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The Disabling City: Older Persons Walking in Central Neighbourhoods of Santiago de Chile

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Abstract: Walking reports numerous benefits for older persons, yet its practice can be hindered by the built environment. This article seeks to understand how and why certain elements of the built environment facilitate or impede the everyday trips older persons complete on foot. It reports the findings of a set of walking interviews conducted in four central neighbourhoods of Santiago de Chile, where forty older persons were invited to walk and talk about the trips they complete on foot and the aspects that facilitate or hinder them. The findings reveal that older persons are aware of the benefits of walking and travel regularly on foot despite the barriers they find in their neighbourhoods. The presence/absence of greenery, the conditions of the facades and the level of cleanliness of the streets affect older persons' walking experience and can increase/diminish their willingness to walk. Damaged and poorly designed pedestrian infrastructure can cause fear, provoke accidents and become serious hazards. Older persons develop strategies to overcome these barriers, yet the data suggest that they see Santiago as a "disabling city" because it has obstacles that could be unsurmountable in a near future if an illness or an accident diminishes their abilities.

Keywords: older persons; walking; walkable cities; walkability; walking interviews; built environment

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1. Introduction

The majority of older people (persons aged 60 years or older [1,2]) have independent lifestyles and different capacities according to their life trajectories and the resources they have available [3]. They are a diverse group which is subject to stigmas that often downplay their capacities (e.g., ageism) and assign them to the domestic sphere [4,5]. Older persons are more women than men and, therefore, their study requires gender perspectives [6]. They tend to spend more time in the neighbourhoods where they live than younger individuals and walk more than other groups to fulfil their daily needs [7,8].

Walking regularly reports numerous benefits. From transport studies, a large body of research has indicated that walking can help to tackle the challenges that affect contemporary cities (e.g., greenhouse gas emissions) [9–12]. From the social sciences, it has been suggested that, through walking, people build public familiarity, exercise citizenship and reproduce capitals of different nature [13–15]. From health-related perspectives, numerous studies have asserted that walking is beneficial for people's physical (e.g., prevention of cardiovascular diseases) and mental health (e.g., stress reduction) [16,17]; it is an activity that can also delay physical and cognitive decline or ameliorate the impacts of chronic illnesses that may afflict older persons [18–20]. Moreover, it has been argued that walking is one of the main strategies that older persons employ to stay active, visible and connected with the community and the wider society [21–25].

There is broad agreement in the literature that dense and diverse neighbourhoods that have pedestrian-friendly arrangements and public transport available can make walking more feasible [26–29]. Studying older persons, several authors have suggested that attractive landscapes, natural elements (e.g., greenery) and street furniture (e.g., benches) can have restorative properties [30–32] and encourage walking [33–35]. The presence of facilities, services and green areas in the neighbourhoods where older persons live can make its practice more attractive among older persons [22,23,36–38]. Conversely, deteriorated and poorly designed pedestrian infrastructure (e.g., sidewalks, kerb cuts) and complex street crossings can be a challenge for some older persons with reduced mobility and those who, after suffering an accident (e.g., falls), have lost confidence in their abilities [39–41]. Deficient street lighting can increase the—already high—perception of insecurity that older persons have and discourage walking and out-of-home activities during the hours in which natural light is scant [42–44]. Out-of-home activities, such as walking, are crucial for older persons' wellbeing, but these are difficult in cities that, as Loo [45] suggests, are designed following vehicle-oriented paradigms.

Chile is a signatory of several treaties that seek to protect older persons' rights [1,46,47]. The country also participates in numerous initiatives that aim to promote healthy ageing and create age-friendly urban environments [48,49] and has numerous policies and programmes orientated to improve older persons' wellbeing [2,50]. Despite these efforts, older persons in Chile are a vulnerable group, affected by stigmas and different forms of poverty [51–54]. The evidence gathered by the "National Survey of Quality of Life at the Old Age" [55] indicates that the majority of the older population in the country does not have their financial (56.8%) and health-related needs (55,9%) satisfied. A significant portion feels excluded (24%), isolated (23%) and afraid of being unable to have an independent life (65%). Seven out of ten do not engage in regular physical activity (72%), and more than four fifths (83%) walk fewer than fourteen blocks per day (~1.5 km). Several works have highlighted the hostile environments that older persons and other groups (children, women and deprived communities) face when walking through Chilean cities [56–59]. Inadequate pedestrian infrastructure (e.g., damaged, neglected and narrow sidewalks), absence of services (e.g., public toilets) and street furniture (e.g., benches) in the public space and lack of facilities in territories that are highly unequal have been described as common obstacles that older persons encounter in Chilean cities [60–64]. Likewise, it has also been suggested that the norms and devices (e.g., traffic lights) that regulate traffic have tended to be detrimental to pedestrians and have created a number of issues (e.g., short pedestrian crossing times) that can hinder older persons' trips [65–67]. After studying the hostile public spaces older persons face, some works have concluded that older persons are able to travel with relative normality in Chile because they have strong networks that provide support and not because of the amenities offered by its cities [25,68]. However, despite those efforts, there is still a lack of clarity on how the built environment influences walking among older persons in Chile and the different issues (e.g., experiences, apprehensions) that shape its practice, in particular from the perspective of older persons themselves.

This article investigates the links between the built environment and older persons' walking. It aims to understand how and why the attributes of the built environment facilitate or hinder the everyday trips older persons complete on foot, based on the narratives of older persons. To that end, the article reports the findings of a set of walking interviews in which forty older persons were invited to walk in their neighbourhoods doing their daily errands, that is, going to places where they normally do, and converse about: the routes they follow, the precautions they take, the people they encounter and the elements of the built environment that hinder or facilitate their walks. The participants were residents of four central neighbourhoods located in the surroundings of the historic district of Santiago de Chile. By studying such cases, the article also aims to contribute to the Latin American discussion that, in recent years, has started to put more attention on the forms in which the built environment influences older persons' walks [25,64,66], broadening the scope of a

body of research that has focused on the associations between attributes of the urban space and older persons' travel behaviour [69–71].

Following this introduction (Section 1), the article is structured into four sections. Section 2 provides details of the methods employed to gather the data and describes the characteristics of the four neighbourhoods where the data was collected. Section 3 contains the main results and is divided into two subsections that cover older persons' walking patterns in central neighbourhoods of Santiago de Chile (Section 3.1), and the elements of the built environment that affect older persons' walking experience and hinder or facilitate the trips they complete on foot (Section 3.2). An additional section (Section 4) contains the main conclusions of the research and final remarks.

2. Methods and Materials

To reach the objectives outlined earlier, this article reports the findings of a set of walking interviews in which forty older persons were invited to walk in their neighbourhoods and converse about walking and the aspects that facilitate or hinder its practice. The four neighbourhoods, given their central location, permit residents to fulfil many of their needs in a walkable range. Indeed, these neighbourhoods have some of the features normally associated with the fifteen-minute city that have been discussed in recent global urban debates (originally proposed by Professor Carlos Moreno for the COP21 summit, the 15 min city was an appealing political idea that helped Paris' Mayor Anne Hidalgo to be re-elected in 2020). Guided by a semi-structured questionnaire that contained relatively open questions, the participants were asked to talk about (i) the places where they go/do not go on foot, (ii) the precautions they take before and when walking, (iii) the destinations of their walks, (iv) the people they encounter in the streets, (v) the aspects of the built environment that are relevant for their walks, (vi) the elements of the built environment that hinder and contrarily facilitate their walk and (vii) the improvements they believe would make their pedestrian trips easier. The participants chose the meeting point (generally their homes), the hour, the destination(s) (e.g., parks, shops and banks), the extension of the walk and the route that would be followed during the interview and were encouraged to walk at their regular pace.

On average, the conversations lasted forty-one minutes (the longest lasted two hours and forty-nine minutes and the shortest twenty-one minutes) and, with the consent of the participants, were recorded in audio and GPS, transcribed, anonymised and later sequentially imported into the qualitative data analysis (QDA) computer software *atlas.ti* (version 8.0). Using software features, significant fragments of the transcripts, which varied from short sentences to lengthy interactions between the participants and the interviewer, were isolated and assigned with a "code" (i.e., descriptive label) that reflected their structure of meaning. Later, all the excerpts tagged with the same code were visualised simultaneously to identify patterns, relationships and omissions within the data gathered. Following a "discovery-oriented approach" [72], codes emerged from the data, were grouped into broader categories according to their content and were systematically refined with the addition of new transcripts into the software, the discussion of the analysis with the research team and the contrast of the findings with the relevant literature. The analysis was carried out in Spanish (participants' native language).

The participants were recruited through local gatekeepers (i.e., community leaders, public servants working in the neighbourhoods) who provided the contact details of older persons interested in collaborating. Following a snowball scheme [73], these older persons were contacted, interviewed (if agreed) and later asked for the contact details of acquaintances who would be interested in the research. Forty older persons agreed to participate; they ranged between sixty and ninety years old, were mostly women (thirty-one female participants and nine male participants) and were residents of four neighbourhoods of the centre of Santiago de Chile that have distinctive trajectories, predominant building types and land use patterns (Figure 1). In detail:

Figure 1. Participants and studied neighbourhoods. Source: authors' own.

Case A Low-rise residential neighbourhood, single family houses (Pedro Montt-San Eugenio): this is a neighbourhood predominantly of single-family houses that rarely have more than two storeys. It is part of the old industrial belt of Santiago (Figure 1) and is delimited by transport infrastructures (i.e., highways, railways), correctional (i.e., penitentiary) and military facilities and industrial buildings that are, in most cases, in disuse. The origin of the majority of the housing estates located in this area is tied to its industrial past; several were among the first Chilean efforts to provide shelter to working-class families—built at the beginning of last century, and many are today considered heritage. Unlike the other cases, this area is served only by bus services and has not suffered significant changes in recent years.

Case B Mid-rise mixed-use neighbourhood, perimeter block buildings (Ejército-República): this is a historic neighbourhood predominantly of continuous building frontages (Figure 1). This area consists of residential flats but also commerce, local shops, universities and other services, being a mixed-use area. It is bordered by a highway, served by subway lines and bus services and is located nearby parks and facilities of metropolitan importance. After suffering a profound decline, the neighbourhood has been revitalised since 1980 by institutions of tertiary education that occupied large buildings of heritage interest. That process has been accompanied by the construction of residential buildings (between eight and ten storeys high) that have replaced single-family houses and have changed the social architecture of the neighbourhood.

Case C Mid-rise mixed-use neighbourhood, block apartments (Huemul-Franklin): this is a neighbourhood predominantly of apartment blocks. It is a diverse and well-connected area (two subway lines and several bus services cross it) located nearby one of

the most traditional commercial districts of Santiago (*barrio Fraklin-Bío Bío*). A large portion of this area is occupied by three housing estates which, like those located in Case B, were among the first to provide solutions to working-class families. The oldest (*Huemul I*) is a neighbourhood of one-storey houses that has been gentrified in recent years. The other two (*Huemul II* and *Huemul III*) are complexes of blocks of apartments (between two and four storeys high) that have inner collective gardens.

Case D High-rise mixed-use neighbourhood, high-rise buildings (San Isidro-San Borja): this is a neighbourhood predominantly of residential high-rise buildings and towers (Figure 1). It is a well-equipped area (hospitals, universities, offices, shops, parks and other facilities are located within its boundaries) and well-connected with the rest of the city through subway lines and bus services. Part of this area is occupied by a large project of urban renewal built during the decade of 1970 (*Remodelación San Borja*). Following the precepts of modern architecture, this housing estate consists of twenty residential blocks of more than twenty storeys high connected by elevated walkways (most of them closed), large terraces and commercial podiums. In the rest of the neighbourhood, the rapid proliferation of residential high-rise towers (many over twenty storeys and more) has dramatically changed the traditional streetscape and the social composition of the communities. Moreover, the everyday life of those who live in this area has been severely disrupted by the social unrest that erupted in October of 2019 and the demonstrations that, until today, occupy symbolic places located in the vicinity (*Plaza Dignidad*).

In addition to the analysis of the conversations described earlier, the routes followed by the participants and the places pointed out as significant (e.g., the damaged section of a sidewalk, dangerous street crossing and well-kept green area) were recorded with GPS devices and, later, drawn on maps. To complement the data, the physical features of neighbourhoods, including the characteristics of buildings (typologies, uses and heights), sidewalks (width, conditions) and crossings (kerb cuts, pavement markings and traffic lights), were registered on-site, digitalised with the assistance of computer-aided design and drafting software (i.e., AutoCAD, SketchUp) and employed to build maps of the cases and three-dimensional representations of significative streets.

Most of the data were collected in spring, during a period of time (August–December 2021) in which the most stringent measures implemented to control the expansion of COVID-19 (e.g., lockdowns) were not in force due to the low number of active cases. Despite that, all the activities that did not strictly require face-to-face contact with the participants (e.g., recruitment) were conducted remotely to minimise risks through phone calls and instant messaging platforms such as WhatsApp. The mobile interviews, which did require direct contact between participants and researchers, were carried out observing all the preventive measures recommended by the local health authorities (i.e., use of masks at all times, physical distancing). All the protocols employed in this research were reviewed and approved by the Committee of Ethical and Scientific Evaluation (*Comité de Evaluación Ético Científico*) of the Faculty of Architecture and Urbanism of the University of Chile (*Universidad de Chile*).

The following sections contain the main findings of the analyses outlined earlier and cover (i) older persons' walking in four central and changing neighbourhoods and (ii) the elements that facilitate/hinder walking and those than can impede its practice and, ultimately, disable older persons. To exemplify relevant phenomena, these sections include maps built with the information gathered when walking with the participants, three-dimensional representations of some relevant streets and snippets of the conversations that are "functional" translations of the originals in Spanish. The fragments are accompanied by general identifiers (i.e., gender, age) and, if relevant to provide context, the case where the participant resided.

3. Results

3.1. Understanding Older Persons' Walking Patterns in Four Central Neighbourhoods

3.1.1. Older Persons' Walking: Routes, Destinies and Patterns

The participants walked, on average, at 0.75 m per second (2.7 km/h). Twenty-three participants walked at speeds below that average and seventeen above it (Table 1). In addition, thirty-two participants did not reach 0.9 m/s (3.2 km/h), which in Chile is the lowest designed walking speed for puffin and pelican crossings [66]. The interviewed older persons walked, on average, 2.53 km. Of the forty participants, six walked less than one kilometre, sixteen walked distances between one and two kilometres, twelve walked more than two kilometres and fewer than four kilometres and six participants walked more than four kilometres. On average, the participants from Case D (high-rise mixed-use neighbourhood) walked more than the residents of the other neighbourhoods (3.33 km); those living in cases A (low-rise residential neighbourhood) and C (mid-rise mixed-use neighbourhood) walked around two kilometres and those from Case B (mid-rise mixed-use neighbourhood) around two-and-a-half kilometres on average (Table 1). Among the ten participants who walked more, four were residents of the high-rise mixed-use neighbourhood (case D). Conversely, among the ten older persons who walked less, five were residents of the low-rise residential neighbourhood (Case A). Moreover, the data gathered did not show any significant correlation between the distances walked, the speeds and the participants' age.

Table 1. Distances walked and speeds of the participants during walking interviews. Source: authors' own.

	Distance (km)			Speed (m/s)		
	Shortest	**Average**	**Longest**	**Lowest**	**Average**	**Highest**
Case A (10 participants) Low-rise residential neighbourhood Single family houses	0.98	2.00	4.31	0.5 (1.8 km/h)	0.74 (2.7 km/h)	1.26 (4.5 km/h)
Case B (12 participants) Mid-rise mixed-use neighbourhood Perimeter block buildings	0.54	2.57	7.32	0.42 (1.5 km/h)	0.76 (2.7 km/h)	1.27 (4.6 km/h)
Case C (8 participants) Mid-rise mixed-use neighbourhood Block apartments	0.99	1.98	4.94	0.58 (2.0 km/h)	0.70 (2.5 km/h)	1.26 (4.5 km/h)
Case D (10 participants) High-rise mixed-use neighbourhood High-rise buildings	0.81	3.33	8.79	0.34 (1.2 km/h)	0.69 (2.5 km/h)	1.15 (4.1 km/h)
All participants	*0.54*	*2.53*	*8.79*	*0.34*	*0.75*	*1.27*

The maps drawn with the information gathered during the walking interviews (e.g., routes) show that the older persons who live in the mid-rise mixed-use neighbourhood (Case B) followed very different routes (Figure 2). They have options because this neighbourhood is diverse, attractive (e.g., presence of heritage) and relatively walkable (e.g., numerous streets have wide and well-kept sidewalks, greenery and well-defined crossings) and, as such, provides a number of pleasant routes to go on foot. In the high-rise mixed-use neighbourhood (Case D), the participants' routes also differed considerably, yet this seems to be caused by the hostilities provoked by the hyper-densification of the neighbourhood (e.g., congestion) and the environmental impacts caused by the construction of new buildings (e.g., destruction/deterioration of sidewalks, circulation of trucks and noise). Many older persons from this neighbourhood portrayed their routes as a sum of streets, crossings and public spaces best fitted to their particular condition (e.g., surface soils/grass surfaces to relieve joint discomfort/pain) and preferences (e.g., enjoyment/dislike of busy streets). The routes described by the older persons from the low-rise residential neighbourhood (case A) and the mid-rise mixed-use neighbourhood (case C) varied less, heading towards

clear points of interest (such as markets in Case C) or following the main avenues of the vicinity (Case A).

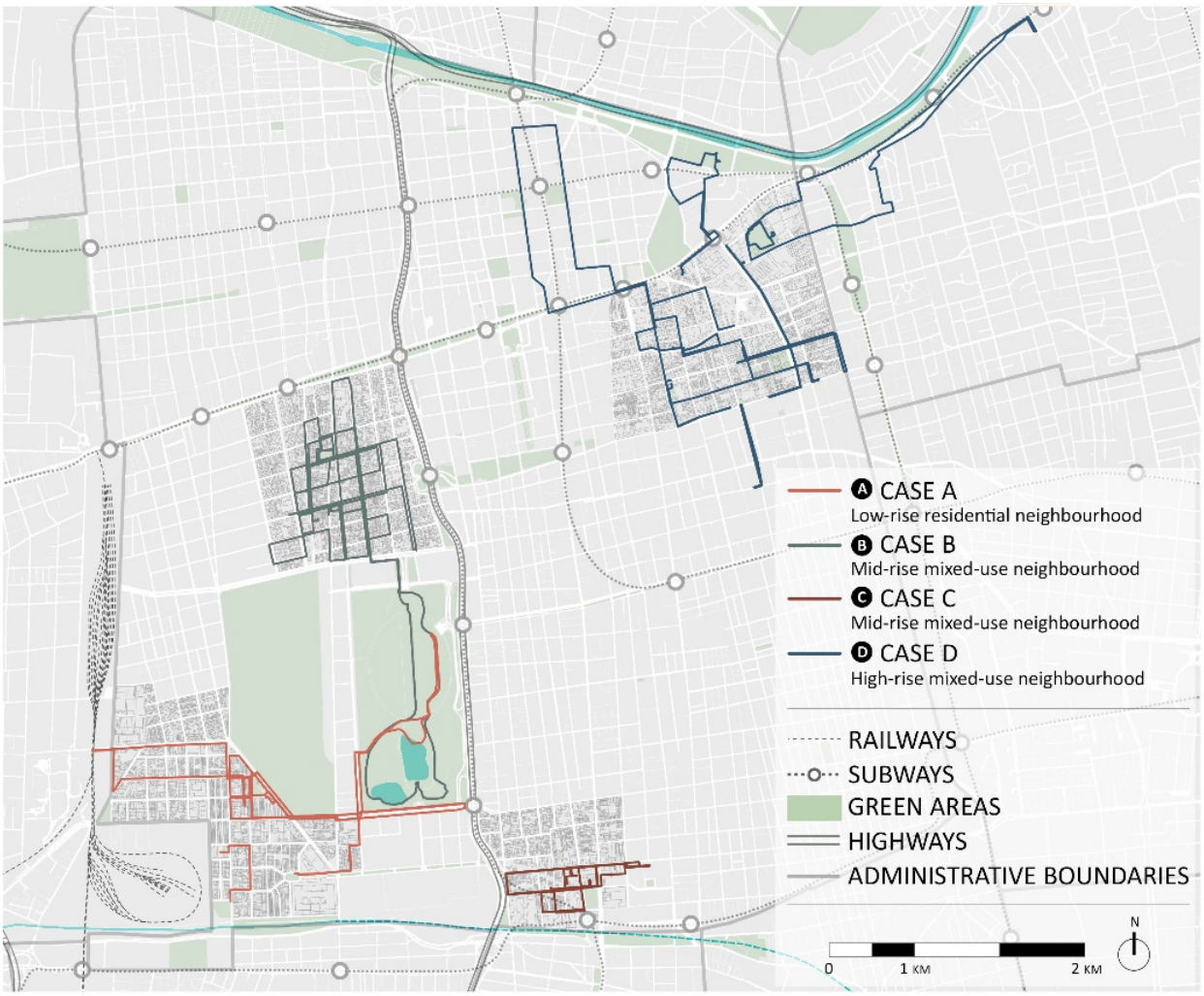

Figure 2. Routes of the participants during the walking interviews. Source: authors' own.

The participants rarely left the vicinities to which they belong during the walking interviews (Figure 2). The few participants who did left the neighbourhoods to reach parks (cases A, B and D) and lively districts (Case D). Likewise, only the participants who resided in the high-rise mixed-use neighbourhood (case D) reached places located outside the commune of Santiago. The rest remained within the administrative boundaries of the commune and made vague descriptions of the neighbourhoods located beyond them. In addition, the interviewed older persons rarely crossed large infrastructure such as railways, highways or large avenues (Figure 2). None of them crossed the highways that flank cases A, B and C and the railways that define the western border of Case A—and just a few crossed the many thoroughfares that converge in the surroundings of the neighbourhoods, which may suggest that large infrastructure acts as barriers to older persons.

Regarding the destinations of older persons' walks, the majority of the participants bought groceries during the mobile interviews (nine). Another group invited the interviewers to stroll along parks (seven), visit squares (six) or to enjoy the urban life of vibrant districts located around (four). Two participants also visited banks and other financial institutions, indicating that having the company of the researchers made them feel safe enough to carry cash and perform transactions. The rest did not have a clear destination. Many of the interviewed older persons felt vulnerable walking outside, an "easy target" for wrongdoers or a "nuisance" treated with disdain and even ignored by others. Furthermore,

the analysis of the walking interviews suggests that older persons feel that they have limited opportunities to make their voices heard and participate in the broader society. Several participants, particularly the residents of cases A and B, were active members of local organisations (e.g., churches, charities and clubs), yet others were much more isolated. These older persons define themselves as opinionated individuals who, through walking, try to influence—at least—the future of the neighbourhoods where they reside.

Walking was often characterised as a practice that reports a number of benefits. As the literature acknowledges [13–15], the interviewed older persons indicated that walking provides opportunities to participate in society. Several participants also asserted that walking makes them visible and indicated that the many interactions tied to its practice keep them connected with others [21]. During the walking interviews, the researchers frequently observed how nods, waves and other slight interactions emerged spontaneously between the participants and passers-by. These gestures and demeanours later emerged in the analysis as significant facets of walking that play a crucial role in the construction of public familiarity, conduce complex interactions (e.g., conversations) and strengthen the ties between older persons and the rest of the community:

(1) "I try to remember faces because I do the same walk every day . . . sometimes twice a day. I try to remember people to see if I can 'hook' someone's attention" (female, 78 years old, Case B, mid-rise mixed-use neighbourhood).

The participants were well-aware of the beneficial impacts that walking has on their physical and mental health. They walk to alleviate pains, prevent physical decline, protect their hearts and, more broadly, remain in good physical shape. Additionally, they consistently placed these benefits among the main reasons why they walk. Using apps or smartwatches, some participants counted the number of steps, measured the distance travelled and registered the time dedicated to walking and set goals (e.g., walk *n* km or *n* hours per day/week) to improve their endurance and cardiovascular capacity. Others indicated that they walk to prevent/delay the emergence of chronic diseases and not become immobile in the long term. Coinciding with the findings of Franke et al. [24] and Herrmann-Lunecke et al. [25], the majority of older persons who took part in this research characterised walking as a strategy to remain active and added that its practice has, in addition, helped them palliate the adverse consequences that the COVID-19 pandemic has had on their lives.

The first walking interviews were carried out during the first weeks of August of 2021, after the COVID-19 surge that hit the country during autumn and winter (March–July 2021) receded and when the most severe measures to control the spread of the disease (e.g., lockdowns) were in the process of being lifted. Some older persons, especially those who exercised outside and kept a certain level of physical activity during the periods with more restrictions (older persons were allowed to exercise outside one hour per day, three times per week from May of 2020 onwards [63]), were walking in public spaces with relative normality when they were invited to collaborate with this research. Other participants, however, were just returning to walk regularly in open spaces after months of being isolated in their houses, facing a changed landscape (e.g., fewer persons present in the public space in certain hours), experiencing the consequences on the body of long periods of inactivity (e.g., weight gain, loss of endurance/strength) and confronting new fears (e.g., fear of being infected) that joined the many dreads that already surrounded any travel they completed on foot. Already prior to the COVID-19 pandemic, the interviewed older persons felt vulnerable walking in the streets of Santiago de Chile: threatened by the public spaces of neighbourhoods that had changed in numerous ways and endangered by a built environment that can transform walking into an unbearable experience.

3.1.2. Changing Neighbourhoods: Building Typologies and Older Persons' Walking

Of all the fragments of the interviews coded, eighty-nine (10.8% of the total fragments coded) included references to the changes that have occurred in the studied neighbourhoods. Twenty-six fragments contained allusions to the densification of the neighbour-

hoods, either describing the increase in the population (37 fragments) or the transformation of the landscape (48 fragments) caused by the construction of new buildings in traditional vicinities. Another eighty-four fragments (10.2% of the total) were descriptions of changes in the composition of the population of the neighbourhoods, providing details of how gentrification (28 fragments) and migration (56 fragments) have altered the familiarity that the participants have built over time with those they routinely encounter when walking. In fact, familiarity emerged in numerous forms in the participants' narratives. Most older persons indicated that they purposely interact (e.g., eye contact, waving conversations) with the individuals they routinely encounter outside to know their stories, build trust and feel connected and protected in the streets (e.g., there is a high chance of receiving help if an emergency arises). A group of participants also suggested that these actions have helped them to rebuild their networks after the COVID-19 pandemic forced them to stay in isolation and overcome the fears that emerge when groups with different behaviours start to occupy the streets of the neighbourhoods (e.g., students, migrants and young families). In the participants' narratives, the arrival of new groups was commonly tied to the many changes that have occurred in their neighbourhoods in recent decades and, particularly, related to densification processes.

The participants were well aware that densification happens in central and well-served neighbourhoods such as theirs. The older persons who have lived for a long time in the studied neighbourhoods described in depth how the vicinities of single-family houses in which they grew and became older were completely transformed by the construction of mid- and high-rise residential buildings in recent decades. Other interviewees asserted that the remaining single-family houses they see when walking will soon be replaced by denser and taller developments. The majority of the participants indicated that the construction of denser and higher developments has somewhat "modernised" the neighbourhoods, upgrading sections of long-neglected pedestrian infrastructure (e.g., sidewalks, kerb cuts) that made walking difficult in the past, and incorporating greenery (e.g., lawns, gardens and trees) that made it more attractive (e.g., more colourful) to otherwise monotonous and grey landscapes. Densification, however, has had a number of flipsides in the neighbourhoods where the participants live. Some older persons indicated that the densification has made noise pollution and traffic and pedestrian congestion into unavoidable inconveniences. Other older persons added that the number of new residents and the transient population has increased abruptly in recent years, forcing them to negotiate the few places in which they meet neighbours, acquittances and friends such as squares, or where they solve everyday needs, such as facilities and services. More importantly, new incomers have reduced the—already—limited space to walk:

(2) "When I arrived [in the neighbourhood], it was nice to walk along that street because . . . you saw 'normal' groups of people, but now the sidewalks are chaotic. Everything is crowded, very crowded. They [real-estate developers] built many towers, many! And they continue building more . . . " (female, 72 years old, Case D, high-rise mixed-use neighbourhood).

Older persons from all cases believed that the infrastructure of their neighbourhoods is not adequate to sustain an intense densification process. Most of the participants indicated that neighbourhoods where single-family houses still predominate or where densification has been moderate (mid-rise residential buildings or blocks of four to eight storeys) are better suited for them and more walkable. According to the participants, neighbourhoods of single-family houses are quiet and, therefore, friendly to older persons who cannot walk rapidly. Participants also pointed out that mid-rise buildings disrupt little the landscape, the public space and its life—and provide common spaces that enrich the routines of the residents. Several older persons from Case C (mid-rise residential neighbourhood), for instance, described how outdoor common spaces of the mid-rise buildings where they live have been "havens" during the COVID-19 pandemic. Indeed, participants described having the possibility to walk, to enjoy the open air and to safely interact with others in those spaces. This allowed them to remain active and connected even during periods with

stringent restrictions. Residential high-rises (of more than ten storeys), however, were described in much more negative ways.

It was suggested by older persons that residential high-rises are often part of "predatory" densification processes that weaken the social structure of communities, negatively transform the built environment and, by doing so, create hostile conditions for walking. The participants indicated that high-rise buildings are disproportionately tall for the section of some streets and cast shadows on sidewalks that feel cold and unhygienic (e.g., odours) most of the day. The eye level of high-rises was also disliked by the interviewees. They transversely argued that such buildings have poorly designed facades and dwarf houses that have not been demolished and replaced by new developments. In addition, older persons from all neighbourhoods indicated that residents of high-rises contribute little to their neighbourhoods because they hardly interact with their neighbours and have little willingness to participate in local organisations.

Older persons' apprehensions over high-rises were commonly rooted in the consequences that hyper-densification processes have had in several central and pericentral neighbourhoods of Santiago: places where residential towers of more than 10, 20 and even 30 storeys have transformed historical low-rise quarters in the last three decades. The participants described these cases in depth and feared that something similar could occur in the places where they live. The apprehensions of older persons who live in Case D (a neighbourhood affected by hyper-densification), however, seem to be expressions of their everyday lives. Figure 3 illustrates a part of a street from Case D and shows the many forms in which the intense densification that took place in the neighbourhood affected older persons' lives and walks. Motorised traffic is high, and the streets are noisy. Sidewalks are dark, cold and congested. Façades are irregular and jump from small houses to tall buildings. Some participants argued that they feel uncomfortable walking in the streets of this neighbourhood. Other older persons went further, suggesting that this is not a place to "age"; they feel isolated because they hardly know their neighbours despite the efforts they routinely make to engage in meaningful interactions (e.g., conversations) and feel threatened by hostile streets.

3.2. Exploring Elements of the Built Environment That Facilitate and Hinder Older Persons' Walking

3.2.1. (Un)engaging Streets: Greenery, Facades, Cleanliness and Older Persons' Walking

Six-hundred and forty-seven fragments of the interviews (78.9% of the total fragments coded) contained references to aspects of the built environment that affected older persons' walking experience, making its practice more or less engaging, comfortable or pleasurable. Fifty-seven excerpts of the interviews (6.9% of the total) were allusions to the conditions (e.g., level of deterioration/damage) and characteristics (e.g., colour, details) of the facades that border the streets through which they walk. One-hundred and forty-eight (18% of the total) fragments included descriptions of natural elements, such as trees, flowers and grass. Seventy-seven excerpts of the interviews (9.3% of the total) were descriptions of the environmental conditions of the streets, especially the level of cleanliness (e.g., presence of rubbish), and another thirteen (1.6% of the total) contained references to urban furniture (e.g., benches). The participants consistently argued that these attributes of the built environment do not put the trips they complete on foot at risk but have a significant impact on their walking experience.

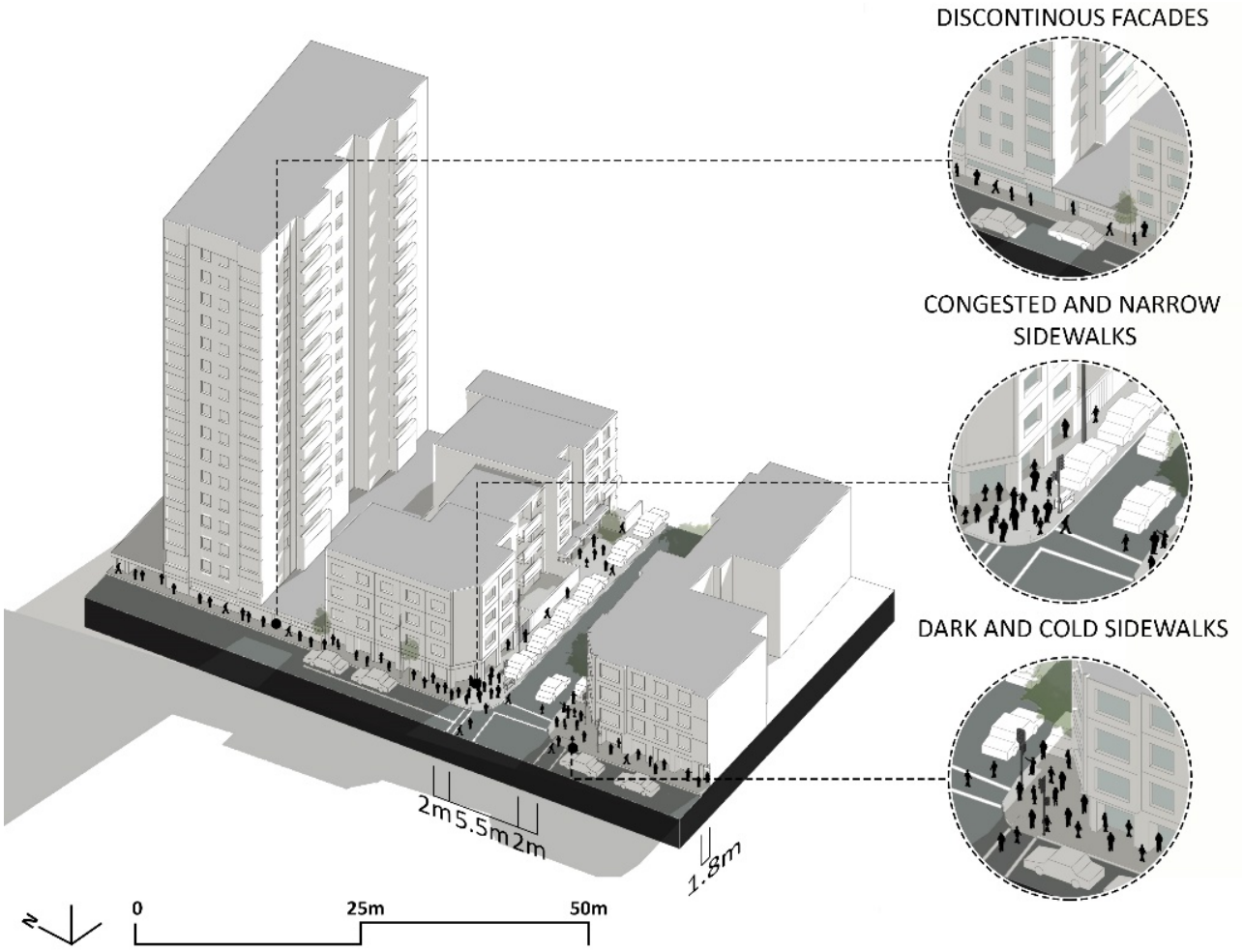

Figure 3. Detail of a street located in Case D (high-rise mixed-use neighbourhood). Source: authors' own.

The participants indicated that deteriorated, neglected, dirty and vandalised (i.e., graffiti) facades make walking a less enjoyable experience and, to some extent, strengthen the monotonous character they believe Santiago has. Conversely, streets bordered by well-kept (e.g., clean) and colourful facades and "beautiful" buildings (e.g., historic architecture), and streets with natural elements (e.g., trees, greenery) and urban furniture (e.g., benches), enrich older persons' walking experience. These attributes can be captivating (details of well-kept facades), elicit memories and stories (historic buildings) and, ultimately, facilitate the enjoyment of the city. Moreover, the older persons who took part in the research described the well-known restorative effects of walking through environments that natural elements have [30–32], suggesting that going on foot through places with trees, flowers, grass, etc., helps them to "clear the mind:"

(3) "I like to see . . . the gardens . . . the trees . . . It gives me tranquillity and calms me" (female, 71 years old, Case A, low-rise residential neighbourhood)

The accumulation of rubbish, pet waste and debris on the streets and the absence or destruction of urban furniture also worsen older persons' walking experience. As other authors have shown [59], these conditions of the built environment were depicted as meaningful issues and thoroughly described as signs of absent institutions and the presence in the community of groups and individuals that do not care about the common good. The participants suggested that walking through dirty and neglected streets is unpleasant. It prompts negative emotions (e.g., frustration, sadness), strengthens older persons' sensation of being powerless agents with little support from others to change what seems wrong and decreases their willingness to be outside and engage with the community. Figure 4

illustrates the opposite case, a street located in Case B that was described as "engaging" because it has wide and equipped sidewalks and is flanked by the facades of well-preserved historical buildings.

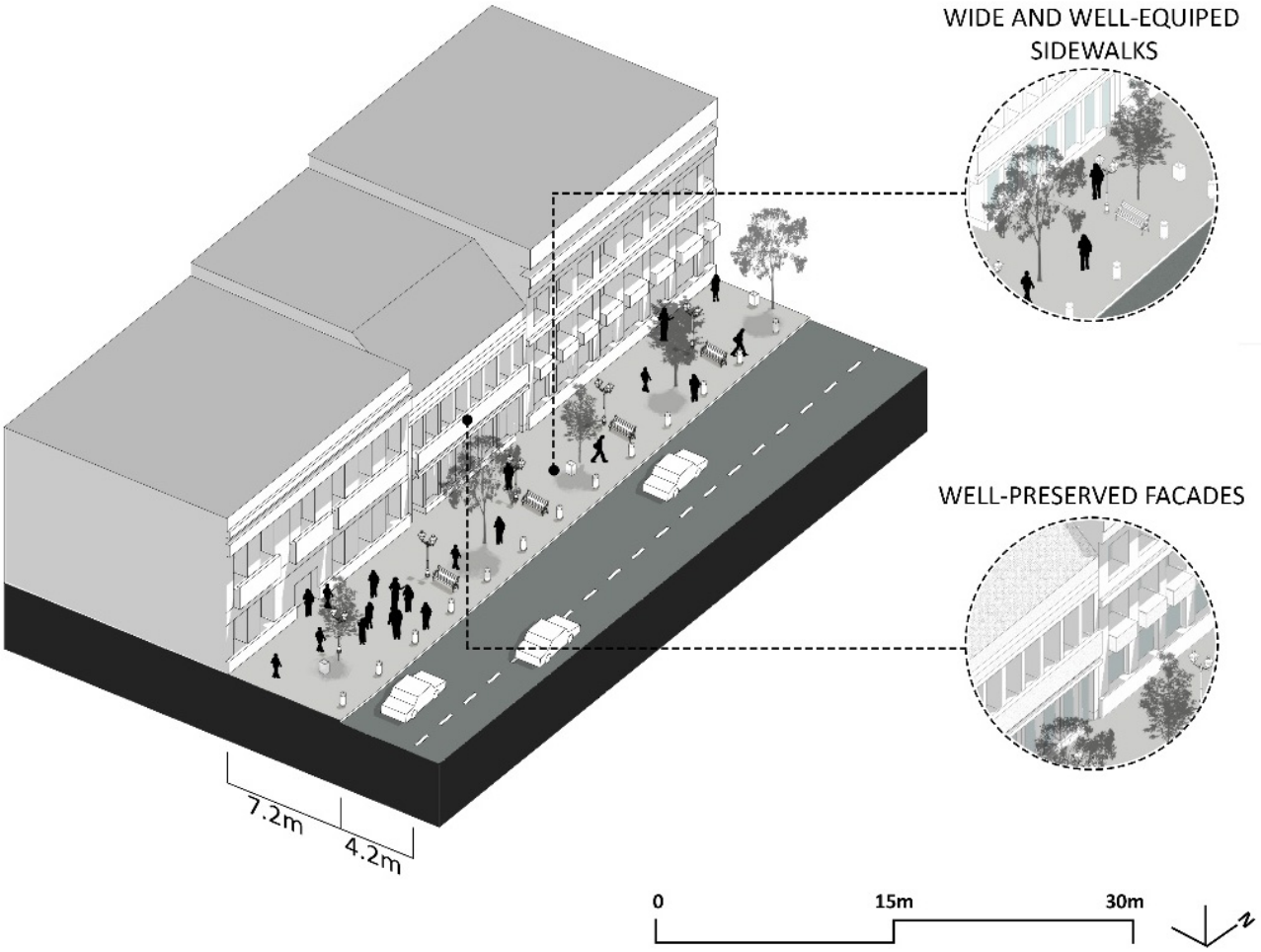

Figure 4. Detail of a street located in Case B (mid-rise mixed-use neighbourhood). Source: authors' own.

3.2.2. Enablers and Disablers: Sidewalks, Crossings and Older Persons' Walking

The majority of older persons who participated in this research described their walks in relation to what they were able to do in the past (e.g., walk at a certain speed) and what they expect to be able to do in the future (e.g., unsteady gait). They also described the impacts of the built environment in dynamic forms considering future scenarios and suggesting that aspects of the streets that do not represent a challenge in the present can be insurmountable barriers in the future if an accident (e.g., falls) or a disease reduces their capacities. Moreover, most participants asserted that they are able to walk in the neighbourhoods where they live not for the friendliness of the environment but because their health—still—allows for it. When asked if the short pedestrian cycles of the traffic lights of the neighbourhood hinder her walks, one participant, for instance, answered "no" because "I can still run" (female, 72 years old, Case B, mid-rise mixed-use neighbourhood). The participants mentioned numerous aspects of the built environment that hinder walking and can potentially impede and suppress its practice. Two hundred (24.4% of the fragments coded) were references to the sidewalks, their dimensions (78 fragments), evenness and regularity (18 fragments) and conditions (104 fragments). Another large number of fragments mentioned elements of the built environment that regulate the relation between pedestrians, motorised traffic and

bicycles (130 fragments, 15.9% of the total), including pedestrian crossings (85 fragments), cyclist infrastructure (26 fragments) and traffic lights (19 fragments).

As the literature acknowledges [39–41], the characteristics and conditions of the sidewalks are crucial for older persons. During the interviews, the participants consistently highlighted their relevance and described how the many hazards present on the sidewalks where they walk have become increasingly critical after accidents or chronic pains have reduced their functional abilities. Several older persons narrated how they have fallen when walking in their neighbourhoods due to improper slopes, poorly executed patchworks, missing panels and pavement tiles, cracks, root heaves and protruding, broken or missing utility covers—and how, to prevent future accidents, they have memorised the location of the hazards and changed their routes. A few participants who suffer from joint pains also have changed their routes, preferring streets that have strips of softer surfaces (e.g., soil, grass) between the roads and sidewalks. These participants prefer to walk along these softer surfaces, since it reduces their joint pains. Furthermore, the participants pointed out that it is difficult to walk accompanied because most of the sidewalks of their neighbourhoods are narrow (often fewer than two or one metre), interrupted by utility poles or partially occupied by street vendors and parked cars. In some cases, the scant available space for pedestrians have forced older persons to descend and walk on the roads, multiplying the conflicts between them and other means of transport:

(4) "Sometimes you cannot cross because of the parked cars [block the sidewalk]. You have to descend to the road to able to walk" (female, 71 years old, Case D, high-rise mixed-use neighbourhood).

Most participants indicated that they have been involved in incidents with bicycles riding on the sidewalks, a behaviour prohibited by Chilean law (in Chile, older persons, children under 14 years and persons with disabilities are allowed to cycle on sidewalks in streets without cycle lanes), and mistreated and even hit by reckless cyclists. The older persons' answers, however, suggest that the construction of cycle paths does not necessarily solve such conflicts. In some cases, cycle paths built on the sidewalks have reduced the available space for older persons, whereas those built on the roads, with better standards, created new inconveniences. Several participants indicated that they do not know where to watch when crossing contra-flow lanes or bi-directional cycle paths that, as in the following excerpt, are located on one-way streets:

(5) "In that cycle path we had . . . not an accident, but almost . . . because we believed the cycle path followed the direction of the motorised traffic, but no! It is bidirectional! We barely had time to stop and avoid the cyclists that came from the other direction" (female, 71 years old, Case A, low-rise residential neighbourhood).

The interviewed older persons fear motorised traffic and avoided crossing large infrastructure, such as railways, highways or large avenues. The majority believed that drivers do not respect older persons and overlook the norms (e.g., speed limits), traffic signs (e.g., zebra crossings) and traffic calming measures (e.g., speed bumps) that limit speeds and safeguard pedestrians and, therefore, crossed streets with caution. In line with existing evidence, large infrastructure reduces the probability of walking [74], isolating entire communities from participating in urban life [75]. Some older persons have strategies to be more visible (e.g., raising the cane), whereas others almost run to reach the other side of the street as fast as possible when crossings have no traffic lights. Crossings equipped with traffic lights were often preferred by the participants but were still represented as challenging. The participants narrated experiences that are consistent with the findings of several works that analyse traffic lights in Chile and conclude that their cycles are coordinated for cars and not for pedestrians [65–67]. Some older persons indicated they fear crossings where vehicles are allowed to turn during pedestrian cycles, a common situation in Santiago. Others added they barely cross some streets due to short pedestrian green lights that, as mentioned earlier, are calculated in Chile using pedestrian speeds (0,9 m/s) that are much higher than the pace many older persons reached during the walking interviews [65]. Numerous participants indicated they changed their routes to avoid crossings that have

complex traffic lights such as the one depicted in Figure 5. This figure illustrates a street crossing located in Case A (low-rise residential neighbourhood) where two thoroughfares converge. The sidewalks of both avenues are heavily damaged and partially occupied by parked cars. The traffic lights allow vehicle turns during pedestrian cycles that are, in addition, short.

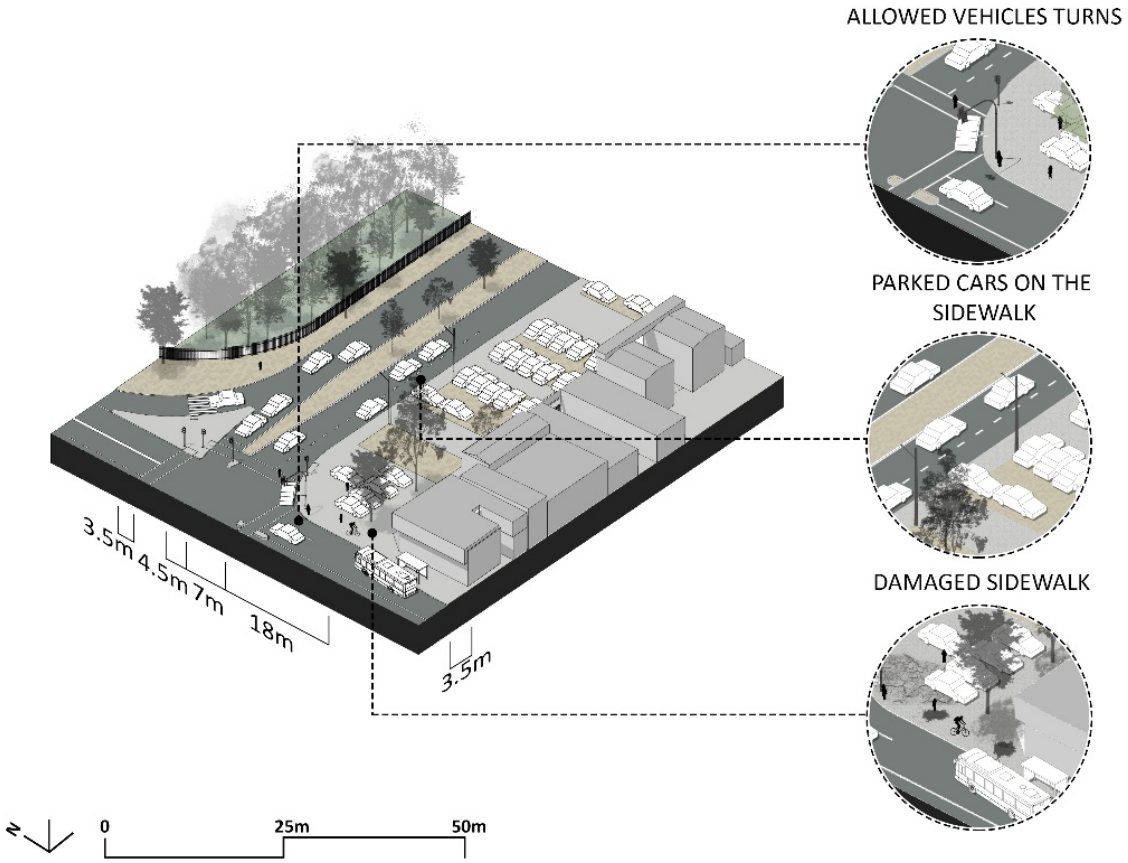

Figure 5. Detail of a street located in Case A (low-rise residential neighbourhood). Source: authors, own.

In line with the findings of several studies [42–44], the participants felt vulnerable to crime when walking, particularly when crossing places where artificial light is scant. It is worth noting that criminal activity in Santiago (percentage of households that experienced any type of criminal activity in the past six months) decreased from 22.8% in 2020 to 20.8% in 2021 as a consequence of the COVID-19 pandemic [76]. Notwithstanding, the perception of insecurity increased in the same period from 84.3% to 86.9% [76]. This issue was identified in twenty-two fragments of the interviews (2.7% of the total) and was described by older persons as one of the main reasons why they stay at home during night hours.

4. Conclusions: The Disabling City

This article aimed to investigate how and why the attributes of the built environment facilitate or hinder the everyday trips older persons complete on foot in Santiago de Chile. It sought to understand how the built environment influences older persons' walking and the different issues (e.g., experiences, apprehensions) that shape its practice. In general, the participants mentioned most of the benefits of walking that have been described in the literature. They walk to be visible and connected [21–23], to build familiarity and exercise citizenship [13–15] and to be healthier [18–20] and remain active [24,25]. The respondents also acknowledged that living in central neighbourhoods has some advantages but also numerous flip sides as several processes of change (e.g., gentrification, densification) constantly alter the communities, the familiarity they have built with those they routinely

encounter in the streets, the landscape and the conditions they face when walking. Hyper-densification was consistently described as an issue that makes walking unpleasant because it weakens the local community and transforms the nature of the public spaces (e.g., congestion, noise). The analysis of the data suggested that most participants' apprehensions towards the construction of taller and denser buildings were reactions to "predatory" processes of densification that have occurred in many central areas of Santiago.

From the analysis, numerous aspects of the built environment that affect older persons' walks emerged. Neglected and deteriorated built environments make walking less enjoyable. Likewise, streets polluted with rubbish, pet waste and debris elicit negative emotions and diminish older persons' willingness to walk, be outside and interact with others. As the existing body of literature acknowledges [39–41], sidewalks of all four neighbourhoods were consistently represented as critical infrastructure that can hinder and even impede walking. Some are narrow and the majority have hazards (e.g., poorly executed patchworks, missing panels and pavement tiles) that can cause accidents. In fact, several participants indicated that they have fallen due to these hazards and have changed their routes to prevent future accidents, or memorised hazards along routes, thus creating "strategies" to overcome them. Street crossing and traffic management devices were also represented as complex features that hinder walking. In this case, the participants feared drivers and cyclists' behaviour and, echoing the vehicle-oriented paradigm described by Loo [45], the preference that traffic lights give to cars. Deficient streetlights induce fear and, as several authors report [42–44], increase older persons' perception of insecurity during night hours. The participants explained that they deal with these issues due to their relatively good physical conditions, yet they believe that at some point in the near future they will not be able to do so.

In this context, the hostile conditions of the built environment and its public spaces can immobilise and disable older persons, becoming a "disabling city" for many people once they reach older ages. The findings suggest that older persons see Santiago de Chile as a disabling city because it has obstacles that may severely restrict their walking trips if an illness or an accident diminish their abilities. This discriminates against the mobility of older persons, and barriers in public spaces need to be acknowledged by society and resolved through urban policies and adequate streetscape design.

Urban policies need to regulate the design of wider sidewalks (minimum 2.5 m in local streets and at least 3.5–4.0 m in main streets), prioritise pedestrians at traffic lights and reduce street crossing distance. Street furniture is also important to enhance the walking experience of older persons and needs to include public toilets, benches as well as trees and other natural elements in public space. Interestingly, the participants highlighted that softer surfaces such as surface soil and grass are often better suited for their walking, since it releases joint pains. Considering that these surfaces are also more permeable and allow for rainwater absorption, they should be promoted in streetscape design. Finally, urban community plans (*Planes de Desarrollo Comunal*) need to address more explicitly urban improvements to facilitate walking [77].

This study has numerous limitations. All the participants walked regularly, and their experiences could not necessarily represent older persons who, for different reasons, are less active. Most participants were older women, potentially minimising the voices of older men. Moreover, none of the four neighbourhoods studied was affluent. Future research could explore to what degree older persons' walking experiences in less affluent neighbourhoods differ from those in more affluent neighbourhoods, and how the built environment can facilitate or impede the everyday walking of older persons who are less active. Additional analyses should also be conducted to check correlations between individual demographics, such as gender and age classes and the role that specific built environment attributes have on facilitating or impeding walking trips. Moreover, the interviews were conducted during the COVID-19 pandemic and, therefore, the participants' answers were influenced by the impacts it had on their lives.

We employed strategies to ensure the credibility of the results, including prolonged engagement, persistent observation and triangulation. To facilitate readers' transferability judgment, we described in detail the socio-cultural context and the procedures used to gather/analyse data. Lastly, this study gathered data in central neighbourhoods of a large metropolis, more research is needed to understand the influence of the built environment on older persons' walking patterns in other settings (e.g., periphery, intermediate cities and smaller cities).

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy and ethical reasons.

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