

Bridging Temporal and Transport Justice

A case for considerations of time use in urban justice food

Maria Nordström

KTH Royal Institute of Technology*

ABSTRACT | The transportation system is essential for urban life – the spatial nature of our cities requires us to travel. Hence, we need to spend time in transit. However, time is a scarce resource. In transportation research, travel time savings are the key benefit of transportation improvements. Yet, “time savings” primarily function as a proxy for presumed societal benefits rather than reflect actual reductions in travel time. Moreover, time constraints are rarely considered in the transport justice literature. Based on the case of gender differences in travel patterns and travel time, this paper argues that a lack of interest in time is partly due to *accessibility* being the established metric for transport justice. Nevertheless, temporal inequality should be a concern for urban justice. The answer to “justice of what” needs to include a temporal component. By connecting the literature on temporal justice with the literature on transport justice, this paper considers the foundations of a time-specific metric as well as its advantages and disadvantages.

KEYWORDS | Urban Justice; Temporal Justice; Transport Justice; Accessibility; Gender Differences

* *Correspondence:* Maria Nordström – Division of Philosophy, KTH Royal Institute of Technology, 100 44 Stockholm, Sweden. Email: marnords@kth.se



1 Introduction

“No amount of money can make agents autonomous, if every hour of their day is under external control; if others decide how we spend all of our time, we simply cannot live our lives as we see fit, regardless of our other resources. Therefore, if the way we live our lives is to reflect our own decisions, control over how we spend our time is of crucial importance.”

(Eriksson et al. 2007)

Time is, in many ways, at the center of life. Almost everything we can wish to pursue requires time: “[t]ime is a scarce resource that individuals and households must allocate to produce goods, obtain services, and pursue rest and relaxation” (Williams et al. 2016). Much of what we wish to pursue as part of city life also requires movement of sorts, often some sort of travel. Both time, travel, and travel time (and time travel, though it lies far beyond the scope of this paper) have been extensively studied by various scholars in philosophy, urban studies and transport economics (among other fields). The aim of this paper is to contribute with a philosophical perspective on mobility by bridging the literature regarding time in political philosophy, the literature on time poverty, and the literature on transport and urban justice. In doing so, I wish to explore the possibilities and challenges of amending time to the currently established metric of transport justice, namely accessibility (Martens 2006). I believe that insights from the literature on temporal justice could service as a complement to the generally accepted view and raise important questions: what does it mean for urban justice if time is recognised as a valuable resource in itself to which people have distinct claims? Although the value of time is key in transport economics, I will show that the current framework and established practices do not consider the temporal circumstances of travellers in a way that one might believe at first glance. While ‘time savings’ are at the heart of transport economics, no time is actually being saved. The underlying assumption is that willingness to pay for shorter travel time reflects and encompasses the potential scarcity of time. This assumption, I claim, is not justified. As argued by Julie L. Rose, there is no perfect substitution between time and money (Rose 2016). Hence, I argue in this paper that time needs to be considered in its own right for urban justice to reflect the circumstances of urban living.

The value of considering time will be illustrated by a case of gender inequalities in time use, in particular in travel time. I argue that such inequalities are not being captured by the established account of accessibility as the metric of transport justice. I have chosen to frame the argument in terms of gender inequalities

since there is a substantial body of literature that considers gender aspects concerning travel with recent contributions on the gender gap in cycling, time constraints impacting women's car use and even how travel patterns were affected by the covid-19 pandemic (Shaw et al. 2020; Shirgaokar and Lanyi-Bennett 2019; Bin et al. 2021). Yet, this perspective is notably absent in most mainstream literature on transport justice.

The focus of this paper is to explore time as the “currency” of transport justice. Hence, it adds to the literature on “justice of what” rather than building on any particular normative theory. Only a few philosophers have developed distributive justice accounts that involve time directly. Specifically, arguments for considering time have been put forward by Goodin and coauthors and by Julie L Rose. Goodin et al. develop an account of justice of discretionary control over one's time, so-called “discretionary time” which time you have autonomous control over (Goodin et al. 2008). Rose, in turn, argues that in order “to pursue any end other than meeting the necessities of life, one must have some amount of free time” (Rose 2021). These perspectives should be relevant to the discourse on urban justice and contribute to the theoretical diversification of the subject, which is a recent trend (Verlinghieri and Schwanen 2020). By bridging the related but rarely connected literature, I also strive to show that there are aspects of valuing travel time that are relevant to the philosophical understanding of temporal justice and urban policies.

The outline of this paper is as follows. In section 2, I set the stage by introducing the argument against the substitutability between time and money and the notion of accessibility as the metric of transport justice. I then, in section 3, present a case for why temporal aspects should be considered in urban justice, namely, the case on gender inequalities in travel time and travel behaviour. I provide an overview of time in transport economics, time poverty and temporal justice in section 4 and motivate why it is relevant to consider time in addition to accessibility in a framework for urban justice in section 5. Section 6 considers the advantages and the disadvantages of such an account. Section 7 concludes.

2 Setting the Stage

In her book *Free Time*, Julie L. Rose provides a summary of what political philosophers have said on the topic of time (Rose 2016). She argues that the so-called *time-money substitutability claim* is the reason why distributive theorists have not paid much attention to temporal resources (Rose 2016). If there is substitutability between time and money, it would be sufficient for a theory of justice

only to consider the distribution of income and wealth. However, Rose argues that the time-money substitutability claim is false because it rests on two false assumptions. The first is *the perfect divisibility of labor demand*, namely that “all individuals can freely choose to reduce their hours of paid work to the level they prefer” (Rose 2016). This, she claims, is empirically false. The second assumption is *the perfect substitutability of money and basic needs satisfaction*, i.e., all household and bodily basic needs can be met by purchasing goods or services. This is false since not all activities can be bought with money. Despite being true that for *some* necessary activities, one *can* substitute income for time, “it does not follow that a theory of justice is entitled to assume that citizens should make such a substitution” (Rose 2016). Rose further argues that under some social circumstances, hiring somebody to help meet one’s household or bodily needs presents a threat to civic equality.

Indeed there seems to be something special with time as a resource, good or commodity. Time allocation is a zero-sum game of sorts; time saved on one activity has to be allocated toward other activities immediately and cannot be saved due to constraints and characteristics of time (Nordström et al. 2019). Any changes in activity times must add up to zero. On the one hand, we all have equal amounts of time (seen from a day-to-day rather than a lifetime perspective). On the other hand, our circumstances and commitments concerning time differ. Broadly, time-use can be divided into five categories: (1) work time, (2) unpaid work, (3) childcare, (4) leisure and (5) personal care (Williams et al. 2016). And then there is ‘travel time’. Given the spatial structure of our cities, the mismatch of residential location, work and place of leisure often require us to move from one place to another. This movement, the necessary travel, takes time.

In transportation research, the need to travel is commonly seen as derived, i.e., travel is needed to participate in desired activities, such as work or leisure.¹ In this context, the interest in transportation justice has been rapidly growing (Martens 2006; Gössling 2016; Pereira et al. 2017). If the purpose of a transportation network is to provide access to desired activities, it is understandable that transport justice is commonly viewed as just access to such activities. Here, accessibility refers to the mere potential of access; “[h]aving accessibility to a wide number

¹ There have been arguments for more nuanced treatment of time in transport economics (Metz 2008), but transport is still primarily seen as a purely derived need in mainstream transport research. The fields of transport geography and urban studies, as well as work related to mobility planning, provide a substantially more complex framing of travel as mobility and the role of mobility for cities (Jensen 2009; Sheller and Urry 2006). However, the work in these fields rarely overlaps with the mainstream literature on transport justice which is taken as the basis for the argument in this paper. Therefore, it is outside the scope of this paper.

of jobs, shops, medical services or educational facilities is a value in itself, even if no actual use is made of these destinations, as it increases choice and thus future options" (Martens 2006). Geurs and van Wee put forward a more formal definition of accessibility as "the extent to which land-use and transport systems enable (groups of) individuals to reach activities or destinations by means of a (combination of) transport mode(s)" (Geurs and Van Wee 2004). They also identify four components of accessibility: land-use, transportation, temporal and individual. For the purposes of this paper, the *temporal* component is the most relevant. It is intended to reflect temporal constraints, such as the available time that individuals have to participate in activities (e.g., work, leisure and so on) and the availability of these activities at different times of the day. For example, a store is only accessible when it is open, so shopping has to be done during opening hours.

The components identified by Geurs and van Wee are, in turn, relevant when considering various measures of accessibility (Geurs and Van Wee 2004). The authors point out that while an accessibility measure ideally should include all components, this is rarely the case in practice. Measures of accessibility can broadly be divided into four categories: infrastructure based, location-based, person-based and utility-based (Geurs and Van Wee 2004). Infrastructure-based measures do not account for temporal components at all, they focus on the performance of the transport network, such as "average speed on the roads." Location-based measures do include temporal components in a general sense by measures such as "number of jobs within 30 minutes of travel from origin." Such measures hence reflect that the focus should be on access to activities within reasonable travel time (Banister 2008). However, the individual temporal constraints are not considered. Geurs and van Wee note that infrastructure-based measures are typically used in transport planning, while location-based measures are used in urban planning. The person-based measures, in turn, can be found in the field of space-time geography (Hägerstrand 1970) with accessibility considered at an individual level: "the activities in which an individual can participate at a given time" (Geurs and Van Wee 2004). Such measures arguably provide the best basis for taking individuals' temporal constraints into account, which is also reflected in some of the work that has considered gendered perspectives thus far (Kwan 1999; Schwanen et al. 2008; Scholten et al. 2012). As will become evident, the gender differences in travel patterns, behaviour and choices are well-studied and well-known. Still, little attention has been given to these differences in the context of transport justice. I will now use the case of gender inequalities in relation to urban transport. The case will illustrate that a justice account that does not consider time runs the risk of not providing the necessary basis for an analysis that would capture such inequalities.

3 Gender Inequalities in Relation to Transport and Time

Time, as hopefully has been established by now, is a scarce resource. How this resource is allocated differs between times, cultures and individuals. Time-use studies make it possible for scholars to observe differences in time use. In transportation, the differences in travel time use depend on travel behaviour, i.e., the choices about travel one makes. These choices subsequently influence the time that has to be allocated towards travel and the quality of this time. Differences in travel behaviour can lead to so-called temporal inequalities. For the purposes of this paper, I will discuss one type of such inequalities, namely gender inequalities. Such temporal inequalities are prominent in the realm of transport due to the gender differences in travel behaviour: “[w]omen in the developed world have different transport and travel patterns from men. Women are often involved in poorly resourced, highly complex, multiple purpose trips (trip chaining); men tend to make single-purpose trips at higher cost and using superior modes of transport” (Turner and Grieco 2000).² Women, as it often stands, face the challenge of coordination. They need to manage the work, household responsibilities and childcare, including taking the children to childcare (if outside of the home). As a result, women are time poor due to the disproportionate level of household tasks they are required to perform within present social structures (Turner and Grieco 2000). Turner and Grieco argue that public transport services are not designed to fit the needs of mothers with small children. Additionally, poor quality of public transport can contribute to time poverty. Their view is that the coordination challenges women face have been understudied, neglected and rarely regarded as a fit topic of interest for transport planners. Even though it has been argued that there is an increasing convergence in travel patterns on an aggregated level (Rosenbloom 2004),³ the differences in travel behaviour is a trend that seems to continue. A recent Swedish study that included data over a period of 30 years concluded that women in younger generations are more active in out-of-home non-work activities, and their trip chaining is more complex compared to men (Susilo et al. 2019). Additionally, attitudes among men and women about time aspects of transport differ: women have a more positive attitude towards public transport and are willing to accept longer travel times by public transport compared to car travel (Hjorthol 2001).

As noted above, women’s time-space commitments are often more complex

² See Loukaitou-Sideris (2020) for an overview of cultural, economic, physical and psychological barriers affecting women’s travel as well as gender differences in travel patterns.

³ Though Rosenbloom concludes that travel behaviour is still far from equal and trends towards convergence may be slowing (Rosenbloom 2004).

because women are generally more involved in managing domestic responsibilities than men. Such responsibilities and the travel associated with care work – i.e., “[u]npaid labour performed by adults for children or other dependents, including labour related to the upkeep of a household” – is neither commute nor strictly leisure and is understudied, at least from a value of time perspective (De Madariaga 2013). The standard is to value work time, commute time and leisure time differently, with time spent travelling for leisure valued the lowest. The travel time necessary to perform care work and the “weight” of mobility of care is systematically under-represented in urban transport (De Madariaga 2013). Sánchez de Madariaga argues that this unveils unconscious gender bias built into concepts, methods and theories since it undervalues care mobility and overvalues trips to the workplace. Additionally, short trips are not counted because they are not considered relevant for infrastructure policy-making, but women in their daily routines more frequently make such trips. In a recent paper, Loukaitou-Sideris argues that transportation policies still neglect and disregard women’s needs even though there are initiatives to include gender perspectives into every stage of the policy process (Loukaitou-Sideris 2020).

Besides the neglect of gender inequalities in urban transport policies, gender inequalities are also largely neglected in the mainstream literature on transport justice.⁴ Though there is recent work on, for instance, the gendered harassment and violence on city transit (Lubitow et al. 2020) and the need to recognise and examine particular mobility needs has been called for (Verlinghieri and Schwanen 2020), there is still a gap between the empirical work on temporal inequalities and differences in travel behaviour and the work on transport justice. This can partly be explained by the difficulty of capturing gender differences in a transport justice framework based on accessibility. If accessibility is the opportunity to reach destinations of interest, these opportunities are (at least hypothetically) the same for individuals that share place of residence and have the same access to means of transportation. Imagine a household where all adult family members have equal access to a car and shared financial resources, meaning it is equally costly for them to travel. On most accessibility accounts, their level of accessibility is equal. Given that we are not studying actual behaviour nor taking temporal constraints into account, no difference in accessibility can be observed. Even understanding accessibility as a capability and thus taking into account how personal characteristics such as gender shape interpersonal differences in accessibility levels requires

⁴ It ought to be noted that there is a literature on gendered mobilities, for example (Hanson 2010; Cresswell and Uteng 2016; Greed 2016; Rosenbloom 2004; Sheller 2016), among others. However, there seems to be a disconnect between this literature and the literature on transportation justice where the gender differences are rarely framed as a matter of justice.

a metric that would capture such differences (Pereira et al. 2017). Building more comprehensive accessibility measures, as is claimed to be necessary by Pereira et al., should mean including temporal constraints to enable a gender analysis.

In summary, the empirically evident differences in travel behaviour and consequently differences in travel time and the resulting temporal inequality should be a concern for urban justice. To include this perspective, two conditions are necessary. The first condition is a person-based measure of accessibility. This would capture interpersonal differences in general. Second, time-specific differences need to be captured, namely, differences in temporal constraints, commitments and circumstances. These conditions, and ultimately a broadened account would not replace but rather complement the accessibility account. I believe it is crucial to ensure that an urban justice framework supports gender analysis of accessibility and that it allows considerations of gendered time use. Hence, the answer to transport “justice of what” needs to include a temporal aspect. The neglect of travel time for carework and lack of attention to trip-chaining and short trips will not be solved by including time in a justice measure, but it would at least provide tools to carry out the necessary analysis.

4 Value of Time and Time as a Resource

To further develop and understand how to incorporate a temporal aspect into urban justice, I will in the following section introduce and briefly summarise relevant literature on time in transport economics, time poverty and temporal justice. Though much of the literature concerns notions of time and fairly similar themes, it rarely overlaps. Thus, I will in this section provide an overview to connect, or at least to provide enough background for the reader to identify similarities and differences.

4.1 Time in Transport Economics

Time is of great importance in transportation research since travel time savings are considered the key benefit of transportation improvements. Duration, understood as quantitate time, is the dominating aspect in transport economic models. It is also seen as the main component of the perception of the travel even though the conditions of the journey, i.e., the qualitative aspects of time, do matter to some degree. In transport economics, the qualitative aspects of time, such as under crowded conditions, are by definition seen as subjective, compared to the objective measure of clock time. However, this distinction between clock time and subjective conditions is not as clear-cut as it might seem. For example, Hjorthol (2001)

distinguished between quantitative time (clock time) and qualitative time, which relates to how the time is perceived. On her account, there can be a qualitative aspect to duration. Interestingly enough, transport economists see quantitative time as an objective measure even though some research indicates that commuters' response to time duration is non-linear (Johansson et al. 2003). So, while actual time is used when modelling expected travel behaviour, travel time can actually be perceived individually, not only concerning the qualitative aspects but concerning the quantitative aspects as well.⁵

Since the underlying assumption is that travel is a derived need, less travel and thus shorter travel time is preferable, all things considered. Willingness-to-pay is used to obtain a monetary value for travel time savings. This monetary value of time is then used in cost-benefit analysis of transport investments. But, the term "savings" can lead to misunderstandings (Daly and Hess 2020). Extensive academic and applied work has been carried out to derive the value of travel time. However, it is primarily used in appraisal, for example of infrastructure projects. In this context, what is being evaluated is the time differences between alternative futures. So, as Daly and Hess put it: "[t]he use of the term VTTS [i.e., value of travel time savings] is misleading, giving the reader the impression that it is being applied to situations in which individuals gain time as a result of transport policy" (Daly and Hess 2020). But this is not the case. Most transport investments generate long-term benefits. Furthermore, the transport system is constantly changing with changes accumulating over time (Börjesson and Eliasson 2014). Most importantly, the travellers and the travel option they face and the travel choices they make change over time: "[t]ravelers are gradually replaced, as people move, change jobs, are born and die" (Börjesson and Eliasson 2014). New travellers do not have the same reference points as previous travellers. Hence, it is not considered meaningful to think in terms of stable reference points for such long time horizons. Think of a new bridge built to connect two sides of a city. It will shorten the time it takes to travel from residences on one side of the river to jobs on the other side. Even if the current residents are time-poor, the bridge will take five years to build. New residents might move in in that time, and we can no longer know if they are also time-poor. Thus, taking the reference point to be someone who is time-poor and estimating benefits based on that reference point can wrongly indicate the 'actual' future benefits. As Daly and Hess write: "[w]hile of course it is to be hoped that do-something will lead to better time outcomes for most travellers than do-minimum, these differences are not experienced by travellers and so time gains

⁵ So-called distorted perception of travel time can be a reason for discrepancies between forecast models and actual behaviour of travellers (Peer et al. 2014).

or losses are not relevant” (Daly and Hess 2020).

The constant changes in urban transport, land-use and life circumstances lead to new travel patterns. These lead to gains and losses of time, unrelated to transport and not relevant for a particular appraisal at hand. To evaluate an investment is to compare two possible futures, one where no changes are made and one where a transport intervention is implemented. It is argued that “[f]ew if anyone will ever be in a position where they can actually compare the two alternative realities directly against each other. For the people living in one of the realized path, the other one will simply not exist; the fork in the road may have happened months, years or decades ago” (Börjesson and Eliasson 2014). Furthermore, the changes in accessibility lead to changes in land development and consequently to changes to the wider economy (P. Mackie et al. 2018). Hence, an improvement in accessibility is positive from a societal point for two reasons: (1) potential increase in individual’s welfare and (2) economic growth due to increased productivity (P. J. Mackie et al. 2001).

Since reference points are not considered meaningful,⁶ welfare evaluations have to be based on stable, long-term preferences. In the transport welfare economics-based evaluation framework, the marginal rate of substitution (such as the value of travel time savings) is the cornerstone. Additionally, when forecasting travel demand, a standard value of time that applies to each time instance and all amounts of travel time is required (Daly and Hess 2020).

It is not within the scope of this paper to comprehensively assess the validity of assuming that there is perfect substitutability between time and money for the purpose of urban transport investment appraisal. Neither is it to assess whether a stable rate of substitution exists. I do believe it is sufficient to point out that aside from obvious differences between time and money as such (Nordström et al. 2019), the argument put forward against the time-money substitutability claim by Rose is applicable here. Additionally, taking short-term willingness to pay data framed around short-term decisions and assuming this to be representative of long-term substitution rates has been criticised (Beck et al. 2017). All in all, it seems at least warranted to question whether it is justified to assume perfect substitutability between time and money, even in this particular context.

What is important to note here is the difference between what we fundamentally take to be true and what we believe to be good-enough assumptions for pragmatic reasons. The time-money substitutability claim might be a good-enough

⁶ However, even Börjesson and Eliasson note that reference-dependent evaluation can be relevant and justified in certain situations, for example, “in cases where for instance residents are compensated for increased noise due to a transport investment at a specific point in time” (Börjesson and Eliasson 2014).

assumption, at least given certain market conditions (such as a reasonable match between supply and demand on the labor market). It might also be a good-enough assumption for the specific purpose of transport investment appraisal. However, it can, at the same time, be false in the sense that there is no actual substitutability between time and money. From the perspective of justice, we need to consider whether the lack of actual substitutability should be accounted for in a justice framework. How does the assumption that time is a personal resource and a commodity that can be sold and bought at the market impact how we formulate an account of urban justice? As I will discuss further, this disconnect between a good-enough assumption and actuality also matters from a policy perspective. It does not imply that time is generally treated in transport economics unsatisfactorily; it might just be so in the particular context of distributive justice of transport resources.

4.2 Time Poverty

Time poverty or time scarcity and the connection between time use and wellbeing have been studied and considered at the policy level over the past two decades (Williams et al. 2016). It fits into a broader literature highlighting the need for an expanded set of measures for understanding the state of society beyond GDP and income poverty. Vickery first introduced the notion of time poverty in a paper where she argued that a benefits scheme that defined poverty in terms of money alone would create an equity problem (Vickery 1977). It has since been prevalent in the debate on inequalities in time-use and time pressure. At the core is the familiar assumption that money and time are not perfect substitutes. In support of this assumption, it has been found that material affluence does not lead to temporal affluence. Even when general wealth rises, people report that they feel time poor (Giurge et al. 2020). In theory, this is not particularly surprising - even if there were unlimited wealth, we would still have to decide on an allocation of time. Furthermore, time is inherently embedded into the mechanisms connecting low economic status and health (as well as other outcomes): you need time to engage in physical activity, to be able to study and to rest (Williams et al. 2016). Time poverty has been linked to lower well-being, physical health, and productivity.

A simplistic way of defining time poverty is to say that people are time-poor when they have too many necessary things to do and not enough time. From a scientific perspective, time poverty can be understood on a conceptual, methodological and empirical level (Giurge et al. 2020). Giurge et al. note that there is room for improvement in terms of clarity on the three levels, which is aligned with work by Williams et al., where they point out the lack of a unifying framework of

time poverty (Williams et al. 2016). For example, there are many definitions of time poverty. Time poverty can be understood as consisting of both quantitative and qualitative aspects of time, meaning concerning the quantity of time as well as the quality of time. Not only should one have sufficient time, one needs to have autonomy over time allocation. Going back to the difference between time and money, having “time” is substantially different from having “money” in the sense that there are many more constraints on time. While the quantitative aspect of time is to have time to allocate, the qualitative aspect can be said to involve such constraints. Measurements of time poverty can be both relative and absolute, with varying strengths and weaknesses for each type of measure. While clearer conceptualisation would ease further research on the subject and increase adaptation, scholars have noted the difficulty of categorising activities as necessary in contrast to discretionary (Harvey and Mukhopadhyay 2007). For time poverty to be a useful measure, more rigor must be applied, and systematic and transparent categorisation of time use activities when defining and calculating time poverty must be adopted (Williams et al. 2016). Williams et al. conclude by noting that policies that could benefit time allocation and especially benefit women have been largely unstudied. As will be discussed in section 5, the role the transport network plays for time allocation reserves be recognised. There is a clear connection between urban planning and time poverty.

4.3 Temporal Justice: (Value of) Free and Discretionary Time

It is surprising that philosophical interest in time as a commodity so far has been fairly modest, given that time is necessary for almost everything we do. The notion of temporal justice stems from the view that temporal inequalities track an important dimension of how people can be better or worse off. The interest in the normative significance of temporal inequalities has mostly concerned inequalities in amounts of free time (Rose 2016; Goodin et al. 2008). Goodin considers time, or rather, discretionary time necessary in the same way as “self-respect” is the primary of primary goods in a Rawlsian sense (Goodin 2010). Without self-respect, other primary goods cannot be made use of. Time functions similarly; it is needed to pursue any type of project or plan.

As a starting point, Eriksson et al. put forward a hypothesis: that people’s subjective satisfaction is (among other things) a function of how much autonomy they have over the allocation of their time (Eriksson et al. 2007). Autonomy, meaning freedom and capability to choose, is on this account correlated with quality of life. All things equal, having more control is more satisfying than having less control. So, control matters for instrumental as well as for intrinsic reasons. In their

work, and consequently, in the work of Goodin, discretionary time is defined as the amount of time left after people have spent the strictly necessary time in three dimensions: paid labor, unpaid household labor and personal care (Goodin 2010). Eriksson et al. and Goodin then define “strictly necessary” in the three dimensions. For example, strictly necessary time in paid labor is the time needed to earn enough to have a poverty-level income. Even though people usually spend more time doing paid labor than “strictly necessary” striving for a above poverty-level income, anything above the ‘strictly necessary’ threshold is considered a choice. Hence, it can be seen as an exercise of autonomy (Eriksson et al. 2007). From a justice perspective, it should be of interest to consider how policies and practices affect differences in temporal autonomy of different groups of people.

Similarly, Rose argues that free time should be regarded as a necessary resource or opportunity, alongside money and other opportunities that are commonly considered in theories of distributive justice (Rose 2016). Furthermore, she argues that citizens have legitimate claims to fair shares of free time. These claims are grounded in the liberal egalitarian theories of justice where it is believed that “citizens have legitimate claims to fair shares of the resources that are generally required to exercise their liberties and opportunities” (Rose 2016). Rose continues: “[t]o exercise one’s right to vote, to participate in a town meeting, or to join in a protest, one must have not only the means to travel to the polls, the town hall and the public square, one must also have the free time to exercise these liberties” (Rose 2021). Thus, time is necessary for autonomy. Time is also needed in order to access to most fundamental liberal rights.

In the above example, the time it takes to exercise these liberties has to (arguably) include travel time. However, travel time is rarely explicitly discussed. When discussing what governments can do to close the gap between those that have less discretionary time (such as lone mothers) and those that have more discretionary time (such as members of a dual-earner household with no kids), Goodin considers measures such as tax-transfers and child-care systems as well as influencing the terms of divorce (Goodin 2010). Yet, as is discussed in Section 3, travel behaviour and having to spend (more) time on inconvenient travel is a clear ‘time trap’ for women that are already pressed for time. So, from an urban planning and policy perspective, easing travel and focusing on travel time should also be considered an alternative. After all, transport interventions already set out to shorten travel time (in theory, not in practice).

Tyssedal argues that it is a mistake for a theory of temporal justice to only consider shares of time, the quality of time has to be considered as well (Tyssedal 2021). He argues that the notion of free time does not sufficiently track valuable time, that time is a resource for which units differ in use-value. This is well-aligned

with the accounts that argue for a distinction between the quantity of time and the quality of time. From a policy perspective, closing the gap in discretionary time and taking women's more complex travel patterns into account has to include qualitative aspects of travel time.

5 Why Consider Time in a Framework for Transport Justice?

As made evident by the case of gender inequalities presented in section 3, not considering time as a resource is an obvious limitation of any account of urban justice based solely on accessibility with no temporal component. Although time or the value of time savings has a prominent place in transport economics and transport appraisal, it has not been given much attention in the discourse on urban justice. Technically, saved time is transformed into increased accessibility,⁷ based on which most accounts of transport justice are framed. But as has been explained in section 4.1, the time savings do not imply shorter travel times for individuals. The standard view in transport economics is that what is done with the saved travel time doesn't matter:

Of course, on a strict constructionist view, it is not possible to save time, only to transfer it between higher valued and lower valued activities. But similar considerations apply to many other consumer decisions. People buy electric hedge trimmers in order to reduce the time and physical effort of trimming their garden hedge. If they then invest part of the time saving in trimming their next door neighbour's hedge, this does not deny the value of investing in the hedge trimmer. Similarly, whether or not people choose to take out part or all of a travel time saving in travelling to/from a preferred location is very relevant to modelling but does not undermine the concept of travel time values as a proxy for the value of enhanced accessibility. (P. Mackie et al. 2018)

This quote is a response to a critique of accessibility relying on people spending their saved travel time on additional travel.⁸ It illustrates that the commodity "time" in transport is not actual time as it might seem but instead a proxy for accessibility. And as has been discussed in section 2, while there is a temporal

⁷ The accessibility is consequently seen as a proxy for economic growth since the "saved" time can spent productively, such as on additional work.

⁸ The argument is that time savings are problematic as a measure of benefits of transport investment since they do not sufficiently take changes in land use into account (Metz 2017).

component of accessibility – you need time to take advantage of accessibility – few accessibility measures include this component. I find this somewhat problematic. Whether we actually travel less in the long run is disputed. But arguably, a transport intervention might make it possible for some to be able to spend less time commuting. Shouldn't the temporal circumstances of these travellers matter? And shouldn't it matter what gets done with the extra time? Furthermore, while it is the case that large infrastructure projects indeed take a lot of time and people change during the build, other interventions are not as time-consuming. Such interventions can also concern qualitative aspects of time. The distribution of such interventions seemingly should be included in a justice framework for transport. Given how essential time allocation is in everyday life and significant impact of the transportation network on the urban environment, connecting these aspects is both relevant and needed.

It could be argued that using willingness to pay as it is done in practice in transportation economics will reflect a time scarcity or even poverty. If you have very little free time, you would be willing to pay more for shorter travel time. Theoretically, the value of a travel time "saving" depends on the opportunity value of time, meaning the value that could be attained if the travel time was used for some other activity. The less available time one has, the higher the opportunity value. In turn, the direct value of travel time depends on the comfort, productivity or enjoyment of the trip. It is measured compared to the value of being at the destination. This should cover the qualitative aspect of time: if the travel time is productive or, enjoyed, one is willing to spend less money to shorten it. For example, in Swedish data, the value of travel time is higher for those that are employed and those that have children; assumingly, they have less free time (Börjesson and Eliasson 2014). But in practice, these potential differences are not reflected in the appraisal process, for obvious reasons. After all, the goal is a stable, long-term rate of substitution between time and money. While willingness to pay theoretically can reflect time-poverty at a particular point, the intention is to attain a substitution rate free from such influence. But such an intention might not give us the proper tools to analyse how and if the benefits of an investment are unequally divided between those that have more time and those that have less. Additionally, it can be questioned whether aspects of time can ever be meaningfully unconnected with the social context within which they exist (Hjorthol 2001).

The same study as referenced above found no gendered differences in the value of time (Börjesson and Eliasson 2014) even though there is empirical evidence of gendered differences in travel patterns and in time use as such. This could indicate that there are elements of time, time-scarcity and time-use that are not reflected by a willingness to pay measure. In that case, it seems relevant

to ask what these elements are and if they are significant from the perspective of justice.

Lastly, there is the matter of time and status. Who we make wait matters. For example, who gets priority at a signal crossing clearly indicates who is important (Hjorthol 2001). Having to wait for the bus can be experienced and thus understood as status degradation, especially since the passenger has very little control over the wait, both from the perspective of duration and environment. ITC solutions that indicate the time until the transport service arrives can give a (arguably false) sense of control and put the part of the responsibility on the traveler. If you know that the bus will arrive in 7 minutes, you can use the waiting time more efficiently. Perhaps some information is better than no information at all but it does not guarantee that the bus will actually arrive in 7 minutes, nor does it allow the traveler to spend the time however s/he wants due to constraints on the “commodity” time. In transport economics, the burden of waiting is somewhat reflected in waiting time being valued higher than travel time. So, shortening waiting time should yield higher societal benefits than shortening travel time. But again, this does not necessarily provide the right tools to analyse who is made to wait. Citizens with resources can avoid queues by buying themselves free and letting others do the waiting. This is the case for “pay-as-you-go” speedways and, to a certain extent, congestion charges, which are increasingly popular interventions in congestion-heavy cities. Either you pay and are granted smoother travel with less congestion and consequently, less travel time, or you cannot afford the charge and are left with a cheaper but slower alternative. You are made to wait. The wait can be seen to reflect the status of the traveller. As Hjorthol (2001) argues, having the economic resources to choose one’s means of transport results in gaining more temporal and spatial flexibility. In a sense, this also implies greater autonomy.

6 Implications of considering Time in an Urban Justice Framework

In the previous section it is argued that from a philosophical standpoint, an accessibility-based metric of justice is insufficient. Although there are person based measures of accessibility that can account for individuals’ temporal constraints, such measures are rarely used in transport economics. Additional consequences of including a temporal component in a justice framework are developed in this section.

6.1 Further Advantages

There are additional advantages of considering temporal circumstances besides the reasons considered in section 5. Assume that there are two types of transport-related interventions: one that leads to shorter travel times and consequently so-called time reductions and one that improves the conditions of travel without making it shorter. The second type of intervention does arguably not impact the accessibility of the traveller. Technically, if the time is perceived to be less burdensome, which it could be with improved conditions, the willingness to pay to spend less time in such conditions would be lower.⁹ So, the improvement is measurable given the established practices. However, it is unclear to which extent such an improvement would contribute to economic growth if no time is freed for other value-creating activities. If no measurable increase in accessibility is observed, there is no impact on transport justice considered solely based on accessibility. A justice metric encompassing the aspect of time would, on the other hand, enable us to consider the justice of the distribution of such improvements. Additional advantages of including some operationalisation of time as part of a transport justice framework are discussed below.

As noted above, a metric based on time would allow for a measure of both duration and quality of time. Research indicates that the qualitative side of transport, especially public transport, is significant: “[t]he positive VTAT for public transport is a strong indication for the importance of travel conditions, in turn suggesting that improvements in travel conditions of public transport might be as important as investing in shorter travel times” (Hössinger et al. 2020). The actual duration could be discounted based on various characteristics, such as if the journey is safe, quiet, if the mode is well ventilated and so on. Aspects of noise, pollution and risk can be incorporated into the notion of transport justice in a way that is more intuitive than in an accessibility-based framework.

While the value of time is understood to encompass whether or not it can be spent productively since this is something willingness-to-pay would reflect, no consideration is usually given to how travel time impacts the time available for activities that cannot be done while travelling. Such activities include work that cannot be done remotely, as well as unpaid labour such as childcare and cooking. Some leisure activities also cannot be carried out remotely, such as playing tennis or the piano. Usually, time allocation outside of travel does not impact the value of travel time savings since how the saved time is actually spent is not seen as

⁹ In this case, it might also impact accessibility. If the trip conditions enable the traveller to spend the time more productively and thus “save” time, the saved time can be seen as an increase in accessibility. However, most measures of accessibility would not account for such a change.

relevant. However, a metric that included time could potentially be more holistic and leave room to consider such aspects temporal justice.

One perspective is that the benefit of shorter travel time for someone who can work remotely and can spend the commuting time on work, for example by travelling by train or even bus, is arguably less than for someone who is not able to spend the travel time productively. Though technology (if it is accessible and affordable) enables most to do “something” with one’s travel time, there are tasks that cannot be performed while travelling. Many of these tasks are so-called care work or unpaid labour, for example, child-care and household tasks. You cannot cook or clean on your way to work. Notably, a shift to self-driving cars might enable those who commute by car and can work remotely to re-allocate work time to the commute and thus be less at the workplace. However, most care-work will by its nature not be affected by the “automated vehicles revolution.” Also, when the time is saved matters. For example, if my trip consists of two parts with a transfer in-between. Reducing travel time is only beneficial if it is in the beginning or end of the journey. If it only affects one leg of the journey and results in longer waiting time while transferring – it’s probably worthless (or worse, since waiting time is valued higher than regular travel time, so a journey with shorter travel time and longer waiting time has a higher generalised cost). Since time cannot be accumulated and has various other characteristics that make it less fungible, “saved” time must be re-allocated to other activities immediately. The particular characteristics of time are also the reason why certain tasks do not only require time; they also require one to be at a particular location, such as many care-work tasks do (you cannot cook dinner without being in the kitchen). So, “where” the saved time is matters and as well as the length of it. Small time savings are reasonably worth less because they are more difficult to re-allocate to tasks that require larger chunks of time.

6.2 Disadvantages

Not all implications of considering time as a component of a justice metric for transport are beneficial, there are also possible disadvantages. The first disadvantage is a practical one, namely the difficulty of operationalisation of a metric with a temporal component. To consider potential time savings as a result of a particular transportation intervention, it is in transport economics assumed to be enough to know the length of the saved time, the number of travellers that benefit from the saving, the mode they travel by and the purpose of their trip (whether the travel is for work, commute or leisure). If the time saving is to be valued differently based on whether it benefits those that are time-poor or if the saved time is put toward

particular use, more has to be known about those affected by the intervention. Assuming we will never pinpoint the exact individuals affected by the intervention, estimates and generalisations have to be made. For example, the difficulty in valuing small time savings lower than longer ones arises from not knowing the full door-to-door journey of a passenger on a particular leg of a trip. If part of a road is widened,¹⁰ it will benefit both those for whom it is part of a quick journey and those that travel significantly longer. As it is phrased in transport economics, the argument is that we cannot know the total length of the journey for each traveller. The composition of travellers on a particular link changes each day. Hence, we cannot know if the saving is significant in relation to their total journey or not. This argument is similar to the argument that we cannot know if the individuals that eventually benefit from the intervention are time-poor or what they use their saved time on.

The second disadvantage is that if observed travel time is considered and time is seen as a resource, we cannot know if the way the time is spent is due to personal preferences or external circumstances. Simply put, we do not know whether the observed travel time is due to taste or need. While it has been found that women tend to travel more by public transport and reduce their car travel more than men, even when they have easy access to a car, we do not know if the gendered differences in travel behaviour are due to taste or external circumstances. Mechanisms that could explain a difference in behaviour include prevalent ecological norms and sustainability goals as well as women's less ingrained car habits (Matthies et al. 2002). Distinguishing between choice and can be a challenge: "[w]hile differences in activity and trip patterns (e.g., trip chain complexity, trip distances) may explain mode choice, the reverse may also play a role, i.e., differences in mode choice may help explain variance in activity and trip patterns" (Scheiner and Holz-Rau 2012).

However, the same challenge (i.e., distinguishing between choice and must) can arise when using other person-based measures of accessibility. After all, the primary factor that affects accessibility is one's place of residence. By choosing place of living, I also choose the level of access I find acceptable (mind the caveats here: assuming I even have a choice and the levels of access do not drastically change by factors outside of my control, such as closings of public transport services). But reasonably, even if I count on certain services to be available when moving to a suburban, I make some sort of choice regarding accessibility compared to if I chose to live in the middle of a busy city center.

¹⁰ Assume for argument's sake that widening the road leads to less congestion and thus quicker journeys, although this mechanism has been contested due to the induced traffic generated by such an improvement.

7 Conclusions

Many aspects of urban life are connected through travel. It is both expected and accepted that city living means spending time on travel. In a sense, transportation needs result from a strive for efficiency, with a concentration of services seemingly more efficient. From the perspective of a city planner, it can be seen as more cost-efficient, with fewer yet larger playgrounds than many smaller ones. However, this results in longer times for families to get to a playground since not everyone can live next to one of the large ones. The small, local shops have been replaced by supermarkets and malls where we efficiently can do all our shopping at once. Still, any errand requires a substantial drive from the residential area. This mismatch can be traced back to seeing speed instead of proximity and connectivity as means to achieve accessibility. On the one hand, transport projects that lead to shorter travel time seem to build on the assumption that is less necessary travel time is good. The same assumption can be found in the literature on free and discretionary time. On the other hand, time savings in transportation economics only serve as a proxy for expected economic growth. Whether travellers actually spend less time travelling (or just if their travel time improves) is not considered. Nor are the temporal circumstances of those affected considered. Furthermore, the prevailing metric of justice, i.e., accessibility, does not leave room for analysis to highlight the temporal aspects of justice. What you can theoretically access is quite different from what you have time to access, especially if you are a time-pressed single parent. Thus, the time the travel time has on everyday life should not go unnoticed. Urban planning could look differently if considering citizens' distinct claims to time. At the very least, it is time to put time higher on the planning and policy agenda.

References

- Banister, David. 2008. "The Sustainable Mobility Paradigm." *Transport Policy* 15 (2): 73–80. <https://doi.org/10.1016/j.tranpol.2007.10.005>.
- Beck, Matthew J., Stephane Hess, Manuel Ojeda Cabral, and Ilka Dubernet. 2017. "Valuing Travel Time Savings: A Case of Shortterm or Long Term Choices?" *Transportation Research Part E: Logistics and Transportation Review* 100 (C): 133–143. <https://doi.org/10.1016/j.tre.2017.02.001>.

- Bin, Elisa, Claudia Andruetto, Yusak Susilo, and Anna Pernestål. 2021. "The Trade-Off Behaviours between Virtual and Physical Activities during the First Wave of the COVID-19 Pandemic Period." *European Transport Research Review* 13 (1): 1–19. <https://doi.org/10.1186/s12544-021-00473-7>.
- Börjesson, Maria, and Jonas Eliasson. 2014. "Experiences from the Swedish Value of Time Study." *Transportation Research Part A: Policy and Practice* 59 (C): 144–158. <https://doi.org/10.1016/j.tra.2013.10.022>.
- Cresswell, Tim, and Tanu Priya Uteng. 2016. "Gendered Mobilities: Towards an Holistic Understanding." In *Gendered Mobilities*, edited by Tim Cresswell and Tanu Priya Uteng, 15–26. London: Routledge. <https://doi.org/10.4324/9781315584201-6>.
- Daly, Andrew, and Stephane Hess. 2020. "VTT or VTTs: A Note on Terminology for Value of Travel Time Work." *Transportation* 47 (3): 1359–1364. <https://doi.org/10.1007/s11116-018-9966-4>.
- De Madariaga, Inés Sánchez. 2013. "From Women in Transport to Gender in Transport: Challenging Conceptual Frameworks for Improved Policymaking." *Journal of International Affairs* 67 (1): 43–65. <http://www.jstor.org/stable/24461671>.
- Eriksson, Lina, James Mahmud Rice, and Robert E. Goodin. 2007. "Temporal Aspects of Life Satisfaction." *Social Indicators Research* 80 (3): 511–533. <https://doi.org/10.1007/s11205-006-0005-z>.
- Geurs, Karst T., and Bert Van Wee. 2004. "Accessibility Evaluation of Landuse and Transport Strategies: Review and Research Directions." *Journal of Transport Geography* 12 (2): 127–140. <https://doi.org/10.1016/j.jtrangeo.2003.10.005>.
- Giurge, Laura M., Ashley V. Whillans, and Colin West. 2020. "Why Time Poverty Matters for Individuals, Organisations and Nations." *Nature Human Behaviour* 4 (10): 993–1003. <https://doi.org/10.1038/s41562-020-0920-z>.
- Goodin, Robert E. 2010. "Temporal Justice." *Journal of Social Policy* 39 (1): 1–16. <https://doi.org/10.1017/S0047279409990225>.
- Goodin, Robert E., James Mahmud Rice, Antti Parpo, and Lina Eriksson. 2008. *Discretionary Time: A New Measure of Freedom*. Cambridge: Cambridge University Press.
- Gössling, Stefan. 2016. "Urban Transport Justice." *Journal of Transport Geography* 54 (1–9). <https://doi.org/10.1016/j.jtrangeo.2016.05.002>.

- Greed, Clara. 2016. "Are We There Yet? Women and Transport Revisited." In *Gendered Mobilities*, edited by Tanu Priya Uteng and Tim Cresswell, 257–268.
- Hägerstrand, Torsten. 1970. "What about People in Regional Science?" *Regional Science Association* 24 (1): 6–21. <https://doi.org/10.1007/BF01936872>.
- Hanson, Susan. 2010. "Gender and Mobility: New Approaches for Informing Sustainability." *Gender, Place & Culture* 17 (1): 5–23. <https://doi.org/10.1080/09663690903498225>.
- Harvey, Andrew S., and Arun K. Mukhopadhyay. 2007. "When Twenty-Four Hours Is Not Enough: Time Poverty of Working Parents." *Social Indicators Research* 82 (1): 57–77. <https://doi.org/10.1007/s11205-006-9002-5>.
- Hjorthol, Randi. 2001. "Gendered Aspects of Time Related to Everyday Journeys." *Acta Sociologica* 44 (1): 37–49. <https://doi.org/10.2307/4194860>.
- Hössinger, Reinhard, Florian Aschauer, Sergio Jara-Díaz, Simona Jokubauskaite, Basil Schmid, Stefanie Peer, Kay W. Axhausen, et al. 2020. "A Joint Time-Assignment and Expenditure-Allocation Model: Value of Leisure and Value of Time Assigned to Travel for Specific Population Segments." *Transportation* 47 (3): 1439–1475. <https://doi.org/10.1007/s11116-019-10022-w>.
- Jensen, Ole B. 2009. "Flows of Meaning, Cultures of Movements – Urban Mobility as Meaningful Everyday Life Practice." *Mobilities* 4 (1): 139–158. <https://doi.org/10.1080/17450100802658002>.
- Johansson, Börje, Johan Klaesson, and Michael Olsson. 2003. "Commuters? Non-linear Response to Time Distances." *Journal of Geographical Systems* 5 (3): 315–329. <https://doi.org/10.1007/s10109-003-0111-2>.
- Kwan, Mei-Po. 1999. "Gender and Individual Access to Urban Opportunities: A Study Using Space–Time Measures." *The Professional Geographer* 51 (2): 210–227. <https://doi.org/10.1111/0033-0124.00158>.
- Loukaitou-Sideris, Anastasia. 2020. "A Gendered View of Mobility and Transport: Next Steps and Future Directions." In *Engendering Cities*, 19–37.
- Lubitow, Amy, Miriam J. Abelson, and Erika Carpenter. 2020. "Transforming Mobility Justice: Gendered Harassment and Violence on Transit." *Journal of Transport Geography* 82:102601. <https://doi.org/10.1016/j.jtrangeo.2019.102601>.

- Mackie, Peter, Richard Batley, and Tom Worsley. 2018. "Valuing Transport Investments Based on Travel Time Savings – a Response to David Metz." *Case Studies on Transport Policy* 6 (4): 638–641. <https://doi.org/10.1016/j.cstp.2018.08.002>.
- Mackie, Peter J., S. Jara-Diaz, and A.S. Fowkes. 2001. "The Value of Travel Time Savings in Evaluation." *Transportation Research Part E: Logistics and Transportation Review* 37 (2-3): 91–106. [https://doi.org/10.1016/S1366-5545\(00\)00013-2](https://doi.org/10.1016/S1366-5545(00)00013-2).
- Martens, Karel. 2006. "Basing Transport Planning on Principles of Social Justice." *Berkeley Planning Journal* 19 (1): 1–17. <https://doi.org/10.5070/BP319111486>.
- Matthies, Ellen, Silke Kuhn, and Christian A. Klöckner. 2002. "Travel Mode Choice of Women: The Result of Limitation, Ecological Norm, or Weak Habit?" *Environment and Behavior* 34 (2): 163–177. <https://doi.org/10.1177/0013916502034002001>.
- Metz, David. 2008. "The Myth of Travel Time Saving." *Transport Reviews* 28 (3): 321–336. <https://doi.org/10.1080/01441640701642348>.
- . 2017. "Valuing Transport Investments Based on Travel Time Saving: Inconsistency with United Kingdom Policy Objectives." *Case Studies on Transport Policy* 5 (4): 716–721. <https://doi.org/10.1016/j.cstp.2017.07.003>.
- Nordström, Maria, Sven Ove Hansson, and Muriel Beser Hugosson. 2019. "Let Me Save You Some Time...on Valuing Travelers' Time in Urban Transportation." *Essays in Philosophy* 20 (2): 206–229. <https://doi.org/10.7710/1526-0569.1640>.
- Peer, Stefanie, Jasper Knockaert, Paul Koster, and Erik T. Verhoef. 2014. "Over-Reporting vs. Overreacting: Commuters' Perceptions of Travel Times." *Transportation Research Part A: Policy and Practice* 69:476–494. <https://doi.org/10.1016/j.tra.2014.07.005>.
- Pereira, Rafael H. M., Tim Schwanen, and David Banister. 2017. "Distributive Justice and Equity in Transportation." *Transport Reviews* 37 (2): 170–191. <https://doi.org/10.1080/01441647.2016.1257660>.
- Rose, Julie L. 2016. *Free Time*. Princeton: Princeton University Press.
- . 2021. "Rationing with time: time-cost ordeals' burdens and distributive effects." *Economics and Philosophy* 37:50–63. <https://doi.org/10.1017/S0266267120000103>.

- Rosenbloom, Sandra. 2004. "Understanding Women's and Men's Travel Patterns." Conference on Research on Women's Issues in Transportation.
- Scheiner, Joachim, and Christian Holz-Rau. 2012. "Gendered Travel Mode Choice: A Focus on Car Deficient Households." *Journal of Transport Geography* 24:250–261. <https://doi.org/10.1016/j.jtrangeo.2012.02.011>.
- Scholten, Christina, Tora Friberg, and Annika Sandén. 2012. "Re-reading Timegeography from a Gender Perspective: Examples from Gendered Mobility." *Tijdschrift voor economische en sociale geografie* 103 (5): 584–600. <https://doi.org/10.1111/j.1467-9663.2012.00717.x>.
- Schwanen, Tim, Mei-Po Kwan, and Fang Ren. 2008. "How Fixed Is Fixed? Gendered Rigidity of Space-Time Constraints and Geographies of Everyday Activities." *Geoforum* 39 (6): 2109–2121. <https://doi.org/10.1016/j.geoforum.2008.09.002>.
- Shaw, Caroline, Marie Russell, Michael Keall, Sara MacBride-Stewart, Kirsty Wild, Dory Reeves, Rebecca Bentley, et al. 2020. "Beyond the Bicycle: Seeing the Context of the Gender Gap in Cycling." *Journal of Transport & Health* 18:100871. <https://doi.org/10.1016/j.jth.2020.100871>.
- Sheller, Mimi. 2016. "Gendered Mobilities: Epilogue." In *Gendered Mobilities*, 271–280. London: Routledge.
- Sheller, Mimi, and John Urry. 2006. "The New Mobilities Paradigm." *Environment and planning A* 38 (2): 207–226. <https://doi.org/10.1068/a37268>.
- Shirgaokar, Manish, and Kelly Lanyi-Bennett. 2019. "I'll Have to Drive There: How Daily Time Constraints Impact Women's Car Use Differently than Men's." *Transportation* 47:1–28. <https://doi.org/10.1007/s11116-018-9969-1>.
- Susilo, Yusak, Chengxi Liu, and Maria Börjesson. 2019. "The Changes of Activity-Travel Participation across Gender, Life-Cycle, and Generations in Sweden over 30 Years." *Transportation* 46 (3): 793–818. <https://doi.org/10.1007/s11116-018-9868-5>.
- Turner, Jeff, and Margaret Grieco. 2000. "Gender and Time Poverty: The Neglected Social Policy Implications of Gendered Time, Transport and Travel." *Time & Society* 9:129–136. <https://doi.org/10.1177/0961463X00009001007>.
- Tyssedal, Jens Jørund. 2021. "The Value of Time Matters for Temporal Justice." *Ethical Theory and Moral Practice* 24 (1): 183–196. <https://doi.org/10.1007/s10677-020-10149-1>.

- Verlinghieri, Ersilia, and Tim Schwanen. 2020. "Transport and Mobility Justice: Evolving Discussions." *Journal of Transport Geography* 87:102798. <https://doi.org/10.1016/j.jtrangeo.2020.102798>.
- Vickery, Clair. 1977. "The Time-Poor: A New Look at Poverty." *The Journal of Human Resources* 12:27-48. <https://doi.org/10.2307/145597>.
- Williams, Jason, Yuta Masuda, and Heather Tallis. 2016. "A Measure Whose Time has Come: Formalizing Time Poverty." *Social Indicators Research* 128 (1): 265-283. <https://doi.org/10.1007/s11205-015-1029-z>.