



UNIVERSITY
OF WOLLONGONG
AUSTRALIA

University of Wollongong
Research Online

Faculty of Science - Papers (Archive)

Faculty of Science, Medicine and Health

2012

Driving, cities and changing climates

Gordon R. Waitt

University of Wollongong, gwaitt@uow.edu.au

Theresa Harada

University of Wollongong, tmh952@uow.edu.au

Publication Details

Waitt, G. & Harada, T. (2012). Driving, cities and changing climates. *Urban Studies*, 49 (15), 3307-3325.

Research Online is the open access institutional repository for the University of Wollongong. For further information contact the UOW Library:
research-pubs@uow.edu.au

Driving, cities and changing climates

Abstract

The relevance of cars in relation to changing climates seems indisputable: scientific evidence points out the significant contribution of cars globally in causing greenhouse gas emissions. Despite higher levels of general public understanding and concern about climate change, this has not generally resulted in decreased car use. This paper outlines how a spatial perspective drawing on a cultural economy approach may provide insights into the paradox of the environmental 'value action gap' by focusing on suburban belongings, passions and anticipations derived from driving. Drawing on insights from Burraneer Bay, an affluent Sydney suburb, the paper illustrates how habituated and embodied knowledge of driving props up class envy, the spatial bordering of the city and the transformation of a love of driving into driving as love, underpinned as much by a desire to consume as by the performance of an identity. The implications for urban policy are considered that look beyond culture as attitudes.

Keywords

changing, climates, cities, driving, ERA2015

Disciplines

Life Sciences | Physical Sciences and Mathematics | Social and Behavioral Sciences

Publication Details

Waitt, G. & Harada, T. (2012). Driving, cities and changing climates. *Urban Studies*, 49 (15), 3307-3325.

Driving, cities and changing climates

Abstract

The relevance of cars in relation to changing climates seems indisputable: scientific evidence points out the significant contribution of cars globally in causing greenhouse gas emissions. Despite higher levels of general public understanding and concern about climate change this has not generally resulted in decreased car use. This paper outlines how a spatial perspective drawing on a cultural-economy approach may provide insights into the paradox of the environmental ‘value action gap’ by focusing on suburban belongings, passions and anticipations derived from driving. Drawing on insights from Burraneer Bay, an affluent Sydney suburb, we illustrate how habituated and embodied knowledge of driving props up class-envy, the spatial bordering of the city, and the transformation of a love of driving into driving as love, underpinned as much by a desire to consume as by the performance of an identity. The implications for urban policy are considered that look beyond culture as attitudes.

Key words Australia mixed-methods cultural-economy cars climate change

Introduction

Within urban studies the social interactions between the automobile and the city have received significant attention. In particular, the automobile has featured in political economy accounts of suburbanisation that have sought to conceptualise the impact of the socio-spatial forces of economic restructuring on urban life and city spaces. Political economists interpreted the suburb as a class adaption within the system of capitalist industrial production (see Harvey, 1973). Some feminists extended the political economy approach demonstrating how suburban streets become gendered

and classed by styles of driving expected of middle-class women chauffeuring their children to everyday activities (see Dowling, 2000).

Given the centrality of the automobile in urban studies, work has commenced on examining the relationships between increasing car sales, excessive driving, city life and climate change (Gifford and Steg 2007; Matthies and Blobaum 2007). Urban studies have tended to consider climate change through focusing on urban form (Newman and Kenworthy 2007; Parkhurst 2000). For political economists, climate change is itself an expression of just-in-time urbanism and is as much a product of state policies as it is of economic investment and resource development surrounding the automobile (Doucet 2007; Mikler 2009). In contrast, New Urbanists, an intellectual movement of architects, emphasise the car dependency generated by the suburban form and advocate a return to pedestrian-orientated urban living arrangements (see Frumkin *et al.*, 2004). The car is positioned as the prime villain in city life by new urbanism.

Such accounts generally do not consider the discursive construction and embodied knowledge of urban life. The relationship between climate change, driving, emotion, affect and everyday urban life has not been examined. Thinking spatially, and drawing on a cultural-economy approach, we argue that there is a need to theorise how driving practices are felt in specific places. The objective of such a project is to develop a more nuanced understanding of the social relations and cultural practices associated with driving as a habit. If urban studies are to capture the relationship between driving and changing climates then the interconnections of practices and processes related to production, consumption, regulation, representation and identity

must be fully examined. Following Amin and Thrift (2007) our cultural-economy approach is one in which culture and economy are inseparable. This approach shares much with political economy in terms of a common interest in regimes of capital accumulation, power, social foundations and institutional bearings; but relies upon an understanding of the urban transport economy as performed through the driving habits, embodied knowledge, moral justification and passions that each shape and are shaped by space. This paper explicitly attempts to frame such an approach in terms of a number of intersecting ideas concerning driving; the powers associated with freedom that has most resonance with the governance of the automobile (Bohm *et al.*, 2006); the tacit knowledge embodied in bodily experience past and present (Sheller 2007; Sheller and Urry, 2000); how networks of bodies, automobiles and roads are aligned through rhythms to produce habits shaping driving cultures (Edensor, 2004); and the intense affect, that energises markets, driving pleasures and identities (Thrift, 1999 and 2008). As Conradson and Latham put it, affect might be understood as the 'energetic outcome of encounters between bodies in particular places' (2007, p. 232). We agree with Bissell (2010) that attending to affect in transport during an age of increased carbon conscience is hugely important because it prompts us to consider what drivers can do, rather than what car-drivers are assumed to be.

A cultural-economy approach is posited alongside a wider dissatisfaction with policy making inspired by simply re-stating the science of climate change, or emphasising the 'common-sense' of taking mitigating actions— like walking and public transport. . Consistently, environmental behaviour surveys report the so called 'value-action gap', that is the disjuncture between public awareness about climate change and the limited behavioural responses (Lorenzoni *et al.*, 2006; Robbins, 2007). As Lakoff (2004,

p.14) suggests “the facts bounce off”, if the science does not support a person’s cultural values, and thereby a person’s everyday goals; regardless of the credibility of scientific data on climate change, remain unchanged. Mounting evidence from social scientists suggests that the ‘Enlightenment model’ of human decision-making is incomplete, and promoting environmental behavioural change through public awareness of climate change is inadequate to change behaviour. The Enlightenment approach to reason has overemphasised people as purposeful rational consumers and failed to apprehend that facts play only a partial role in shaping people’s judgements (see Burgess *et al.*, 2003; Malpass *et al.*, 2007; Marres, 2009). For instance, Gleeson (2008, p. 2653) argued persuasively there has been a “failing to apprehend the deeper socio-cultural forces that drive the (over)consumption of nature.” While Crompton (2010, p. 8), drawing primarily on the work of psychologists, pointed out that it ‘is increasingly apparent that our collective decisions are based importantly upon a set of factors that often lie beyond conscious awareness’, and which are informed in part by emotion – in particular, dominant cultural values, which are tied to emotion. Extending these arguments we draw on a cultural economy approach to consider the spatial relational attributes of car-culture, and how the bodies of car-drivers have a particular way of anticipating, sensing and moving within a continually emerging urban transport economy. Our contention in this paper is that paternalistic policies that merely constitute the travelling subject as environmentally responsible are not sufficient to persuade people to drive less; the challenge is to better understand how driving is individually felt through the body; including the passions, embodied knowledge and social norms which inform the interconnections between driving, bodies, automobiles and the world. We argue that changing everyday driving practices requires a better understanding of how drivers spatially configure and

understand the ways in which it is appropriate to move about the place in which they live through the automobile.

To examine the embodied experiences of being on the move, this paper unfolds as follows. The first section reviews literature on mobility that open up driving to critical interpretation. In the past decade, geographers, sociologists and anthropologists have come to understand driving as a state in which different configurations of bodies, technologies, and objects world are aligned spatially to form different experiences of 'being with'. A cultural-economy perspective of driving behaviour accepts rules of value based on price, consumer tastes, the seduction of marketing images, and the market power of branding. Driving behaviour is also impregnated with the historical emergence of particular set of rationalities and practices of government, as well as passion, habit, tacit and embodied knowledge of past driving experiences and places. We outline how unfolding moments of varying affectual intensity, which work through assemblages involving co-relationships between cars and bodies, have the capacity to generate particular actions, feelings and emotions, that inform participants' understandings of problematic driving. Hence, in the case of driving, it is not just inferring a correspondence between image and meaning through the branding of cars that matters (Katz, 2000; Miller, 2001). Also at stake are ways in which bodies familiar with driving are laden with felt connections, which are both anticipated and contemporaneous to the ubiquitous phenomenon of the car. This way of thinking is woven through the next sections of the paper. The subsequent section introduces the empirical work conducted in the suburb of Burraneer Bay, Sydney, Australia (See Map 1) with 12 people from affluent socio-economic backgrounds. Attention then turns to explore how the driving body becomes skilfully habituated to sensations,

dangers and pleasures. What is significant in this article is the underlying similarity in driving practices, passions and anticipations, and a consequent locking into high-carbon emissions regardless of personal understandings of climate science. We argue these similarities illustrate how the body sensually attuned to negotiate the pleasures and physical dangers of the road leaves drivers feeling unjustifiably insulated from the greenhouse gases emitted during their driving.

Cars, climate change and cultural-economy

Transport studies demonstrate that the car is one of the largest contributors to greenhouse gas emissions worldwide, is the dominant form of daily movement in the minority world, and confirms the ostensible dependence on the private car in many cities (see Chapman, 2007). Most transport studies understand mitigating carbon emissions from cars through a narrowly scientific, objective and quantitative model. Some of these studies have suggested road building to reduce traffic congestion by increasing road capacity (Qingquan, Zhang, Wang and Zeng, 2010). By contrast, others argue of the necessity to reduce both the total number of cars and overall car use in cities (Schrank and Lomax, 2001). Infused with assumptions of rational thinking *homo economicus*, still others advocate for pricing mechanisms to discourage car use (Potoglou and Kanaroglou, 2008; Reckien *et al.*, 2007) including parking charges (Anable and Boardman, 2005), road tolling (Mitchell, 2005) and road congestion pricing (Creutzig and He, 2009). Drawing on behavioural psychology, discernable attitudinal patterns and tendencies have also been identified for mitigating climate change that suggest an underlying willingness amongst women to drive less (Polk, 2004; Best and Lanzendorf, 2005) and those people most concerned with

‘quality of life’ (Steg and Gifford, 2005). However, as consistently reported people often do not act in accordance with what they know or care about, particularly in the case of habitual travel behaviour that is not always preceded by conscious consideration (Whitmarsh, 2011). These results are hardly surprising to anyone familiar with the emotional ‘ties’ of the automobile.

Adopting insights from recent rethinking of the city through a cultural-economy conceptual lens has much potential in exploring the relationship between driving and climate change (Gibson and Kong, 2005; Amin and Thrift, 2004), because it brings the methodological tools and theoretical advantages of cultural theory to bear on questions of economy, regarding how humans access, use, exchange and value financial and material resources. Cultural-economic research begins empirically, documenting a stated phenomenon, event or scenario, and traces qualitatively the relationships that unfold in situ between humans, technologies, other living things, institutions and overarching ideologies (Amin and Thrift 2007, p. 145). Rather than seeing all drivers as *homo economicus*, working to machinist rule as profit-seeking units in an entity called ‘the economy’ – or indeed, seeing culture as a separate sphere somehow beyond questions of material resources and transactional relationships – cultural-economic research traces a ‘single phenomenological plane’ (Amin and Thrift 2007, p.145) outwards from a scenario or location, documenting actions and emergent relationships between agents that shape material outcomes.

In the context of driving cars in an age of carbon consciousness we begin from the position that if you drive a car, at a basic level, the decisions drivers make are economic – purchasing petrol, insurance, models and brand. But the values supporting

and shaping the decision to drive a car are more or less are fundamentally cultural – because preferences and behaviours stem from cultural norms, habits, tacit knowledge and passions. We wish to show how particular cultural geography dimensions are woven into the performance of the cultural-economy of driving. As such, driving is conceived as simultaneously influenced by regimes of automobility (Bohm *et al.* (2006); the comfort of cultural habits (Ingold and Kurttila 2000; Edensor 2004) and haptic knowledge (Thrift 1996 and 2008). The emphasis in exploring these three, sometimes overlapping, strands of research is to underscore the compositional capacity of driving that connects drivers with formal institutions, places, cars, habits, emotions and affects rather than as an economic entity in its own right.

Cresswell (2010) provides a compressive review of the literature that foregrounds mobility at the centre of the unfolding of identities and everyday geographies. One early and enduring strand of research concentrates on the distinction between the automobile and automobility; that is, the important distinction between the car itself and the related states of socio-techno-political practices that shape society along particular visions, interests and norms (Urry, 2004 a; Featherstone *et al.*, 2004; Bohm *et al.*, 2006). For example, Bohm *et al.* (2006) drawing on Foucault, illustrated how the regime of truth of automobility operates to (re)produce as self evident tropes of cars as convenient, cheap, stylish, progressive and efficient. The regime of power of automobility is illustrated in the range of governmental institutions that engage in monitoring, shaping and disciplining drivers and non-drivers. Finally, the ways in which automobility involves a regime of subjectivity is illustrated by car driving as a mechanism of social differentiation around categories of gender, class, age or race. Moreover, automobility helps stabilise a hierarchy of subjectivities by sustaining

particular understandings of car driving as normal and alternative modes as deviant. This approach draws on ideas of Latour (1992) and argues that alongside socio-techno-political networks a human-auto hybridity is essential to conceptualising 'automobility'.

A second strand offered by Henri Lefebvre's Rhythmanalysis (2004) is also useful for understanding drives experienced on a routine basis. This strand is concerned with how entangling rhythms shape human experience in timespace. Following Lefebvre's ideas, Edensor (2004) contended that there is a rhythmic quality to suburban driving; say the daily school drop-off, commute to work and drive to the shops. Car trips can be thought of as a configuration of multiple synchronised, coordinated and habituated activities. Driving is intertwined with numerous and unpredictable constituents, experiences and interactions and is deepened by experience over time, so that the body becomes skilfully habituated to its pleasures and dangers. The comfort of habit is in part grounded in the collective sense of place established through sharing spatial and temporal co-presences framed by the regular rhythmic gait of driving; its tempo, timing and sequence.

The third strand entails phenomenology. Citing the work of writers including Bourdieu, de Certeau, Hägerstrand, Heidegger and Merleau-Ponty, Thrift (1996) and Ingold and Kurttila (2000) connect their ideas to theories of practice. Anthropological work has focused on rethinking transport not just as a means of movement from points of departure to arrival, but as part of a 'taskscape' (Ingold and Kurttila, 2000). 'Taskscape' refers to the idea that engaging in everyday mundane tasks creates, maintains and transplants certain fundamental habits into our bodies (Ellegard and

Vilhelmson, 2004). Here, everyday driving practices are not merely cognitive, but also shaped by unreflexive assumptions and dispositions, revealing kinds of common-sense modes of 'being-in-the-world'.

Similarly, geographical work on the relationship between mobility and non-cognitive thought has attended to the human interactions and encounters with the things that make up the world (Thrift 1996 and 2008). Work on embodiment has been attentive to a more sensually attuned body which takes account of, and learns how to negotiate space through a range of sensory and affective registers. Citing Thrift (2001), Sheller (2004) argued that driving has:

transformed the way we sense the world and the capacities of human bodies to interact with that world through the visual, aural, olfactory, interoceptive and proprioceptive senses. We not only feel the car, but we feel through the car and with the car (Sheller, 2004, p. 228).

The tactile affordances of car mobility are through car-seats, tyres, engines and steering-wheels. Consequently, the bodily sensations of car mobility sustain particular ways of moving, sensing, and thinking. For example, the sense of driving movement and touch produces a sensorium that is particular to place and time, and the performance of gendered identity within that place and time. This way of thinking alerts us to how the sensualities of driving rather than existing in individual drivers, instead prompts thinking about how the frustration, irritations and delights of automobility emerge and decay as particular spatial relational flows, fluxes and currents, in-between people, cars and places. Conradson and Latham (2007, p. 238) suggest that such 'affect fields' reflect 'the coming together of people, buildings, technologies and various forms of non-human life in particular geographical settings.'

Starting with these insights from this critical work on mobility, we argue that the driving body has much to offer urban studies, and disrupt the significance of suburban form in discussion of the relationship between driving and climate change.

Methodology: research led by what a person knows when they are driving

In designing this project we chose to focus on automobile cultures of an affluent Sydney suburb for three reasons. First, the dominant understanding of responsibility for climate change climate has been constructed in Australia by the resource and energy industries. Citing national interests, obligations to reduce carbon emissions have tended to be steered away from resource and energy industries. Instead individuals and households are held accountable through their consumption practices. Hence, while the energy sector which is responsible for over 74 percent of all Australian greenhouse gas emissions, the state has targeted drivers to shoulder a lion's share of emission reductions responsibilities, even though passenger cars only account for around 7 per cent [41.9 Mt CO₂-e] of the Australian total (Department of Climate Change, 2007). Second, in a context where suburbia is regularly positioned as the environmental villain in Australian urban debates, we had an interest in exploring how people living in an affluent suburb were responding to climate change politics. Finally, we were interested in investigating why car use remains dominant despite provisions to encourage pro-environmental behaviour: access to public transport, a decade of information and education on climate change, increasing traffic congestion as well as incentives to change travel preferences. Hence our choice of Burraneer Bay, Sutherland Shire, located some 35 kilometres south of the Sydney Central Business District (Map 1).

In the Sutherland Shire, the motor car is the dominant mode of transport, with 78.2 per cent of trips made by car (Transportation Data Centre, 2007). Traffic congestion is commonplace. Urban consolidation policies have enabled the population since 1996 to increase by 32, 4000 per year or 1.2 per cent to around 218,000 in 2006. Since 1996 motor vehicle ownership increased threefold. As a result Sutherland Shire Council has actively focussed attention on 'sustainable transport' and initiated a number of policies to promote walking, cycling and public transport rather than driving (see Department of Environment and Conservation, 2004). For example, to encourage use of privately owned bus companies, council focussed on changing the temporal order by making services more frequent and faster. Another example is how the Sutherland Shire Council deployed spatial design to encourage use of the State owned City Rail network by providing cost free parking at railway stations. These are examples of an emergent form of government that influence people's behaviour without forbidding any options, what Jones *et al.* (2010, p.1) term 'libertarian paternalism.'

The suburb of Burraneer Bay is located on a peninsula with one main access road. Public bus services are extremely restricted, and the three morning and afternoon buses are scheduled to the rhythm of the school weekday. Woolooware Station is on the Cronulla branch of City Rail's Illawarra Line. Trains to the Central Business District are scheduled to the rhythms of a working week. Located at the northern end of peninsula, no residence in Burraneer Bay is located more than 3km from Woolooware Station. The results presented in this paper are based on fieldwork conducted in Burraneer Bay that included a questionnaire survey, in-depth interviews,

diaries and 'drive-alongs'. Participants were recruited from a survey titled: *What Does Driving in and around Burraneer Bay Mean to You?* In May 2009, 600 survey forms were distributed over two days to each household in Burraneer Bay. The first section explored what, when, where, and why respondents drove. The second section turned to the extent of agreement or disagreement with statements about climate change. Forty survey forms were returned, and 17 participants indicated a willingness to contribute to future research.

On the basis of these survey returns, potential participants then received copies of our consent form and participant information sheet; at this stage three declined and two were not contactable. Between June and October 2009, one of us visited the remaining 11 people (5 women and 6 men) either in cafes or their homes. At the initial meeting participants gave their consent to participate in the project over a three month period. Like Thrift and Dewsbury (2000, p. 412) we 'want(ed) to make space livelier'. It seemed appropriate, therefore, to design a project more sensitive to the embodied knowledge and affective fields of real-time driving circumstances. Hence, in addition to a range of mixed-ethnographic methods that occurred outside the car including conversations, semi-structured interviews, sketches and a solicited driving diary, like Büscher and Urry (2009) we also conducted drive-alongs on a regular journey for at least six times. Becoming a passenger with participants helped provide insights of the phenomenal experiences of the driving body and how affect serves to colour ways of inhabiting the car during car routine suburban journeys. Semi-structured interviews provided detailed insights to the propensity of affect to envelop the drivers, expressed in terms of the mood generated by travelling-with the relational assemblage that comprises the car. Becoming a passenger revealed the embodied

experiences of driving and how through the transmission of affect, emotions well-up from within, informing that moment of the driver's existence.

Our interpretation relies on a principle that acknowledges that each of our methods must be "apprehended as performative in themselves, as doings" (Dewsbury *et al.*, 2002, p. 438). The empirical material is therefore conceived as the outcome of an encounter that offers insights into the knowledge that resides in the driving body as a set of embodied social practices, dispositions and sensibilities. Our analysis therefore required paying attention to how the embodied knowledge that permeated driving practices is expressed and observed through texture, tone and tense. In the following section we draw on sketches, diaries and narrative data to highlight how travelling with cars in and through suburban space cultivated three key dispositions: belonging, passionate attachments and anticipations.

The geographies of suburban driving: belongings, passions and anticipations

The car is an integral part of the everyday in Burraneer Bay. Our survey results confirmed the ABS (2006) statistics, and indicated that the car was the principal mode of transport, accounting for 90 per cent of journeys during the week, and 88 per cent at the weekend. Driving was reported as an important part of weekly commutes to work (83 per cent), leisure (28 per cent), study (18 per cent), shopping trips (14 per cent), and Burraneer-based sociability (31 per cent) through which familial relationships and extra-familial friendships were maintained. From our qualitative research it quickly became apparent that amongst participants car mobility was understood as a basic right, multiple cars were a necessity to maintain desynchronised household rhythms and learning to drive was a rite of passage to adulthood.

Our survey also suggested the popularity of driving luxury vehicles fuelled entirely by fossil fuels including those manufactured by BMW, Mercedes, Audi and Porsche (57 per cent (n = 49)), of which 30.6 per cent (n = 15) were four-wheel drives. Only 2 per cent (n = 1) employed hybrid fuel technology [engines that combine electrical power with internal combustion]. In comparison compact vehicles, which were primarily second, or third vehicles owned by a household, accounted for the remaining 43 per cent of vehicles (n = 37), of which 16.2 per cent (n = 6) were four-wheel drives, and 2.7 per cent (n = 1) employed hybrid technology.

The paradox of the widely reported value-action gap was notable from our survey. From the household survey, 82 per cent expressed concern about climate change (n= 31), 79 per cent of respondents expressed a clear understanding of climate change (n= 30) and 72 per cent of respondents (n = 28) expressed a willingness to change their behaviour to lower CO² household emissions. However, only four survey respondents over the previous twelve months had actually decreased their driving. They cited events that disrupted habituated routines including ill health and employment, not action in relation to climate change. Various contextual barriers exist to action in relation to driving less. It is well established that automobility has fragmented social practices, producing lengthy commutes between home, work, shopping and leisure (Urry, 2004b). Our findings suggest that personal responsibility for mitigating climate change by changing transport behaviours is trumped by the ways in which travel habits help shape, and are shaped by space. This reciprocity becomes more evident taking into consideration the cultural meanings and embodied knowledges associated with driving.

Belongings

Branded cars are central to how suburban life is configured and reconfigured in Burraneer Bay through marketing. As Lucy and Daniel explained there are sign-values (such as career success and social status) and normative discourses to be considered that frame smaller, hybrid, lower-carbon emission cars as presently out of place on the roads of the affluent suburb of Burraneer Bay.

So just from the look of the car you form an idea of who drives it, who they are, where they are from

Interview, Daniel (student, 20-30 years)

We've got big cars here. ... Around here people tend to keep up with the Joneses – like if one person would get solar power and water tanks etc everybody would, if you know what I mean, the same with hybrid car. At the moment four-wheel drives are popular but if hybrid cars became popular then people around here would drive them.

Interview, Lucy (student, under 20 years)

Here then, are examples of two dimensions of automobility as theorised by Urry (2006) that operate as contextual barriers. Firstly, as an item of individual consumption the sign-value of the carbon-intensive four-wheel drive provides status to its owner, propping up class-envy, and reconfiguring spatial borders of the city through turning class distinction into a commodity. Four-wheel drivers splinter city-drivers along different collective lines. In constructing the hybrid-car as 'other, and the implied 'respectability' of the four-wheel driver, the hybrid car is framed as redundant. Secondly, as the dominant mobility culture, automobility "sustains major discourse of what constitutes the good life, what is necessary for appropriate

citizenship of mobility,” regardless of its environmental pedigree (Urry, 2006 p. 18). However, in relation to travel behaviour cultural meanings associated with driving offer only a partial explanation of the barriers to change. Regularly travelling by car differentiates Burraneer Bay from other parts of Sydney by car mobility producing a distinct tacit and embodied knowledge fashioned by the encounter between bodies, cars and roads.

The vast majority of participants described a narrow range of driving conditions in which they felt relaxed. Repetitive commutes by car to the city were presented as a source of frustration. The familiarity with traffic congestion on the arterial roads of Sydney fostered a heightened sensual appreciation of Burraneer Bay that was articulated as ‘home’ (Figure 1). Yet, the interviews and sketches of the experiential modalities of driving suggest the sense of ‘belonging’ is varied and contingent on congenial relations between drivers. Driving produced unfolding moments of affectual intensity, particularly when compact car drivers encountered four-wheel-drives. The bodies of many compact car drivers were enlivened and frustrated by the multi-sensual impacts of aggressive driving manoeuvres of four-wheel drivers including, tailgating, flashing of headlights and sounding of horns. For example, Marie and her husband have lived in Burraneer for 23 years and drove a standard Holden Vectra station wagon. Narrating her sketch Marie expressed how as a motorist she was made to feel too slow and too old when driving on Woollooware Road:

This [tailgating] happens all the time. We have a lot of people in our street with four-wheel drives. Because we are close to the boat club so a lot of people have them to tow their boats and trailers. There will often be a line of them and they tend to sit right on your tail and make you hurry. There is a 50 km restriction on our road. And I really don't like it. Here am I a little granny

in my little car. It is 50 km. These people are sitting on top of you and they get very impatient. As I turn into here, coming down the hill. They are over the other side of the road.

Interview, Marie (retired teacher, 60 years plus)

This quotation illustrates Katz's (2000) suggestion that drivers experience cars as extensions of their bodies. Hence, Marie's dislike of becoming 'a little granny in my little car' because of the tailgating manoeuvres by four-wheel drivers. Again the intertwining of identities and the car is illustrated by Harry who expressed anger at becoming the subject of aggressive driving manoeuvres while driving through Burraneer Bay.

Stop winking at me! I can't go any faster! He is flashing his lights. I do get irritated with that. I am doing 45. He wants me to do 55. I will get out of his way. I'm not doing anything wrong, I'm being careful.

Participant observation inside car, Harry (60 years plus, retired engineer)

Harry is bursting with fury; his face is flushed, his body tenses and the tempo of his speech quickens. In these moments the affective relations between drivers are reconfigured. Harry deploys the cathartic effect of testifying to his frustration to prevent the affect taking hold of his body. Harry's tacit automobilised embodiment as an upstanding moral driver and Burraneer Bay citizen is being eroded. Indeed, the anger and frustration experienced in this moment illustrates Katz's (2000, p. 46) suggestion that there are driving situations "in which a carefully nurtured identity is forcefully undermined." As is illustrated in these quotations, respondents acknowledged feeling bullied by aggressive four wheel-drivers. Tailgating worked against the sociality produced by the choreography of the familiar regulatory framework that encourages drivers to be careful, considerate and 'civilised'. The

affective field sustained from being tailgated demonstrates the capacity of affect to splinter the social cohesion of Burraneer Bay and distancing drivers. Such embodied responses point to those drivers behind the steering wheel of smaller compact cars being made to feel 'out of place', because of the aggressive driving strategies of four-wheel drive vehicle drivers.

The tailgating strategies of four-wheel drivers illustrate the sensual embodiment of certain identities and moral values. A working consensus has been achieved amongst four-wheel drivers about what are seemingly the more, and less, acceptable styles of driving in Burraneer Bay. In the case of tailgating, the tailgating driver needs to be more skilful than the 'responsible' driver in deploying technical and interactive skills. Paradoxically, in an era of climate change, a sense of belonging in Burraneer Bay is sustained through the luxury four-wheel-driver hybrid that has substantially higher carbon dioxide emissions than compact cars. The next section explores the ways in which the driving body hybrid distances the climate change emergency - through the multi-sensual affordances of cars, including design, smells, sounds and touch which are experienced and expressed as love.

Passionate attachments

Extensive writings have highlighted the 'love affair' with the car (see Motavalli, 2000; Miller, 2001 and Sachs, 2002). Particular attention has been given to the major discourses which provide potency to the car. For example, Alvord (2000) outlines the role of marketing and advertising since the 1890s in establishing and circulating discourses to keep the romance alive with the automobile. Conley (2009, p. 38) identifies how advertising has sexualised the car as a 'magical object' that appeals to

the desire for power, speed and excitement. More pointedly, couched within non-representational idioms, the next section investigates the central role of bodily presence – of sensuous, tactical and experiential being – in the co-constitution of self and car – and dispositional car passions, often expressed as ‘love’.

Several participants spoke of a love of car mobility found in the bodily sensations of comfort.

I do love my car and I really enjoy driving that car. ... I love the comfort of it and everything.

Interview, Phil (general manager, 40-50 years)

Traffic very heavy due to long weekend, but listened to radio and music. Thoroughly enjoyed being back in the smooth, quiet, cocooned comfort of the X5[BMW four-wheel drive]. Nice relaxing journey despite the traffic.

Diary, Phil (general manager, 40-50 years)

Light drizzle; what a comfort it is to go door to door (almost) by car, low heat on, listening to 2RN. Warm, quiet and comfortable. With the car windows closed, it almost excludes the rest of the world. ...I'm beginning to think I DO have a love affair with my car.

Diary, Harry (retired, 60 plus)

These quotations confirm Bissell's (2008) argument that thinks through comfort as a specific affective resonance. Participants talk of a love founded in the sensation of comfort as an affective relation that circulates between and through bodies and cars, rather than solely as aesthetic sensibility. At the same time a love affair with comfort necessitates a simultaneous distancing and withdrawal of the driving body to facilitate

other sensibilities such as quietness, solitude, relaxation and speed. This, allows drivers to dwell in an individualised privatised space separated from the stress and dangers of the world beyond the windscreen. As argued persuasively by Sheller (2004), embodied comfort works towards disconnecting people from the bodily discomforts beyond the windscreen. The physical engineered environment ensures that bodies travelling by car are ‘cocooned’ from intrusive sounds, smells and sounds beyond the car. How participants discussed adjusting heaters, radios, satellite navigations, chairs and air conditioning illustrates Bissell’s (2008) assertion that comfort does not reside in any particular object but is ‘an embodied contingency forged between the body and the proximate environment’. Through this rendering of a relational sense of comfort, forged through a synergy between body and car, enables the seated driver to enact a specific corporeal identity, territorialise space and personalise time. It is how a love of comfort is folded through spatially performed identity and bound up with discursively constituted subjectivities that choices of transport are entangled.

For example, Phil is aware of the link between his own driving practices and climate change and as a workplace manager he takes responsibility for reducing greenhouse gas emissions. However, love of his luxury car, registered as bodily comfort, is central to why he diverges from the moral benchmark in the context of mobility.

Obviously I am well aware of the whole impact of greenhouse gases and everything else. It is interesting at work at the moment...we are recycling waste and doing everything we can to reduce our impact on the environment. And where you really got me thinking is, hang on, I am doing all of this and I am jumping in this 2 tonne vehicle that burns up a lot of fuel. ... Do I really

need it a 3 litre, 6 cylinder, 2 tonne car? No I don't ... I could get around in a Honda Jazz or something similar. But I do enjoy driving that big car.

Interview, Phil (general manager, 40-50 years)

In a rational way, Phil questioned his need to drive a large, heavy, prestigious vehicle, acknowledging that he could maintain his mobility in a much more sustainable manner. A Honda Jazz would provide exactly the same utility and usability. But Phil is willing to overlook the faults of the BMW, including greenhouse gas emissions, because not only is this particular car integral for his self-image, but also his bodily disposition as a business commuter would change in driving an alternative car. Phil can rationalize the importance of acting on climate change science by driving a smaller car. However, the visceral controls his behaviour: the kinetic and dynamic affective pleasures of driving a BMW win.

Important here is how bodies, technologies and objects are kinaesthetically intertwined. For example, Phil's decision to purchase a fossil-fuelled BMW four-wheel drive over a hybrid Toyota Lexus RX 400H [combines a 3.3 litre V6 fossil-fuel engine with two electric drive motors] illustrates the importance of sensual form of appreciation for the road, experienced through the driving body. As Phil explained:

Like I said to you, I did test drive the hybrid Lexus...it is really boring. The whole lay out of the car. I didn't really like the driving position in it. I just felt completely disconnected from the driving experience, it was all very smooth, and it was almost like getting into an automatically driven bus or something. The nice thing about the BMW is that they still put sports suspension on it, you can feel the road a little bit more and the steering is very precise. You can have the performance of the engine if you want it to be a quite racy vehicle. I like the

feel of this. I test drove the Audi as well... I like that very much. I just thought it [the Audi] was very ugly.....

Interview, Phil (general manager, 40-50 years)

In addition to performance and aesthetics, the visceral level of design and performance come into play. The ways in which he feels the physical world through and with commuting are central to his purchase decision. Phil outlines how his sensory responses to driving produce feelings that favour the ‘racy’ BMW over the ‘boring’ Toyota or ‘ugly’ Audi. The pleasures of driving are not simply ‘felt’ and then ‘expressed’, but are instead elicited, invoked, regulated and managed (Thrift, 2004). As a business commuter, Phil anticipates and imagines what a ‘comfortable’ car should look and feel like driving along a road. The next section further examines how research more attuned to how sensations are anticipated and managed during routine car journeys are relevant to practical efforts to encourage people to consider catching public transport, walking or cycling.

Anticipations

Regular rhythms of mobility that course through the suburb help sustain Burraneer Bay. When asked about travelling by public transport, participants expected the presence of the car to negotiate and sustain the entangled rhythms of their everyday life in Burraneer Bay.

‘I s’pose the car for me is just a necessary mode of transport. You just think about it as one of the necessities of life. I know people use public transport but you wouldn’t want to live out here if you wanted public transport

Diary, Jim (retired manager, 60 years plus)

Public transport would not get me to where I need to go during the day; within the timeframes I need to operate ... It is just not a practical proposition

Interview, Phil (general manager, 40-50 years)

If it [public transport] worked into my schedule with what I do, when I was working. You are so busy, you do things for convenience

Interview, Anna (teacher, 40-50 years)

I have missed trains by minutes and have to wait half an hour for the next one, and that really frustrates me because when you have a car you can go when you want to. You are not stuck to timetables.

Interview, Lucy (student, under 20 years)

These quotations confirm Edensor's (2010, p. 5) point that rhythms of mobility flow 'contribute to the spatio-temporal character of place'. These quotations also begin to hint at how the rhythms and mobility of public transport in Sutherland Shire does not fulfil participants' habitual dispositions towards spontaneous or instantaneous mobility. As Nigel Thrift (2000) ably argued, cars mobilise a particular 'landscape of anticipation' that is informed by intersecting discourses of freedom, safety, convenience and efficiency. Within the discourses of freedom, car journeys are anticipated as maximizing access to destination choices, facilitating personalised rhythms of movement, harmonising multiple household activities, as well as combining planned and spontaneous events. In this sense, the ways in which the automobile enables the co-ordination and scheduling of activities that comprise everyday life is often pitched as 'convenient'. Shove (2003, p.20) suggests that the idea of convenience is important because it "legitimises and sustains specific forms of consumption". Within the discourses of time efficiency, car journeys are anticipated as instantaneous, economical, smooth, seamless and as having priority over walking,

cycling, trains or buses. Furthermore, as Jain (2006) pointed out, individual car journeys are anticipated as flexible, eliminating the need to become part of mobile public forged by tickets, collective scheduling, connections and timetables.

Shove (2003, p.20) noted that convenience devices have a paradoxical effect: “inadvertently exacerbating the sense of harriedness and generating demand for even more convenient solutions”. Our survey showed the paradoxical attributes of the car as a convenience device in fashioning everyday rhythms. On the one hand, respondents most enjoyed the convenience of automobiles in scheduling aspects of their everyday life (60 per cent (n = 24), followed by independence (15 per cent (n = 6)). On the other hand the ease of automobile in scheduling activities over increasing distance has generated its own set of problems made visible by traffic congestion. Not unexpectedly then, 45 per cent of respondents reported negotiating ‘traffic’ as being what they most disliked about driving. The driving body attuned to the familiar affordances of car mobility, including the capacity of car drivers to control the scheduling of activities and the choreographies of the road, the unexpected driving manoeuvres that reduce the anticipated affordances of car mobility may cause a change in the disposition of drivers:

I think it is quite easy in the car to get ... the road rage sort of thing; someone cuts in front of you. You tend to find yourself getting very wound up.

Participant observation inside car, Phil (general manager, 40-50 years)

*Granny idiot!...This would be another one of those things that piss me off!
[Becoming stopped behind a car trying to turn right].*

Participant observation inside car, Daniel (student, 20-30 years)

In these examples a change in the disposition of drivers was witnessed. The slowing down of the car became out of sync with the expected speed of drivers. Routines and itineraries were snarled. Habits which enable commuters to travel without much reflective thought were shattered. Our respondents and interviewees illustrate wider social anticipations that the flow of traffic should continue uninterrupted to enable routine car journeys to be experienced as seamless, efficient and convenient.

Anticipating car mobility as a necessity for living in Burraneer Bay, the comfort of routinely experiencing familiar landmarks through regular journeys in the privatised space of the car, and skilfully habituated to the sensations and dangers of driving, some respondents were apprehensive about travelling by public transport.

I was dropped at Cronulla Station to catch a train into uni. The train is cheap, which is why I use it. Plus I don't need to find parking if I catch the train. Though, it takes almost twice as long as driving, they're often dirty and sometimes I feel quite afraid as there is no security and people on the train can be quite scary.

Diary, Lucy (student, under 20 years)

I suppose you feel slightly unsafe on the train – you see some people get on the train who worry you. That's the detraction of getting a train I think – you feel slightly unsafe. Driving your own car you feel safe and comfortable... We are all spoilt now. It is possible to live without a car. At our age we are looking for comfort and safety and everything. We want our car! Our cars!

Interview, Patrick (retired tradesman, 60 plus years)

For someone of my age [using public transport] would be a ridiculous hardship.

Interview, Harry (retired engineer, 60 plus years)

Enmeshed in the rhythms of car mobility, participants wallowed in the pleasures made possible by certain comfortable and familiar affordances of car mobility. In comparison the vast majority of respondents expressed the relatively less familiar rhythms and affordances of public transport - including smells, sounds and time-schedules - as evoking a sense of displacement, vulnerability, fear and disgust. Car mobility was discursively constituted by participants as a right (Cresswell, 2006). In contrast, public transport was wrapped up in narratives of aesthetics, worthiness and the logic of othering. Working against public transport mobility is how bodily dispositions to car comfort render the spaces of the carriages of Sydney's CityRail as disgusting..

If the train was air conditioned it's not too bad... but they are disgusting.

Interview, Marie (retired teacher, 60 plus years)

I've got no idea what the cost benefits would be, and they [trains] are so filthy. I can't stand them because they are so filthy.

Interview, Anna (teacher, 40-50 years)

Disgust disavows intimate connections, and in spatial terms disgust is distancing. As Munt (2008) argued, disgust is at the embodied core of how people reject people or ideas that are no longer in good taste. The possibility of catching the train is experienced in ways that are moral and implicated in the production of relations of domination. The distancing from public transport was perhaps further intensified by how dominant ideas surrounding cleanliness ran concurrent with affective relations of disgust. Shove (2003) argued that judgements made about cleanliness are also closely associated with classed and raced bodies. For participants the car becomes

experienced as a purified site that guarantees the body will arrive prepared for social interactions of work or study. In contrast, participants describe public transport as placing the body at risk of defilement and danger, which may be recast as 'other'. This finding supports the stance that cost alone is not going to encourage all people to incorporate public transport into their travel plans. We have demonstrated the vast differences in how respondents described their emotional and embodied senses of being and 'belonging' as passengers on public transport and driving private cars.

Conclusion

Climate change scientists clearly position fossil-fuel cars as an integral part of the climate change problem. Within contemporary framing of adaptation and mitigating climate change, priority has been given through government policy to technological and pedagogical approaches, rather than cultural approaches. In Australia this has led to a focus on engineering and educational solutions that promise to lower greenhouse gas emissions. However, it is increasingly recognized by government policy that 'behaviour change', requires 'cultural change' (see Knot *et al.*, 2008). Nevertheless, a culture change framework has given precedence to understanding culture as attitudes and has therefore overlooked what a cultural geography approach may contribute to climate mitigation policies. Our aim in this paper is to address the silence of spatial thinking in debates about the contribution of fossil-fuelled automobiles to greenhouse gas emissions and public transport behaviours. In the context of an affluent Sydney suburb, our aim was to explore why driving cars rarely becomes understood as problematic, regardless of acceptance or rejection of climate change science.

Drawing on the diverse literature on mobility, which we argue emphasises the driving body, we have sought to explore how automobility underpins the reciprocal relationships between bodies and space that shape, and reshape each other. This study of the suburban driving practices of an affluent Sydney suburb demonstrates the ongoing pleasures of driving cars, in a context where, for all, driving is affordable, underpins the rhythms of everyday life, and helps sustain understandings of the self, home and city.

In conducting this analysis, we have remained mindful of arguments that bodies are enlivened by different modes of transport which shape, and are shaped by space. As our discussion suggests, different modes of transport most notably luxury cars, four-wheel drives, buses and trains have significance in establishing and maintaining understandings of Burraneer Bay and social difference. We are not seeking to suggest that education policies are not important in changing behaviour. Rather, we argue that a focus on the spatiality of the driving body presents an opportunity to provide alternative insights into automobile culture and facilitate understandings of what drivers constitute as problem driving in the context of the rhythms that sustain produce a mobile sense of place. Focusing on the alignment between bodies, cars and space enabled us to begin to account for the paradox between climate concern and knowledge on the one hand, and climate action on the other. Working against behavioural change is the sense of belonging, the pleasures derived from the everyday rhythms and the anticipated affordances of car mobility including speed, comfort, convenience, safety and privacy. In this light ‘problem’ drivers were those who drove too slowly, or disrupted orderly flows.

To conclude, our argument is that alongside discursive socialities, the multi-sensual registers of suburban driving play an important part in explaining the resistance to changing driving behaviours. While technically each fossil fuelled car trip adds to greenhouse gas emissions, routine city driving for those long-term residents living in Burraneer Bay is felt as convenient, comfortable, safe, and private. Furthermore, car ownership is widely socially sanctioned as an expression of caring for family, sociability, independence and social status, while the spaces of Sydney RailCorp are registered as dangerous, dirty and unreliable.

What does this mean for policy? Changing transport behaviour is going to be a challenging but not impossible task. What people understand as normal is always malleable. Automobility has fashioned a city life reliant on an individual mode of coordination. At one level, automobility has encouraged singular meanings of comfort, cleanliness and convenience that lock-in an ever rising demand for carbon-intensive resources. At another level, car mobility is integral to how people make and remake understandings of themselves, their families and places to call home, work and 'nature'. A cultural-economy approach encourages planners to consider the relationship between consumption, social norms, technology, everyday practices and how the body is enlivened, habituated and challenged by smells, sounds and touch. Our results suggest that educational policies and structural changes to transport are insufficient to change travel behavior in tackling climate change. Rather than a future of driving envisaged by Urry (2008) where power works through an Orwellian digital panopticon of tracking drivers within a carbon budget, to encourage people to drive less, transport providers might push further into the body and begin to consider how travel habits are acquired and jettisoned. This requires more careful attention to a

provisional, phenomenological sense of power that intentionally sets out to bring about certain responses, predispositions and engagement with city driving. As such, the use of textures, lighting, sound and layout could be used in the design of cars and roads to make driving less an automatic response and to further engage drivers in more reflexive contemplation which sustains consideration of their travel behaviour.

Map 1. Location of Burraneer Bay

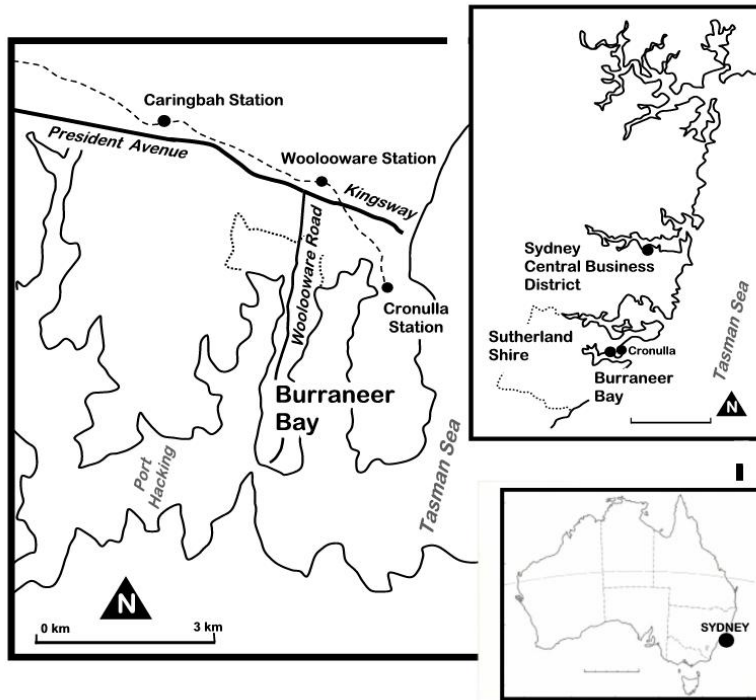
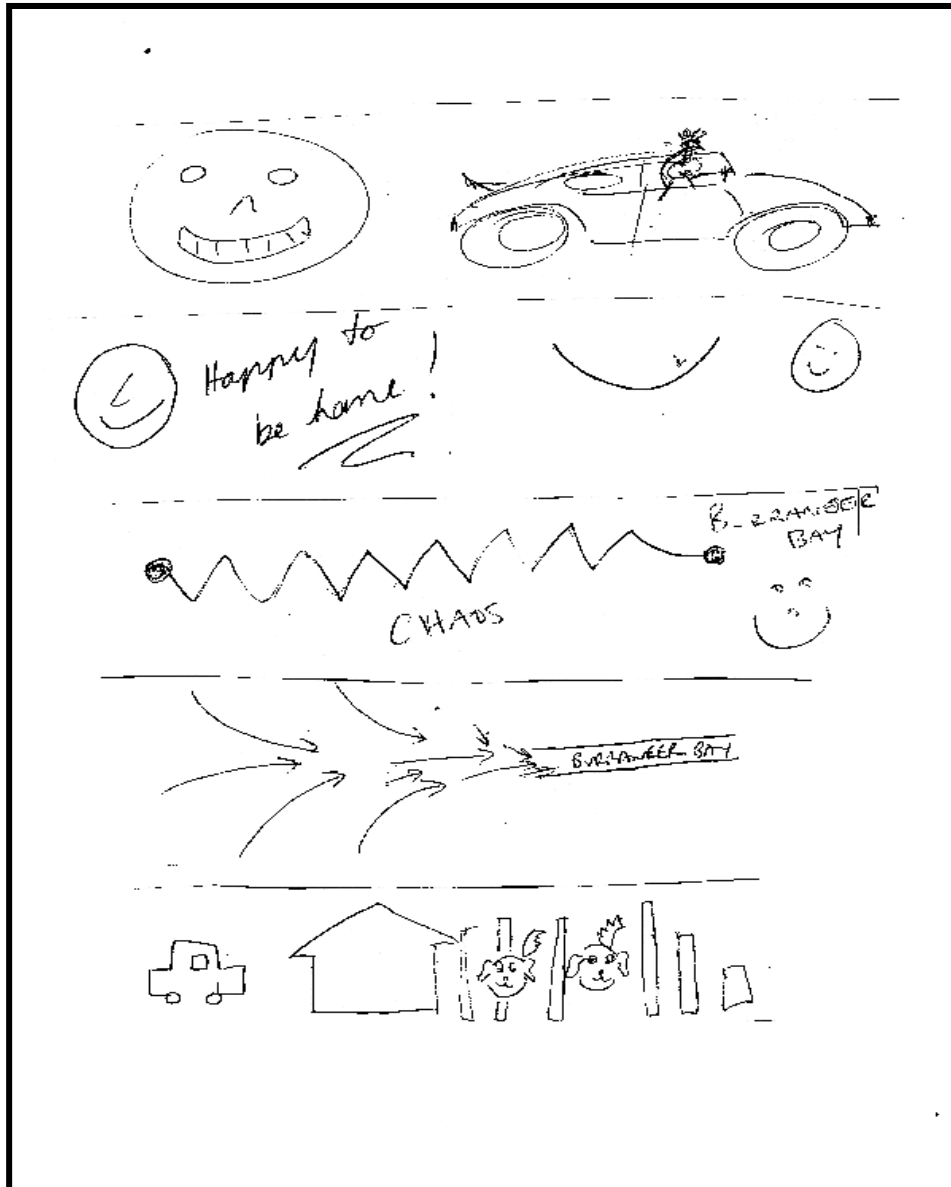
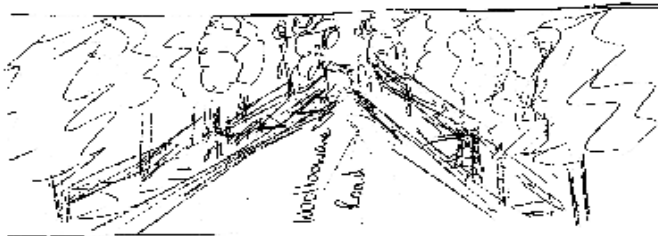


Figure 1. Participants' sketches of driving in and around Burraneer Bay

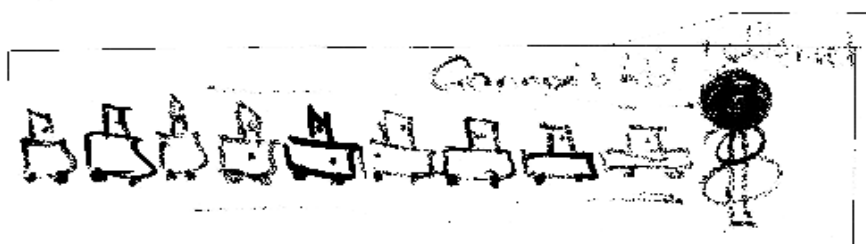
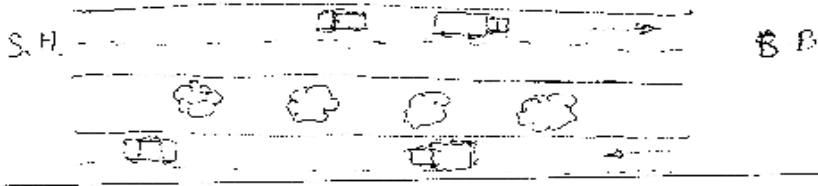




TAILGATING BY 4WD'S ON
WOOLLOOWARE RD!



leafy
grand
private
active streetscape



References

- Alvord, K. T. (2000) *Divorce your Car! Ending the Love Affair with the Automobile*, Gabriola Island B.C., New Society Publishers.
- Amin, A. and Thrift, N. (2004) Introduction. In Amin, A. and Thrift, N., (eds), *Cultural economy: a reader*, Oxford: Blackwell.
- Amin, A. and Thrift, N. (2007) Cultural-economy and cities, *Progress in Human Geography*, 31(2), 143-161.
- Anable, J. & Boardman, B. (2005) 'Transport and CO₂, United Kingdom Energy Research Centre, Working Paper, August 2005.
- ABS (2006) Australian Bureau of Statistics, 4102.0 Australian Social Trends, 2006, Public Transport of Work & Study.
(<http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4102.0Chapte10102008> accessed 03.08.2010)
- Best, H. and Lanzendorf, M. (2005) Division of labour and gender differences in metropolitan car use. An empirical study in Cologne, Germany, *Journal of Transport Geography*, 12, pp. 109-121.
- Bissell, D. (2010) Passenger mobilities: affective atmospheres and the sociality of public transport, *Environment and Planning D: Society and Space*, 28, pp.270-289.
- Bissell, D. (2008) Comfortable bodies: sedentary affects, *Environment and Planning A*, 40, pp. 1687-1712
- Böhm, S. Jones, C. Land, C. and Paterson, M. (2006) Part One Conceptualizing Automobility: Introduction: Impossibilities of automobility, *The Sociological Review*, 54, pp.1-16.
- Büscher, M., Urry, J. (2009) Mobile methods and the empirical, *European Journal of Social Theory* 12, (1), pp. 99-116.
- Burgess, J. Bedford, T. Hobson, K. Davis, G. Harrison, C. (2003) (Un)sustainable consumption. In: Berkhout, F.M. La, I.S. (eds.), *Negotiating Environmental Change. New Perspectives from Social Science*. Edward Elgar Publishing Ltd., Cheltenham, pp. 191-261.
- Chapman, L. (2007) Transport and Climate Change: a Review, *Journal of Transport Geography*, 15, 5, pp.354-367.

- Conley, J. (2009) 'Automobile Advertisements: The Magical and the Mundane' in: J. Conley and T. A. McLaren A T (eds) *Car Troubles: Critical Studies of Automobility and Auto-Mobility*, London, Ashgate Publishing.
- Conradson, D. and Latham, A. (2007) The experiential economy of London: antipodean transnationals and the overseas experience, *Mobilities*, 2, pp. 231-254.
- Creutzig, F. and He, D. (2009) Climate Change Mitigation and Co-Benefits of Feasible Transport Demand Policies in Beijing, *Transportation Research Part D Transport and Environment*, 14, (2), pp. 120-131.
- Crompton, T. (2010) Common Cause: The Case for Working with our Cultural Values, World Wildlife Fund (WWF), (http://www.wwf.org.uk/wwf_articles.cfm?unewsid=4224, accessed 11/11/2011)
- Creswell, T. (2010) Mobilities 1: Catching up, *Progress in Human Geography*, 34,(5), 550-558.
- Cresswell, T. (2006) The right to mobility: the production of mobility in the courtroom, *Antipode*, 38, (4), 735-754.
- Department of Climate Change, Australian Government, (2007) National Greenhouse Gas Inventory, (http://www.climatechange.gov.au/climatechange/~/_media/publications/greenhouse-report/national-greenhouse-gas-inventory-pdf.ashx , accessed 06/09/2010).
- Department of Environment and Conservation, New South Wales (2004) Local Air Improvement Program Bus Niche Marketing Project. ([http://www.sutherland.nsw.gov.au/ssc/rwpattach.nsf/viewasattachmentPersonal/Bus+Niche+Marketing+Project.pdf/\\$file/Bus+Niche+Marketing+Project.pdf](http://www.sutherland.nsw.gov.au/ssc/rwpattach.nsf/viewasattachmentPersonal/Bus+Niche+Marketing+Project.pdf/$file/Bus+Niche+Marketing+Project.pdf) accessed 11/02/2010).
- Dewsbury, J.D., Harrison, P., Rose, M. and Wylie, J. (2002) Enacting geographies – introduction, *Geoforum* 33, pp.437–40.
- Dowling, R. (2000) Cultures of mothering and car use in suburban Sydney: a preliminary investigation, *Geoforum* 31, pp.345-353.
- Doucet, C. (2007) *Urban Meltdown, Cities, Climate Change and Politics as Usual*, New Society Publishers, Canada.

- Edensor, T. (ed) (2010) *Geographies of Rhythm, Nature, Place, Mobilities and Bodies*, Ashgate, UK.
- Edensor, T. (2004) *Automobility and National Identity: Representation, Geography and Driving Practice*, *Theory, Culture & Society*, 21, (4/5), pp. 101-120.
- Ellegard, K. and Vilhelmson, B. (2004) *Home as a Pocket of Local Order: Everyday Activities and the Friction of Distance*, *Swedish Society for Anthropology and Geography*, 86, 4, pp 281-296.
- Featherstone, M., Thrift, N. and J. Urry, J.(eds) (2004) 'Automobilities Special issue', *Theory, Culture and Society*, 21(4-5).
- Frumkin, H., Frank, L. and Jackson, R. (2004) *Urban Sprawl and Public Health*. Washington, DC: Island Press.
- Gibson, C. and Kong, L (2005) 'Cultural economy: a critical review', *Progress in Human Geography*, 29, 5, 541-561.
- Gifford, R. & Steg, L. (2007) *The Impact of Automobile Traffic on Quality of Life*, in Garling, T. & Steg, L. *Threats from Car Traffic to the Quality of Urban Life: Problems, Causes and Solutions*, Elsevier, NY
- Gleeson, B (2008) *Waking from the dream: an Australian perspective on urban resilience*, *Urban Studies*, 45, pp.2653-2668.
- Harvey, D. (1973) *Social Justice and the City*. London: Edward Arnold and Baltimore, MD: Johns Hopkins University Press
- Ingold, T. and Kurttila, T. (2000) *Perceiving the Environment in Finish Lapland*, *Body & Society*, 6, 3-4, pp. 183-196.
- Jain, S.L. (2006) *Injury. The Politics of Product Design and Safety Law in the United States*. Princeton, NJ: Princeton University Press.
- Jones, R. Pykett, J. & Whitehead, M. (2010) *Governing temptation: Changing Behaviour in an Age of Libertarian Paternalism*, *Progress in Human Geography*, Article in press.
- Katz, J. (2000) *How Emotions Work*, Chicago, IL, University of Chicago Press.
- Knott, D., Muers, S., Aldridge, S. (2008) *Achieving Cultural Change: a policy framework*, London: Cabinet Office, Prime Minister's Strategy Unit.
- Lefebvre, H [1992] (2004), Elden, S. and Moore, G. (trans) *Rhythmanalysis : Space, Time, and Everyday Life*, UK, Continuum.
- Lakoff, G. (2004) *Don't Think of an Elephant! Know your Values and Frame the Debate*, White River Junction, VT, Chelsea Green Publishing.

- Latour, B. (1992) Where are the Missing Masses? The Sociology of a Few Mundane Artifacts pp. 225-58 in: W. Bijker, T. Hughes and T. Pinch, (Eds.) *The Social Construction of Technical Systems*, Cambridge MA, MIT Press.
- Lorenzoni, I. Nicholson-Cole, S. and Whitmarsh, L. (2007) “Barriers perceived to engaging with climate change among the UK public and their policy implications”, *Global Environmental Change*, 17, 445-59.
- Malpass, A. Barnett, C. Clarke, N. and Cloke, P. (2007) Problematizing choice: responsible consumers and sceptical citizens in Bevin, M. and Trentmann, F. (eds) *Governance, Consumer s and Citizens*, Palgrave-Macmillan, Basingstoke 231–46.
- Marres, N. (2009) Testing Powers of Engagement Green Living Experiments, the Ontological Turn and the Undoability of Involvement, *European Journal of Social Theory* ,12 (1), 117-133.
- Matthies, E. & Blobaum, A. (2007) Ecological Norm Orientation and Private Car Use, in Garling, T. & Steg, L. *Threats from Car Traffic to the Quality of Urban Life: Problems, Causes and Solutions*, Elsevier, NY.
- Mikler, J. (2009) *Greening the Car Industry: Varieties of Capitalism and Climate Change* , Cheltnam ,Edward Elgar Publishing.
- Miller, D. (2001) Driven Societies, in: D. Miller (Ed.) 2001, *Car Cultures*, Oxford, Berg.
- Mitchell, G. (2005) Forecasting Environmental Equality: Air Quality Responses to Road User Charging in Leeds, UK, *Journal of Environmental Management*, **77**, pp. 212–226.
- Motavalli, J. (2000) *Forward Drive: The Race to Build the Clean Cars of the Future*, San Francisco, CA.,Sierra Club Books.
- Munt, S. R. (2008) *Queer Attachments: The Cultural Politics of Shame*, Aldershot, Ashgate Publishing.
- Newman, P. & Kenworthy, J. (2007) Sustainable Transport Form: Transport Infrastructure and Transport Policies, in Garling, T. & Steg, L. *Threats from Car Traffic to the Quality of Urban Life: Problems, Causes and Solutions*, Elsevier, NY.
- Parkhurst, G. (2000) Influence of Bus-Based Park and Ride Facilities on Users’ Car Traffic, *Transport Policy*, 7, 159-172.

- Polk, M. (2004) The influence of gender on daily car use on willingness to reduce car use in Sweden, *Journal of Transport Geography* 12:, pp. 185-195.
- Potoglou, D. and Kanaroglou P. S. (2008) Modelling car ownership in urban areas: a case study of Hamilton, Canada, *Journal of Transport Geography* 16, pp.42-54.
- Qungquan, L., Zhang, T., Wang, H. and Zeng, Z. (2010) Dynamic accessibility mapping using floating car data: a network-constrained density estimation approach, *Journal of Transport Geography*, in press.
- Reckien, D., Ewald, M., Edenhofer, O. and Lüdeke, M. K. B. (2007) What parameters influence the spatial variations in CO2 emissions from road traffic in Berlin? Implications for urban planning to reduce anthropogenic CO2 emissions, *Urban Studies* 44(2), pp. 339-355.
- Robbins, P. (2007) *Lawn people* Temple University Press, Philadelphia PA.
- Sachs, W. (2002) *For Love of the Automobile: Looking Back into the History of Our Desires*, Berkeley, University of California Press.
- Schrank, D. and Lomax, T. (2001) The 2001 Urban Mobility Report, Texas Transportation Institute, The Texas A & M University system, (<http://mobility.tamu.edu>. accessed 02/10/2010.)
- Sheller, M. (2004) Automotive Emotions: Feeling the Car, *Theory, Culture & Society*, 21, 4-5, pp. 221-242.
- Sheller, M. (2007) Bodies, cybercars and the mundane incorporation of automated mobilities *Social & Cultural Geography*, 8, 2, pp.175 — 197.
- Sheller, M. and Urry, J. (2000) The City and the Car', *International Journal of Urban and Regional Research*, 24, 4. pp. 737-757.
- Shove, E. (2003) *Comfort, Cleanliness & Convenience, the Social Organisation of Normality*, NY, Oxford.
- Steg, L. and Gifford, R. (2005)Sustainable transportation and quality of life, *Journal of Transport Geography*,13, pp. 59-69.
- Thrift, N. J. (1996) *Spatial formations*, London, Sage.
- Thrift, N. J. (1999) Steps to an ecology of place, in : J. Allen, and D. Massey (Eds) *Human Geography Today*, Cambridge, Polity Press.
- Thrift, N. J. (2000) Still Life in Nearly Present Time', *Body and Society*, 6, (3-4), 34-57.
- Thrift, N. J. (2001) Elsewhere, in: N. Cummings and M. Lewandowska (Eds) *Capital*, London, Tate Modern.

- Thrift, N. J. (2004) Performance and Performativity: A Geography of Unknown Lands' In: J. S. Duncan, N. C. Johnson, and R. H. Schein, (Eds) *A Companion to Cultural Geography*, UK, Blackwell Publishing.
- Thrift, N. J. (2008) *Non-Representational Theory: Space, Politics, Affect*, UK, Routledge.
- Thrift, N. J. and Dewsbury, J. D. (2000) Dead Geographies and How to Make Them Live', *Environment and Planning D: Society and Space*, 18, pp. 411 -432.
- Transport Data Centre, New South Wales Government, (2007) *Household Travel Survey Summary Report, 2007* (<http://www.transport.nsw.gov.au/tdc/publications.html>. accessed 17/10/2010).
- Urry, J. (2004a) The 'System' of Automobility, *Theory, Culture and Society*, 21 (4/5) pp. 25-39.
- Urry, J. (2004b) Connections, *Environment and Planning D: Society and Space*, 22, pp. 27-37.
- Urry, J. (2006) Inhabiting the Car, *Sociological Review*, 54, pp. 17-31.
- Urry, J. (2008) Governance, Flows and the End of the Car', *Global Environmental Change*, 18, pp. 343- 349.
- Whitmarsh, L. (2011) Scepticism and uncertainty about climate change: Dimensions, determinants and change over time, *Global Environmental Change*, 21, (1), pp.55-65.

