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Vulnerable Road Users or Vulnerable Transport Planning?

*Meleckidzedeck Khayesi**

Independent Researcher, Geneva, Switzerland

The concept of vulnerable road users is widely used in transport and road safety discourse. The concept refers to walkers or pedestrians and cyclists (bicyclists and motorcyclists) who are easily injured and killed in a car-dominated road space. Who is really vulnerable: road users or transport planning? This paper subjects the concept of vulnerable road users to a critical analysis. It finds this concept wanting because research and practice show that the real vulnerability lies within transport planning that gives in to influences that are more focused on the needs of motorized transport. The paper proposes the concept of vulnerable transport planning to underscore the fact that transport planning often lacks inclusion and is influenced by forces that favour motor vehicles. This influence leads to omission and neglect of walkers, cyclists, children, persons living with disabilities, the elderly and highway-adjacent communities in transport and land-use planning. A focus on vulnerable transport planning directs research and practice to addressing the root cause of vulnerability rather than concentrating primarily on those affected by this vulnerability.

Keywords: vulnerability, road users, walkers, cyclists, transport, planning, decision-making

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***Correspondence:**
Meleckidzedeck Khayesi
mkhayesi@yahoo.com

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INTRODUCTION

The scientific and practice community continuously generates and promotes concepts and phrases to help in searching for solutions and raising the profile of an issue. Some of the concepts become widespread while others "die" off. In development, it has been observed that there is an impressive landscape of concept constructions, reconstructions and rebuttals (Darkoh and Khayesi, 2009). Chambers (2005, p. 186) describes this changing concept landscape in development as follows: "Additions to the common lexicon of development in the past two decades have been prolific. New words have been added faster than old have fallen into disuse. Some such as integrated, coordinated, planning, and socialism have peaked and passed into decline. Others in the eclectic and perhaps ephemeral language of postmodernism, such as deconstruction, narrative and meta-narrative, text and subtext, have largely languished in academic and literary backwaters. Others, such as equity and poverty, have been robust and resilient. Yet others, some old, some new, which have come close to the mainstream of much development discourse during the past two decades include: accountability, capabilities, civil society, consumer, decentralization, democracy, deprivation, diversity, empowerment, entitlement, environment, gender, globalization, governance, human rights, livelihood, market, ownership, participation, partnership, pluralism, process, stakeholder, sustainability, transparency, vulnerability, well-being."

While concepts and ideas are necessary to shape the world, they can easily reach a status where they are taken for granted (Peet, 2009). Researchers and practitioners sometimes become beholden to concepts and methods without deeply questioning their origin and relevance (Mees, 2009; Peet, 2009). For example, the concept of sustainable development, at the centre of national and international policy discourses, is in fact a contested concept, requiring continued discussion and operationalization by researchers and practitioners (Connelly, 2007; Purvis et al., 2019).

Transport and road safety literature refers to a certain section of road users—walkers and cyclists—as a vulnerable group (see for instance, Mohan, 1992; OECD, 1998; Peden, 2004; Constant and Lagarde, 2010; Institute for Road Safety Research, 2012; Goel et al., 2018; European Commission, 2020; European Transport Safety Council, 2020; PIARC, 2020). While the value of this term in pointing out the dangers that walkers and cyclists face in the road environment is appreciated, it is limited if it is not used along with an examination of the inherent structural neglect and bias of these road users in transport planning. If the term is not contextually applied, it could be used to reinforce the traditional view in road safety that places the sole responsibility of road traffic crashes on individual road users, overlooking other factors related to the design of roads or vehicles (Mohan, 1992; OECD, 1998; Peden, 2004; Institute for Road Safety Research, 2012; European Transport Safety Council, 2020). This way of looking at road safety could easily be used to justify the shifting of responsibility for key omissions and transgressions in transport planning from designers or planners to a group of road users. This paper subjects the concept of vulnerable road users to a critical analysis. It achieves this objective by tracing the origin and use of this concept in transport and road safety research, and then subjects it to a critical analysis within the context of the emergent evidence on where the vulnerability really lies.

VULNERABILITY IN TRANSPORT AND ROAD SAFETY RESEARCH

Given the extensive use of the word vulnerability and the related words like adaptation and resilience in research and planning (Vogel et al., 2007), a valuable question to answer at this stage is: "What is vulnerability?". As explained by Luna (2018), the word "vulnerability" comes from the Latin *vulnerare*, which means to wound. This explains why vulnerability is commonly used to refer to possibility of being wounded. Essentially, it refers to the fragility of beings and things (Luna, 2018). Assessment and response to vulnerability takes into consideration exposure, susceptibility, resilience and solutions. For example, in the case of flooding, vulnerability arises out of a combination of several physical, social, economic, and ecological factors (Salami et al., 2017). Vulnerability occurs to individuals, ecosystems, institutions and communities at different geographical and administrative units.

Having provided the basic definition and clarification of vulnerability, I now turn to the use of this concept to refer to a group of road users. The question to answer at this stage is: "What is the origin and extent of the use of 'vulnerable road users' concept in transport research and practice?". Reference to unprotected road users, who later came to be generally referred to as vulnerable road users, first appeared in literature in the 1950s (Ptak, 2019). The concept continued to be used and clarified in the 1960s, 1970s, and 1980s as research continued into vehicle-pedestrian crashes, focusing on vehicle design for pedestrians, biomechanics of vehicle-pedestrian contact and legislation. Though the concept was increasingly used, scholars like Mohan (1992) argued that vulnerable road users had received less attention in research. The use of this concept has grown over the years and is widely used in publications, conferences, programmes and policies. It is widely accepted that vulnerable road users constitute a disproportionate share of people killed and injured in road traffic crashes at national and international levels (Mohan, 1992; OECD, 1998; Peden, 2004; Institute for Road Safety Research, 2012; European Commission, 2020; European Transport Safety Council, 2020). Analyses move between focusing on one specific category of these road users and merging two or three of them into one category (see for instance, Híjar et al., 2003; Goel et al., 2018).

There are briefings and guidance on the concept of vulnerable road users in form of factsheets, planning manuals, design manuals and position papers (Mohan, 1992; OECD, 1998; Peden, 2004; Institute for Road Safety Research, 2012; European Commission, 2020; PIARC, 2020). There are also sessions in some conferences that are dedicated to the theme of vulnerable road users. While preparing this paper, I conducted a basic search using Google search engine on 12 March 2020 on vulnerable road users, which yielded 53,200,000 hits, which reflected publications, policies, programmes, videos, images, maps and news items on this topic. It was not a systematic electronic database literature search as the interest was in getting a quick overview of the number of hits on vulnerable road users.

But what is meant by the term vulnerable road users? The literature defines them as (Mohan, 1992; OECD, 1998; Peden, 2004; Institute for Road Safety Research, 2012; European Commission, 2020; PIARC, 2020):

- Road users outside the car;
- Those most at risk in traffic; and
- Those unprotected by an outside shield.

Vulnerable road users commonly identified in literature are walkers, bicyclists and motorcyclists. With respect to demographic characteristics and capability, it is argued that some groups among walkers and cyclists are more vulnerable than others. Three groups commonly identified are children, people living with disability (specifically those who use wheel chairs) and older persons.

A logical question from the preceding description is if there is a comprehensive theory or conceptual model of vulnerable road users and vulnerability in transport research. Different theoretical aspects of vulnerable road users are evident in the literature. For example, the relationship between impact speed and pedestrian injury severity has been extensively studied, revisited and refined. Research in the 1990s that was cited extensively showed that pedestrians had a 90% chance of surviving car crashes at speeds of 30 km/h or lower, but less than a 50% chance of surviving impacts at 45 km/h (Pasanen, 1991). There has been a change in this knowledge largely due to the work of Rosén et al. (2011). After correcting sampling and statistical analysis errors in previous research, they found that an adult pedestrian has approximately a 20% risk of dying if struck by a car at 60 km/h (Rosén et al., 2011).

The biomechanics of vehicle-pedestrian crashes has also been conceptualized and studied. This research shows that most pedestrian–vehicle crashes involve frontal impacts. This research

has described fully the sequence of events in a frontal impact, with the starting point assumed to be a standing adult pedestrian who is struck by a car front. A diagram showing the contact points between the pedestrian and the car during a crash has been developed (Yang, 2005).

There has also been a theoretical and empirical analysis of the idea of safety in numbers. A key proponent of this concept is Jacobsen (2003) who argued, based on statistical analysis, that greater numbers of walkers and cyclists improve safety of these and other road users. Subsequent research by Bhatia and Wier (2011) has cautioned against the use of safety in numbers in transport policy and planning dialogue. This caution arises out of inadequate evidence to support a specific mechanism for the safety in numbers effect.

Research also draws attention to planning omissions and decision-making neglect that create vulnerability for walkers, bicyclists and motorcyclists (Vasconcellos, 2001). This issue is discussed in the next section. While this line of investigation sheds light on and alludes to real vulnerability, a political economy model of planning and decision-making in transport has not been at the centre of transport research, which is generally dominated by a positivist model of science (Khayesi et al., 2017). Changes taking place in transport research with respect to analysis of the political economy and governance systems are examined in the next section.

While there is sustained discourse on vulnerable road users, there is limited conceptual rigour in the analysis of vulnerability in the pioneering studies. While an effort has been made to develop and examine models of vehicle-pedestrian crashes and biomechanics, there is a need to critically look at where the real vulnerability lies. Several studies point out that vulnerability of walkers and cyclists largely comes from the way the transport system is approached and designed, highlighting that decision-making and practices favour motorized transport over walking and cycling (Burrington and Thiebach, 1995; Monheim, 2003; Mohan, 2008; Stone and Mees, 2010; Whitelegg, 2014; Legacy, 2016). However, some studies continue to refer to walkers and cyclists as vulnerable road users (see for instance, Constant and Lagarde, 2010). Even studies that refer to walkers and cyclists as vulnerable road users point out that deficiencies in road design, vehicle design and transport policies are key in increasing risk for these road users (Mohan, 1992; Tiwari, 2018; European Transport Safety Council, 2020). Why not call out transport planning as being vulnerable?

REAL VULNERABILITY IN THE PRACTICE OF TRANSPORT PLANNING

In 1896 the coroner who examined the first reported pedestrian death of Ms Bridget Driscoll in the United Kingdom is quoted to have hoped that "such a thing would never happen again" (Wikipedia, 2020). One wishes the coroner's statement had become true. The reality is that this "thing"—death of a pedestrian or a road traffic collision—has happened time and again, several times, not only in the United Kingdom but in other countries as well. It has become a global challenge, with 23% pedestrian, 3% bicyclist and 28% motorized two- and three-wheeler deaths of the estimated 1.35 million road traffic deaths every year (World Health Organization, 2018).

An important contributor to "such a thing would never happen again" happening time and again is the neglect of walkers and cyclists in transport planning and decision-making (Monheim, 2003; Whitelegg, 2014; Soltani, 2017; Vasconcellos, 2017). For instance, after assessing urban transport planning in Brazil, noting the exceptional case of Curitiba, Vasconcellos (2017, p. 19) observes: "Nonmotorized transport modes have never been taken very seriously in Brazilian transportation planning. No city can claim to have a high-quality sidewalk network, and while bicycles are heavily used in smaller cities…they have never received proper attention." He indicates that there are only a few cities, especially in the south, that have invested in bicycle infrastructure (Vasconcellos, 2017). Soltani (2017) provides an in-depth assessment of urban transport planning in Iran. He describes how cities like Isfahan and Shinaz had public realms suitable for walking and socializing. He contrasts this nostalgic past with the modern Iranian cities that have been invaded by cars. He reports that walking is not formally recognized as a travel mode in most contemporary transportation masterplans in Iranian cities. Soltani (2017, p. 142) concludes his assessment by observing: "In recent decades, Iranian cities have relentlessly pursued policies in favour of car use. Car-oriented planning policies have shaped cities in which people need to drive tens of kilometres to reach their destinations. Urban life has become inconvenient for many people without a car."

Automobile dependent transport planning is a complex system consisting of ideas, practices, infrastructure, institutions and individuals. As explained by Urry (2004), automobility is a powerful complex constituted through technical and social interlinkages with other industries, car parts and accessories; petrol refining and distribution; road-building and maintenance; hotels, roadside service areas and motels; car sales and repair workshops; suburban house building; retailing and leisure complexes; advertising and marketing; urban design and planning; and various oil-rich nations. It is a self-producing system, leading to path-dependent lock-in for society (Urry, 2004). Growth in motor vehicles and related industries, which started in high-income countries, has spread to the rest of the world. Whereas the car confers accessibility benefits to individuals and society, it also dishes out costs such as pollution, congestion, crashes and urban sprawl (Ewing, 1997; Stead and Pojani, 2017). It is while planners and decision-makers attend to the needs of motorized transport that they neglect walkers and cyclists.

Neglect of walkers and cyclists in transport planning and decision-making occurs at several levels (Vasconcellos, 2001; Marden and Reardon, 2017):

- The baseline assessment and design stage which largely relies on the four-stage transport and landuse planning model and its extensions or improvements that focus on collecting and analyzing data related to motorized traffic with limited attention to travel behavior of walkers and cyclists.

- Political decision-making stage to allocate financial and human resources in which the transport researcher and planner are least involved, and prioritization is based on weighing several competing needs from transport and other sectors.
- Execution, monitoring and evaluation stage in which the omissions introduced at the assessment stage are realized if there is no intervention from the public consultation, and review within transport or pressure groups to correct the situation.

The transport researcher has relatively focused less on studying the reality of transport planning and decision-making, and has largely concentrated on quantitative aspects, which generate useful information (Marden and Reardon, 2017). However, the quantitative tradition, within the technical-rational model, does not provide insights into the dynamics of decision-making and how governance systems within and outside the transport sector shape and sustain the prevailing automobile dependent transport planning.

This situation has been steadily changing over the years, especially with the incorporation of the communicative turn and governance frameworks into transport research. This development is providing an understanding of how the process of transport planning, which seeks to determine, select and implement policies, plans and strategies to ensure movement of people and goods using different land, water and air modes of transport, works and is influenced by several decisions and stakeholders (Whitelegg, 2014; Legacy, 2016; Marden and Reardon, 2017). Examples are cited from this literature in the section that follows to illustrate vulnerability of transport planning.

Insightful examples of the neglect of walkers and cyclists in automobile-dependent transport planning have been investigated and published. For example, Mitullah and Opiyo (2017a) depict the absence of pedestrian paths and cyclist lanes on 18 road corridors in Nairobi, Kenya. While some corridors have facilities for walkers and cyclists, others do not. Overall, the type of infrastructure provided was not uniform and did not fully conform to design principles, coherence, attractivess and comfort. This type of situation is reported in several urban and rural areas in low- and middle-income countries. However, this situation is not limited to low- and middle-income countries. Several cities in the United States of America are described as having been built for the car and not for people on foot or bicycles (Jacobs, 1961). This reality is compounded by a lack of an efficient public transport system in several cities not only in the United States of America but also in Europe and Australia (Stone and Mees, 2010; Whitelegg, 2014).

An example of the influence behind the scenes that gives rise to the observed neglect is given in a study by Flyvbjerg (2002). He gives details about how regulations kept on changing for an environmental and traffic component in a project meant to preserve the character of the historical downtown area of Aalborg. The environment and traffic component sought to radically improve public transportation; enhance environmental protection, develop an integrated network of bike paths, pedestrian malls, and green spaces; and develop housing stock. Vehicle traffic was a major concern in the downtown project and the target was to reduce automobile traffic by one-third in the downtown area. Flyvbjerg (2002), through an in-depth scrutiny and interpretation of archival sources, found out that the chamber of industry and commerce was key in altering the traffic component. It achieved this influence by debriefing the project planning group in the company of the city council technical committee and the police. There are several ways through which automobile industry and related power holders leverage the planning and political systems to create conditions and make decisions favourable to motorized traffic at the expense of walking and cycling. Continued funding and approval of motorized transport and other mega infrastructure projects with overestimated costs is an example of how decision-making sustains automobile dependent transport planning (Cantarelli et al., 2010). Ignoring public inputs into debates and review of a proposed transport project and going ahead to approve its development by politicians is another way by which the powers that be hold transport planning captive to political influences (Legacy, 2016).

One of the effects of vulnerable transport planning is a decline in walking and cycling and an increase in car use, even for short-distance, largely attributed to inadequate attention being paid to walkers and cyclists. This situation partly contributes to health consequences, such as cardiovascular diseases, because of sedentary lifestyle. The vehicle is not the only cause but one of the contributors to sedentary lifestyle. A specific example of decline in walking and cycling is children independent mobility. This aspect refers to the freedom of children to get about in their local neighbourhood without adult supervision (Shaw et al., 2013).

A study conducted in 1990 revealed that, in England, between 1971 and 1990, there was a dramatic decline in children's independent mobility (Hillman et al., 1990). In 1971, 80% of 7 and 8-year-old English children surveyed were allowed to go to school without adult supervision. The study reported that by 1990, the figure had fallen to 9%. Over the same period, in Britain, although the volume of traffic nearly doubled, child fatalities on the roads nearly halved. These findings contrasted sharply with results of similar surveys that were also conducted in the then West Germany in 1990. It was found that German children in comparable areas had substantially higher levels of independent mobility, despite higher levels of car ownership. A follow-up study was conducted in 2010 (Shaw et al., 2013).

The key findings from the follow-up study are as follows (Shaw et al., 2013):

- There was substantial reduction in the independent mobility of primary school children in England since 1971: the proportion of children walking to school dropped from 81 to 63%, while the percentage being taken in cars increased nearly 4-fold (from 9% of primary school children to 34%) and the percentage of children using public transport or a school bus dropped from 9% to 3%.
- The number of English children accompanied by an adult on the journey home from school had increased in 2010 compared with 1971: 86% of the parents of primary school children surveyed in 1971 indicated that their children were allowed to travel home from school alone. This figure had

dropped markedly to 35% by 1990, and further dropped to 25% in 2010.

- Compared to England, in 2010, Germany had 51% points more primary school children allowed to come home from school alone, 30% points more were allowed to cross roads alone and 20% points more were allowed to use buses alone. The gap between England and Germany for the lisence to travel home from school alone also seems to have remained large.

The decline in the children independent mobility is attributed to several factors related to parents, children and the external environment. However, surveys of parents showed that their fear of traffic was the main reason for picking up both primary and secondary school children from school. Parents were concerned about the likelihood of their children being involved in road traffic crashes and this concern affected whether parents would grant their children licence or permission to cross roads (Shaw et al., 2013).

The preceding illustrative examples and a critique of transport planning reveals its vulnerability to consist of prioritizing needs of motorized traffic over walking and cycling in assessment, design, execution and monitoring of transport projects. It lends itself to influences and forces that take its focus away from prioritizing walking and cycling in transport infrastructure development as has been shown in the case of Aalborg city. This study does not go into developing indicators for measuring vulnerability of transport planning. Whereas it is an important aspect to address in concept development, the scope of this paper is in making the case for reframing vulnerability in transport and road safety planning. The theme on indicator development can form the focus of follow-up work.

WHAT HAPPENS WHEN TRANSPORT PLANNING ADMITS AND CORRECTS ITS VULNERABILITY?

Through leveraging by advocacy groups, researchers, citizens, pedestrians and cyclists to overcome the "vulnerability" label, transport planning often wakes up to admit its vulnerability. For example, liveable streets and placemaking movements have been key in advocating for inclusive transport planning. Some scholars have had to make bold research-supported statements to show that walking and cycling are part of integrated or chain trips. For instance, Hillman and Whalley (1979) went as far as stating a basic principle as the title of their book *Walking is transport*. This emphasis on a basic principle is still relevant today for both walking and cycling for two main reasons. The first reason is because walking and cycling can be used as the only modes of transport for an entire trip for various purposes like going to school or going to work. The second is because these two modes of transport are key for a trip, especially at the beginning and end of a trip undertaken using motorized transport. This second reason is related to the concept of addressing the first and last mile challenge. This concept refers to the difficulty of accessibility and connectivity associated with the beginning or end of a trip between home and the bus stop or a farm and a market centre or a work place and a bus stop or a transport hub and final delivery point (Boarnet, 2017; European Environment Agency, 2020). This short distance, including the trip from home to the garage or parking lot for private car users, is generally not well catered for in transport planning. Ensuring safe, secure and accessible walking and cycling infrastructure and services contributes to easing transition from home or work place to public transport services.

Transport planning is not always on the defensive side. There are occasions and examples of when it admits its vulnerability. Positively, in some cases, transport planning acts to correct its omissions and neglect of walkers and cyclists in decision-making and infrastructure design. For example, the Netherlands, Denmark and Germany have over the years implemented integrated and self-reinforcing landuse and transport planning policies, consisting of provision of separate cycling facilities along heavily travelled roads and at intersections, traffic calming of most residential neighbourhoods, provision of ample bike parking facilities, integration with public transport, traffic education and training of both cyclists and motorists, and promotional cycling events (Pucher and Buehler, 2008; Whitelegg, 2014). This sustained and deliberative transport planning and decision-making effort has resulted in a high level of bicycle use in these three countries, compared with the United Kingdom and United Sates of America that had a small proportion of about 1% of trips by bicycle.

Pucher and Buehler (2017, p. 689) note: "Until recent decades, however, cycling was largely neglected by most European, North American and Australian transport planners and academics, not even considered a legitimate mode of transport, and thus excluded from most travel surveys and studies." This situation is changing following the adoption of cycling infrastructure, policies and programmes implemented in the Netherlands, Denmark, Germany and in other European cities. This policy change is reflected in increasing bicycle mode share as revealed in an analysis of data for 19 cities of Western Europe, North America and South America between 1990 and 2015 (Pucher and Buehler, 2017). While Copenhagen and Amsterdam still showed an increase over their existing high rates, 10% and 12%, respectively, countries that have had low rates showed significant increases, for example, Sevilla (6%) in Spain, Bogota (5%) in Colombia, Buenos Aires (3%) in Argentina and Portland in Oregon (5%) (Pucher and Buehler, 2017). Curitiba, Singapore and New York City have also taken steps related to legislation, infrastructure design and landuse planning to promote walking, cycling and public transport (Han, 2010; Khayesi and Amekudzi, 2011; Chen et al., 2013).

The city of Freiburg-im-Breisgau in Germany is cited as an example of proactive transport planning that has over the years taken transport and landuse planning decisions that have shifted travel from car dependence to other modes of transport (Roorda et al., 2011; Whitelegg, 2014). Examples of decisions and actions taken are development of a bicycle master plan, provision of bicycle parking spaces, pedestrianization of the old town centre, introduction of a 30 km/h speed zone on all residential streets and introduction of a low-cost-flat-rate monthly "environment ticket" for the region-wide bus service (Roorda et al., 2011). These decisions and actions have resulted in significant increase in walking, cycling and public transport trips (Whitelegg, 2016).

FIGURE 1 | Walking facilities in Cape Town, South Africa.

For example, in 2016, 29% of all trips was by walking, 34% by bicycle, 16% by public transport, 5% by car passenger and 16% by car driver (Whitelegg, 2016).

On the other hand, there are urban and rural areas in Africa with high levels of walking, but the transport planning and decision-making is yet to meaningfully tap into this encouraging situation. For example, walking is a key mode of transport in Nairobi, Dar es Salaam and Cape Town, constituting 73.7%, 70.3%, and 46.7%, respectively, of all trips undertaken in these cities (Vanderschuren and Jennings, 2017). Bicycle use makes up about 1% of all trips in these three cities in Africa. One would realistically expect that urban transport planning in Africa would prioritize these two modes that are at the centre of sustainable transport policy, but this is not the case. Though non-motorized transport strategies and policies have been developed for Nairobi, Dar es Salaam and Cape Town, their implementation has not been consistent (Jennings et al., 2017; Mitullah and Opiyo, 2017b). There are encouraging steps such as providing pedestrian paths and enforcing traffic laws in Accra, Lagos, Cape Town (**Figure 1**), Addis Ababa, Dar es Salaam and Nairobi but "coordination and strategic movement toward implementing a transformative NMT policy remains a hindrance" (Mitullah and Opiyo, 2017b, p. 202). Cities in Chile, like these African cities, have high levels of walking despite a transport policy that favours motorized traffic. A comprehensive review of literature by Herrmann-Lunecke et al. (2020) reveals the persistence of walking as the most important mode for daily trips in Santiago, constituting 34.5% of all trips. This mode of transport prevails among lower-middle income groups. This persistence is attributed to cultural, environmental, economic, and built environment factors, and not to proactive transport planning policy (Herrmann-Lunecke et al., 2020). The illustrative empirical findings from African and Chilean cities reveal the existence of a virtuous walking virus attributed to socio-economic and built environment factors, which needs to be sustained by a proactive transport planning approach, but this expectation is far from being seen as the authors cited have indicated.

An example of a road safety approach that admits that transport planning is vulnerable is the safe system framework. It advances the view that a change is needed in understanding and assigning responsibility in decision-making and constructing a safe transport system (Belin et al., 1997; International Transport Forum, 2016; Tiwari, 2018). It points out the importance of system designers in delivering a safe transport system. When transport planning fails to consider the needs of all road users and privileges motorized transport, then it is vulnerable in the sense that it is susceptible to rationality and forces that favour automobile dependent transport planning, excluding and neglecting some of the groups it is to serve. This framework argues for system designers to understand and cater for road users with varying physical or human capabilities. It also argues that road users have a responsibility to obey traffic rules. Thus, the decision-making in transport planning becomes vulnerable if it favours one mode of transport over other modes, paying inadequate attention to the tolerance of the human body to injury.

CONCLUSION

We need to answer a key question as we conclude our learning journey in this study: "Who is truly vulnerable"? Given that it is transport planning that has generally neglected the needs of walkers and cyclists, then the real vulnerability is with this planning system. Hence, it is logical to be talking about vulnerable transport planning rather than vulnerable road users to direct efforts for solutions strategically at tackling the root cause of vulnerability. This study proposes and reinforces the idea that attention should be focused on vulnerability of transport planning instead of primarily beginning with road users, commonly referred to as vulnerable road users, who are essentially victims of neglect and omission in the planning of transport systems. Transport planning vulnerability is a pervasive phenomenon that is situated not only in transport planning decision-making but also in overall interaction of several economic, social, technological and political factors that contribute to automobile dependent transport planning. As we continue to reflect on where the real vulnerability lies, let us remember the words of Juliet to Romeo: "That which we call a rose, by any other name would smell as sweet" (Shakespeare, 2020).

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary materials, further inquiries can be directed to the corresponding author/s.

ETHICS STATEMENT

Written informed consent was not obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

AUTHOR CONTRIBUTIONS

The author confirms being the sole contributor of this work and has approved it for publication.

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