

## Theorising infrastructure: a politics of spaces and edges

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## Theorising infrastructure: a politics of spaces and edges

Peter Cox

### Introduction

As a growing number of authors demonstrate, ‘infrastructure is never neutral and always inherently political’ (Nolte 2016: 441, compare McFarlane and Rutherford 2008; Young and Keil 2009). Infrastructures of all types, whether hard (as in material structures) or soft (as in skills and knowledge) are those systems that support action. Infrastructures both provide the potential for social actions and processes and are produced by social actions and processes. In creating potential, however, infrastructures inevitably also order and govern the actions they make possible (Koglin 2017). Infrastructures organise and shape potentials, providing for some courses of action and not for others.

The mechanism of ordering and governing is one of facilitation – infrastructural provision being the provision of material facilities or the facilitation of actions through social development. While certain actions are facilitated by both kinds of infrastructure, actions and practices that fall outside of its desired outcomes are rendered unruly, ungoverned, perhaps even ungovernable and deviant. Consequently, material infrastructures are not only comprised of their material dimension but also operate on discursive levels. Infrastructure’s multiple dimensions and impacts can be traced, according to Picon (2018: 263), as ‘the result of the interactions between a material basis, professional organizations and stabilized sociotechnical practices, and social imagination’. These interactions, and the constitution of those actants, are ably traced in individual chapters elsewhere in this volume. This chapter seeks to engage with a selected range of current theorisations of the politics of infrastructure, and to apply them to specific cases of cycle-specific infrastructures. It subsequently relates the ideas of social and spatial justice arising from these perspectives to bell hooks’ consideration of marginalisation, to consider how the patterns of marginalisation and mainstreaming revealed in the contributions to this volume might be understood through a lens of a critical and radical politics.

### Theorising Infrastructure

Ash Amin (2014) brings together a range of recent discussions on cities and infrastructure observing the multiple ways in which thinking about infrastructures allows us to rethink the social life of city. Clearly echoing Jane Bennett’s (2010) concern with *Vibrant Matter*, he introduces the phrase *Lively Infrastructure* to highlight the agentic qualities it has in the formation of urban life. Not only is infrastructure political, but it also has to be seen as more than an inert material product of human design. Amin highlights three areas of discussion in relation to cities and infrastructure that, between them, provide a framework for this discussion of the politics of cycle infrastructure.

First, the city emerges as “a provisioning machine”, yet, simultaneously, its capacity to provision is limited: cities’ supply and distribution of goods are often unequal. Importantly, Amin (2014: 138), points out “failed, incomplete or mismanaged infrastructures” affect the poor and the marginalised most. The expectation that a city can and will act for its populace as a supply source of the requisite necessities defining the good life is part of the social contract that distinguishes a citizen from a denizen. However, the reality is that unequal and asymmetric provision and distribution of physical and social infrastructures ensures the continuation and exacerbation of inequalities. Thus, citizenship is unequally distributed. Though envisaged as a provisioning machine, the city (or other relevant unit of governance) does not produce and provision all its citizens to the same degree.

Second, and developing this argument further, Amin observes how infrastructures both embody and enact symbolic power and social selectiveness, privileging certain groups above others, raising their status as well as providing material support. These inequalities are not simply due to failings or mismanagement but are specifically built into the system. They do not just concern the distribution of infrastructure provisioning, but inequalities are further produced through the design and form of implementation. Amin’s concerns here can be extended by explicitly connecting them with Soja’s (2010) insistent concern for spatial justice. Integrating a stronger understanding of and concern for the spatiality of infrastructure, allows us better to consider how the spaces of mobility and the topography of provision serve to promote or hide questions of social justice and injustice. Through this combination, infrastructure is revealed as having a moral political dimension.

Amin’s third interpretive lens focuses on how infrastructures ‘are implicated in the human experience of the city and in shaping social identities’ (Amin 2014: 139). He highlights how infrastructure has important aesthetic dimensions: sensory landscapes contribute to shaping human capacities to move through and to dwell in the spaces of the city. Recent work on sensory ethnographies of cycling (Cox 2018, Popan 2019) reveal the ways in which cycling infrastructures shape behaviours. These shaping influences operate at collective rather than individual levels, reinforcing Shove’s (2010) argument that collective practices needs to be seen as more than choices or the aggregate of individual behaviours (Southerton 2013). The aesthetic and sensory dimensions of cycling infrastructure shape users’ perceptions. They have the discursive power to celebrate or to denigrate their users depending on the qualities of the mobility spaces produced. These powers are reinforced by the physical qualities of built environments and their impact on the types and styles of performances that their designs permit (or constrain).

To understand the politics of infrastructure we need attend to all these dimensions and to understand how they express and perform a variety of distributions of power. Power as discussed here should be read through Lukes’ (2004) analysis, modified with perspectives arising from activist perspectives

(see especially Starhawk 1988). Power is not just an object or state to be attained, but a quality of all relationships framed not just in terms of domination but also as capacity (power-to-act or power from within) and also power-with: the power not to act but to bind together (compare Hartsock 1983; da Costa et al 2015). Community Development practice perspectives ([www.iacdglobal.org](http://www.iacdglobal.org)), drawing on a Freirean heritage in their exploration of the practical problems of empowerment and disempowerment, stress that structural relations of privilege and subordination cannot be overcome by grant or favour. Empowerment cannot be given or delivered as a gift from spaces of privilege. It can only arise through endogenous development. However, that does not mean one cannot create space for its growth or the appropriate conditions for its nurture. If empowerment needs conceptual space and time for growth, we need also acknowledge that material spaces created by infrastructure provision may also be vital to provide opportunities for the growth of social imaginaries.

As a traveller, the cyclist is not only created as a subject by the infrastructure, but infrastructures and the spaces of travel they provide are essential elements of cycling as a sociotechnical assemblage, constituted by the interweaving of rider, machine and environments of travel (Cox 2019). Thus the spaces of travel are more than simply agentic objects, since, as Amin (2014) points out, infrastructure can also be conceptualized as a sociotechnical assemblage. It hybridises both human and nonhuman elements, inextricably linking the material to the politics of its formation, through the agencies of all those involved in conceptualisation, planning and delivery as contributors to this volume consistently make clear. The spaces of travel are agentic in producing the travelling subject and part of that subject in its assemblage.

### Infrastructure and justice

Soja's (2010) work on spatial justice likewise impels us to consider space not just as a contributory element in the political and to ideas of social justice but as a causative agent. Thinking in terms of spatial justice reprioritises our consideration of the ways that space is ordered and governed. Not only does a spatial justice perspective reveal that infrastructure is inherently and inescapably political, it also highlights, as Nolte (2016) demonstrates, how the infrastructures that order that space express the politics of the regimes that construct it. We can illustrate these concerns and processes by relating them to discussions around the value put on the appropriate provision of infrastructure in order to encourage (or at the very least, not to discourage) cycling.

Infrastructures not only reflect the regimes that produce them, but also reproduce the power inequalities inherent (or unexamined) by those regimes. 'Build it and they will come', has provided a powerful slogan for academic advocacy for cycling, especially in the USA (see for example Cervero Cadwell and Cuellar 2013), but following the analysis presented here, one might rephrase the problem. Build it without addressing the fundamental imbalances of power that make cycling

unpleasant or unsafe, and they will see their world shaped by hegemonic regimes in which cyclists are allocated segregated, separate but equal, status; with all that the phrase implies in its historical legacy. Perhaps the phrase is not as snappy and incapable of acting as a recruiting slogan, but it does designate a counter to the over-simplification and erasure of deep-seated structural inequalities of class, race and gender. However strongly worded is the insistence (from whatever quarter) that only high quality infrastructure should be built, and that failures are due to the inadequacy of some specific part of the design implementation and construction process, a reading of the politics of infrastructure suggests that the situation is more complex. This is especially true when implementation is made with disregard to existing inequalities of class race and gender (Golub, Hoffmann, Lugo and Sandoval 2016, Lugo 2018) .

A purely anti-reformist, one might almost say Leninist, rejection of infrastructure development and provision is not the necessary corollary of this critique. Absolutist rejection – as seen in for example Forester's (1993 [1984]) dismissal of infrastructural provision, does not help with the everyday realities of fear on the roads. Consequently, whilst comprehending that infrastructural provision is not the answer, it may very well be part of the answer and a necessary redress in the context of the world as it is at present. Indeed, such is the importance of infrastructural identification that it is even embraced by activists who have create their own painted cycle lanes when authorities refuse to act (See for example, Doolittle 2007, Moynihan 2013, O'Sullivan 2017).

Even when it originates in guerrilla actions that are subsequently embraced by government, the official provision of infrastructure produces new forms of subjectivity. How these are perceived by those subjects created, crucially depends on the existing relations of subject to state: Infrastructures become the interface between governance and citizen. They express the value of the subjects governed by them. Hence, the quality of infrastructure is vital, not merely in terms of design adequacy but also in discursive terms because of the statements it makes about those who are defined by it. Divergent trajectories of infrastructure development, from above and from below, are the starting point for Gartner's (2014) work on the politics of infrastructure development discussed later in this chapter, but before moving to consider her contributions we need to examine some existing conflicts over types of provision.

Insurgent infrastructure, such as activist guerrilla painting of white lines to create bike lanes demonstrates the value of infrastructure in specific locations and also points to a need to consider how multiple forms of infrastructure development can co-exist. We need a more sophisticated model here than one which assumes that all infrastructure is imposed on a passive, malleable populace.. Kistner (2014) revisits and revises a Lockean form of social contract to link Chatterjee's (2004) postcolonial subaltern politics with the materiality of infrastructure and the ambiguities of counter-

politics and politics from below in their capacity to frame alternative worlds. Using similar assumptions about infrastructure and governance as developed in this chapter, she spotlights Mitropoulos' (2014) observations on infra-political actions as a way of articulating insurgent infrastructural provision from below: "the infra-political, in other words, revisions activism not as representation but as the provisioning of infrastructure for movement, generating nomadic inventiveness rather than royal expertise." (Mitropoulos 2012:117, cited in Kirstner 2014: 6). Guerrilla actions to paint bike lanes precisely fit this model, proceeding from below rather than imposed from above. Kirstner's point, however is that while these are to be recognized and celebrated, they are also problematic inasmuch as their actions alleviate problems but do not provide means through which to tackle the structural inequalities at work. Advocacy for cycle infrastructure is poised between two worlds: that which is and that which could be. Solutions can never be pure or perfect. The more effectively they address existing problems the more they may hinder deeper structural changes.

Tensions between defensive and future-oriented actions are manageable within activist and advocacy communities as long as these communities remain the agents of change. Whilst users remain the drivers of change, they retain a sense of ownership of the physical infrastructure, since they are an integral part of the social infrastructures of which the physical is a manifestation. When users and advocacy communities are separated from processes of planning, implementation and governance, when there is no sense of ownership by users (see Freudendal-Pedersen, this volume), then problems become significant. Infrastructures appear as imposed.

Chatterjee's (2004) arguments within the context of subaltern politics exposed the modern figure of the governed as one that lies between sovereignty and government. The promise of investment and infrastructure always comes with a price: of being governed. In terms of mobilities, the protection of the rights of the mobile subject is necessarily linked to the constraint of the subject. Thus the history of infrastructure provision can also be read as one that shift the mobile subject from citizen to the subject of administrative policy. Far from being merely a semantic problem of shifting linguistic description, this shift is one that carries the inherent danger of homogenization of its subject. The subject of administrative policy is not defined in its diversity and multi-layered complexity, but only in terms of where it exists within the structures of governance and of administration.

Following Soja consistently in his attention to spatial justice, we need also consider space not just *as* a construction, but also *how* it is constructed and thus how it acquires different meanings in different locations. Locality matters. Similar physical conditions can produce utterly different experiences depending on their governance and social context. To provide an example, fast cycle routes (*Snelfietsroutes*) are being promoted across the Netherlands and beyond as an important provision to

extend cycle use to longer distance/ higher speed cycle traffic than hitherto (see, for example, Province of Gelderland 2017). These encourage use of a wider diversity of cycle styles than the typical upright Dutch bicycle, particularly e-bikes and more aerodynamically efficient cycle designs (achieving higher speeds for the same human power). The physical characteristics of high-speed cycle routes are directness and longer distance uninterrupted travel, sufficient width, wide turn radii and minimal gradient change. These are physical characteristics also provided by the repurposing of rail lines built expressly for a higher speed transport mode. These physical characteristics not only permit higher speed riding but also positively script it (Akrich 1992). That is, the sensory scape itself suggests a style of riding.

Against a background of high numbers of everyday cyclists, but relatively low speeds of travel, higher speed cycle travel is understood as critical for further increase in cycle use. Thus the new form of infrastructure attracts investment and users discover a consonance between the infrastructure provision and the development of faster riding styles. In the UK, where cyclists' numbers are small, repurposed rail lines form significant parts of the national cycle network. In this very different context, the scarcity of segregated spaces means that they are "aimed at attracting people who do not currently cycle, [and who] are not likely to ride as fast as the experienced urban cyclist. Route designs are not, therefore, based on a high cycling speed" (Sustrans n.d) . The physical characteristics of the spaces, however are the same as the *snelfietsroutes*. Thus a considerable degree of dissonance exists between the infrastructure and the functions that it scripts. The political dynamics created by the infrastructures set up tension within an already numerically small number of cyclists. Novice cyclists are constituted as a needy group, the experienced cyclists are encouraged to revert to riding in amongst road traffic or denied the capacity to ride in the way that the physical infrastructure encourages.

A further dimension to the politics of infrastructure in this particular case arises from the relation of the infrastructure provision to the state itself. The sole strategic cycle infrastructure in the UK is the National Cycle Network (NCN), initiated and undertaken by a charitable body, Sustrans (Sustrans 2018). While the NCN covers 16,575 miles, 68% is on existing public highway. Sustrans only owns or has access rights to 3% of the total: 97% is run in negotiation with a wide variety of landholders. Upkeep and maintenance are therefore subject to a wide range of agreements and arrangements and much local maintenance work is undertaken through local volunteer labour. Consequently, cycleways frequently fall outside any consideration of transport provision and though provision for cycling should be included in local transport plans, these are necessarily disconnected from any strategic consideration. In a context of hostile road environments, those riding for everyday transport and those giving of their time to ensure the maintenance of Sustrans routes can feel aggrieved at a lack of any sense of reciprocity from the state, whose investment in support for roads is clear. The nonphysical

infrastructures “formed by people and their social networks” that support urban mobility are as important as the physical infrastructures, according to Mains and Kinfu (2017: 265), especially in situations where direct state investment in these infrastructures is limited. From the combination of failure to nurture these networks and the cognitive dissonance induced by the gap between the ideals of the management of the network and the scripted discourses arising from the physical infrastructure we should not be surprised by a resultant deep ambivalence towards aspects of cycling infrastructure. This ambivalence is reflected in wider discourses concerning the relevance of cycling specific infrastructure, even among riders themselves. Consequently, hard cycling infrastructure then becomes even more politicised as an object of direct contention.

The politics of infrastructure development.

Thinking through the politics of infrastructure development, Gartner (2016) starts by distinguishing between two directions of infrastructure development, as described in the examples above. The first one arises from local perspectives, expressive of and sensitive to existing conditions; the second, imposed from afar, serves to reify inequitable power relations. While the gaps between these may be overcome by processes labelled participation or consultation, frequently the mechanisms employed are little more than surface redress or conciliation, rather than a serious attempt to bridge the gulf. Emphasising pragmatic processes as a means to overcome disparities, creating spaces for contending parties to discuss their different perspective may be insufficient. Cornell West’s (1993) powerful critique points out that the noble, pragmatic liberal emphasis on the pedagogical and the dialogical errs in assuming that vast disparities in resources can be overcome by offering dominated subjects a voice at the table or in the negotiations. Even the most ambitious transition management process, designed to include and give voice to all stakeholders in a process of change, (see, for example van de Kerkhof and Wiczorek 2005) is problematic. The language of stakeholder erases differences in the resources and capacities of participants. Invitations to participate presuppose and emphasise the existing conditions and marginality of those who have to be invited to participate in a process not of their own devising and action.

Gartner (2016) provides an analytical framework to understand different way in which infrastructure is understood. Her framework is particularly pertinent when considering the politics of cycling infrastructure. First, reflecting on the kind of concerns highlighted above, she argues in a general sense that the exclusion of particular and critical perspectives in planning and development is indicative of the operation of a greater politics of inclusions and exclusions. In order to address this lacuna, there is a vital need for “a more representative and inclusive knowledge of infrastructure development” (Gartner 2016: 378). The processes through which infrastructure is planned and

negotiated must become transparent: the academic task is clear for investigation and mapping of the processes.

Gartner identifies a threefold typology of approaches to the implicit politics of infrastructure development: the technocratic, the interventionist and the critical. While based on a much broader theorisation of infrastructure development in the context of critical (post-)development studies these observations are equally applicable as we explore the contestations over infrastructure development described in other contributions to this volume.

Technocratic approaches to infrastructure primarily focus on the material value and provision of physical systems: necessary as part of the modernization process. Most frequently, justification is premised on cost-benefit analysis and the calculation of likely systemic benefits according to the value measures adopted. Applied to cycling infrastructure, the problem of the lack of cycling for transport is simply a technical one to be remedied by the provision of infrastructure. Both advocates and institutional planners can be seen to treat cycling infrastructures as a technocratic problem. Solutions, by definition are to be found in infrastructural implementation. For example, provision of cycling infrastructure is a necessary part of the redefining of transport infrastructures in a low carbon economy.

The problem of technocratic approaches are, according to Gartner, twofold. First, the approach tends to homogenise those at whom the infrastructure is aimed. Social agents in their own right, capable of participation and self-determination are transformed into passive recipients through their assumed willingness to use the facilities. While good design might create desire among some, the second dimension of difficulty created is that, by referring solely to the users of infrastructure, it overlooks those who are rendered as non-users. Rather than considering why provision might not match desire and considering reasons for this disjuncture, non-use is rendered as deviant behaviour. Both of these problems are linked, in the case of cycling infrastructures, to systemic disregard to the physicality and material effective realities of the infrastructure. Focusing solely on the importance of provision, technocratic modelling rarely considers the actuality of delivery; who it serves, how it constructs its users and who it therefore includes and excludes (even when fit for purpose). In designing for cycle traffic, Parkin (2018) highlights the danger of the automatic assumptions of best practice as universally applicable. While there may be physical and material realities that should always be taken into account in planning spaces of cycle use, the diversity of designs of uses and of expectations requires careful consideration and understanding of the local conditions and the heterogeneity of users.

A further powerful effect of approaching infrastructure development and implementation as a purely technological challenge, to be solved through technocratic lens, is that of de-politicisation. As Zhang

(2016) argues, structural tensions are redefined as technical issues of supply and shortage. Thus, social conflicts that may be at the heart of mobility problems are rendered invisible, and infrastructure becomes a means by which to divert the gaze or to cover over more fundamental socio-economic and socio-ecological problems. Or, in Picon's more provocative but succinct phrasing, "engineers do politics while pretending only to be serving objective purposes" (Picon, 2018: 269).

Gartner's second category of approaches is the interventionist, an approach dominant in cycle advocacy. As with the purely technocratic approach, infrastructure is considered as instrumentally valuable, but its value derives more broadly from the degree to which it facilitates other developmental objectives. For example, health, environment and economic gains might all be considered as justifications for intervention, rather than for cycling itself. Interventionist approaches usefully (for planning and for cost-benefit dominated approaches) provide numerous opportunities to produce indicators and metrics through which the success or otherwise of interventions can be measured.

A problem that Gartner identifies with interventionist approaches is, that like technocratic approaches to infrastructure development is that they reproduce a curious circular logic, unable to deal with issues of exclusion. Because interventionist approaches consider that exclusion exists because of a lack of intervention, then intervention by definition should end exclusion. Continuation of exclusion after intervention is not therefore the fault of the intervention, but of the excluded who are unwilling to take advantage of the interventions. Interventions, designed according to best practice, offer the ideal solutions to the problems they address. This circular logic lacks and deep understanding of the "diverse complexity of place-specific environments and, like technocratic perspectives, underestimate the heterogeneity of societies. In other words, the interventionist perspective is premised on the assumption that infrastructure is inherently good, valuable, and has a benefit to society – no matter what that society" (Gartner, 382). When applied to the design of cycling infrastructure, including the soft infrastructures of training and skilling, interventionist logics also curiously downplay actual cycling practices. By constantly stressing its value in terms of other goals, inherent qualities of cycling are disvalued. Cycle travel is rendered as a necessary but potentially undesirable action, justified only by its contribution to greater goods. Only through its contribution to other, external goals does it become worthwhile.

The lack of criticality in both technocratic and interventionist approaches also hints at an underlying and unexamined positivism. In a discussion of New Urbanism, Wang (2009) employs Ellul's critique of technique to highlight a series of assumptions about the influence of built environment on behaviour. Perceptively he observes that "today's technical consciousness simply cannot see the logical contradiction that, while its own zeitgeist rejects positivism, nevertheless it embraces [a] cause

and effect mechanism” (Wang 2009: 462) assuming that the provision of certain environments and facilities will automatically engender specific behaviours. While I have argued here that spaces do have measurable effects and affect, these should not be considered in a positivist, predictable and linear causal relationship. .

In contrast to these two interlinked (and dominant) perspectives, Gartner proposes a third, critical way of thinking about infrastructure, more sensitive to its political dimensions and implications. A critical perspective does not refute the utility and the practicality of technocratic and interventionist approaches, nor would it undermine the necessity of their deployment as means to unlock technocratic bureaucracies or to ensure funding or planning from bodies based on interventionist logics. Nevertheless, a critical approach demands that these not be used without conscious reflection. Rather, she argues, “the value of infrastructure cannot be pre-assigned without careful consideration of the socio-political environment” (Gartner, 2016, 382). Because infrastructure is “fundamentally a relational concept” (Star 1999, 380 cited in Gartner, 2016 382), its impact and the values it embodies and propagates depend on the actors engaged and their prior power-relations.

Gartner’s critical perspective argues perceptively that “infrastructure can be simultaneously beneficial and harmful for populations ... infrastructure objects are not apolitical instalments but can symbolize existing power struggles and can be understood as the material outcomes of social-political relationships that exist within fragmented and inequitable societies” (Gartner, 2016, 382). This provides a lens through which to reinterpret Warrington Cycle Campaign’s nearly 20 year online photographic chronicle of poorly designed and implemented cycle infrastructure (<http://wcc.crankfoot.xyz/facility-of-the-month/index.htm>, see also WCC2007, WCC2016). Implementation that ignores the safety or the basic requirements of users is not simply a problem of adequacy but is an outworking of power structures: visible implementation of the disregard of its (potential) users by providers. McFarlane and Rutherford use Latour’s description of technology as ‘politics pursued by other means’ (Latour, 1988: 38 in McFarlane and Rutherford 2008: 370) as a way to emphasise how the technical dimensions of infrastructure manifest the balance of power. In similar vein, Gartner (2016) notes, lack of infrastructure provision, or the withholding of infrastructure, is also an assertion of power over potential user groups and a statement on their social value.

Parts of this ambiguous contribution, simultaneously both positive and negative, arises from the manner in which infrastructures, including cycling infrastructures, necessarily discipline and govern (Bonham and Cox 2010). The benefits of route provision are the constraints that the route imposes on the traveller. Within a comprehensive system of mobility provision (such as a road network), these constraints are not experienced as restrictive. When networks are limited to few nodes and connections and adequate routes are in short supply, constraint is felt much more strongly. The

traveller loses agency in themselves and their movement is governed and directed by the supply of infrastructure. The agency of technocratic governance emerges once more as the strongest power.

A peculiarity of the provision of dedicated cycling infrastructure in northern European nations, especially in Belgium and in the UK, is the opportunistic repurposing of redundant rail lines. Providing direct inter urban routings, these routes also highlight the disjuncture between different transport modes and their characteristics in terms of spatial service provision. Roads provide a fine-grained network connecting every point within a community. The necessary linearity of railways often creates local disconnection: whilst in operation rail lines bisect the landscape, uncrossable except at specific points. They are designed around a much coarser granularity, with stations as nodes. In their repurposing as cycleways, these same lines, while providing inter-communal communication, are frequently problematically disconnected and cannot function as intra-communal facilitators of travel. Their inheritance from their former identity is of infrequent access and so in the role of cycleways may continue to bypass the communities through which they travel. Exclusions remain built in to the infrastructure through the spatial reality.

#### Looking from the margins

One corollary of spatial governance and constraint is the ways in which cycle infrastructure in particular has come to inhabit a spatial marginality. At the edge of the road, or segregated by verges from traffic, cycleway design separates cycle traffic from other modes for good reason (Parkin 2018). Whether or not cycle-specific infrastructure following existing mixed mode use is located on road or separated and parallel to the roadway, the rider always travels at the physical edge of larger traffic flow. Numerically, motor vehicle traffic may not be as large but the sheer physical mass of motorised vehicles, often (but not always) travelling more rapidly, highlights the comparative fragility of the cyclist. Mass and physical volume dominate space. As travellers, cyclists necessarily perceive their progress in comparison with other modes. The metaphor of flow, and of traffic streams locates the cyclist at the margin of that flow. Continuing the metaphor, the edges of the main flow is the space of turbulence, of eddies. Indeed, airflow patterns in mixed mode traffic move this experience from metaphor to physical reality as anyone who has felt the buffeting from passing vehicles while riding will be aware. Following Sojas emphasis on spatiality, we can focus this in at micro-level to interrogate the implications of the spatial location of cycleways at the edges of other traffic provision in terms of their access to power., however,

For bell hooks, marginality occupies a special position in both the politics of space and feminist theory: 'to be in the margins is to be part of the whole but outside the main body' (hooks 1990: 341).

Her analysis is of the exclusions attached to race, class and gender and the physical separations that enact and enforce them, a far more powerful place of exclusion than the edges of mobility spaces discussed here. Yet her insights are valuable to augment shields observations and provide a means to articulate the politics of cyclists spaces. She continues exploring how the margin "is also the space of radical possibility, a space of resistance, ... a central location for the production of a counter-hegemonic discourse that is not just found in words but in habits of being and the way one lives.' (1990: 341). This theme is taken up by Rob Shields (1991: 277): 'Margins, then, while a position of exclusion, can also be a position of power and critique. They expose the relations of the entrenched, universalising values of the centre'. From the edge of the road, the contrast between travel modes are highlighted. The physical and discursive power asymmetries are made visible. The distance from the centres of power and the concentrations of value is that which lends perspective. But to place this perspective into a constructive critique this marginalisation needs to be harnessed to more than a feeling of isolation or resentment. To continue using hooks' insights: 'Many of us are motivated to move against domination solely when we feel our self-interest directly threatened. Often, then, the longing is not for a collective transformation of society, and end to the politics of dominations, but rather simply for an end to what we feel is hurting us.' (hooks 1994: 244)

To understand and theorise the politics of infrastructure is to engage in a process of both analysis and to engage a prospectus. A common theme among the writers whose works have been examined here is that their commitment to understanding a politics of space echoes a parallel commitment to a politics of transformation, of which infrastructure is but one aspect.

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