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E-cargo bikes: how does a bike-car hybrid negotiate velomobility & automobility geographies & infrastructures in the UK?

Presentation for Nordic Geographers Meeting 25th June 2024

Panel Geographies of vélomobility I: Planning, Mobilities and Infrastructure

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Structure of talk

Why e-cargo bikes?

The research gap

The ELEVATE project and neighbourhood trials

Mobility systems

Geographies

Infrastructures – Paths, Parking, Maintenance and Fuelling

Regulation

Cultures

Others





E-cargo bikes' theoretical potential for substituting car trips: Trip distances

97% of all UK trips (including flights) are under 50 miles (Wadud et al. 2024 *in press*)

~30% of all car trips are <=10 miles/16km (DfT 2022)

(however, the 3%t=60%d=70%c)





Car-like functions – hybridicity?

Cargo function (Wrighton and Reiter 2016)

Passenger function (Riggs 2016, Bjørnarå et al. 2019)

Weather-proofing – "identified as potential weakness of CBs [...] more advanced (e.g., weather-protected) CBs could increase comfort" (Bissel and Berger 2024: 221, 230)

Assistance – extend older use (Johnson and Rose 2015, Leger et al. 2019), especially in hilly areas (Behrendt et al. 2021), health/fitness

Convenience? Key question





The research gap

Non-shared and non-commercial use, and non-health impact focus

Household use - "Although E-cargo cycles can be used for both private and commercial transport, the current literature concentrates more on the latter" (Narayanan and Antoniou 2022: 279) "More attention could be given to the emerging trend of e-cargo bikes which enhance the possibility to carry goods and children" (Rérat et al. 2024: 10)

Longer than e.g. daily hire **loans**: "35% of the respondents [Becker and Rudolf 2018] conveyed that they are planning to buy a cargo cycle. Thus, cargo cycle sharing schemes can induce purchase of cargo cycles." (Narayanan and Antoniou 2022: 294)

Empirical trials – "providing parents with children in kindergarten with access to e-bikes might result in increased and sustained cycling, also during the winter season" (Bjørnarå et al. 2019)



The Elevate project and neighbourhood trials

Surveys tested awareness, use, attitudes and behaviour Nationally representative, neighbourhoods, participants





The Elevate project and neighbourhood trials

Sample:

Keener than average cyclists

Who also drive more than average

More cycles AND cars than average

Wealthier than average - 64% sample (-44% neighbourhoods, ~30% nationally) HH income £50k+

Middle aged with children

 \sim 2/3 with children under age 10



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FACULTY OF ENVIRONMENT

The Elevate sample

Sample:

70+%





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Mobility systems

Multi-dimensional and totalising – alternative modes imply and engender total system change (Cox)

Legal, technical, cultural, spatiotemporal

Threaded through/overlaid/in competition? (Cass, Schwanen and Shove)

MLP regimes and emergent/niche modes/regimes?





Findings: Geographies

Terrain and especially hills: "with e-power you can say, well the hills don't matter, because that's the usual line isn't it, that the Netherlands is flat, and Denmark's highest hills are 100m or something [...]" (B107)

"I just feel like really kind of almost like grateful for the bike like that is allowing me to do this journey like, which I literally could not do otherwise with a normal bike" (L323)

"straight up the hill and it's pretty steep, but I was doing that on the eBike and that was great. I've done that road on my regular bike and it absolutely kills you" (B153)

"I think the hills of Yeadon and Guiseley do put people off [...] **There is no such thing as a hill once you've got an eBike**. It's just, it is revolutionary. I can't believe I didn't join the eBike movement earlier. I'm an absolute fool. But I do think the eBike thing is the answer and I think, I just wish people would get out of their cars and give it a go" (L45)



Findings: Geographies/Infrastructures – 'paths'

Roads? "for me it's safer [...] It's bigger. I just take up the whole lane. I don't move. Whereas with my bike I go over to the left and a car's moving... [...] with a cargo bike I just sit in the middle." (O589)

"it's normally quicker just to go down Abingdon Road. But because the bike is **wider**, if you do that you get **stuck in the traffic**, so I just used the cycle route more and it's a nicer route. It's just a bit more enjoyable anyway going down the quieter roads." (O646)

"routes I [avoid] on my normal bike [are] more usable and better routes on the Cargo bike [...] because it gets up to **speed** quicker, **cruises** well and it's got more **road presence**" (L203)

"[Not] on roads [with] national speed limit [...] on residential roads where there's a 20 or 30mph speed limit, but we haven't tried [...] country roads [with less] visibility" (O72) – urban/rural? (Sub)urban residential



Findings: Geographies/Infrastructures – 'paths'

Pavements? "Until we have the infrastructure some people are only ever going to feel **safe** on the pavements" (L45); "I go from pavement to there and there, and sort of jump it a little bit as well" (L329B); "And you couldn't fit down the side of the traffic in the **non-existing bike lane** […] So I just did it […] largely on the pavement, and getting on the road as much as I could." (L208)

Cycle paths? "we talked about the school run and [...] that **cut through** and I said, [...] I'm not sure if I can get the bike through the cut through [but] she got through! And then you got through and then it actually, it was okay, wasn't it?" (O11)

"along the railway path the **things to stop motorbikes** getting through [...] bike lanes are just rubbish but then the roads haven't got the space for them, maybe **ban all cars** from the roads, that would make it a lot nicer" (L258)

Both/either! "You've got this convenience of, you can be on the road and you can go on the cycling path [...] that's definitely one of the advantages of it for me, the appeals of it." (L329B)



Findings: Geographies/Infrastructures - parking

"Unfortunately one of the main trips [...] for martial arts was just a complete non-starter because there was **nowhere to lock it up** on the ground floor and [...] carrying it up three flights of stairs [...] was just not an option." (L18)

"you just need time to get used to it and plan your routes and work out where you're going to **store** it and everything" (O72)

"when I lock it up at work I feel comfortable with that because you know, it's locked up, it's in a garage, you need a fob to get into the garage, so that's been fine" (L258) - security

Car-like house/parking infrastructures had least inconvenience, cyclists overcame awkward storage (key competence element of cycling?!)



Findings: Infrastructures - maintenance

"I was thinking about warranty, you know, like having 2 years free maintenance or whatever. I don't know, like you do with a car. That would be more appealing [...] if I buy it and the motor goes after like a year [...] that is the **benefit of renting** something rather than owning it [...] like I can **maintain a pushbike but** I can't, once you get into the mechanics of the motor and all that [...] that's a [...] huge step in complexity from just a normal [...] renting a car is so prohibitively expensive, [...] but maybe you could do like that with an eBike in exchange for not having to maintain it so much." (L323B)



Findings: Regulation

"what else could be done to make the road environment easier, apart from infrastructure?

"if you did increase it to 20, and there was a willingness to accept that 20 was a proper speed limit, [...] **bring the speed limit for the eBike up to 20**, and it's all about getting enough critical mass of people on a bike, that it becomes second nature, rather than the first inclination of taking a car." (B107)

"You might as well be on the road if you're confident and competent [...] but that then creates other arguments about should you be going at that speed on that kind of pathway, but ultimately we've got to think this is a car replacement [...] I don't think we should be making too much fuss about somebody being able to ride a bike at 25mph" (L18)



Findings: Identities

"Yeah it was quite funny because I was expecting to stick out like a sore thumb. What I didn't expect was the, it almost felt like **cycling in Amsterdam**, like more social cycling rather than sport cycling to get somewhere." (L18) – **utility cycling = acceptable**

"there is an argument that says **clothing-wise**, that the less you look like a cyclist and more **like a human being**, the less likely you are to be treated like a cyclist, i.e., cut up, knocked off..." (L203); "people shout at me often when I was commuting on a normal bike, whereas on the Cargo, perhaps they think you're a **lunatic**, but they don't [...] shout at you [...] I'm someone who's quite **capable** on the bike, but again can still hop on the Cargo and sort of pretend I'm sort of this **neighbourhood type of leisurely eCargo bike**" (L329B)

"a **sub-community** [...] of eCargo, or cargo bike users. Where they can park, that the wider routes, less turning [...] I do think it is a bit different, I think it's **within the biking community**, but it's its own section" (O85)



Findings: Identities

"the closer you get to Leeds there are more people who are not Lycra-bound cyclists, you know, there are people just getting about their day-to-day on a bike in their work clothes or uni clothes or gym clothes, whatever it is" (L45) – geographies+identities+practices

"I felt more **affinity with mopeds** than I would have done on my normal bike, yeah. Like I let one out [...] I probably wouldn't have done that if I was on a normal bike [...] I definitely think I felt more **like I was a moped rider** than a cyclist a lot of the time" (B153) – **more appropriate 'hybrid**'? "It does intersect with electric scooters as well [...] I can go anywhere I like, I don't need to park" (L289)

"electric **delivery** bikes get a lot of stick, [...] but then [...] **road racers** as opposed to the casual bike users **get a lot of stick** as well [...] going really fast, they're electric motorbikes some of them [...] a lot of them dress in black, and a lot of them have balaclavas [...] a lot of older pedestrians find it intimidating. And [...] a lot of them just ignore things like traffic lights, one way streets, pedestrian crossings, pavements" (L289)



Findings: Convenience

"we've been for days out in the park in the Tern bike [...] you just don't even think about it, just everybody gets, it's **just like getting in a car** [...] if we're out as a **family** [...] just like jumping in a car, just getting the bikes out and getting on the bikes and nobody really questioned it [...] " it was just **how we as a family get around**. People think we're so **strange**" (L45)



Conclusions

Awkward fit in automobile/velomobile infrastructures – yes, and, but. Not possible to create a system around every niche mode?

Electric (Cargo) Bikes – different hybrids shift the (dis)advantages around. E-bikes have advantages in velomobility that cargo bike loose, but ECBS fit better with existing car infrastructures.

Benefits and acceptability based on image/identity and practices of utility cycling – the Amsterdam/Copenhagen/Euro model. 'Virtuous' velomobility.

Unsurprising calls for better velomobility infrastructure, or to level the playing field between cars and ECBs with regulation.

Unsurprisingly, a hybrid struggles to fit between the systems.

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Thank you!

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