in such a way that the delivery of infrastructure trumps other concerns. The end point becomes the justification. This end point might be a specific output in the shape of the delivery of an infrastructural artefact, or it may be more nebulous outcomes such as economic growth, world city status or notions of progress. When such aims are perceived as good in and of themselves they become hard to challenge in consequentialist terms.

The strong orientation towards a B-series conception of time in infrastructure planning and the consequentialist ethical framing of this led us to look for a framework that reflects a wider range of ethical positions. Therefore, we now turn to the framework we sought to develop in order to pose specific ethical questions that are either avoided or not explicit within planning processes. This follows Campbell and Marshall (2002) in arranging the ethical considerations present in planning along a spectrum. As with the different conceptions of time, these are neither binary nor absolutes but rather tendencies. And, as with the different orientations towards A- or B-series time, real-world processes exhibit a stronger or weaker orientation towards one or the other. At one end of the spectrum there are the consequentialist or outcome-focused concerns

which we have shown often dominate infrastructure planning. At the other end are deontological ethical positions which focus on the extent to which procedures by which decisions are taken are consistent with ethical norms rather than the outcomes of those decisions. These highlight the ethical content of the process and movement between events that constitute the time maps described above. This, we argue, helps elucidate the tensions between delivery and democracy that have been identified in the governance of infrastructure (Cowell and Devine-Wright, 2018) and that piqued our own curiosity. This tension was a feature of policy and public debate in both the UK and Canada. The preference for rapid delivery through a rigid governance of time reflected in the approach adopted in the English and Welsh planning system described above was often presented by those with an interest in delivering infrastructure as means of resolving this tension. In contrast the more opaque, less structured Canadian approach was seen to be failing to manage the same tensions as public debate delayed action but seemed to produce little clear improvement to projects.

As ethics of infrastructure often call for compound ethical justification and analysis (Epting, 2016; Wolff, 2006), we argue that there are both first- and second-order questions that need to be asked. These are still deontological or consequentialist but the order changes depending upon the orientation towards an A- or B-series concept of time. We have found it helpful to set these ethical questions within a framework in which the temporal A- and B-series forms one axis (Figure 3), with a second axis consisting of the 'democracy, delivery dilemma' (Cowell and Devine-Wright, 2018). This, however, required a slight reframing. Whilst we support the idea of a tension between 'delivery' (the realisation of a specific infrastructure project) on the one hand and the demands of democratic deliberation on the other, the use of the term *democracy* by Cowell and Devine-Wright takes a more deliberative interpretation of the concept. In the context of the advanced democracies that we are focussing on here, the emphasis on the delivery of outputs seen in more technocratic forms of governance is not inherently incompatible with some conceptions of democracy. Thus, with elite democracy (see Downs cited in Hall, 1980) and many other forms of representative democracy, commitments to the delivery of specific infrastructures are part of the package offered to electorates. Likewise, the recent brand of populism can also be consistent with direct forms of democracy.

As a result, we juxtapose *delivery* with *deliberation*. As a looser term, *deliberation* accounts for a broader discussion within the public realm and more accurately describes the discursive elements of planning processes. This could be either public consultation around specific infrastructure projects or the more general public debate about the need for particular infrastructural solutions, such as reducing congestion or facilitating a shift to more sustainable modes of transport. Some of these deliberations may be focused upon spatial planning (Healey, 1992) or infrastructure planning (Marshall, 2016). Some discussions,

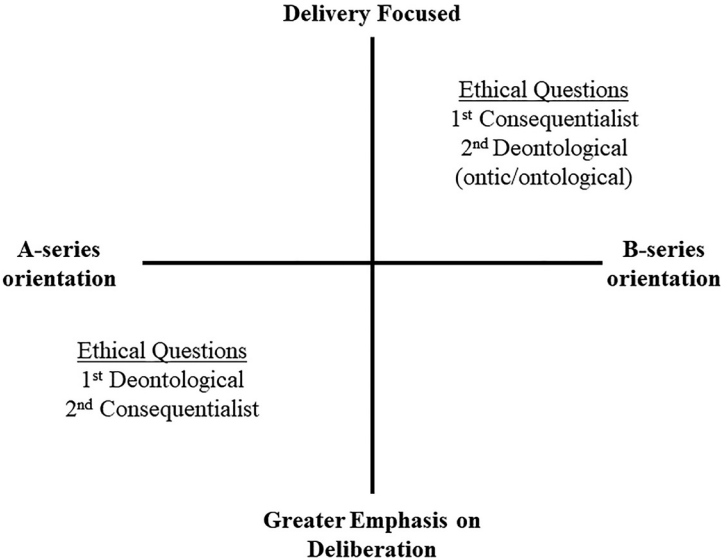


Figure 3. A- and B-series and the tension between ‘delivery’ and ‘deliberation’.

however, may be more general and not necessarily form a defined stage such as consultation within these processes. Whatever the case may be, we make no assumption that time spent in this way is unproblematic. It can be little more than political rhetoric for those seeking to advance their agendas through eye-catching but ill-conceived schemes or a strategy employed by actors for whom delay serves their own purposes (Raco et al., 2018). Nevertheless, in treating time spent in deliberation about infrastructure as existing in tension with time spent in delivering it, we are also able to incorporate a wider range of discussion. This might include less focused public or political debate about issues or the merits of different proposals. But it could just as well include contributions from infrastructure advocates. For example, claims of ‘infrastructure gaps’ (ASCE, 2017) may not be inherently problematic given that the need for action is all too real in some places (Neuman, 2014). Indeed, it is only when these forms of discussion are deployed rhetorically – to silence opposition, for instance, or exclude less powerful voices – that they become problematic.

A-series, deliberation and deontological questions

Some arguments in favour of greater deliberation over infrastructure (Marshall, 2016) or pauses for time to breathe can be located within the temporal A-series in the sense that they are open and do not seek to channel and

contain time within a series of events. Certainly the gaps we have identified in projects like Crossrail as frequent features of project timelines are opportunities. Taking time to breathe implies a pause could be used constructively to re-evaluate projects or it may create 'apertures' for the more 'subversive' side of planning (Cowell and Owens, 2006: 417) to challenge dominant narratives. Thus, they offer chances for the anticipatory identification of a range of possible futures. Therefore, we would argue that the *initial* ethical questions over this use of time are deontological in that they pertain to the ethics of how desired futures are defined; these include issues relating to discourse ethics (Habermas, 1997), questions of power and what is excluded from deliberation (Lukes, 2004). Other deontological questions such as the extent to which infrastructure contributes to essential capabilities (Nussbaum, 1997) should also frame deliberation by establishing basic minimum thresholds for acceptable conditions. This would give moral weight to arguments for the rapid alleviation of circumstances where individual experiences fall below this threshold. Examples of this might be where people are experiencing high levels of pollution or isolation that could be alleviated by clean, affordable forms of transport. It is, however, precisely these circumstances that point to the need for a secondary set of consequentialist questions on the instrumental value of time spent in deliberation, questions we are unwilling to disregard completely.

Whilst deontological frameworks such as discourse ethics may call for a perpetually open realm of deliberation, such perpetual openness is neither desirable nor practical in the production of plans and decision-making (Stirling, 2008). Thus second order, consequentialist questions, can take account of the context in which such deliberations take place. There may be intolerable circumstances or powerful imperatives (e.g. action on climate change) in which deliberation cannot be allowed to continue indefinitely where the need for infrastructure is pressing. Furthermore, this second order of ethical questions is also necessary to guard against attempts to keep deliberation open simply because it serves the interests of a particular group by avoiding a decision or prolonging a stage in the process.

B-series, delivery and consequentialist questions

The primary ethical questions for the performative B-series ordering of time we critique above are consequentialist. When, through concepts like time-thrift, time is framed as a resource that is expended to reach a desired outcome, the justification of this rests first on the desirability of that goal and second, on whether it will actually be reached (and by implication whether current time maps are adequate). The consequentialist end of Campbell and Marshall's spectrum is sufficiently broad to allow utilitarian, unitary public interest or pragmatist answers to the first question. As the value of any map is its ability to direct those using it

towards a goal, we would argue that the second question of the causal links in the chain of events, both individually and as a whole, is also important. In short, if causal inferences turn out to be incorrect or critical links are omitted, then all that is left is the performance of a series of actions with little chance of them producing the desired results. What is called for is greater caution and a sensitivity towards the ethical implications of defining key events, particularly when transitioning between them and when they are directed to a particular end point. Thus, a consequentialist appraisal of that end point, be it economic growth, alleviating social ills or reducing environmental impact, is in and of itself inadequate.

We argue that B-series maps also require second-order questions about the discursive construction and ontologies of the series itself – specifically, what exactly constitutes an event in a series or stage in a process. Put simply, this concerns how and by whom events and legitimate movement between them is defined. This is particularly significant in light of the ambiguous nature of these pauses that we have identified above which are not counted as events and are often excluded in any retrospective constructions of a series. Therefore, the ethical questions regarding the way time is used must return to deontological questions of both an ontic and ontological nature (Glynos and Howarth, 2007). One set of questions concerns the events within the chains from which B-series maps are constructed. The ethics here are both deontological and ontic in the sense that they concern the nature of whatever legitimate agreement is reached and the properties of events within a series that depend upon it. For example, the deontological questions may be the same as for the A-series; have all groups or individuals been included in the decision-making process or have rights to participation and consideration been ignored?

The ontic questions, however, concern the construction of these events or stages such as environmental assessment or public participation. Are they sufficient in the sense the constructions of environments or publics they work with are adequate? For example constructions of the environment purely in monetary terms or as a source of resources might not be a sufficient bases to fully assess impacts upon it. The question here is, is closure of a stage and movement to the next one legitimate because of having satisfactorily completed that stage? or Are powerful actors seeking to define the way the stage is constituted, to delay or to speed up movement through it for reasons of self-interest? These questions remain ontic in that they concern only movement within an agreed series of events rather than challenging the very construction of the series and the constitution of the events themselves.

The ontological questions arise when the boundaries of events in a series are scrutinised. These concern the identification and defining events alongside ordering them. We have already seen that not all time fits into the events and project stages of the B-series. Let us assume, for example, that there are fundamental questions about what constitutes an event. This event could be a decision

point or milestone beyond which it is impossible to advance. In the English and Welsh infrastructure planning regime (heavily B-series in character and governed by time-thrift), such decision points are reached by rigidly governing time simply by imposing strict controls on specific stages, ultimately determining that an event is complete once a set number of days has passed. Yet even within this process, not all events are the same, there are some in which time constraints function very differently. First in the more open pre-application stage. The power to control the process is, however, much more visible in the political decision-making process that follows the recommendations produced by the highly structured planning regime. Here time weighs less heavily on the political decision maker, the Secretary of State (in this case for Transport) and they have considerable freedom to manage the time they have to decide as they are able to extend this almost at will with calls for new evidence. This is in marked contrast to the ability of participants in the examination phase to control time as those managing the process must work to rigid timescales and those participating are often only allotted a matter of minutes to present their case. Thus, the final stage in the English infrastructure planning process is not controlled in the same way as earlier ones. As with the false starts of Crossrail being written out of the timeline for the project some have more power than others to determine the boundaries of events. From a consequentialist perspective, the only question to ask here is whether this imbalance of power was justified by the outcome of the decision. There are, however, important questions and growing deontological constraints to such power which is increasingly subject to judicial challenges based upon rights to information and inclusion in decision-making (Lee and Abbot, 2003).

Conclusion

Our aim has been to disrupt the simplistic notions of causality reflected in the performative, forward projection of B-series time maps such as project management schedules and planning processes by illustrating the moral component of this framing of relationships towards the future. We have also sought to challenge a framing of time spent engaged in planning as time that is wasted. The framework we have developed to make explicit the ethics in infrastructure planning obscured by modern capitalist time can be a start to this process. By pointing out that some forms of infrastructure are exclusive or exclusionary, or that key parts of the process that prevent disenfranchisement have been neglected, inadequately constructed or illegitimately closed, it may be possible to guard against these tendencies. But, challenges to the relentless forward motion of a process, or the power of a particular vision, requires more than the awareness that they are unjust. Whilst we have been critical of a performative playing out of B-series time maps this should not be mistaken for a rejection of the power of process

to challenge attempts to overwhelm it by the force of expectation. Both democratic deliberation and the rights based challenges to the construction and definition of events in a timeline discussed above will also depend upon the delivery of key events along an ordered timeline. Put another way, democracy and participation have their own processes. These;

help to mobilize actions and ethical sensibilities, and—when collected and amplified through micropolitics—to infuse the ethos of politics embedded in institutional settings (Connolly, 2010: 5).

Thus, nested within any spaces or apertures opened up in the process of delivery where one set of temporal logics is disrupted one finds, not simply a void in which we can embrace a sense of time as becoming, but yet again the processual time maps that are our only means of marking our transition through it. The institutional setting that planning affords is in one sense far removed from the ethical questions raised by such a framework. Real-world decisions are rarely so clear-cut, not least because of the way that different orientations towards time, ethics or styles of governance are opaque and intertwined. All these orientations may be present to a greater or lesser degree in any given decision-making context and thus influence the framing of what is the ‘right’ infrastructural solution. Yet there are clear ethical implications to participating in a headlong rush to deliver infrastructure that may exacerbate injustices, even more so the existential threat of climate change. There are also ethical implications to delaying infrastructures that may alleviate injustice or buy future generations time to mitigate threats. Ethical sensibilities alone may not be sufficient to know which situations demand acceleration of efforts and which a pause for reflection and reorientation. But as part of the micropolitics of institutional processes like planning, they offer a foundation that is often absent or unacknowledged yet is one desperately needed if they are to produce decisions and plans that function as maps to a better future.


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