



EMBODIED EXPERIENCES OF CARE MOBILITY: URBAN INEQUALITY AND THE BIOPOLITICS OF MOVEMENT

EXPERIENCIAS ENCARNADAS DE LA MOVILIDAD ASISTIDA: DESIGUALDAD URBANA Y BIOPOLÍTICA DEL MOVIMIENTO

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ABSTRACT:

This study examines the mobility of care as a key space where urban inequalities are produced and embodied. From a biopolitical perspective, it analyzes how urban infrastructure and mobility systems regulate daily life through the differential distribution of effort, time, risk and dependence, configuring unequal conditions of access, autonomy, and participation in urban space. A qualitative, situated and embodied methodological approach was implemented through an exploratory urban walk carried out in the city of Querétaro, Mexico. Various configurations of mobility involving different levels of dependency and care relationships were analyzed. An analytical framework was developed that links accessibility constraints and situational obstacles to embodied effects, such as disruption, body adjustment, waiting, risk exposure, and care dependency. The results showed that urban infrastructure systematically produces differentiated mobility experiences, where people with greater dependency require continuous assistance and experience frequent disruptions, while those who move independently face higher levels of risk. The mobility of care was characterized by cumulative physical, temporal, and cognitive demands. The findings

showed that mobility is not a neutral condition, but a biopolitical process through which urban environments regulate bodies and everyday practices. This study provides an embodied analytical framework that contributes to understanding the mobility of care and offers elements for the design of more inclusive, equitable, and care centered urban systems.

Keywords: Care Mobility, Urban Inequality, Biopolitics, Accessibility, Urban Infrastructure, Embodied Experience

RESUMEN:

Este estudio examinó la movilidad del cuidado como un espacio clave donde las desigualdades urbanas se producen y se encarnan. Desde una perspectiva biopolítica, se analizó cómo la infraestructura urbana y los sistemas de movilidad regulan la vida cotidiana a través de la distribución diferencial de esfuerzo, tiempo, riesgo y dependencia, configurando condiciones desiguales de acceso, autonomía y participación en el espacio urbano. Se implementó un enfoque metodológico cualitativo, situado y encarnado mediante una caminata urbana exploratoria realizada en la ciudad de Querétaro, México.



Se analizaron diversas configuraciones de movilidad que implican distintos niveles de dependencia y relaciones de cuidado. Se desarrolló un marco analítico que vincula las restricciones de accesibilidad y los obstáculos situacionales con efectos encarnados, como la interrupción, el ajuste corporal, la espera, la exposición al riesgo y la dependencia de asistencia. Los resultados mostraron que la infraestructura urbana produce sistemáticamente experiencias de movilidad diferenciadas, donde las personas con mayor dependencia requieren asistencia continua y experimentan interrupciones frecuentes, mientras que quienes se desplazan de forma independiente enfrentan mayores niveles de riesgo. La movilidad del cuidado se caracterizó por demandas acumulativas de tipo físico, temporal y cognitivo. Los hallazgos evidenciaron que la movilidad no es una condición neutral, sino un proceso biopolítico mediante el cual los entornos urbanos regulan los cuerpos y las prácticas cotidianas. Este estudio aporta un marco analítico encarnado que contribuye a comprender la movilidad del cuidado ofreciendo elementos para el diseño de sistemas urbanos más inclusivos, equitativos y centrados en el cuidado.

Palabras clave: Movilidad asistida, Desigualdad Urbana, Biopolítica, Accesibilidad, Infraestructura Urbana, Experiencia Encarnada

INTRODUCTION

Mobility is defined as the movement of individuals from one place to another, regardless of their mode of transportation. It plays a fundamental role in enabling access to goods and services that support a better quality of life, while also facilitating access to personal, professional, and economic opportunities (Pérez, 2019). Mobility is a crucial element that can improve the construction and development of relations, connections, and social ties that improve the consolidation of social capital (Martínez et al., 2022).

People's access to places and facilities, which influences mobility patterns, is shaped by the spatial organization of territory, the distribution of services, and the configuration of public spaces. Within the urban context, the city constitutes the spatial arena in which the interrelation between social dynamics and urban infrastructure materializes. The city is the place where everyday life activities unfold: the infrastructure of the city shapes the social dynamics of urban life (Comas-d'Argemir, 2017).

In recent decades, urban and mobility studies have pointed out that cities organize differentiated forms of access, time, and effort among different social groups, which does not reflect the diversity of experiences that shape

everyday life in urban environments (Hanson, 2010). This structural bias generates particular inequalities for care providers and care receivers, tasks and relations that have been historically undervalued. In this context, it is pertinent to create analytical frameworks that allow to capture the invisible dimensions of urban use associated with care mobility and everyday sustaining of life.

The concept of care mobility, introduced by Inés Sánchez de Madariaga as analytical category, acknowledges the multiple chained and polygonal journeys associated with care tasks (Sanchez de Madariaga & Zucchini, 2020), such as accompanying children, assisting elderly adults, accessing healthcare services, or shopping, all these activities are predominantly performed by women (INMUJERES, 2022). Care related mobility makes visible the temporal, spatial and relational dimensions of care work, which have been traditionally overlooked by transport planning and urban design (Jirón, 2017). Care encompasses the ongoing maintenance of life, health, and well-being, and constitutes a key component of social justice and the advancement of gender equity (Comas-d'Argemir, 2017). This inequitable social dynamic generates, reproduces, and perpetuates structural inequalities. Women devote three times more time than men to domestic and care-related tasks, with this time increasing in households with children (ONU Mujeres y CEPAL, 2021).

In Mexico, urban mobility research has increasingly documented how city planning favoring private vehicle use marginalizes pedestrian and care mobility (Sanghamitra et al., 2024). Studies in Mexican cities have revealed that women devote significantly more time to chained care-related trips, facing longer travel times, higher risk exposure, and fragmented journeys (INEGI, 2020). However, systematic analysis of the embodied dimensions of care mobility—how urban conditions translate into bodily experiences—remains underexplored in the Mexican context, particularly in intermediate cities like Querétaro that have experienced rapid growth and motorization.

Urban mobility systems are planned around capital and productive activities, while reproductive mobility and care-related trips are relegated (Askarizad et al., 2025). In Latin America, infrastructure, mobility patterns, and public policies tend to ignore the spatial and temporal needs of those who sustain care work (Jirón, 2007). These inequalities manifest as longer travel times, increased exposure to risk, fragmented journeys, and disproportionate physical effort (Collectiu Punt 6, 2015).

Inequalities in mobility have been identified from feminist perspectives as the result of a long historical trajectory in which urban planning has been centered on the needs of

a universal male subject, who has the characteristics of being autonomous and detached from reproductive and care-related tasks (Vara, 2024). Urban design and infrastructures materialize the productivist and androcentric logic that fails to account for fragmented time patterns, chained trips, and care responsibilities (Falú, 2009). Among the effects produced by the absence of a gender perspective in urban planning and design are the patterns of spatial exclusion, the limitation of equitable access to services and opportunities, and the aggravation of the vulnerability of those who provide and receive care (Peake & Rieker, 2013). From this standpoint, care mobility constitutes a fundamental entry point for envisioning urban models that recognize interdependence as a structuring principle of social life.

From a biopolitical perspective, urban space can be understood as a key site where power operates through the regulation of everyday life, bodies, and movements (Foucault, 2007). Applying the concept of biopolitics to urban studies, it is possible to explore how cities govern populations through norms, policies, spatial organization, and urban infrastructure that determine differentiated experiences regulated by variables such as exposure to risk, travel times, access to resources, temporal rhythms, and the bodily effort implicit in each journey particularly affecting those who give and receive care (Rose, 2007). Urban infrastructure and mobility systems shape who is able to move safely, efficiently, and autonomously, and who must overcome conditions of heightened risk, dependency, and constraints. Recent studies in critical urban theory point out the complexity of these biopolitical operations that intersect with gender and social hierarchies that determine uneven bodily and temporal costs among urban populations (Joelsson & Lindkvist, 2019).

The body is the site where structural inequalities are experienced: urban space produces bodily demands through infrastructure and mobility strategies that unevenly distribute effort, fatigue, insecurity, dependency, and constrained autonomy (Sheller, 2018; Imrie, 2012). The bodies of those who give and receive care materialize the biopolitical effects of urban design (Falú, 2014), exposing how mobility organization impacts everyday practices sustaining social reproduction.

The analysis of care mobility requires methodological approaches that allow the study of how urban inequalities are experienced and what effects they have in the body in everyday care mobility practices (Ciocoletto, 2014). Studies in Latin America have highlighted the importance of situated experiential methods, and their influence on improving the capacity to reveal experiences that remain invisible with conventional quantitative indicators

(Blanco, 2021). Despite the valuable insights that qualitative methods can provide, limited attention has been given to studies that focus in the analysis of embodied and sensory dimensions regarding mobility (Pink, 2009). While conventional methods such as interviews, surveys, and quantitative mobility studies provide valuable insights, they often fail to account for the material, sensory, and bodily dimensions in which mobility is actually experienced.

Techniques with a qualitative approach, such as urban walks, experimental mapping, and urban audits are practices that allow the construction of new perspectives regarding mobility studies (Collectiu Punt 6, 2024). These techniques allow the study of embodied diagnostics of diverse mobility experiences, making possible to generate a situated understanding of how cities govern care through everyday mobility conditions.

This study aims to examine care mobility as a site where urban inequalities are produced and embodied. From a biopolitical perspective, the study explores how urban infrastructure and mobility systems regulate everyday life through the differential distribution of effort, time, risk, and dependency. This approach contributes to the study of care mobility by offering analytical tools to study how urban inequalities are constructed, experienced, and reproduced through the bodies of caregivers and care receipts, showing how urban environments actively produce and normalize unequal conditions of mobility.

MATERIALS AND METHODS

This study implements a qualitative approach through a situated and embodied methodology to analyze care mobility as an expression of urban inequality. An exploratory urban walk was conducted as a diagnostic tool to examine how urban infrastructure, spatial organization, and mobility priorities shape the everyday experiences of care providers and care receivers. Exploratory walks enable the identification of accessibility barriers, unequal use of public space, perceptions of safety, and embodied constraints that remain invisible in conventional transport analyses (Villagrán, 2022). The study focused on how urban conditions shape care mobility through embodied practices, and how different conditions contribute to the differential distribution of effort, time, risk, and autonomy across bodies.

The exploratory urban walk was carried out in Querétaro, Mexico, a city that has experienced accelerated urban growth, increasing motorization, and persistent challenges in pedestrian infrastructure and accessibility (INEGI, 2020). Research on Mexican cities has documented how

urban expansion and city planning that favors private car mobility, tends to marginalize pedestrian mobility and undermine care mobility (Sanghamitra et al., 2024).

Ethical considerations were carefully addressed. All participants provided informed consent after receiving detailed information about objectives, procedures, and rights, including withdrawal options. Consent processes were made accessible for participants with diverse needs; forms were read aloud when necessary. The protocol was approved by the institutional ethics committee. Caregivers also provided consent. Participants' identities were anonymized. The walk prioritized safety and comfort, incorporating rest breaks and real-time route adjustments. Researchers monitored participants' well-being throughout, and no participant was required to complete any uncomfortable or unsafe segment.

A total of 16 participants took part in the study. Organized into different mobility configurations, according to their mobility condition and the presence or absence of caregiving support with varying levels of autonomy and dependency. These configurations included participants using assistive devices such as wheelchairs, walkers, crutches, canes, and a stroller. This diversity of configurations allowed the exploration of how different bodies and care relations interact with urban infrastructure, and how this generates differentiated mobility experiences. The distribution and characteristics of participants are presented in Table 1.

Table 1: Characterization of Participants

Participant group	Mobility condition	Assistive Device	Presence of Caregiver	Number of participants	Analytical Relevance
Care-dependent participants	Limited mobility with high dependency	Walker	Yes	3 pairs (6 participants, person + caregiver)	High reliance on assistance: continuous bodily support required.
Care-dependent participants	Reduced mobility with full assistance	Wheelchair	Yes	2 pairs (4 participants: person + caregiver)	Strong dependency; mobility mediated by caregiver and infrastructure.
Semi-independent participants	Assisted mobility	Crutches	Yes	1 pair (2 participants: person + caregiver)	Partial autonomy with intermittent reliance on assistance.
Independent participants with assistive devices	Autonomous but constrained mobility	Cane	No	2 participants	Self-managed mobility with increased bodily effort and risk exposure.
Care- dependent participants	Dependent mobility through care relation	Stroller (baby)	Yes	2 participants (baby + caregiver)	Reflects mobility shaped by caregiving responsibilities, highlighting coordination, temporal demands, and dependency.

The 16 participants were organized into different mobility configurations involving varying levels of autonomy and dependency. The process was structured into three stages: organization, exploratory walk, and collective construction of the experience. Table 2 summarizes the stages of the activity.

Table 2: Stages of the exploratory walk

Stage	Description
1.Organization	The activity was introduced, including a description of the route, the definition of care mobility, embodied experience and what are considered constraints and obstacles.
2.Exploratory walk:	Participants documented their experiences, made observational stops, and took notes and photographs.
3.Collective construction of the experience	A focus group was the space where participants shared observations, notes, photographs, ideas, and emotional responses.

The route was carried out in Querétaro's historic downtown. The walk lasted approximately two hours and included spaces such as primary schools, a municipal market, public transport stops, a school for people with disabilities, a public square, a museum, and a religious temple, all of which are associated with care mobility practices. Figure 1 presents the route followed during the exploratory walk.

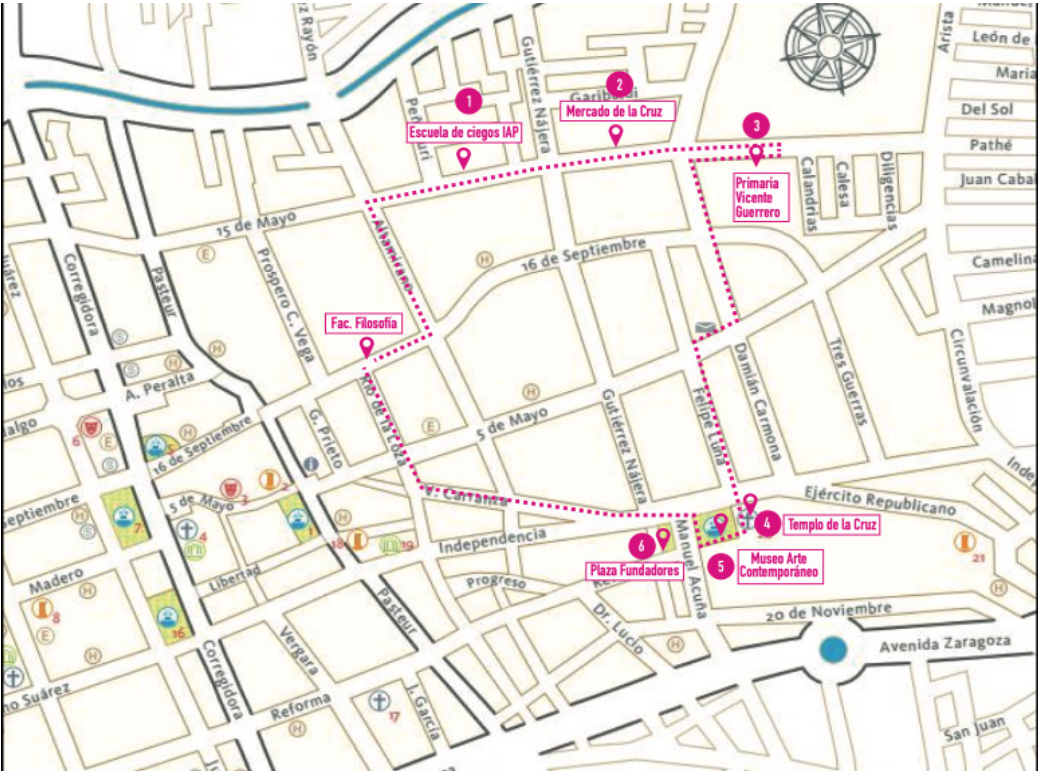


Fig 1. Route path of the exploratory urban walk, including graphic scale and north orientation.

Participants documented their experiences through observation, notes, and reflection, focusing on aspects such as mobility difficulties, including interruption, bodily adjustment, waiting, exposure to risk, and reliance on assistance. This method allowed for the examination of how urban environments translate into concrete bodily demands, during care mobility. The analysis was guided by an analytical framework designed to examine the relationship between urban conditions and embodied care mobility experiences. The framework integrated two complementary dimensions: (1) accessibility constraints and situational obstacles present in the urban environment, and (2) embodied effects experienced during movement.

As described in Table 3, accessibility constraints were understood as socio-spatial conditions that limit individuals' ability to access opportunities, shaped by the interaction between infrastructure, socio-economic factors, and everyday practices (Jirón, 2017). Obstacles referred to material and spatial frictions encountered along the route, including uneven surfaces, discontinuous sidewalks, lack of accessibility features, and physical obstructions. Embodied effects were operationalized through five analytical categories presented in Table 4: interruption, bodily adjustment, waiting, exposure to risk, and reliance on assistance. These categories structured the analysis by enabling the systematic examination of how urban conditions are translated into lived experiences.

Table 3: Analytical dimension: Urban conditions shaping mobility

Category	Definition	Analytical role
Accessibility constraints	Multidimensional conditions that shape access to mobility, including: financial, physical, temporal, organizational, and sociocultural factors that interact to produce unequal accessibility.	Structure the conditions under which mobility is possible, shaping unequal distributions of access.
Obstacles	Material and spatial frictions encountered during movement (e.g., uneven sidewalks, lack of continuity, blocked pathways)	Represent the concrete manifestation of accessibility constraints in everyday movement

Source: Prepared by the author based on Jiron & Masilla (2013).

Table 4: Analytical dimension: Embodied experience of mobility.

Category	Definition	Relation to Experience
Interruption	Moments where the continuity of movement is broken due to environmental or infrastructural conditions	Reveal critical points where accessibility barriers and obstacles materialize
Bodily adjustment	Physical adaptations required to continue movement (e.g., lifting, maneuvering, balancing, changing posture)	Reflect how infrastructural constraints are transferred onto the body
Waiting	Time imposed by external conditions (e.g., lack of priority infrastructure, transport delays, sequencing of care tasks)	Indicates temporal inequalities embedded in mobility systems
Exposure to risk	Situations in which individuals face increased vulnerability, danger, or perceived insecurity	Reflect unequal distribution of safety and protection across urban environments
Reliance on assistance	Need for support from others to complete mobility tasks or overcome barriers	Reveals dependency produced by inaccessible or exclusionary environments

The analytical framework provided a structured approach to identify how urban environments shape mobility through the distribution of effort, time, risk, and dependency, making visible the embodied and relational dimensions of care mobility. Through this framework it is possible to demonstrate how these distributions are not neutral and have different implications for diverse users.

The analysis followed a qualitative and interpretive approach guided by the proposed analytical framework. Data collected during the exploratory urban walk, was organized according to the mobility configurations presented in Table 1. The analytical process was structured in three stages:

- 1) The collected data were coded based on the identification of accessibility constraints and situational obstacles encountered along the route. These categories enabled the classification of the structural and material conditions shaping mobility, in line with the framework presented in Table 3.
- 2) The identified constraints and obstacles were linked to the embodied effects defined in Table 4. These categories were treated as interpretive lenses that allowed for the examination of how urban conditions were translated into lived experiences across different mobility configurations. A cross-analysis was conducted to identify recurring patterns between mobility configurations, urban conditions, and embodied effects. This enabled the identification of relationships between specific infrastructural deficiencies and the embodied responses they produced.
- 3) This analytical process allowed the articulation of how accessibility constraints and situational obstacles are experienced through the body. From this perspective, the analysis made visible how urban environments regulate the conditions under which mobility occurs, contributing to the interpretation of care mobility as a biopolitical phenomenon.

RESULTS-DISCUSSION

The findings are organized according to the mobility configurations identified during the exploratory walk. The analytical framework, links structural accessibility constraints (Jirón, 2017) and situational obstacles encountered along the route with their corresponding embodied effects. This relation reveals how different mobility configurations produce differentiated experiences of movement. Table 5 presents the relationship between mobility configurations, the accessibility constraints and obstacles identified, and the embodied responses they produce. By articulating these elements, the analysis reveals how urban infrastructure generates differentiated distributions of effort, time, risk, and dependency.



Table 5: Relationship between mobility configurations, urban conditions, and embodied effects in care related mobility.

Mobility configuration	Accessibility constraints	Situational obstacle	Embodied effect	Biopolitical interpretation
Wheelchair + caregiver	Physical and spatial constraints: lack of ramps, discontinuous infrastructure	Narrow sidewalks, absence of ramps, uneven sidewalks, utility poles and electrical service installations on sidewalks, cable service installations obstructing pedestrian passage.	Interruption -Reliance on assistance -High bodily effort and adjustment	Mobility is externally controlled and dependent, transferring responsibility from infrastructure to caregiver, reinforcing dependency relations
Walker + caregiver	Physical spatial constraints: insufficient sidewalk width, uneven surfaces	Narrow sidewalks, street furniture, surface irregularities, utility poles and electrical service installations on sidewalks, cable service installations obstructing pedestrian passage	bodily adjustment -Reduced speed -Physical strain	Infrastructure imposes continuous bodily effort and limits autonomy, redistributing mobility burden onto the body
Crutches + caregiver	Physical and temporal constraints: inaccessible design, slow movement conditions	Stairs, lack of accessibility, fragmented pathways, narrow sidewalks, utility poles and electrical service installations on sidewalks, cable service installations obstructing pedestrian passage	Interruption -Reliance on assistance -Waiting	Time and movement are regulated by infrastructure, producing delays and reinforcing partial dependency.
Cane (independent participant)	Spatial constraints: limited pedestrian space, lack of protection.	Obstacles on sidewalks, uneven sidewalks, need to enter vehicular lanes	Exposure to risk -Bodily adjustment	Autonomy is achieved at the cost of increased vulnerability, shifting risk from system to individual body
Stroller (Care related mobility)	Spatial and organizational constraints: lack of priority for care mobility, lack of protection.	Narrow and uneven sidewalks, lack of crossings, lack of ramps, invasion of pedestrian space, utility poles and electrical service installations on sidewalks, cable service installations obstructing pedestrian passage	Waiting -Bodily adjustment -Exposure to risk	Care mobility is subordinated within urban systems, producing additional time burdens and cognitive/physical effort.

Embodied effects of care related mobility

Five embodied categories—interruption, bodily adjustment, waiting, exposure to risk, and reliance on assistance—reveal how accessibility constraints materialize as lived experiences. Wheelchair and walker users experienced systematic interruptions due to absent or deteriorated infrastructure (sidewalk discontinuities, missing ramps, uneven surfaces, and obstructions), fragmenting mobility into sequential episodes of cessation, adjustment, and route reconfiguration.

Interruptions consistently required caregiver assistance and physical exertion—lifting, stabilizing, and maneuvering—while demanding sustained vigilance, particularly when movement extended into vehicular zones. These interruptions demonstrate how infrastructural inadequacies necessitate constant corporeal negotiation.

Bodily adjustment manifested through continuous micro-adaptations—balancing, maneuvering, lifting, deceleration—in response to uneven surfaces, narrow sidewalks, and obstructions. For wheelchair and stroller users, these intensified into acute physical demands: caregivers manually lifted and repositioned equipment to navigate curbs and irregular surfaces, generating strain, fatigue, and pain. This reveals how infrastructural failures transfer directly onto bodies, making care mobility contingent upon caregiver physical capacity rather than environmental support.

Waiting

Waiting emerged as a constitutive element of care mobility, particularly when infrastructure failed to accommodate assisted movement. Temporal delays occurred at sites where sidewalks were obstructed or narrowed, where pedestrian priority was absent, and where safe passage required extended assessment. These interruptions fragmented the temporal continuity of movement, transforming mobility into a discontinuous process. Furthermore, the necessity of synchronizing movement between bodies with divergent capacities and rhythms intensified temporal demands. This coordination required additional time for decision-making, route negotiation, and risk evaluation, particularly in environments structurally inadequate for assisted mobility. Consequently, care related mobility became a time-intensive practice shaped by accumulated interruptions and environmental constraints.

This temporal inequality reflects systemic patterns of prioritization within urban mobility systems, undermining fundamental mobility rights as articulated in Article 4 of the Mexican Constitution.



Risk exposure was markedly intensified for participants utilizing assistive devices in contexts of deficient pedestrian infrastructure. Narrow, uneven sidewalks, and persistent obstacles—including poles, signage, service installations, and irregular surfaces—reduced maneuverability and compromised participants' capacity to respond to unexpected conditions. These infrastructural deficiencies proved particularly critical for populations with mobility limitations, including older adults, children, and persons with disabilities, for whom minimal infrastructural gaps constitute significant threats to safety and autonomy.

The most critical risk condition identified involved spatial constraints that compelled participants to enter vehicular roadways. This transition from pedestrian to vehicular space represented acute exposure, as individuals were required to share space with moving traffic without adequate protection in a context characterized by poor road safety culture. Beyond physical danger, participants reported persistent perceptions of insecurity, necessitating constant environmental scanning and vigilance. This continuous state of alertness transformed mobility into a cognitively and emotionally demanding activity requiring sustained attention and anticipatory behavior.

These findings indicate that existing infrastructure actively produces risk rather than mitigating it. The urban environment systematically redistributes vulnerability onto those navigating it, particularly individuals with limited mobility. Risk exposure is therefore structurally produced, revealing how urban space organizes differential conditions of safety and protection.

Reliance on assistance constitutes a central condition of care mobility, particularly in configurations involving wheelchairs, walkers, strollers, and crutches. Infrastructural deficiencies necessitate external support to compensate for environmental inadequacies and ensure safety. For caregivers, facilitating assisted mobility demands substantial physical and cognitive labor—lifting, stabilizing, maneuvering devices, and simultaneously monitoring environmental risks. For care recipients, infrastructural insecurity generates conditions of dependency with significant implications for autonomy, control, and self-perception. The requirement for mobility support becomes a persistent condition, reinforcing perceptions that independent mobility is unviable without substantial risk exposure.

These findings reveal that care mobility is actively produced through urban conditions, demanding critical reconsideration of planning paradigms to address systemic inequalities embedded in the built environment.

Differential experiences across mobility configurations and biopolitical implications

These differentiated distributions operationalize Foucault's biopolitics at the microscale of everyday mobility. Each embodied category—interruption, bodily adjustment, waiting, risk exposure, reliance on assistance—represents a biopolitical technique: interruption fragments movement rhythms; adjustment inscribes urban power onto corporeal surfaces; waiting governs temporal access; risk exposure constitutes biopolitical neglect; and reliance on assistance transfers state responsibility onto informal caregivers. Urban infrastructure thus functions as a biopolitical apparatus regulating populations through differential effort, time, risk, and dependency (Foucault, 2007).

Accessibility constraints generated uneven distributions of effort, time, risk, and dependency across mobility configurations. Wheelchair users experienced the highest dependency, with mobility almost entirely caregiver-mediated due to absent ramps, sidewalk discontinuities, and obstructions (Imrie, 2012). Walker users retained partial independence but at reduced velocity and sustained exertion; crutch users faced temporal disruptions from inaccessible design, combining partial autonomy with intermittent assistance. Cane users navigated heightened risk, frequently entering vehicular spaces due to deficient pedestrian infrastructure. Stroller users encountered cumulative temporal, physical, and cognitive demands—constant route negotiation, lifting, and risk evaluation—reinforcing how care mobility faces systematic marginalization within dominant urban systems.

Wheelchair users experienced the highest dependency levels, as environmental conditions and infrastructure deficiencies rendered mobility almost entirely caregiver-mediated. Continuous physical intervention was required to overcome interruptions caused by absent ramps, sidewalk discontinuities, and obstructions. These findings corroborate previous research demonstrating how inaccessible urban environments transfer mobility burdens onto caregivers, thereby reinforcing dependency relations (Imrie, 2012).

Walker users retained partial independence; however, their mobility was characterized by reduced velocity, sustained bodily exertion, and continuous environmental negotiation, consequently constraining autonomy. These observations align with mobility scholarship describing how limited accessibility transforms ambulation into physically demanding activity, disproportionately affecting populations with reduced mobility—a demographic intrinsically linked to care mobility (Marcheschi et al., 2020).

Crutch users experienced temporal disruptions attributable to inaccessible urban design, their mobility combining partial autonomy with intermittent assistance dependence. Participants notably identified insufficient rest spaces, reflecting broader patterns within care mobility literature where temporality emerges as a critical inequality dimension.

Cane users navigated conditions of heightened risk exposure, achieving autonomy at safety's expense through frequent vehicular space incursion necessitated by deficient pedestrian infrastructure, obstacles, and uneven sidewalks. This corroborates existing research indicating urban environments' unequal risk redistribution, disproportionately affecting vulnerable populations (Kapsalis et al., 2022).

Stroller users encountered cumulative temporal, physical, and cognitive demands requiring constant route negotiation, lifting, adaptation, and risk evaluation—generating anxiety and stress primarily because environments failed to prioritize pedestrian movement. These findings reinforce arguments that care mobility faces systematic marginalization within dominant urban mobility systems.

The research confirms mobility as a non-neutral, non-universal condition—rather, a differentiated experience structured through interactions between bodies, care relations, and urban infrastructure. Mobility systems regulate everyday access and participation, predominantly affecting care providers and recipients through unequal distributions of autonomy, dependency, effort, time, and risk exposure.

From a biopolitical perspective, these findings reveal urban infrastructure as a biopolitical apparatus: it determines who can move safely, who must wait, whose bodies bear the brunt of deficient planning, and who requires assistance. The built environment thus reproduces social inequalities by transferring responsibility from public systems onto caregivers and vulnerable bodies, governing populations through the differential regulation of effort, time, risk, and dependency (Foucault, 2007; Rose, 2007).

These results align with mobility scholarship emphasizing accessibility as a sociospatial condition reflecting broader inequalities, particularly considering intersectional factors (Jirón & Mansilla, 2013). Consequently, care mobility represents a critical site where inequalities become visible, experienced, and embodied, warranting continued scholarly attention and policy intervention.

Study Limitations

This exploratory study presents several limitations that should be acknowledged. First, the research was

conducted in a single urban context—the historic center of Querétaro, Mexico—which limits the generalizability of findings to other cities with different infrastructural, cultural, and socio-economic conditions. Second, the sample size (16 participants) is relatively small, and while it enabled in-depth qualitative analysis, it does not capture the full diversity of care mobility experiences across different populations, neighborhoods, or mobility conditions. Third, the study focused on a specific route within the historic downtown, which may not represent mobility challenges encountered in peripheral or informal urban areas. Fourth, the exploratory urban walk method, while valuable for capturing embodied experiences, is inherently limited by its situational and temporal specificity; mobility conditions and obstacles may vary significantly across different times of day, seasons, or weather conditions. Finally, the study did not include systematic post-walk follow-up interviews, which could have provided additional depth regarding participants' longer-term mobility strategies and coping mechanisms. Despite these limitations, the findings offer robust analytical insights and transferable conceptual tools for understanding care mobility in similar Latin American urban contexts.

Despite these context-specific limitations, the findings offer transferable analytical insights for other Latin American cities facing similar challenges of rapid urbanization, motorization, and deficient pedestrian infrastructure. The analytical framework—linking accessibility constraints, situational obstacles, and embodied effects—can be adapted to different urban contexts, while the identified patterns of effort, time, risk, and dependency distribution likely resonate with cities sharing comparable socio-spatial dynamics. Transferability should be assessed based on infrastructural conditions, mobility cultures, and care policy frameworks in each specific context.

CONCLUSIONS

This study demonstrates that care mobility is far from a neutral act; rather, it is shaped by urban environments that systematically distribute effort, time, risk, and dependency in deeply unequal ways. Through an embodied and situated methodology, the research reveals that individuals with higher dependency levels—such as wheelchair and walker users—face frequent interruptions, sustained physical strain, and heavy reliance on caregivers, while those who move independently with assistive devices endure heightened risk exposure. Across all configurations, care mobility imposes cumulative temporal and bodily costs that transform everyday journeys into demanding, often precarious, practices.

Methodologically, the exploratory urban walk proved invaluable for capturing embodied dimensions overlooked by conventional surveys. The analytical framework linking accessibility constraints to embodied effects—interruption, bodily adjustment, waiting, risk exposure, and reliance on assistance—offers structured tools for translating urban design failures into lived experiences.

Theoretically, the findings reinforce a biopolitical reading (Foucault, 2007): infrastructure governs populations by regulating who moves safely, who waits, and whose bodies bear deficient planning. This biopolitical regulation—operating through interruption, adjustment, waiting, risk, and dependency—reproduces social inequalities by transferring systemic failures onto caregivers and vulnerable bodies.

For urban planning and architecture, these results call for intersectional perspectives accounting for gender, age, disability, and caregiving roles. Care-centered cities must prioritize pedestrian safety, continuous accessibility, and the temporal needs of those sustaining daily life.

Future research should expand embodied methodologies to other Latin American cities and incorporate longitudinal designs to further unravel mobility inequalities as a matter of social justice and the right to the city.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

Authors' Contribution (CRediT Taxonomy)

Author	Roles
Author 1	Conceptualization, Investigation, Methodology, Funding acquisition, Resources, Writing – original draft.
Author 2	Data curation, Formal analysis, Software, Supervision, Validation, Visualization, Writing – review & editing.
Author 3	Investigation, Methodology, Funding acquisition, Formal analysis.
Author 4	Investigation, Methodology, Funding acquisition, Writing – review & editing.
Author 5	Formal analysis, Software, Supervision, Validation, Formal analysis.

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