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RESEARCH ARTICLE

E-Micromobility, Cycling and 'Good' Active Travel

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This article explores how e-micromobility (EMM) can produce 'good' active travel together with cycling. Foregrounding the unique affordances of the electric unicycle (EUC) and e-bike, we highlight their potential to produce good active travel with cycling through protected bike lanes and traffic-calmed neighbourhood greenways. We argue that electric unicycling and e-biking can create good active travel together with cycling by advancing multiple and competing visions of the common good or political philosophies of mutual flourishing. We imagine 'good' active travel as practices and infrastructures that equip a plurality of common goods, based on industrial, market, civic, domestic and ecological worths, as well as challenge the hegemonies of automobility and market worth. Using mobile ethnographic data from Vancouver, our analysis shows that electric unicycling and e-biking can, through infrastructures shared with cycling, advance these common goods, including decolonizing extensions of domestic worth, while challenging the car and neoliberal capitalism. Ultimately, we conclude that 'good' futures for electric unicycling, e-biking and cycling demand mobility justice through a consolidation of their decolonizing, civic and ecological worths at the expense of their industrial and market worths.

Keywords: e-micromobility; electric unicycle; e-bike; cycling; active travel; common good; mobility justice; bike lanes; Vancouver

1. Introduction

This article explores how certain forms of e-micromobility (EMM) can produce 'good' active travel together with cycling. Its origin story begins shortly before the COVID-19 pandemic, when I, Nicholas, a lifelong cyclist, relinquished my (it turned out) unjustified preconceptions about EMM. In one memorable exchange with Travers—an early adopter of the electric unicycle (EUC) who slowly rolled me into collaborative mobilities research—I worried that EMMs would: reproduce some of the worst aspects of automobility (something from which cycling is not immune); exacerbate gentrification; have a negative impact on more-than-human environments; replace rather than augment walking, cycling and public transit; and make mobility in Canada, a wealthy car-dominated country, altogether more inert and detached from

bodily exertion than it already was. I even conjured, in jest—I am now embarrassed to say—the boogeyman of *Wall-E*, the famous Pixar film that depicts future humans adrift in space on a cruise ship after escaping a dying earth despoiled by megacorporation Buy N Large, only to grow too bloated and lazy to move anywhere without hover chairs. While not all of my concerns were off the mark, this last one was. Far from feeding Canada's obesogenic, disembodying urban sprawl that continues to expand through automobility far faster than space for active travel (Ibbitson, 2018), EMMs carry enormous potential, I see now, to advance if not democratize active travel through their unique and powerful affordances. Travers helped open my eyes to the broader-than-just-biking possibilities presented by electrified active travel—including the tantalizing synergy with which EMM and cycling might join forces to contest the car and advance mobility justice.

To explore how e-micromobility and cycling can co-produce "good" active travel, our article foregrounds the unique affordances of the electric unicycle (EUC) and e-bike. Our central argument holds that electric unicycling and e-biking can create good active travel together with cycling by advancing multiple and competing visions of the common good. Without suggesting that all EUC and e-biking space should also be cycling space, or vice versa—particularly in more dangerous, high speed spaces (>30 km/hr)—we highlight the vast potential to produce shared EMM-cycling infrastructures in the salient forms of lanes/pathways protected from motorists and traffic-calmed neighbourhood greenways (Nello-Deakin, 2020). Our analysis shows that, building on the production of space for cycling, electric unicycling and e-cycling can advance multiple common goods by providing efficient transport, profitable returns, ecological benefits, social equity and expanded notions of home and place. EUCs and e-bikes afford their own mobile social and spatial possibilities, and they can help cultivate and diversify active travel by including longer distances and more kinds of bodies and capabilities. Like cycling, however, EUCs and e-bikes carry costs and liabilities, like frictions and fears surrounding negative, all too often violent and dehumanizing treatment of active travellers by motorists. They are also susceptible to tendencies by Canadian policymakers to reduce the worth of transport to technical efficiencies and profit making. This violence and narrow view of worth only magnify the imperative to produce electric unicycling and e-biking not at the expense of cycling (or walking, skateboarding, or public transit), but at the expense of hegemonic automobility and neoliberal capitalism.

Our article proceeds, first, by theorizing "good" active travel. Thereafter, we outline our mobile ethnographic research methodology. We then move into the bulk of the article, our analysis, by examining five distinctive ways in which electric unicycling and e-biking can together with cycling produce active travel for the common good. Our article concludes by briefly speculating on the question: what could "good futures" for active travel look like?

2. Theorizing "Good" Active Travel

We conceive of "good" active travel as active travel that advances the *common good*. The common good refers to a particular kind of moral worth, namely a political philosophy of mutual flourishing wherein differences of moral worth are continually contested according to a higher common principle and "inequalities offer some benefit to the least favoured members of society" (Boltanski & Thévenot, 1991/2006, p15). Applying a "pragmatic sociology" approach (Blokker, 2011), we consider how certain principles for mutual flourishing leave the theoretical realm of philosophy and enter the material world through associations with everyday practices and objects. How common goods become equipped in the real world (Thévenot, 2002) is a hallmark of pragmatic sociology, along with its emphasis upon the fundamental plurality of incompatible common goods to which people appeal in disputes when attempting to publicly justify and enlarge the validity of their claims. Each common

good provides a distinctive moral grammar, with which actors qualify and publicly justify subjects but also mobile practices and infrastructures. People rely heavily on the support of qualified objects and mediators (Latour, 2007) to effectively furnish common goods and deal with the inherent uncertainty surrounding which common good applies in a given situation. Thus far, to our knowledge, pragmatic sociology has yet to be applied to active travel as a category encompassing cycling and e-micromobilities. Nevertheless, there is good reason to assume its relevance, as scholars have used pragmatic sociology to illuminate the contested moral worths of roads (Thévenot, 2002), sidewalks (Conley and Jensen, 2016), cycling (Scott, 2020), urban redevelopment schemes (Blok and Meilvang, 2015; Holden and Scerri, 2015), and more-than-human actors and environments (Kukkonen et al., 2021; Blok, 2013).

Our analysis draws upon the canonical common goods identified by pragmatic sociology, whose moral vocabularies reach far beyond the realm of transport and mobility. These include: *industrial worth*, which exalts the engineers, scientists and city planners who assemble complex infrastructures for economic efficiency over long term horizons; *market worth*, based on competitive, short term exchanges in open markets driven by self-interests in acquiring scarce goods and experiences through wealth; *civic worth*, where people and things become virtuous if they advance equity, social solidarity and social justice; *domestic worth*, rooted in tradition, ancestry and local, hierarchical lines of social and familial dependencies; and *ecological worth*, which extends moral worthiness in a non-anthropocentric direction to other-than-human persons, habitats, biodiversity and climate stability (Boltanski and Thévenot, 1991/2006; Thévenot et al., 2000; Blok, 2013). We contend each of these common goods animates and helps publicly justify the production of electric unicycling, e-biking and cycling. But we add a caveat to address an important criticism of pragmatic sociology. Like transport knowledge in general, pragmatic sociology tends to privilege Northern and European ideals and practices that perpetuate the domination of Western thought (Roy, 2009, 2016; Schwanen, 2018; Wood et al., 2020). Therefore, we argue that domestically worthy active travel demands decolonization and support for Indigenous knowledges and traditions.

Thinking electric unicycling, e-biking and cycling through their associations with multiple common goods not only shows the competing ways in which these mobilities are produced as good active travel. It also helps chart their path towards greater mobility justice (Sheller, 2018), a model that emphasizes the advancement (and interconnection) of civic, ecological and domestic/decolonizing worths over industrial and market worths by, for example, contesting hegemonic automobility. And while scholars have yet to apply pragmatic sociology to active travel as a mobility space including e-micromobilities, EMM research reveals growing attention to particular common goods. For example, key debates in e-bike scholarship, echoing cycling research, include whether e-cycling expands social inclusion and equity in active travel or bolsters kinetic elitism and consumption (Cherry and Fishman, 2021; Boland et al., 2020; Haustein & Møller, 2016), and whether EMMs can help bring about environmental sustainability (Abduljabbar et al., 2021; de Bortoli, 2021; McQueen et al., 2021; Weiss et al., 2015). The relevance of pragmatic sociology for elucidating active travel as it evolves with emerging e-micromobilities rests on its capacity to consider at once the full range of common goods active travel promotes––shedding light on which common goods dominate its production, which are marginalized and how we might reconfigure public justifications of active travel towards moral worths associated with mobility justice.

EMMs have recently surged, but not on even moral terrain. After decades of privatizing state assets, deregulating industries, marketizing infrastructures and globalizing competition for scarce capital, Canada, the settler state in which our analysis takes place, privileges industrial and most especially market worth over common goods associated with mobility justice (Walks, 2015). Therefore, we advocate for good active travel practices and infrastructures that

advance a plurality of common goods while challenging the hegemonies of automobility and market worth. We believe that electric unicycling, e-biking and cycling share a unique, machinic potential to promote mobility justice, and given the explosive growth of EMM in recent years, the stakes are high. A recent *Knowledge Synthesis* of EMM publications notes that people who are initially excluded from EMM are likely to become more so as time goes on (Travers et al., 2022; Fitt and Curl, 2020). In other words, if mobility justice is not purposefully built into the practices and objects of EUCs, e-biking and cycling in the first place, they may end up exacerbating existing injustice, "dark design" (Jensen, 2019) and bad mobility.

3. Mobile Methods

Our research asks, how can electric unicycling and e-biking advance the common good, not as a political principle left on the pages of a philosophy book, but through lively, everyday practices that enroll complex and qualified objects? To explore this question, we use mobile ethnography, a methodology for making observations about mobile subjects firsthand by participating (and becoming part of) their journeys, and "by concentrating on what people actually do while on the move" (Vannini and Scott, 2020). We both gained (separate) ethics approvals for using this approach in Vancouver from our university's ethics research board.

Our analysis relies on two forms of mobile ethnography. The first entails the "go-along" (Scott, 2019), whereby the researcher accompanies participants on an outing and they "engage in loosely-structured conversation about the spaces where the journey takes place, the excursion itself, and anything else related to the experience" (Vannini and Scott, 2020). Paola Jiron in "On Becoming 'la sombra/the shadow'" (2011, p42) explained why "going along" became important to her after one of her research participants described a new public transport system: "if planners ever got on a bus like we do, they would understand why their proposals will never work." For Jiron,

> To understand the complexity of changing transport modes, of climbing on and off buses, of body pressing against body, getting lost, feeling scared or disoriented, being fondled, robbed or amused, one needs to experience it. The lack of such understanding all too often leads architects, engineers and planners to ignore these complexities in transport innovation. I wanted to accompany travellers to understand what they did and how they did it and the traces left behind in their bodies and mental and emotional lives. (Jiron, 2011, p42)

Owing in part to advances in audiovisual recording technologies, such as lightweight GoPro cameras and wireless lavalier microphones, the go-along has become a powerful qualitative method (Vannini and Scott, 2020; Scott, 2020). The second form of mobile ethnography we deploy entails mobile autoethnography, whereby the researcher turns their gaze toward their own practices and experiences while on the move, including ephemeral moments that would otherwise be difficult to describe or express through traditional methods (Spinney, 2011; Larsen, 2014).

The principal part of our research design entails me (Nicholas) on an e-bike going along with Travers on their EUC in Vancouver, British Columbia in 2022. Building on 2021 exploratory ride-alongs, we designed multiple 2022 rides to encompass different purposes and styles of EUC riding, including work and leisure, and relevant infrastructures, such as dedicated bike lanes and traffic-calmed greenways, and places that are significant to Travers as an EUC rider and advocate. I recorded the two go-alongs that underpin our analysis in this article using a GoPro Hero8 camera and wireless lavalier microphone, which allowed us to document and afterward reflect on the voyage experience with help from fine-grained audiovisual data

(selected stills from the film are included below). Our go-alongs concluded with stationary, unstructured interviews. The secondary part of our research design rests on my autoethnographic observations of e-biking journeys, including longer distance commutes and wilderness journeys in British Columbia's Lower Mainland which I have been filming and reflecting on since 2016. Thinking about e-biking affordances and experiencing other people's reactions to my e-biking, including accusations of cheating from other people cycling, helped me understand that e-biking is not some simple, linear extension of cycling, but rather generative of its own, different lifeworld. Going along with Travers alongside this insight heightened my attention to the fact that electric unicycling may also offer its own, peculiar lifeworld within the larger e-micromobility umbrella.

It might be unusual to focus on only one other person, but Travers represents a "paradigmatic case study," or a case that defines a school or domain that the case concerns (Flyvbjerg, 2006). Travers, in fact, literally defined a school, what they affectionately call their "EUC University."

Figure 1: EUC University.

To better understand how people successfully ride EUCs, in March 2021 I "enrolled" for a day in "EUC University" (see **Figure 1**). On a cloudy, nondescript afternoon in Vancouver, inside an unforgiving, decommissioned Royal Canadian Mounted Police parking lot with sharp, stomach-height concrete walls, I find myself teetering on one of Travers' "wheels." While frantically gripping a wall so I might not eat the concrete, I attempt to glide on one wheel. I gingerly lean forward in order to activate the EUC's acceleration, prefiguring how I might even more quickly lean backwards to apply the brakes. But then I look sidewise at a large group at the other end of the same parking lot learning how to ride motorcycles, the most dangerous civilian vehicle in the world. Maybe this is the reason I suddenly spin around and "eat it", my bloodied hands soiling my gloves. I am not able to quickly learn how to flow with the EUC, unlike other colleagues at EUC University. Nevertheless, I later experience dreams of swiftly riding an EUC (albeit on soft, grassy meadows).

After Travers showed me on a practical level how people successfully accomplish electric unicycling, I could reimagine active travel as not simply accommodating diverse EMMs like EUCs, but also becoming better in doing so—by giving more kinds of people, with more kinds of bodies and capabilities, meaningful avenues for non-motorized mobility. Travers is helping define EUC travel as a new domain, training colleagues, kin and multiple city councillors in Vancouver how to ride an EUC, and one dog how to flow alongside one. But they also

represent an "extreme case," a kind that reveals more information than a representative case by activating "more actors and more basic mechanisms in the situation studied" (Flyvbjerg, 2006, p229). Travers is atypical. Even suffering two broken feet when they were sideswiped by a van in 2020 while riding their EUC barely slowed them down from developing the EUC as a vehicle both for active mobility and community. Highly motivated to demonstrate the EUC's various worths, perhaps especially for people who, like them, cannot physically cycle or e-bike for active travel, they quickly became ingrained with the local EUC community by taking social rides in small and large groups across greater Vancouver and beyond, connecting with EUC influencers via YouTube and Facebook across North America, and participating in a long-distance group tour of southern California. The city of Vancouver feeds into Travers' atypicality, offering a large network of cycling infrastructures that rivals those of many major European cities (Firth et al., 2021; Perkins, 2018). While our mobile ethnography is limited with respect to generalizing beyond Travers' and my own experiences, our joint expertise in the politics and practice of EUCs, e-biking and cycling nevertheless supports theoretically important insights into these mobilities' competing moral worths.

4. Producing Good Active Travel through Electric Unicycling, E-biking and Cycling

Industrial worth

On a sunny Friday in Vancouver, February 2022, as we whip across several neighbourhoods and waterways, I become Travers' shadow while they pick up, transport and drop off food orders through Uber Eats. A typical order starts in situ, rolling down a street, with a ping to their phone gripped by a motorcycle glove, whose location Travers assesses for infrastructural and geographical convenience. Once they commit, the game is on. With utmost efficiency Travers rides to the restaurant or sandwich shop (see **Figure 2**). I can (mostly) keep up with Travers on my e-bike, because it shares with Travers' wheel the capacity for quick acceleration.

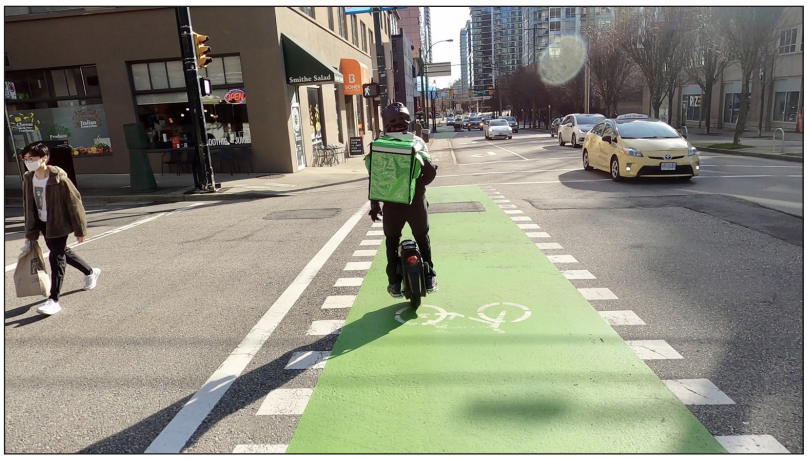

Figure 2: Travers picks up an Uber Eats order.

We negotiate painted bike lanes, protected bike lanes, arterial highways, sidewalks, alleyways, shared active travel pathways, traffic calmed greenways, and construction zones for new subway lines and condominium towers with ambiguous traffic rules. Travers strongly prefers protected bike lanes—"so I can stay alive"—so much so that, when new protected lanes were set to open last year in downtown Vancouver but were delayed by the pandemic, they found themself along with other delivery workers breaking in, sliding through barriers to enter the

coveted infrastructure. When Travers picks up their delivery, showcasing EUCs' small size and portability, they seamlessly flow on and off the street (see **Figure 3**) through sometimes congested sidewalks, accessing buildings in a way that bikes and e-bikes cannot.

Figure 3: Travers disembarks with an Uber Eats order.

Once Travers secures the package—sometimes falling prey to the "sunk cost fallacy," they admit, if the order takes longer than expected—their phone cheerfully announces the way to their next destination, and they are just as seamlessly off again into another maze of urban street infrastructures.

Travers' preference for protected bike lanes "to stay alive" reflects a wider industrial problem for the expansion of active travel in car driven countries. The most generalizable scientific finding about EMM to date identifies the most important barrier to its expansion: roads choked with motor vehicles that offer little protection for vulnerable active traveller bodies (Almannaa et al., 2021; Arsenio et al., 2018; Leger et al., 2019; Mayer, 2020; Nematchoua et al., 2020). This finding echoes decades of cycling research showing that cycling promotion fundamentally demands the construction of protected bike lanes on busy roads (see **Figure 5**) separated from car traffic and local neighbourhood greenways equipped with traffic calming (see **Figure 6**) (Nello-Deakin, 2020).

Figure 5: Travers rides up Burrard Bridge with people cycling.

Figure 6: "Travers relies on traffic calmed greenways built for cycling".

Truly pillars of good active travel, protected bike lanes and neighbourhood greenways have grown substantially across some Canadian cities in recent years. However, this growth pales in comparison to the quantity of new and wider roads, suburbs and big box stores built for motor vehicles (Ibbitson, 2018). So it is promising that e-bike usage appears to be replacing car driving for short trips in some jurisdictions, including the United States, Northern Europe and Australia. Still, this does not appear to be the case everywhere, including China (Bigazzi and Wong, 2020), and some research suggests that the effects of e-bikes displacing car trips may be overstated (de Haas et al., 2021; Fitch et al., 2021). In short, the ongoing expansion of automobility in Canada suggests an industrial paradigm shift, particularly in the mindsets of engineers, planners and policymakers, is required before EUCs, e-bikes and cycling can compete fairly with the car.

Besides limited road space, another industrial dilemma confronted in our go-alongs "is the sanctity of the 'bicycle lane' being reserved for nonmotorized vehicles only or any vehicle that fits the performance envelope of a bicycle (i.e., wheeled, human scaled, and slow)" (Cherry and Fishman, 2021, p163). Compared to frictions with motor vehicles—Travers is convinced that if they get hit again it will be a stressed-out driver of one of the ubiquitous delivery vans (see **Figure 7**) that we encounter on our go-alongs—Travers has had few altercations with cyclists.

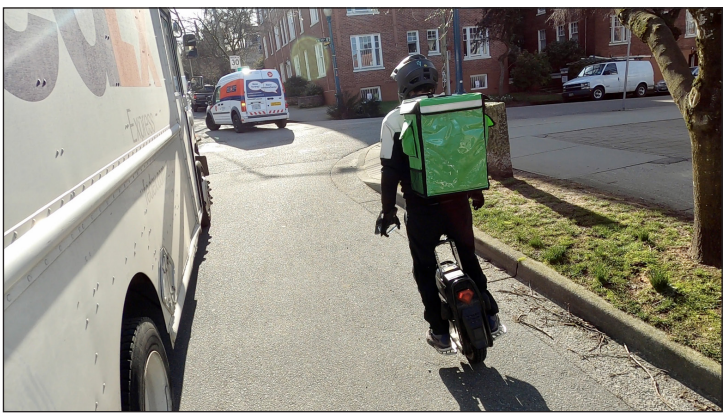

Figure 7: "Uber Eats meets FedEx and Canada Post delivery vans".

However, they do occur, typically when cyclists fail to signal. When people cycling, e-biking and electric unicycling share bike lanes, given their different rhythms and speeds, they intermittently pass and get passed by one another, sometimes back and forth like an accordion, depending on the terrain. In my and Travers' experience, however, what generates the most dangerous conflict is not such reciprocal passing in close quarters, even when it takes the hurried form of "zigzag" negotiations around other active travellers (see Jensen 2010: 398), but rather when EUCs and e-bikes with illegally removed speed governors travel at speeds higher than 30 km/h.

A related infrastructural dilemma concerns sidewalks, where bikes and EUCs do not technically belong. Riding on the sidewalk transgresses standard rules for these spaces governed by industrial models for efficient traffic flow. However, I watch Travers deftly infiltrate sidewalks on their EUC (see **Figure 4**) in order to reach the entrances and exits of residential and commercial buildings, and to safely skirt arterial highways and one-way streets for fast cars.

Figure 4: "Travers (slowly) utilizes the sidewalk".

I am struck by Travers' capacity to hold onto their flow, using clear hand signals for turning and slowing, while creating civility by performing deference towards pedestrians in their spaces. This performance lubricates relations with cyclists, too, where Travers travels on bike lanes in the wrong direction. Ultimately, access to sidewalks and bike lanes enhances Travers flexibility for circulation—as the cinematic go-along data clearly and uniquely illuminates, this access promotes the core industrial principle of efficiency (Thévenot, 2002). The small size and unique portability of the EUC compared to cycling and e-biking promotes industrial flows through food delivery and micrologistics, and by integration with public transit and secure parking arrangements.

The industrial worth of EUCs, e-bikes and cycling is growing, as engineers, planners and policymakers rationalize and standardize their spatial production. Speed is the critical planning factor. We observe that occasional bursts of speed (e.g., riding downhill, cruising over bridge straightaways) are not only compatible with safety, but also important for the pleasure and play of active travel. Rather than eliminate faster than 30 km/h speeds—-while still emphasizing this limit, past which it becomes too easy to maim and kill others and too difficult to perceive your surroundings—-we suggest governments refrain from engineering top-down, technical solutions to control electric unicycling, e-biking and cycling, for two reasons. First, an over-reliance on techno-scientific interventions grew automobility, which these modes seek to replace, into an ever-expanding threat to the earth's biosphere (Nikiforuk,

2021). Second, EUCs, e-biking and cycling are already growing and spilling into "car territory," appropriating it in a largely self-organized, safe and somewhat chaotic way (e.g., using infrastructures in the "wrong" manner). For example, the car trips that e-bikes are replacing tend to be longer, more frequent and more complex than typical cycling trips—traversing difficult grades without overexertion, carrying family members and goods, and extending deep into the suburbs and rural countrysides (Rérat, 2021; Cherry and Fishman, 2021). Rather than build out elaborate new infrastructures, governments ought to break the unjust monopoly that the car has over existing road space, and reallocate it to active travel.

Market worth

In contrast with industrial worth with its long-term planning for the future, market worth thrives through fast, short term transactions for enhancing trade, competition and wealth. Alongside an explosion in online shopping and use of food delivery apps, one of which Travers uses to "gamify" their EUC practices, COVID-19 triggered a surge in market demand for active travel itself, wherein people chafing under lockdowns explored new forms of outdoor exercise. We witnessed a bike and, especially, e-bike boom. Shared and private e-bike usage ate substantially into cycling's market share (de Haas et al., 2021; Kroesen, 2017; Sun et al., 2020), and the pandemic boosted e-bike sales into uncharted territory, rising 145 percent in the US between 2019 to 2020, above twice the rate for self-propelled bikes and far outstripping sales in electric cars (Surico, 2021). Beyond the pandemic, the combination of a rapidly developing lithium-ion battery market and shared e-bike systems in major cities promoting their use, has turned e-bike technology into a commodity coveted by big tech, global cities and wealthy kinetic elites. The market worth of active travel shows in the fact that the price of e-biking is a significant barrier to participation (Travers et al., 2022)—the "median income of US e-bike riders is about $100,000 a year, compared to the US average of about $60,000" (Cherry and Fishman, 2021, p163).

The legitimacy of market worth itself, however, has in the U.S., Canada and other wealthy nations been corroded for several decades by a market fundamentalism that has underpinned a relentless expansion of private automobility, urban sprawl and energy consumption (Walks, 2015). Divergent forms of post-Fordist neoliberalism have eclipsed industrial capitalism and undermined the infrastructures of other common goods—precluding the capacity for EUCs, e-bikes and cycling to compete with the car in the kind of fair, collectively minded marketplace that Adam Smith imagined. We unequivocally advocate against "market solutions," not because EUCs, e-bikes and cycling do not carry impressive business cases, but because income and, most especially, wealth, have grown so toxically unequal as of late as to undermine the conditions of liberal democracy required for maintaining a plurality of common goods with which people might enlarge the validity of their claims. For a market common good to succeed, market inequalities must "offer some benefit to the least favoured members of society" (Boltanski & Thévenot, 1991/2006, p15)—which cannot happen if these members are permanently excluded from participating. The lucrative relations between dedicated bike lanes and greenways, and financialized real estate in Vancouver (Soules, 2021), may look like it advances a market common good. However, by inflating property values, rents and real estate speculation in one of the least affordable places to live in the world (Soules, 2021), desirable infrastructures for EUCs, e-bikes and cycling—markers of liveable, happy and smart cities—may inadvertently promote a predatory "economization" (Çalışkan and Callon, 2009) that puts these active mobilities beyond the reach of low and no-wealth members of society.

Put another way, while it is technically and physically impressive, especially when looking at the film of Travers crisscrossing the city, that they made $15,000 from Uber Eats during an ethnographic side hustle for their sabbatical last year (more than enough to buy a new EUC),

as important as the capacity for EMMs to generate profitable work is the nature of this work for vulnerable people—and uneven access to active travel in the first place.

Civic worth

The civic production of active travel lies in its potential to bolster social equity and solidarity—crucial elements of mobility justice (Sheller 2018). EUCs and e-bikes contain the potential to render active travel more inclusive by cultivating higher levels of diversity in rider demographics than cycling. As note Cherry and Fishman (2021, p165), "e-bikes truly are physical activity levellers, and one of their main appeals is that they reduce terrain barriers and allow riders to arrive at their destinations without too much exertion." Removing some systemic barriers to cycling, EUCs and e-bikes invite people who previously did not, or cannot, cycle, like Travers (Boland et al., 2020; Haustein & Møller, 2016). Our go-along data show, for instance, reveal how a person who cannot cycle because of injury, rides on one wheel elegantly with two feet recently broken by a sideswiping van in traffic. Having the ability to travel for longer distances with less exertion is, in general, quite significant for older people and folks with disabilities, injuries or other conditions that make cycling less feasible if not impossible (Leger et al., 2019; Popovich et al., 2014). Reflecting patriarchal divisions of household labour, women with e-bikes were early adopters of e-cargo bikes that facilitate more complex trip chaining (Cherry and Fishman, 2021). Social equity among e-bikers is greater in contexts that enjoy stronger cycling cultures and infrastructures, such as Northern Europe (Dane et al., 2020). By contrast, low-cycling countries like Canada and the US show less diverse e-bikers who on average tilt white, male, older, with postsecondary education and higher income (Macarthur et al., 2018; Marincek et al., 2020).

The potential for EUCs and e-bikes to consolidate active travel privilege, as the demographics of e-bikers in low cycling contexts suggests, poses a formidable challenge for expanding their civic worth. On social inequity, electric unicycling and e-biking can take important lessons from how cycling became instrumentalized for urban redevelopment and "platform capitalism" (Srnicek, 2016). Critical attention by cycling scholars in recent years highlights how current policies strip cycling of

> alternative qualities to intensify a focus only on those that can enhance productivity, whether that be through speed, spectacle, surplus or image. Congruently, what we seem to be producing is a cycling system that attempts to mimic the car system, just slightly slower. … The manner in which cycling is being popularised – bringing cycling into cities through entrepreneurial circuits of capital and to solve economic crises – means that the versions of cycling we are witnessing are somewhat desiccated ones that reflect and reproduce a narrow vision of the city as primarily geared towards economic growth rather than human flourishing (Spinney, 2021, p13).

There is pressure on EUCs and e-biking to mimic coercively flexible, hegemonic car travel in Canada predicated on economization and profit-making rather than social connections that could support the redistribution of wealth and power. In addition to the playful and pleasurable mobility that Travers experiences while delivering Uber Eats, for example, for more vulnerable platform labourers and gig workers, the algorithmic management of their mobilities often results in precarious work conditions, isolation and individualistic entrepreneurialism. A central imperative for equitable EUC riding and e-biking as they intersect with platform capitalism entails supporting platform workers' capacity to self-organize in order to resist and "override" the power and information asymmetries of algorithmic workforce management (Popan, 2021, p15; Popan and Anaya-Boig, E., 2022).

The social inequity of the gentrifying effects of infrastructures for EUCs, e-bikes and cycling poses a vexing challenge for their civic worth. For example, "cycling investment is related to both characteristics of privileged current demographics and to markers of gentrification" whereby "communities that are already privileged capture a disproportionate amount of cycling infrastructure investment" (Flanagan et al., 2016). The problem is not cycling per se, but rather the ways in which planners, politicians and developers use cycling infrastructure as an instrument for investment and development, so it worsens class and racial divides. In Boston for example, "just 1% of those who use the city's bike-share scheme are black, even though black people make up more than 20% of the city's population. Even in Amsterdam, where almost 40% of journeys are made by bike, Moroccan and Turkish immigrants are less likely to ride" (Geoghegan, 2016). In Vancouver, which over the past 15 years added over 150 km of protected bike lanes, painted bike lanes and local street bikeways, "inequities in access to bikeways have not changed over time," such that areas with more children and Chinese people *still* have less access to protected bike lanes, while districts with more university-educated adults continue to enjoy more local bikeways (Firth et al., 2021). Vancouver's cycling infrastructure shows, like shared e-bike systems that struggle with expanding access for low income and BIPOC communities, the importance of designing equity into active travel at the outset.

Domestic/decolonizing worth

EUCs, e-biking and cycling can advance another non-economistic common good by protecting local communities, traditional places and existing cultures. The domestic worth of active travel is under threat where traditional cultures and communities are displaced, for example through bike lane development, which in some places (e.g., California) might be legitimately described as a "new colonial urbanism" (Lugo, 2018, p141). Like cycling, EUCs and e-bikes carry unique abilities to not only destabilize existing local communities but also strengthen them in novel ways.

Domestic worth resonates with some of Travers' EUC riding experiences, particularly where their EUC riding has transformed their sense of home. They bring this up when I ask what they have learned the most from riding their EUC for work and leisure. They tell me that one powerful lesson has little to do with the successful accomplishment of EUC travel, but rather the way they have through active EUC travel re-learned their neighbourhood and local community. The EUC's rhythms and affordances, magnified when Uber Eats gave Travers a reason to enter heterogenous local businesses and private residences, opened a novel inside-outside reality and deepened their sense of community attachment—in a place they already thought they knew. This finding emerged on our go-along, after I witnessed their access to places that were private and inaccessible to me, the shadow. In a broad yet decisive way, EUC riding enriched Travers' daily production of home.

Similarly, e-biking opened up my ways of relating with and supporting my local communities, family and kin. I discovered that cycling with and beside other people e-biking who do not enjoy cycling as much as I do affords a whole new form of sociable, active travel with neighbours and loved ones. E-biking enables me to meditate with my local environment, which I found surprising. When I first started, I struggled with the idea that e-biking simply flattens the experience of cycling: faster uphill, slower downhill, consistent performance across weather. But e-biking for everyday active travel, especially for those carrying goods and children, does not flatten cycling, so much as offer its own manner of engaging with, especially, people in one's local community. I entered the e-micromobility lifeworld through an able-bodied, anti-car perspective. Far more Canadians enter it from the dominant car world, including Travers, who replaced 90% of their car trips with the EUC. The benefits of shifting

from cars to e-bikes and EUCs for engaging local communities and cultures often result in a life-changing event (Edge et al., 2018). It shows that, alongside civic and, we will see, ecological worth, domestic worth has the potential to create a moral triumvirate for 'active travel justice' against neoliberal capitalism (Scott, 2020).

Domestically good active travel, however, requires challenging whose local traditions and places are protected. Many wealthy, liberal Vancouverites, for example, living in desirable urban districts zoned for single family homes fiercely protect their neighbourhoods' "character" against any incursions by desperately needed denser forms of housing (Cheung, 2022). Given the European, settler bias of canonical common goods (and property law), we suggest broadening the lens of domestic worth through decolonization (Wood et al., 2020; Roy, 2009, 2016; Schwanen, 2018). Mobility justice (Sheller, 2018) seeks to actively decolonize mobilities in part by centring the voices, knowledges, capabilities and epistemologies of Indigenous peoples—including the sḵwx̱wú7mesh (Squamish), selílwitulh (Tsleil-Waututh), xʷməθkʷəy̓əm (Musqueam) and many other First Nations on whose unceded and traditional territories so-called Vancouver and British Columbia lie. Decolonizing active travel has a promising future here, as Nations collaborate, for example, with Trails B.C. (https://trailsbc.ca/) and British Columbia Cycling Coalition (https://www.bccc.bc.ca/) to incorporate Indigenous languages and knowledges into the design of new, shared pathway systems—a regional political mobility project to which both Travers and I, as settlers on Turtle Island, are committed. These systems have the potential to reconnect First Nations communities forcibly isolated by superhighways and megaport infrastructures. By drawing on First Nations' traditional ecological knowledges, emerging networks that support EUCs, e-bikes and cycling can not only help decolonize active travel but also advance mobility justice by holding accountable the governments and industries most responsible for biodiversity loss, mass extinction and climate change.

Ecological worth

On a drizzly February afternoon in Vancouver, after riding across the busiest cycling bridge in North America (Perkins, 2018), Travers and I all of a sudden find ourselves inside an urban wilderness. Here, in Stanley Park (see **Figure 8**), a lake in the woods with a beaver dam joins up to one of Vancouver's few remaining free-flowing streams where salmon still return to spawn.

Figure 8: "Travers and I reflect at Beaver Lake in Stanley Park".

Travers and I reflect on what this wilder nature in the core of the city might have felt (and sounded) like before colonial authorities unceremoniously evicted its Indigenous and settler residents (most by 1931), and began representing 'wilderness' as something that was separate from humans and cities (Waitt and Lane, 2007), just as tourists began flooding the urban park in motor vehicles.

EUCs, e-bikes and cycling offer powerful ecological affordances with respect to sensing, noticing, respecting and interacting with nature. On their EUC, a sense of flow and joy—"the stoke"—that sometimes overtakes Travers while riding and carving back and forth along open, traffic-calmed greenways in the city (see **Figure 9**) is magnified where they take the time to pleasure ride into the urban wilderness (**Figure 10**).

Figure 9: "Travers carves their way along Beach Avenue".

Figure 10: "Travers rides for pleasure in Stanley Park".

"The stoke," glimpseable in our Go-Pro go-along footage, is difficult to condense into words and academic prose. Travers' technique switches from linear instrumental efficiency to more playful mobility and expansive engagement with the trees, mountains and gleaming, silver-blue ocean on the horizon. Travers' experience here deeply resonates with my own. On an e-bike and a bicycle, I find that I can transfer kinetic (and kinaesthetic) energies

from utilitarian transport behaviour to meditative, artful (dance, for example) practices and becoming lost in more-than-human atmospheres. I tend to get lost along the aerial trajectories of crows and clouds. Ultimately, I find that e-biking with Travers, when they perform EUC riding as a way of engaging nature, opens up my own willingness to notice my more-than-just-human surroundings.

Despite these notable ecological affordances, not unlike the Tesla (Rapley, 2021), when you look under the hood of EUCs and e-bikes, and consider the consumption practices with which they are associated, there are worrisome reasons to question their reputation as sustainable modes of mobility. Some key reasons for e-bikes include battery manufacturing, end-of-life disposal and recycling, the type of mobility they replace, lifetime usage, shipping from manufacturing facility to point of sale, shared or private use, charging technologies and, especially, the nature of electricity generation (Travers et al., 2022; Abduljabbar et al., 2021; de Bortoli, 2021; McQueen et al., 2021; Weiss et al., 2015). So, while e-bikes emit no greenhouse gas emissions when in use, their total environmental impact rests on myriad other factors, which vary substantially across contexts. For example, e-bikes in China primarily use lead-acid batteries, contributing to lead pollution, while higher priced e-bikes in Europe and North America typically deploy higher energy density lithium-ion batteries that avoid such pollution. And while even small modal shifts towards e-bikes in wealthy low-cycling countries such as Canada, where short trips are dominated by private cars, could provide significant environmental benefits (Abduljabbar et al., 2021), the awkward fact remains that, similar to Teslas, e-bikes, given their rider demographics, may nevertheless correlate with high levels of wealth, consumption and kinetic elitism that disproportionately destabilize the climate. In order to ecologize e-bikes as well as EUCs, which likely face similar challenges, their social and material production in wealthy jurisdictions such as Vancouver, like cycling, must somehow attenuate rather than enhance consumption.

5. Conclusion

In this article we examined how electric unicycling and e-biking can create good active travel together with cycling by advancing multiple and competing visions of the common good. By including these e-micromobilities alongside cycling we aimed to illuminate one, machinic model for the production of 'good' active travel with strong potential to challenge high speed, hegemonic automobility in low-cycling countries such as Canada. By helping to bridge in motorists—the biggest market for active travel converts by orders of magnitude—by removing barriers to cycling tied to distance, terrain and exertion, EUCs and e-bikes effectively equip active travel for the population we have rather than the one health and fitness experts idealize. Moreover, smaller-sized EUCs offer novel ways of integrating with public transit and moving in and out of buildings, e-bikes provide powerful ways of carrying goods and children, while cycling continues to provide a lower cost and uniquely intimate and embodied connection with speed and self-propulsion. Yet, other modes of active travel remain critical, too. We did not consider e-scooters (see Tuncer et al., 2020), or many other forms of active travel, "such as running, kick scooting, skateboarding and wheelchair use" (see Cook et al., 2022), with their unique performances, uses of space and different population profiles. Another limitation of our analysis rests on our relative positions of privilege and that of Vancouver as a whole. Future ethnographic research can build on ours by examining how a more inclusive set of active travel modes—not just measured by health and contributions to physical activity—can advance contrasting common goods, and by incorporating a wider range of socio-economic and ethnocultural experiences.

The "market shares" of incompatible common goods, like the democratic capacity of different nations and communities to make compromises between them, remain in flux over

time. We therefore conclude on the question, what might good futures for active travel look like? How might they extend or diverge from the moral distribution of worth that currently values EUCs, e-bikes and cycling through an overwhelming economizing bent? How might they deal with the ever-present danger of capitalizing on active travel's market worth in order to support their common expansion only to lock in further social inequity, ecological ruin, and settler colonialism? Given the manner in which platform capitalism, neoliberal urbanism and, more prosaically, car-oriented suburban sprawl continue to dominate the development of Canada's immense, colonial territory (Ibbitson, 2018), it is tempting to follow John Urry's (2008, pp261, 265) imagining of the future, extrapolating from automobility's "superior capacities to adapt and evolve by comparison with all other mobility-systems": "there is no free lunch here. … The world may be torn between two bleak scenarios as a consequence of the twentieth century's exceptional degree of resource use, between a Hobbesian war of all against all and an Orwellian digital panopticon. The twentieth century would seem to be reaping its bitter revenge." This rather bleak prediction could be right. But it must be tempered with emerging historical evidence of humanity's radical capacity for socio-spatial reorganization (see Graeber and Wengrow, 2021).

Humanity may not coalesce as one against the common enemy of climate change and ecological collapse, but since humans already contain the ability to quickly and fundamentally change the ways in which they live together, they probably will do so again, once horrific climate change-related disasters start occurring even more frequently. As a hopeful and utopian alternative to Hobbesian warlordism and Orwellian panopticons, we suggest good futures (plural) for active travel can break automobility by pragmatically consolidating active travel's decolonizing, civic and ecological affordances at the expense of active travel's industrial and hegemonic market constellations. Idealistic alternative futures, of course, paper over the plural and incommensurable nature of domestic/decolonizing, civic and ecological common goods themselves, leaving unaddressed the specific political work of reconfiguring active travel networks in ways that foreground—but also make difficult compromises between—these non-economistic moral worths at the heart of mobility justice (Sheller 2018). This includes the work of persuading progressive and privileged settlers on Turtle Island who live in single family homes inside vibrant cities to make space for the far more denser housing and mixed land uses that cultivate inclusive active travel. A self-propelled and battery-assisted machinic complex of e/bikes, EUCs and other forms of active travel just might provide the right amount of chaos to tip over a corrupt, hegemonic system of socio-spatial organization by bridging some motorists into active travel better than cycling ever could on its own—mobilizing a more diverse critical mass against the worst, anonymizing tendencies and banal violence of motor vehicles.

Competing Interests

The authors have no competing interests to declare.

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