



Right to the city and human mobility transition: The case of São Paulo

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ABSTRACT

This paper discusses the question about the right to the city and the influences of the dispute for the city on urban mobility, using São Paulo, Brazil's largest city, as a study case. We present the concept of the human mobility transition, which relates to the idea of large shifts in human mobility dynamics that have affected the constitution and development of urban settlements, the structure of the urban form, and social networks. We then argue that the latest stage of this transition is heavily influenced by the fact that cities have become both the arena for and the object of the political struggle between unsustainable economic growth and sustainable human development. Health consequences of the dispute for the city in the context of urban mobility are discussed. Final section uses the case of São Paulo to illustrate these arguments, focusing on changes that occurred from the end of the 19th century onwards.

1. Introduction

In June 2013, millions of people occupied the streets of over 100 Brazilian cities to protest against urban living conditions that jeopardize basic human rights (BBC News, 2015), such as the right to health, education, leisure, housing and freedom of movement (United Nations, 2015). Our understanding is that they were claiming their right to the city, through democratic management, social organization, and the full exercise of citizenship (Harvey, 2003; Sorensen & Sagaris, 2010). The current urban forms¹ of Brazilian cities, as in most of other cities around the globe, are not random and are not natural (Brenner, Marcuse, & Mayer, 2009). They are the result of changes largely driven over the last century by multiple forces, including financial institutions, commercial corporations, and developers (Lynch, 1984; Vitali, Glattfelder, & Battiston, 2011), usually in partnership with the city authorities (Harvey, 2011; Jacobs, 2000; Sager, 2011). These forces work to modify and transform the urban form in order to fulfil their economic interests, for example through the lobbying of city councils to influence urban plans and land use regulations. This shapes everyday

city life, often with a negative impact on quality of life, liveability, natural environment, and health (Jacobs, 2000; Karanikolos et al., 2013; Rydin et al., 2012; Sorensen & Okata, 2010).

This type of urban development and urbanization has become a key mechanism for capital reinvestment (Harvey, 2011), with social segregation as a key mechanism that modifies urban form (Villaça, 1998). This seems to occur in all capitalist contemporary metropolises, being more visible or stronger in more unequal cities (Villaça, 1998). The concentration of money and power in private hands (Piketty, 2014; Vitali et al., 2011), enables the wealthiest institutions, corporations and individuals to dominate cities' political systems and thus to dominate people's everyday living, mainly through dispossession and debt (Harvey, 2011). In response to these forces, many social movements have emerged in Brazil/across the globe. They include, among others, the Healthy Cities, the World Social Forum, the Homeless People's Movement, the World Bike Forum, La Via Campesina, Occupy, and the Free Pass Movement. There is a growing international awareness and approximation of each movements' agenda and coordinated efforts, reinforcing the idea that “only a powerful social movement based on

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¹ Urban form is understood here as the “spatial arrangement of persons doing things, the resulting spatial flows of persons, goods and information, and the physical features which modify space in some way significant to those actions” (Lynch, 1984)(page 84)

collective action at every level of society will deliver planetary health and, at the same time, support sustainable human development” (Whitmee et al., 2015). In this direction, Planetary Health (Whitmee et al., 2015) and Integral Ecology (Pope Francis, 2015) are concepts that highlight in the urban context the strong interdependence between human health and human civilization with flourishing natural systems.

The catalyst for the protests in Brazil in 2013 was the rise in public transport fares in Sao Paulo, however demonstrations were led by a network of social movements, not all directly dealing with transport issues (Harvey et al., 2013). This happened in a city with a long tradition of uprisings against the quality of the public transport system, in a country which was the first to include the right to the city in its Constitution in 1988 (UN-Habitat, 2010).

Cities have become both the arena for and the object of the political struggle between unsustainable economic growth and sustainable human development (Harvey et al., 2013; Lynch, 1984; Sorensen & Okata, 2010). At the same time, since cities are the most radical experience of humankind into transforming its own reality, any discussion around the cities we want for the future is now intrinsically linked to the questions of which society we aspire to become (Harvey, 2003) and which vision of a just city inspires us (Fainstein, 2010).

The right to the city draws together many rights usually dealt with separately, working as a common cause for different and yet interlinked social determinants of healthy living (Sorensen & Sagaris, 2010). This paper focuses on the issue of mobility within the city, with special attention to Brazil's largest city, São Paulo, which with its suburbs in 2014 had approximately 20 million inhabitants. This paper examines the history of urban and transport development of São Paulo through a critical lens, more commonly found within the contemporary human geography and urban sociology disciplines but largely missing from contemporary transport literature. By bringing those disciplines together through a Marxist critique of the traditional neoliberal thinking that currently pervades transport decision-making (Gössling, 2016; Imbroscio, 2012; Verlinghieri & Venturini, 2018), we aim to contribute to the discussion on how some of the driving forces that shape cities and mobility systems influence both human mobility and health in the urban context.

2. Mobility transition

The re-creation of cities to promote the so-called urban advantage in health has to take into account the non-linear transitions that are occurring across urban settings, the mechanisms through which cities are being shaped, and the diversity and underlying tensions hidden within each of them (Harvey, 2003; Rydin et al., 2012). Since urban form largely determines human motion and is determined by it, understanding the constraints of human mobility is a key step to transform our cities. The current dispute for the city can be placed on the last stages of the human mobility transition.

The concept of mobility transition relates to the idea of large shifts in human mobility dynamics that have influenced the constitution and development of urban settlements, the structure of the urban form, and the formulation of people's social networks and everyday interactions. Despite the challenges of characterizing the time-resolved location of individuals and populations in the past, the mobility transition throughout human existence can be understood in five broad stages: 1) Random Walk; 2) Sedentarization; 3) Auxiliary forms of transport; 4) Acceleration and Immobility; and 5) Human urbanism (more details in Box 1 at the end of this section).

From the random walk for food procurement among Palaeolithic hominids to the intensification of motorization and extensive use of non-renewable energy sources nowadays, the economic, political and demographic forces driving the human mobility transition are the same as those driving shifts in mortality, fertility and morbidity patterns. This is mainly due to changes in the everyday practices related to diet, physical activity, energy use and environmental exposures. Since food

and human movement are heavily interconnected, this mobility transition can be linked with the nutrition transition (Popkin, 1993) in many ways, providing an important framework to understand trends in human motion over history. Just as in the nutrition transition, the pace of changes in mobility has accelerated in more recent decades through the actions of wealthy minorities who privatize and ‘commodify’ everyday living. The mobility transition stages are synthesized in Fig. 1.

Its latest stage, which Harvey refers to as ‘human urbanism’ (Harvey, 2003; Harvey et al., 2013), may be seen as a ‘viable future’ and relates to the changes observed in recent decades as a response to the failure of this acceleration and immobility condition, particularly in the urban context. Based on ideas such as the human urbanism (Harvey et al., 2013), integral ecology (Pope Francis, 2015), ‘buen vivir’ (Gudynas, 2011) and planetary health (Whitmee et al., 2015), the transition to ‘human urbanism’ points towards cities with both sustainable and socially just mobility systems, with a renaissance of non-motorized modes, particularly walking and cycling, reductions in automobile dependency, development of renewable energy motorized modes and a global movement in favour of collective modes of transport. The idea of justice, although only vaguely defined here, is strongly in line with democratic and distributional concerns commonly shared among various theoretical interpretations of just mobility (Martens, Golub & Robinson, 2012; Pereira, Schwanen, & Banister, 2017; Soja, 2010). These concerns aim for the creation of inclusive urban mobility systems through participatory co-production of urban space and transport policies, a system which guarantees a sufficient level of accessibility to all persons, that expands people's capabilities to access out-of-home activities and mitigates inequality of opportunities and transport externalities, particularly for disadvantaged groups (Soja, 2010).

The state of urban development varies significantly across cities in the globe but also within cities, particularly within megacities with large populations that extend over large territories. The concept of mobility transition is not meant as a deterministic idea that points to an inexorable trend with a linear path. Similarly to the nutrition and epidemiologic transitions, which take place at different moments and paces for countries with different levels of social and economic development, the human mobility transition unfolds at different paces and with different intensities across a wide variety of urban contexts. As we will note in the case of megacities like São Paulo, one might observe that this mobility transition can also occur at different paces and intensities in different parts of the territory of the same urban agglomeration, due to the great spatial inequalities and complex institutional governance contexts commonly found in these metropolises.

We will explore in further detail the mechanisms related to the two last stages of the human mobility transition as well as their health consequences in the next section.

3. Privatization of the urban form and its health consequences

3.1. Privatization of urban form

Travel is an intrinsic constituent of human beings, affecting the differentiation of our species (Kuliukas, 2002) and the genes we share today (Chakravarthy & Booth, 2004; Neel, 1962; Pagani et al., 2016). Walking, the most ancient form of displacement, is simultaneously experienced as “both biological embodied reality, and as socially constructed discursive activity, part of the symbolic repertoire at our disposal to communicate complex gendered, sexual, age, ethnic and sub-cultural identities” (Green, 2009).

Freedom to travel has been understood as an imperative for human development and for the full experience of urban advantages (UN-Habitat, 2013). From supranational (Dora et al., 2014; Haines, Alleyne, Kickbusch, & Dora, 2012) to street level (Harvey et al., 2013), changes in urban mobility in favour of active forms of travel and universal public transport have been argued as vital for sustainable human

Box 1

Despite the challenges of characterizing the time-resolved location of individuals and populations in the past, the mobility transition throughout human existence can be understood in five broad stages: 1) Random Walk; 2) Sedentarization; 3) Auxiliary forms of transport; 4) Acceleration and Immobility; and 5) Human urbanism.

Long before the development of *homo sapiens*, bipedality played a decisive role in the evolution of the first hominids (Kuliukas, 2002). In the first stages of human mobility, during the Late-Paleolithic era (50,000–10,000 BC), walking and running were the only forms of locomotion, much likely following a random walk pattern (Levy walk) (Raichlen et al., 2014), similar to that of other group mammals (Edwards et al., 2007; Viswanathan et al., 1999). The Levy walk pattern seems to optimize searching for, acquiring, processing, and transporting foods and is linked with variations in the availability of prey and gatherings (Edwards et al., 2007; Raichlen et al., 2014; Viswanathan et al., 1999). It might also have contributed to prevent the occurrence of epidemics although the Late-Paleolithic population would still suffer from high rates of mortality, mostly related to infectious disease. Even though conditioned by food availability, hunter-gatherers were able to move autonomously and relatively free to explore their surroundings (Raichlen et al., 2014).

With the development of agriculture and animal husbandry (around 10,000 BC) (Wendorf & Schild, 1998), humans begin to settle, the first great wave of sedentarization of humankind (Tauger, 2011). Mobility becomes more predictable, influenced by place density and the number of intervening opportunities in a given area, although still strongly deterred by the costs (in time and energy) associated to physical distance. This sedentarization process brings famine, epidemics and endemic diseases, although with increases in fertility rates. At the same time, men and women became physically attached to their herds and crops.

Animal husbandry has not represented an immediate use of animal force for human mobility. Horse-riding – the first auxiliary form of transportation – was documented only 5,000 years later (around 4800 BC) in the steppe cultures in the centre of the Eurasian continent (Anthony, 2010). This new technology, together with a later development (around 3400 BC) of carts and chariots (the first wheeled vehicle designed for speed) allowed Proto-Indo-European speakers to overcome the boredom and isolation of grass steppes and the costs of physical distance in cattle management (Anthony, 2010). It also helped them to gradually wide spread their culture and language from India to Portugal (Anthony, 2010). Nevertheless, from that period until the end of the Middle-Age, auxiliary forms of human transport designed for speed, safety and convenience were almost exclusively for a minority of the population (the elite, the traders or the military personnel), a condition that remains throughout history until recently. Since distance-related costs reduce, human mobility becomes more dependent on the intervening opportunities in the journey, i.e., the number of opportunities between origin and destination able to satisfy the needs who gave rise to one's travel (Stouffer, 1940). Auxiliary forms of travel contributed for the elimination of many nutritional deficiency diseases as well as the dissemination of infectious diseases worldwide due to the ability to transport food and pathogens over large distances, especially after the development and expansion of maritime auxiliary forms. These have led to important mortality declines among populations who mastered auxiliary forms of transportation followed by striking mortality increases (in many cases, the complete extinction) among those who did not.

Dispossession from rural land first in Britain (Thompson, 1963) (most intensive in the 19th century) and in different parts of the world created a landless working surplus – providing the human workforce for the Industrial Revolution – who migrated to cities, accelerating urbanization (Thompson, 1963). The challenges of human mobility in this new environment (Virilio, 1986), intrinsic to the new economic system (Harvey, 2011), contributed to the development of motorised forms of transport, initially mass transit by road and rail and later by individual motorised modes. The bicycle also improved considerably along the 19th century to function as an auxiliary form of transportation more suitable for the modern urban environment, enabling increasing speed for individuals (Herlihy, 2006). Despite the fact that human mobility pattern in the urban context remains determined by place density and intervening opportunities (Noulas, Scellato, Lambiotte, Pontil, & Mascolo, 2012; Stouffer, 1940), the dissemination of motorised forms of transportation made auxiliary travels predominate in human mobility for the first time in history. It transformed mobility, with people moving less, in terms of movement and energy expenditure, and moving more and faster, in terms of displacement. Another novelty present in the Acceleration and Imobility stage is the reliance on non-renewable energy sources, namely fossil fuels, unlike traditional energy sources previously adopted, such as human and animal traction or natural forces (winds and sea currents, mainly). On the other hand, the inequality between those without access to the most technologically advanced auxiliary forms of transport and those with access were perpetuated in the urban context, with traffic-related morbidity and mortality rates strikingly higher among pedestrians, many of whom lacked other option to travel except for walking.

development and for global health equity (Friel, Marmot, McMichael, Kjellstrom, & Vågerö, 2008). However, the growing control of circulation through privatization of the urban form since the past century, such as the enclosure of public urban spaces and the growing appropriation of road space by private vehicles, has curtailed the right to travel to the majority of the population living in cities.

The right to travel within cities is often constrained by the tensions between private interests and collective rights as the control of circulation is a determinant of both capital reproduction and realization of life potential. Impediments to travel include the following:

- Uncontrolled urban growth through housing and urban land speculation, leading to the continued expansion of slums and sub-standard housing to accommodate surplus of labour (Harvey, 2003; Sorensen & Okata, 2010; UN-Habitat, 2010, 2012).
- Unregulated financialization of daily life including of housing,

public spaces and travel, leading to overreliance on individual responsibility, economic disruptions and crisis. (Harvey, 2011; Karanikolos et al., 2013; Martin, Rafferty, & Bryan, 2008; van der Zwan, 2014).

- Unsustainable car-oriented transportation systems, unable to provide access to destinations for everyone, leading to inequity, injuries, pollution and economic inefficiency (Dora et al., 2014; UN-Habitat, 2012; Vasconcellos, 1999, 2001).

These all result from the commodification of cities – the conversion of cities to places for consumption and places to be consumed, undermining their social function (Gottdiener, 1993). The spatial flows in the modern city are largely orientated around the use of motor vehicles, particularly private cars as they provide the speed necessary for capital accumulation both as a mode of transport, accelerating movements of goods and workers, and as a high added value product in a complex

Urbanization, economic growth, economic and political power concentration, financialization

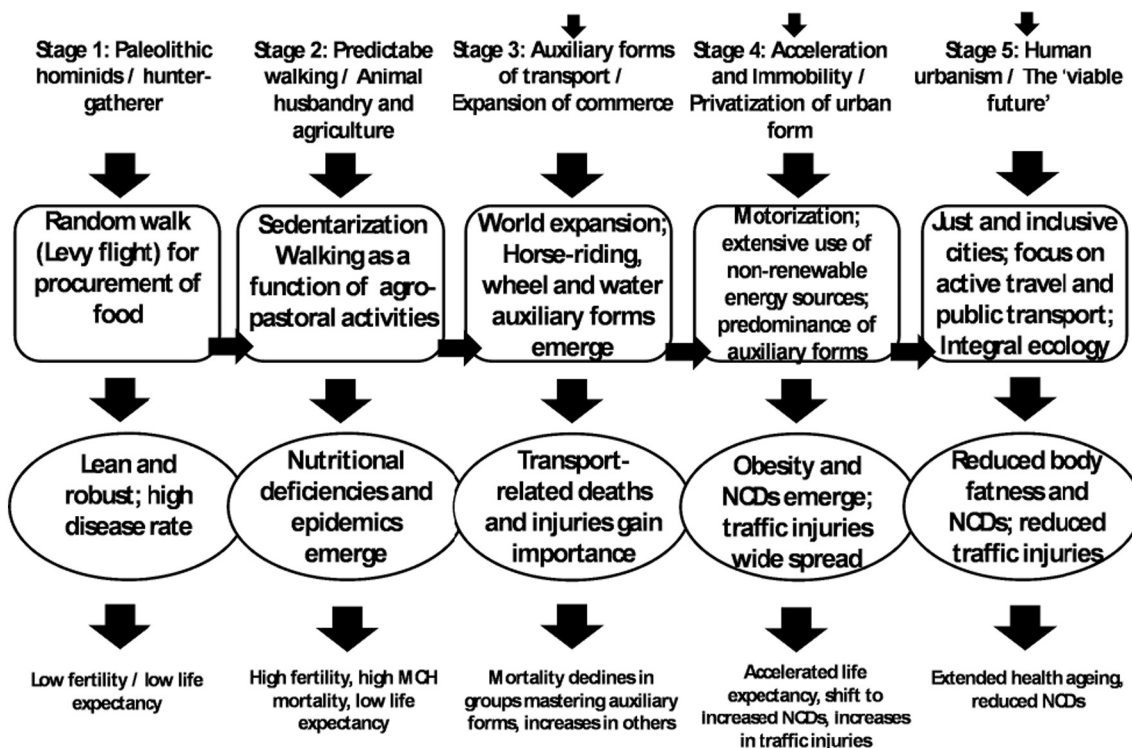


Fig. 1. Stages of the mobility transition (adapted from Popkin, 1999) (Popkin, 1999).

industrial chain (Banister, 2011). These flows also create the need for costly and complex urban interventions, such as roads and viaducts, through which surplus capital can be allocated. A hierarchy of daily travellers has long been established, with the wealthiest at the very top and the most deprived at the bottom. (UN-Habitat, 2012; Vasconcellos, 1999, 2001) Public transport systems have been historically developed as ways for workers to commute – not necessarily to access the advantages of urban life (Harvey et al., 2013; UN-Habitat, 2012; Vasconcellos, 1999, 2001). Cities have become a collective means of constant consumption, including the consumption of travel, with cars as a social symbol of status and which (Freudenberg, 2014) sees as part of an ideology committed to a systematic dispossession of public goods. This ideology and its mechanisms of operation in the city, including the dispossession of public goods, change the idea of the city, undervaluing its nature as a space for human exchange and replacing it as a space for the circulation of capital, both as supply and workforce (UN-Habitat, 2013).

3.2. Health consequences

This privatization of urban form in the last century has involved an accelerated transition from non-motorized to motorized modes of transport. As cities commodify, daily mobility becomes increasingly dependent on one's ability to pay for either faster modes or well-located housing. Those without such resources are forced to live farther out and to reallocate time from other daily activities to commuting, increasing their exposure to environmental pollution and traffic violence as well as disrupting their travel time budget and thus their everyday life (Metz, 2008; Mokhtarian & Salomon, 2001). Those able to afford having a car or motorcycle spend a lot of time in traffic, losing the opportunity of physical activity and interaction with the urban environment.

Thus, people at all levels of wealth and vulnerability suffer from some form of health problems because of environmental burden related to urban transport. Hence, we now experience a double burden of

problems related to transport in both extremes at a high human cost, a pattern similar to several other contemporary health challenges, such as in the epidemiological and nutrition transitions. This double burden of the privatization of urban form and automobile-dependency in the production of harmful urban mobility systems has a powerful analogy for the role of corporations in shaping the double burden of disease in the nutrition transition (Freudenberg, 2014; Freudenberg & Galea, 2008). Through their policies and practices, corporations have gradually increased the burden of obesity, first affecting the more affluent sectors of society, while under-nutrition remained a problem for the largest share of the population (Moodie et al., 2013; Swinburn et al., 2011).

Reductions in production costs due to technological advances and work exploitation, and increased awareness of the health damaging effect of these products (e.g. cars and soft drinks) on consumers, have pushed companies' marketing and retailing strategies towards the more vulnerable in such a way that obesity and undernutrition now coexist in several places worldwide (Popkin, 1999), including Brazil (Conde & Monteiro, 2014). Similarly, major corporations in the car, oil, finance, media, construction and real estate sectors have had an important role in shaping the mobility systems of cities in the last century, from predominantly active travel to predominantly individual motorized modes of transport (Harvey, 2011; Jacobs, 2000; Parra, de Sá, Monteiro, & Freudenberg, 2018; Sager, 2011). The shift first occurred in the wealthiest segments of the population, just as with the ultra-processed food and drink products – here understood as products made from processed substances extracted or refined from whole foods (but with little or no whole foods in its composition), very durable, palatable, and ready to consume, and mostly made, advertised, and sold by large or transnational corporations (Moodie et al., 2013; Swinburn et al., 2011). However, unlike in the food systems and dietary patterns, where health consequences were initially felt by the rich mainly (Moodie et al., 2013; Swinburn et al., 2011), the analogous shift in mobility through increased access to individual motorized forms of transport affected

simultaneously everyone because growing car use represents an immediate increase in environmental pollution and traffic injuries for the vulnerable segments of society.

Similar to the observed with ultra-processed food and drink products, in rapid developing countries like Brazil, China and India, there is now a striking increase in motorcycle and car use among the poorer segments of the population, causing higher levels of exposure to environmental hazards and lower levels of physical activity in daily commuting. For instance, motorcycling is, at the same time, an efficient, comparatively cheap way to overcome the large distances imposed by spatial segregation against the poor, and a particular damaging behaviour as it combines all the health harms mentioned above. In such developing countries, even though motorisation has reached new segments of the population, it has not necessarily represented a choice in urban mobility for them. At the same time, the global north is seeing a reverse trend in driving, licensing and car ownership followed by increases in cycling in some population subgroups with more freedom to move within and across urban settings, starting in places like Denmark and Holland in the 70s and later in other places such as Australia (Healy, Catchpole, & Harrison, 2012), Germany (Kuhnimhof, Buehler, & Dargay, 2011) and the United Kingdom (Kuhnimhof et al., 2011). Finally, the increasing motorization trend has direct health consequences (e.g. traffic fatalities and exposure to air pollution) that have been widely acknowledged in the literature (Rydin et al., 2012).

All of the issues mentioned above are increasingly common to cities throughout the world and São Paulo is no exception. While many cities across the globe could be used to illustrate the processes discussed in this study, São Paulo was chosen as a case study because of the lack of attention dedicated to it in this sort of discussions, despite of its importance as one of the largest and most unequal metropolitan areas in the Global South. Moreover, São Paulo is in different ways an exemplar of how many cities in developing countries will look like in the future, extremely unequal, with large and dense populations, and where there is a strong increase in automobile use and dependence with all the negative externalities it creates. In the next section, we examine the case of São Paulo to illustrate how the historical context of this megacity, as well as recent changes in its urban form and policies have direct influence in human mobility and the right to travel. The influence of historical conditions and policy decisions described below on shaping the city and its surroundings may be seen in different ways, of which the study below is one.

4. The case of São Paulo

Prior to the arrival of the Portuguese conquerors to Brazil in 1500 and the foundation of the Saint Paul of the Fields of Piratininga Jesuit College in 1554 – the initial settlement who originated Sao Paulo – indigenous societies inhabiting the region would lie under stages one and two of the mobility transition, with economies based on foraging, subsistence agriculture and warfare, such as the Tupiniquins, the Tupinambás, and the Karijós (Bueno, 1999; Schaden, 1954). While some indigenous populations of Sao Paulo region may have been exposed to more sophisticated auxiliary forms of transport, particularly through their contacts with the Inca Empire (Bueno, 1999), it is certainly the colonization by the Portuguese that introduces and consolidates the use of new and advanced auxiliary forms of transport – including the horse – inaugurating mobility transition stage three in the region.

São Paulo remained a relatively small city until the end of the 19th century, with a population of around 60,000 people in 1889, the year of the proclamation of Brazil as a republic. In 1900–1901 the first electric trams and the first municipal train station were installed together with the commercial electrification of São Paulo,² a privilege for few

wealthier people on those days. Stage four of the mobility transition begins although most of the daily trips in the city were still based on animal traction powered modes or taken by pedestrians, including mainly freed slaves who had the city streets as their territory (Fernandes, 2013; Rolnik, 1989). This slave-mainly pedestrians also retained the sense of inferiority in walking following the previous rural context; one more inheritance of Brazilian slavery culture (Fernandes, 2013).

In the following decades, the inner and a new outer city grew very fast, driven by the rise in the coffee industry and then other forms of industrialization. Individual motorized forms of transport follow, particularly through the introduction of cars by the wealthy families. International immigration, especially from European countries, was heavily promoted by the local and federal governments in an attempt to ‘improve’ and ‘regenerate’ the Brazilian people (Diwan, 2007) (In 1920 one third of São Paulo residents were foreigners). The black and admixed people living in well-located but poorly constructed slums were expelled in favour of migrants from Europe and elsewhere, and were in effect forced to live in a peripheral ‘poverty belt’ round the city (Rolnik, 1989) which still exists and continues to grow.

This is also the period when there was intense debate and dispute on the principles underlying the development of the first urban plans of São Paulo. These plans were seen as necessary to resolve problems partially derived from rapid urban growth, such as floods, infectious disease outbreaks, and increased traffic. Modernist and futurist ideas prevailed, with strong support from the fast expanding car industry. One of such plans was the master plan *Plano de Avenidas* (Plan of Avenues), proposed in the 1930s by Francisco Prestes Maia (later São Paulo mayor). This was inspired by the radial concentric master plans implemented in some major European cities, but with troublesome particularities in the case of São Paulo. Rail and river transport were largely neglected. The tram system was gradually replaced by buses, rivers became increasingly polluted and in effect dead, parks, river valleys and green belts were ignored – most of the rivers were buried to give room for new avenues. The *Plan of Avenues* marked the shift from rail to road transport and from public shared to private individual transport, with perpetual support for cars and motorists over other street users, and priority given to circulation over all other daily activities in public space (Vasconcellos, 1997), further intensifying the transition from stage three to stage four of mobility.

This pro-private ideology was continued by successive administrations and arguably intensified during the 1964–1985 military regime, reinforcing the idea of a ‘middle class city’ (Rolnik & Klintowitz, 2011; Vasconcellos, 2014), in which “the elite and the middle classes remain prisoners to their concept of life – clearly expressed in the growth of isolated, high-quality residential clusters while the poor and captive users of public or active transport struggle to survive” (Vasconcellos, 2005). Perhaps an exception to this trend was the construction of São Paulo’s subway system, which was constructed for the most part in the 1970s and 1980s (lines 1 and 3), when São Paulo city population went from 5.9 to 8.5 million residents, after decades of massive immigration from less industrialized and impoverished Brazilian regions. Even nowadays, the subway of São Paulo still has relatively limited spatial coverage, reaching 78.4 Km after its recent expansions in the years 2000s (lines 2, 4 and 5). As a rule, the transport planning of São Paulo has been historically technocratic and insulated with little social participation (Marques, 2016).

Despite efforts to introduce alternatives to the car in São Paulo, with modest expansion and modernization of rail and subways systems, a small move towards transition to stage 5, the transport conditions in the city became in fact much harder in the last decades, particularly for the poor. The monthly cost of transport has dramatically increased between

(footnote continued)

prefeitura.sp.gov.br/historico_demografico/introducao.php

² Demographic History of São Paulo, Prefeitura de São Paulo: <http://smdu>.



Fig. 2. The latest stages of the mobility transition in São Paulo.

Note: In the first picture (left), São Paulo city centre at the end of the 19th century, with public space still shared by different forms of transport although auxiliary forms (still non-motorized), such as the chariot, exclusive for the rich (stage 3). In the second picture (right), São Paulo at the beginning of the 21st century, with public space dominated by private motorized auxiliary forms of transport (stage 4) (Left Photo: Marc Ferrez; Right Photo: Oswaldo Corneti/Fotos Públicas).

1977 and 1997 from 9% to 41% of the minimum wage (Vasconcellos, 2005). In the same period, available public transport infrastructure shrank relative to resident population (from 34 to 25 km/10 million people) (Vasconcellos, 2005), which keeps growing particularly in peripheral slums. This contributed for more people walking (from 28% to 35%) of all trips (between 1977 and 1997) and also for high levels of traffic deaths of around 25 deaths per 100,000 residents, mostly of pedestrians (Vasconcellos, 2005). In 2002, for the first time, private transport (53%) surpassed public transport (47%) (Fig. 2).

In recent decades, some attempts have been made to address this crisis and promote alternatives to private vehicles. These include plans for public transport expansion and interconnection, bus and rail fleet renewals, and dedicated lanes for buses and bus rapid transit systems (BRTs). Nonetheless, São Paulo faced continuous delays in the expansion of the railway system by the state government. Average commute time to work has continually increased from 38 min in 1992 to 46 min in 2013 (Pereira & Schwanen, 2013). Moreover, public transport fares continued to rise above inflation whereas families' expenditure on private transport (including acquisition and maintenance of vehicles) were three times smaller than inflation between 2001 and 2012 (Carvalho et al., 2013). Federal programs and policies aiming to address the global and financial crisis through increases in internal consumption also contributed to maintain automobile dependency – for instance, tax breaks for the purchase of new cars contributed to an 18% increase in the fleet of São Paulo between 2007 and 2012 (against a 2% increase in the population in the same period). Despite bringing some improvements to the quality of life of the poor, now better able to circumvent the spatial segregation of the city, this Federal initiative – strongly influenced by the lobby of car manufacturers – was a lost opportunity for the development of a more sustainable city.

The latest city's Master Plan of 2014, including its Urban Mobility Plan,³ emphasizes the prioritization of pedestrians, cyclists and public transport users as well as the social value of property (Prefeitura de São Paulo, 2014). This new plan is more aligned with the 5th stage of mobility transition discussed in the section two of this paper. The plan was marked by a participatory approach with more than 60 public hearings and more than 25 thousand participants, which helped local authorities to push forward an agenda of transit oriented urban development (Balbim, Krause, & Linke, 2016). Gradually, this agenda is being put into practice, with the construction of new Bus Rapid Transit

lines, reallocation of road space from cars to create segregated bus corridors, regulation of land use allowing for higher urban densities along transport corridors, and the promotion of bicycle and walking infrastructure, traffic-calming policies and open street programs. There has also been a slowdown in public transport fare rises, mainly forced by the protests of 2013 (Estadao, 2013; SPTrans, 2018), although not sustained over the following years (SPTrans, 2018).

When it comes to cycling policies, for example, these policies have been in São Paulo's municipal agenda since the 1980s but only recently the cycling network in the city has received more substantial investments. The first technical studies on cycling infrastructure in São Paulo date back to the early 1980s, following national policy guidelines (Malatesta, 2012). However, the first cycling infrastructure in the city were only constructed in the mid-1990s in city parks with a more leisure focus and only latter in the mid-2000s the city authorities officially incorporated such infrastructure planning as part of its transport policies (Malatesta, 2012). Despite initial plans of building a 174 km-long cycling network in São Paulo in the 1990s, these plans have changed over time and their implementation have been historically slow and relatively fragmented. It was only after 2010 that cycling infrastructure received more attention in the city, reaching a 365 km-long cycling network in the city by November 2015 and 463.9 km of cycle lanes and cycle paths by January 2017.⁴

Although these recent plans and initiatives contrast with the city's historical car-oriented policies, it is still too soon to evaluate whether such efforts will have any success in re-shaping the direction of São Paulo's urban and transport development. The long record of car-oriented investments in São Paulo (Marques, 2016) and segregated housing policies have (Amore, Shimbo, & Rufino, 2015) created a path dependency for the history of urban and transport development in the city that largely shapes the mobility transition of the city nowadays and will continue to do so in the future (Rolnik & Klintowitz, 2011). If the national experience serves as a reference, the wave of progressive urban legislation implemented in Brazil since the 1990s have had so far very limited success in overcoming a historical trajectory of fragmented and unequal urban development in the country (Klink & Denaldi, 2015). It seems reasonable to assume that such recent policies will face major challenges in braking with such historical trend and that these initiatives do not amount to a major shift in the ideology that favours private advantage over public goods, nor to human mobility conditions. The extent to which they will be sustained and help to reverse negative health trends remains to be properly evaluated. Some of those trends in

³ Sao Paulo Master Plan: <http://gestaourbana.prefeitura.sp.gov.br/marco-regulatorio/plano-diretor/arquivos/>. Sao Paulo Mobility Plan: http://www.prefeitura.sp.gov.br/cidade/secretarias/upload/chamadas/planmobsp_v072_1455546429.pdf

⁴ Sao Paulo Mobility Plan: http://www.prefeitura.sp.gov.br/cidade/secretarias/upload/chamadas/planmobsp_v072_1455546429.pdf

Sao Paulo include rises in obesity, reductions in active transport and in outdoor physical activity practice (de Sa, Garcia, & Claro, 2014; Schmidt et al., 2011), and the persistence of high levels of air pollution (Bell, Davis, Gouveia, Borja-Aburto, & Cifuentes, 2006) and traffic injuries (Companhia de Engenharia de Tráfego, 2012).

As a whole, the long history of how urban and transport plans helped shape the mobility transitions in São Paulo makes a clear case that historical processes of human mobility transitions are far from being simple and linear processes driven solely by technological innovations. The transport policy choices historically implemented in São Paulo reflect some of the disputed views of how the city's mobility system should develop to cope with city growth. The current dispute for the city in São Paulo, of which the dispute for the right to freedom of movement summarised here is a leading example, illustrates tensions in the latest stages of the human mobility transition and its health consequences (stages four and five, in particular). Rather than a situation restricted to a given period and place, these stages of the human mobility transition and the tensions arising from the dispute for the city continue to illustrate the condition of different geographic and socio-economic subpopulations around the globe (Brenner et al., 2009).

5. Conclusions

Cities across the globe are often divided, fragmented and prone to conflicts. The conflicts around rights to just mobility is only one example of these, but an increasingly important one as the case of São Paulo demonstrates. The right to the city goes beyond the individual right to access its resources and advantages (UN-Habitat, 2010). It is a collective right to transform ourselves by transforming our cities upon the exercise of a collective power on the process that recreate the urban form to support human capabilities (Commission on Social Determinants of Health, 2008; Harvey, 2003; Lefebvre, 2001), and which improve and protect health and well-being.

Whether and how cities are able to move in the future to the last stage of the human mobility transition is a question that lies beyond purely technical innovations. While emerging technologies like autonomous vehicles and ubiquitous sensors in smart cities can contribute for example to reduce traffic fatalities and promote more efficient use of road space, the adoption of such technologies will not automatically lead to more inclusive and sustainable transport policies with lower levels of car use, pollution and energy consumption, nor lead to less segregated urban spaces. In fact, the potential impacts of these new technologies raise important ethical questions (Bonneton, Shariff, & Rahwan, 2016) and uncertainties about whether they could actually exacerbate socio-spatial inequalities in cities by aggravating technocratic governance practices, the commodification of urban spaces and the corporatization of citizenship (Kitchin, 2015; Luque-Ayala & Marvin, 2015).

The case of São Paulo helps illustrate how the 'viable future' that emerges from this new urban politics is neither determined nor necessarily positive but a result from political struggles. At least in São Paulo, the effects of the demonstrations of June 2013 were largely in favour of healthier and more sustainable transport system, from the immediate effect of reversing raises in the public transport fare, to the impulse in the prioritization of urban mobility in the political agenda. This impulse contributed to the creation of new mechanisms for social appropriation of the public space, financial investments to facilitate non-motorized transport and enhance public transport quality, stronger efforts to tackle corruption and demand transparency in future transport contracts, and direct social participation in the development of policies, such as the São Paulo City Urban Mobility Plan. Policymakers and practitioners in transport, housing, urban planning and welfare development should also guide their practices towards participatory, inclusive and sustainable policies, contributing to the creation of a just city. Finally, policy makers and practitioners have a crucial role in steering urban and transport policies towards a better integration

between transport and land-use planning, the prioritization of more sustainable non-motorized and public transportation modes, and the prioritization of expanding transport accessibility of low-income and socially disadvantaged groups, who are often the most dependent of public and active transport modes.

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None.

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