

Article

Rethinking the Contextual Factors Influencing Urban Mobility: A New Holistic Conceptual Framework

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Submitted: 13 May 2022 | Accepted: 6 October 2022 | Published: 27 October 2022

Abstract

Urbanisation, urban mobility (active travel), and public health continue to be three defining issues of the 21st century. Today, more than half of humanity lives in cities, a proportion that is expected to reach 70% by 2050. Not surprisingly, urbanisation has significant impacts on mobility, health, and well-being. Today's cities struggle with health challenges such as those that are either a direct result of infectious and non-communicable diseases or issues related to violence and injuries. According to the World Health Organisation, the lack of suitable space in urban areas for physical activities and active living has turned cities into epicentres for diseases. The concept of urban mobility and its connection to health is not new. However, the ways through which a healthy city objective is achieved are poorly investigated in the academic literature. Accordingly, this article proposes a holistic conceptual framework by consolidating knowledge around factors impacting urban mobility by adopting a scoping review methodology to determine the field's scope, coverage, and existing knowledge gap. To achieve the above objectives, 3,189 research articles and book chapters published between 2014 and 2021 were screened. A total of 92 studies were identified as eligible for inclusion in the scoping review. This approach revealed the importance of understanding urban mobility and healthy cities and of identifying and enacting associated enablers. Covid-19 has amplified the urgency of giving attention to these issues. The scoping review also showed a need for further research that investigates the future of urban mobility and healthy cities. A conceptual framework has been drawn from the literature to guide such future research.

Keywords

healthy cities; social-ecological systems resilience theory; socio-economic factors; theory of planned behaviour; urban mobility; urbanisation; well-being

Issue

This article is part of the issue “Healthy Cities: Effective Urban Planning Approaches to a Changing World” edited by Elmira Jamei (Victoria University), Simona Azzali (Prince Sultan University), Hendrik Tieben (The Chinese University of Hong Kong), and K Thirumaran (James Cook University, Singapore).

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1. Introduction

For decades, city and transportation planning in developed and developing countries has primarily focused on accommodating the fast-growing demand for the use of private cars (i.e., auto-centric planning), result-

ing from experiencing rapid economic growth. Although due to the negative consequences of such planning approaches (Banister, 2011; Harrington & McConnell, 2003), the underlying paradigm around urban mobility has been shifting. The new focus seems to be related to a few factors across cities, including socio-economic

factors (Ahmad & Oliveira, 2016), the characteristics of the transport systems (Ingvardson & Nielsen, 2018), different dimensions of urban mobility, and land use patterns (Newman & Kenworthy, 2015). A recent study by Teoh et al. (2020) found consistent evidence that urban mobility transitions through economic growth and rising levels of income. Cities prioritising these socio-economic aspects in their planning approaches are more likely to improve urban mobility. These findings are not surprising as the concept of urban mobility has direct economic roots. Heterodox economic theories such as the bid rent theory, the post-Keynesian notion of convention, agglomeration economies, and the theory of the location of industries create a dynamic foundation to configure the concept of urban mobility in modern days. Bid rent theory was first introduced by David Ricardo (1817) as an agricultural analogy and later was used in economic geography and urban economics. The theory defines the changes in real estate price and demand as a function of distance from the central business district, indicating more competition and higher processes for lands closer to the central business district. This theory is essential to understanding the configuration of capitalist cities.

Post-Keynesian literature provides further emphasis on urban economics. It details the concepts of uncertainty and conventions, emphasising that economic agents' (i.e., individuals and firms) uncertainty and expectations have significant and inevitable impacts on the types and volumes of economic activities. This approach influenced urban economics literature by arguing that the economic landscape can be described as a "landscape of uncertainty," as mentioned in Clarke et al. (1986).

Furthermore, the theory of the location of industries originated based on the "least cost principle," and it is used to explain the locational decisions of the manufacturing industries. The theory presupposes aggregate demand uniformity and transportation as a function of cargo weight and distance. And finally, the perennial gale of "creative destruction" theorised by Schumpeter (1942) saw disruptions leading to the destruction of old and redundant technologies and the reallocation of market resources to create more contemporary industry jobs and opportunities (Chaiechi, 2014). This phenomenon of creative destruction ultimately increases the profitability of new ways of production, altering agglomeration economies and changing spatial urban landscapes (Holgersen, 2014) through mobilising resources and re-shaping urban zones.

Classical location theories suggest that some activities with weaker associations with main commercial centres may occur around an isolated urban centre and are independent of the rest of the economic system (Figueiredo & Crocco, 2015). These theories fail to regard the factors that lead to the concentration of activities in urban spaces. However, a few heterodox economists and economic geographers proposed disagglomerative and fragmented models to define the shape of the cities and

the formation of consumer centres (away from the central business districts). Economic geographer Christaller introduced the central place theory in 1933 and associated the concept of the neighbourhood with factors such as density, income (affordability and per capita income), education, culture, and transport and the cost of travel to get to a place (Christaller, 1933/1966). Heterodox economist Lemos (1988) placed transportation cost at the centre of his disagglomerative models, and while his work was mainly concentrated on commercial location decisions, it has opened a dialogue around transport and its cost to getting to optimum places. As it is becoming more evident today, urban transport planning and policies have a significant impact on public health (Khreis et al., 2017; Nieuwenhuijsen & Khreis, 2019), and the concept of mobility and access are becoming increasingly regarded as an essential leverage point to tackle the climate crisis (Khomenko et al., 2020).

Together, these theories provide a coherent heterodox context to understand city dynamics and shape new urban conventions' frontiers. Nonetheless, considering socio-economic factors in planning for urban mobility is not adequately explored in the context of accommodating configurations of urban structure. Furthermore, how a healthy city objective is achieved is poorly understood in the literature. The other under-researched area is understanding ways through which cities can prepare for achieving increasingly essential goals such as enhanced urban mobility, walkability (Habitat III, 2016; Principle 8), transit-friendliness (Principle 8), urban safety (Principle 9) while protecting the vulnerable population. The significance of accomplishing such goals is further intensified when studying tropical cities that are swiftly expanding due to the growth of tropical economies, increasing urban entrepreneurial activities and accelerating demographics (Chaiechi & Eijdenberg, 2022; Choongo et al., 2020).

Despite economic prosperity achieved through market-oriented reforms in the post-World War II era, wealthy cities still face increasing social and environmental problems. To address these issues and build healthy and liveable cities, "beyond-gross domestic product" indicators must be integrated into urban planning and economic decisions. Consequently, the unsustainable economic growth in recent decades has turned cities into arenas for political struggles to create a balance between the environment, society, and economy. Optimum urban mobility does not only ensure access to economic opportunities and services for city dwellers, but it also provides the potential to address some of the global concerns such as human health, sustainable economic development, and the natural environment. Despite the existence of such multidisciplinary evidence, there is still a compelling need for a holistic conceptual framework that provides a single source of evidence-based and informed best-practice planning guidelines.

Recognising that cities are complex systems and urban health outcomes depends on interactions with a

wide range of indicators and feedback loops, this study utilises a scoping review to propose a holistic conceptual framework to predict patterns of urban mobility. Through this process, this study identifies the key contextual factors that influence urban mobility and presents a framework for further investigations.

2. Material and Methods

2.1. The Scoping Review

This article primarily follows Arksey and O’Malley’s (2005) scoping review methodology to determine the field’s scope, coverage, and existing knowledge gaps. Arksey and O’Malley (2005) developed a six-stage methodological framework (optional sixth step). This article follows the mandatory five steps, including:

1. Identify the search (guiding) question;
2. Identify relevant studies;
3. Study selection;
4. Charting the data;
5. Summarising and reporting the results.

These stages are iterative rather than linear, and researchers are encouraged to intuitively engage with

each stage where needed (Mushaya et al., 2022). Following Chaiechi (2020) and Azzali et al. (2022), the article established review strategies in the form of an a priori protocol, including developing a guiding question and identifying eligibility criteria (as represented in Figure 1 and Table 1), search strategy and literature profiling techniques. The guiding question used to search for articles was: What are the economic impacts of urban mobility and healthy cities? The search strategy involved utilising the Science Direct search engine, which was then replicated to extend to Google Scholar.

Only research articles and book chapters were included in the search. Review articles, book reviews, conference papers, short communications, case reports, data articles, and encyclopedias were excluded from the search. The time span was set to include all publications between 2014 and 2021. The year 2014 was selected as the starting year as it marks the launch of the Urban Electric Mobility Initiative by UN-Habitat during the UN Climate Summit in September 2014 in New York. Working with authorities, industry, SMEs, knowledge partners, and international agencies, Urban Electric Mobility Initiative aims to pursue sustainable development goals, particularly transport and urban mobility (UN Habitat, 2013). Accordingly, appropriate filters were used in ScienceDirect and Google Scholar

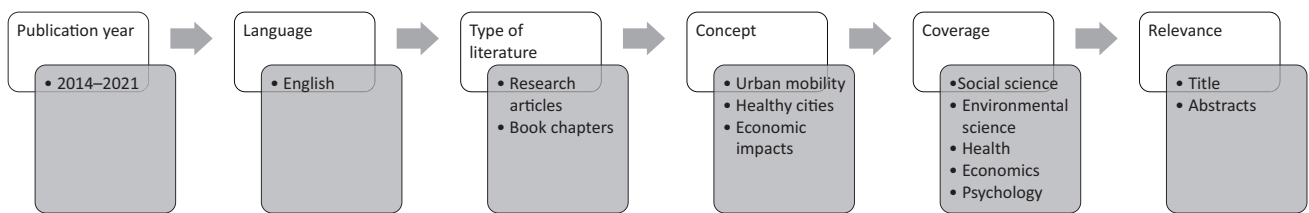


Figure 1. Inclusion criteria.

Table 1. Inclusion and exclusion criteria.

Criteria	Inclusion	Exclusion
Publication year	Studies published in the years between 2014 and 2021	Studies outside this time span
Language	English only	Studies in languages other than English
Type of literature	Research articles and book chapters	Reports, grey literature, books, review articles, book reviews, conference abstracts, editorials, data articles, correspondence, case reports, and encyclopedias
Concept	Concepts related to urban mobility, healthy cities, and economic impacts	Concepts unrelated to urban mobility, healthy cities, and economic impacts
Coverage	Social sciences, environmental science, health, economics, psychology, business, and management and accounting	Medicine, agricultural and biological sciences, nursing and health professions, engineering, and energy
Relevance	Relevance of titles and abstracts to the topic coverage	Titles and abstracts that did not appear related to the topic coverage

search engines to extract studies limited to the selected time span. The time span was set to include all publications between 2014 and 2021.

To uncover topical relationships between the articles in the sample and explore the parallel existence of discrete knowledge sources, the articles were grouped based on their discipline specifics and dissemination specifics. The subject areas were quite diverse, demonstrating complementary capabilities of academic fields that contributed to the topic area. The subject areas included: business; decision science; economics, econometrics and finance; environmental sciences; social sciences; environmental sciences; management and accounting; medicine; psychology; and engineering.

The initial search on the Science Direct database resulted in 3,144 articles, of which 2,685 were research articles and 459 were book chapters. The Google Scholar database has limited filters that include years of publication and sorting options based on relevance applied in our search. Google Scholar does not distinguish between types of articles, books, review articles, and book chapters. Accordingly, the search result was exhaustive and selecting appropriate studies required due diligence. Overall, an additional 45 articles were collected through Google Scholar, resulting in an initial sample of 3,189 articles, including a search in the James Cook University Library One Search Database, resulting in 35 new articles. The authors screened all articles by title and abstract according to eligibility criteria.

A step-by-step screening approach was followed based on the eligibility criteria (as depicted in Figure 2). Eligible articles were then reviewed in full text to confirm eligibility. The relevance was explored firstly upon inspec-

tion of the titles and the abstracts, then based on the full-paper evaluation. The duplicate articles were removed from the sample following this screening step. Ultimately, after going through over 3,189 search results, 92 studies were selected and included in the final review.

As part of “charting the data”—i.e., step 4 in Arksey and O’Malley’s (2005) protocol—the literature was initially profiled to extract relevant information or data from each article and book chapter. This information allowed for a descriptive summary of the data. It also enabled data to be collated and summarised to provide a scope of the extant literature. The results are presented below.

3. Results

One of the main aspects of profiling the data was identifying the geographical scope of the selected articles and book chapters. Figure 3 shows that, overall, nine countries were identified from the selected studies, with most articles ($n = 20$) being related to the United States, closely followed by China, Spain, and Canada, with the most publication representations in the selected sample.

Figure 4 shows only occasional publications focusing on the relationship between urban mobility and healthy cities from 2011 to 2019, but the topic area seems to gain impetus in 2020 and 2021. The stacked column represented in Figure 4 is useful in comparing the year of publication and the geographical scopes of the studies in the sample, which captures the cumulative magnitude of both elements.

To improve our initial understanding of how the concepts of urban mobility and health are presented in

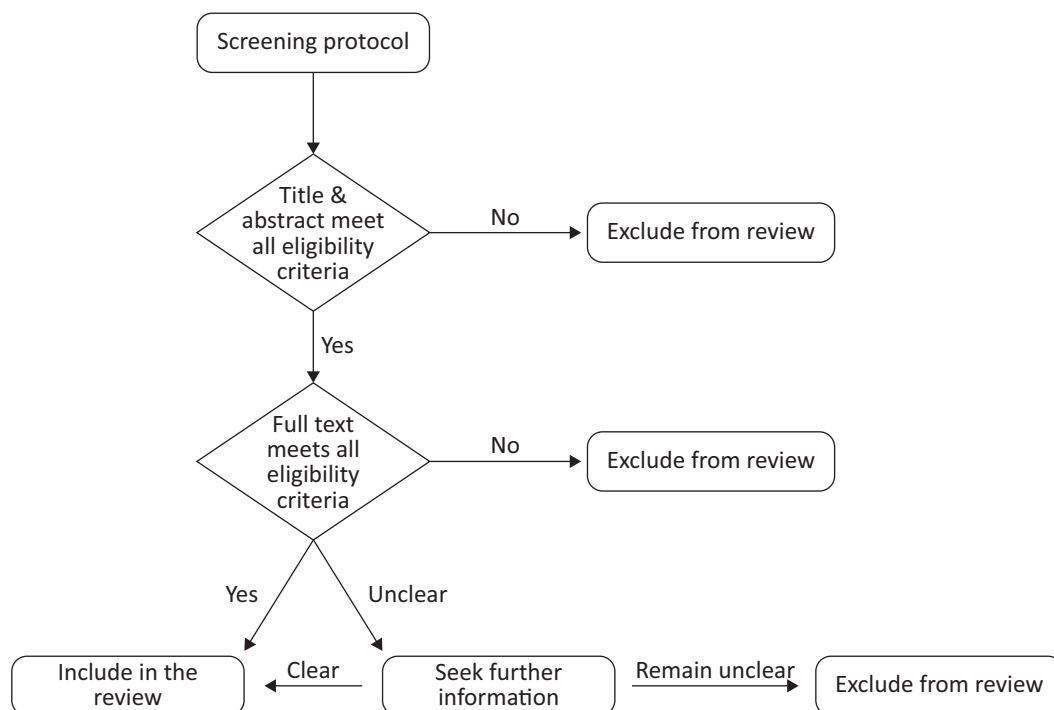


Figure 2. The screening protocol.

Geographic Scope and the Frequency of the Selected Studies

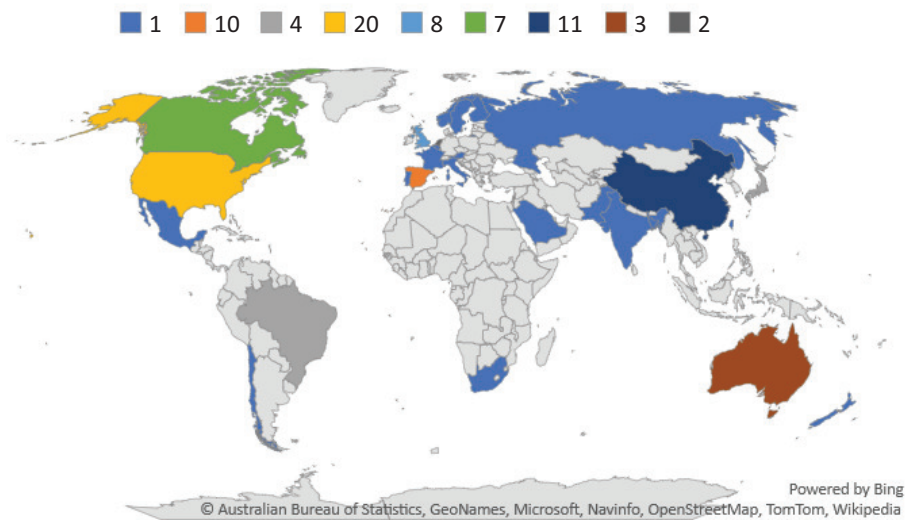


Figure 3. Geographic scope and the frequency of the selected studies. Data source: Authors.

the selected sample, a word frequency cloud was produced, which is shown in Figure 5. The word cloud displays the 100 most frequently used words in the selected articles, and the size of each word indicates its greater dominance. Figure 5 shows that most of these articles have also paid great attention to the concepts of health, transport, urban, public, walkability, mobility, and physical activity.

As the 92 articles were reviewed, it was possible to identify four main areas of research that were being explored in the articles. These were: active travel and safe neighbourhoods, the role of perception in promoting active travel, and the impact of the Covid-19 pandemic on active travel.

3.1. Urban Mobility and Urban Living

Urban mobility or active modes of travel (i.e., “active travel” or “soft urban mobility”) are means of transport that promote physical activities such as walking, cycling, running, skateboarding, etc. (Louro et al., 2019; Oja et al., 2011). Enhanced urban mobility has proven to improve populations’ access to places, hence increasing the competitiveness of different areas of a city or neighbourhood (Banister & Button, 1993; May et al., 2006). Soft urban mobility has motivated some policy-makers to adopt an integrated policy centred around sustainable and healthy modes of transport. Examples include Interreg CHIPS (cycle highways innovation for smarter people

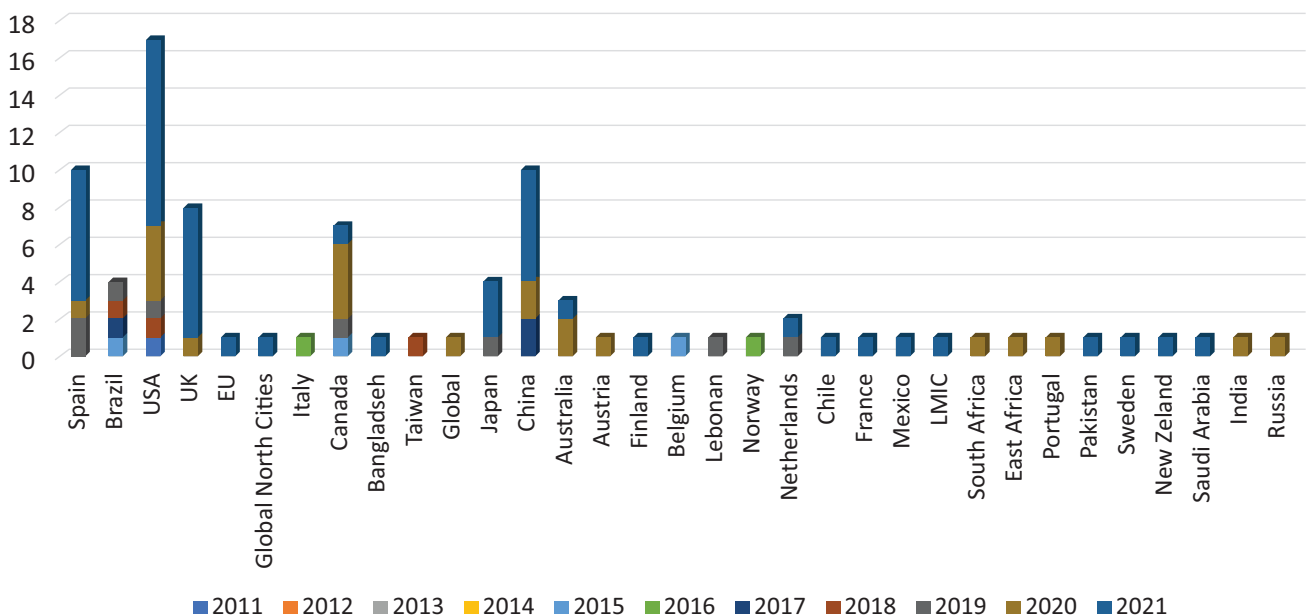


Figure 4. The cumulative magnitude of studies concerning their geographical scope and year of publication.



Figure 5. Word frequency cloud.

transport and spatial planning) in Belgium, Germany, the Netherlands, and the UK, or DePICT (designing and policy implementation for encouraging cycling and walking trips) in Brazil, the Netherlands, Designing And Policy Implementation for Encouraging Cycling and Walking Trips (DePICT) in the UK, and HANDSHAKE (supporting the take-up and transfer of successful cycling measures) cycling capital cities (i.e., in Amsterdam, Copenhagen, and Munich). These policies have not only contributed to improved public health outcomes but have also reduced the number and length of car trips, diminishing the negative impact of traffic and pollution on the environment and on the economy (loss of time and loss of productivity;

Maltese et al., 2021). Active travel also has the capability to improve urban design and planning (López-Lambas et al., 2021). This relationship between the “built environment” and “active travel” is represented in Figure 6.

A group of studies in the literature sample consider urban and neighbourhood walkability as an important factor that positively impacts public health (Cebrecos et al., 2019; S. R. Liu et al., 2018; Y. Liu et al., 2017; Yoon et al., 2021). This relationship is depicted in Figure 6 (Active travel/Subjective well-being). Other studies focused on older and ageing adults and associated the concept of healthy cities with a number of influencing factors such as city and neighbourhood safety, accessibility, physical

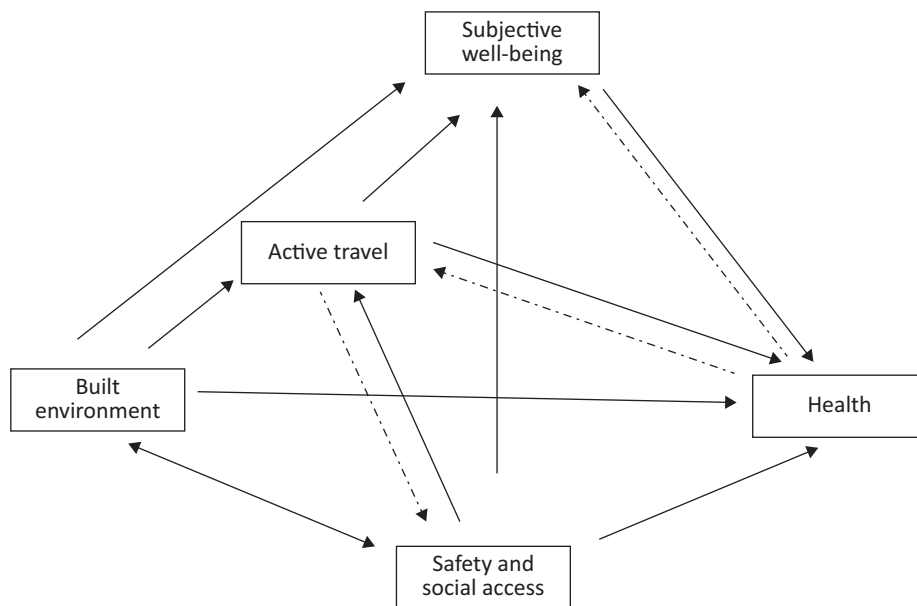


Figure 6. Relationship between safety, social access, and active travel. Source: Authors’ work based on selected studies.

and social environment, and subjective well-being (Ronit et al., 2021; Sharov, 2020; Yin & Zhang, 2021), as noted in Figure 6 (Active Travel/Safety and social access, Active Travel/Subjective well-being, Active Travel/Health). The role of safety in promoting walkability is not extensively researched; nonetheless, some studies link poor walking and travel behaviour with safety concerns associated with the built environment, including long distances to amenities, shortages of sidewalks, traffic, and lack of cycling paths (Cambra & Moura, 2020; Iroz-Elardo et al., 2021; Lee et al., 2020; S. R. Liu et al., 2018; Y. Liu et al., 2017; Riggs et al., 2020). With respect to policies focusing on the built environment, the availability of safe and connected sidewalks and cycling paths is crucial for enhancing the overall rate of active travel adoption (Maltese et al., 2021; Rivera-Navarro et al., 2021). This conceptual relationship is depicted in Figure 7.

Nagata et al. (2020) focus on micro-scale walkability to promote walking behaviour and find a relationship between leisure walking by ageing females and micro-scale walkability based on the quantified streetscape. Nevertheless, studies indicate that due to a lack of research and data constraints, the practical advantages of walkability and associated measures are not fully explored in the literature (Nagata et al., 2020; Ronit et al., 2021).

3.2. The Role of Perception and Attitude in Promoting Urban Mobility

Another group of studies in the sample emphasised the deep connection between individuals' perceptions of and attitudes toward walking environments and social environments (Chen et al., 2021; Fontán-Vela et al., 2021; Huerta & Utomo, 2021; Iroz-Elardo et al., 2021; Klein et al., 2021; Lee et al., 2021; Rivera-Navarro et al., 2021;

Weimann et al., 2020). In particular, it has been noted that "social access" plays a key role in perceptions and attitudes toward urban mobility. For example, investigating through 20 survey instruments, Iroz-Elardo et al. (2021) found that social interactions and networks (e.g., walking partners, knowing neighbours, and neighbourhood events), social cohesion (e.g., getting along, mutual trust, general view of the neighbourhood, community identity; Rivera-Navarro et al., 2021), and social conduct norms (e.g., knowing other who walk, catching up with others while walking) are positively connected with neighbourhood walkability. Personality traits have also been directly associated with perceptions relating to the quality of neighbourhood walkability. For example, along with health status, individuals' moods have been found to directly impact urban mobility and recreation (Chen et al., 2021).

The four main dimensions associated with social access have included people, activity, novelty, and ability. These four aspects have been explored in connection with urban mobility in public spaces. A few studies found that individuals relate to public places through other individuals or activities they know and are familiar with (Klein et al., 2021). Hence, emphasising the importance of safety and social access to urban mobility. Moreover, the affordability to travel to public spaces and the readiness with which previous experiences are described are also found to promote visiting public spaces in urban areas (Emerson et al., 2011; Klein et al., 2021). These relationships illustrate that perceptions and attitudes impact "willingness to use public spaces" and, ultimately, urban mobility, as depicted in Figure 7.

At the same time, perceptions of fear, insecurity, and dirtiness negatively affect physical activities, as such perceptions would keep people unmotivated (Rivera-Navarro et al., 2021). So, in such cases,

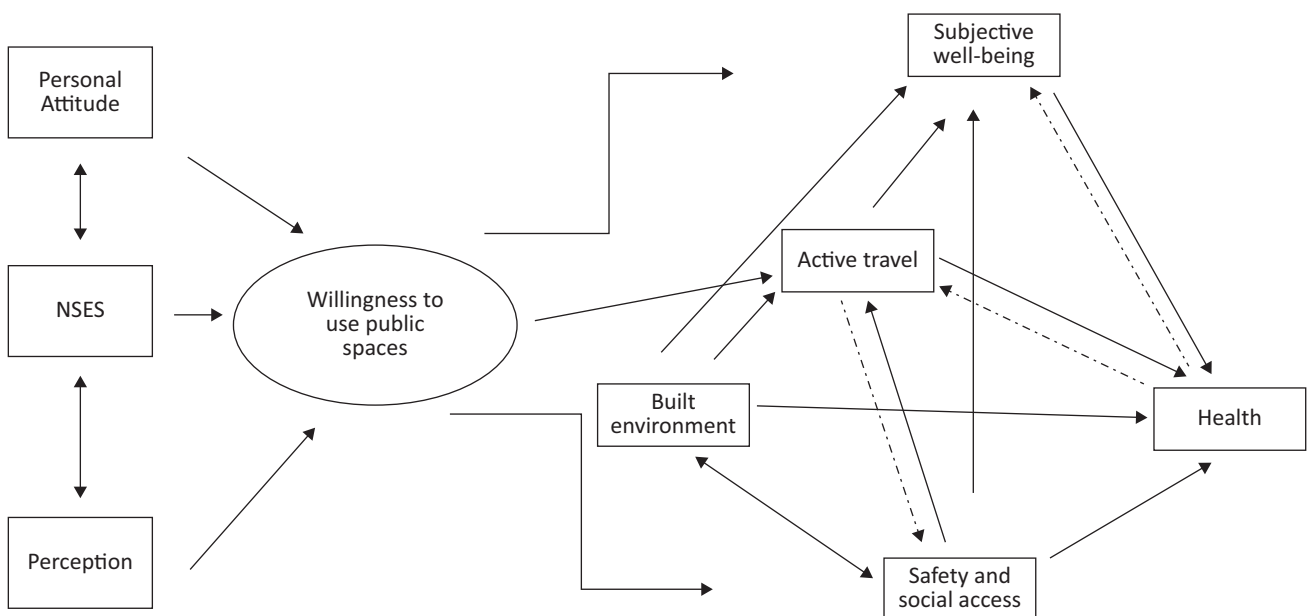


Figure 7. The relationship between perception, personal attitudes, and active travel.

governments' policies, practices, and interventions in the maintenance of public places are important. For instance, socio-spatial policing is an effective tool for the regulation of drug use in neighbourhoods (Ezell et al., 2021) and urban green spaces (Huerta & Utomo, 2021). In so doing, public and personal attitudes can be positively influenced. The relationship between personal attitudes and use of public spaces is also noted in Figure 7.

Nonetheless, proactive government interventions to improve well-being in urban areas could be hindered by society's negative perceptions of surrounding neighbourhoods. For example, neighbourhoods known for substance abuse and crime create negative perceptions of the surrounding built environment, resulting in feelings of hopelessness and, therefore, impacting mental health and active travel (Weimann et al., 2020).

Complementing the abovementioned views, the neighbourhood socio-economic status (NSES) of the residents, their gender, and age groups (Cheng et al., 2019; Khomenko et al., 2020; S. R. Liu et al., 2018; Mifsud et al., 2019; Rivera-Navarro et al., 2021) are found to impact how individuals interact with green public spaces (Fontán-Vela et al., 2021), as illustrated in Figure 7. Regardless, there seems to be a need for a better understanding of how these factors influence the attractiveness and perceptions of the neighbourhood environment to promote the active use of public spaces.

3.3. The Covid-19 Pandemic, Social Distancing, and Urban Mobility

Heterodox economics explains the economic processes of external events and disasters as a non-equilibrium phenomenon that opposes classical equilibrium economic theories (Chaiechi, 2020). Recent studies have broadly discussed the economic impacts of external risks and threats such as climate change, natural disasters, and public health emergencies. However, most of these discussions fail to investigate these economic effects concerning changes in human physical and mental health and behaviour during and post-disaster. Nonetheless, a few theories have been developed to account for the complex dynamic behaviours that emerge during unexpected changes. One of these theories is the social-ecological systems resilience (SERS) theory which refers to the adaptive capacity to transform and support human well-being in the presence of unexpected changes. Emerging from the works of Gunderson et al. (1995), Holling (1978), and Walters (1986), SERS has grown into an integrative and transdisciplinary approach that combines natural and social sciences perspectives of human well-being without looking at the economic factors associated with the concept of well-being. SERS appears to be applicable in studies regarding pandemic control measures, including extensive lockdowns, restricted mobility, and social isolation. The built environment has been associated with health and active travel (Cambra & Moura, 2020; Iroz-Elardo et al., 2021; Lee

et al., 2020; S. R. Liu et al., 2018; Y. Liu et al., 2017; Maltese et al., 2021; Riggs et al., 2020; Rivera-Navarro et al., 2021). Living in larger dwellings, living farther from city centres and near large park areas (Mouratidis, 2020), and other positive neighbourhood features (such as quality of dwellings, availability of sidewalks, etc.) have also been linked with mental health and the ability to handle stress (Finucane et al., 2022; Vatavali et al., 2020; White & Van Der Boor, 2020). These articles highlight that "proximity" is another factor to be considered when addressing the use of public spaces and mobility. They suggest that any urban planning and focus on the built environment should also include considerations of proximity. Accordingly, this has now been captured in the conceptual framework proposed in the next section.

The Covid-19 pandemic's social and mental health impacts have been found to be more severe on socio-economically disadvantaged groups in segregated neighbourhoods and non-white communities (Barber et al., 2020; Falchetta & Noussan, 2020; Finucane et al., 2022). As the mental health of the urban population deteriorated due to Covid-19 restrictions on movement, the value of urban public and green spaces significantly increased in people's perceptions of these places (Huerta & Utomo, 2021; Rahman et al., 2021).

Restricted physical activity resulting from home confinement has also impacted the population's eating habits and overall well-being (Ammar et al., 2020). At the same time, neighbourhood trips significantly increased after curfew periods, while transit travels plummeted (Rahman et al., 2021). Unfortunately, however, there is a lack of remote sensed-based data on fuel consumption (as an indicator for car-based travels) and active travel, particularly in developing nations; nonetheless, studies highlight the importance of urban green and public spaces as a tool to improve community resilience, subjected well-being and overall physical and mental health (Huerta & Utomo, 2021; Rahman et al., 2021).

3.4. Proposed Conceptual Framework to Predict Urban Mobility

Collectively, the studies extracted from the scoping review evidence the elements of a conceptual framework that predicts urban mobility (active travel). They highlighted that perception strongly influences "willingness to use public spaces" through its interplay with NSES and personal attitudes (Figures 6 and 7). The relationship between willingness to use public spaces and urban mobility is also impacted by factors such as safety, social access, perceived external threats (e.g., Covid-19), and, most importantly, the built environment (Figures 6 and 7). The intent or willingness to use public spaces can ultimately result in urban mobility and, subsequently, subjective well-being, good public health, and healthy cities, as noted in Figure 7. SERS theory provides some explanation for the realisation of active travel. More broadly, the conceptualisation of personal attitudes and

perceptions through a willingness to use public spaces for urban mobility can best be explained by the theory of planned behaviour (TPB).

The TPB is an evolution of the theory of reasoned action, which was originally proposed and described by Ajzen and Fishbein in the 1980s (Drennan & Pryce, 2022). TPB seeks to explain the often-observed discrepancy between behavioural intentions and actual behaviour (Ajzen, 1985, 1991). Both TPB and theory of reasoned action (TRA) recognise that “subjective norms” can influence behavioural intentions, but the TPB extends that thinking by arguing that “perceived behavioural control” influences behaviour, either directly or through behavioural intentions. Ajzen (1985, 1991) contended that where perceived behaviour control works through behavioural intentions to affect behaviour, it is indicative of motivational factors. Hence, it is reasonable to advance TRA as a way to explore and understand how willingness to use public spaces and urban mobility are enacted because, according to TRA, individuals’ perceptions and attitudes influence and are influenced by factors such as NSES and the built environment. Equally, TRA provides a richer and deeper insight into the factors at play between the willingness to use public spaces (i.e., behavioural intentions) and urban mobility (behaviour). Additionally, it can lead to informed decisions being made in relation to policies.

According to Badami (2009), worldwide experiences show that adding new roads is beneficial only in the short term, improving speed and easing congestion only briefly. Over time, the resulting increase in travel by single motorised vehicles, shifting of travel from public modes to cars, and diversion of traffic from other destinations and routes will instead cause new and longer

car-based trips and decrease active travel. As previous studies showed, the lack of detailed urban design guidelines impedes the creation of pedestrian-friendly environments (Zhang et al., 2018). In this sense, planning public consultation policies could help better understand the “willingness to use public space” by capturing diverse and different attitudes and perceptions and, in this way, involve the local population in the transportation design process.

The proposed framework (Figure 8) can support local policies and further investigations aimed at defining new ways to face the urban mobility challenge, focusing, for example, on relevant areas of intervention such as integrating land-use and transport planning; and supporting a multi-modal approach to transportation (integrating different modes) that facilitates the shift from one option to another, and, in turn, fosters urban mobility. The proposed framework brings together concepts and constructs (i.e., attitudes, perceptions, subjective well-being, public health, healthy cities, willingness to use public spaces, and urban mobility) and associated factors (e.g., built environment, safety, social access, NSES, and external threats) that can inform policies and plans that promote increased willingness to use public spaces and urban mobility.

4. Conclusion

Around the world, urban mobility associated with rapid urbanisation and motorisation presents challenges to individuals, cities, and nations. New urban developments are experiencing impressive rapid growth in demand for transportation and increased demand to cope with limited infrastructure and deterioration of health and

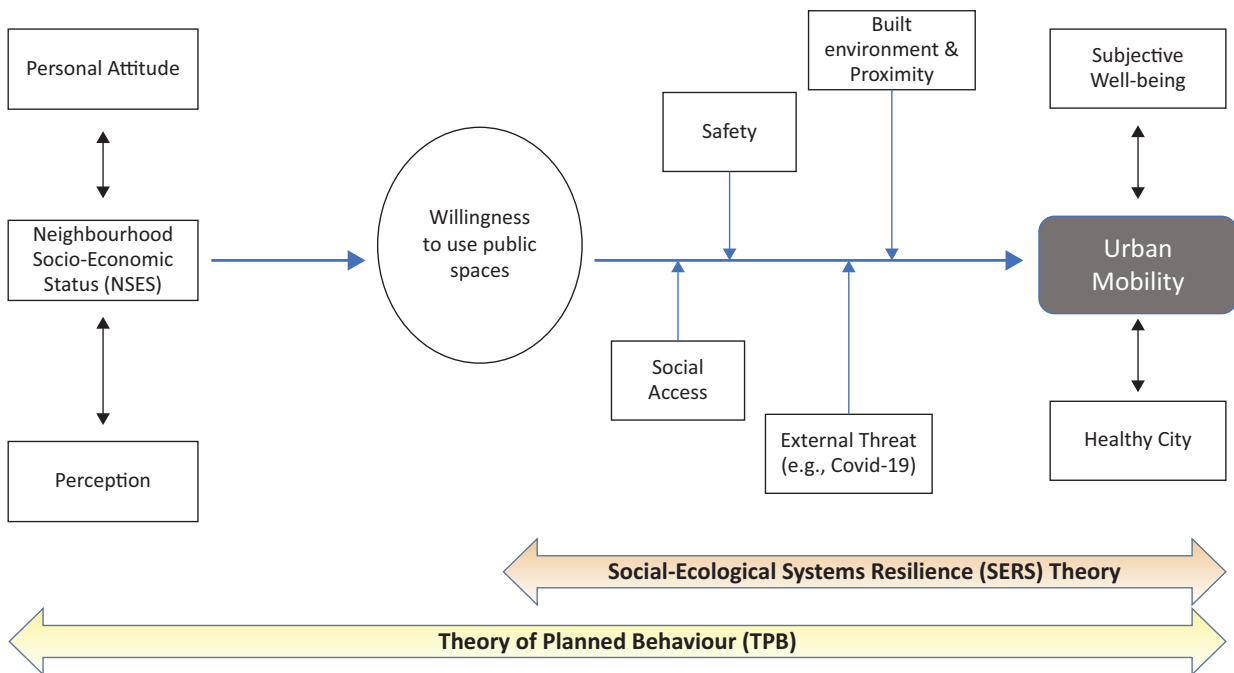


Figure 8. Proposed conceptual model to predict patterns of urban mobility in cities in the post-pandemic period.

well-being due to limited urban mobility. Within this context, this scoping review sought to determine the economic impacts of urbanisation on urban mobility and healthy cities. It found that the focus of the literature emphasised factors beyond economic aspects. In particular, the literature highlighted that urban mobility was a fundamental aspect of urbanisation and that it was instrumental in enabling subjective well-being and positive health outcomes. The studies also revealed that willingness to use public spaces was a key element for achieving urban mobility and that this behaviour was enacted through personal attitudes and perceptions, both of which were impacted by NSES.

Beyond the demographic variables, the studies noted that external variables (e.g., the built environment, social access, and safety) also impacted people's intentions to use public spaces and related urban mobility. Furthermore, the scoping review highlighted that the relationship between willingness to use public spaces and urban mobility is impacted by perceived external threats (e.g., Covid-19). In bringing together the findings from the scoping review, it was realised that the SERS theory presented explanations for the mechanisms of these relationships, and TPB afforded an extended conceptualisation of the relationships indicated by the literature. This realisation allowed for the development of a conceptual framework (Figure 8) that lends explanations for why individuals do or do not engage in urban mobility. Accordingly, the study proposes that this conceptual framework can support local policies to further define new ways to face the challenges of urban mobility, focusing on relevant areas of intervention such as integrating land-use and transport planning and supporting multi-modal approach transportation.

The proposed conceptual model could also serve as a point of departure for further theory development through empirical studies. Researchers could explore the different variables and interrelations between the variables of the conceptual model, such as examining how a neighbourhood's socio-economic status determines urban mobility and how this causal relationship is mediated by the willingness to use public spaces. The use of surveys that target various stakeholders would be a starting point for gathering such data. Additionally, insights from qualitative interviews could enrich the quantitative findings by providing contextualisation and deeper meaning to the numbers. Ultimately, increasing urbanisation demands that attention be given to urban mobility. Here, an integrated approach is proposed that allows for alleviating some of the potentially deleterious impacts of urbanisation.

Acknowledgments

We are grateful to the anonymous reviewers for their valuable feedback on the development of this article and to James Cook University for the support of the publication.

Conflict of Interests

The authors declare no conflict of interests.

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