CYCLING
& SOCIETY
Annual Symposium

Book of abstracts

Centre for
Transport &
Society

UWE Bristol | University of the West of England

Session 1: PLENARY SESSION (2D67)
Moderator: John Parkin (University of the West of England)

Kiron Chatterjee (University of the West of England) and Eva Heinen (University of Leeds)
Increasing Levels of Cycling: The Contribution of Longitudinal Studies to Understanding What Encourages People to Cycle

What is required to increase cycling is usually deduced from looking at places where cycling is common, and groups for whom cycling is popular, and seeking to transfer conditions and practices. However, attempting to copy conditions and practices from 'cycling exemplars' may not result in effective interventions. In recent years there have been a significant number of longitudinal studies that have tracked people's cycling over time, and use of other forms of transport, which have shown in what circumstances people start and stop and increase and decrease cycling. These have often been carried out in the context of programmes and schemes aimed at increasing cycling. They include quantitative studies, capturing cycling behaviour at regular intervals through a panel survey, and qualitative studies asking people about their cycling histories. This paper provides an overview of longitudinal studies around the world. It reports what these studies tell us about the extent to which cycling is stable or variable in people's lives and the role of different types of influencing factors – personal circumstances, social networks, seasonal and climatic conditions, physical provision for cycling and organisational arrangements. We explain how this improves our understanding of the effectiveness of different interventions to promote cycling.

Brett Petzer (Eindhoven University of Technology)
Competing Sustainabilities: Cycling-as-a-Service Narratives in Rotterdam and Amsterdam

Building on previous attempts to integrate discursive methods and the Multi-Level Perspective from transitions theory (Geels, 2012; Geels and Verhees, 2011; Hermwille, 2016; Rosenbloom et al., 2016), this paper investigates competing attempts by actors within the Cycling-as-a-Service (CaaS) niche and Dutch mobility regimes to promote or challenge the legitimacy of dockless CaaS systems in particular, and constructions of CaaS in general. It applies the multi-dimensional discursive interaction approach developed by Rosenbloom et al (2016) to the case of Rotterdam and Amsterdam leading up to the introduction, en masse and at scale, of dockless CaaS in these cities in 2016-2017, with a particular focus on Amsterdam's temporary ban on these systems on public land. The author argues that this stopgap measure, which contrasts with Rotterdam's more circumspect approach, represents a missed opportunity for more nuanced engagement by authorities with an innovation that has significant potential to contribute to both cities' stated sustainability aims. The authors conduct a narrative analysis of approximately 450 Dutch online and print media articles, policy documents and social media posts to determine the storylines that (de)legitimate dockless CaaS. The results are discussed in focus groups with users, CaaS providers and local government to contextualise framing struggles and other narrative work within the CaaS niche and validate findings. A key limitation in Rosenbloom's framework emerges in its treatment of space and scale, echoing critiques of the socio-technical transitions literature in this regard (Raven et al., 2012). The author contributes a revision and expansion of

Rosenbloom's multi-dimensional discursive interaction approach that explicitly recognises space as a basic determinant of the success of narrative work for niche actors, alongside existing dimensions (actors, claims, and context), thereby addressing a significant limitation and enhancing the framework's precision when applied to the inherent spatiality of urban mobility.

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Ben Wooliscroft (University of Otago, New Zealand)
Understanding Mobility Cultures to identify barriers to cycling

Mobility cultures represent the \attitudes and behaviour characteristic of a particular social group" (Simpson and Weiner, 1989) with respect to mobility. Cultures include explicit and/or implicit membership, feedback loops, diferences/variations, dominant groups, contrary groups (subcultures), language, meaning, messaging, rules and mores, much of which goes unwritten and unsaid | it is normal, until you leave the culture.

The cultures perspective has been used successfully in considering energy use and changes in energy use (Stephenson, Barton, Carrington, Doering, Ford, Hopkins, Lawson, McCarthy, Rees, Scott, Thorsnes, Walton, Williams and Wooliscroft, 2015), but it fails to account for the

particularities of mobility. While energy is consumed in the citizen's `castle' largely independent of social interactions, mobility takes place in shared spaces with potential for a `clash of cultures'.

These clashes of cultures will impact on the most vulnerable disproportionately. Understanding mobility cultures requires a more sophisticated model than the simplistic energy cultures framework, one that includes the factors external to the subjects' whose mobility cultures we are interested in studying, in this case, particularly, cyclists.

Much cycling research and policy intervention has focussed on infrastructure (c.f. Pucher and Buehler, 2008; Pucher and Dijkstra, 2000). While there is no question that infrastructure is important, there are many other factors that impact on the decision to cycle, or the perception that it is a viable mode of transport. The mobility cultures model that will be presented aims to capture the system of interactions and allow measurement with the purpose of identifying where social and/or policy interventions are required to increase cycling.

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Robin Lovelace (University of Leeds), Malcolm Morgan (University of Leeds), Craig Morton (Loughborough University), Anna Goodman (London School of Hygiene and Tropical Medicine)

Severance, parallels and integration: a three phase methodology for assessing the active travel impacts of major transport infrastructure projects

The background of this research is the huge impact major transport infrastructure projects such as HS2 will have on walking and cycling and the lack of evidence and established methodologies for estimating such impacts before work begins. Large infrastructure projects affect many aspects of life and there are well-established methods in economic appraisal, cost-benefit analysis and environmental impact assessment. Recently other types of assessment have emerged, including health and equality impact assessment. There is an emerging literature focussing explicitly on active travel impacts, much of which seeks to evaluate the impacts of new schemes on walking. However, there is little in the way of methods for assessing likely impacts of new schemes a-priori, let alone reproducible methods for assessing potential impacts before they arise.

Motivated by the need for accessible and scalable tools to assess active travel impacts of new developments, this paper sets out methods for active travel impact assessment. It is based

on the division of active travel impacts based on the geographic relations between the development and walking and cycling desire lines: Severance, when new infrastructure cuts across routes with high active travel potential; parallels, opportunities for constructing new routes parallel new infrastructure; and integration with existing transport services, where new or different active travel options are unlocked by new infrastructure.

We find that the methods have the potential to identify and act on risks and opportunities associated with proposed developments down to road segment level. We conclude that new methods, such as those presented in this paper, have the potential to ensure that the impacts of major infrastructure projects on walking and cycling are properly accounted for before building begins.

Session 2.1: COMMUNICATION (2D67)
Moderator: Caroline Bartle (University of the West of England)

Cat Silva (Technical University of Munich)
Coding Interactions on Street Segments with Unprotected Bicycle Lanes

Understanding how road users behave on street segments with unprotected bicycle lanes in place is vital to assessing how safe this type of infrastructure is for bicycle mobility. A growing body of research utilizes user perception surveys to understand how safe people feel when riding a bicycle or using particular types of urban infrastructures (Aldred 2016; Caulfield, Brick, and McCarthy 2012; Manton et al. 2016; Krizek and Roland 2005; Piatkowski, Marshall, and Johnson 2017). Limited research, however, has applied an observational approach to unpack and analyze how people behave when using and interacting with unprotected bicycle lanes. This research aims to add to the existing body of perception research by illuminating what is happening 'on the ground'.

Rather than deploying an observational study with a predetermined set of behavioral variables, as other observational studies have done (Bernardi and Rupi 2015; Greibe and Buch 2016; Jensen 2008), this research uses a grounded theory approach. Upon collecting video recordings, shot from above, of street segments with unprotected bicycle lanes, the three-step Straussian grounded theory method is applied (Corbin and Strauss 2015; Kenny and Fourie 2015). First, an extensive list of actors (road users and objects) are identified along with a list of the multitude of actions these actors are observed engaging in. Second, these actor-actions are categorized into events describing different types of situations and circumstances which have an apparent impact on how well the unprotected bicycle lane is functioning as a safe, dedicated travel lane for bicyclists. Lastly, the aim of this framework is to identify what consequences the different categories of events have on bicycle safety.

This presentation will introduce the coding framework established by applying this methodology to a pilot study, including the actor-action variables and categories of events identified through an observational pilot study. The framework will be applied in a subsequent observational study to quantify these qualitatively identified variables and statistically analyze which road users behavior and which elements of infrastructure design have the greatest impact on the safety and functionality of unprotected bicycle lanes.

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Sam Bennett, Kate Pangbourne and Al Baker (University of Leeds)
Effective Targeting of Pro-Cycling Messages: Arguments, Attitudes and Values

This presentation will present results from the interdisciplinary ADAPT project which is developing effective messages for encouraging sustainable travel behaviour. The aim is that the messages will be suitable for delivery via personal technologies (e.g. Smartphone apps). The experiment that we report here explores how argument type, and the value arguments appeal to, effect the persuasiveness of messages designed to encourage cycling as a form of transportation. We also investigated whether travel attitude and personality moderate this effect.

Participants were asked to rate the persuasiveness of arguments designed to encourage cycling as a method of transportation for journeys under 2 miles. 16 short arguments were developed from our Sustainable Transport Communication Database (STCD) and were manipulated on two variables: the value appealed to (health, financial, environment and convenience) and the form of argumentation used (ad populum, authority, consequence and practical inference). Participants' travel attitudes and personality were also measured. We hypothesised that health arguments and arguments from authority sources would be rated

as most persuasive, but that these ratings would be dependent on participant scores on the agreeableness personality scale.

Preliminary Analysis showed that arguments relating to the health and financial benefits of cycling were significantly more persuasive than those of environmental and convenience benefits. This difference was largely attributable to participants scores on the agreeableness personality scale. Participants low in agreeableness rated environmental arguments as less persuasive while participants high in agreeableness rated convenience arguments as less persuasive. Additionally, we found that arguments from authority sources were rated as more persuasive across all values, except for those relating to financial benefits, where ad populum arguments were most persuasive. We will provide a full summary of the findings and discuss how they relate to the structuring of persuasive messages for behaviour change with a focus on personalising messages.

Seamus Allison (Nottingham Trent University)
Old blokes and kids cycle, but not me: exploring self-image barriers to cycling

Background

This paper reports on early findings from a four-phase project exploring emerging-adults' (EAs) perceptions of cycling, specifically utility cycling. Given the UK Government's ambition to start a cycling revolution it is posited that considerable behaviour change amongst key population groups is required. If the revolution is to materialise policy makers will have to encourage EAs to consider cycling.

Research exists on the situational barriers to cycling; limited research explores less tangible concerns, such as how cyclists and cycling is perceived with regards to EAs. If EAs are to be encouraged to cycle, cycling needs to be seen as more attractive in terms of social acceptability and self-image maintenance.

Methods

Four focus groups of ten people aged between 18-25 were held. Groups one and two consisted of undergraduates, group two was a mix of business based masters students and group three involved employed people aged 18-25. They were digitally recorded. NVivo3 was used for coding, organising and analysis. In analysis we draw on work that posits cycling as 'a practice' constituted from competences, meanings and materials.

Results

EAs appear to be a difficult group to motivate; the notion of being a cyclist is anathema and cycling appears to be an irrelevance. For EAs, competence in cycling is something to be avoided. Incompetence, by contrast, would be considered both cooler and less associated with children and older generations. The materials of cycling, as linked to dominant stereotypes (child and clubman) are similarly off-putting, whilst meanings are clearly linked with the establishment of an identity that is essentially non-cycling.

Impact

Our results are of interest to policy makers who are responsible for encouraging cycling in the UK. Infrastructure-based programmes may not be enough to facilitate a cycling revolution. Policy maker may need to focus on improving the image of cycling.

The introduction of cycling facilities to a city's transport network has effects in terms of safety for a variety of users as well as the uptake of cycling for different journey types. Measuring these effects has proven difficult due to a number of factors, not the least of which being the often patchy and incomplete data on cycling rates. Here we look at the safety effects of the introduction of a network of cycling facilities over the period 2005 – 2014, in the city of Portland Oregon, USA.

Portland has been chosen because of the availability of data on both infrastructure and cycling levels; including data on installation dates and locations of all cycling facilities. GIS shape file data has been used to define the facility's locations within the Portland network. Additional shape files containing information about injury collision rates and locations were also used. Portland has relatively high levels of cycling which means that there are enough data points to test statistical significance, which can be an issue in English speaking cities that typically have low levels of trips made by bike.

Many previous studies looking at this issue have suffered from the key weakness of failing to control for exposure; i.e. looking at where cyclists are injured but without being able to account for where cyclists are riding. This means that apparently dangerous sites might appear so because of high volumes of cyclists, rather than high risks for each cyclist. We have used local count data combined with trip records produced by users of the Strava cycling smartphone app to generate control points whose infrastructural characteristics can be compared with injury points. This enables us to see whether, for instance, bicycle boulevards (streets with reduced motor traffic volumes and/or speeds, which cyclists are encouraged to use) are associated with lower injury risk.

Analysis is currently under way and will be complete by August ready to present the results at the Symposium.

Session 2.2: INFRASTRUCTURE AND INTERACTIONS WITH TRAFFIC (4X113)

Chair: Fiona Crawford (University of the West of England)

Jonathan Flower; John Parkin (University of the West of England)

Exploring the Implications of Turning Vehicles Giving Way to Pedestrians and Cyclists

Background. 'Turning the Corner' started as a British Cycling campaign to create simpler and safer junctions through design and by creating a 'universal' rule to give way when turning in the UK. This study responds to the 'Turning the Corner' report which acknowledges that research is needed to establish the feasibility of successfully managing road user behaviour and to address concerns raised by groups representing disabled people.

Methodology. Q-methodology was used to make sense of the divergent viewpoints of road users on the proposed changes. The methodology is good at capturing and describing divergent views and consensus in a group. It provides a quantification of patterned subjectivities. 50 cyclist, pedestrian and driver participants, including people with visual impairments and wheelchair users took part, representing a broad range of perspectives. After a brief presentation of what the Turning the Corner proposals entail and what they currently look like as practised in other countries, each participant took part in a Q-sort. This involved sorting a comprehensive set of statements which reflected all of the different things

people might say about the topic, compiled in advance from mainly conversational sources such as discussion forums on the subject. The initial sort required participants to categorise the statements according to whether they agreed, disagreed, or did not care, followed by a more refined sort ranking the statements from those they most agreed with to those they most disagreed with, in a pre-defined matrix. Each participant was also briefly interviewed to establish why they sorted as they did.

Results. Findings will be available in September and will provide a better understanding of shared viewpoints on the topic and why people hold those views. It will also provide insight into the values, perspectives, opinions, tastes and also generally what people think and feel about the proposals that will influence how effective the implementation of any changes will be.

Impact of the research. The study will help inform discussion about design changes at junctions as well as possible changes to the Highway Code and traffic regulations.

Uttley, J. & Fotios, S. (University of Sheffield)
Road brightness and cycling rates after-dark

Cycling needs to be a viable and safe travel option at all times of the day if it is to meet the needs of an increasingly 24-hour modern society. Darkness produces a significant drop in the number of people cycling, compared with the same time of day but in daylight. Public lighting may encourage people to cycle when it turns dark, by giving them greater reassurance of being seen by drivers and by making it easier to see potential hazards in their path. We examined the size of the reduction in cyclists after-dark at 48 locations in Birmingham, UK. We calculated odds ratios to account for effects of time of day and time of year on the number of people cycling. This compares the ratio of cyclists in the same hour of the day but in daylight or dark conditions to the ratio of cyclists over the same periods of the year but in an hour when the light condition does not change. A larger odds ratio indicates a bigger reduction in cyclist numbers due to darkness. Odds ratios at each of the 48 locations in Birmingham were compared against the relative brightness of the road or path at those locations, estimated from night time aerial images. Results showed an escarpment-plateau relationship between brightness and odds ratio (Figure 1). A small initial increase in brightness produced a significant reduction in the negative impact of darkness on cycling rates. This effect plateaued, with further increases in brightness having little impact on cycling rates after-dark. These results suggest minimal levels of lighting could encourage more people to cycle after-dark.
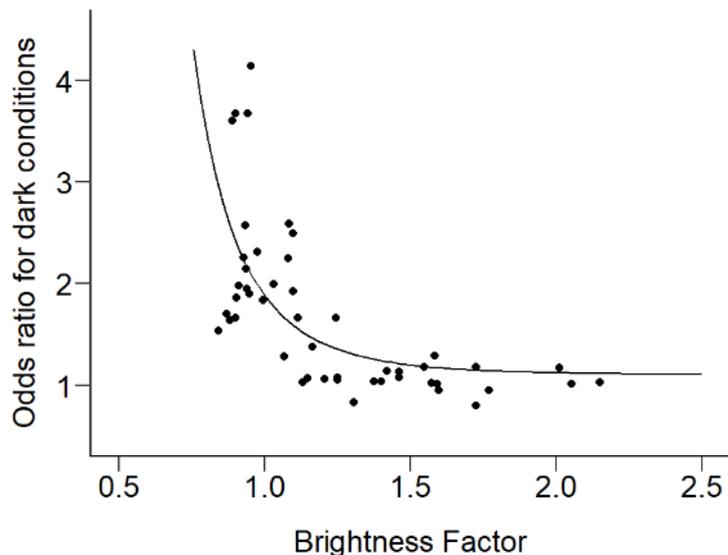
Figure 1. Escarpment-plateau relationship between reduction in cyclists after-dark (odds ratio) and relative brightness of road or path (brightness factor).

Tom King, Rob Snowball (Newcastle City Council)
Local evaluation of cycling strategy – developing a pragmatic methodology in Newcastle

Background
Evaluation is a label at the end of project plans but typically follows a financial audit methodology: design capability and local experience can be limited. National templates for large projects lack 'cycling as transport' objectives, focusing on health (economics) for active travel. Stakeholder enthusiasm for learning from what was effective in Newcastle instigated work to establish: A narrative elaborating user experiences in the context of local data available, and national targets; and recommended evaluation for the City's revised Cycling Strategy.

Methodology
Local evaluation practice was reviewed at three levels comprising process, schemes and overall strategy, with focus on the last. Existing strategy was scrutinised for suitable aims to operationalise and two objectives selected: the development of strategic radial routes; and the increase of the number of short trips made by active modes. The Welsh Audit Tool was extended with learning rides on 3 strategic routes to include incremental aspects of process.

Results
'Strategic' routes orient to experienced commuter cyclists but compromise on technical design standards. Short trips are infeasible to measure directly, leaving non-commuting behaviour poorly understood due to reliance on national data. Cycle counters/Bikelife show successful increases in numbers cycling are travel to work (to 7%) or other peak time, not short trips in general. Connectivities to trip attractors are currently poor; focus of schemes on infrastructure design, often to a high standard for improved segments leaves discontinuities for trips.

Impacts

Scheme transport objectives facilitate monitoring of success by collecting initial data, and improve planning conceptualising stages of journeys by groups. Cycle monitoring uses estimated modal proportions for key routes, and accessing the city centre. Strategic mapping of routes will include key destinations and connectivities. User evaluation is extending to identify other groups of cyclists and trip purpose, as well as disruptions for vulnerable groups.

Kevin Hickman (Wheels for Wellbeing)
The temporal instability of three wheels

Invented at the same time that the bicycle was introduced into Britain, the Reverend RH Charsley's manumotive tricycle, the Velociman, bridged a period of great change in cycles, cycling and in women's rights in which it played a role. At the time it was also a boon to people with a lower limb disability, but despite its apparent popularity and fitness for purpose it recently had to be reinvented.

Although originally designed and patented as a mobility aid for the 'lame', in the 1880s it was also bought and used by non-disabled people, including Lewis Carroll who recorded his experience of it in his diaries. However, despite two further patents to add different methods of foot propulsion, the Velociman became associated with disabled people such as suffragette Rosa May Billinghurst who used it throughout her time in the Women's Social and Political Union, and Singer Cycles ceased production of it in 1913.

The factors affecting the fortunes of what became a niche product - changing fashion and attitudes, loss of a market and an advocate, new technology and increasing relative cost - are considered, weighed and compared against the Velociman's modern day equivalent, the Mountain Trike. Will this latest incarnation fare any better? I argue that little has changed in the intervening century and that the underlying reason for the transitory nature of these products is systemic and linked to the contrasting, enduring nature of the bicycle.

Session 3: POSTERS Foyer to Glendinning Lecture Theatre
8 facilitators leading 8 groups, 5 minutes per poster

Chris Bristow & Kristine Bloor (BetterPoints Ltd)
BikeSmart Reading – using a digital app and incentives to encourage modal shift from cars to cycling

BikeSmart Reading, a 6-month EMPOWER-funded project run by BetterPoints for Reading BC who aimed to 'substantially reduce use of conventionally fuelled vehicles through reward rather than punishment'.
A localised BetterPoints App and web portal were created (bikesmartreading.betterpoints.uk). Participants earned BetterPoints™ primarily by tracking cycle journeys using the app, with bonus rewards available for engaging with the programme and prize-draws. BetterPoints are exchanged for high street vouchers or donated to charity. Non-monetary rewards of push messages, in-app medals and leaderboards enhanced motivation.
It wasn't necessary to own a bike or be a confident cyclist to participate because we teamed up with ReadyBike & Avanti Cycling to reward participation in cycle training, skills sessions

(60+ sessions delivered) and cycle-hire, addressing common barriers to cycling and increasing expertise and confidence. A successful weekly ride with mental health charity 'Sport in Mind' and engagement with community groups and charities helped vulnerable groups access BikeSmart.

Results

Over 600 participants regularly tracked cycling and earned rewards

331,762 miles of cycling tracked potentially saving approximately 9 tonnes CO2 emissions

In response to the in-app question at the end of a cycle journey (not asked every time) over 70% said the journey replaced a car journey.

65% of respondents to the end of programme survey said BikeSmart encouraged them to change their travel behaviour

As well as the positive effects on congestion (and thus air quality) of a reduction in single user car journeys there are a wide range of positive outcomes for individuals and communities.

Mary Lawler (University of Central Lancashire)
Pathways of Desire

The Desire Lines Cycle Network project seeks to build on existing technologies and platforms to harness data. We are interested in the routes people use to access the official cycle routes across the city. This project explores these questions further via a series of qualitative and quantitative, 'data sprint' workshops

Over the course of this project, we have followed an ideation process to look at the problem of a lack of clear cycle routes in and around Preston. The first workshop defined the problem by empathising with users. We found that the desire lines or chosen paths might have been similar routes, but one size doesn't fit all. There were differences in acceptability ratings of the paths depending on the age, gender, type of journey, time of day, etc. The problem definition was also enlarged to include a lack of communication between users and designers to develop cycle networks and also notify of maintenance issues

In the second workshop, the focus was on imagining the communication channel. The use of social media and other platforms, as well as the ways participants engaged with civic society, current data sharing, and cycling information needs were explored. A strong desire emerged for a clear, easy to use App that integrates with existing technologies and platforms. A crucial element for buy-in was the ability to see that by sharing their data and contributing there was a tangible improvement or action as a result.

This is an ongoing project. Engaging with cyclists and local authority planners, a better understanding of the needs, wants and constraints of each 'side' has been developed and by opening the channels of communication, each begins to understand the other. The design and development of prototype is currently underway, which will be tested over the summer of 2018.

David Hicks (ITP)
Beyond the cycle path: designing for a future of mixed mobility devices

Since the 80s in France several urban policies have emerged targeting a shift from car to other transport modes. Despite new infrastructures and communication campaigns, the results of such policies still remain lower than expected [Kaufmann, 2000 ; Buhler, 2015]. For most of

French cities, bicycle modal share remains under 3%. My PhD work focuses on the reasons of this.

A consistent literature suggests institutional, technical and economical reasons, but in our knowledge there are few research works about bicycle usage from the cyclist's point of view. The hypothesis we tackle here concerns the "cycling-ability" that makes a person cycle or not.

In an urban environment, a cyclist needs to deal with a lot of different parameters: position on the road, route, balance, speed, other users' moves... Dealing with these factors at the same time needs to have an important part of them internalized, a psychological process that transfer them into automatic reflexes.

To study "cycling-ability", that is to say the way urban cyclists deal with all these parameters at the same time, we developed a mobile method consisting in following volunteer cyclists in real time conditions letting them comment their ride. This method, partially based on similar works [Meissonnier, 2012], consists in two parts:
– First we ask the user to cycle on a well-known route for him.
– Then we ask him to cycle to another place we choose.

In both parts, we follow him with an embedded camera, in order to record his behavior and his comments. This method lets the user describe his experience in real time, without the need of questions, so it limits the risk of influencing his discourse. It gives the opportunity to see his behavior in his environment, without any filter. Then this method allows to carry out other research projects: comparisons among different people cycling through the same place, or between the same person's behavior in different places, or among different kinds of users, etc.

The presentation will be first about the aims of the experience, then the method in itself will be described, and finally we will see the first results.

Esther Fasan, Miles Tight and Harry Evdorides (University of Birmingham)
Promoting Cycling among High school children

Despite the significant investment to promote cycling for high school students in the United Kingdom, cycling remains the least used mode of travel in urban areas among this road user group, despite it being sustainable and involving a level of physical activity every day. Cycling is neglected for several reasons some of which include parental safety concerns, inadequate supporting infrastructure, lack of bespoke actions to support the use of the bicycle and bicycle theft, among others. Consequently, cycling in high school students is low in the United Kingdom in comparison to countries such as the Netherlands, Germany and Denmark, despite its social, health, economic and environmental benefits.
There is a need therefore for an in-depth understanding of factors, influencing modal choice and specifically, the possibility of adopting cycling in high school. A review of literature suggests a disproportionate provision of infrastructure, policies and intervention for school children. A proper understanding is needed of their mobility and effectiveness of potential interventions to further increase the possibility of the use of cycling for trips. Research shows cycling abilities and tendencies could then be transferred into adulthood. Furthermore, a

review of the literature on children mobility and cycling intervention to obtain current trends reveals a need to re-examine current policies and infrastructural provision for cycling. This would ensure a better connection between the needs and provision made. To achieve this, this study suggests that interventions should be introduced following consultation with the end-users (school children) and other stakeholders in the design and implementation stage to produce the desired result in cycling growth. These stakeholders may include but are not limited to, parents, siblings, school authorities, policymakers, urban designers and town planners. Such consultation is necessary to explore the desired needs of the end users and interventions aimed to address these needs. This consultation should occur at both the design and implementation stage of the intervention to ensure an alignment of needs and interventions.

Nadia Williams (Dundalk Institute of Technology)
The Role of Radio Broadcasts in the Marginalisation of Cycling

1 Introduction
In spite of expressed good intentions (Department of Transport, 2009 p. 6) and a number of efforts to encourage cycling uptake, Ireland's modal share for cycling is only 1.7%, and has grown at a mere 0.1% annually between 2012 and 2017 (Department of Transport Tourism and Sport A 2017, p.12).

2 Methodology
In the researcher's overall study, the hypothesis being tested is that the roads network is a social system, on which a Social Dominance (Sidanius and Pratto, 1999) dynamic is in operation, which plays a critical role in poor cycling uptake.
A critical analysis was conducted to answer the question: are the characteristics of radio broadcasts related to cycling and cyclists consistent with the overall hypothesis?

3 Findings and Impact
The tone and language in the artefacts are consistent with the hypothesis. Patterns emerged that would be expected under conditions of Social Dominance and cultural violence (Galtung, 1990). The tendency to violence from dominant groups directed at subordinate groups inherent in Social Dominance is an issue of concern. The dynamics of Social Dominance can also affect willingness to provide safe cycling infrastructure, and can explain the widespread perception of cycling as dangerous in driver-dominated cultures such as Ireland's. Understanding this dynamic also leads to an understanding of a plea to take up cycling as a plea to voluntarily join a subordinate social group. When understood as such, the failure of the efforts made in Ireland to increase cycling uptake is a logical outcome, as these attempted to entice behaviour change within a system that discourages the desired behaviour at every level. However, this understanding also offers compelling possibilities for overcoming this problematic culture as a first step towards increasing cycling uptake.

William Clayton and John Parkin (University of the West of England)
Addressing the needs of disabled cyclists: a call to action

Cycling can offer health benefits, and these benefits are relevant for disabled people. Few disabled people cycle, and disability is under-researched in cycling studies. This paper (i)

reviews current research into disabled cycling, and provides a critique of inclusive cycle design guidance; and (ii) reports on a recent study which highlights some of the significant issues faced by disabled cyclists in accessing cycle infrastructure and using designated cycle networks.

The study utilised a qualitative approach to exploring barriers to disability cycling. A semi-structured focus group was conducted with eight inclusive cycle scheme users, seven care providers supporting the majority of the cyclists, and a scheme organiser.

Our results demonstrate that the needs of disabled cyclists are increasingly being taken into consideration in infrastructure design guidance, but there are many issues to be resolved before cycling is accessible to and usable by disabled people. There is little research on understanding the experiences of disabled cyclists, and hence there is a knowledge gap concerning the efficacy of current design guidance. The data presented in this paper provide a useful insight into the experiences of a group of disabled cyclists, but these data are limited to the specific context of that group.

We hope that the impact of this research can be to highlight disability/inclusive cycling as an underrepresented area in cycling studies, and to help contribute to raising the relative volume of discussion and debate in this area. The intention is for this study to serve as the strong foundation for further large-scale research activity into to the barriers faced by disabled cyclists, with the ultimate aim being an improvement to the provision of infrastructure and support for inclusive cycling.

Eugeni Vidal (University of Leeds)
Analysing the link between cycling rates, access to cycle-friendly infrastructure, and deprivation in the South London Partnership

One of the main deterrents of cycling is fear of an accident with motorised traffic. For this reason, cities are increasingly investing in bicycle-specific infrastructure and traffic calming measures. However, when implementing these facilities, policymakers generally do not consider social equity, and as a consequence, cycling infrastructure is not always well distributed. Often the poorest areas are benefitting the least, when, actually, they are the most vulnerable in terms of health and social exclusion.

Recent research has found that people from deprived and poorer areas cycle less than residents of more affluent areas in London. We investigated the relationship between cycling, infrastructure facilities and deprivation in the South London Partnership (SLP), an area that has a mix of levels of deprivation. It also has poorer public transport supply than similar areas in London and, consequently, higher car dependency. The objectives of the study are to: (1) analyse the link between cycling rates, access to cycling infrastructure and deprivation in the SLP; (2) assess if the cycle-friendly infrastructure is equally distributed among its areas; and (3) reveal areas in which future investment in infrastructure could help to increase cycling among the population living in deprived areas. For this, we conducted statistical analysis and created a bivariate choropleth map.

The study revealed that there is no association between cycling rates and access to cycle-friendly infrastructure. However, we found a clear negative correlation between cycling rates and deprivation. Our analyses also showed, that areas with higher levels of deprivation, have greater provision of cycle lanes and quiet streets; although, the safest infrastructure, cycle tracks, were less commonly present in deprived areas. Finally, we identified small spatial areas in which future investment might increase equity in cycling.

Sridhar Raman (Oxford Brookes University)

Understanding bike-sharing patterns in conjunction with the public transport network

Bike-sharing, and in particular, dockless bike sharing has increased rapidly in the past six months in many cities around the world. In the United Kingdom, Oxford has at least five different operators with varying levels of ridership. A cursory analysis of the predominant bike-sharing hotspots indicates that they provide a good option for last-mile connectivity. In fact, most operators mention this as the main reason for bike-sharing services. Additionally, from a public health point of view, more bike trips in conjunction with public transport usage is considered one of the more beneficial active multi-modal combination. There are big data sources for public transport and bike-sharing services, in the form of General Transit Feed Specification (GTFS) data and various open data-sets (public APIs) released by bike-share operators. This study looks at the geo-spatial intersection of the public transport network with bike-sharing operators in Oxford. It aims to identify "blind spots" in the public transport network and verify whether these gaps are being fulfilled by bicycles, and bike-sharing, in particular.

Session 3: INCLUSION (2D67)
Chair: Loes Holtmaat (ECF)

Sile Ginnane (Liberty Bell)

The Potential of Combining Empathy and Data to Remove Barriers to Cycling by Primary School Students

In 2016, those walking and cycling accounted for 25% of primary school commuters in Ireland, a reduction of 50% from 1986. In Rotterdam, 49% of primary children cycle to school - in Dublin city, the comparable figure is 3.2%.

In order to grow the numbers of those embracing active travel and to remove the barriers to active travel, it is important to understand fully the perceptions and user experience of a diverse group of people - diverse genders, diverse age ranges, diverse abilities. The combination of both empathy and data, both quantitative and qualitative, provides powerful insights into people's perception of public space as they cycle through it.

Liberty Bell worked with An Taisce Green Schools, the Irish ecoschools programme which works with schools to undertake assessment of safe active travel routes to school. Specifically Liberty Bell worked with students, ages 8 - 10, from an all-girls school in Walkinstown, Dublin, to assess routes to school for cycling, microscooting and walking.

The data was collected while children were on the move, using smart bicycle bells and smart pedestrian wristbands acting as field research tools. Issues - both positive and negative - were categorised and described by the school children in their own words. Issues recorded were automatically timestamped and mapped. Issues included not only how participants perceive the streets and infrastructure as they cycle and walk but also instances of social interaction and the behaviour of others encountered. Each street audit was followed with a class discussion about the issues encountered.

The anonymised data, was presented as an open data set to Dublin City Council in order to improve the infrastructure of the routes.

Tiffany Lam (London School of Economics)
Cycling London: An Intersectional Feminist Perspective

London's "cycling revolution"—characterised by former Mayor Boris Johnson's unprecedented investment in cycling infrastructure—has garnered international attention and augmented the political capital of cycling. Current Mayor Sadiq Khan has pledged to preserve and build that legacy and to that end, he has invested £770 million in cycling initiatives and appointed Will Norman as London's first full-time Walking and Cycling Commissioner. Despite London's increased investment in cycling infrastructure and overall growth in cycling over the past decade, the gender gap remains unchanged whereby men make 74% of cycle journeys in the city. This paper critiques cycling policy and infrastructure projects in London from an intersectional feminist perspective that considers gender as a complex category that intersects with other socially constructed categories of identity (i.e., race, class, sexuality, physical ability, migrant status, etc.) to contour urban cycling experiences. Material infrastructure dominates cycling advocacy and policy in London, particularly infrastructures of mobility that manifest as either Cycle Superhighways or Quietways. However, the notions of equity and inclusion are omitted in infrastructure investment, design, planning, and provisioning. As such, London's cycling paradigm privileges material infrastructure as an apolitical and value-neutral spatial fix and exhibits an implicit androcentric bias. Consequently, London's cycling interventions raise the profile of already-visible, privileged cyclists (white, middle-class men) for whom cycling is a lifestyle choice while further marginalising those for whom cycling is a necessity due to economic deprivation and spatial isolation. Equity and inclusion must foreground cycling advocacy, policy, and infrastructure in a growing and increasingly diverse London, especially if London's cycling paradigm is to be regarded as a global prototype.

Anna Watt (University of Birmingham)
The role of gender and experience in cycle preferences and behaviour in the UK

This research aimed to fill the gap in non-London UK based research into women's cycle infrastructure preferences and cycle behaviours (use of helmets and high visibility clothing), in order to add to public policy understanding. It used risk perception as a hypothesised driver for preferences and behaviours, and examined the role of experience, in the form of training, years of cycling and type of cycling undertaken, in these preferences.

The mixed-method approach combined policy interviews with national and local policy makers; a stated preference on-line survey which recorded gender, infrastructure preferences, use of hi-vis and helmets, and type of experience; and a revealed preference survey (on parallel routes of differing infrastructure from south Birmingham into the city centre) which recorded gender, helmet and hi-vis use.

Results showed that, within the stated preference survey both genders have a preference for segregated infrastructure but the preference is higher amongst women. The revealed preference survey shows a higher percentage of women using routes that are more segregated (not statistically significant). The stated preference and revealed preference surveys showed contradictory results for the use of hi-vis. Both surveys showed gender neutrality (statistically) regarding the use of helmets.

Safest route choice compared to preferred route choice analysis showed both genders hold more similar views on route safety than for preferred route choice and this indicates that

other factors come into play between preferences and safety perception. Qualitative feedback indicates that directness and personal safety may be relevant factors.

The overall pattern of type of cycling, training and years' experience appeared to show that despite training, increasing experience and exposure to on-road cycling, preferences remain strongly for segregated provision, more for women than men. Policy implications are for the reach of behavioural interventions to support women to cycle in the absence of the segregated provision.

> **Leticia Lindenberg Lemos, Marina Kohler Harkot and Paula Freire Santoro (University of São Paulo)**
>
> **Is a city safe for cycling a city inclusive for women? Findings on gendered cycling from São Paulo, Brazil**

Gender and cycling have gained more attention in the past years by scholars and activist groups. The debate has largely focus on the high or low share of women (and girls) cycling in the cities and the existence, inexistence or ongoing deployment of cycling infrastructure in cities around the world. An idea, credited to Gil Peñalosa, that has been largely reproduced by politicians, practitioners and even cycle activists is that "if there aren't at least as many women as men [cycling], then usually it's because cycling is not safe enough. It's an indicator that you do not have good enough cycling infrastructure".

To reflect on this idea, we must first discuss how our cities have been debated and planned. Urban planning and urban studies have generally focused on building diagnosis and plans that aim at the "general interest" of the community. Transport planning has mirrored this and reproduced this generalizing approach, overlooking the diversity of mobilities in the cities.

The mobility that "matters" has always been the one that enables the productive work (home-to-work journeys), but not reproductive (taking the kids to school, doing the grocery, leisure, health care).

Also, the direct correlation between building infrastructure and including women, ignores the complexity of issues and inequalities that are present on gender relations. In recent years, when a lot of infrastructure was built, there was an increase of women using bicycles.

Nevertheless, what was deployed sums up to less than 2% of the extent of streets and avenues in the city. Is this increase due to the infrastructure? Or maybe what was crucial was the attention the issue received, both being central on the mobility policies and with a strong civil society?

This research tries to deepen the knowledge on both gendered cycling inequalities by exploring the subjectivity and individual experiences on choosing to ride bicycles. This research has benefited from the accumulated researches, explored secondary data and carried out in-depth interviews with women and men in São Paulo. Above all, the interviews allowed to perceive the complexity of each individual's subjectivity and how choosing to cycle or not goes much beyond feeling safe to ride the bicycle, especially for women.

FRIDAY 7TH SEPTEMBER

> **Session 4: DIGITAL TECHNOLOGIES AND DATA (2D67)**
> **Chair: Holger Haubold (ECF)**

Manfred Neun (European Cyclists' Federation)

Fusion Mobility – Using a systemic approach to make use of and question sustainable mobility architecture and artificial intelligence for cycling development

Since introduced from September 2017, Fusion Mobility has launched an academic and practitioner discussion about a new sustainable mobility architecture that sets out to fill gaps in our future world of transport, urban design and beyond to society in general. (1) It is bridging the social and the technical world; (2) it provides an approach for handling benefits and risks of AI (Artificial Intelligence) in the context of connected and autonomous mobility; and (3) it is taking the strengths of ITS methodologies and merging them with parallel developments in Active Mobility and Sustainable Development to ensure further improvement of inter- and multimodal solutions for seamless transport and quality of life.

This paper discusses what Fusion Mobility as a systemic approach can contribute to make cities and regions more inclusive, firstly according to all aspects of people's accessibility and social inclusion, but also on the environmental and economic aspects. It is necessary because in the near future existing policy initiatives will have already inaugurated dramatic changes in mobility systems. For example, the use of driverless cars and the phasing out of internal combustion engine vehicles will have significant effects on mobility systems.

Although many aims and objectives are shared the fragmentation of the different academic and practitioner communities can lead to conflicting objectives, language and approaches, which undermine the potential of both. In particular policy makers at all levels need to be able to make informed choices about the development of future mobility, which maximise both human and technological benefits. Fusion Mobility is prioritising Active Mobility, as Active Mobility approaches are delivering high economic, social and environmental benefits, with cycling alone identified as contributing to 14 of the 17 United Nations Sustainable Development Goals.

Therefore, the Fusion Mobility frame of sustainable development can accelerate adoption and acceptability of new approaches and will maximise collaboration between all actors who favour Active Mobility.

Graeme Sherriff, Mags Adams, Nicholas Davies (University of Salford)

Bike Sharing for Healthy Active Cities: User perceptions

Bike sharing schemes (BSS) have exploded in cities around Europe. In the UK 'Boris bikes' (now Santander Cycles) were introduced in London in 2010. Seen as a game-changer in cycling, other regions have followed suit and Greater Manchester now has fleets of dockless bike share, introduced by Chinese companies including Mobike and Ofo.

These schemes offer the possibility of easy, cheap bike hire for workers, students, and visitors as well as for low-income groups that often have low rates of cycling. Such new mobility options offer potential for active travel in a changing, but still car-dominated, urban transport landscape and society. BSS can potentially overcome prominent barriers including bike ownership, storage, and secure parking, whilst simultaneously creating new challenges related to mobile phone and credit card access.

BSS in relation to active travel is under-examined; it is important to understand how BSS might increase access to cycling, how access might vary across the social gradient, and how BSS relates to, reinforces, or mitigates existing barriers to cycling.

This paper explores the nature and experiences of BSS users in Greater Manchester. Practitioner workshops and in-depth qualitative interviews were complemented by an online survey in collaboration with British Cycling. We present findings about the demographic distribution of BSS users and non-users and analyse the behaviour, attitudes, motivations and barriers of residents, employees and visitors to Greater Manchester. We investigate how user engagement with BSS changes over time, how use intersects with other modes, and identify the extent to which BSS is recruiting to the practice of cycling. The research identifies dockless bikes' contribution to more equitable cycling provision and considers whether it reduces or eliminates the known barriers to cycling in a changing transport landscape. We conclude by assessing the extent to which they introduce additional barriers to wider participation in society.

Frauke Behrendt (University of Brighton)
(Video) Blockchain and Cycling

What are the implications of blockchain for cycling? Blockchain, or distributed ledger technologies, are often seen as transformative in similar ways to the Internet [3]. In a nutshell, "a blockchain is a ledger of transactions of digital assets: of who owns what, who transacts what, of what is transacted and when" [1]. Rather than a focus on information as known from the Internet, with blockchain there is a focus on value. The Internet of Things, including data sharing and trading around connected vehicles, is a major use case with significant industry investment – with an overwhelming focus on cars, and very little attention to cycling. This paper focusses on cycling use cases. They will be analysed with a sustainability perspective on blockchain (unlike power-hungry cryptocurrencies), drawing on recent scholarship on "innovative B4G [Blockchain for Good] applications that could help deliver socially and environmentally beneficial outcomes […] through challenging existing business models and providing new opportunities for value creation" [1].

The qualitative methodology (1) provides a longlist of current blockchain cycling projects and (2) focusses on three case studies. For each case study, project reports and websites are analysed alongside news coverage. Questions guiding the analysis are: How does the blockchain element work? How is social, economic and environmental sustainability (and value) considered? What is the cycling specific aspect? Results will be compared across case studies.

The results illustrate how the three case studies deal with blockchain and as well as social, economic and environmental value/sustainability in the cycling context. The first case study is 'oBike' where an existing app-based bike sharing company proposes paying riders in blockchain-based 'Tron' for switching to cycling as part of policy initiatives around sustainable and active transport [5]. The second case study is a collaboration by the Dutch Road Transport Authority's with the insurance sector for a blockchain-based solution to e-bike theft [2]. The third case study is MIT work on 'Motivating Urban Cycling Through a Blockchain-Based Financial Incentives System' [4].

In terms of impact, the paper will provide a first systematic overview of blockchain in the context of cycling, outline a future research agenda and highlight policy and industry implications.

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Anna Nikolaeva (Utrecht University & University of Amsterdam), Marco te Brömmelstroet (University of Amsterdam) and Rob Raven (University of Utrecht)
Smart Cycling Futures: Moving Towards a Research Agenda

Smartification of cycling is a phenomenon that attracts interest both of stakeholders traditionally interested in cycling and new communities, organisations and industries, with a potential of new alliances emerging around narratives of smart technology, liveability and environmentalism. Moving towards smart(er) cycling futures could be supported both by the processes of transitioning to smart mobility and a boom of attention to cycling in cities worldwide. These futures, however, have not been critically interrogated. In this paper we fill this gap by charting the landscape of smart cycling innovation and identifying its key features, discussing how ICT and IoT technologies can profoundly change the way cycling is practiced, given meaning and governed. Using constructivist grounded theory approach, we analyse 90 texts on smart cycling innovations and systematically outline changes envisioned by innovators, including new type of relationships between the owner and the bike, changing socialities on the bike path and power relationships on the road, increasing use of surveillance technologies in cycling and growing similarities between the system of automobility and velomobility. Having identified tensions between and within the futures, promised by these innovations, we conclude that smart cycling futures, are multiple and contested, just as cycling presents are. Hence, we propose a number of questions for further research to support not only understanding the futures of smart mobility and smart cycling but also policy-making and decision-making as the multiplicity of futures requires deliberation and making choices. Furthermore, we argue that smart cycling innovations are produced by and are producing new cycling geographies, and are part of wider urban transformations and may be driven by particular imaginaries of urban futures. Understanding diverse, contested,

embodied and embedded cycling presents is part and parcel of imagining and co-creating (smart) cycling futures.

Marián Gogola, Yannick Cornet (University of Žilina, Slovakia)

The value of travel time experience when cycling - developing a smartphone-based travel survey

The value of travel time (VTT) is usually defined as the cost of time spent on transport. This value has for the last decades been instrumental in the evaluation of transport infrastructure projects by planners, economists, engineers and decision-makers. According to this view, travel time is considered 'wasted' (i.e. it has no utility). However, this assumption does not necessarily hold true for all transport modes. Cycling is increasingly recognised as a low-cost, space-and energy-efficient solution to mobility in cities where congestion, air and noise pollution seem increasingly insoluble with car-based mobility. Yet obtaining positive benefit-cost ratios has proven difficult, largely due to the wider societal benefits of cycling not being fully internalised in such measures. In recent years, emerging conceptualisations of VTT have stressed that travel time value should not necessarily be associated only to the "economic" dimension of lost time. Value can also refer to ideas of pleasant, meaningful, worthwhile or healthy travel time. The MoTiV project (motivproject.eu) investigates new approaches for capturing the value of travel time for various transport modes, and what value means in relation to travellers' needs, expectations and lifestyles. One crucial point for investigation is whether cyclists have different valuation of VTT compared to other travellers. The analysis relies on mobility and behavioural data to be collected throughout Europe via a smartphone app (the MoTiV app) developed in the project. This contribution is focused on the conceptual, methodological and user interface (UI) design challenges in collecting travel experience data via an app in door-to-door, multimodal trips, based on an automatic trip mode detection module. The project aims to produce an aggregated value of 'worthwhile time' for cycling based on principles laid out by the Hensher formula. This paper explores the difficult balancing act between the needs for simplicity of the UI and data collection for research, dealing with issues such as bias, reductionism, statistical validity, and comparability between cities.

Session 5.1: CYCLING PRACTICES (2D67)

Chair: Cosmin Popan (Manchester Metropolitan University)

Yannick Cornet (University of Žilina/Aalborg University)

Resistance to experimentation in cycling transitions

The need for a transformation of transport systems towards a more sustainable paradigm is widely acknowledged. The transition management literature has provided a useful framework for analysing and managing processes leading to innovative transport solutions, including transport infrastructure retrofitting for cycling. Experimentation and the accompanying growing interest for urban laboratories is one such promising process. However there remains a gap in understanding under what conditions precisely niche innovations are allowed to come into being and experiments to be conducted, which this paper begins to fill using the renewal of a local roundabout as part of a national initiative to increase cycling uptake in the UK as a case study. The paper draws on the current critical

literature on transport and urban sustainability transitions to examine in more details the type of barriers, explicit and implicit, in experimenting with the state-of-the-art in the City of Oxford. Four particular aspects are analysed: the spatial embeddedness of experiments in their specific geographical context and within the existing transport network; the legitimation of innovations through policy and cultural discourses; the potential for the gradual institutionalisation of innovation development; and the politics and agency of the various actors involved. It is found that for this case, factors contributing to resistance in experimentation include the inertia of the built environment and the associated challenge in reallocating space, the lack of institutionalisation of appropriate data and expertise for safe cycling infrastructure planning and policy, the varying levels of engagement with stakeholders, particularly between bus operators and cycling advocates, and finally the importance of underlying but dominant narratives about 'unfettered motorised movement'. This is not to say that only these four aspects matter for successful planning anywhere, but it shows integrated planning requires looking beyond the built environment, and into planning organisations, stakeholder interests and the evolution of narratives in the context of study. Our argument is that transitions towards sustainable urban mobility via the up-scaling of experimentation are likely to be thwarted by a number of constraints that limit what is allowed to be experimented with in the first place.

Rorie Parsons (Newcastle University)
Thresholds of 'safe' cycling: an analysis of cycle campaigning and building practices of cycling

Everyday travel is somewhat dominated by the system of automobility and more sustainable forms of mobility such as cycling remain marginalised and unsafe. Given the widely perceived imperative of growing cycle use in the UK, due to its health and ecological benefits, creating a mobility practice that is safe is a key part in encouraging cycle usage growth. This paper contributes to debates around safe cycling practices, particularly in relation to what defines safe cycling infrastructure and performances of safe cycling. Using two prominent cycle campaigns in Newcastle upon Tyne: Tynebikes (1982-2008) and Newcastle Cycling Campaign (2010-Present) a combination of semi-structured interviews and document analysis was used to explore how cycle campaigns construct cycling practices and advocate for better cycling provision. Social Practice Theory was used as a theoretical framework, utilising the popularised three-elemental model of materials, meanings, and competences.

This paper presents that while both campaigns envisioned and advocated for improved cycle infrastructure, the materiality of such infrastructure differed significantly. Furthermore, Tynebikes once popularised the importance of particular skills and competences in the form of 'vehicular cycling', yet this was deemed to undermine safety by Newcastle Cycling Campaign. The findings suggest that both campaigns envisioned a different threshold necessary in constructing safe performances of cycling. What the findings also suggest is that such cycling visions were largely adopted and utilised by Newcastle City Council, thus having a level of influence in how future practices of cycling were constructed. Consequently, it is important to consider what practices of cycling are being formed by advocacy groups and more significantly, for who as these have a wider impact on future trajectories of cycling and resultantly, defining perceptions of safety.

Raúl Acosta García (Universität Konstanz)

A sense of balance: lessons from urban cycling in Mexico

Cycling entails and requires a multi-sensory experience, of which the sense of balance is fundamental and yet usually taken for granted. This paper explores the significance of this sense for the reawakened interest in the bicycle as vehicle and its growing appraisal as a symbol of sustainability. It is informed by an anthropological investigation of cycling activism in Mexico, where those interested in promoting the bicycle as a form of transport have achieved important changes in Guadalajara and Mexico City. The analysis presented here builds on the 'sensory turn' to reflect on what complementary forms of 'thinking with' senses can entail. By developing skills to keep their balance while on a bicycle in crowded, aggressive, and poorly signalled streets of Mexican cities, activists have accumulated bodily experiences which end up shaping their individual lives and their collective efforts. It is common for cycling activists to seek other forms of balance, be it in their diet, in their ecological footprint, or in key life decisions. Collectively, these activists shape emerging aspirationscapes, providing narratives of improved quality of life in the city. In this process, balance is key: from that of individuals seeking improved infrastructures for quotidian cycling transportation, to that of collectives striving to help the city in its complexity seek an improved sense of balance relating to ecology, conviviality, and material life.

Denver Nixon and Tim Schwanen (University of Oxford)

More than Movement: Community transformation through grassroots cycling initiatives in London and São Paulo

São Paulo and London are both cities with uneven provision of mobility infrastructures across space and social strata. This leaves marginalized groups with fewer options to move safely throughout the city. Insufficient supportive infrastructure for walking and cycling, in particular, removes opportunities for healthy exercise and the social interactions that change community perceptions and soften perceived divides between people. It may take eyes off the street, exacerbating perceptions of neighbourhoods as insecure spaces, or remove self-propelled bodies from the transport milieu, thus undermining 'safety in numbers', effects. The research presented discusses results from fieldwork on community-led initiatives aimed to encourage walking and cycling in disadvantaged communities in London and São Paulo. These initiatives, such as bicycle repair workshops for women and gender variant people, cycle training for those with disabilities, or groups walks for residents of low-income neighbourhoods, create what may be seen as relational and processual 'infrastructures' that support the mobility of those facing transport disadvantages. In this way they challenge norms regarding who belongs where, when, and how, and link otherwise abstract ideals regarding sustainability, well-being, and justice to everyday practices, concerns and needs.

Session 5.2: SAFETY (4X113)

Chair: Graeme Sherriff (University of Salford)

J.D. Shires, E. Heinen and D.H. Johnson (University of Leeds)

Willingness to Pay for On-Bike Safety Systems: a European study

A key barrier preventing the wider uptake of cycling is perceived risk of traffic accidents, particularly between cyclist and motorised vehicles.

On-bike safety technology that alerts both drivers and cyclists to potential collisions between each other was developed as part of a European wide H2020 project, X-Cycle. The technology offers two types of system: (1) A passive tag based system, whereby a smart tag attached to a bicycle enables its location to be located by an in-vehicle detection based system –only the driver is alerted; (2) An active system whereby both the driver and the cyclist receive alerts.

We investigated the Willingness to Pay (WTP) for this technology, and whether this varied by type of cyclists, country and attitudes towards cycling.

Data was collected online in six countries: Hungary, Italy, Spain, Sweden, the Netherlands, and the UK (n=2,417). Type of cyclist was determined using an adjusted version of Dill & McNeil's (2013) method that characterises cyclists into 4 groups: (1) Strong and fearless; (2) Enthused and confident; (3) Interested but concerned; and (4) No way, no how. Attitudes were measured by asking the extent to which respondents agreed with 14 statements on cycling. We used factor analysis to reduce these to three attitudes. WTP values were obtained using SP-experiments.

Initial results suggest that 13% of UK respondents belong in the strong and fearless group, compared to an average of 6.4%. Respondents are overall willing to pay around 80% more for the active technology than for passive technology. Respondents in Sweden and the Netherlands were less willing to pay than respondents from Spain and Italy and women were more willing to pay than men. These findings suggest that technology is in demand to reduce the perceived high risk, but that the WTP differs by individual characteristics, country and type of cyclist.

Fiona Crawford; Jonathan Flower; Chris Alford; John Parkin; Graham Parkhurst (University of the West of England)
Interactions of autonomous vehicles and cyclists: results from real-world and simulator trials

Background. The VENTURER project, funded by Innovate UK, has assessed the responses of road users, including cyclists, to autonomous vehicles (AV) in a series of increasingly complex trials and demonstrations within urban settings. Trial 3 comprised of, inter alia, an overtake of a parked car with an on-coming cyclist, and a right turn into a side road with an on-coming cyclist. Participants experienced the events both in the real world with the Wildcat autonomous vehicle and in the VENTURER Simulator.

Methodology. In total, 134 cyclist, driver and pedestrian participants were asked to rate their trust in the AV immediately after they had observed each event. The participants did not interact with the AV themselves, but observed events from viewpoints relevant to their role. Trust scores are compared between the real-world and the simulator, and also between participant role.

Results. The reported trust ratings were high. Overall, 85% of the scores for cycling interactions in the VENTURER Simulator and 87% of the scores given to the Wildcat were 7 or above (out of 10). Trust ratings did not differ significantly by participant role. Trust in the overtaking manoeuvre of a parked vehicle by the Wildcat AV was rated higher with, as

opposed to without, an on-coming cyclist. This pattern was not observed in the VENTURER Simulator. Age and driving experience were not found to be correlated with the trust scores. **Impact of the research**. The trials are helping inform discussion about the development of insurance models and the legal framework for autonomous vehicle technologies, as well as the Highway Code and traffic regulations. Trial evidence suggests road users may be too trusting and road user education about AV capability may be required.

de Geus B., Vanderroost M., Van Hemelryck J. (Vrije Universiteit Brussel, Belgium), Van Cauwenberg J. (Ghent University, Belgium), Schepers P. (Utrecht University, The Netherlands)
Cause and characteristics of bicycle crashes in adults (45+)

BACKGROUND: Throughout the past decades bicycle crashes have been approached and analysed from different angles. Only a limited number of studies included exposure (distance and/or time cycled) in their analysis. There is a lack of data on bicycle crashes in elderly, bicycle crashes with an electrically assisted bicycle (EAB) and the combination of both topics.
PURPOSE: The purpose was to investigate bicycle crashes with conventional bicycle riders and electrically assisted bicycle riders, aged +45 years. We first aimed to study differences in characteristics between conventional bicycle riders and electrically assisted bicycle (EAB) riders, who were involved in a crash. Secondly, this study aimed to determine characteristics that increased the likelihood of a bicycle crash. The final aim of this study was to include exposure in the analysis in order to calculate the 'risk' of bicycle crashes among conventional cyclists versus EAB cyclists.
METHODS: A retrospective cross-sectional survey-based study was conducted in Flanders and the Netherlands. Male and female cyclists, living in Flanders or the Netherlands, aged +45 year.
RESULTS: EAB cyclists were significantly older ($p = .002$) and had a significantly higher BMI ($p < 0.001$) compared to conventional bicycle cyclists. Significantly more EAB users reported to be in poor to moderate health ($p < 0.001$). For EAB crashes, a higher score for the clusters 'Mental' (OR: 1.547, 95% CI 1.193 – 2.006) and 'Strength & Functionality' (OR: 1.572, 95% CI 1.103 – 2.242) increases the likelihood of a bicycle crash. For conventional bike crashes, only the cluster 'Mental' (OR: 1.634, 95% CI 1.327 – 2.014) is a significant predictor for a bicycle crash. The overall incidence rate (IR) in our study was 0.937 per 1000 trips (95% CI 0.824–1.051).
CONCLUSION: This study provides evidence that EAB users exhibit characteristics and behaviour that influences their crash likelihood. EAB cyclists are presumed to be older and to have less physical fitness. Nevertheless, objective measurements on several physical fitness parameters are needed to confirm and objectify this statement.

Kathryn Stewart and Suzanne Meade (Edinburgh Napier University)
Safety in Numbers: Meso-spatial analysis and mapping

The SiN (Safety-in-numbers) effect has become prevalent within cycling research in recent years. It describes the phenomenon whereby cycling accident risk may fall when the volume of cyclists increases. However, according to resent research, the SiN effect can coexist with a decline in cyclist safety (Aldred et al., 2017). Further, any beneficial SiN effect may be highly

location dependent and cycling risks are significantly higher, per kilometre travelled, than both motorised and pedestrian travel.

This paper presents a methodology to estimate cyclist risk and the mapping of SiN by utilising recently developed open source analysis tools (Lovelace et al, 2017), cycling routing engine applications (www.Cyclestreet.net), developed specifically for cyclists, and application of spatial statistics regression at meso-spatial area level.

The results confirm that a SiN effect is present at a global level, that the effect varies in strength and that cycling risks remain despite its presence. The spatial element of this research locates the strength or weakness of SiN across intermediate data zone areas in Edinburgh. By comparing local model results, that take account of non-stationary spatial effects across data zones, with global regression models it is possible to compare explanatory variables across a the city. The paper will also explore the role of the exposure metric and the impact it can have on the evaluation of risk. The spatial evaluation of risk and exposure is currently difficult especially for those who must implement current transport polices due to lack of data. This research aims to provide transport planners and policy makers with a better understand cyclist road safety and the SiN effect at a local level. The research also demonstrates the application of spatial statistics for transport, in particular mapping model explanatory results (demographic, environmental, infrastructure) at meso level, to provide a useful exploratory and visualisation tool for transport research and practitioners.

Session 6: CYCLING CULTURES (2D67)
Chair: Esther Anaya (Imperial College London)

Cristina Caimotto (University of Torino and FIAB)
Normalising cycling: a discursive approach

While cycling is becoming more and more popular in European cities as a response to problems of pollution and traffic congestion, an opposite trend can be observed, as cyclists are sometimes portrayed as a "scourge" creating problems for drivers and pedestrians (Walker, 2015). Indeed, people perceive their mobility---related identity as something to be cherished and protected, even if in fact they are at the same time pedestrians, drivers and, in many cases, also cyclists in different moments of their weekly routines. The application of double standards --- cyclists riding through red lights might be generally judged much more negatively than other road users breaking rules --- and the fierce strength with which people are ready to defend their mobility---related rights (Pooley, 2013) may be considered signals that important identity issues come into play when discussing actual mobility problems (see also Skinner and Rosen, 2007; Kiernan, 2018).

Representatives of cycling advocacy tend to demand better cycling infrastructures by providing facts and data showing the advantages brought by the promotion of cycling (e.g. EUCS, 2017). Yet, according to Lakoff, too many people are still hindered by what he calls "the Trap of Enlightment Reason" as they believe that by telling people the facts, they will reason to the right conclusion. But, he explains, if the facts do not make sense in terms of the people's system of frames, they will simply ignore them (Lakoff, 2010).

The hypothesis that my research aims to investigate is how discourses about mobility (e.g. advocacy and policy documents, political campaigns, advertisings, driving licence manuals,

cartoons...) contribute to the shaping of identities of mobility and how this knowledge may help advocacy groups improve their effectiveness by building up the right frames in the long term. The discourses are investigated through a blend of approaches including Critical Discourse Analysis (Wodak and Meyer, 2009), Appraisal Theory (Martin and White, 2005) and Critical Metaphor analysis (Charteris Black, 2004).

Can anything be done at discourse level to re-frame the way in which cycling is portrayed by those who perceive it as a problem rather than a solution?

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Katja Leyendecker (Northumbria University)
Method in the madness – autoethnography against automobility

The Advocacy and Academia exchange day in Newcastle, UK, in 2015, resolved that story telling is a vital tool to advancing the cause of urban mass cycling. In my presentation I ask: "How well is academia equipped to create narratives that matter?" I will report about the methods I employed in my PhD, ranging from traditional methods of interviews to the use of autoethnographic methods of video diaries and blogging. My PhD is concerned with capturing

the story of women activists in Newcastle, UK, and Bremen, Germany. Using inventive methods may be an answer to the mobilisation of new ideas about cycling, if we accept the focus of urban design as a contested political practice.

Yonca Krahn, Bernhard Tschofen (University of Zurich)
Negotiating New Urbanities – Ethnographic Insights in Zurich's Diverse Cycling Culture

The qualitative importance of cycling in Zurich, Switzerland's biggest city, is nothing to be pointed out. But although cycling in Zürich has no significant impact on the developments of restructuring social behaviour or has a leading impact of the global development of mobile cycling practice, like it can be found in Copenhagen or Amsterdam, it's qualitative traces represent city-specific logics, are part of creating local identities and mirror many specifies of the place and it`s people`s practices.

Ethnographic research on places, things, scenes and related practices conducted in a research project with MA students has shown that cycling is a present topic of everyday life – shaped by both policies and popular practices. As it is normal to have and use a bike in the hilly city of Zürich, lifestyles can be re-read though bicycles. Where streets are narrow, tram tracks and cold winters ad additionally, the bike becomes a way of distinction, following lifestyle trends and forming personal identities. At the same time structural developments like the old velodrome, become a political issue, dealing also with housing-agendas; political discourses on cycling lanes in the city do not necessarily decide pro-bike lobby; cycling as a hobby forced developments like do-it-yourself or "Meet-Up"-groups for (social) training rides share local knowledge on training terrains; smart cycling becomes present, start-ups produce electric bikes to be tested at a Swiss market and bike-messengers now also deliver food from trendy restaurants – cycling is a vehicle of new urbanity. At the same time, interviewees know to tell personal and emotional stories of their connection with their bikes. It is partly made out of those emotions but – specifically for Zurich – out of those differences that form the Zurich-specific and pluralistic field, having the bike ubiquitous in the city. A city whose urbanity therefore is not only negotiated in a new way, it is also a driving factor of this new urbanity.

Robert Egan (Dublin City University)
Precarious Entitlement and Utility Cycling in Dublin: A Grounded Theory Study

This project began with a curiosity regarding how utility cyclists in Dublin experience and deal with matters of risk. In this study, a classical grounded theory methodology was used and qualitative interviews were the primary method of data collection. Emerging from data collection and analysis, 'precarious entitlement' was identified as a main concern for utility cyclists in Dublin. Precarious entitlement is conceptualised as the condition in which one has an entitlement to something that is liable to give way or is inherently insecure. Utility cyclists experience this in relation to space. Two properties impinge on this experience: 'precarious designation' of entitlements to space and 'precarious recognition' of entitlement by others, including law enforcement. It was conceptualised that utility cyclists may deal with this phenomenon in primarily two distinct ways. First, precarious entitlement was dealt with by taking personal responsibility for the vulnerability created by precarious entitlement (i.e. by 'privatising vulnerability'). This involved enduring transgression from others of entitlement, anticipating disregard by others and refraining from using or insisting upon spatial entitlement. Second, precarious entitlement was dealt with by engaging in various ways of

provoking a sense of responsibility in others to recognise and respect their spatial entitlements and vulnerability. This involved indicating and punishing transgression by others of entitlement, asserting entitlement in the face of potential disregard by others, compelling awareness in others of one's presence in a particular space, and garnering favour in other road users as a means of provoking them to act more responsibly and respectfully. The findings of this study provide a theoretical perspective on utility cycling experience and cyclist behaviour in Dublin. Such insights could inform debates and highlight issues regarding the design of urban infrastructure, training and safety campaigns for road users, and the state of road traffic law and its enforcement.