Fairness and the sufficiency turn in urban transport

Abstract

This commentary considers the research and policy implications of applying the sufficiency principle to urban transport. It explores 'enoughness' against a backdrop of increasing carbon emissions in the transport sector, inevitable ceilings for resource intense movement and the essential requirement of providing access to opportunities in cities. Given the relative lack of progress, increasingly polarising political debate and urgent requirement for change, this commentary advocates for a more direct and open engagement with a sufficiency turn in urban transport. Most importantly, fundamental questions about a fair distribution of remaining emissions and finite street space within the transport sector must be considered. This engagement can build on the emerging field of transport equity while joining up social justice perspectives of the 'here and now' with sustainability justice recognising global society, future generations and nature. While acknowledging the political risks of embracing sufficiency in urban transport, this commentary builds on the above rationale and directly engages with the idea of establishing budgets for transport-related carbon emissions and space consumption. It encourages further exploration and presents critical questions for future research and policy practice based on Martens et al's (Martens, Bastiaanssen et al. 2019) three transport equity components of considering mobility benefits and burdens, the disaggregation of social groups, and determining the distribution principle.

Summary for policymakers

- Global GHG emissions from transport continue to increase and even high-income countries with ambitious climate goals are struggling with a transition towards sustainable transport.
- The excessive space consumption of conventional car use is incompatible with good urbanism with only a minority of trips that can be accommodated by private vehicles in scarce urban street space.
- Direct acknowledgement and open communication of scarcity and consumption limits in transport can be politically toxic but is helped by a clearer analysis of available carbon emissions and space consumption budgets for urban mobility.
- Applying the sufficiency principle to urban transport necessitates to centrally consider fairness and equity aspects as part of policy interventions. In turn, this requires differentiating between process, absolute and distributional fairness as well as the three transport equity components of benefits and burdens, social groups, and distribution principles.
- Public policy needs to directly target advancing urban accessibility and access to opportunities as integral part of a sufficiency turn in urban transport and communicate that it is increasing not restricting urban access.
- Embracing the sufficiency turn in urban transport leads to critical research and policy questions which city practitioners and the research community can jointly address with bold experiments and policy labs.

Key Words: accessibility, cities, transport equity, just transitions, mobility budgets, consumption corridors

1 Introduction

Despite far-reaching global commitments and efforts, climate change is advancing at unprecedented pace. It is increasingly becoming clear that the next decade may well be the last opportunity to avoid tipping points of climate change that could make a "hothouse earth" unavoidable (Lenton, Rockström et al. 2019). A dedicated policy focus is particularly pressing for the urban transport sector. Prior to the pandemic, transport-related emissions were not only stubbornly high, but had started to rise again in several countries where they had been reduced (IEA 2021). For the EU, the International Council on Clean Transport warns that transport could consume the EU's entire carbon budget (Buysse and Miller 2021). For some time, transport emissions were growing more rapidly than in any other sector and were projected to increase by 50% by 2035 and almost double by 2050 under a business-as-usual scenario (Sims R. 2014). Carbon emissions from road and urban transport are increasing as a result of ongoing motorisation, increasing shares of sport utility vehicles (SUVs) and other heavier, carbon-intensive vehicles offsetting any GHG reductions from rapid growth in the sales of electric vehicles (Popovich and Lu 2019, IEA 2021).

But contemporary urban transport suffers from a second, arguably even greater tension on the ground: the degree to which conventional car-based mobility at scale is incompatible with fundamental ideals for good cities. Congestion, road crashes, community severance all share being an indication that the equation between available space, urban space use, vehicle size, speed and space requirements is fundamentally broken. At 30 km/h, the provision of mobility in scarce urban street space requires 2 sqm per person for light rail or up to 75 sqm per person for cars (Rode and Gipp 2001). This difference becomes even greater for higher speeds and jumps in order of magnitude when incorporating parking requirements. Yet, urban environments that are highly desirable for living, working and visiting are precisely those which combine high densities of people and activities with clear limits for street space availability.

What both challenges above share is that they are confronted with conditions of scarcity and finitude. In the first case it is the available carbon emissions limited as a result of globally agreed targets to prevent climate breakdown and in the second instance it is the available street space constrained as a result of valued urban morphologies that evolved over time. While the case for an urban transport transition that recognises the above has been established decades ago, direct acknowledgement and open communication of scarcity remains politically toxic. At the same time, Millonig et al. (2022) argue that the efficiency and consistency principle of sustainability has so far not produced the outcomes that are urgently needed. This elevates the importance of embracing the third sustainability principle of sufficiency or, simply put, the recognition of 'enoughness' (Jungell-Michelsson and Heikkurinen 2022). Here, sufficiency refers to an end state as well as the means of adjusting resource use levels to environmental limits (Jungell-Michelsson and Heikkurinen 2022). Given the relative lack of progress, increasingly polarising political debate and urgent requirement for change, this commentary considers implications of more directly and openly engaging with a sufficiency turn in urban transport. Most importantly, a sufficiency approach leads to fundamental questions about a fair distribution of permitted emissions and finite street space within the transport sector.

To date, sufficiency has remained an implied and rarely referenced concept in urban transport (Waygood, Sun et al. 2019, Zell-Ziegler, Best et al. 2021). However, it features prominently as an

underlying category of the well-established 'avoid-shift-improve' approach for sustainable urban transport (TUMI 2019). Here, the 'avoid' component targets the reduction of the need to travel by advancing compact and mixed-use urban development. Similarly, the 15-min city approach engages with transport sufficiency by advocating for actions that increase opportunities within a short walk or cycle ride. Furthermore, low traffic neighbourhoods (LTNs) improve non-motorised mobility by filtering out through traffic while aiming for 'traffic evaporation' which implies sufficiency for the latter. Even road pricing, congestion charging and low emission zones directly targeting the negative externalities of transport include aspects of a sufficiency lens. In turn, this lens is confronted with uncomfortable questions about excess travel and driving, about how much transport is too much and what type of mobility should be encouraged or discouraged.

There are few policy domains where a suspected sufficiency perspective creates stronger reactions and outright rage than transport. Even in the absence of concrete measures, the mere suspicion of being limited, restricted or constrained in car use becomes a trigger for strong responses and a fierce battle not limited to social media. Fundamental concerns about personal freedoms, individual self-determination and state overreach blend with status anxiety and loss aversion. Within an instance, transport sufficiency becomes part of a culture war where car use is threatened by a 'tyranny of proximity' or even 'climate lockdowns' (Reuters 2022). When motivated by naked self-interest, these arguments even ignore the basic libertarian principle that individual freedoms must not violate the rights of others. Whatever the motivation, the polarising effect of transport sufficiency is real and becomes even greater when it can be framed as unfair, as harming disadvantaged groups or as an attack on opportunities in cities.

In this regard, it is fundamentally important that a sufficiency turn in urban transport is not equated with a reduction in accessibility or opportunities. In fact, a sufficiency approach for car travel in inner city areas is usually advanced precisely to increase levels of accessibility. Above all, access to opportunities in cities often does not require to travel over long distances and behavioural adjustments towards a lower degree of travel intensity is possible. Most cities already offer viable alternatives to conventional, high-carbon car use such as public transport, shared mobility, walking and cycling. Such opportunities create co-benefits far beyond climate change mitigation by helping to reduce the enormous societal costs of car-based mobility. A recent study for Germany estimated these costs to be around €5,000 per car and year (Gössling, Kees et al. 2022) underscoring the vast societal benefit of reducing car ownership and use. Lastly, the electrification of road transport is supported by a higher density of charging stations and the potential for sharing more expensive electric vehicles.

For operationalising a more open approach to transport sufficiency, globally agreed carbon emission caps, nationally determined contributions and city-level climate reduction plans are translated to emission budgets which can also be expressed in kilometers by transport mode. Similarly, available street space can be translated to space use budgets for specific areas which will vary significantly from one to another transport mode. Both can then be introduced as ceilings into the sphere of accessibility (the broader urban transport domain). There they become part of mobility resources that must be fairly distributed within that sphere. In other words, while equity concerns linked to mobility resources may want to centrally consider the definition and guarantee of group-specific minimum standards for accessing opportunities (floors), carbon emissions and space consumption have clearly defined aggregate maximums (ceilings). The ceilings for mobility resources (and indirectly for accessibility) are thus derived at indirectly through the constraints of carbon emissions and space consumption.

Millong et al. (2022) argue that greater transparency of overusing resources has a considerable potential to be both an acceptable and effective trigger for behaviour change. However, in the first instance this requires the creation of awareness of resource-intense behaviour for which overall

emission reduction targets at the national level and aggregate street space constraints are too abstract for appreciating a sense of personal responsibility and agency. Second, viable alternatives for behaviour change must exist. The urban transport sector is particularly well suited to ensure both with tangible and easy to communicate carbon and space consumption budgets and often readily available options for changing mobility behaviour. By addressing the personal sphere of action based on a principle of ambitious goal setting in the transport sector, these budgets for the urban transport field may in turn establish the experimental ground for implementing sustainable consumption corridors[1] across sectors and policy domains.

This commentary builds on the above rationale for engaging with budgets for transport-related carbon emissions and space consumption. Its focus is on the fairness dimension of transport sufficiency. It first reviews the shifting focus of transport justice to then establish the boundaries of a justice domain for transport sufficiency. It reviews broader justice models that may have to be utilised for that and touches on some initial aspects and questions for future research. It is based on the working paper "Enabling Sufficiency: Towards an actionable concept of fairness in mobility and accessibility" prepared for the European research project "MyFairShare - Individual Mobility Budgets as a Foundation for Social and Ethical Carbon Reduction". Employing the concept of carbon allowances translated to the transport sector as mobility budgets, the project targets the development of policy tool kits and guidelines to support the introduction of socially acceptable carbon budgets for mobility. The broader context of the MyFairShare project is a shift towards sufficiency as part of sustainable mobility.

2   The shifting focus of transport justice

Established concerns about fairness in transport

Modernist transport policy and planning, particularly during the post-war period, was predominantly concerned with addressing congestion and lacking capacities in transport systems. It did not explicitly engage with questions of equity and fairness. Instead, its paradigmatic underpinning was to establish the conditions for effective and efficient movement of both people and goods based on existing transport demand (Goodwin, Hallett et al. 1991). Martens (2016) suggests that traditional transport planning operates with a distributive principle of demand rather than one of equality.

Banister (2018) notes that of a wide range of equity, fairness and justice concerns and definitions which are part of today's transport policy debate and practice, there were only two which featured more frequently in the past. The first relates to questions about how to pay for providing transport infrastructure and services and the degree to which different users and non-users would have to contribute. The second refers to a basic needs perspective which for some time has been and continues to be central for the provision of public transport. It is this second perspective which has also informed the Sustainable Development Goals' Target 11. 2 "… to, by 2030, provide access to safe, affordable, accessible and sustainable transport systems for all …" (UN 2015). Still, most of these issues were not mainstream concerns of transport professionals in the past.

While traditional transport planning may not operate with a clear ethical and distributional principle as a point of departure, it cannot escape an ex-post distributional reality with considerable fairness implications. Martens (2016) identifies two faces of fairness in traditional transport planning: a

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[1] these corridors are defined by floors (e.g. minimum standards or basic needs) and ceilings (e.g. resource or emission limits) of consumption patterns

progressive and regressive face. The first relates to an egalitarian tendency which treats transport not unlike the universal access ambition prevalent in engineering for the case of water, sanitation and electricity provision. With resource constraints in the past not as prevalent as today, this ideal could be summarized as "everybody is to receive unhindered travel speed on the transportation network of her choice" (Martens 2016, p25). The progressive nature of this face of fairness stems from the same transport access being provided independently from an individual's socio-economic characteristics and residential location.

The regressive face in traditional transport planning is revealed when considering accessibility as the ultimate end of mobility. Because of an equality of speed, accessibility can be highly unequal between urban centres and peripheries. Furthermore, the central role of forecasting in transport planning is based on existing, often highly unequal mobility patterns and then reproduces existing differences. This " … suggests an implicit assumption that demand constitutes the just principle upon which the distribution of new transport facilities is to be based" (Martens 2016, p29). Finally, the widespread reliance of transport infrastructure decisions based on cost benefit analysis (CBA) tends to reproduce existing inequalities. CBA operates with a monetization of travel time savings which are typically based on income levels of different existing and potential users of a transport system. As a result, transport investments benefitting higher income groups, certain modes and types of travel will perform better in a CBA. In addition, Martens (2016) argues that strong population groups with greater levels of mobility intensities benefit disproportionally from CBA-based decisions and their focus on aggregate travel time savings.

To summarise the traditional perspective, it is worth noting that the politics of transport over the last century always maintained a framing of "travel as freedom" from which a basic right to travel can be extracted, in turn enabling a freer choice of where to live and self-development (Banister 2018). Once again, this connects directly with the universal access perspective and its egalitarian lens.

Contemporary framings of transport equity

By contrast, contemporary discourses and policy engagement related to transport equity tend to be most concerned with various forms of discrimination and an unequal distribution of transport resources (SDC 2011, Van Wee and Geurs 2011, Martens 2012, Nordbakke and Schwanen 2014, Banister 2018). It is informed by a new awareness of mobility needs and constraints of groups that were marginalized in modernist transport planning: women, children and young people, older people, lower income groups, ethnic minorities, people with disabilities and other disadvantaged groups. Aligned with a more inclusive transport perspective is the recognition of trip purposes other than commuting and business travel: reaching services and care facilities, educational institutions, retail and recreational travel.

A major focus of contemporary transport fairness deliberations focus on questions of urban accessibility, above all travel times and costs (Martens 2016, Nello-Deakin 2019). For policy making, these usually translate to concerns about the equity implications of large-scale transport infrastructure investments and land use planning. Hananel and Berechman (2016) highlight three elements as part of a new standard approach to inequality in transport: affordability, accessibility and personal/group mobility characteristics.

A further contemporary dimension of transport equity engages with the distribution of negative socio-economic and local environmental externalities from transport. For these, common transport burdens include various health impacts; noise and air pollution; congestion; compromised urban amenities, open and green space; community severance as well as safety and security (Banister 2018). A

particularly important perspective on a fair distribution of transport burdens highlights that it is often those groups in society that benefit the least from contemporary transport systems that are at the same time exposed to their greatest negative impacts.

The UK's Sustainable Development Commission's report on Fairness in a Car Dependent Society (2011) refers to the "less-travelled" being the "travelled-upon" (p.5). This may lead to a form of triple injustice as these groups often have fewer opportunities to complain about their situation and to be heard in addition to having limited access to mobility resources and suffering from negative externalities. Gössling (2016) concludes that transport injustices are interrelated and compounding each other with adversarial consequences for those disadvantaged and bearing the costs of contemporary transport.

New frontiers of mobility justice

Over the last decade and based on the concerns and interests above, transport justice has been a rapidly growing field of academic inquiry. Beyond the issues above, there are several new frontiers of mobility justice which a sufficiency turn in urban transport will have to engage with: implications of sustainability justice, a needs-based perspective of mobility and access, the speed and distance bias of transport policy, intrinsic values of mobility and the justice of public (street) space use.

To date, transport and mobility justice has been mainly concerned of the justice of the "here and now" and to a lesser extent with broader inter- and intra-generational justice of sustainability. While most transport justice scholars acknowledge planetary limits and environmental sustainability, few incorporate these directly as part of their justice analysis. One exception is Banister (2018) who in his book *Inequality in Transport* refers to obligations to future generations as part of securing their freedoms.

Directly related is a new requirement to better define the consumption of mobility by distinguishing between necessities and luxuries. Such engagement can build on broader theories of human needs and concepts for consumption corridors, identifying floors and ceilings for consumption patterns (Gough 2020). For the transport and mobility sector, this shifts the focus from the supply of transport resources to the need for mobility. Banister (2018) notes that, to date, inequality perspectives in transport have been focusing mostly on accessibility and affordability rather than a concept of needs.

More recent justice considerations also challenge another deeply embedded bias of transport policy: First, the prioritisation of longer trips – macro-accessibility is frequently considered more important than micro-accessibility. Second, the importance given to higher speeds – the requirements of faster travelling vehicles still dictate urban street design and faster moving vehicles are often given priority at intersections over non-motorised mobility. Both the environmental sustainability perspective as well as good urbanism inverse that logic.

The increasing recognition of intrinsic values of mobility and transport (Niblett and Beuret 2021a) rather than a "means-to-an-end" understanding linked to accessibility results in particularly complex implications for mobility justice. Considering the joy of travel, status benefits of vehicle ownership or intrinsic preferences for certain means of travel are even harder to qualify and require a high granularity of considering individual cases.

A new framing of transport justice also re-emphasises the local scale and how street space is being distributed (Creutzig, Javaid et al. 2020). This moves the focus away from the distribution of large-scale transport resources linked to major investments, travel time and metropolitan access and instead to the local use of a street. Nello-Deakin (2019) argues that this allocation question once belonged

almost exclusively to the technocratic domain of transport engineers and modellers supported by transitional cost benefit analyses. Once again, this so far implied a focus on the movement function of faster moving traffic rather than slow mobility and place functions of streets. A further expansion of the use of public space and a fair distribution thereof requires a fuller account of space consumption over time based on "time-space" (Rode and Gipp 2001).

Finally, it is important to recognise three viewpoints that establish the transport sector as a relevant and separate domain for both climate action and fairness considerations: a governance, climate and justice perspectives. Clearly, transport while highly interdependent, dynamic and complex, is a concrete arena within which policy making operates and for which specific expertise, clear criteria and indicators as well as budgets have been established (Rode, Floater et al. 2017, Rode 2018, Randal, Shaw et al. 2020). As briefly outlined in the introduction, the transport domain also plays a unique role for addressing the climate emergency. From a fairness perspective, Martens (2016) utilises Walzer's Spheres of Justice (1983) for a compelling perspective. He settles on accessibility – the capacity to access places – as the ultimate social meaning of the transport good and as an appropriate distributive sphere observing that injustices within the accessibility domain cannot be simply compensated by intervening in other domains.

3   Utilising justice models for urban accessibility

For clarifying the normative fairness perspective that underpins transport justice and transport sufficiency it is helpful to go back to fundamental justice models. Of the broader spectrum of social justice approaches presented, the social-liberal justice ideals of Mill, Rawls, Dworkin and Sen are most relevant. This section briefly presents the case of Rawls' egalitarianism and the capabilities approach (Sen and Nussbaum) and how these social justice models relate to the domain of transport. In addition, the overview presents environmental and sustainability justice as an expansion of the justice models of a "here and now". This perspective is relevant for incorporating a climate change lens because it establishes the justice baseline for carbon as well as mobility budgeting.

Social Justice Models

A particularly prominent social justice perspective adopted by transport scholars is Rawls' egalitarianism (Martens 2016, Lewis, MacKenzie et al. 2021). This is hardly surprising as John Rawls' *A Theory of Justice* (1971) is widely considered a cornerstone of contemporary political philosophy. His theory evolves around defining a fair distribution of primary social goods for which two sequential principles are proposed: First, the principle of greatest equal liberty which holds that basic rights need to apply equally to everyone and should be maximised as long as they do not compromise the freedom of others. Second, social and economic inequalities can only be acceptable if they are at the same time (a) a result of a fair equality of opportunity and (b) they benefit the most disadvantaged members of society which is referred to as the difference principle (Rawls 1971).

Rawls' original list of five primary social goods has been repeatedly tested regarding the possibility of accommodating transport or accessibility related goods (Martens 2016). The five initial social goods are (1) basic rights and liberties, (2) freedom of movement and free choice of occupation, (3) powers and prerogatives of office and positions of responsibility, (4) income and wealth and (5) the social bases of self-respect (Rawls 1971). One perspective of considering transport as part of these social goods is to consider transport as part of freedom of movement and to understand when this freedom violates the freedom of others (Banister 2018). Alternatively, it has been proposed to treat accessibility as an additional primary good for which the difference principle would have to be

applied (Van Wee and Geurs 2011, Martens 2016, Pereira, Schwanen et al. 2017). However, Martens (2016) warns that this approach is confronted with the problem of interpersonal comparison and (paternalistic) value judgements as different primary goods would have to be weighed against each other.

In an applied research and policy context, Rawls' egalitarianism is commonly interpreted as a fairness rationale for interventions benefiting the most vulnerable and disadvantages. In transport policy, most commonly, children, the elderly and disabled people are singled out. When introducing accessibility as primary social good, unequal impacts of policy interventions such as transport infrastructure, land use regulation and transport service provision can then only be justified if they improve access for the most disadvantaged. The Rawlsian justice perspective also has highlighted the importance of minimum levels of primary goods to cater for basic needs for which governments would be responsible – above these minimum levels allocation may be the role of regulated markets (Pereira, Schwanen et al. 2017). Based on their assessment of how fairness principles can be accommodated in the transport sector, Lewis et al. (2021) warn that a common, simple adoption of egalitarianism leads to many imprecisions and should be avoided.

Developed by Amarta Sen and Martha Nussbaum, the capability approach builds on Rawls' difference principle and argues for a shift in focus from primary goods to human capabilities (Robeyns 2021). These capabilities are defined as the "activities we are able to undertake ('doings') and the kinds of persons we are able to be ('beings')" (Robeyns 2021, s2.1). A shift towards capabilities implies moving away from a focus on 'means' such as resources and goods to the 'ends' of what people can do or become. In other words, it is not so much a primary good that matters but a person's capacity to convert resources into a meaningful outcome. This shift acknowledges individual choices and agency as protection against paternalism and cultural imposition as well as broader abilities that may determine ends. Sen's capabilities also go beyond differentiating just and unjust by adding a comparative perspective between different societal states and their relative level of justice (Sen 1999, Robeyns 2021).

A particular advantage of the capabilities approach for the context of the transport and mobility policy is that, unlike broader approaches such as egalitarianism, it can be more easily applied to specific sectors (Lewis, MacKenzie et al. 2021). Pereira et al. (2017) argue that accessibility rather than mobility should be positioned as a capability. Furthermore, critical for adopting a capability approach for the transport sector is Sen's prioritisation of securing basic capability equality through committing to context and culture specific minimum levels. Based on this, Banister (2018) suggests that minimum levels of access to essential destinations would need to be set but warns that this may be problematic. Pereira et al. (2017) note that the identification of minimum accessibility thresholds remains unresolved. They also identify a second challenge linked to accessibility being a capability combining personal abilities with complex transport system-land use interactions. This would require bringing together a transport studies' understanding and measurement of accessibility linked to location and the capability approach's concern about freedoms of individuals.

Environmental and Sustainability Justice

Environmental and sustainability justice expands the notion of fairness beyond current members of a society and their main political space. Environmental justice is a well-established concept with a strong social movement connotation and a particular concern for environmental harms affecting disadvantaged and marginalised communities (Sze and London 2008). From a political science view, the justice in environmental justice has been referred to as the "equity in the distribution of environmental risk, recognition of the diversity of the participants and experiences in affected

communities, and participation in the political processes which create and manage environmental policy" (Schlosberg 2004, p.517).

By contrast, sustainability justice is an evolving justice lens and requires further explanation. First, sustainability is itself already a more integrative concept combining concerns of environmental degradation and the depletion of natural capital with those of human poverty and prosperity. It therefore includes both mutually reinforcing concerns as well as trade-offs (Waas, Hugé et al. 2011). Second, sustainability expands the unit of analysis and intervention from the common political space of a society (e.g. nation state) to that of a global society. The resulting intra-generational justice claims can build on international and environmental justice approaches (Schlosberg 2004, p.517, Blake and Smith 2021). Third, and most importantly, sustainability justice combines claims across three different relations, the relations between contemporary members of global society, with future generations and with nature (Stumpf, Baumgärtner et al. 2015). These three sustainability relations also create the most distinct difference with traditional political philosophy which have been described as the ethics of the "here and now" (Jonas 1985, p5).

Alongside, the principle of sufficiency with a definition of "what is enough" has been associated with sustainability justice (Stumpf, Baumgärtner et al. 2015). In the context of transport and a fair allocation of finite street space, Creutzig et al. (2020) refer to global environmental efficacy which considers the two global problems of climate and land use change. Low GHG emissions and efficient space use (avoiding urban sprawl) become the specific ethical interpretation of sustainability in the transport and land use space. Here the link to wider public goods (via environmental and natural capital) from the local to planetary scale is introduced. But sustainability also dictates that environmental damage needs to be balanced against other social allocation approaches and ethical concerns – some of these have recently been considered under the broader well-being framework.

4   Fairness and sufficiency in urban transport as a research agenda

This final section introduces important points for future research which could inform policy-relevant insights and perspectives for a better understanding of the potential role of fairness and sufficiency in urban transport. When considering sufficiency as point of departure for transport policy, a coherent domain-level application of a justice lens is fundamental. Unsurprisingly, most work of integrating ethical perspectives in the transport context is not operating with environmental or sustainability justice. In a study of more than a dozen publications on transport justice, only one incorporated some environmental aspects (Lewis, MacKenzie et al. 2021). A tangible implication for any justice claims following the sustainability perspective is the recognition of finitude and relatively clearly defined limits of the natural world (Hayward 2001). In other words, environmental justice essentially establishes sufficiency upfront and fairness of subsequently distributing transport resources can focus on the justice of the here and now.

It is likely that research on transport sufficiency will connect fairness in mobility with opportunities and externalities of mobility-induced accessibility. In other words, the main accessibility inputs under consideration are transport resources rather than land use changes. Negative externalities which occur in other justice domains, particularly related to the environment and planetary health may not directly be considered as part of fair burden sharing (ie, a fair distribution of climate change risks) but instead are translated to the limited availability of transport resources expressed by mobility-related carbon and space use budgets.

Building on the broader ethical principles above, future research will have to clarify the more specific and applied components of fairness that will underpin the respective contribution. Differentiating the following three aspects of fairness may be helpful:

- **Procedural fairness** involves the 'proper adherence to the rules' of a decision-making situation (e.g. legitimacy and representation).
- **Absolute fairness** is established independently from a comparative perspective and can be judged at the level of individual experiences (e.g. minimum standards or basic needs).
- **Distributional fairness** embraces a comparative lens and can range from full equality "everyone the same" to proportional fairness considering efforts or "price being paid".

While research on procedural fairness is more or less domain agnostic, work on absolute or distributive fairness in the accessibility domain can be structured by Martens' et al. (2019) approach. Their framework operates with three key components: (1) the definition of benefits and burdens, (2) the social characteristics to be differentiated and (3) the allocation principle. Below follows the identification of future research opportunities for each of these components applied to the specific case of a sufficiency approach in transport.

Mobility benefits and burdens

- What are the key metrics and indicators that need to be considered when positioning mobility benefits as accessibility benefits, i.e. the opportunity to reach destinations in space?
- How should a sufficiency approach to mobility benefits incorporate non-passenger travel? To what degree should other accessibility characteristics, e.g. digital connectivity, land use, etc. be considered?
- Which mobility benefits other than accessibility related ones need to be considered? How can the value of intrinsically motivated travel, e.g. for pleasure and status (Niblett and Beuret 2021b) be measured?
- To what extend should and could mobility budgeting include mobility burdens other than those that directly help defining the ceiling (e.g. carbon emissions or space consumption)?
- Does the mobility burden of space consumption in cities (taking space away from others) require a different consideration compared to other negative externalities as it is directly connected to the mobility benefit of having a certain amount of private space for travel?

Social characteristics

- What level of disaggregation of population groups should be considered for mobility budgeting?
- Which specific population groups should be differentiated as part of the allocation of mobility budgets?
- Should (residential) location and therefore the level of access provided by public and non-motorised transport be considered a core characteristic of population groups?
- Besides disadvantage (age, income, wealth, gender, impairment, ethnicity, etc.), should there be other criteria for differentiating population groups?
- Which proxies for these social groups are readily available for transport policy practice (e.g. vehicle size or value, number of cars per household, etc.)?
- How can data requirements and availability for relevant social characteristics be reconciled?

Allocation principle

- Which allocation principle derived from the range of different justice models introduced earlier should be utilised for transport sufficiency?
- How does transport sufficiency relate to relevant end-state-oriented allocation (e.g. proportional equality, maximum gap standard, minimum standard, principle of need) or an intervention-oriented allocation (e.g. equalisation or market-based allocation based on tradable certificates)?
- How could different allocation principles be combined as part of first, second and third order allocation approaches of mobility related carbon and space use budgets?
- What would be a consistent approach to ordering allocations principles (e.g. 1 - minimum standards, 2 - principle of need, 3 - proportional equality)?
- How can minimum standards for mobility resources and accessibility levels be identified? Which group specific characteristics would have to be considered based on a principle of needs?

To explore some of the questions raised above, five urban-level living labs of the MyFairShare project in Vienna (AT), Berlin (GER), London (UK), Sarpsborg (NO), and Jelgava (LV) and one country-level lab (Austria/Latvia) are planned for 2023 and 2024. These will also test the general approach for establishing mobility budgets as outlined in Figure 1.
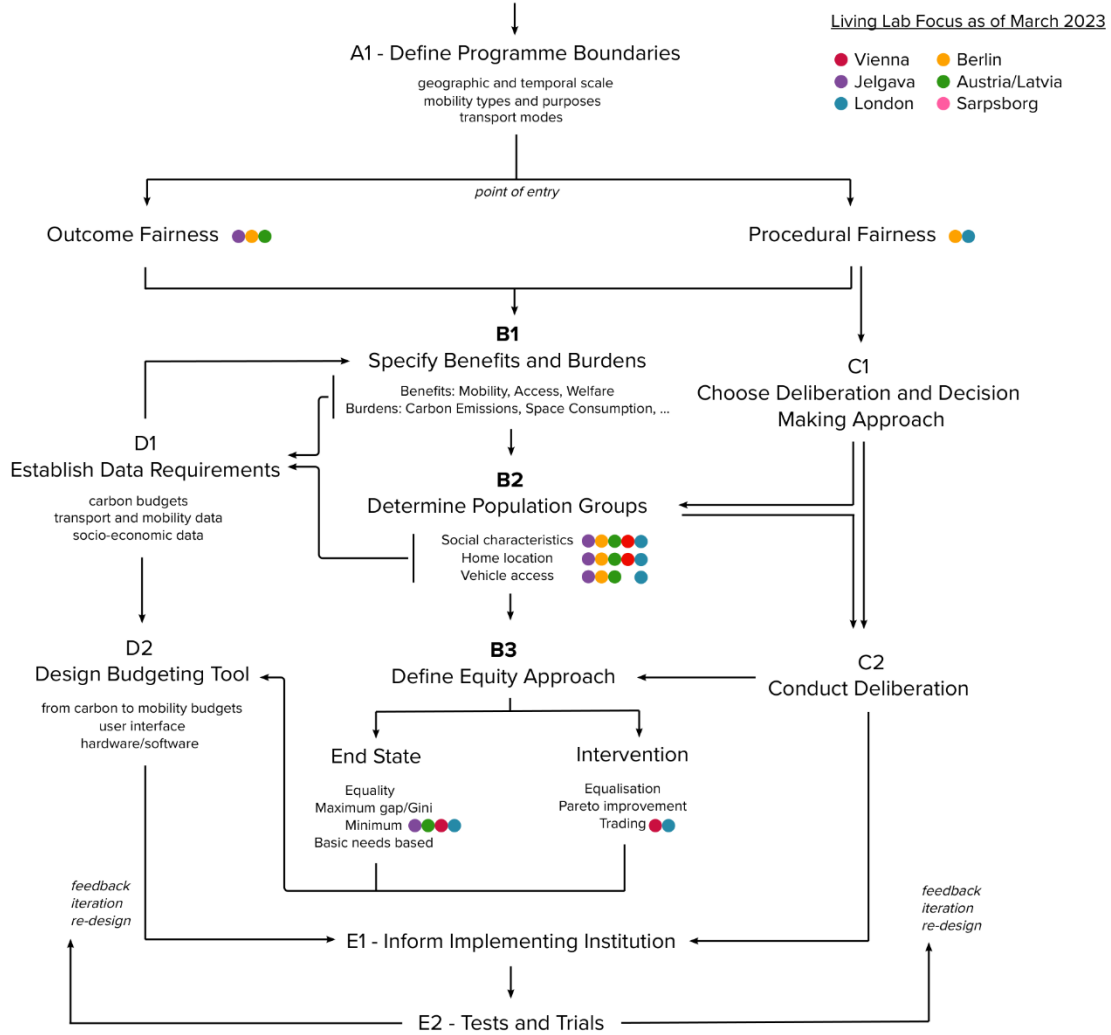
Figure 1: A general framework for establishing fair mobility budgets
Source: Author

5 Conclusion

This commentary introduces the point of departure, conceptual aspects and concrete questions for operationalising a fairness perspective in the context of a sufficiency turn in urban transport. The most fundamental equity considerations concern the choice of procedural fairness (how the decision on choosing any distribution of transport resources is made) or directly considering outcome fairness. For the first case, the focus is establishing a decision-making process which reflects a legitimate and democratic approach to reaching any conclusions about how a more open and direct engagement with sufficiency could be approached. In the second case, researchers and at some point, policy makers need to consider the questions above as part of an iterative process building on existing theoretical and policy frameworks, past research findings and the expertise of relevant knowledge partners.

Given the divisive nature and polarising effect of sufficiency measures in the urban transport and mobility domain, critical questions about political narratives and communication need to be addressed alongside the above. The required 'stories' will have to be able to much better connect with the norms and values that underpin people's reactions. Besides identifying language that connects proposed interventions with such values, this is also about the units that may underpin sufficiency measures, which should focus on indisputable 'bads' and the recognition of access to opportunities as the public good that is being protected at the local level.

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