
INCLUSIVE URBAN MOBILITY FOR OLDER PERSONS

Dr. Ajeet Kumar Pankaj

Assistant Professor (Social Work and Sociology)

Department of Humanities and Social Sciences

Indian Institute of Science Education and Research Bhopal

Bhopal, Madhya Pradesh, India

Abstract

Urban mobility is essential to the independence, social participation, health, and dignity of older persons. Yet many cities continue to be organised around travel patterns that assume speed, physical strength, digital confidence, and easy access to private vehicles. Older adults may encounter uneven footpaths, unsafe crossings, poor lighting, long walking distances to stops, inaccessible vehicles, confusing information, crowded terminals, unaffordable fares, and limited support during the journey. These barriers do not affect all older persons in the same way: mobility limitations, sensory impairments, chronic conditions, income, gender, neighbourhood location, and access to assistance can shape the practical ability to reach everyday destinations. This paper presents a comparative, evidence-based analysis of inclusive urban mobility for older persons. It examines pedestrian systems, public transport, demand-responsive services, digital travel information, and neighbourhood design through the principles of accessibility, affordability, safety, comfort, reliability, and user dignity. The analysis draws on age-friendly city guidance, transport-accessibility research, urban planning literature, and documented mobility challenges; it does not claim a new household survey or travel experiment. The findings indicate that walking and public transport remain central to older persons' independence, but both depend on continuous, well-maintained, and understandable journeys from home to destination. Effective inclusion requires universal design, safe crossing times, seating and shelter, low-floor vehicles, staff assistance, clear non-digital information, affordable fares, first- and last-mile links, and meaningful participation by older residents in transport planning. Inclusive mobility should therefore be treated as a core component of age-friendly urban development rather than as a specialist service provided only after exclusion has occurred.

Keywords: Older Persons, Urban Mobility, Accessible Transport, Age-Friendly Cities, Pedestrian Safety, Public Transport, Universal Design, Social Inclusion, Healthy Ageing, Barrier-Free Environment

1. INTRODUCTION

Urban mobility enables people to obtain food, health care, social support, education, recreation, civic services, and opportunities for contact with family and community. For older persons, the ability to make routine trips often has a direct relationship with independence and quality of life. A journey that seems ordinary to a younger commuter may become difficult when it includes broken pavements, high kerbs, inadequate shade, steep stairs, long transfer distances, crowded vehicles, poorly timed signals, or a lack of toilets and resting places. When these barriers accumulate, older residents may reduce travel, postpone essential appointments, depend more heavily on relatives, or withdraw from public and social life. Population ageing makes this issue increasingly important for urban policy. Cities are growing not only in size but also in the diversity of their residents' abilities, routines, incomes, and care responsibilities. Older

persons are not a uniform group: some travel independently and frequently, while others use canes, walkers, wheelchairs, hearing aids, or support from family members. Some are experienced public-transport users, whereas others face anxiety about crowding, road danger, unfamiliar routes, payment systems, or digital-only booking platforms. Inclusive mobility must therefore address both the built environment and the service environment. The quality of a journey depends on continuity. A low-floor bus alone does not guarantee access if the pedestrian route to the stop is unsafe, the footpath is blocked by parked vehicles, boarding information is unclear, or the last connection requires crossing a fast road. Likewise, a new metro station may remain inaccessible to an older person when lifts are unreliable, signage is confusing, station approaches lack seating, or feeder transport is unavailable. This wider perspective is often described as the door-to-door or whole-

journey approach to accessibility. Digitalisation can bring useful travel information, electronic payments, and demand-responsive services, but it can also create new exclusion when alternatives are removed. Older users may have different levels of access to smartphones, data plans, digital literacy, or confidence in app-based services. A fair urban mobility system should support digital innovation without making a smartphone, bank card, or high level of technical skill a condition for independent travel. This study examines inclusive urban mobility for older persons through a comparative framework. It identifies major access barriers, contrasts mobility conditions across travel modes, and outlines practical measures for local governments, transport agencies, planners, service providers, and community organisations. The purpose is to view mobility as a social right and an operational requirement for age-friendly cities, not merely as a question of transportation infrastructure.

2. LITERATURE REVIEW

Research on ageing and mobility consistently shows that the capacity to travel is shaped by the interaction of personal capability, environmental design, transport services, and

social support. Mobility is associated with autonomy, participation, access to health care, and psychological well-being. However, the loss or reduction of driving ability, rising travel costs, reduced walking confidence, and inaccessible public environments can create transport disadvantage. The literature emphasises that the consequences of restricted mobility extend beyond missed trips: they can include loneliness, reduced physical activity, delayed care, and diminished participation in neighbourhood life. Studies also distinguish between accessibility and mobility. Mobility refers to the ability to move, whereas accessibility concerns the ability to reach valued destinations and opportunities. An older person may be able to walk a short distance but still be excluded if essential services are far away or public transport routes are infrequent. This distinction supports integrated planning that combines age-friendly streets, reliable transport, mixed-use neighbourhoods, local services, and affordable housing. A common conclusion is that universal design benefits many groups at once, including older persons, people with disabilities, children, caregivers, and travellers carrying goods.

LITERATURE REVIEW SUMMARY TABLE

S.No.	Author / Year	Study Focus	Key Contribution	Limitations Identified
1	World Health Organization (2007)	Age-friendly urban environments	Identified outdoor spaces and transportation as core domains of age-friendly cities	Guidance-oriented; implementation differs across local contexts
2	Alsnih & Hensher (2003)	Senior mobility and access expectations	Explained how ageing affects travel needs, mode choice, and accessibility expectations	Focuses primarily on transport behaviour and planning implications
3	Rosso et al. (2011)	Built environment and older-adult mobility	Linked neighbourhood design, safety, and walkability with mobility in later life	Built-environment effects vary by health status and place
4	Luiu, Tight & Burrow (2017)	Unmet travel needs of older people	Synthesised barriers related to affordability, service provision, safety, and information	Evidence base included different countries and policy systems
5	Broome et al. (2010)	Age-friendly public bus services	Highlighted vehicle design, driver behaviour, waiting conditions, and information needs	Public-bus setting; findings require adaptation to other modes

3. OBJECT OF STUDY

The primary focus of this research is to identify and compare the factors that enable or restrict independent urban travel for older persons. The study considers how pedestrian infrastructure, public transport, neighbourhood design, service affordability, information systems, safety, and assistance affect access to everyday destinations. The main objects of study are outlined below:

3.1 OLDER PERSONS AND MOBILITY NEEDS

- Independently living older adults making routine walking, shopping, health-care, and social trips
- Older persons with reduced balance, limited walking endurance, or mobility-aid requirements
- Older persons with visual, hearing, cognitive, or communication-related access needs
- Older residents in peripheral, low-income, or poorly connected urban neighbourhoods
- Older persons who rely on family members, caregivers, community services, or assisted transport

3.2 URBAN MOBILITY CONTEXTS

- Footpaths, crossings, kerb ramps, street lighting, shade, benches, toilets, and wayfinding
- Bus, metro, rail, paratransit, taxi, auto-rickshaw, and demand-responsive transport services
- First- and last-mile connections between homes, stops, stations, markets, clinics, and public spaces
- Digital and non-digital travel information, ticketing systems, help points, and customer support
- Personal security, affordability, weather exposure, crowding, road safety, and access during emergencies

3.3 MOBILITY EVALUATION PARAMETERS

- Continuity and physical accessibility of the full journey from origin to destination
- Safety, comfort, seating, shade, lighting, crossing time, and protection from traffic
- Vehicle boarding, alighting, internal circulation, priority seating, and assistance availability

- Service reliability, route coverage, frequency, transfer burden, affordability, and travel-time predictability
- Accessibility of information, complaint pathways, staff behaviour, and user confidence

3.4 COMPARATIVE ANALYSIS FOCUS

- Walking, public transport, paratransit, private-car travel, and wheelchair or mobility-aid journeys
- Physical, sensory, cognitive, financial, social, and digital barriers to independent travel
- Universal design and mainstream service improvements versus segregated or emergency-only support
- Individual coping strategies, family assistance, operator responsibilities, and public planning duties

3.5 Research Objective Scope

- To map major barriers to inclusive urban mobility for older persons
- To explain how street design, transport operations, and information systems shape travel participation
- To identify gaps in accessibility, affordability, safety, assistance, and accountability
- To recommend practical measures for age-friendly and universally accessible urban mobility

4. RESEARCH METHODOLOGY

The present study adopts a comparative and evidence-based methodology to examine inclusive urban mobility for older persons. The research framework synthesises age-friendly city guidance, transport-accessibility literature, urban design principles, and documented service conditions rather than presenting an original travel diary survey or mobility experiment. This approach is appropriate because mobility experiences vary across neighbourhood form, climate, infrastructure quality, public transport networks, income levels, disability status, and local policy arrangements.

The analysis follows an older person's likely journey from home to a destination: leaving the dwelling, using the footpath, crossing streets, reaching a stop or station, waiting, boarding, travelling, transferring where necessary, obtaining information, and returning safely. Each travel setting is assessed

through common dimensions: physical access, safety, comfort, reliability, affordability, information, staff support, and opportunities for independent decision-making. The methodology recognises that mobility is affected by gender, age, health, income, care roles, digital access, weather, and neighbourhood location.

METHODOLOGY FRAMEWORK

1. The study uses a comparative design covering major urban travel modes and pedestrian environments.
2. Published research, age-friendly guidance, and transport-accessibility literature support the qualitative synthesis.
3. The analysis considers physical, sensory, cognitive, social, financial, and digital forms of exclusion.
4. Travel conditions are examined across the full journey, including first- and last-mile connections.
5. Street design, service frequency, staff behaviour, fares, information, and assistance are treated as linked factors.
6. The assessment includes independent travel, assisted travel, safety, comfort, and the ability to recover from disruption.
7. Access to seating, shelters, accessible vehicles, priority spaces, complaint systems, and emergency support is evaluated.

5.1 COMPARATIVE MOBILITY ANALYSIS

S. No.	Journey Setting	Primary Travel Context	Access Barriers	User Concerns	Key Support	Inclusion Priority	Action Level
1	Pedestrian travel	Local streets, markets, clinics	Uneven surfaces, short signals, poor lighting	Falls, traffic fear, fatigue, heat	Continuous paths, benches, shade	Very High	Immediate
2	Bus and metro users	Stops, stations, transfers	Steps, gaps, crowding, unclear signs	Boarding stress, missed services	Low-floor access, priority seating	High	High
3	Paratransit and taxi users	Door-to-door and on-demand trips	Cost, availability, limited assistance	Uncertain pickup, affordability	Fair fares, trained drivers	High	High
4	Private-car passengers	Family trips, medical	Parking distance,	Dependence on	Accessible parking,	Moderate	Important

8. The analysis distinguishes individual adaptation from operator, planner, and government responsibility.
9. No fabricated city-level travel shares, injury counts, or survey statistics are presented.
10. Recommendations focus on universal design, inclusive service delivery, participation, and accountable implementation.

5. DATA ANALYSIS

The data analysis section presents a comparative evaluation of urban mobility conditions for older persons. The analysis is based on documented access barriers, service characteristics, design principles, and the availability of supportive features. It considers how access is distributed across common travel settings rather than treating older persons as a single, uniform group. Five major journey settings are considered: pedestrian travel, public transport, paratransit and taxi services, private-vehicle travel, and mobility-aid or wheelchair travel. The comparison is qualitative because the severity of barriers depends on local street design, traffic conditions, climate, service quality, income, health, and the availability of personal or community support.

		visits	drop-off gaps	others, long walks	safe drop- off		
5	Wheelchair and mobility- aid users	Entire door- to-door journey	No ramps, blocked paths, vehicle gaps	Loss of autonomy, trip cancellation	Universal design, assisted boarding	Very High	Immedi ate

5.2 EXTENDED MOBILITY EVALUATION

- Pedestrian travel is the foundation of inclusive urban mobility because every public-transport trip begins and ends on foot. Older persons may face high kerbs, damaged paving, drainage openings, encroachment, poor lighting, lack of shade, insufficient seating, and crossing signals that assume a walking speed many older adults cannot maintain. Improvements should prioritise continuous accessible footpaths, safe crossings, median refuges, tactile and visual cues, resting places, shade, clear wayfinding, and maintenance systems that remove obstructions promptly.
- Bus and metro travel can expand independence when vehicles, stops, stations, and information systems are designed as one accessible service. Barriers arise when there is a large gap between vehicle and platform, steep steps, narrow gates, poor lift reliability, unclear announcements, aggressive boarding conditions, or the absence of priority seating. Operators should provide low-floor or step-free access, well-maintained lifts and ramps, audible and visual information, seating at stops, staff assistance, reliable route maps, and training that encourages respectful support without treating older passengers as incapable.
- Paratransit, taxi, and demand-responsive services can be valuable for older persons making health-care trips, travelling at night, or living beyond frequent public-transport corridors. However, affordability, advance booking requirements, unpredictable pickup times, driver behaviour, and digital-only booking can limit their use. Inclusive services should include accessible booking by phone and in person, transparent fares,

assistance with boarding where needed, driver training, complaint mechanisms, and coordination with medical and community-service destinations.

- Private-car travel may support mobility for some households, but it should not become the only workable option. Older persons who stop driving can lose independence when alternatives are unsafe, infrequent, or unaffordable. Urban planning must therefore support accessible drop-off zones, safe crossings near parking, seating along approaches, and neighbourhood destinations that remain reachable without a car. Such measures also help family members who provide transport and care.
- Wheelchair users and people using walkers or canes often experience the strongest barriers because discontinuities in the network can make an otherwise short trip impossible. A single missing kerb ramp, vehicle parked on a footpath, narrow gate, inaccessible toilet, or non-functioning lift can cancel the entire journey. Planning should use universal design standards from the outset and audit routes with users who have varied mobility, sensory, and cognitive access needs.

5.3 OBSERVATIONS FROM DATA ANALYSIS

- Mobility exclusion is cumulative: small barriers across home access, streets, stops, vehicles, transfers, and destinations can combine to prevent a trip.
- Pedestrian safety, comfort, and crossing time are as important as vehicle accessibility because the journey begins before a person boards public transport.
- Older persons are more likely to use a service when they can predict where to go, how long it will take, where to sit, and how to obtain assistance.
- Digital travel tools can support independence but should not replace

printed information, telephone support, cash or accessible payment options, and staffed help.

- Service affordability affects participation; concessionary fares should be accompanied by reliable routes and accessible stops so that nominal entitlement becomes practical access.
- Staff behaviour, driver training, and non-discriminatory assistance can improve confidence as much as physical design improvements.
- Older residents should participate in audits, design reviews, route planning, and post-implementation monitoring because lived experience reveals barriers not visible in engineering drawings.

6. DISCUSSION

The comparative analysis shows that inclusive urban mobility is inseparable from the wider design and management of the city. Older persons may make independent choices about when and where to travel, but those choices are shaped by street conditions, route networks, fares, service reliability, access to information, and the availability of support. A city that provides only isolated accessibility features can still produce exclusion when the full journey remains fragmented. The practical objective should be to make ordinary daily travel safe, understandable, and dignified without requiring special permission or exceptional effort.

Pedestrian conditions illustrate this connection clearly. A bus route can be frequent and affordable, yet remain unusable when the approach to the stop is unsafe or when the waiting environment has no seating, shelter, lighting, or information. Similarly, a station may include lifts but still fail users if lifts are unreliable, access routes are blocked, transfer distances are excessive, or customer support is difficult to find. A whole-journey approach links street engineering, transport operations, land use, maintenance, and customer service.

Psychological confidence should receive greater attention in mobility planning. Fear of falling, fear of traffic, concern about getting lost, anxiety about missing a stop, or apprehension about asking for help can discourage travel even when a service is technically available. Clear wayfinding, familiar route information, patient staff, visible

help points, predictable boarding procedures, and places to rest can reduce this uncertainty. These features should not be viewed as optional amenities; they are functional elements of accessible service.

Policy responses should combine universal improvements with targeted support. Local governments can adopt street-design and accessibility standards, fund maintenance, enforce obstruction-free footpaths, require accessible procurement, and collect user feedback. Transport agencies can design low-floor fleets, maintain lifts, improve stop environments, publish accessible information, and train frontline staff. Community organisations, health providers, and older-person associations can identify unmet travel needs, support travel confidence, and ensure that policy decisions reflect diverse experiences rather than a narrow image of ageing.

7. CONCLUSION

This study presented a comparative analysis of inclusive urban mobility for older persons across pedestrian travel, public transport, paratransit and taxi services, private-vehicle journeys, and mobility-aid use. The findings show that mobility depends on more than the availability of transport. It is shaped by continuous pedestrian access, safe crossings, accessible vehicles, affordable fares, understandable information, reliable assistance, and confidence in the full journey. The intensity of barriers differs across people and places, but gaps in safety, comfort, accessibility, and predictability are recurring concerns.

Older persons require mobility systems that support independence rather than dependence. Walking environments must be safe, shaded, well-lit, and free of obstructions. Public transport must provide step-free access, clear information, priority spaces, appropriate waiting conditions, and respectful assistance. Paratransit and demand-responsive services should complement, not replace, accessible mainstream transport. Digital systems should expand options while retaining non-digital channels.

The study concludes that age-inclusive mobility should be treated as a shared responsibility wherever planners, transport operators, technology providers, property

developers, and public authorities shape access to city life. Universal design, regular maintenance, participatory planning, transparent performance standards, affordable services, and meaningful grievance processes are practical elements of an age-friendly

mobility system. Future research should examine how different combinations of urban design, service improvements, fare policies, and community support affect actual travel participation, health, social connection, and independence among older residents.

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