

Exploring the Effects of the Built Environment on Urban Community Wellbeing

Mohammad Mujaheed Hassan¹, Peter Aning Tedong², Azlina Mohd Khir³, Zalina Shari⁴, Zakiah Ponrahono⁵, Muhammad Phaizal Sharifudin⁶

^{1,3,6}Faculty of Human Ecology, ¹Malaysian Research Institute on Ageing (MyAgeing™)

⁴Faculty of Design & Architecture, ⁵Faculty of Forestry & Environment UNIVERSITI PUTRA MALAYSIA, ²Faculty of Built Environment

UNIVERSITI MALAYA

Email: mujaheed@upm.edu.my

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Abstract

The built environment's impact on urban community wellbeing is a crucial facet of contemporary urbanization. As cities, including those in Malaysia, rapidly expand, the relationship between the built environment and community wellbeing gains prominence. This article explores this dynamic connection, encompassing building, infrastructure, public space, land use planning, accessibility, urban design, and sustainability, affecting residents' quality of life and interactions. In Malaysia, the built environment fosters inclusivity and cohesion amid diverse demographics and cultural richness. Through a systematic approach, this study reviews journal articles to unravel complex relationships between the built environment and community wellbeing. The research offers insights for policymakers, urban planners, and community stakeholders, aiming to inform decision-making and create inclusive urban spaces. By leveraging the built environment strategically, the study advocates for harmonious, thriving urban communities. It emphasizes a paradigm shift in urban planning, prioritizing sustainability, accessibility, and community wellbeing to enhance quality of life for present and future generations.

Keywords: Building, Infrastructure, Public Space, Land Use Planning, Built Environment.

Introduction

In the dynamic landscape of urbanization, the built environment stands as an integral cornerstone, shaping the physical, social, and psychological dimensions of urban communities. As cities across the globe, including those in Malaysia, undergo rapid transformation and expansion, understanding the intricate interplay between the built environment and community well-being takes on paramount importance. The built environment encompasses the tangible elements of our surroundings, ranging from

infrastructure and architecture to public spaces and urban design. Its design and configuration hold the potential to profoundly impact the quality of life, interactions, and overall well-being of urban residents. In the context of Malaysia, a nation characterized by its rich cultural tapestry and diverse demographics, the built environment holds a significant role in fostering cohesion, inclusivity, and the enhancement of community well-being. The nation's urban centers have evolved into vibrant hubs where individuals from diverse ethnicities, religions, and cultural backgrounds converge, seeking opportunities and improved living standards. As urbanization accelerates, understanding how the built environment influences the well-being of these diverse urban communities becomes increasingly crucial. The Malaysian urban landscape is a testament to the juxtaposition of tradition and modernity, with ancient cultural heritage coexisting alongside contemporary architectural marvels. Rapid urban development has led to the emergence of bustling metropolitan areas that house a mosaic of cultures, reflecting Malaysia's pluralistic society. Within this context, the built environment assumes the role of a common ground, a space where diverse communities intersect, interact, and shape their shared experiences. The built environment's impact on community well-being extends beyond mere aesthetics. It encompasses various facets, including housing quality, accessibility to green spaces, transportation infrastructure, and the provision of essential amenities. Each of these elements contributes to the physical and emotional comfort of residents, influencing their overall happiness and sense of belonging. Moreover, the built environment serves as a canvas for cultural expression and identity. Architectural styles, public art, and the arrangement of public spaces can evoke a sense of pride and attachment to one's community and heritage. It is through these physical manifestations that individuals forge a connection to their surroundings, enriching their sense of identity and collective purpose. As Malaysia grapples with the challenges and opportunities of urbanization, harnessing the potential of the built environment becomes a pivotal endeavor. Effective urban planning, design, and policy formulation that prioritize community well-being can lead to safer, more sustainable, and harmonious urban communities. This study delves into the nexus between the built environment and urban community well-being, seeking to unravel the multifaceted relationships that underpin the nation's urban fabric. By examining how the built environment influences social interactions, access to resources, and overall quality of life, this research aims to provide insights that can guide informed decision-making, foster inclusive urban spaces, and contribute to the well-being of Malaysia's diverse urban communities.

Methodology

The research methodology employed in this study adopts a systematic and structured approach to explore the interplay between the built environment and community well-being. The objective is to comprehensively review and synthesize relevant journal articles to gain insights into the complex relationship between physical surroundings and the overall welfare of urban communities. Extensive searches were conducted across reputable academic databases including ScienceDirect, ResearchGate and Google Scholar, utilizing keywords closely tied to the "built environment," "community well-being," and related terms. The search strategy aimed to identify articles that delve into the influence of the built environment on various facets of community well-being. Selected articles underwent meticulous review and analysis, extracting crucial details encompassing research objectives, methodologies employed, key findings, and implications derived from the studies. The data extracted from each article were meticulously synthesized to identify recurring patterns,

emerging trends, and common themes pertaining to the impact of the built environment on community well-being. The findings drawn from the reviewed literature are presented and discussed within the context of the identified themes, shedding light on how various components of the built environment, such as infrastructure quality, urban design, green spaces, and public amenities, play a role in shaping residents' overall quality of life and sense of belonging. The ensuing discussion seeks to delve into the intricate mechanisms through which the built environment influences community well-being. The exploration encompasses the effects of housing conditions, neighborhood planning, accessibility to nature, and the availability of communal spaces on residents' experiences and interactions. By synthesizing the insights gleaned from diverse journal articles, this research aims to provide valuable guidance for policymakers, urban planners, and community stakeholders. The study's ultimate objective is to furnish recommendations for cultivating a built environment that fosters community well-being, unity, and contentment. Through this comprehensive analysis, the research endeavors to shed light on how the built environment can be strategically leveraged to create inclusive, harmonious, and thriving urban communities.

Finding and Discussion

Article Discussion

This section undertakes a comprehensive endeavor in the form of a meticulous analysis and exploration of scholarly articles sourced from the designated journal. The objective is to unveil the intricate mechanisms underpinning the multifaceted built environment's influence on the well-being of urban communities. The principal aim of this study revolves around elucidating the intricate interplay among diverse components within the urban environment, thereby facilitating a heightened comprehension of its role in shaping communal well-being. In pursuit of this overarching goal, a methodical selection procedure was implemented, encompassing nine pertinent journal articles in alignment with the central thematic focus of this discourse. The article selection process was conducted with meticulous intent, guided by a rigorous keyword-based methodology. This involved a deliberate concentration on terminology intrinsically associated with the concept of the built environment, including terms such as "built environment," "building," "infrastructure," "open space," "architecture," "planning," "land use," "design," and "community well-being." The meticulous adherence to this keyword strategy ensured the meticulous inclusion of articles adeptly capturing the intricate interplay that exists between the built environment and the well-being of urban communities. The ensuing analysis of the chosen articles stands as the cornerstone upon which the empirical investigation of this study is constructed. This analytical exploration facilitates a nuanced examination of the multifaceted mechanisms composing this intricate relationship. Through the platform of this scholarly discourse, we aspire to make a substantive contribution to the ongoing academic dialogue concerning the pivotal role of the built environment in shaping and nurturing the well-being of urban communities.

Article 1: Public transport use among the urban and rural elderly in China: Effects of personal, attitudinal, household, social-environment, and built-environment factors by Zhang, et al., (2018).

The study conducted by Zhang et al (2018) undertakes an examination of the interplay between built environment factors and the utilization of public transport within the demographic of elderly residents, both in urban and rural contexts in China. A comprehensive range of built environment attributes is scrutinized, encompassing dwelling unit density,

intersection density, land use mixture, bus-stop density, commercial accessibility, and the presence of greenspace. Notably, augmented dwelling unit density, quantified at 1000 units/km², is discernibly associated with heightened engagement in public transport among the elderly populace. Likewise, a higher count of intersections, approximating five per km², contributes to a more pronounced proclivity for public transport utilization. In contrast, neighborhoods characterized by mixed land-use configurations exhibit a reduced inclination towards public transport adoption among the elderly. The availability of a greater number of bus stops within a specified area, as indicated by bus-stop density, correlates positively with increased elderly public transport usage. Commercial accessibility, gauged by proximity to commercial establishments within a kilometer radius from the epicenter of the neighborhood, demonstrates a favorable impact on public transport utilization trends. Similarly, a higher extent of greenspace along the pedestrian route connecting residential areas to bus-stops exhibits a positive correlation with elevated levels of elderly public transport trips. Proximity to bus-stops emerges as a pivotal factor; the elderly population living in closer proximity to bus-stops registers an augmented frequency of public transport travel. Considering the socio-demographic dimension, the research integrates factors such as age distribution, average income, and educational attainment as constituents of the social environment. It is discerned that neighborhoods characterized by lower average income levels exhibit diminished social norms conducive to public transport usage. Conversely, neighborhoods with a relatively lower proportion of elderly residents are associated with increased elderly engagement in public transport. This research augments our comprehension of the multifaceted determinants underpinning elderly participation in public transport within a medium-sized Chinese city. It underscores the intricate interplay between built environment elements and social factors in shaping the proclivity of the elderly towards public transport usage. The study thereby underscores the need for targeted interventions to promote both public transport utilization and physical activity among the elderly demographic. In light of these findings, it is evident that the attributes of the built environment, encompassing metrics such as bus-stop density, land-use mixture, and greenspace accessibility, exert a discernible influence on public transport engagement among the elderly population, both in urban and rural settings within China.

Article 2: Urban planning and quality of life: A review of pathways linking the built environment to subjective well-being by (Mouratidis, 2021).

The study conducted by Mouratidis (2021) intricately navigates the dynamic interplay between the built environment and subjective well-being (SWB), unearthing a trove of enlightening insights that collectively reshape our understanding. Focusing on the Built Environment, the research unfurls a multifaceted tapestry of profound revelations that beckon critical contemplation. A pivotal revelation of the study is the commanding dominion held by the built environment over a mosaic of SWB dimensions, weaving together an intricate fabric of factors encompassing land use, transportation systems, urban designs, housing arrangements, and communal spaces. This convergence serves as a crucible, melding diverse elements to shape individuals' lived encounters and precipitate overarching well-being outcomes. Central to this discourse is the pivotal role that travel undertakes in molding SWB, heralding an intricate dance of variables that encompass travel duration, transportation modalities, and the qualitative facets of travel experiences. This nexus exerts a profound influence on the spectrum of well-being outcomes. Of marked significance is the discernible elevation of emotional well-being and pervasive life contentment through streamlined travel

times and modes that actively foster physical activity, typified by pedestrian and cycling pursuits. Furthermore, the built environment unfurls as a potent emotional alchemist, capable of catalyzing or eroding well-being. Deliberately nurtured green spaces and aesthetically pleasing urban designs evoke affirmative emotional responses, crystallizing into stress mitigation, heightened feelings of security, and an overarching enhancement of well-being. The profound symbiosis between health and well-being finds eloquent articulation within the confines of the built environment, wherein dynamic elements such as physical activity during transit, the ready availability of urban green expanses, strategic noise reduction measures, and the equitable provision of amenities coalesce to orchestrate augmented physical and mental health outcomes. This symphony reverberates, consequentially elevating well-being to loftier heights. Significantly, the study casts an illuminating spotlight on the built environment's discernible agency over the tapestry of social interactions and relationships. Compact urban configurations act as crucibles, forging communal bonds and galvanizing heightened community engagement. The accessibility of public spaces further nurtures social cohesion, thereby bestowing a substantive contribution to the panoramic vista of well-being. Moreover, the intricate dance of residential spaces, intricately interwoven with the attributes of neighboring environs and the seamless accessibility of amenities, collectively weaves a narrative that indelibly stamps its imprint on residential well-being, inextricably weaving this thread into the broader canvas of SWB. Paramount to this discourse is the imperativeness of equitable access to resources, facilities, and verdant expanses, emerging as a linchpin determinant of an inclusive built environment. This ethos, while pivotal in augmenting residential well-being, spawns' ripples that reverberate with far-reaching resonance across the expanse of well-being's spectrum. Intriguingly, the crucible of the COVID-19 pandemic casts a stark spotlight on the pivotal role assumed by green spaces, local amenities, and virtual engagements in orchestrating well-being modulation within urban landscapes, underscoring the resilience and adaptability intrinsic to urban environments. Ultimately, the research resounds as a clarion call, advocating for a paradigm shift in urban planning—a shift anchored in the blueprint of creating compact, pedestrian-friendly, and cyclable realms. It exhorts the imperative of equitable access, the fostering of vibrant social interactions, and the evolution of streamlined transportation systems, all harmonizing as cardinal strategies in amplifying well-being's crescendo within urban ecosystems. In summation, the study unfurls an intricate and multi-dimensional panorama, casting a spotlight on the symphony choreographed between the built environment and subjective well-being. It accentuates the pivotal import of urban planning strategies that, when orchestrated in unison, unleash affirmative emotional experiences, galvanize kinetic interactions, kindle social synergies, and ensure just access to resources. This harmonious crescendo converges to culminate in an elevation of well-being symmetries within the urban tapestry.

Article 3: Bicycle safety outside the crosswalks: Investigating cyclists' risky street-crossing behavior and its relationship with built environment (Bi, et al., 2023).

Bi, et al., explore the potential impact of the built environment on the occurrence of risky street-crossing events. The investigation comprehensively examines various indicators encompassing land use patterns, roadway designs, traffic facilities, and sociodemographic factors. Notably, the study focuses on the augmentation of commercial and industrial areas, balanced land utilization, and specific zones for education, medical, and recreational purposes. The intricate aspects of roadway design are studied, including roadway

classification, on-street parking, and intersection density – factors known to influence risky street-crossing occurrences. Traffic facilities are analyzed, considering street lighting, traffic signal density, and parking sign density. The sociodemographic dimensions encompass age, gender, cycling experience, knowledge of road rules, and risk perception. The study delves into the connection between risky riding behaviors and bicycle accidents, particularly related to unlawful street-crossing practices at unprotected mid-block areas. It highlights the heightened risk for cyclists who cross recklessly and disobey road rules. Despite the significance of this issue, research on cyclists' misconduct remains limited due to data scarcity. To address this gap, the study introduces a GPS-based detection framework, utilizing extensive bike sharing trajectory data to capture instances of risky street-crossing behavior. The analysis employs data-driven modeling based on structural topic modeling (STM) to unravel habitual risky crossing behavior. Importantly, the study examines the interplay between individual behavior and the built environment's influence on risky street-crossing events. A key focus is the application of a gradient boosting decision tree (GBDT) model to understand the relationship between built environment attributes and the frequency of risky street-crossing incidents. Empirical findings from a comprehensive case study reveal a prevalence of risky street-crossing behavior, including a notable example where 16.94% of cycling trips involve illegal crossings. Temporal and spatial patterns emerge, indicating higher engagement during daylight hours and at central street sections, demonstrating intriguing heterogeneity. The study also uncovers latent motivations driving risky actions, such as the allure of reaching destinations quickly and the inconvenience of accessing distant legal crossing facilities. Notably, the research establishes an association between the built environment and cyclists' tendency for illegal street-crossing actions. Specific locations, including employment and catering establishments, play a significant role in fostering such behaviors. Moreover, attributes like road length, hierarchy, bus stops, and metro stations also contribute to risky actions, showcasing nonlinear correlations with crossing frequency. In essence, the study pioneers an exploration into cyclists' risky street-crossing behaviors within the context of the built environment. The findings advocate for a reevaluation of urban planning strategies, emphasizing the integration of insights to enhance crossing behaviors and bolster bicycle safety. The study's introduction contextualizes it within the broader goal of promoting sustainable and safe urban transportation, particularly cycling. It acknowledges the complexities cyclists face in navigating urban spaces and underscores the need to address risky behaviors in conjunction with the built environment. By unraveling these intricate dynamics, the study offers valuable insights for urban planning policies aimed at promoting cyclist safety and well-being, aligning with the broader mission of sustainable urban mobility.

Article 4: Modelling the relationship between green built environment and occupants' productivity by (Mallawaarachchi, et al., 2017).

The study by Mallawaarachchi, et al (2016) investigates how various factors within the green built environment impact the productivity of occupants in green-certified office buildings in Sri Lanka. These factors encompass thermal quality, acoustic quality, ventilation, indoor air quality, visual quality, spatial quality, building maintenance, office type, building materials, workplace appearance, office layout, and social engagement. The study's primary aim is to establish a link between these built environment elements and occupants' productivity. To achieve this goal, the researchers conducted a survey involving occupants from three green-rated office buildings in Sri Lanka. They employed statistical methods such as Spearman correlation and ordinal logistic regression analysis to analyze the survey data. The findings

highlight a significant correlation between the built environment and occupants' productivity within green-certified office buildings. This underscores the importance of considering these diverse built environment elements in enhancing overall productivity. The study holds practical implications, potentially enhancing the criteria for evaluating indoor environmental quality within the GREENSL® national green-rating system. The research contributes to existing literature by addressing a gap where previous studies largely focused on individual facets of the built environment. In contrast, this study unveils the combined impact of multiple factors within the green built environment on occupants' productivity, offering valuable insights for sustainable building design and management. The modern concern for a sustainable environment is especially relevant in creating living spaces that prioritize healthiness and comfort. Individuals occupying buildings seek comfort to boost their productivity in work settings. While maximum comfort may not guarantee maximum productivity, evidence suggests that an improved and healthier environment can reduce worker complaints and absenteeism, indirectly enhancing overall productivity. Green building concepts have gained prominence in contemporary architecture, emphasizing environmentally friendly materials and enhanced indoor environmental quality. Such buildings, with their emphasis on natural lighting and ventilation, are associated with higher occupant satisfaction compared to conventional structures. While prior studies have indicated a potential link between the green built environment and occupant well-being and productivity, much of this research has focused on specific aspects of the built environment. This study seeks to fill this gap by comprehensively investigating the relationship between the green built environment and occupants' productivity, particularly within green-certified office buildings in Sri Lanka. The indoor environment is of paramount importance, given that people spend most of their time indoors. Enhancing indoor environmental quality has gained significance, with green building emerging as a philosophy promoting environmentally friendly materials and improved indoor environmental quality. As such, the interplay between the green built environment and occupants' productivity is crucial, yet a clear definition of productivity within the office environment remains elusive due to the diverse nature of tasks and jobs. Nonetheless, several case studies suggest that better-quality office environments can lead to productivity gains. The study aims to shed light on the relationship between the built environment and occupants' productivity, addressing the ambiguity surrounding critical built environment factors that influence occupants' productivity within green buildings. Through a comprehensive review of literature, the study identifies 54 built environment factors across 12 major environmental aspects that influence occupants' productivity. These factors include provisions for daylighting, lighting quality, thermal quality, indoor air quality, visual quality, and acoustic quality. The study emphasizes the importance of maintaining a high indoor environmental quality to promote occupants' well-being and productivity. Ultimately, the study seeks to evaluate the relationship between these identified factors and occupants' productivity based on the developed research hypothesis.

Article 5: Air Pollution and Human Health: Investigating the moderating effect of the built environment (Wang, et al., 2022).

Wang et al (2022) stated design (building density, building height, standard deviation of building height, greenness area, road length and road crossing), destination (hygiene facility, government agency, residential community, industrial park, traffic facility, gas station and catering facility), land cover (construction land, forestland and water area), landscape (aggregation index, edge density, perimeter-area fractal dimension and patch density) and

diversity (diversity of built environment, diversity of design, diversity of point of interest and Shannon's diversity index) has a moderating effect towards air pollution and human health. For destination, it is counted of how many facilities are within the grid. Air pollution poses a severe threat to human health, culminating in mortality, necessitating the exploration of efficacious preventive measures to alleviate its detrimental impact. The cultivation of a rational built environment emerges as a potential avenue for enhancing human well-being. Considering this, the present study undertook a granular assessment of the interplay among the built environment, air pollution, and mortality, delineated across 1 km × 1 km grid cells. Employing a moderating effect model, the investigation delved into the influence of diverse built environment factors on the nexus between air pollution and cause-specific mortality, while also elucidating variations across distinct areas stratified by building density and height. The outcomes of this endeavor unveiled a pivotal role for greenness in ameliorating the adverse consequences of ozone (O₃) and nitrogen dioxide (NO₂) on mortality. Likewise, the presence of water areas and a diverse land cover exhibited the potential to mitigate the impact of fine particulate matter (PM_{2.5}) and NO₂ on mortality. Furthermore, specific elements of the built environment, namely gas stations, edge density (ED), perimeter-area fractal dimension (PAFRAC), and patch density (PD), were identified as catalysts in attenuating the deleterious effects of NO₂ on mortality. Notably, the moderating effect of the built environment was not uniform across cause-specific mortality and areas classified based on building density and height. Regions characterized by high-rise structures and elevated population density demonstrated the most pronounced moderating effect. Consequently, this study extends insight into the significant role played by the built environment in mediating the relationship between air pollution and mortality. The findings underscore the multifaceted nature of this interaction, with diverse built environment factors exerting varying degrees of influence on different causes of mortality. The implications of these findings reverberate profoundly within the realm of urban planning and design, offering actionable strategies to counteract the adverse health ramifications of air pollution. The optimization of landscape configurations, diversification of land cover, and augmentation of green spaces and water bodies emerge as pivotal tactics for mitigating the deleterious effects of air pollution on human well-being. Moreover, the study accentuates the indispensability of accounting for heterogeneity in built environment attributes and geographic characteristics when devising interventions to address air pollution-related health risks. In essence, urban planning endeavors should encompass the multifarious moderating effects inherent in distinct areas to achieve efficacious outcomes. Overall, this study contributes substantially to the comprehension of the intricate interplay between the built environment and air pollution, thereby accentuating the imperative of incorporating considerations pertaining to the built environment into urban planning paradigms, aimed at safeguarding public health and mitigating the far-reaching implications of air pollution.

Article 6: The influence of built environment factors on elderly pedestrian road safety in cities: The experience of Madrid by (Gálvez-Pérez, et al., 2022).

The global phenomenon of an ageing population presents a substantial societal challenge, warranting comprehensive investigation into the complex interplay between road safety and elderly pedestrians. While the decline in pedestrian capabilities among the elderly has received substantial scholarly attention, there remains a dearth of research focused on the intricate contribution of built environment factors to elderly pedestrian collisions. This study seeks to elucidate the influence of exposure, socioeconomics, land use, and infrastructure

indicators on elderly pedestrian safety in urban environments, with Madrid, Spain as a focal point of analysis. The demographic shift towards an ageing population has far-reaching implications, especially concerning mobility and road safety. As the elderly population becomes an integral part of urban mobility, the prevalence of road fatalities and severe injuries involving elderly pedestrians has become a pressing concern. Urban planners and policymakers must prioritize the creation of age-friendly cities that facilitate safe pedestrian mobility for older individuals, underscoring the need to scrutinize the built environment variables that impact elderly pedestrian accidents. The work by Galvez-Perez et al (2022) identifies a set of crucial built environment indicators that significantly influence elderly pedestrian safety. These indicators encompass exposure factors, including total street length and average annual daily traffic (AADT); socioeconomics variables such as elderly and non-elderly inhabitants, population density, and average income; land use considerations encompassing point of interest density, residential proportion, green area proportion, and main street proportion; and infrastructure elements including sidewalk density, junction density, traffic signals, traffic lights, metro stations, and bus stops. The study accentuates the vital role of exposure indicators in predicting pedestrian collisions. Specifically, greater total street length is associated with elevated collision risks, while AADT exerts a positive impact on collision occurrence due to reduced reaction times for elderly pedestrians. Socioeconomic variables further contribute to collision incidents, with population density and elderly inhabitants per kilometer acting as determinants of collision likelihood. These findings emphasize the elevated risk of collisions in densely populated areas, particularly those with a higher concentration of elderly residents. The research underscores the multifaceted role of land use and infrastructure in shaping elderly pedestrian safety outcomes. Areas characterized by higher point of interest density and greater residential proportions exhibit a reduced likelihood of collisions among non-elderly pedestrians. Infrastructure components emerge as pivotal determinants, with wider sidewalks and an increased density of traffic lights corresponding to diminished risks of elderly pedestrian collisions. In contrast, augmented junction and bus stop densities correlate with heightened collision probabilities, signifying the need for targeted interventions in these areas. Comparative analysis between elderly and non-elderly pedestrian collisions reveals distinct influencing factors. Elderly pedestrian accidents are primarily influenced by AADT, population density, and the presence of elderly inhabitants, whereas non-elderly pedestrian incidents are more affected by traffic signals, metro stations, and specific land use proportions. This differentiation underscores the necessity for tailored strategies to bolster elderly pedestrian safety, advocating for measures such as enhanced sidewalk width and augmented traffic light density to mitigate collision risks. These findings lend weight to the development of "age-friendly" cities, demanding customized actions in regions characterized by a higher concentration of elderly residents. Further research avenues could explore more refined spatial units and delve into specific street segment typologies to augment comprehension and formulate targeted recommendations for elderly pedestrian safety. This study makes significant strides in unraveling the intricate web of built environment factors influencing elderly pedestrian safety. By shedding light on the multifaceted nature of these interactions, the research underscores that while general road safety measures have universal benefits, additional measures specifically tailored to built environment elements are indispensable for mitigating elderly pedestrian collisions. The integration of these findings offers valuable guidance to policymakers and urban planners, facilitating the design of more sustainable, secure, and

accommodating cities that effectively address the distinctive challenges posed by an ageing population.

Article 7: Linking the quality of public spaces to quality of life by (Beck, 2009).

The role of well-designed and maintained public spaces in enhancing the quality of life for individuals and communities is widely acknowledged. However, the lack of robust evidence to support this assertion has hindered comprehensive understanding and quantification of the relationship between investment in public spaces and improvements in quality of life. This study aims to address this gap by analyzing existing data on the quality of public spaces and quality of life to identify correlations and shed light on the multifaceted connection between the two. This research was conducted as a collaboration between Heriot-Watt University and Oxford Brookes University, commissioned by CABE Space, the government's advisor on urban public spaces. A total of 34 national datasets were analyzed to explore the correlative relationships between quality-of-life indicators and indicators of public space quality. The study employed correlation and regression analyses to determine the strength and direction of associations between various aspects of public space quality and quality of life dimensions. The study distinguishes key dimensions of public space quality, including condition/maintenance, design, user experience, and function. Condition/maintenance focuses on the robustness and adaptability of facilities, with safety being a paramount concern. Design quality encompasses factors such as well-planned, legible, and enclosed spaces. User experience emphasizes elements like social interaction, relaxation, and fulfillment. Finally, the functional aspect pertains to public spaces' viability, their role as community resources, and proper functioning. Existing research underscores the significant positive impact of well-designed and managed public spaces on various aspects of individual and community well-being. These benefits include economic value, physical and mental health improvements through exercise and nature access, cost savings, educational opportunities for children, personal development through volunteering, and overall enhancement of happiness and well-being. Despite the recognition of the positive contributions of high-quality public spaces, the evidence base linking public space quality and quality of life remains limited. England lacks consistent national indicators to measure the value of public spaces on a larger scale, which complicates the task of quantifying the impact of investments in public spaces on people's well-being. Existing data collection tends to focus on easily measurable aspects and often overlooks the nuanced reality of individuals' lives. The study's findings highlight various associations between specific indicators of public space quality and dimensions of quality of life. Notably, maintenance, safety, and comfort of public spaces show consistent and positive correlations with indicators related to satisfaction with living environments, feelings of attachment to places and people, and overall community well-being. Furthermore, the availability of green space is linked to increased participation in culture and leisure activities and a heightened sense of attachment to places. While the intricate relationship between high-quality public spaces and quality of life is complex and multifaceted, this study contributes to a better understanding of these linkages through its national-scale analysis. The findings emphasize the need for stronger evidence to justify investments in regenerating and enhancing public spaces, particularly in underprivileged areas that often experience the poorest quality of environments. As policymakers and practitioners seek to advocate for the value of public spaces, bridging the evidence gap

becomes vital in ensuring that these spaces contribute effectively to individuals' and communities' quality of life.

Article 8: Personal safety and improvements concerns in public places by (Badiora, et al., 2020).

The purpose of the research study is to investigate concerns for personal safety and potential improvements in a Nigerian public transport facility, particularly a rail transport terminal. The study aims to determine whether respondents' perceptions of safety and improvement measures influence their frequency of use of the public transport facility. The research employs a case study approach, involving on-site assessments, objective insecurity assessment, and subjective insecurity surveys. Both quantitative and qualitative data were collected and analyzed using various statistical techniques. Public places, including public transport facilities, play a crucial role in the built environment and serve as essential community anchors for social interaction. These places facilitate creative interactions, relaxation, and encounters with familiar and unfamiliar faces. In the context of public transport, such as rail terminals, ensuring personal safety and addressing users' concerns are critical factors for encouraging patronage and enhancing the overall quality of the transportation system. In Lagos, Nigeria, the rail transport system is a vital component of the urban landscape. However, concerns about personal safety and security have emerged as significant challenges affecting the use of these facilities. Crime and victimization incidents in public places have underscored the need for improvements in safety and security measures. Addressing these concerns is vital for boosting public confidence, promoting patronage, and contributing to the overall development of the city. The study presents an exploratory examination of users' perceptions of personal safety and improvement concerns in a Nigerian rail transport facility. The research process involves three key steps: on-site assessment using crime prevention through environmental design (CPTED) strategies, identification of objective insecurity factors, and a subjective survey to gauge feelings of insecurity. The study also explores the relationship between perceived personal safety, improvement concerns, and the frequency of rail transport use. Key findings from the research indicate that the rail transport facility lacks adequate crime prevention through environmental design strategies. Crime incidents, particularly thefts, were prevalent around the station area. Respondents expressed significant concerns about their safety, especially during nighttime and while waiting on platforms. Enhancements in lighting were identified as the most crucial improvement concern, followed by cleaner station environments. The study also highlights the importance of involving users' perspectives in the development of place policies, as their opinions and concerns can guide the planning process and lead to better services. Recommendations for improving personal safety and reducing victimization risk include measures such as improved lighting, installation of security cameras, regular maintenance of vegetation, and increased police or security presence. However, the study acknowledges its limitations, including a small sample size and the need for more robust statistical analysis techniques. Future research could involve larger samples, more case studies for comparison, and ongoing surveys to track safety perceptions and guide security planning. Ultimately, addressing users' concerns, enhancing perceived safety, and promoting a sense of orderliness in public transport facilities can contribute to increased patronage and a more vibrant urban environment. In conclusion, this research sheds light on the importance of addressing concerns for personal safety and implementing improvements in public transport facilities, particularly in the context of

Nigerian rail terminals. By incorporating users' perspectives and considering crime prevention strategies, transportation authorities can create safer, more attractive, and user-friendly environments that encourage greater public use and contribute to the overall well-being of the community.

Article 9: Built environment and seasonal variation in active transportation: A longitudinal, mixed-method study in the Helsinki Metropolitan Area by (Kajosaari, et al., 2022).

Active transportation, such as walking and cycling for transport, has numerous physical, mental, and environmental benefits. However, in urban areas with distinct cold winter seasons, participation in active transportation often declines, leading to a shift towards motorized transport modes. This shift adversely affects physical activity levels and public health. While prior research has explored the connection between the built environment and active transportation, few studies have investigated its influence on year-round active transportation in cold climates. This longitudinal study examines the potential impact of the built environment on seasonal changes in adults' walking and cycling for transport. Kajosaari et al (2022) report that urban form, residential density, land-use mix, winter maintenance of cycleways, street connectivity and pedestrian and cycling infrastructure are the indicators for built environment that could lead to active transportation. The urban form focuses on travel-related urban zones which are intensive and basic public transport zones. The intensive public transport zone has a maximum of 5-10 minutes waiting time for public transport and basic public transport zone is maximum 15 minutes waiting time. In both zones, the maximum walking distance to nearest public transport stop is 250m for bus stop and 700m for a rail connection. Next, for residential density is to focus on the ratio of the residential floor area to the land area in residential use. The land-use mix emphasizes the diversity of the land which is residential, commercial, traffic and recreational (greenspace and recreational areas). Winter maintenance of cycleways is focused on priority-maintained cycleways within 500m and 1km. For street connectivity is the count of the number of intersections within the home buffer divided by the buffer area. Lastly, pedestrian and cycling infrastructure emphasize the length in kilometers of pedestrian and cycleways within the home buffer. The study findings highlight the ways in which the built environment contributes to maintaining year-round active transportation. Residential density and urban structure were key factors influencing both walking and cycling behavior. The study underscores the significance of factors such as land-use mix, street connectivity, and the winter maintenance of cycleways in promoting active transportation. Notably, some microscale features of the built environment, such as road maintenance and lighting, were critical for facilitating wintertime active transportation. The study's outcomes have implications for urban policy and planning. Strategies aimed at promoting year-round active transportation should focus on both macro and micro aspects of the built environment. Enhancing cycling infrastructure to cater to winter conditions is vital, given the substantial decrease in cycling during winter. Moreover, policy interventions should consider integrated solutions that promote both walking and cycling in conjunction with public transportation, thereby addressing the seasonal variations in transportation choices. This study provides valuable insights into how the built environment influences year-round active transportation behavior, particularly in areas with cold winters. By identifying factors such as residential density and urban structure that support active transportation during winter, policymakers and planners can develop strategies to mitigate the decline in physical activity and encourage sustainable transportation modes throughout the year. In

addition, the study emphasizes the need to consider both macro and micro built environment features to create an environment conducive to year-round active transportation.

Article Summary

In conclusion, the diverse array of studies presented here offers invaluable insights into the intricate interplay between the built environment and various aspects of human well-being, behavior, and health. These studies collectively underscore the profound impact that the design, configuration, and attributes of our built surroundings exert on individuals and communities. The implications drawn from each study highlight the multifaceted nature of the relationship between the built environment and its effects, shedding light on critical considerations for urban planning, design, and policy-making. From the investigation into public transport usage among the elderly in China Zhang, et al (2018), we learn that the built environment's attributes, such as dwelling density, intersection density, and accessibility to amenities, significantly influence elderly residents' engagement in public transport. These findings emphasize the importance of creating well-connected, pedestrian-friendly neighborhoods with easy access to public transportation, particularly for vulnerable populations. The exploration of the relationship between the built environment and subjective well-being Mouratidis (2021) reveals that a thoughtfully designed built environment, characterized by green spaces, accessible amenities, and pedestrian-friendly infrastructure, can contribute to enhanced well-being and social interactions. This underscores the need for urban planning strategies that prioritize equitable access to resources and vibrant public spaces to foster a sense of community and well-being. The study on cyclists' risky street-crossing behavior Bi, et al (2023) offers insights into the role of the built environment in shaping cycling safety. By understanding how land use patterns, road design, and traffic facilities influence cyclists' behaviors, urban planners can implement targeted interventions to enhance cyclist safety, ultimately promoting sustainable and safe urban mobility. The examination of the impact of the green built environment on occupants' productivity Mallawaarachchi, et al (2017) demonstrates the significance of indoor environmental quality in influencing worker productivity. This underscores the importance of incorporating elements such as thermal comfort, acoustic quality, and visual aesthetics in building design and management to create healthier and more productive work environments. The investigation into the moderating effect of the built environment on air pollution and human health Wang, et al (2022) illuminates the potential of the built environment to mitigate the adverse effects of air pollution on mortality. Strategies such as enhancing green spaces and optimizing land cover can contribute to reducing the health risks associated with air pollution, emphasizing the need for urban planning that prioritizes environmental sustainability and public health. From the exploration of elderly pedestrian road safety in Madrid (Gálvez-Pérez, et al., 2022) we learn that the built environment has a significant impact on the safety of elderly pedestrians. Factors such as exposure, socioeconomics, land use, and infrastructure indicators can influence the occurrence of pedestrian collisions. These findings emphasize the importance of designing pedestrian-friendly urban environments that prioritize safety for all age groups, particularly the elderly. The study linking the quality of public spaces to quality of life Bec (2009) reveals that well-designed and maintained public spaces contribute positively to various dimensions of individual and community well-being. Despite challenges in quantifying the impact, the study emphasizes the need for evidence-based investments in public spaces to enhance quality of life, foster community engagement, and promote a sense of attachment to places. Research

on personal safety and improvement concerns in public places (Badiora, et al., 2020). highlights the significance of addressing safety concerns and implementing improvements in public transport facilities. By considering users' perspectives and employing crime prevention strategies, urban planners can create safer and more attractive environments that encourage increased public transport use and contribute to overall community well-being. The longitudinal study on seasonal variation in active transportation Kajosaari, et al (2022) in a cold climate context emphasizes the importance of the built environment in maintaining year-round active transportation. Factors such as urban form, residential density, land-use mix, and cycling infrastructure influence individuals' walking and cycling behavior, even during harsh weather conditions. These findings underscore the need for tailored urban planning strategies that accommodate and promote active transportation throughout the year. Collectively, these studies underscore the intricate relationships between the built environment and various dimensions of human well-being, behavior, and health. They advocate for a paradigm shift in urban planning and design that embraces principles of sustainability, accessibility, and community well-being to create environments that enhance the quality of life for present and future generations. Table 1.0, accompanied by the subsequent discussion, provides a concise yet comprehensive synthesis and analysis of prior research. This examination delves into the intricate interplay between the built environment and community wellbeing, shedding light on their dynamic relationship.

Table 1.0

Key finding of Social Environment on Wellbeing in Urban Communities

Authors/ Sources	Title	Indicators
Zhang, et al (2018)	Public transport use among the urban and rural elderly in China: Effects of personal, attitudinal, household, social-environment and built environment factors	<ul style="list-style-type: none"> • Dwelling units' density • Intersection density • Land use mixture • Bus-stop density • Commercial accessibility • Green space
Mouratidis, (2021)	Urban planning and quality of life: A review of pathways linking the built environment to subjective well-being	<ul style="list-style-type: none"> • Land use • Transport systems • Urban designs • Housing
Bi, et al (2023)	Bicycle safety outside the crosswalks: Investigating cyclist risky street-crossing behavior and its relationship with built environment	<ul style="list-style-type: none"> • Land use • Roadway design • Traffic facilities • Sociodemographic
Mallawaarachch et al (2016)	Modelling the relationship between built environment and occupants' productivity	<ul style="list-style-type: none"> • Thermal quality • Acoustic quality • Ventilation • Indoor air quality

		<ul style="list-style-type: none"> • Visual quality • Spatial quality • Building maintenance • Office type • Building materials • Appearance of the workplace • Office layout • Social engagement
Wang, et al (2022)	Air pollution and human health: Investigating the moderating effect of the built environment	<ul style="list-style-type: none"> • Design • Destination • Land cover • Landscape • Diversity
Galvez-Perez, et al (2022)	The influence of Built environment factors on elderly pedestrian road safety in Cities: The experience of Madrid	<ul style="list-style-type: none"> • Exposure • Socioeconomics • Land use • Infrastructure
Beck, (2009)	Linking the quality of public spaces to quality of life	<ul style="list-style-type: none"> • Public space <ul style="list-style-type: none"> • Condition/maintenance • Design • User • Function
Badlora, et al (2020)	Personal safety and improvements concern in public places	<ul style="list-style-type: none"> • Public space rail transport <ul style="list-style-type: none"> • Types of crimes • Concerns of safety • Areas of improving
Kajosaari, et al (2022)	Built environment and seasonal variation in active transportation: A longitudinal, mixed-method study in the Helsinki Metropolitan Area	<ul style="list-style-type: none"> • Urban form • Residential density • Land-use mix • Winter maintenance of cycleways • Street connectivity • Pedestrian and cycling infrastructure

The Theme, Conceptual Definition, and Indicator Analysis

In this section, a meticulous procedure has been employed to group indicators that demonstrate noteworthy correlations in previous research endeavors. These indicators have been systematically categorized based on shared attributes, resulting in distinct themes. Each thematic grouping embodies a cohesive conceptual framework that unveils the fundamental principles governing the encompassed indicators. The rationale underlying this methodological approach stems from the aspiration to enhance lucidity and facilitate a deeper grasp of the interconnected nature among the identified indicators. By arranging

these indicators into coherent themes, we not only elaborate on their individual significance but also unveil intricate patterns that surface when examining them collectively. Through a rigorous analytical endeavor, the thematic arrangement of these indicators provides a vantage point, enabling an in-depth exploration of the thematic foundations. By expounding upon the core of each theme, this section makes a substantial contribution to scholarly discourse, shedding illumination on the intricate interplay of variables and fostering a more nuanced understanding of their implications within the research study's context. The built environment refers to the human-made or constructed surroundings in which people live, work, and interact. It encompasses the physical structures, spaces, and infrastructure that are intentionally designed, planned, and built to accommodate various activities and support daily life within a particular area. The built environment includes both indoor and outdoor spaces and ranges from individual buildings to entire urban landscapes. Table 2.0 shows the summary of theme, conceptual definition and indicator significantly related from previous research study.

Table 2.0

Theme, Conceptual Definition and Indicator significantly related from previous research study

Theme	Conceptual Definition	Indicator Significantly Related from Previous Research Study	Author(s)
Buildings	This includes residential, commercial, industrial, and institutional structures. Buildings provide spaces for living, working, shopping, education, and other activities. The architectural design, layout, and interior functionalities of buildings coalesce to shape the urban experience, contributing to the city's character and vibrancy.	<ul style="list-style-type: none"> • Dwelling units' density • Housing • Design • Office type • Appearance of the workplace • Office layout • Residential density 	<ul style="list-style-type: none"> • Zhang, et al (2018) • Mouratidis, (2021) • Mallawaarachchi et al (2016) • Wang, et al (2022) • Kajosaari, et al (2022)
Infrastructure	Infrastructure comprises transportation systems (roads, bridges, public transit), utilities (water supply, sewage, electricity), communication networks (internet,	<ul style="list-style-type: none"> • Bus-stop density • Transport systems • Traffic facilities • Infrastructure • Pedestrian and cycling 	<ul style="list-style-type: none"> • Zhang, et al (2018) • Mouratidis (2021) • Bi, et al (2023) • Galvez-Perez, et al (2022) • Street connectivity

	<p>telephone), and other essential facilities that enable and support urban functions. These foundational elements collectively underpin urban operations, fostering efficient and interconnected communities.</p>	<p>infrastructure</p>
Public Spaces	<p>Public spaces are communal areas accessible to the public, such as parks, plazas, squares, and recreational areas. These spaces facilitate social interactions, community gatherings, and leisure activities</p>	<ul style="list-style-type: none"> • Green space • Landscape • Public space rail transport <ul style="list-style-type: none"> • Zhang, et al (2018) • Mouratidis (2021) • Beck (2009) • Badlora, et al (2020)
Land Use Planning	<p>Land use planning involves regulations and policies that designate specific areas within a city for different purposes, such as residential, commercial, industrial, or green spaces.</p>	<ul style="list-style-type: none"> • Land use mixture • Land use • Land cover • Land-use mix <ul style="list-style-type: none"> • Zhang, et al (2018) • Bi, et al (2023) • Wang, et al (2022) • Galvez-Perez, et al (2022) • Kajosaari, et al (2022)
Accessibility	<p>Ensuring accessibility in the built environment involves designing spaces that are usable and navigable by individuals of all abilities, promoting inclusivity and equal access.</p>	<ul style="list-style-type: none"> • Intersection density • Commercial accessibility • Destination • Street connectivity <ul style="list-style-type: none"> • Zhang, et al (2018) • Wang, et al (2022) • Kajosaari, et al (2022)
Sustainability	<p>The built environment can impact environmental sustainability through practices such as green building design, energy</p>	<ul style="list-style-type: none"> • Thermal quality • Acoustic quality • Ventilation • Indoor air quality • Visual quality <ul style="list-style-type: none"> • Mallawaarachchi, et al (2016) • Kajosaari, et al (2022)

efficiency, waste management, and conservation efforts.	• Spatial quality • Building maintenance • Winter maintenance of cycleways • Building materials
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Urban design	The arrangement and layout of buildings, public spaces, and transportation systems within a city or urban area. Urban design and planning aim to create functional, attractive, and sustainable environments.	• Urban designs • Roadway design • Diversity • Urban form	• Mouratidis (2021) • Wang, et al (2022) • Kajosaari, et al (2022)
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Conclusion

In the dynamic landscape of urbanization, the built environment emerges as a defining cornerstone, intricately shaping the physical, social, and psychological dimensions of urban communities. As cities on a global scale, including those in Malaysia, undergo rapid evolution and expansion, comprehending the intricate interplay between the built environment and community well-being becomes of paramount importance. This multifaceted relationship encompasses tangible elements ranging from infrastructure and architecture to public spaces and urban design, and holds the transformative potential to significantly influence the quality of life, social interactions, and overall well-being of urban residents. Within the context of Malaysia, a nation characterized by its diverse demographics and rich cultural heritage, the built environment assumes a pivotal role in nurturing cohesion, inclusivity, and the augmentation of community well-being. Malaysia's urban centers have matured into vibrant hubs where individuals of various ethnicities, faiths, and cultural backgrounds converge, all seeking opportunities and an elevated standard of living. As the tide of urbanization surges forward, comprehending how the built environment shapes the well-being of these diverse urban communities takes on heightened significance. The Malaysian urban landscape stands as a testament to the harmonious coexistence of tradition and modernity, where ancient cultural heritage harmonizes with contemporary architectural feats. Swift urban development has heralded the rise of bustling metropolitan centers, fostering a convergence of cultures that mirrors Malaysia's pluralistic society. In this tapestry, the built environment is a common stage, a space where diverse communities intersect, engage, and collaboratively script their shared experiences. The influence of the built environment surpasses mere aesthetics, encompassing dimensions such as housing quality, green space accessibility, transportation infrastructure, and the availability of essential amenities. Each facet contributes to the physical comfort and emotional contentment of residents, ultimately shaping their happiness and sense of belonging. Beyond this, the built environment becomes

a medium for cultural expression and identity, with architectural styles, public art, and spatial arrangements evoking community pride and attachment. These manifestations provide individuals with a conduit to connect with their surroundings, enriching their identity and collective purpose. As Malaysia grapples with the challenges and opportunities presented by urbanization, harnessing the potential of the built environment emerges as a pivotal pursuit. Effective urban planning, design, and policy-making that prioritize community well-being can lead to safer, more sustainable, and harmonious urban communities. The study at hand delves into the nexus between the built environment and urban community well-being, aiming to untangle the intricate relationships underpinning the nation's urban fabric. Through a careful examination of how the built environment influences social dynamics, resource access, and overall quality of life, this research seeks to provide insights that can inform decision-making, foster inclusive urban spaces, and contribute to the well-being of Malaysia's diverse urban communities. In closing, the assortment of studies showcased here imparts invaluable insights into the intricate dance between the built environment and various facets of human well-being, behavior, and health. Collectively, they underscore the profound sway exerted by the design, configuration, and attributes of our constructed surroundings on individuals and communities. The implications gleaned from each study cast light on the multifaceted nature of the relationship between the built environment and its effects, offering guidance for urban planning, design, and policy-making endeavors. From understanding elderly public transport usage in China to exploring the connection between green spaces and subjective well-being, each study imparts crucial lessons. They champion a paradigm shift in urban planning and design, rooted in principles of sustainability, accessibility, and community well-being, fostering environments that elevate the quality of life for present and future generations. Furthermore, the breakdown of key indicators, ranging from buildings and infrastructure to public spaces and accessibility provides a comprehensive panorama of the multifarious dimensions of the built environment. Ultimately, as urban landscapes continue to metamorphose, the built environment's role in shaping communities, nurturing connections, and enhancing well-being becomes increasingly profound. This realization calls stakeholders, policymakers, and urban planners to unite in sculpting environments that not only accommodate growth but also foster thriving, harmonious, and inclusive urban communities for generations to come.

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References

- Badiora, A. I., Wojuade, C. A., & Adeyemi, A. S. (2020). Personal safety and improvements concern in public places. *Journal of Place Management and Development*, 13(3), 319–346. <https://doi.org/10.1108/jpmd-03-2019-0013>
- Beck, H. (2009). Linking the quality of public spaces to quality of life. *Journal of Place Management and Development*, 2(3), 240–248. <https://doi.org/10.1108/17538330911013933>
- Bi, H., Li, A., Zhu, H., & Ye, Z. (2023). Bicycle safety outside the crosswalks: Investigating cyclists' risky street-crossing behavior and its relationship with built environment. *Journal of Transport Geography*, 108, 103551. <https://doi.org/10.1016/j.jtrangeo.2023.103551>

- Galvez-Perez, D., Guirao, B., Ortuno, A., & Picado-Santos, L. (2022). The influence of built environment factors on elderly pedestrian road safety in cities: The experience of Madrid. *International Journal of Environmental Research and Public Health*, 19(4), 2280. <https://doi.org/10.3390/ijerph19042280>
- Kajosaari, A., Ramezani, S., & Rinne, T. (2022). Built environment and seasonal variation in active transportation: A longitudinal, mixed-method study in the Helsinki Metropolitan Area. *Journal of Transport & Health*, 27, 101511. <https://doi.org/10.1016/j.jth.2022.101511>
- Mallawaarachchi, H., De Silva, L., & Rameezdeen, R. (2017). Modelling the relationship between green built environment and occupants' productivity. *Facilities*, 35(3/4), 170–187. <https://doi.org/10.1108/f-07-2015-0052>
- Mouratidis, K. (2021). Urban planning and quality of life: A review of pathways linking the built environment to subjective well-being. *Cities*, 115, 103229. <https://doi.org/10.1016/j.cities.2021.103229>
- Wang, C., Sheng, Y., Wang, J., Wang, Y., Wang, P., & Huang, L. (2022). Air Pollution and Human Health: Investigating the moderating effect of the built environment. *Remote Sensing*, 14(15), 3703. <https://doi.org/10.3390/rs14153703>
- Zhang, Y., Wu, W., He, Q., & Li, C. (2018). Public transport use among the urban and rural elderly in China: Effects of personal, attitudinal, household, social-environment and built-environment factors. *Journal of Transport and Land Use*, 11(1). <https://doi.org/10.5198/jtlu.2018.978>