



ACCESS FOR ALL SERIES ↖ ↑ ↗ POLICIES FOR INCLUSIVE TOD
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Access and Babies, Toddlers, and Their Caregivers



AUTHORS AND ACKNOWLEDGEMENTS

Main Authors:

Christina Jang, Institute for Transportation and Development Policy
 Iwona Alfred, Institute for Transportation and Development Policy
 Daniella Ben-Attar, Bernard van Leer Foundation
 Aimee Gauthier, Institute for Transportation and Development Policy
 Rushda Majeed, Bernard van Leer Foundation

Contributors:

Ankita Chachra, Bernard van Leer Foundation
 Cecilia Vaca Jones, Bernard van Leer Foundation
 Julien Vincelot, Bernard van Leer Foundation
 Leticia Bortolon, Institute for Transportation and Development Policy
 Ramon Cruz, Institute for Transportation and Development Policy
 Han Deng, Institute for Transportation and Development Policy
 Jacob Mason, Institute for Transportation and Development Policy
 Taylor Reich, Institute for Transportation and Development Policy
 Beatriz Rodrigues, Institute for Transportation and Development Policy
 Luc Nadal, Studio Nadal

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 Helen Ketema, Qendra Marrëdhënie
 Sara Candiracci, Arup
 Will Newton, Arup
 Skye Duncan, Global Designing Cities Initiative
 Sam Sternin, Bernard van Leer Foundation
 Jeff Risom, Gehl

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Cover Photo: Caregivers walk together with their small children in Monterrey, Mexico. Source: Héctor Ríos.

INTRODUCTION TO THE ACCESS FOR ALL SERIES

In many cities and regions around the world, the automobile and its related infrastructure have deepened social divisions between the haves, those who have access to the services and opportunities that cities bring, and the have-nots, those who are excluded from these. Low-income communities tend to live either farther from their jobs and central business districts or in areas that are poorly served by public transportation.

While there is a trend to design urban centers as areas where people live and work, there is a greater need to build more accessible neighborhoods around transit hubs. Transit-oriented development (TOD) provides integrated urban places that bring together people, activities, services, buildings, and public space, but it does not inherently lead to social inclusion and equality and can result in displacement. There is a challenge to ensure that trendy neighborhoods and new developments that concentrate job opportunities and public services such as education, recreation, and health services can benefit all, without discriminating against different demographic groups.

With countries having adopted the Sustainable Development Goals, the Paris Climate Agreement, and the New Urban Agenda, people expect their city governments to respond to and address major issues such as poverty, climate change, and access. Climate change threatens the livelihoods of many communities, disproportionately impacting those with less mobility options, such as young children, pregnant women and caregivers, and in response, this paper series opens a dialogue on how transport affects these stakeholders differently.

This series distills common messages of inclusion, equity, and access for everyone who can contribute to finding solutions to sustainable transport and urban development, while improving quality of life. In this second issue of the series, the Institute for Transportation and Development Policy (ITDP) and the Bernard van Leer Foundation explore how transportation systems have failed to account for diverse mobility patterns and needs among babies and toddlers (0-5 years old), and caregivers. It provides key stakeholders from civil society, subnational authorities, donor organizations, and national governments with a brief overview of the mobility needs of babies, toddlers and caregivers, and a set of recommendations to promote gender- and age- responsive actions.



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THE CASE FOR ACTION: SUSTAINABLE URBAN MOBILITY FOR BABIES, TODDLERS, AND THEIR CAREGIVERS

By: Rushda Majeed, Bernard van Leer Foundation



Babies and toddlers need safe and healthy environments where they can experience warm and loving interactions with their caregivers. Mexico City, Mexico. Source: Héctor Ríos.

Over a billion children live in cities. These children and their families need accessible, inviting, and safe mobility options and public spaces but are not finding them.¹ This is especially true for the birth to age five range: public spaces designed for young children have largely “disappeared” within a generation, be it in Nairobi, New Delhi, or Jakarta.

The scale and pace of the rapid urbanization in many cities around the world has failed to make the mobility needs of babies and toddlers in the public realm a priority. Cities, particularly neighborhoods, should focus on creating a safe and nurturing environment for young children and their families, but many are not doing so. It is becoming harder to raise children in cities, not least because decision makers and planners are not focused on sustainable mobility for our youngest residents and those who care for them.

¹ UNICEF, *Growing Cities*, 2020.

Figure 1:
Trip patterns or
mobility chains of
people with different
levels of caregiving
responsibilities.

Figure 1.1 shows a person with little to no caregiving responsibilities whose daily trip needs are mainly for employment.

Figure 1.2 shows a person making two types of caregiving trips in one day. These trips can revolve around employment or around other caretaking responsibilities such as taking care of elderly grandparents.

Adapted from Bernard van Leer Foundation.

Figure 1.1

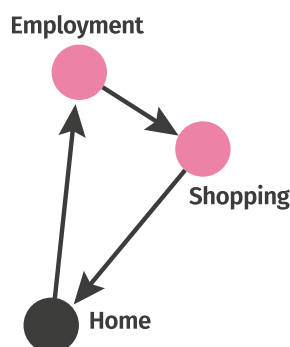
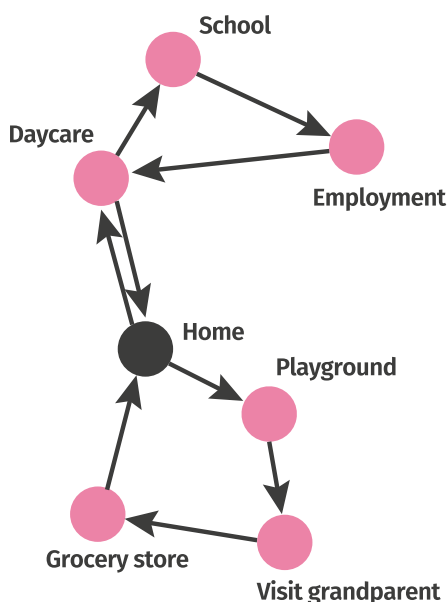


Figure 1.2



Caregiver interactions that are playful, responsive, and meaningful play a crucial role in the healthy development of a child. Cities need to provide opportunities for these interactions. This means providing walkable neighborhoods that cater for the basics a young family needs, public spaces close to home that attract all generations while allowing small children to explore and play safely, and reliable public transport and smaller modes that make it accessible, affordable, and enjoyable for families with young children to travel where they need to go.

Caregivers with infants or toddlers need to feel comfortable and safe when they walk outside, take public transport, or access services further from home. If a city makes it easy and convenient for children to accompany caregivers, instead of primarily catering to the working population, young children will not be restricted to the home. The city would actively help nurture a constant connection between young children and itself.

Achieving sustainable urban mobility for infants, toddlers, and their caregivers requires design considerations that specifically address the needs of this group. Relevant measures include implementing traffic calming and management, paying attention to the quality of sidewalks and to security on the streets, providing ramps for strollers, ensuring well-lit and safe streets, adding informal play spaces within sidewalks, implementing dedicated car-free streets (permanent or temporary), adding wayfinding measures at the correct height for children, adding cycle lanes and safe intersections, and managing stray animals.

Further, neighborhoods with streets and roads that are safe and connected with accessible routes for walking and cycling would encourage the uptake of active transport among families of young children. When combined with accessible, convenient, reliable, and seamlessly connected public transport, caregivers would find it easier to experience the city with their baby or toddler.

Achieving sustainable mobility for infants, toddlers, and their caregivers also means locating services close to where families live. A child below the age of five will usually explore the home, the street, the block, and the neighborhood. The walkability of the very young—either independently or in strollers, on bikes, or carried by a caregiver—is limited to under 1 kilometer from their home. City leaders must therefore prioritize locating services such as health clinics and daycare centers close to where children and their families live.

When city leaders make decisions that work for the youngest, they are not only guaranteeing a productive and engaged future generation but also making decisions that will have a positive impact today on families and communities.

This paper seeks to help decision makers and practitioners deliver on this promise for the future by improving cities for babies, toddlers, and their caregivers now. This resource begins by laying out why it is important to focus on babies, toddlers, and their caregivers and then moves on to explain their needs from urban mobility. It concludes with some key recommendations for how to plan and implement sustainable urban mobility for babies, toddlers, and their caregivers. With this, cities can become better places for young children now and allow for better lives in the future.



Tactical interventions help build political and public support while demonstrating that healthy and engaging spaces for babies and toddlers bring enjoyment and benefits to all space users. Before intervention: TOP LEFT: Before; TOP RIGHT and BELOW: After.
Source: Courtesy of Urban95 Udaipur, Udaipur Municipal Corporation/Bernard van Leer Foundation and ICLEI-SA.

WELL-BEING OF BABIES, TODDLERS, AND THEIR CAREGIVERS IN CITIES



As cities continue to expand and urbanize, they need to consider how to create good environments for young families. Lodwar, Kenya. Source: ITDP.

Four billion people live in urban areas today, and nearly a third of them are children.² By 2050, nearly 70 percent of children around the world will live in urban areas, in which many of them will grow up in polluted, congested, and unsafe environments and suffer from multiple deprivations.³ Anticipated migrations from climate change and conflicts will add to this population, resulting in the same deprivations for even more babies and toddlers.⁴ Already, almost 21.5 million individuals are displaced every year by climate- and weather-related disasters,⁵ with the majority being women and children.⁶ The scale and speed of global rapid urbanization and the climate crisis is expected to outpace response, leaving the needs of babies, toddlers, and their caregivers behind. The COVID-19 pandemic has brought into stark relief the need for our cities to provide better environments for the well-being of people. This is the moment to recenter care in our cities. Designing a city for babies, toddlers, and their caregivers does just that and creates a foundation for a more inclusive and accessible city for all, although it is just the beginning.

Creating better urban environments for babies and toddlers is important for their development and their lifelong well-being. The early years of childhood, from birth to age five, lays the foundation for social, emotional, cognitive, and physical development for the rest of a person's life.⁷

² UNICEF, *Growing Cities*, 2020.

³ Child Friendly Cities Initiative, *Growing Cities*, Accessed July 28, 2020.

⁴ United Nations, *Make cities and human settlements inclusive, safe, resilient and sustainable*, 2019.

⁵ United Nations, *Frequently asked questions on climate change and disaster displacement*, 2016.

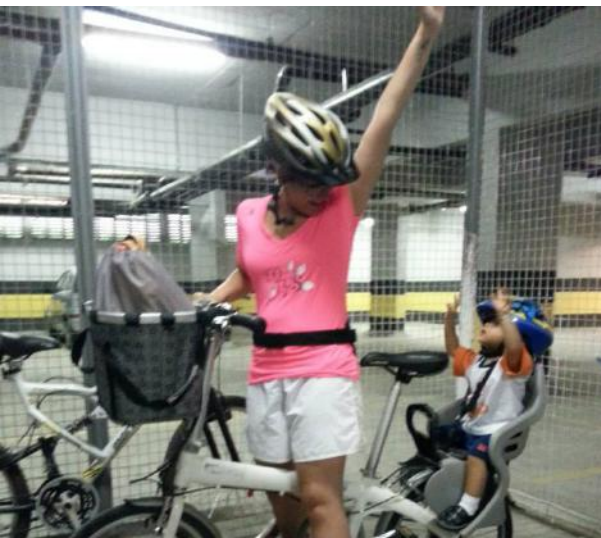
⁶ UN Women, *In Focus: Climate action by, and for, women*, accessed November 1, 2020.

⁷ UNICEF, *Why early childhood development*, accessed November 1, 2020.

This development rests on a child's well-being, which is contingent on both the quality of care from their caregivers and the quality of the environment. Bolstering one's well-being during early childhood improves future adult outcomes, from health to education to income generation possibilities.⁸ This period is so critical that every 1 USD of investment during this time results in a return on investment of 4–13 USD, and in some cases much more.⁹ More importantly, every child has a right to well-being and should be given the opportunity to grow, develop, and thrive in any environment.

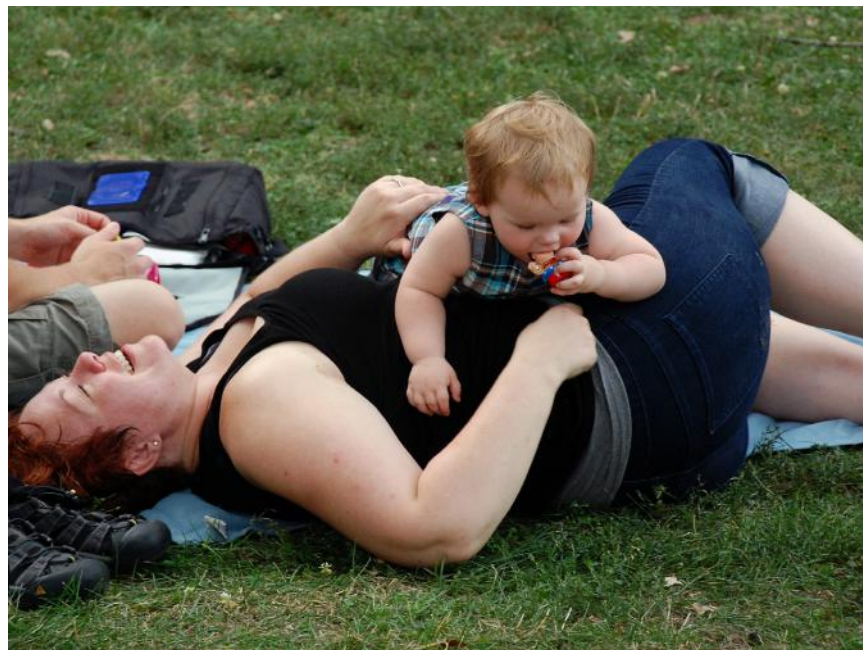
BABIES AND TODDLERS: THE EARLY YEARS

Babies and toddlers are the best learners on the planet. They are born learning, with their brains growing the fastest before their fifth birthday. During those early years, the brain is at its most sensitive to external experiences and input than at any other time in life.¹⁰ According to UNICEF, over 80 percent of a baby's brain is formed by the age of three, including the neural connections that shape language skills, cognitive functions, and sensorial capacity. These early years have a profound, lasting impact on a person's future physical health and mental well-being.¹¹ This "window of opportunity" determines cognitive evolution, from core skills acquisition, executive function development, memory processing, the establishment of healthy attitudes and behaviors, and the flourishing of mature relationships.¹² Two of the most important factors for child well-being during this period are **(1) safe and stimulating physical environments to explore** and **(2) frequent, warm, and responsive interactions with loving adults**.¹³



Active forms of transportation allow opportunities for interactions between caregivers and their babies and toddlers, including the joy of exploring, pointing, stopping and observing. Rio de Janeiro, Brazil.
Source: ITDP.

Loving interactions help babies and toddlers develop attachments with their caregivers and healthy socioemotional skills. Source: Lena via Flickr.



⁸ Bill Steiden, *Governing from a child's perspective: Recife, Brazil, works to become family friendly, 2017–2019*, 2019.
⁹ No Small Matter, *Why early learning*, accessed November 1, 2020.
¹⁰ Urban95, *An Urban95 starter kit: Ideas for action*, 2019, 5.
¹¹ UNICEF, *Early Childhood Development: Building your baby's brain*. Accessed July 13, 2021.
¹² William Isaac Newton and Sara Candiracci, *Proximity of care*, 2019, 6.
¹³ Urban95, *An Urban95 starter kit: Ideas for action*, 2019, 8.

Providing safe and stimulating physical environments for babies and toddlers to explore includes ensuring opportunities for play in environments that are conducive to their health and well-being, free from threats of urban violence and road crashes. Play is the building block for learning because it builds brain architecture, including the development of motor, cognitive, and socio-emotional skills. When moving around the neighborhood or city, young children need places where they can crawl, climb, touch, and interact with their surroundings. The smallest features, such as a step or a pattern of tiles on the sidewalk, invite play and exploration, and the whole city could function as a landscape for learning.

Children are also the most vulnerable to environmental factors—such as poor air quality, noise pollution, and road safety—during the early years. Poor air quality negatively impacts early childhood development, with impaired lower lung function and impaired neurological and cognitive development associated with air pollution.¹⁴ Because the average height of a young child, at 95 centimeters, places them closer to sources of local pollutants like tailpipes, and because they have faster respiratory rates (30–60 breaths per minute), babies and toddlers absorb more toxic pollutants.^{15,16} Noise pollution has been associated with reduced cognitive function, inability to concentrate, and increased feelings of nervousness and helplessness in babies and toddlers.¹⁷ Lastly, at a height of 95 centimeters or less, young children are often invisible to motor vehicles, especially as cars continue to get larger, and are also at greater risk of injury and death when involved in a road crash with motorized vehicles.¹⁸

The built environment affects early childhood development not only directly, through the quality of the environment that babies and toddlers are exposed to and their opportunities to interact with it, but also indirectly, by modulating interactions between babies and toddlers and their caregivers.¹⁹ The more stressful the environment, the more stressed the caregiver will be, resulting in either transmitting that stress to babies and toddlers or hampering the quality of their interactions with young children. And interaction with their caregivers is one of the most important factors for the development of babies and toddlers.



Safe and stimulating spaces promote children's healthy growth. Pune, India. Source: ITDP.

¹⁴ World Health Organization, *9 out of 10 people worldwide breathe polluted air, but more countries are taking action*, 2018.

¹⁵ Suzanne Reuter et al., *Respiratory distress in the newborn*, 2014.

¹⁶ Urban95, *An Urban95 starter kit: Ideas for action*, 2019, 22.

¹⁷ Susan Marie Viet et al., *assessment of noise exposure to children: considerations for the national children's study*, 2014, 105.

¹⁸ World Health Organization, *Children and road traffic injury*, accessed November 1, 2020.

¹⁹ Urban95, *An Urban95 starter kit: Ideas for action*, 2019, 5.

CAREGIVERS

Fundamentally, the well-being of babies and toddlers rests on the well-being of their caregiver. As stated above, one of the most important factors for early childhood development is frequent, warm, and responsive interactions with loving adults.²⁰ These interactions include playing together, storytelling, singing, reading, or talking. Interacting with and responding to a baby or toddler (also known as “serve and return”) is key to building the brain architecture that creates the foundation for socio-emotional and language evolution. Interactions such as cuddling, eye contact, and gestures help build an emotional bond and help the child understand the world around them. Storytelling, singing, and reading together create an important foundation for social and emotional development, language skills, and later literacy. These interactions with caregivers occur multiple times over the course of the day and are essential parts of activities, errands, and rest. They can also include indoor and outdoor play opportunities that set the foundation for problem-solving, social interaction skills, and physical health.

In addition to this, caregivers are responsible for the physical well-being of the children they care for, including health and nutrition, basic hygiene, and safety, inclusive of nonviolent approaches to discipline.²¹ Basic nutrition and healthy eating are fundamental to growth and development and set the foundation for lifelong health. Pregnant women, caregivers, babies, and toddlers frequent some services more often than others, such as parks, healthy food stores, public spaces, primary healthcare, and childcare. Well-being for babies, toddlers, and caregivers depends on whether caregivers are able to use those services, as well as the quality of those services. Finally, the mental health of a caregiver affects the babies and toddlers in their care. Mental health can be affected by a combination of many factors: social isolation, stress, postpartum depression, anxiety, violence, to name a few. When caregivers are affected by stress or depression, they will be less able to respond to and interact with the children in their care, and it may limit their ability to seek services for the children.²² Regardless, chronic stress from socioeconomic and environmental factors will impede a caregiver’s capacity to care for the emotional and cognitive development of babies and toddlers.

Frequent, warm, and responsive interactions with loving caregivers are critical to the development and well-being of babies and toddlers.
Source: Jon Spaul/ Bernard van Leer Foundation.



20 Urban95, *An Urban95 starter kit: Ideas for action*, 2019, 8.

21 Urban95, *An Urban95 starter kit: Ideas for action*, 2019, 12–17.

22 Urban95, *An Urban95 starter kit: Ideas for action*, 2019, 12–17.

A caregiver provides unpaid or paid physical and/or emotional care for the household broadly and/or for specific members, such as babies and toddlers, other children, older people, and people who are ill or injured.²³ They complete essential tasks in a household, such as childcare, household maintenance, medical visits, grocery shopping, and visiting relatives and friends. While caregivers encompass a full spectrum of people and genders and can include family members like parents, older siblings, and grandparents, as well as friends and neighbors, globally, over 70 percent of caregiving work is performed by women or girls.²⁴ For paid domestic workers, globally, over 80 percent are women, and the sector is characterized by low wages, vulnerability to exploitation and harassment, and high job insecurity, including a lack of access to basic protections, like paid family and medical leave and sick days.^{25,26}

References in this paper to women as primary caregivers are not intended to reinforce gender roles but instead to recognize existing power structures that embed binary norms and often decrease women's access to economic, social, and political participation. Gender is a construct based on social and cultural factors. It is not unchanging, monolithic, or binary. Still, gender roles are weaved in institutional practices and power structures, including who is responsible for caregiving activities.

To truly understand the experience of caregivers, planning needs to account not only for people of all genders, including people who are non-binary or transgender, but for a multiplicity of intersecting identities, like race, ethnicity, ability, income, age, and religion. Intersectionality is a concept developed by Kimberlé Crenshaw, through her legal analysis that showed that black women face both race discrimination and sex discrimination and that the intersectional experience of discrimination was greater than the individual parts: racism or sexism.²⁷ An intersectional approach to understanding issues facing caregivers, babies, and toddlers is essential to create solutions that meet those communities' needs while acknowledging the structural and systemic biases that people face. In cities, inattention to these inequalities is likely to lead to even more adverse outcomes, ultimately embedding and reinforcing these discriminations into the built environment.²⁸ The disinvestment of communities with the least resources often results in worse environmental conditions, such as more polluted air, less open and green space, and limited access to key services.²⁹



When caregivers have lower stress while traveling through the city, they can better interact with their children in a way that is playful and responsive, which is critical for early childhood development. Bacolod City, Philippines. Source: Brian Evans via Flickr.

The ability of a caregiver to meet the needs of babies and toddlers is dependent on the design of our cities and neighborhoods and their mobility systems. These needs are supported by access to services, opportunities, and goods and by the mobility options available, as well as by the quality of the urban environment. The next section examines these accessibility and mobility considerations for babies, toddlers, and caregivers.

23 National Partnership for Women & Families, *The female face of caregiving*, 2018.

24 Belén Garijo, *COVID-19 highlights how caregiving fuels gender inequality*, 2020.

25 UN Women, *Chapter 1, Substantive equality for women: The challenge for public policy*, 2015.

26 International Labour Organization, *Recognizing the rights of domestic workers*, 2018.

27 Kimberlé Crenshaw, *On intersectionality: Essential writings*, 2019.

28 Steven Raphael and Michael Stoll, *Job sprawl and the suburbanization of poverty*, 2010.

29 UNEP, *Air pollution hurts the poorest the most*, 2019.

Figure 2: Caregivers Moving Through the City

Primary caregivers often include parents, older siblings, grandparents, or pregnant women.



Caregivers walk to places near and far, often traveling with multiple children under their care.



Multitasking caregivers make daily journeys with their young ones for various purposes, such as to a doctor's office, a grocery store, or even for employment.



Caregivers traveling by bike can travel with multiple children in multiple ways and in conditions ranging from mixed traffic to protected cycle lanes.



Caregivers use intermediate public transport, like auto-rickshaws, to take longer or more complicated trips with their young children and other family members.



Caregivers using public transport have to navigate getting on and off the vehicle usually while carrying a child or with goods.



ACCESS AND MOBILITY FOR BABIES, TODDLERS, AND THEIR CAREGIVERS



A caregiver carrying a child and walking with a toddler easily alights from a bus in Pune, India. Source: ITDP.

Access is at the very heart of what a city needs to foster for early childhood development and caregiver well-being. The integration of land use and mobility is the foundation of access, defined as the number of places, activities, and services that can be reached within a certain distance or time.³⁰ While this spatial understanding is the basis for access, it has additional dimensions that need to be factored in to understand what is truly accessible; these factors include:

- **Affordability:** the price of mobility services and the price of services like childcare, healthcare, and food
- **Safety:** personal security from violence and harassment, as well as safety from vehicular crashes
- **Service quality:** the reliability, frequency, cleanliness, and comfort of public transport and the quality and quantity of services such as childcare

³⁰ "Access" is defined by Todd Litmann as the ability to reach desired goods, services, activities and destinations and by Jarrett Walker as how many useful or valuable things you can do in a given time period. Jarrett Walker, *Transit's product: Mobility or access?*, 2011.

For example, a person does not have true access if they are physically close to public transport that comes just once an hour; that is overcrowded, encouraging pick pocketing or harassment; or that the person cannot afford to use. Thus, true accessibility is actually quite limited. In the sections that follow, we will focus primarily on the spatial dimensions of access but will make reference to the issues of affordability, safety, and service quality.

Babies, toddlers, and their caregivers have particular needs for services that are enabled by land uses and zoning, and unique ways of moving through the city that are enabled by mobility options. Improving local access means improving (1) the local environment, which is so important for the development of babies and toddlers, and (2) mobility options, which enable caregivers to better meet babies and toddlers' needs. Understanding these needs, however, is the first step in developing recommendations for land use and transportation that increase access for young children and those who care for them.

IMPROVING ACCESS THROUGH LAND USE

Needs and Challenges from Land Use

Caregivers frequent certain services more often than others to provide for the well-being of babies and toddlers, as well as their own well-being. These services include:

- Water, sanitation, and hygiene (WASH) locally
- Local fresh food sources, including grocery stores, small shops, and informal fruit and produce stands
- Open spaces, including parklets, plazas, green areas, and playgrounds with baby changing facilities
- Healthcare services and pharmacies
- Daycares, kindergartens, and primary schools
- Employment options
- Cultural and community centers, including social services
- More specialized services and shopping

Each need is now explained in more depth, including why it matters for babies, toddlers, and their caregivers, and what challenges are associated with it.

Water, Sanitation, and Hygiene

Basic access to WASH is important for babies and toddlers to ensure their health and good development. Good sanitation and hygiene are crucial to protect babies and toddlers from infections while their immune systems are developing, especially during the first few months of life. Clean running water is also needed for washing, bathing, and cooking. As cities have expanded, access to quality WASH services has not kept pace with urban population growth, with more urban residents in 2017 living without good access to WASH services than in 2000.³¹ According to UNICEF, over 700 children under the age of five die every day from diarrheal diseases due to lack of appropriate WASH services.³² Poorer communities, including informal settlements, suffer from a lack of these basic services. When these services do exist, they are often inadequate and provided by private service providers at prices much higher than in other communities in the city—a trend often known as the poverty penalty.³³

31 UNICEF, *Water, Sanitation and Hygiene (WASH)*.

32 UNICEF, *Water, Sanitation and Hygiene (WASH)*.

33 Jane Weru, *COVID-19 and the city: It's smart to be dense*, 2020.



Neighborhood markets provide healthy nutrition for families. Fez, Morocco Source: Just Another Photographer via Shutterstock.

Local Fresh Food Sources

Access to local fresh food contributes to the fundamentals of brain and body development, and a lack of nutrition can lead to increased risk of illness and obesity in later life, as well as stunted development. According to the World Health Organization (WHO), 45 percent of deaths in children under five years of age can be attributed to nutrition-related factors.³⁴ Convenient, safe, and close access to healthy, affordable fresh food is critical, because caregivers often buy groceries multiple times a week, shop with children, and stock goods for the entire household. Many lower-income neighborhoods lack access to fresh food.



Spending time outside, in green areas or on streets, provides an infinite number of opportunities for babies and toddlers to learn, think creatively, and expend energy. Fortaleza, Brazil. Source: Marcos Moura.

Open Spaces

Having open space for social interaction, physical movement, exploration, and play is essential for babies and toddlers to develop their social and motor skills. Spending time outside in green areas and on streets has numerous positive impacts on health for both young children and caregivers.³⁵ Open spaces allow a caregiver to linger, interact with and feed the baby, or play and explore with the toddler. Having space for physical movement helps bodies develop, from lungs to muscles to hearts. Physical movement can also help expend energy and lead to better sleep at night. Open spaces also offer experiences that babies and toddlers cannot get indoors, leading to better brain and body development. Open spaces are also where babies and toddlers can play.

Play is the universal building block for child health,³⁶ and streets were the original playground in cities for children. Streets can make up 80 percent of a city's public space, but the over-prioritization of cars leaves little room for open space and play.³⁷ As the motorized movement of goods and people grew and motorized vehicles proliferated, play was eventually segregated from streets, and open space for people was reduced.

³⁴ World Health Organization, *Children: Reducing mortality*, 2019.

³⁵ Marc G. Berman et al., *The cognitive benefits of interacting with nature*, 2008.

³⁶ Caroline Brown et al., *Special issue: Child-friendly cities*, 2019.

³⁷ National Association of City Transportation Officials, *Urban street design guide*, accessed November 1, 2020.



Children should receive ample amounts of physical activity outdoors. While children should spend 1-3 hours outdoors, in many places in the world they spend much less.

Medellín, Colombia.

Source: Carlos Felipe Pardo.

For this reason, public space for children is often considered a separate use or space, such as playgrounds or other designated, enclosed areas. Because of a lack of public open space, some of these designated play spaces are private and have costs associated with their use, reducing access.

Infants need “tummy time,” interactive floor-based play, which allows them to develop their motor skills, a couple of times a day for 3–5 minutes at first until they get stronger, and then for at least 30 minutes total a day. They should be taken outside, as appropriate for the environmental conditions and with protection, two to three times a day. Toddlers need outdoor play time that allows them moderate physical activity for at least 60–90 minutes.³⁸ The American Academy of Pediatrics recommends 180 minutes of daily physical activity, including walking, unstructured free play, and playing on a playground.³⁹ WHO also says that toddlers should have at least 180 minutes of activity a day.⁴⁰ This helps develop motor skills, as well as brain development and social skill development.⁴¹ Finally, caregivers also need social interactions, and these can happen in open spaces.

Due to limited space, road safety concerns, threats of urban violence, noise pollution, and poor air quality, the availability of and opportunities for open space are reduced or nonexistent for many. Moreover, caregivers may avoid an area that is chaotic or unsafe for themselves or their young ones.

Healthcare Services and Pharmacies

Pregnant women, babies, and toddlers have a greater need for access to medical services because of more frequent doctor’s visits. Prenatal care is one of the biggest factors in having a healthy birth and baby, and pregnant women should have prenatal checkups at the beginning of their pregnancy once a month, accelerating as they get closer to birth to twice a month and then weekly.⁴² For women with risk factors, check-ins could be even more frequent. Inaccessibility to doctors and medical appointments due to proximity or trip complexity disrupts prenatal care and increases the risk of pregnancy-related mortality.⁴³ For postnatal care, the American Academy of Pediatrics recommends follow-up visits for the baby every two to three months for the first year, and then every six months until the child is three years old.⁴⁴

³⁸ Caring for our Children, Chapter 3: Health promotion and protection: 3.1 Health promotion in child care, 2018.

³⁹ Natalie D. Muth, *New report guides physical activity counseling in pediatric clinical settings*, 2020.

⁴⁰ World Health Organization, *To grow up healthy, children need to sit less and play more*, 2019.

⁴¹ Caring for our Children, Chapter 3: Health promotion and protection: 3.1 Health promotion in child care, 2018.

⁴² National Institutes of Health, *What is prenatal care and why is it important?*, 2020.

⁴³ March of Dimes, *Nowhere to go: Maternity care deserts across the U.S.*, 2018.

⁴⁴ Healthy Children, *AAP schedule of well-child care visits*, 2020.

Long travel times have been associated with increases in overall maternal stress and a reduced number of prenatal and postnatal visits and complete medical checkups.⁴⁵ Barriers to healthcare and medical services, such as them not being nearby or those services being clustered in a few central urban areas, contribute to poorer health outcomes for babies and toddlers and more stress for caregivers.



Access to medical services is linked to prenatal and maternal health, including access to regular checkups before a baby is born. Source: Niko Guido via iStock.

Daycares, Kindergartens, and Primary Schools

Every child has the right to high-quality childcare. Participation in high-quality early childhood programs has been linked to lower levels of depression and obesity later in life, higher chances of completing primary and secondary education, and 25 percent higher incomes in adulthood.⁴⁶ Moreover, families are often composed of multiple children at varying stages of independence and education, and caregivers are responsible for meeting all their needs. Having primary schools and kindergartens nearby helps the caregiver meet the competing educational needs of the household.

For caregivers, childcare is a key enabler for their access to jobs and economic opportunities. The lack of high-quality, accessible, and affordable daycare services nearby is a crisis for working families.⁴⁷ Without affordable services or childcare centers nearby, a caregiver may be forced to forgo income-generating opportunities, bring their baby or toddler to work with them, pull older kids out of school to take care of younger siblings, or place a child in substandard care. In the United States, female caregivers are more likely to give up employment if they lack a social network, facilities, or economic resources to care for their children.⁴⁸ COVID-19 is exacerbating this inequality. In the United States, women, particularly Black and Brown women, are leaving the workforce at much higher rates than men: of the 1.1 million people who left the workforce in September 2020, 80 percent were women, and in December, women accounted for 100 percent of the jobs lost.⁴⁹ In surveys conducted by the World Bank in Latin America, female workers had been 44 times more likely than male workers to lose employment at the beginning of the pandemic.⁵⁰

⁴⁵ Lehigh University, *Pregnant women with long commutes to work at increased risk of adverse birth outcomes*, 2019.

⁴⁶ U.S. Council of Economic Advisers, *The economics of early childhood investments*, 2015, 21.

⁴⁷ Annabelle Timsit, *We're facing a global childcare shortage—and women and children are paying the price*, 2019.

⁴⁸ National Partnership for Women & Families, *The female face of caregiving*, 2018.

⁴⁹ Kweilin Ellingrud & Liz Hilton Segel, *COVID-19 has driven millions of women out of the workforce. Here's how to help them come back*, 2021.

⁵⁰ LACGIL, *The gendered impacts of COVID-19 on labor markets in Latin America and the Caribbean*, 2021.



High-quality childcare is critical both to early childhood development and to enabling economic and job opportunities for caregivers. LEFT: Dar es Salaam, Tanzania. Source: ITDP; RIGHT Source: Jon Spaul/ Bernard van Leer Foundation.

Employment Options

Because of the challenges of childcare, many caregivers need employment options nearby to facilitate picking up and dropping off children at daycare, schools, and after-school activities, and to enable them to respond to emergencies, such as if the child is sick. In Delhi, India, when residents were displaced from an existing informal settlement to the city's periphery, employment fell by 27 percent for women (as compared to 5 percent for men) because travel time increased threefold.⁵¹ Traveling long distances can be an impediment to a caregiver working, especially if good quality childcare is not available.

Cultural and Community Centers, Including Social Services

Caregivers need support, and babies and toddlers need socialization. Community and cultural centers are places to find both. Community and cultural centers, social service centers, and public libraries offer programming for young children and caregivers alike. Read-aloud, singing, and dancing workshops provide children opportunities for socialization and development, and caregivers an opportunity to interact with other caregivers. Caregiving, nutrition, and mental health coaching are important anchors for new caregivers and those in distress or feeling isolated. These services are often offered at local clinics or organized by local community-based organizations. Those institutions can promote meetup groups for further support.

More Specialized Services and Shopping

Caregivers are often providing care for the whole household and in charge of maintaining domestic responsibilities, including household retail and shopping needs beyond groceries. This can range from clothing for babies, toddlers, and other household members, to supplies for daycare and school, to household items and staples. Providing access to other goods nearby will help reduce caregiver stress in meeting the needs of the household.

51 Geetam Tiwari, *Planning and designing transport systems to ensure safe travel for women*, 2014.

Summary

These needs and services should form the basis of the neighborhood, and thus the local environment, that children live and are raised in. But more and more, cities are becoming sprawling places where it is harder and harder to find these services nearby. Over the past couple of decades, urban areas have been expanding on average twice as fast as their populations.⁵² Sprawl is the antithesis to proximity and to the need of caregivers to have activities nearby. Moreover, the neighborhood is much more than its land uses, and it affects babies and toddlers in more ways than just access. Neighborhood characteristics affect health outcomes, while reflecting and reinforcing systemic injustices and inequities, including disinvestment that has occurred because of socioeconomic factors, like race, income, or ethnicity.⁵³ According to WHO, social determinants—nonmedical factors that influence health, like the conditions where you are born, live, work, and age—can account for 30–55 percent of health outcomes.⁵⁴ Research in the United States has shown that a person’s postal code is a good predictor of life expectancy. These social determinants contribute the most to health inequities.⁵⁶ Marginalized communities typically have had less investment from the public sector and thus may lack basic services like water, sewage, and electricity, and can even lack a sufficient street network. These communities are also likely to be hotter and more polluted and lack green spaces.⁵⁷ As we look at the needs of babies and toddlers in terms of their local environment, this context also needs to be addressed.

Framework for Land Use: Proximity of a Mix of Different Services

The activities (land uses) we have discussed in this section are central to early childhood development, from nutrition to health to spaces for play and socialization. Proximity to these services determines how often a caregiver can access them, whether outdoor play is facilitated, and how well young children’s needs can be met within the limited time and money budget that many caregivers have. Having the services nearby also helps to lower stress and duress for caregivers, which can, in turn, give more opportunity for loving and warm interactions. Proximity to a mix of services is critical, but given the frequency of use, some services may need to be closer than others. Figure 3 looks at different care activities along a continuum of frequency of use to understand the relationship between activity, frequency, and proximity. The more frequent the activity, the closer it should be to home. The figure is meant to give more of a descriptive, not prescriptive, understanding of this relationship and to allow for the relative importance of an activity to be locally determined and to vary in specifics due to different contexts.

⁵² Karen C. Seto et al., *Global forecasts of urban expansion to 2030 and direct impacts on biodiversity and carbon pools*, 2012.

⁵³ Healthbox, *Root causes of health*, 2019.

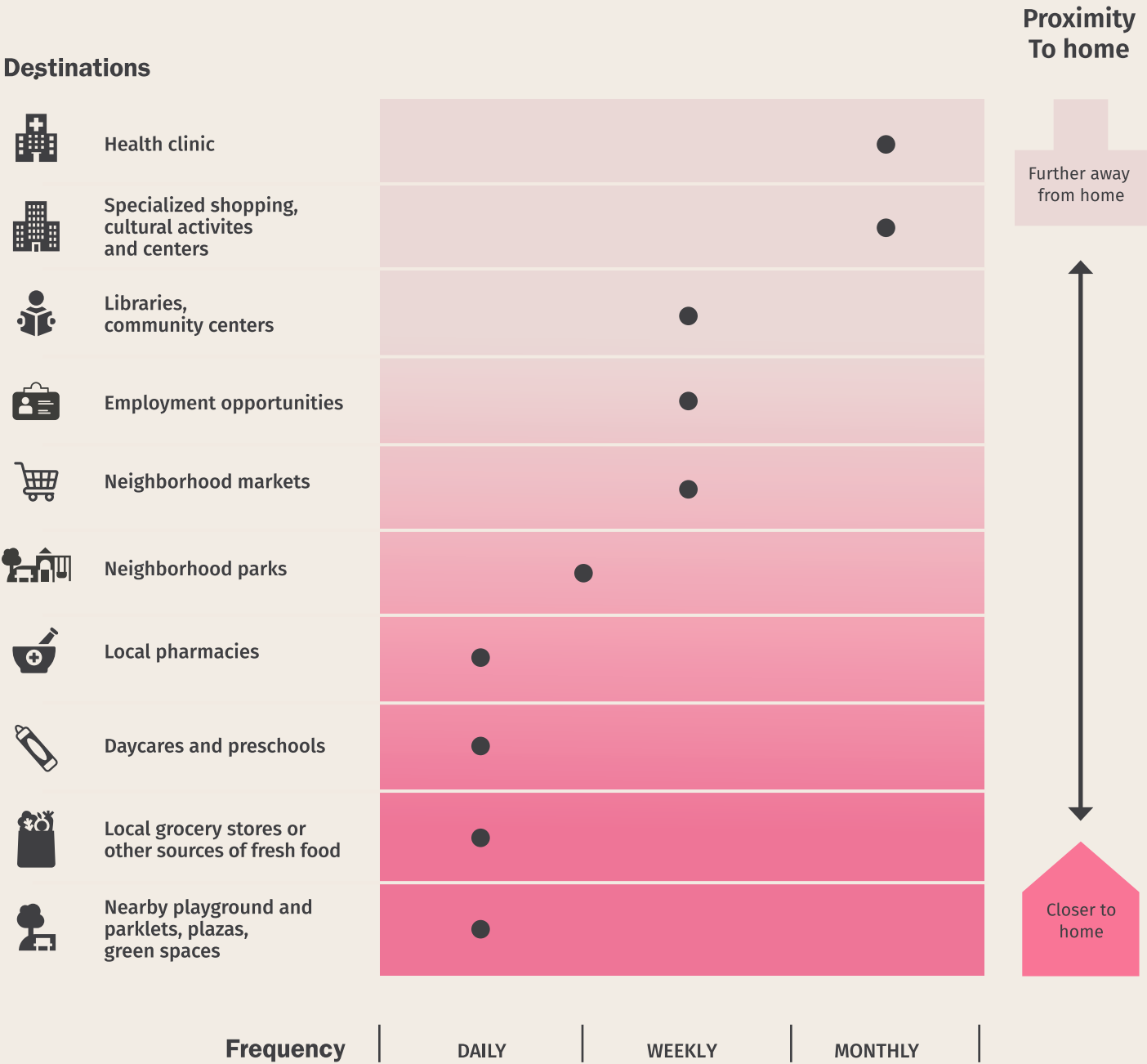
⁵⁴ World Health Organization, *Social determinants of health*, accessed November 1, 2020.

⁵⁵ Jamie Ducharme and Elijah Wolfson, *Your zip code might determine how long you live—and the difference could be decades*, 2019.

⁵⁶ World Health Organization, *Social determinants of health*, accessed November 1, 2020.

⁵⁷ Bryan Lufkin, *Heat gap: Why some city districts are hotter than others*, 2020.

Figure 3: Relationship between Frequency of Needs and Their Proximity to the Home



Activities that happen frequently would ideally be close by, but current land use and transportation design reveals a fragmented landscape that results in caregivers embarking on strenuous trips to meet their needs and the needs of others. Traveling with a baby or toddler can be challenging because of their frequent feeding and sleeping schedules, the supplies needed for the trip, the sensitivity of children to the environment, and the unpredictable nature of toddlers. Thus, having to travel long distances and the challenges of traveling with a young child can restrict or prevent access. Thus, the next section examines the mobility needs and options for babies, toddlers, and those who care for them.

IMPROVING ACCESS THROUGH MOBILITY OPTIONS

Mobility Characteristics and Needs

How babies and toddlers move through the city is dependent on their caregivers, as young children never travel alone. Caregivers have specific travel characteristics and needs, based on the types of trips they need to take, when they take them, and under what conditions.

These characteristics and needs include:

- Dependent mobility, often carrying goods
- Shorter trips, more often
- Slower walking speeds
- Frequent stopping
- Higher risk aversion
- Limited time
- Trip chaining
- Off-peak travel to noncommercial destinations
- Affordability

Each characteristic and need is now explained in more depth, including why it matters for babies, toddlers, and their caregivers.

Dependent Mobility, Often Carrying Goods

The defining feature is that babies and toddlers are dependent on caregivers when traveling outside the house. Caregivers are often taking care of more than just one baby or toddler and may travel with other members of the family, including other children, older people, and people who are ill or injured. More space is needed to accommodate families traveling together, even if it is just a caregiver with a toddler. Traveling as a family can also result in more expensive trips. While navigating the city, caregivers are often carrying supplies like food, clothes, or toys and could be using mobility assists like strollers. This means that stairs will be hard to navigate, and caregivers may have a preference for elevators or escalators.

Shorter Trips, More Often

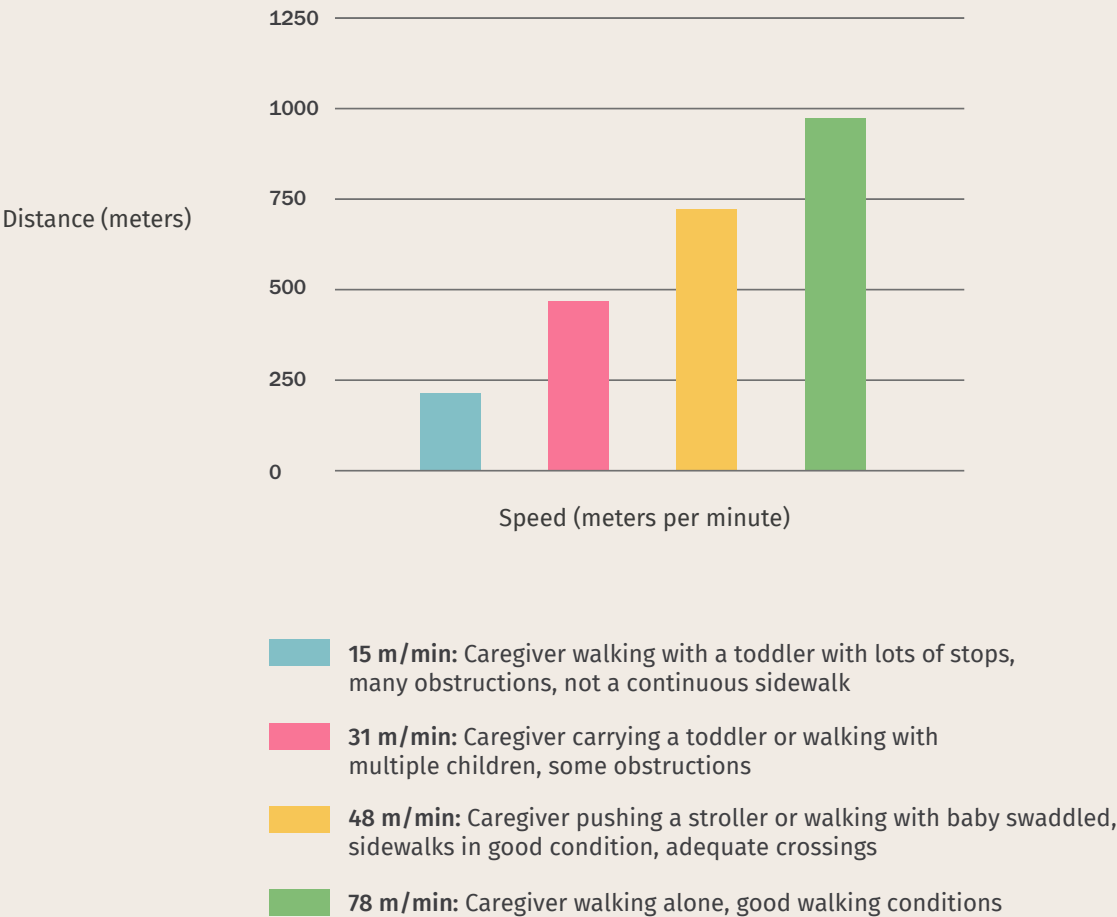
Caregivers tend to prefer flexible, shorter trips and being closer to home, as they also need to manage the care of babies and toddlers, such as frequent feeding and sleeping schedules, and the unpredictable nature and behavior of young ones.

Slower Walking Speeds

Caregivers and young children travel more slowly. The walking speeds of caregivers tending to babies and toddlers can range on average from 15 to 60 meters per minute, depending on trip conditions, how and with whom they are traveling, the caregiver's ability, and the trip purpose. Toddlers have shorter gaits when walking and may also have trouble navigating stairs, curbs, and similar features.

The graph below shows the distance that a caregiver can travel at various walking speeds that represent different conditions, including whom they are traveling with and in what environments.⁵⁸

Figure 4: Distances Reached within 15 Minutes Based on Walking Speeds.



Frequent Stopping

Caregivers need the ability to pause, stop, and sit during a trip, ideally out of the flow of pedestrian traffic. A toddler may want to stop at an eye-catching storefront or explore a green area. A caregiver may need to find a place to feed a baby or soothe a temperamental toddler. Whatever the reason, caregivers need flexibility in their urban space to stop. Providing areas for them to interact with a baby or toddler and for young children to play can enable positive interactions during trips.

58 UNICEF, *Shaping urbanization for children*, 2018.
Aldis Run Larusdottir et al., *Evacuation dynamics of children - walking speeds, flow through doors in daycare centers*, 2014.
Abel Tãiti Konno Pinheiro et al., *Walking speed of children by age under the lead of nursery school teacher on a sidewalk and overpass bridge stairs during an urban evacuation drill*, 2014.
Kristin Agnello, *Strollers and scooters: Perspectives of a millennial planner living in a retirement community*, 2017.
Canadian Council of Motor Transportation Administrators, *Countermeasures to improve pedestrian safety in Canada*, 2013.

Higher Risk Aversion

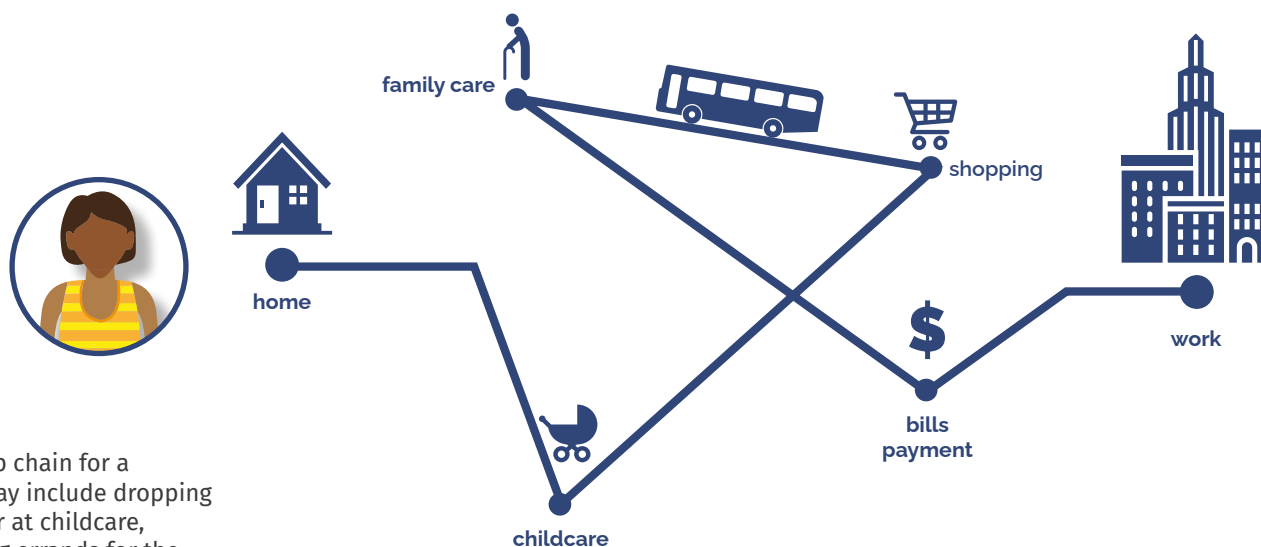
Caregivers have a heightened sensitivity to obstacles and dangers as they care for themselves and their young ones. They carry the cognitive burden of safety, from personal security to road safety, while traveling with young children and are less willing to take risks. Understanding this characteristic not only includes assessing risk to young children in public space but also understanding the caregiver's identity in public space. Women, people of marginalized races and ethnicities, older people, and people with disabilities may be more vulnerable to harassment, crime, and violence. Finally, assessing risk also includes assessing environmental conditions, like cleanliness.

Limited Time

Family needs are interconnected, and caregivers often need to juggle and multitask between childcare, care of other family members, employment, and household tasks. All of these increase the number of responsibilities that caregivers balance within a given day, on top of making time and space for themselves and to interact with babies and toddlers. These responsibilities, coupled with the slower walking speed and frequent stopping associated with traveling with young children, often leaves caregivers extremely time constrained. For this reason, the predictability and reliability of a particular mode are critical in trip planning.

Trip Chaining

In part because of being time constrained and juggling multiple responsibilities, caregivers typically take more complex trips, where they combine multiple stops in one journey to complete a range of activities.⁵⁹ They visit various destinations, at times using different transport modes in one trip to maximize time and resources. For example, a caregiver with a toddler might walk another child to primary school, followed by walking to daycare to drop off the toddler, and then taking public transport to work. This can affect the cost of the trip if the caregiver has to pay multiple fares along the route.



A typical trip chain for a caregiver may include dropping off a toddler at childcare, then running errands for the household before going to work. Source: Women and Children's Access to the City, ITDP, 2018.

Off-Peak Travel to Noncommercial Destinations

Caregivers tend to travel to destinations other than central business districts and face more limited transportation options and service to reach those destinations, because transport systems are primarily designed to serve high-demand commute trips, which tend to serve men, often with more formal jobs. Caregivers may travel outside of the normal peak time for commuters, such as early morning for daycare drop-off and during afternoon hours for grocery runs, school pickup, or medical appointments. Caregivers also may need to travel in the evening and at night to fulfill obligations, errands, and employment, if they are providing care during the day.

Affordability

Affordability is another consideration that is not solely specific to caregivers but still relevant as households navigate the many expenses of the family. Families have more expenses and less disposable income, and the cost of traveling with a family will be higher. The cost of the trip is a combination of time and money. Affordability is often the first lens through which people make travel decisions. When a caregiver does not have money, they will pay for the trip in time or may not make the trip at all. The other factor to consider with the cost of transport is that as the cost of housing decreases, the cost of transport typically increases. So, the cost of transport intersects with housing location to influence considerations around affordability, trip distances, and accessibility.



The “mobility of care” framework highlights that many trips, including by walking, cycling, and public transit, are for care trips rather than the work commute. Rio de Janeiro, Brazil. Source: ITDP.

Challenges from Traditional Transportation Planning Approaches

The “mobility of care” framework, authored by Inés Sánchez de Madariaga, aims to highlight and elevate the travel that is made to care for the household or accompany other people, which is often invisible in transportation planning and underrepresented in transport data sets.⁶⁰ These trips, with the characteristics described above, often are undertaken by women and are needed for the maintenance and administration of the household, including education and health services, visits to relatives, daily shopping, and errands. Most transportation systems, however, are planned around the commute trip, centering a non-disabled male who works during the day, typically in a commercial district. This results in prioritization of motorized modes and peak public transport service design to commercial destinations at the expense of caregiving travel characteristics and needs, despite those trips representing a significant share of all trips made.

60 Inés Sánchez de Madariaga, “Mobility of Care: Introducing New Concepts in Urban Transportation,” in *Fair shared cities*, 2013.

For example, caregiving activities in Santiago, Chile, compose 47 percent of all trips made,⁶¹ and in the United States, commute trips only make up 16 percent of all trips nationwide.⁶²

This leaves caregivers to face a number of obstacles as they carry out essential activities with reduced mobility options. Mobility options depend on what modes are available, such as walking, cycling, transit, or private vehicles, as well as the dimensions of travel, like affordability, quality, safety, and ease of use. The reality is, though, that few caregivers have good mobility options and what options they do have do not adequately meet their travel characteristics or needs, resulting in stressful conditions or avoidance of the trip altogether.

While streets are the frontline of a city's open space, they are also the foundation of mobility. For most of the past century, streets have been designed for motorized vehicles and their throughput, often displacing other modes like walking, cycling, and transit and degrading the quality of the environment for all street users. Car-oriented infrastructure produces unhealthy street environments for babies, toddlers, and their caregivers by devaluing and decreasing open space, by increasing localized air pollution and noise pollution, and by increasing the possibility of injury or death from road crashes.



In families with primarily male breadwinners, men tend to increase in economic power and become more mobile, through either motorization (car/motorcycle) or convenient and reliable transportation options structured around 9 a.m. to 5 p.m. commutes. For female caregivers, looking after children may decrease their employment opportunities and mobility choices. Pune-Pimpri Chinchwad, India. Source: ITDP.

Traffic is one of the leading causes of air pollution in a city. Particulate matter is one of the major pollutants from motor vehicles and has correlated risks with lower birth weight, damaged lung growth, asthma, allergies, and preterm births.⁶³ Nine out of 10 people breathe unhealthy air, resulting in seven million deaths each year.⁶⁴ Poor air quality disproportionately affects young children, and acute lower respiratory infections are the second leading cause of death for children under five years old.⁶⁵ The negative impacts of air pollution on cognitive development and physical health for babies can start as early as the womb. About 18 percent of total preterm births were associated with exposure to fine particulate matter (PM_{2.5}).⁶⁶ Traffic also contributes to noise pollution, which degrades the environment and affects the cognitive development of young children.

61 Lake Sagaris, *New urban planning horizons from a gender perspective*, 2019.

62 American Association of State Highway and Transportation Officials, *Commuting in America 2013*, 2015.

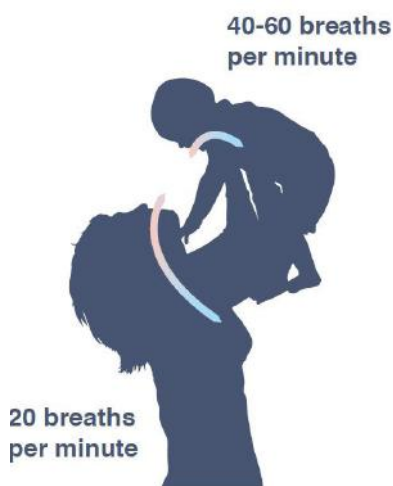
63 American Lung Association, *Living near highways and air pollution*, 2020.

64 World Health Organization, *9 out of 10 people worldwide breathe polluted air, but more countries are taking action*, 2018.

65 World Health Organization, *Number of deaths in children aged <5, by cause*.

66 Christopher S. Malley et al., *Preterm birth associated with maternal fine particulate matter exposure: A global, regional and national assessment*, 2017, 173–82.

Lower respiratory illnesses are one of the two leading causes of death in children between birth and five years old. Source: Health.huanqiu.com

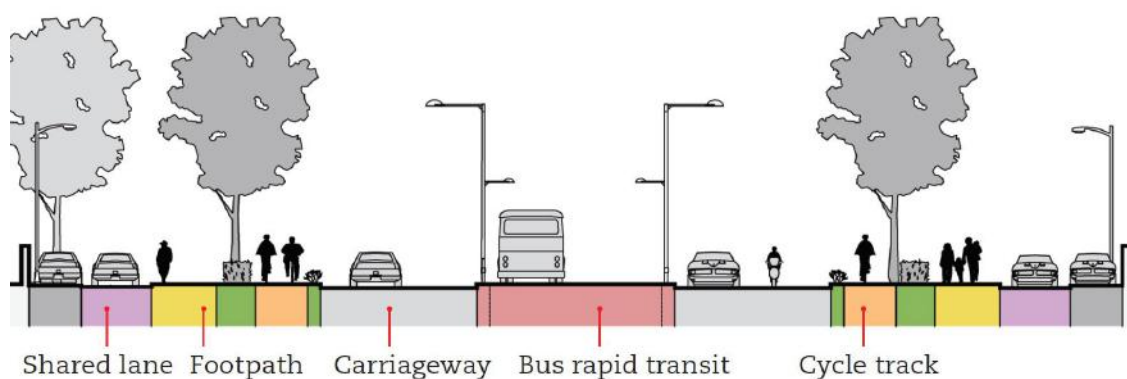


Air pollution is a major threat to babies and toddlers, considering they breathe polluted air into their developing lungs more quickly than older children and adults. Source: Bernard van Leer Foundation.

Because of the speed and number of motor vehicles, as well as a lack of street space for walking, cycling, and transit, road safety is a top risk and concern for families. Approximately 1.35 million people die each year from traffic crashes due to dangerous road conditions, in which speed is the biggest factor in the increased likelihood of death and increased severity of injuries from road crashes.⁶⁷ Road traffic injuries are the leading cause of death for children and young adults between the ages of five and 29 years old.⁶⁸ Globally, low- to middle-income countries account for 93 percent of child road deaths.⁶⁹ Not only do road crashes affect young children but they have the ability to increase the burden for caregivers when another member of the entire household is injured or killed.

Finally, climate change is expected to add to the caregiving burden of households through increased illnesses and extreme events. Transport is one of the leading contributors to climate change. Moving away from streets that prioritize private vehicle throughput to streets that are grounded in sustainable modes will also help reduce transport's contribution to climate change and hopefully climate change's burden on caregivers.

The overdominance of private motor vehicle planning has left our streets more dangerous and polluted and our cities less accessible. Moreover, most caregivers globally do not have access to private motor vehicles. The characteristics of caregiver mobility reveal the importance of proximity of services and the quality of the environment, both of which are at risk when streets are designed for private vehicles.



Complete streets provide space for sustainable modes, pedestrians, and cyclists, among them caregivers traveling with children. Source: Streets for Walking and Cycling in African Cities, ITDP, 2018.

⁶⁷ World Health Organization, *Road safety-speed*, 2020.

⁶⁸ World Health Organization, *Road traffic injuries*, 2020.

⁶⁹ World Health Organization, *Road safety-speed*, 2020.

Sustainable Mobility Options: Opportunities and Constraints

Streets need to be designed for multiple roles and multiple modes, specifically walking, cycling, and public transport. In addition to being cleaner modes than private motor vehicles, they confer more benefits to babies, toddlers, and their caregivers, from increased opportunity to interact with each other and their environment, to increased physical activity, to supporting a density of activities and destinations nearby. Designing streets for multiple sustainable mobility options—walking, cycling, and public transport—would give caregivers options to meet their needs, while also creating the most cost-effective, most efficient, and most resilient types of streets. Despite the potential of sustainable modes to improve travel and experiences in the city, current conditions for these sustainable modes largely fail to engender a clean, safe, and inviting environment for young children and their caregivers, mainly because the priority in street design has been motor vehicles. In the following sections, we look at these three main forms of sustainable transport to understand how they support baby, toddler, and caregiver mobility and what constraints these users currently face when using these modes.

Walking

Walking is a fundamental form of mobility for caregivers traveling with babies and toddlers. It is relatively reliable and predictable, and the simplest mode to plan around. A caregiver knows how long it will take to walk to a destination and does not need to factor in extra time for traffic, hailing services, following service schedules, or other trip planning factors. Walking provides flexibility for a caregiver to stop and attend to a child, to take a break, and even to return home more easily if needed. Walking also allows opportunities for interactions between the caregiver and baby or toddler, like talking and singing, as well as interacting with the larger environment. Walking stimulates young children's senses and helps with brain development because during the trip they can see, smell, and experience the world around them. Walking is also a key way for a toddler to get physical activity during the day.



Walking is a fundamental form of mobility for caregivers traveling with babies and toddlers. Monterrey, Mexico. Source: Héctor Ríos.

Walking is already how many caregivers worldwide travel, often because of a lack of choice. It is free, and affordability is usually the first lens through which a travel mode is chosen. Walking can be strenuous when distances are too long, infrastructure conditions are poor, or conditions are not safe because of urban or gender violence and road crashes. Whether caregivers choose to walk out of convenience or necessity, their experience can quickly turn into a stressful one in the following scenarios:

- **Discontinuous, poorly maintained, or nonexistent walkways:** Walkways, also known as sidewalks and footpaths, may not be paved, may have breaks or gaps, and may not have ramps, which makes traveling with a toddler or stroller harder. Walking infrastructure may also not exist at all, forcing people to walk in the roadway. Without a continuous and connected network of walkways, walking becomes more stressful and difficult for caregivers traveling with a stroller, walking hand in hand with a toddler, holding a baby, and/or carrying goods.
- **Narrow, overcrowded, or obstructed walkways:** Walkways are places for multiple activities and can quickly become overcrowded spaces. They often lack multipurpose designs to accommodate these different uses, like commerce, movement, art, greenery, leisure, rest, and play. Since caregivers with babies and toddlers travel more slowly and may take up more space because they need to walk side by side or because they are accompanied by family members, the sidewalk width may be too narrow to facilitate their movement while allowing others to pass and can lead to overcrowded conditions in the walkway, making it more difficult for families to navigate that space. Narrow walkways and obstructions from utility poles, signs, and similar obstructions, as well as encroachments like parked vehicles, disrupt caregiver travel and increase the likelihood of road crashes as they move to the roadbed to navigate around obstructions. The lack of a fine-grain street network inhibits mobility and access and can also lead to overcrowding. Many cities, especially in the fast-growing informal settlements and suburban areas, lack a sufficient public right-of-way.
- **Chaotic crossings:** The intersection is the most dangerous site while walking because it is where pedestrians interact the most with motorized vehicles and other modes. Because young children are hard to see and vehicles are moving and turning in many directions, caregivers must be vigilant as they negotiate traffic flow and assess risk for themselves and their dependents. In an attempt to address this, cities sometimes implement pedestrian under- and overpasses, which means pedestrians have to change the level that they cross at, either above or below the street.⁷⁰ Caregivers traveling with small children and/or goods may have to carry the children or the goods, or both, up and down stairs. This also makes the route much longer, with a pedestrian overpass that uses ramps being up to 14 times the length of just crossing the street. Because of caregivers' slower speed of travel, an increase in distance has a disproportionate time penalty. For a caregiver walking slowly, an at-grade crossing could take half a minute to cross, but a pedestrian bridge that uses ramps could take almost 8 minutes to cross. Furthermore, these isolating, segregated structures can be sites of urban violence, especially at night. At signalized pedestrian crossings, the time given to cross is sometimes not enough for slower-moving families, and without pedestrian refuge islands, they can be dangerous to cross for caregivers with babies and toddlers.

70 ITDP, [Pedestrian bridges make cities less walkable. Why do cities keep building them?](#), 2019.

- **Poor quality of local environment:** Factors such as air and noise pollution impact the pedestrian realm. Fast traffic also creates an unsafe and unsettling environment. Seating and places for caregivers to pause and rest, or feed and attend to a child, may not exist. Without shade from trees and shelter for different weather conditions, factors like heat, rain, and snow make the walking environment uncomfortable or difficult. A lack of street activity and/or street lighting also poses road safety and personal security risks, especially at night.
- **Distances too long:** As most caregivers desire to be close to home and not travel with a baby or toddler for extended periods of time, short walking distances to daily activities like markets and childcare are critical. Without services nearby, some caregivers walk very long distances, because they cannot afford other travel modes or those options are not reliable, predictable, or available. This is where land use and transport choice intersect.



LEFT: Lack of frequent and safe crosswalks forces caregivers to cross midblock and exposes them and the young children in their care to traffic injuries.

Salmiya, Kuwait.
Source: Samira Akil Zaman via Shutterstock.

RIGHT: Caregivers encounter obstacles in the footpaths, which force them into the roadbed and between the cars. Jakarta, Indonesia.
Source: ITDP.

Cycling

Cycling confers many of the same benefits as walking but allows for greater distances in a similar trip time. Cycling also allows caregivers to carry more, more comfortably. Because of that, cycling can give the caregiver greater flexibility and increase access to services that are beyond a reasonable walking distance. It can offer door-to-door travel convenience and reduced trip times, which help facilitate reaching multiple destinations in one trip (trip chaining). It also offers a multitude of health benefits, including increased physical activity, reduced obesity, and lower risk of cardiovascular disease and cancer.⁷¹ Cycling with a baby or toddler can be a time for interaction, connection, and engagement with caregivers, such as talking with the child (building vocabulary and supporting cognitive development), touching and being in close proximity with the child (social touch), and pointing out sights in their immediate environment. As with walking, babies and toddlers are more engaged with their environment when cycling and are more connected to their community. Children who are more active when they are younger have a higher likelihood of being more active throughout their life. Cycling also does not contribute to air or noise pollution. E-bikes offer even greater ease and comfort, especially when carrying children and goods or in topographically challenging places, but are more expensive.

Although cycling can be an affordable and flexible mode of transport for babies, toddlers, and those who care for them, caregivers with young children are underrepresented in cycling ridership around the world. The main reason is that cycling is perceived as dangerous and inaccessible for a caregiver traveling with a young child due, in part, to the following:

A toddler enjoys the movement, freedom, and sensory stimulation while cycling with their caregiver. Osaka, Japan.
Source: ITDP.



Without protected infrastructure and in chaotic environments, often the only people cycling are the most risk tolerant, usually young men.
Kampala, Uganda.
Source: Carlos Felipe Pardo.

- **Lack of connected and protected cycling infrastructure:** The first step for safe cycling is to provide physically separated, wide cycle lanes, but many cities lack protected bike lanes, and when they do have them, they are often not part of a connected network. Protected bike lanes are the best way to encourage cycling for the risk averse. Typical bike lane width standards of 1.5 meters fail to account for cycling side by side with a toddler, the need to pass cyclists biking at slower speeds, and wider cargo bicycle and tricycle designs that allow for carrying children and goods.
- **Dangerous intersections:** As with walking, intersections are the point of highest potential conflict and one of the trickiest moments in the journey, given the intensity of movement that occurs there. Unless the visibility of cyclists at intersections is elevated, cyclists face increased risk of collisions with motorized vehicles.
- **Lack of protected and safe bike parking:** Once a cyclist gets to their destination, they need a safe and secure place to park the bike while they complete their errand. Safe and secure bike parking can also be an issue at the caregiver's residence, where there may not be space inside the apartment or home for a bike, yet it may not be safe to park it outside for long periods of time. Bikes that can carry young children may have accessories or may be cargo bikes, so need more space for parking.
- **Lack of child-friendly bicycles and accessories:** Many people lack access to bikes generally, and especially bikes with seats for children, accessories for family traveling, or specially designed cargo bikes. Even if there is a bike retailer nearby, often they may not sell these types of cycling merchandise, or the merchandise will be expensive and out of reach for many. Bike-sharing systems could fill the gap, as they have been a way to increase access to bicycles, but almost none of them provide child-sized bikes or bikes with child seats, decreasing caregiver use of these programs.
- **Gender bias, harassment, and violence:** Most caregivers are women, and female cycling ridership is consistently low in most cities.⁷² Women underuse cycling as a mode of transport, and the gap widens when looking at the number of caregivers who cycle with children.⁷³ Women cycle less due to a multitude of factors, such as enculturation of women to be more risk averse, fear of urban violence or being harassed, and lack of access to cycles from a young age. Also, in some cultures, women are not encouraged or even allowed to cycle in public, or there is a social stigma against women riding bicycles.

⁷² Dasia Moore, *Women love bikes—so why don't they cycle to work?*, 2019.

⁷³ Kea Wilson, *Study: Cycling Rates Low Unless Women Are Riding*, 2021.

Cycling can be an empowering form of transport for young girls and women, but female cycling ridership is consistently low in most places. Learning how to cycle when young can help overcome this gap. Pondicherry, India. Source: ITDP



Public Transport*

Safe, reliable, and affordable public transport, including informal options and intermediate public transport, is vital to increasing access to key services like childcare, medical services, and public spaces, as well as economic opportunities for caregivers. In areas without nearby care destinations or where the walking and cycling conditions to access them are not safe and comfortable, transit is a critical lifeline for caregivers. For example, caregivers in a neighborhood in Lima, Peru, took motorcycle taxis to take children to daycare, even though it was within walking distance. One issue was that the walk was considered dangerous, especially for a caregiver who had no hands free as she was traveling with a toddler and carrying a child.⁷⁴



Istanbul's tram system has sufficient space for waiting, seating, shade, and lighting, as well as wayfinding and maps to help with trip planning. Turkey. Source: ITDP.

In Africa, Asia, and Latin America, public transport often constitutes a large portion of a city's mode share.⁷⁵ Public transport encompasses the full range of transit options, such as bus, rail, and informal modes, like matatus, dala-dalas, and minibuses. Informal public transport, also known as paratransit, typically operates using unscheduled services on fixed or quasi-fixed routes by an unregulated or loosely regulated private sector. Informal transit significantly contributes to public transport mode share in much of the world and expands transportation choices for many users, particularly women. Globally, women ride public transport more than men.⁷⁶ For example, in Kenya, 70 percent of the population in Nairobi uses matatus, and 60 percent of those riders are women.⁷⁷ Public transportation also includes intermediate modes, a shared mobility option

⁷⁴ BvLF, *Creating a safe walking route in hilly Lima*, 2019.

⁷⁵ Christo Venter et al., *From mobility to access for all: Expanding urban transportation choices in the Global South (working paper)*, 2019, 8.

⁷⁶ Heather Allen, *Module 7a: Approaches for gender responsive urban mobility*, 2018, 13.

⁷⁷ Flone Initiative, *Gender sensitive mini-bus services*, 2019, 33.

* Note from the editor: Around the world, multiple terms are used to describe public transport. In this paper, we use public transport, transit, and public transit interchangeably.

of lower capacity, such as shared two-wheelers, auto-rickshaws, cycle rickshaws, vans, tempos, jeeps, and jitneys.⁷⁸ In many cities, intermediate public transport provides more choices and access to populations who would otherwise remain immobile, such as caregivers. In India, a survey revealed that women compose 45 percent of auto-rickshaws users, but only 38 percent of bus users and 35 percent of rail users.⁷⁹ Due to personal safety concerns, the need for flexibility, and the complexity of traveling with families and goods, caregivers may prefer door-to-door options.



In many cities, intermediate public transport provides more choices and access to populations who would otherwise remain immobile, such as caregivers. LEFT: Agra, India. Source: Malcolm Payne via Shutterstock; MIDDLE: Kampala, Uganda. Source: Carlos Felipe Pardo; RIGHT: Bandung, Indonesia. Source: ITDP.

Public transport provides access to services and opportunities that babies, toddlers, and their caregivers do not have available within their immediate neighborhoods. Transit is also a faster, and sometimes a more comfortable, way to reach destinations than walking, especially if walking conditions are poor. Taking public transport can provide a space for caregivers to interact with their babies or toddlers, instead of focusing on navigating streets. A caregiver's role as passenger versus pilot creates room and time to sing, read, and talk with accompanying children and with other members of the community, as well as to attend to the children during the trip.

Public transport expands the possibility of reaching opportunities and destinations, but caregivers are more likely to forgo trips or travel under the following conditions:

- **Poor service planning for caregiving activities:** Transit service planning centers the commuting, non-disabled male and, as such, may not facilitate trips to destinations caregivers need to reach during the times they may be traveling. Public transport systems are often not connected and integrated with each other and other modes well, producing fragmented mobility systems for caregivers. This can increase both cost and time, and lengthen and complicate routes that caregivers take to reach destinations.

⁷⁸ Sonal Shah et al., *Women and transport in Indian cities*, 2017, 46.

⁷⁹ Sonal Shah & Aishwarya Rama, *What do women and girls want from urban mobility systems?*, 2019, 9.



Standing in line or waiting for buses without a place to sit or rest can be arduous when carrying young children. Recife, Brazil. Source: ITDP.



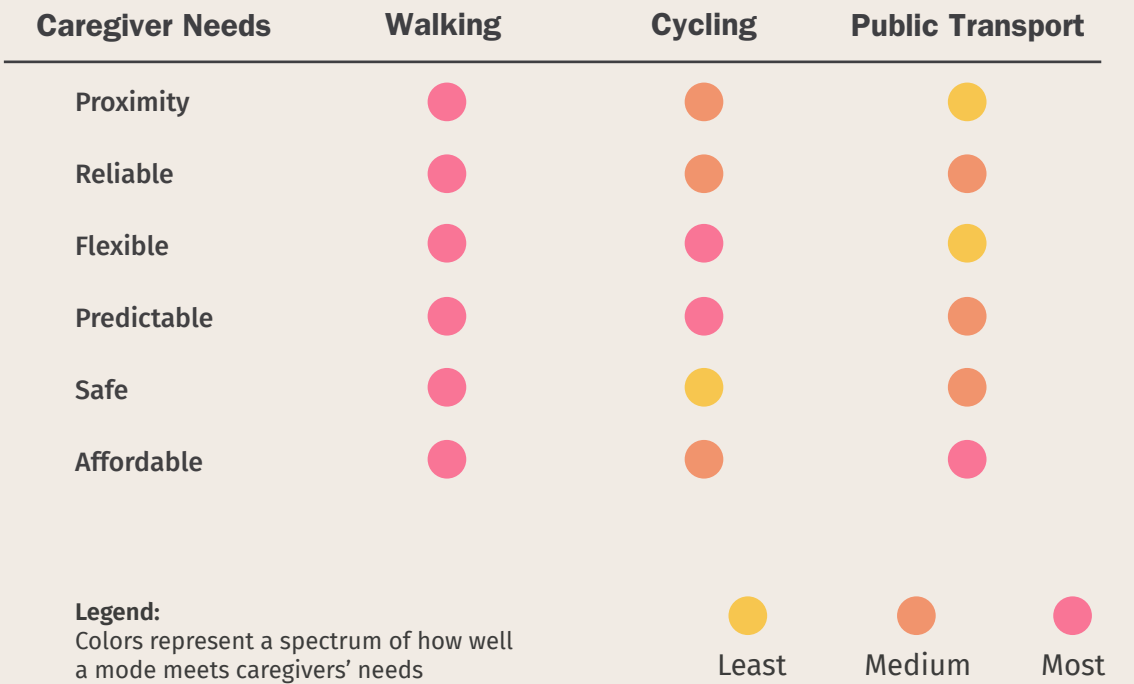
Bus stops without platforms for level boarding and vehicles with big steps make getting on and off the bus stressful and cumbersome especially when carrying goods or young children. Tiruchirappalli, India. Source: ITDP.

- Revenue and fare models that disincentivize caregivers:** Transit systems are often run exclusively or mainly on fare revenue. This results in overcrowding, as the more passengers per vehicle, the more revenue is made per vehicle. This also can result in a lack of services off-peak, as the revenue may not be sufficient to attract private sector operators, as well as longer travel times for passengers as vehicles wait until they are full before leaving. Informal transit often operates on the target system, where driver and conductor earnings are directly tied to the number of passengers carried. This can translate into the mistreatment of passengers and the harassment of women in particular. Other unfavorable conditions include insufficient time to board and alight vehicles as the operators chase after the next passenger, chaos at the curb as vehicles jockey for passengers, and speeding. Finally, many fare models do not allow for transfers to facilitate trip chaining. All this contributes to making journeys for caregivers stressful and expensive and potentially creating unsafe environments for babies and toddlers.
- Overcrowding and lack of space, including space for waiting or seating:** Partly as a result of this revenue model, services are often overcrowded. Moreover, caregivers are often traveling in groups, with children or other family members, and are carrying goods like groceries or supplies for babies and toddlers, all of which becomes harder in overcrowded spaces. Pregnant women and caregivers may not have a space to rest. Many systems, particularly informal public transport, do not have priority seating, and when they do, they bundle priority seating for multiple users, including older people, people with disabilities, and pregnant women. During peak hours or in overcrowded vehicles, seats may be hard to access for babies, toddlers, and their caregivers, and they may need to travel long distances while standing. A lack of a formal space for waiting, either in a station or at a stop, may mean a lack of protection from extreme weather, potential lack of security for those who wait, and conflict with other uses in that space.
- Systems that are not easy to use:** A lack of signage, wayfinding, and information about systems makes it harder for nonfrequent users to take public transport. Unlike commuters who make the same trip every day, caregivers are often doing specialized trips to nondaily destinations and may need help navigating to new places or may be unfamiliar with the system. Another issue is how easy it is to board a transit service, especially paying for transit when the passenger enters the vehicle. On-board fare collection presents a stressful boarding environment as caregivers make payment while juggling supplies and navigating tight spaces with a young child.
- Risk to personal security:** Overcrowded stop and station areas and vehicles, as well as the converse of empty vehicles and isolated areas, make caregivers and young children more vulnerable to potential security threats, like urban violence and harassment. Caregivers may be distracted by attending to children or have their hands full, which makes them vulnerable targets for crime. Poor illumination at stations and while accessing and departing transit areas, especially at night, can heighten caregivers' stress.
- Lack of universal access at stations and in buses:** Without at-grade boarding and off-board fare collection, caregivers face difficulties in accessing stations or vehicles with others and goods. Stairs in buses present obstacles for caregivers as they enter a vehicle while carrying a baby or lifting a stroller.

Framework for Mobility: Walking First, but a Multiplicity of Modes

For caregivers traveling with babies and toddlers, given that they are often traveling in less than ideal conditions and encumbered with supplies, a multiplicity of sustainable mobility modes and options would give them the most flexibility, and walking, cycling, and public transport all offer solutions and have different advantages for caregivers, babies, and toddlers. Given caregivers’ needs, ideally walking would be the first and best choice to fulfill the needs of babies and toddlers. But that only works well for the caregiver if services are nearby and walking conditions are good. When that is not the case, complementing walking with cycling can help expand access fivefold, and with public transport tenfold. Figure 4 reflects ITDP’s analysis of modes as they may meet the needs of caregivers, babies, and toddlers.

Figure 5: Mode Characteristics and Caregiver Needs



Mobility is fundamentally about how far a person can travel within a given amount of time. For each mode, how far a person can go (the distance) is dependent on speed. Given that proximity is paramount for caregivers, babies, and toddlers, the distance that different modes can achieve is critical to understanding what is accessible through mobility. We need to understand this spatial dimension of mobility–distance. Since speed will determine this, we will now look at each mode through the lens of speed and the things that influence speed: mainly user characteristics, environmental characteristics, and service characteristics.

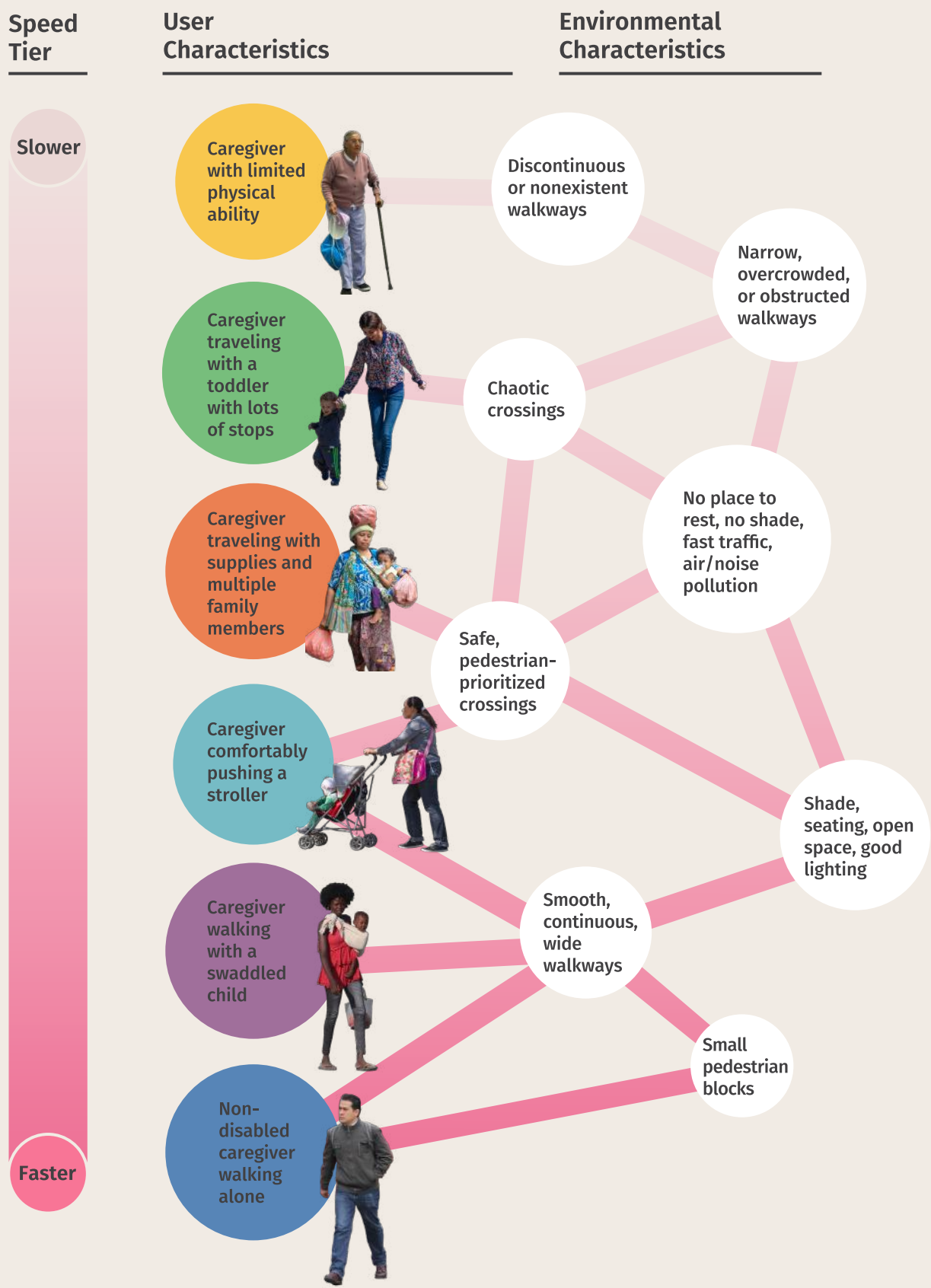
Walking

Walking ideally defines the neighborhood scale and should be the preferred mode for caregivers, but it depends on the local context. The two main factors that influence walking speed are user characteristics, including age, ability, fitness, and with whom and what the user is traveling, and environmental characteristics, which are the conditions of the walking environment discussed in the previous section. Each of these characteristics influence how far a person can go within a given amount of time—in other words, what a person can access. Figure 6 illustrates the factors in each characteristic that influence speed and thus what distance can be reached by walking. The following table is stratified into three levels of speed: (1) slower, with speeds under 33 meters per minute but that could be as low as 15 meters a minute; (2) medium, with speeds ranging from 33 to 66 meters per minute; and (3) faster, with speeds ranging from 66 to 132 meters per minute.



Adding a handrail at the height of a small child helps both the child and the caregiver navigate steps and feel safer walking. Lima, Perú. Source: Asociación Proyecto Alto Perú.

Figure 6: Walking Speed and Its Influences⁸⁰



80 UNICEF, [Shaping urbanization for children](#), 2018.
Aldis Run Larusdottir et al., [Evacuation dynamics of children - walking speeds, flow through doors in daycare centers](#), 2014.
Abel Tãiti Konno Pinheiro et al., [Walking speed of children by age under the lead of nursery school teacher on a sidewalk and overpass bridge stairs during an urban evacuation drill](#), 2014.
Kristin Agnello, [Strollers and scooters: Perspectives of a millennial planner living in a retirement community](#), 2017.
Canadian Council of Motor Transportation Administrators, [Countermeasures to improve pedestrian safety in Canada](#), 2013.

Figure 7: Walking Speed and Distance Ranges in 15 Minutes

Speed Tier	Speed Range	Distance Range
Slower	< 33 meters/minute	< 500 meters
Medium	33–66 meters/minute	500–1,000 meters
Faster	> 66–132 meters/minute	> 1,000–1,500 meters

Cycling

Cycling can expand what is accessible, while conferring many of the interactive and cognitive benefits of walking. Cycling speeds will vary because of the user characteristics, environmental characteristics discussed in the previous section, and service characteristics, including the bike. User characteristics include how comfortable and confident the cyclist is and if they are carrying goods or people. Environmental conditions look at the roadway and network, including most importantly if there are protected bike lanes. Service considerations include the availability of bikeshare and the quality and condition of the bike itself. A lack of data about cycling speeds for different users means that speed ranges are rough and ideally will be validated with research in the future. From the limited research there is, a regular, commuting cyclist averages about 15 kilometers per hour with a range of 14–29 kilometers per hour.⁸¹ In Lyon, France, using data from its bikeshare system, cycling speeds were on average 10 kilometers per hour, but during peak hours increased to 15 kilometers per hour.⁸² Because of a lack of data, we did not want to overly specify speeds and instead set up two tiers of cycling speeds to give a sense of how far a cyclist can travel in a given amount of time. Figure 8: Illustrates the spectrum of speed and its influences, including user, environmental, and service characteristics. Figure 9 translates that into distance ranges that can be achieved on a bike given the intersection of those characteristics.

81 Sustainability Info, [What is the average speed for urban cycling?](#)
82 Lloyd Alter, [New study shows urban cycling is faster than driving](#), 2018.

Figure 8: Cycling Speed and Its Influences

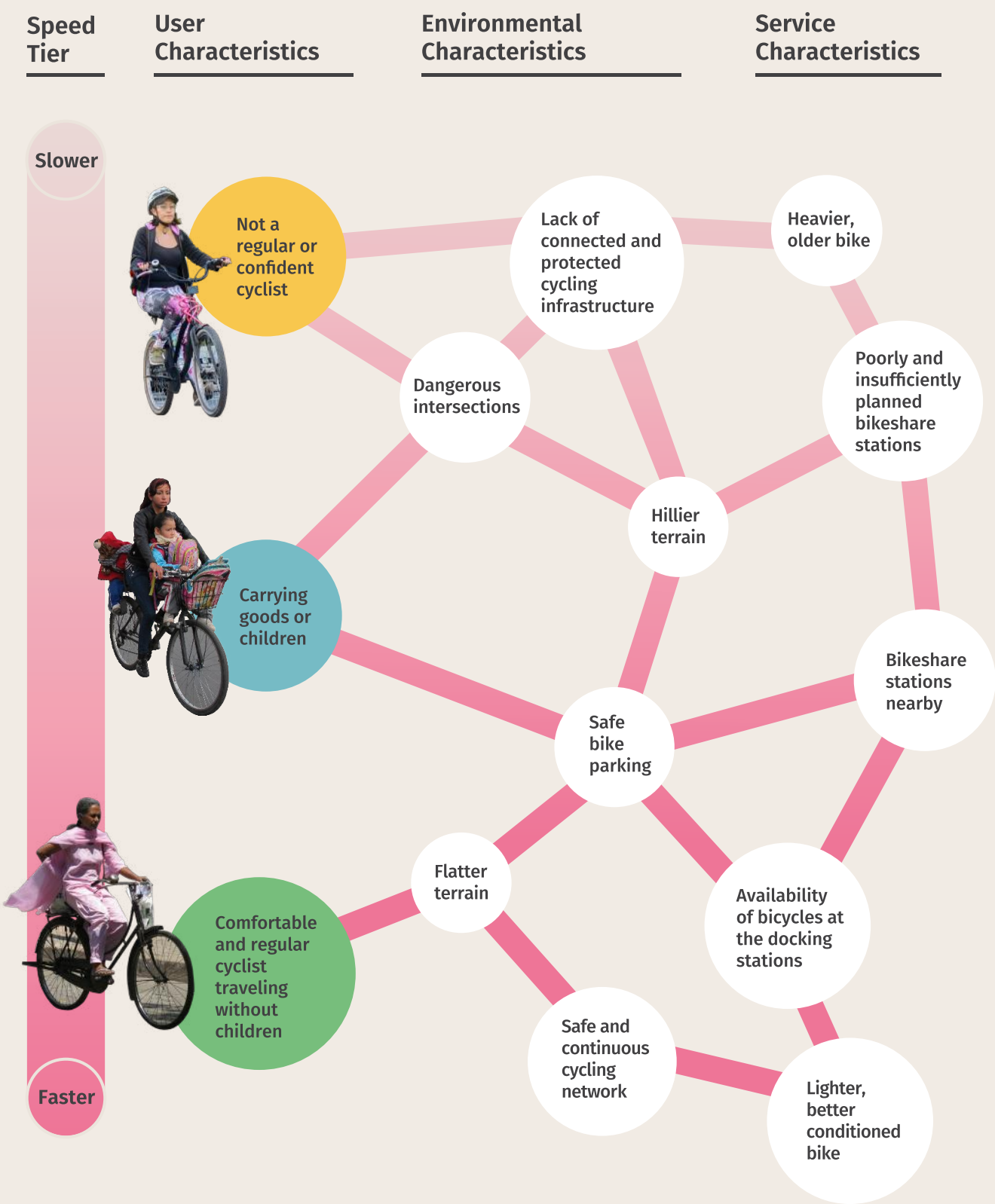


Figure 9: Cycling Speed and Distance Ranges in 15 Minutes

Speed Tier	Speed Range	Distance Range
Slower	< 10 km/h	< 2.5 km
Faster	10– 26 km/h	2.5–6.5 km

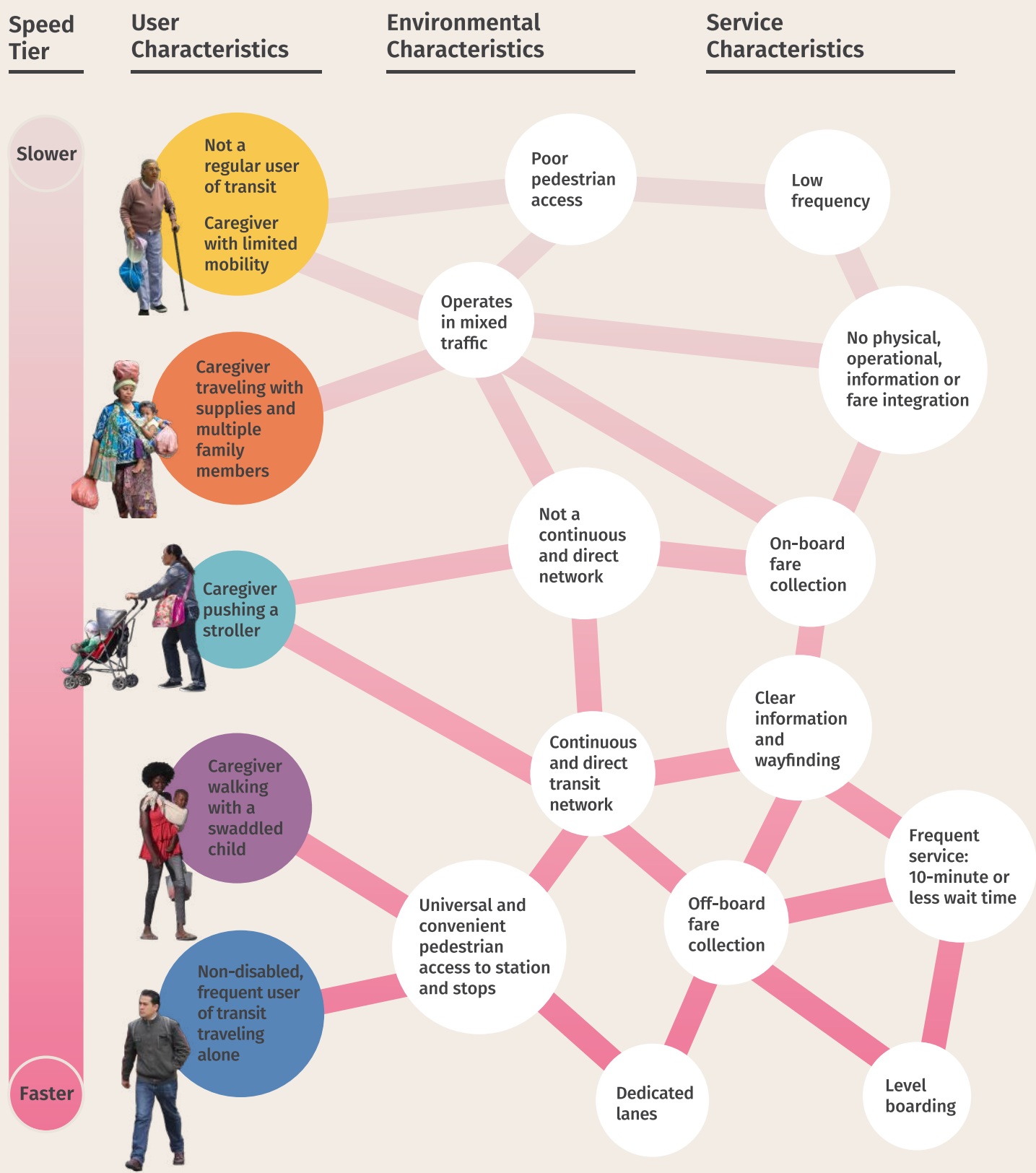
Public Transport

Public transport offers another way to reach more destinations within a given time, with opportunities for caregiver–child interactions between them and the community. User characteristics may influence how quickly a person navigates to and into the system and how easily they can board or alight a vehicle, but the main influences on transit speed are environmental and service characteristics. Figure 10 focuses on the distance and time in the vehicle, but the total trip time should account for those user characteristics that will factor in how long it takes to navigate to transit. Cycling and transit in congested mixed traffic are comparable in terms of what kind of distance can be reached in a given amount of time, but transit with a dedicated right-of-way can travel much further in that same time period. Speed data for bus, bus rapid transit (BRT), and rail is better documented, but for intermediate modes, the data is much sparser. The biggest impact on speed will be congestion, followed by delays at intersections and delays with boarding and alighting the vehicle.



Lack of dedicated bus lanes or level boarding can significantly cause delays in trip times for everyone, but especially caregivers encumbered with goods and children. Niteroi, Brazil. Source: ITDP

Figure 10: Public Transport Trip Speed and Its Influences⁸³



83 ITDP, *BRT Planning Guide*, 2017.
World Bank, *Urban rail development handbook*, 2018.
Tushar R. Bagul et al., *Analysis of autorickshaws as an intermediate paratransit system*, 2018.

Figure 11:
Public Transport
Mode Speed and
Distance Ranges
in 15 Minutes

Speed Tier	Speed Range*	Distance Range
Slower	< 10 km/h	< 2.5 km
Medium	10–20 km/h	2.5–5 km
Faster	20–40 km/h	5–10 km

* Speed range reflects the average operating speeds of the vehicles, which is influenced by the time spent at stops and stations and time stopped at intersections, along with the conditions of the road (mixed traffic, congestion, dedicated right of way).

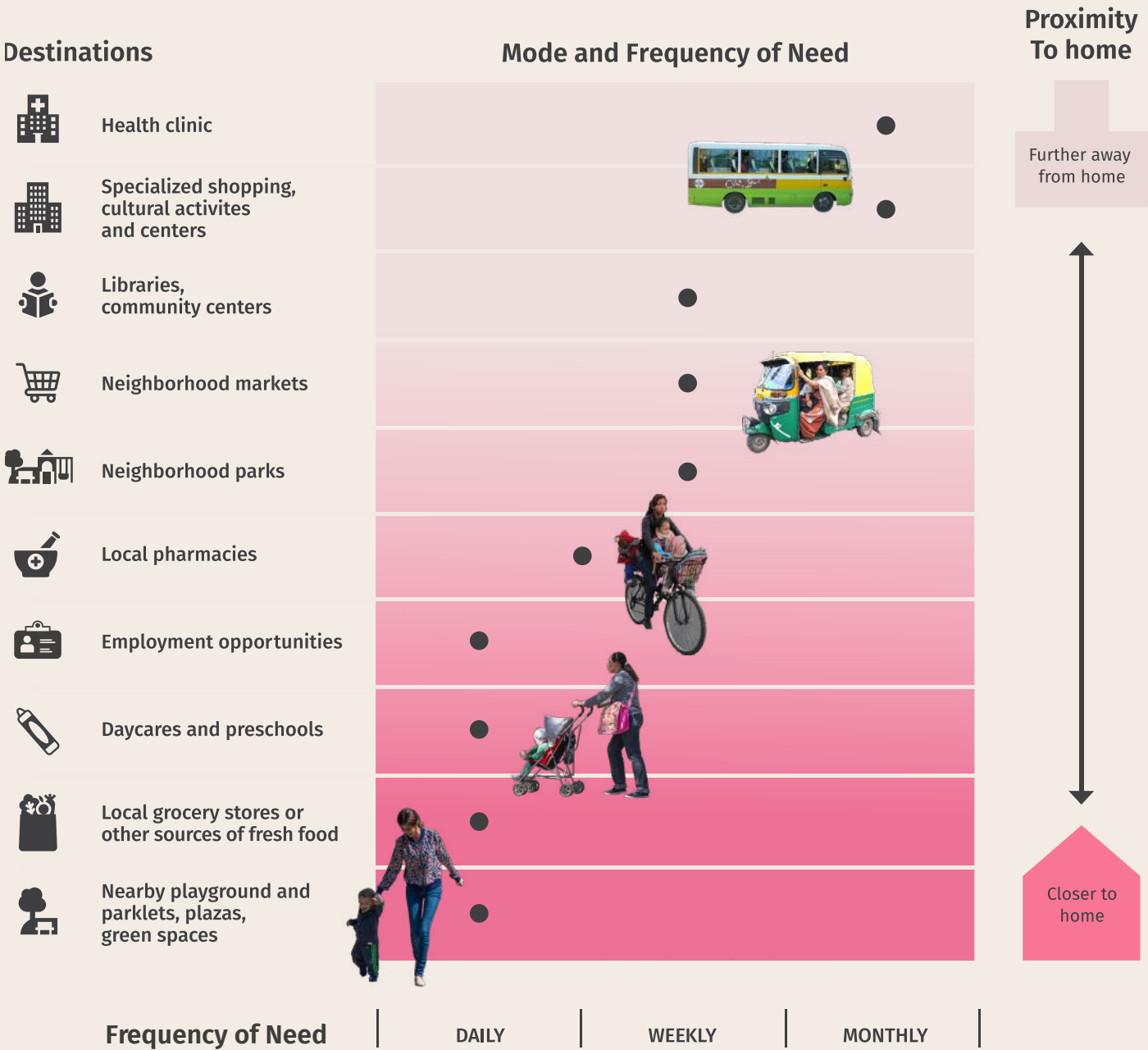
IMPROVING ACCESS: THE INTEGRATION OF LAND USE AND MOBILITY

Babies, toddlers, and their caregivers have specific needs for good growth, development, and well-being that can be facilitated only when land use and transport are integrated. Outside the home, the neighborhood is the most important space for babies and toddlers and their caregivers. For timebound and time-constrained caregivers, having destinations nearby and a safe built environment means they are able to travel with less stress, while having more opportunity and space to engage and play with their babies and toddlers. For babies and toddlers, with frequent sleeping and feeding schedules and lower ability to handle long trips, proximity also matters. Proximity is contingent on where services are located and the available mobility options, as understood through the lens of user, environmental, and service characteristics.

To create better access for babies, toddlers, and caregivers, we need to integrate the two frameworks from the previous sections. Our neighborhoods need to deliver on both proximity of destinations and multiplicity of modes, grounded in a good walking environment. This integration can help relieve stress for caregivers as they take care of young children and give time and space to caregivers to have warm and loving interactions with their young children. Babies and toddlers need stimulating and safe environments that facilitate play and development. Satisfying the density and diversity of services, while also delivering a high-quality pedestrian environment and public realm, is the foundation of access through integration, which will enable caregivers, babies, and toddlers to thrive.

Looking at mobility through the lens of babies, toddlers, and caregivers highlights how frequencies of need and mobility characteristics should inform the proximity of destinations from one’s home. These relationships are not always linear, as the mode choices depend on the intersectional understanding of the user, coupled with the options available and the conditions of the environment. Generally, though, the more frequent the need is, and the more dependent the trip is on walking, especially for the slowest walkers, the closer the destinations should be. Figure 12 summarizes how user characteristics intersect with the distance possible by various modes and the destinations they frequently need to reach.

Figure 12: Mobility Options and Destinations with Frequency of Need for Babies, Toddlers, and Caregivers



The next section offers recommendations to create better places that foster well-being and development for babies and toddlers, as well as their caregivers, based on the integration of land use and mobility needs.

RECOMMENDATIONS

“If children are not designed into our cities, they are designed out...deprived of contact with the material world, with nature, with civic life and with their own capacities.”⁸⁴

George Monbiot, Writer



Young children that feel safe to chase birds and caregivers that feel comfortable using buses show the result of creating walkable, mixed-use neighborhoods and safe, reliable, and affordable transport options. Bogotá, Colombia. Source: Carlos Felipe Pardo.

The recommendations for improving the well-being of babies, toddlers, and caregivers center on two main concepts that aim to strengthen local living at the neighborhood level with a multiplicity of mobility options and transport as the vital lifeline to the rest of the city. These concepts are:

1. **15-minute neighborhood: access to essential services and basic needs within 15 minutes**
2. **10-minute public transport: access to the rest of the city by way of transport that comes at least every 10 minutes throughout the day**

A **15-minute neighborhood** is a vision for how neighborhoods can meet the needs of babies, toddlers, and those who care for them. It recognizes that caregivers have limited time and babies and toddlers have limited ability to travel far from home. This is followed by the **10-minute public transport** framework, which sets the framework for making transport work for caregivers traveling with babies and toddlers. Each key recommendation has several sub-recommendations, which can be seen as the many pathways to achieve the vision of a 15-minute neighborhood or a 10-minute public transport system, as most places are far from these ideals. Cities need options for improving access for babies, toddlers, and caregivers, and these recommendations provide them.

The most important thing is to make it easier to care for babies and toddlers and contribute to their health and development, while lowering stress for caregivers. While these recommendations will create a better enabling environment for babies and toddlers and their caregivers, this is just the beginning for improving early childhood development. These conditions are necessary but not sufficient to enable families to thrive. This paper also provides implementation recommendations for policies and processes that would enable loving and caring environments and go beyond physical design.

15-MINUTE NEIGHBORHOOD

Outside of the home, the neighborhood is the most important space for babies and toddlers and their caregivers. Tirana, Albania. Source: Cecilia Vaca Jones/ Bernard van Leer Foundation.



A **15-minute neighborhood** is broadly understood as one where people have the ability within 15 minutes to reach daily services that facilitate local living and public transport that enables connection to the rest of the city. For babies, toddlers, and those who care for them, the neighborhood should be grounded in **walking**, because walking is the most flexible, affordable, and accessible mode of transport. Walking also gives toddlers and babies more opportunities for physical activity and cognitive development. The pedestrian network is the foundation, while walking conditions and quality of the public realm are critical elements that enable healthy physical, cognitive, and emotional development of young children and reduce stress for caregivers. But often, neighborhoods are not walkable, in terms of both the destinations reachable and the conditions for walking. Thus, the first priority is to meet the needs of babies and toddlers within 15 minutes, no matter the mode. Given the deficiency in many neighborhoods, 15 minutes can and will need to be achieved by other modes, especially cycling, intermediate modes, and public transport. The eventual goal, though, should be for daily services to be within a walking distance of 15 minutes.

The 15-minute neighborhood is not meant to be understood as a distinct, self-contained area, a self-sufficient enclave. Rather, it is a space connected to other neighborhoods of all sizes and the rest of the city through the range of modes and transport systems. At the core, 15-minute neighborhoods should be a measure of inclusive access for everyone, including babies, toddlers, and caregivers.

A 15-minute neighborhood grounded in 10-minute public transport is in essence transit-oriented development, as it allows access to destinations through a mix of land use plus sustainable and equitable modes of transport. A complete neighborhood should include at least one public transport station connecting efficiently to urban resources—employment, education, specialized services, cultural centers—located throughout the city. Transit-oriented development is a framework that can be used to create a better quality of life, with dignity, and a foundation from which to build cities for young children and caregivers, making urban environments friendly for all. Transit-oriented development enables equitable access to opportunities and services through eight core principles of sustainable access and mobility, urban design, and land use, namely WALK, CYCLE, CONNECT, TRANSPORT, MIX, DENSIFY, COMPACT and SHIFT.

To learn more, please see todstandard.org.

For babies, toddlers, and those who care for them, the neighborhood is grounded in walking, allowing young children to explore and play in the public realm. Guangzhou, China.
Source: ITDP

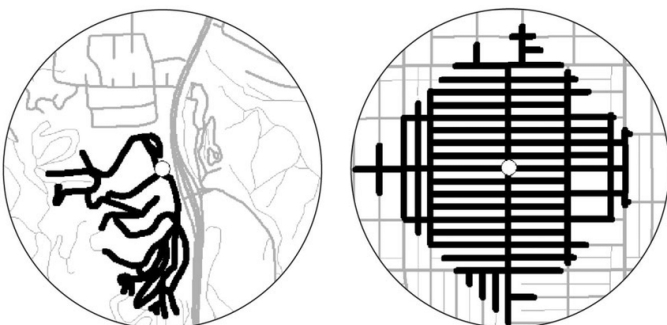


How Far Is 15 Minutes?

The 15-minute neighborhood is meant to define the basic unit of access. Ideally, it is achieved by walking, enabled by ample destinations and good environmental conditions. Because neighborhoods vary in context and condition, and not everyone can walk easily, other modes of travel beyond walking matter. This also means that the actual distances of access may be further than a 15-minute walk. These distances will vary depending on speed, which depends on:

- **The user:** the physical ability of the user, who they are traveling with and how (carrying, hand in hand, stroller), and what goods or supplies they may be carrying
- **The modes available and their service quality**
- **The environment:** the density and connectivity of the street network, the availability and quality of infrastructure, and the topography

The distance needed to travel is also based on where the person needs to go. The distribution of destinations and services that people need affects how far they have to walk, cycle, or ride to reach them. To understand what is reachable within 15 minutes, we have to look both at the mobility options and conditions and at the destinations. For babies and toddlers, locating the most frequent or critical needs, such as healthy food or places to play, closer within those ranges will matter.



The diagram on the left shows why the characteristics of the street network affect how far a person can go and why when measuring walking distance, the real distance should be used and not the radius. Both images show what can be reached within a walking distance of 600 meters from a center point in areas with different street characteristics. The dense and continuous street network on the right creates a greater coverage and therefore increases the ability to reach more services in the area within the same distance. The circle shows the radius of 600 meters from the center starting point.⁸⁵

85 Andres Sevtsuk et al. Patronage of urban commercial clusters: A network-based extension of the Huff model for balancing location and size, 2017

Given the range of walking speeds for caregivers with young children in different types of conditions, a 15-minute walkshed in this context can range from 225 meters to 1.2 kilometers, door to door. Most neighborhoods do not have all destinations available within a 15-minute walk, regardless of who is walking. Thus, while the goal of a 15-minute neighborhood is walkable distance, reaching destinations within 15 minutes on any mode helps time-constrained caregivers. When cycling, intermediate public transport, and transit options are added, the 15-minute access-shed can expand to 2.5 kilometers or more, depending on the conditions above. For public transport and bike share, the total trip time also needs to include the time needed to reach the service itself.

Since the distance achieved within 15 minutes can vary so much and the context of neighborhoods also varies, we set up three tiers grounded in distance to help develop options for measuring 15-minute access. These tiers can help understand the variety of neighborhood sizes and mobility options that facilitate convenient trips.

Figure 13: Tiers of Access within 15 Minutes

Baseline

Essential needs and services are within **2.5 kilometers** and easily and safely accessible by public transport or cycling

2.5 km

Good

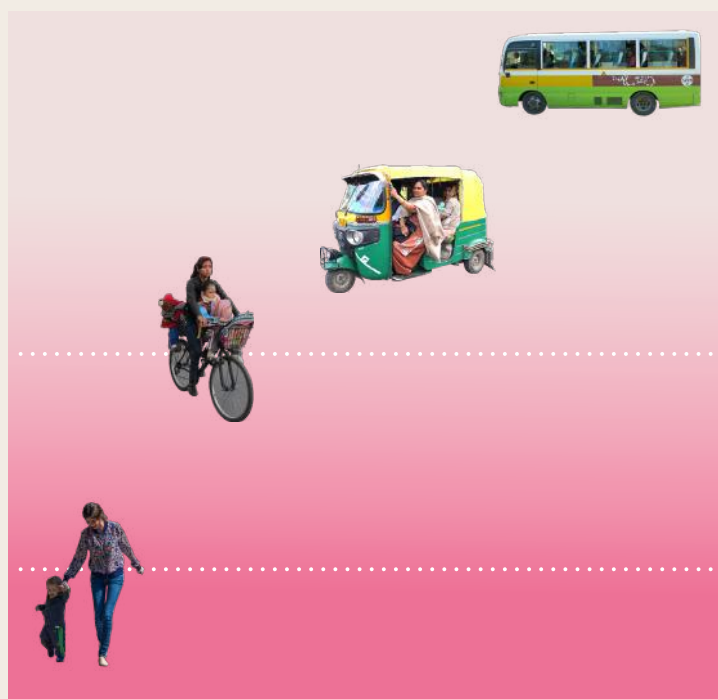
Essential needs and services are within **1 kilometer** and easily and safely accessible by walking, cycling, and public transport

1 km

Ideal

Essential needs and services are within **500 meters** and easily and safely accessible by walking

500 m



15 minutes
distance
from home

The five key objectives of the 15-minute neighborhood are:

1. **The basics:** Ensure basic utilities and public infrastructure systems that support the daily lives of families and allow for safe and convenient mobility are in place.
2. **Local mobility:** Make walking and cycling the preferred and most comfortable mode of local travel for babies, toddlers, and those who care for them.
3. **Local destinations:** Ensure key caregiving destinations are within walking or cycling distance of a mix of housing types, creating inclusive neighborhoods for all families.
4. **Local play:** Enable play by creating safe and healthy open space in the public realm.
5. **Local environment:** Reduce environmental stressors from motor vehicles by slowing speeds, reducing car use, and shifting space from cars to people.

1. The basics: Ensure basic utilities and public infrastructure systems that support the daily lives of families and allow for safe and convenient mobility are in place.**1.1. Provide basic urban services in good supply:**

- Water
- Stormwater management
- Sewage
- Solid waste management
- Electricity

Basic urban services and utilities (sewage, stormwater drainage, water, electricity, and solid waste management) are critical to the well-being of babies, toddlers, and those who care for them, as well as being the cornerstone for healthy and equitable walkable neighborhoods. Many places will need to be retrofitted for these services, or have the quality and quantity of existing services improved, or have temporary services installed. The rebuilding of roads is a good opportunity to retrofit for these services.

1.2. Ensure access to public transport:

- Intermediate public transport
- Informal public transport
- Buses and rail

Public transport is a public utility and essential service, and local residents need access to it within a walkable distance. Not only is public transport necessary to connect the caregiver to the rest of the city for employment opportunities, specialized services, and cultural, historic, and recreational sites, but most neighborhoods currently lack key destinations and services within a walkable distance for young children and their caregivers. Public transport, including shared two- and three-wheelers, informal transport, buses, and rail, is critical to increasing their access to these destinations. (Further elaborated in the recommendation for 10-minute transport.)

1.3. Ensure short blocks and sufficient public right-of-way for streets and open space:

- 30–50 percent of total land area in the city is public space, including street network
- Block length is 110 meters on average

Streets are one of the biggest sources of public space in a city, and a fine-grain street network is fundamental for creating short, direct, and varied access by walking or cycling. Streets and the public right-of-way should constitute on average 30 percent of total land area, and open space should constitute on average an additional 15–20 percent of total land area.⁸⁶ Optimal block length for walking and cycling is 110 meters or less. Cities with undeveloped land or without a grid system should prioritize design for sustainable modes like walking, cycling, and transit; building more urban highways should be avoided. For places with large blocks, short blocks can be achieved by creating public thoroughways midblock.

The Charkop sites and services program in Mumbai, India, during the 1980s made parcels of land with basic infrastructure, planned around short blocks, available to low- and middle-income households and self-help groups, who built it up and upgraded it incrementally over time to become a thriving neighborhood, as pictured now. Source: Sonal Shah.



86 Gregory Scruggs, *How Much Public Space Does a City Need?*, 2015.

2. Local mobility: Make walking and cycling the preferred and most comfortable mode of local travel for babies, toddlers, and those who care for them.

2.1. Provide a safe and continuous network for walking and cycling:

- Continuous and connected routes
- Dedicated and protected space
- Small blocks

A street network with adequate and safe pedestrian and cycling infrastructure, consisting of continuous and connected routes, offers a grid of convenient and direct routes in all directions. To ensure that they are functional, walking and cycling need to have dedicated space that is protected from motorized vehicles, especially parked vehicles. Small blocks help slow traffic, provide a direct network, and offer more choices of walking paths to suit individual needs. Continuous routes can include shared streets (if speeds are under 15 kilometers per hour and motor vehicle volumes are low) and greenways (pedestrian- and/or cycle-only streets and paths).

Road improvements should incorporate safe and convenient pedestrian infrastructure and ensure that pedestrian networks are connected.
Gondar, Ethiopia.
Source: ITDP.

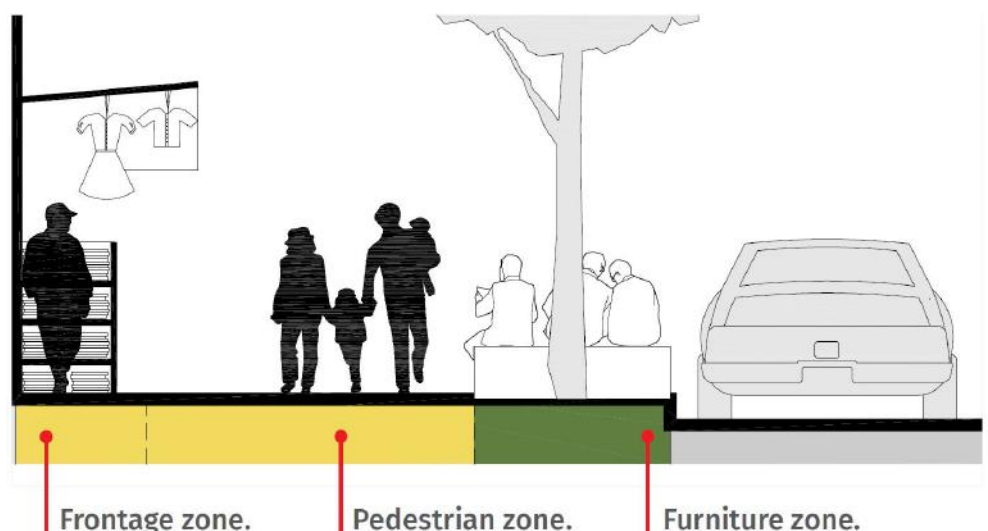


2.2. Create universally accessible, comfortable, and safe walking conditions:

- Smooth, wide, and paved walkways
- Unobstructed and protected walkways
- Good lighting, shade, and seating
- Active frontages
- Well-marked and well-lit crossings

Pedestrian walkways, such as sidewalks, should have a smooth, paved, and wide surface without obstructions from parked vehicles, utility poles, debris, and so on, for caregivers pushing strollers or using mobility assists. Sidewalks are public space and more than just thoroughways for pedestrians. They also need to accommodate the multiple functions that occur in that space. These functions can be understood as different zones of activity: the frontage zone close by the building entrances, the pedestrian zone for through movement, and the furniture zone near the curb where other activities can take place. Furniture zones can include benches and seats and places for caregivers to stop and pause with their babies and toddlers. If wide enough, these can also be places where people can wait for public transport so that they are not crowded onto the sidewalk or the street. Visually active and physically permeable building frontages increase safety and provide eyes on the streets to discourage urban violence; they may have a mix of activity of people entering or leaving the buildings or pausing to look in windows or at goods on the street. Finally, the pedestrian zone is the place for through movement and should be wide enough to accommodate a caregiver walking hand in hand with a toddler. The pedestrian zone should be at least 2.0–2.4 meters wide to accommodate two passing strollers, as well as some space for frontage and furniture zones. For more highly trafficked areas, like commercial areas or schools, the pedestrian zone should be much wider, at least 4.5 meters wide or more if there is a lot of activity.^{87, 88}

The sidewalk is a multifunctional space with three main activity zones: a frontage zone in front of buildings for people to enter and exit, linger, and look; a pedestrian zone that allows through movement; and a furniture zone that is a place for trees, lighting, and places to stop and sit. Source: Streets for Walking and Cycling in African Cities, ITDP 2018.



⁸⁷ Global Designing Cities Initiative, *Designing Streets for Kids*, 2020, 11.

⁸⁸ ITDP, *Pedestrians First*.

Safe and comfortable walkways should also have lighting, which helps increase the sense of security and can help extend time for play and leisure, allowing caregivers to take young children outside during the dusk and evening hours. Use of shade and shelter, such as trees, arcades, and awnings, keeps public spaces temperate and improves the quality of the pedestrian realm. Adding trash cans, public toilets, drinking fountains, and other street furniture makes walking, playing, feeding, and resting more comfortable.

A pedestrian plaza along a sidewalk in Harare, Zimbabwe incorporates shade and rest areas for caregivers awaiting local transport service. Source: ITDP.



Safe and comfortable crosswalks should be well demarcated, ideally at grade, raised to the level of the sidewalk; this will also act as a traffic calming device to slow cars and motorcycles while prioritizing the pedestrian path. But if not, crossings should be universally accessible with ramps and warning strips. Longer blocks should have midblock crossings for increased safety and convenience. Crossing should happen at intervals of 200 meters or less. If crossing more than two lanes of mixed traffic, pedestrian refuges should be available. Crossing times should allow time for slower walkers to clear the intersections before the light changes. Leading pedestrian intervals at signalized intersections help raise the visibility of pedestrians crossing and give them more time to complete the crossing. Leading pedestrian intervals have also been shown to reduce collisions between pedestrians and turning vehicles.⁸⁹

Safe, universally accessible crossings, like this tabletop crossing, are key to completing the pedestrian network. Fortaleza, Brazil. Source: Kiko Silva.



⁸⁹ National Association of City Transportation Officials, [Urban street design guide](#), accessed November 1, 2020.

2.3. Ensure safe, accessible, and convenient cycling:

- Wide and safe lanes
- Safe intersections
- Bikeshare
- Bike parking
- Child-friendly bikes and accessories



Cycling with a young child allows a caregiver to interact with the child while traveling. Availability of bike equipment, such as child seats and helmets, is important to accommodate caregivers cycling with children. Bogotá, Colombia. Source: Carlos Felipe Pardo.

Like with sidewalks, wider cycle lanes allow caregivers to travel with a bigger bike or tricycle, like a cargo bike, or with a small child cycling next to them. Widths for one-direction cycle lanes should be at least 1.8–2 meters.⁹⁰ Safety is one of the key concerns for cycling, and protected bike lanes have been proven as the best way to encourage cycling, plus they will alleviate stress for a caregiver.⁹¹ Designing safe intersections is critical to the cycling trip. Safe intersections minimize the places and times where people in cars and on bikes cross paths and make those crossings as safe as possible. This approach can include protected intersection design, simultaneous green for cyclists in all directions, or a leading cyclist interval at signalized intersections. Painting the cycle lanes through the intersection also gives a visual cue to motor vehicle drivers to expect cyclists, especially as they turn.

For caregivers to cycle, the convenience of cycling needs to be bolstered through close access of 300 meters or less to a safe cycling facility and adequate parking for bicycles, especially at key destinations such as transit stops, daycares, parks, and community centers. Bikeshare is a way to increase access to cycles for those who cannot afford a bicycle or do not have space to park one securely at home. For bikeshare to be useful to caregivers, it needs to be well integrated with the existing public transport systems, including with the fare. Bikeshare should also have bikes with child seats and carrying capacity. Caregivers who want to cycle with babies and toddlers will need access to bicycle stores nearby to buy and maintain cycles and obtain specialized accessories for cycling with a child. Electric bikes, although more expensive, could facilitate caregiver ability to bike longer distances and assist in traveling with dependents and goods.

In Fortaleza, Brazil, the exponential growth of cycleways and the implementation of bikeshare systems contributed to a substantial modal shift and a 153 percent increase in the number of cyclists between 2012 and 2017. This, coupled with other measures, has led to an overall decrease in road crashes of 40 percent. Source: Fortaleza City Hall.



⁹⁰ 2030 Palette, *Urban bikeways*, 2020.

⁹¹ Eric Jaffe, *The most important bike technology is ... street design*, 2020.

2.4. Promote and encourage walking and cycling through targeted programming:

- Programming and prioritizing of children's routes
- Car-free days and organized bike rides
- Cycling classes for caregivers and toddlers

While the goal is that every street is a child-friendly street, some routes that connect areas where families live to child-oriented destinations can be prioritized for improvements in safety and environmental quality. Interactive safety and design features can include elements of color, play, and nature. Crosswalks can include signs displaying the height of a toddler and placards to indicate that children are in the area to alert drivers to slow down. Slow zones can be created near key destinations for young children, like schools, daycares, or parks. Educational and awareness programs for cycling—including introductory cycling classes and car-free days or organized bike rides where caregivers and families can cycle without fear of crashes with motor vehicles—encourage cycling and build confidence. Specific courses for toddlers can teach them safe cycling and encourage cycling at a young age. Bicycle buddy programs, especially for women learning to cycle later in life, help encourage cycling among caregivers.

Interventions along designated children's routes add extra safety measures and stimulating elements for the caregivers walking and cycling with children to school or a local playground. Colors, textures, and traffic mitigating elements alert drivers about children's presence on a shared street in Jakarta, Indonesia. Source: ITDP.



3. Local destinations: Ensure key caregiving destinations are within walking or cycling distance of a mix of housing types, creating inclusive neighborhoods for all families.

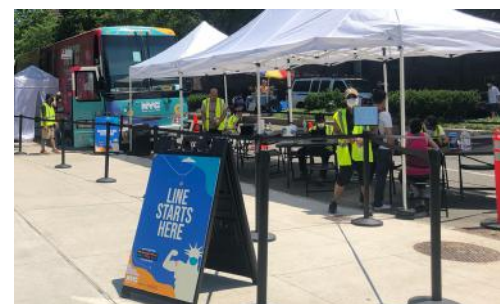
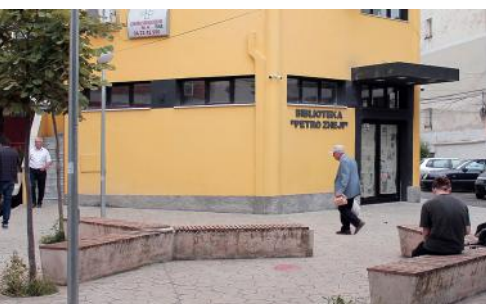
3.1. Ensure a diversity of key services and opportunities within walking or cycling distance:

- Mix of residential and non-residential activities
- Informal vending
- Mobile and pop-up services
- Clustered and co-located services

Mixed-use zoning that supports both residential and non-residential uses in the same or adjacent blocks should be the baseline and can be supplemented by public investment in open spaces, childcare, clinics, and so on. Presence in a neighborhood is the first step, but that alone does not mean those services are in sufficient supply or of good quality. Analysis begins with having these destinations and services within a walkable distance but then needs to expand to ensure sufficient supply and quality, which needs to be locally determined.

Colocating key services together can facilitate trip chaining and create clusters of childhood services and flexible, multipurpose spaces. Locating healthcare centers or daycare facilities near jobs, markets, public transport stations, and other frequent destinations can make trips short, multipurpose, and efficient for caregivers. Child-oriented services like schools, daycares, libraries, and playgrounds can also be clustered together, especially on public land. Creative uses of public areas, like schoolyards open to the public after hours and public parks holding space for fresh food produce or pop-up children's programming, provide opportunities for caregivers and young children to actively engage with their built environment and their community.

Few neighborhoods have a multitude of services, and changing land use and development can take time. Informal vendors often fill a gap in supplying neighborhoods with these services and can be looked to as a potential solution. Other solutions include bringing mobile services and pop-up pilots to areas that need them the most, such as low-income or marginalized communities, including services like mobile primary medical care, pop-up educational programs, mobile libraries, and mobile pharmacies. This 15-minute neighborhood analysis can identify the gaps that need to be filled.



LEFT: In Tirana, Albania, an underused building and car parking space were repurposed to accommodate a library, a clinic, and a safer open space serving the local community. Source: Qendra Marrëdhënie. MIDDLE: Having basic needs, like fresh food and laundry, close to where families live helps caregivers provide for the well-being of babies and toddlers. Buenos Aires, Argentina. Source: ITDP. RIGHT: Pop-up services, like this mobile vaccination bus, can be located near parks and activity clusters to be easily visible and accessible. Queens, New York, USA. Source: ITDP.

3.2. Provide for and protect local business and street vending:

- Small business support and preservation
- Informal vending

Small and informal businesses may provide needed services and local retail in neighborhoods, while also supporting the community as part of the local social safety net. Developing policies that help ensure these businesses can thrive and remain is key to supporting the robustness and resilience of the neighborhood. Planning for informal vending in public space is key to ensuring that these businesses can still operate without crowding the public realm.

A variety of small businesses such as pharmacies and informal fresh food stands are conveniently mixed in the fabric of a Gotera residential development. Addis Ababa, Ethiopia. Source: ITDP.



3.3. Ensure a diversity and density of housing types:

- Upgraded informal housing
- Public and social housing
- Affordable housing policies
- A diversity of housing allowed by right

Density enables sufficient supply of housing, of which cities world-over are facing shortages. The first rule of providing affordable housing is to not destroy the existing stock of low-income housing, which in turn preserves local social safety nets. Therefore, preserving and upgrading informal settlements is the first step to ensuring this diversity and density. Affordable housing policies and public housing can help diversify neighborhoods. Developers should be encouraged to build affordable housing and a diversity of dwelling types for families of different sizes and incomes, from smaller units with communal utility rooms to multi-bedroom apartments to multi-dwelling homes. Housing policies to promote mixed-income areas, such as designating and preserving a number of affordable units, are also critical to creating an inclusive community.

The Yerawada community in Pune, India, was upgraded gradually based on no-displacement principles also known as “in-situ upgrade.” Over time, the neighborhood established healthier living spaces for the residents and secured commercial space for the home-based businesses. Source: Shreesha Arondekar.



4. Local play: Enable play by creating safe and healthy open space in the public realm.

4.1. Increase access to and activate open space:

- Diverse and frequent open spaces
- Activation for different ages
- Educational programming for different ages

Open spaces of all sizes, including parks, playgrounds, plazas, and smaller areas in the public realm, are paramount to the healthy development of babies and toddlers. Parks and playgrounds need to be designed for the different needs of young children at different ages and include loose elements for free play, landscaping with nature, and opportunities for exploration. Incorporating sound, variations in elevation for climbing, and tactile opportunities, such as sand and water, helps open spaces become places of creative engagement and play. A child should be able to be safely on their tummy (tummy time), climb, jump, run, or practice standing. Key features in parks, playgrounds, and plazas also include seating for caregivers (preferably near where the children play), public restrooms, water fountains, lighting, changing areas for babies, and protection from different weather conditions (rain, heat, snow, sun). If parks and public areas are not available, new spaces can be opened by identifying underused or vacant land to be repurposed into a green area or public space. Using existing space, like school yards, for public use after school hours is another way to increase access to open space.

Programming in open spaces builds civic and social infrastructure and provides opportunities for positive interactions between babies, toddlers, and those who care for them, and among the caregivers themselves. Such programming could include storytelling in the park, “play in a box” mobile units with materials for children, mother–baby meetups, a community garden, and parenting classes. Public spaces also become good areas for public sector outreach like vaccination campaigns or maternal health education.

Community and educational programs promoting children’s physical activity like this cycling school for toddlers, provides both outdoor time and social interaction. Santiago, Chile.
Source: Carlos Felipe Pardo.



4.2. Activate streets for play:

- Parklets
- Open streets
- Play streets
- Play elements in the streetscape

As mentioned in recommendation 2.2, sidewalks should have space for stopping, pausing, and sitting. More than that, though, streets can become open spaces themselves. Interventions can include creating parklets from converted parking spaces, opening the street up entirely to pedestrians and cyclists, and creating play streets. Temporary or permanent open streets, where streets are open to pedestrians and cyclists and motor vehicles are not allowed, can greatly expand the number of public spaces that are closer to home for babies, toddlers, and their caregivers. By not allowing through traffic, an open streets program promotes walking, cycling, and outdoor activities locally. Ciclovias, car-free days, and weekend closures are examples of this. Implementing play streets, streets closed temporarily either for a fixed duration like during school vacations or a fixed time during the day, can be specifically programmed for play activities and provide safe spaces for outdoor exploration. Another technique for play streets is to use chicanes, alternating midblock curb extensions that give the road a serpentine configuration to slow cars down, allowing for landscaping or pocket areas for play. Temporary play streets and car-free days are also effective intermediary interventions in neighborhoods to encourage community participation and inclusivity.



LEFT: The participatory planning project in Sao Paulo, Brazil, created visual and play elements, including a slide along the stairways connecting the hilly parts of Jardim Nakamura neighborhood. Source: Cidade Activa. ABOVE: Parklets can use elements of play, shade, and comfortable seating where caregivers can rest and interact with their babies and toddlers. Tel Aviv, Israel. Source: Courtesy of Nadel Roizin Architects. BELOW: New York's temporary protected play parklets during the COVID-19 pandemic created opportunities for outdoor play and learning for young children. Using plain and simple elements not only promotes play but also activates the pedestrian realm. Source: Street Lab.

Activating streets can also include adding colorful paint for visual engagement and adding tactical elements for children to explore, both of which will contribute to their cognitive development. Activating urban spaces and streets in collaboration with local artists through bright colors, artwork, tactical urbanism, and other creative means produces a vibrant and stimulating outdoor environment for babies and toddlers. This can include play opportunities like hopscotch or other visual or physical elements for play.

4.3. Invest in green infrastructure to increase the quality of open and play spaces:

- Trees and street landscaping
- Bioswales
- Green spaces

Nature provides recreation, stimulation, exercise, solace, and a multiplicity of benefits like physical and mental health relief, community building, and leisure outside of privatized urban quarters.⁹² Greenery on streets provides shade and makes a more comfortable walking and cycling environment for babies, toddlers, and those who care for them, as well as helping clean the air, cool temperatures, and facilitate stormwater management. Urban design and architectural features include rest and play areas integrated into the design of the streetscape, such as small and frequent open spaces, foliage, and shading. Planters can be used as protectors of open space while also providing greenery.

Adding green space to a pedestrian zone lowers the temperature, helps clean the air, and provides ways for young children to interact with nature. Guangzhou, China. Source: Karl Fjellstrom



92 Eric Jaffe, *The (pretty much totally) complete health case for urban nature*, 2015.

5. Local environment: Reduce environmental stressors from motor vehicles by slowing speeds, reducing car use, and shifting space from cars to people.

5.1. Slow cars and improve safety through policies and design:

- Safe street design
- Traffic calming
- Slow zones and low speed limits
- Vision Zero

One of the main ways to reduce the impact of cars on children's safety and health is to devise policies that limit motor vehicle speeds, as speed is the biggest factor in the severity of a crash. The first step is to make streets safe by design, where the design encourages cars to go slower through the use of narrower street widths, tighter turn radiuses, more limited sight lines, and other measures. Traffic calming measures, such as speed bumps, raised crosswalks, chicanes, and curb extensions for shorter crossing distances, can be implemented in child-priority areas. These interventions can also help reduce the need for enforcement of speed limits. Lowering speed limits is another critical intervention. Cities can designate slow or school zones where car speeds do not exceed 30 kilometers per hour, typically implemented in residential areas, around schools, and in high foot traffic areas. Many cities are implementing 50 kilometers per hour as the maximum speed for city streets, with 30 kilometers per hour for residential and dense urban areas. Above 30 kilometers per hour, the probability of death from a crash rises exponentially.⁹³ Policy frameworks, like Vision Zero, aim to increase pedestrian safety from cars through measures like speed management, street redesign, and local community engagement. Vision Zero strategies can prioritize key areas where children occupy spaces, like near schools and playgrounds, to increase safety measures.

In the State of Nuevo Leon, Mexico, the Vision Zero initiative aims to reduce the number of deaths and injuries caused by traffic by 50 percent. The initiative mobilizes the state's municipalities to join forces in increasing road safety. Source: Héctor Ríos.



5.2. Reduce polluting private motor vehicle use to improve air and environmental quality:

- Dedicated public transport lanes
- Low- or zero-emission zones
- Pricing mechanisms (congestion, on-street parking)
- Limiting of through traffic
- Elimination of off-street parking requirements

The main way to reduce private motor vehicle use is to give people other, better options. A dedicated lane for public transport not only reduces private vehicle use by reducing the space allocated to it but also creates a more reliable option for using public transport. Additional policies and interventions can limit the exposure of babies and toddlers to air and noise pollution from private vehicles, such as low- or zero-emission zones, superblocks that limit through traffic, congestion pricing, and elimination of off-street parking requirements. On-street parking management regulates and controls private vehicle use by limiting and pricing parking spaces. Also, creating car-light or car-free areas near or on specific routes to childcare facilities and schools can reduce local air and noise pollution where children may be frequent visitors or users.

5.3. Reclaim street space from cars for open space:

- Narrowing of mixed traffic lanes
- Curb extensions
- Tighter turning radiuses
- Conversion of parking space
- Streets as parks

Streets are a city's main public space, and some redistribution of street space from cars and motorcycles may be necessary to rebalance the purposes and functions of a street. This can be achieved by repurposing parking spaces, narrowing vehicle lanes, and closing streets to motor vehicle use. Streets can be permanently converted to parks, and parking spaces can be converted to parklets and resting and feeding areas for caregivers with toddlers and babies. Curb extensions reclaim road space from car use while expanding it for the pedestrian realm. They reduce the space in which a caregiver walking with young children is exposed to mixed traffic, while also helping to slow cars down. Tightening turning radiuses with curb extensions helps slow cars down while again extending the space for pedestrians. Curb extensions can be achieved through tactical interventions using planters and paint or through permanent interventions.

During the COVID-19 pandemic, along the Avenida de los Insurgentes in Mexico City, Mexico, an “emerging” bike lane was implemented, converting on-street parking into cycling space to help alleviate overcrowding on transit. It will now become permanent. Source: ITDP.





Curb extensions, using paint and planters, help tighten the turning radius for motor vehicles, which slows them down, and reinforces the speed limit of 20 kilometers per hour. Buenos Aires, Argentina. Source: ITDP.

Additional Resources

- [Proximity of Care](#), ARUP
- [Infant, Toddler, Caregiver-Friendly Neighbourhood \(ITCN\) Framework and Guidelines](#), Bernard van Leer Foundation
- [Playground Ideas for 0-3 Years](#), Bernard van Leer Foundation
- [Urban 95 Starter Kit](#), Bernard van Leer Foundation
- [Designing Streets for Kids](#), Global Designing Cities Initiative
- [Vision Zero for Youth: Making Streets Safer One School Zone at a Time](#), ITDP
- [TOD Standard](#), ITDP
- [Pedestrians First, Tools for a Walkable City](#), ITDP
- [Streets for Walking and Cycling](#), ITDP Africa
- [China Child-friendly City Blue Paper](#) (in Chinese), ITDP China
- [The Need for Safe Intersections](#), ITDP India
- [Joint Use Toolkit](#), Kaboom!
- [Kindlint](#), Reframing Studio
- [Playing Out UK](#)
- [Cities Safer by Design](#), World Resources Institute

10-MINUTE PUBLIC TRANSPORT

A well-designed transport system for caregivers traveling with young children is one where all the elements, from the network to the stations to the vehicles, work together to create safer, more comfortable, and more efficient journeys.
Source: ITDP.



Public transport is identified as a core basic service in the 15-minute neighborhood. While a 15-minute neighborhood addresses the need for key destinations nearby, public transport is the vital connection between the neighborhood and the rest of the city. It serves as the lifeline for cities and links families to key goods, hospitals, services, and employment opportunities outside of their immediate neighborhoods. Moreover, in many neighborhoods with few to no services nearby, caregivers may have to travel further to reach key destinations. While part of the foundation of a 15-minute neighborhood is access to public transport, it is the quality of the public transport that will enable access for caregivers traveling with babies and toddlers.

The quality of public transport is grounded in service—the extent to which it is reliable, affordable, accessible, safe, and easy to use. To achieve this, the building block is **10-minute public transport**, where people have no more than a 10-minute wait for public transport that is within a walkable distance. Ten-minute public transport reduces stress and travel time for babies, toddlers, and their caregivers through:

- Reduced travel time because of regular or increased frequencies, including at transfers or when making connections
- Increased travel flexibility with frequent schedules all day, not just during peak commuting hours
- Reduced waiting times and reduced variability of waiting times
- Less crowding and isolation
- Better ability to plan trips because of increased reliability
- Improved accessibility to services not in proximity to their household

While the minimum starting point is that public transport is available and frequent, public transport also needs to work well for its passengers. The five key objectives to achieve 10-minute public transport that is affordable, reliable, accessible, safe, and easy to use, while also promoting the health of its passengers, are:

1. **Network and service design:** Ensure caregivers can travel easily, comfortably, and safely throughout the neighborhood and city
2. **Station and stop design:** Plan stops and stations to be accessible and good environments for caregivers traveling with babies and toddlers
3. **Safety:** Improve personal security for caregivers traveling with young children
4. **Fare policy:** Increase accessibility and ease of use through an equitable fare policy
5. **Integration:** Increase accessibility and ease of use through integrated transport systems that facilitate trip planning and navigation

1. Network and service design: Ensure caregivers can travel easily, comfortably, and safely throughout the neighborhood and city.

1.1. Develop a connected public transport network grounded in a fine-grain street network:

- Fine-grain street grid
- Integration with other forms of public transport

For public transport to work, it needs to be a connected network that reaches the whole city, including not only commercial districts but markets, recreational sites, cultural institutions, historic places, medical specialists, and—importantly—residential clusters. The goal of a 10-minute public transport, well-connected transit network is to ensure that people are able to travel anywhere in the city by a reasonably direct and quick path.⁹⁴ This is facilitated by a fine-grain street grid with streets that serve different functions, such as arterials that can handle the size and volume of public transport vehicles and local access that allows more convenient and direct access to public transport by walking, cycling, or intermediate public transport. Often, this means colocating other public transport services near each other to facilitate those connections.

TransJakarta, working to integrate informal transit with the BRT, has increased its service coverage to 83% of the city's population.
Source: ITDP.



94 Jarrett Walker, *The power and pleasure of grids*, 2010.

1.2. Provide frequent, all-day service with extended hours of operation:

- 10-minute all-day frequency
- Extended hours of operation
- Weekend service

For public transport to be reliable and easy to use, frequency is a cornerstone of service design. Public transport frequency that is under 10 minutes all day helps relieve the need to plan trips and gives more flexibility, especially during off-peak times, when caregivers may be traveling. It can also help reduce overcrowded conditions on the vehicles. Overcrowding can increase stress, prevent caregivers from using a service, or provide more opportunity for crime or harassment. Frequent service must be available to passengers throughout the day, at least 16 hours a day, but ideally 20 hours for caregivers who need to travel late at night or early in the morning to access jobs. Weekend service that is frequent and all day enables caregivers to access employment, markets, or other recreational, cultural, or historic places and activities.

1.3. Dedicate space for public transport in the roadway:

- Dedicated lanes
- Transit-only streets (i.e. transit malls)

Reliability and predictability are important for caregivers, who may be concerned about long travel times with babies and toddlers; every extra minute of travel is a possible risk or an increase in stress. Reliability can be improved through dedicated lanes that help public transport vehicles not get caught in congestion with mixed traffic. Dedicated lanes speed up vehicle times and reduce time spent in-vehicle to reach destinations. Transit-only lanes also improve road safety, as other vehicles are not jockeying for passengers at the curb and creating a chaotic experience for babies, toddlers, and their caregivers as they board and alight. For dedicated lanes to be effective, they need to be protected from the encroachment of turning vehicles and parked vehicles. For that reason, placing dedicated lanes in the median is recommended, as opposed to aligning them with the curb. Transit malls, where only public transport vehicles are allowed, usually along with walking and cycling, are another way to dedicate space to transit and increase reliability.

The Dar es Salaam, Tanzania, BRT system has both dedicated bus lanes on a major arterial and a transit mall in the downtown, where only the BRT buses, cyclists, and pedestrians are permitted. This has reduced travel times from the Kimara terminal to the city center from 2 hours to 45 minutes.

Source: ITDP.



Belo Horizonte, Brazil, has a transit mall in its downtown where only buses, pedestrians, and cyclists are allowed.
Source: ITDP.



1.4. Provide vehicles that allow caregivers, babies, and toddlers to travel safely and comfortably together:

- Priority seating for families in vehicles
- Newer vehicles or cleaner technology
- Level boarding

Inside the vehicle, having space for families traveling together, with supplies or with bulky mobility assists like strollers, is key to enabling caregiver travel with babies and toddlers. Priority seating for pregnant women, as well as babies, toddlers, and their caregivers, allows for them to interact, rest, and play, while making it easier for caregivers to tend to the needs of babies and toddlers. It is also safer for caregivers to do so while seated while vehicles are moving and not have to be preoccupied with potential for crime, such as pickpocketing. Using newer buses with cleaner technology, such as electric motors, can minimize emissions in the transport corridor and near waiting areas. A level boarding option inside the vehicle, meaning no stairs as a passenger enters, should be the default, even if the bus has steps in the back section of the vehicle. Low-floor buses may be easier as they create level boarding opportunities with the station or stop and do not have stairs at the entrance that need to be navigated upon entry. High-floor buses will require a raised platform at the station or stop to enable level boarding.



LEFT: Low-floor buses coupled with a boarding bridge from the station to the bus allow easy entry into the bus in Yichang, China. Source: ITDP.
RIGHT: Signage indicates where caregivers with strollers should board the bus so that they enter where there is space for the stroller inside the vehicle in the BRT system in Cape Town, South Africa. Source: ITDP.

2. Station and stop design: Plan stops and stations to be accessible and good environments for caregivers traveling with babies and toddlers.

2.1. Dedicate space for well-maintained, safe, and comfortable stops and stations:

- Ample space
- Seating
- Shade and weather protection
- Colocated public facilities

Waiting for public transport in safe and comfortable spaces allows caregivers to rest and young children to move and play, and provides space for their belongings. Sufficient and ample space, especially for stops adjacent to or in the walkway area, is fundamental for riders as they wait to board and when they alight, as well as to allow for adequate passenger circulation and for other functions like ticketing and information. For stations, the minimum width should be 3 meters, but ideally 4 or 5 meters for higher volumes, and for stops located adjacent to the sidewalk, the minimum should be 1.5 meters in addition to the walkway area. This minimizes conflicts with pedestrians and circulating passengers, reduces overcrowding, and improves the perception of personal safety. Overcrowded stations and stops are more likely to encourage pickpocketing and harassment.

Stations and stops should offer some form of weather protection, such as trees, canopies, or enclosed areas. Seating and benches help alleviate, for caregivers, the burden of waiting and can provide areas for tending to babies and toddlers, including feeding them. Conveniently located public facilities, such as public bathrooms, baby changing stations, drinking water fountains, hand sanitizing stations, and trash cans, also make the trip easier and more comfortable, thus reducing caregiver stress. Stations and waiting areas should be well ventilated, especially in underground systems.



LEFT: The light rail station in Phoenix, Arizona, USA, provides shade using overhead canopies and slats that allow air to flow but protect users from the sun when the sun is low. Source: ITDP. RIGHT: Stations can be high quality public spaces that people enjoy. Weather protection and ample seating space encourage travel via public transport. Ahmedabad, India. Source: ITDP.

2.2. Enable safety and comfort of journey through universal access:

- Ramps into station or to access stop
- Level boarding
- Wide turnstiles

Universal accessibility should be the baseline so that all people can use public transport; it has the additional advantage of facilitating caregiver travel with dependents, including walking hand in hand with a toddler, carrying a bag for supplies, carrying a child, or traveling with a stroller. At stations and stops, level boarding eases getting on and off the vehicle for caregivers traveling with large items and babies or toddlers. Level boarding includes a platform or curb at the same level as the vehicle floor and ramps to ensure universal access to the stop or station. Stations should ensure that turnstiles and access gates are wheelchair-friendly by having a wider width that can also accommodate strollers, as well as front access for payment. Walking routes to public transport should be universally accessible to caregivers with walking aids and strollers. For more information, see recommendation 2.2 in the 15-minute neighborhood section.

The bus stop in Santiago, Chile, features a higher level platform from the sidewalk with ramps that allows universal access into the waiting areas and level boarding into the low-floor bus. Source: ITDP.



Level boarding and paying the fare before entering the station help caregivers carrying young children navigate getting on the bus with much less stress. Dar es Salaam, Tanzania. Source: ITDP.

2.3. Incorporate green infrastructure into station and stop design:

- Green infrastructure: bioswales, green roofs
- Nature elements: landscaping

Green infrastructure and proximity to nature at stops and stations enable a stimulating environment for babies and toddlers to engage with, provide mental health benefits for all riders waiting to board their vehicles, and help manage environmental conditions, including stormwater runoff. Greening stations and stops adds shade, helps cool the area, improves air quality, and creates a calm and comfortable pedestrian realm. Having landscaping near the places caregivers are waiting with babies and toddlers can give them a chance to interact with nature. Adding bioswales near stations helps channel stormwater runoff and not overwhelm the municipal drainage system or create flooding in the streets, especially near stops and stations. Bioswales can also be incorporated at medians, station verges, or as part of connector links between stations and stops. Rainwater from the station or stop roof can be directed to the bioswale. The planting or preservation of trees along the corridor can assist in reducing the urban heat-island effect. Shade trees also provide weather protection for passengers and act as green canopies for connecting pathways. Tree plantings or landscaping can also form a safe buffer between motorized traffic and pedestrians or cyclists.



Bioswales help manage stormwater runoff and provide a safe buffer between motor vehicles and pedestrians. When coupled with seating, they can make good waiting areas near stops. Washington, DC, USA. Source: ITDP.

2.4. Enhance well-being by adding play elements to a station or stop:

- Bright colors
- Play elements at height of toddler
- Colocated play areas near stops

Stations and stops should be vibrant public spaces and be considered part of a city's civic infrastructure. Public transport waiting areas can offer an opportunity to pause and play, increase caregiver-child interaction, and provide a stimulating environment for young children. A public transport station should incorporate interactive and stimulatory elements that are thoughtfully designed with small rest and play areas and use of interesting materials and designs.

Planning agencies should engage artists and the community to redesign transit stops and transform them into places for toddlers and babies to play and interact with their environment. Design elements include adding shelter visuals and railings around the bottom of the shelter as a place for play, colocating playgrounds near stops and stations, and incorporating an information board with community resources. These spaces need to be clean, comfortable, and well maintained.

Bus shelter design in Boa Vista, Brazil, incorporates seating, foliage, and overhead and playful elements that make waiting with a child more engaging. Source: Boa Vista City Hall.



3. Safety: Improve personal security for caregivers traveling with young children.

3.1. Design stations and stops to increase sense of personal security:

- Lighting
- Transparency
- Clear sightlines

Increasing personal security for caregivers traveling on public transport is one of the main ways to increase access and well-being, while decreasing stress. A caregiver's safety concerns while traveling increase as one factors in gender, race, income, disability, religion, and other identities. Stops and stations can be safer by design through the use of visually porous areas, transparent panes, and illumination at night. Access to the stop and station needs to be safe as well, including well-lit streets, clear sightlines, well-demarcated and universally accessible crossings, and activated streets.



The newly implemented BRT system in Peshawar, Pakistan, features CCTV in vehicles, complementing other gender-inclusive solutions like dedicated areas for women and children at stations and in vehicles. Source: TransPeshawar.

3.2. Develop policies and protocols for reporting crime and harassment:

- Panic buttons
- Public safety personnel
- CCTV

Mechanisms and protocols to report safety incidents, such as panic buttons, apps, SMS services, attendants, public safety personnel (especially at night), or cameras, increase perception of safety and reduce isolation. Having mechanisms for reporting and responding to crime and aggression allows the caregiver to have a recourse when violence occurs. A public safety approach that focuses on prevention, conflict resolution, and de-escalation is recommended as transit systems have been a site of over-policing and violence against marginalized communities.

3.3. Train staff and promote public education around gender and urban violence and the specific needs of caregivers:

- Workshops for transport staff
- Public education campaigns

All transportation staff (attendants, drivers, public safety personnel) should attend workshops on gender and physical violence, which should cover the underlying issues, as well as how to prevent violence, and ways to respond to reports of violence. Training for drivers and station staff should also include why caregivers may need extra time to board or alight and how to help them. Public education campaigns, such as building awareness through materials at stations and on vehicles, as well as online and through social media, can help change cultural attitudes that permit assault and harassment. These campaigns can also help other passengers give their seats to caregivers of children and encourage more civic responses to families traveling together. Improved safety measures help keep all passengers safe.

The Flone Initiative, a not-for-profit based in Kiambu, Kenya, offers training and workshops on gender-sensitive issues for transport operators across cities in Kenya. Source: Flone Initiative



4. Fare policy: Increase accessibility and ease of use through an equitable fare policy.

4.1. Implement equitable fare policies that allow for trip chaining:

- Targeted discounts
- Free fares for children
- Fare capping
- Free transfers within a window of time

Financial burdens increase caregiver stress and reduce opportunities for caregivers to provide loving and stimulating interactions with babies and toddlers; they may also result in caregivers not taking public transport. Considering the majority of the global poor are women, and a disproportionate number of women carry out caregiver activities, fare policies should include targeted subsidies for people with lower incomes. Traveling with multiple members of a family means the total cost of the trip is higher. Having free fares for children reduces that cost burden. Other options include discounted monthly or weekly passes. Since people with lower incomes cannot usually afford the upfront cost of a bundled discount, fare capping is another way to achieve that by allowing people to buy trips one by one, but after a certain number of trips within a set period, the rider is no longer charged. Caregivers typically trip chain, combining multiple destinations into one trip, as they complete household activities. Public transport should facilitate, not penalize, trip chaining patterns through fare policies such as fare capping, free transfers, or allowing a window of time during which a passenger does not need to pay the fare again.

4.2. Make boarding and alighting easier for caregivers with off-board fare collection:

- Barrier control
- Ticket vending machines or kiosks
- Proof of payment

As a caregiver juggles traveling with a child and carrying goods, paying while boarding a vehicle can be very stressful. Off-board fare collection alleviates this stress because fares are collected before, not while, caregivers enter a vehicle. The two most effective approaches to off-board fare collection are “barrier-controlled” using a gate, turnstile, or checkpoint upon entering the station, where the ticket is verified or a fare is deducted, and “proof of payment,” where passengers pay at a kiosk or vending machine, online, or from a customer service agent, and then those payments can be verified on board the vehicle by an inspector. This also enables all-door boarding, which reduces the stress of everyone boarding through one entrance.

LEFT: Off-board fare collection often uses barriers to control who can access the system, such as turnstiles like these at a TransMilenio BRT station in Bogotá, Colombia. Sufficiently wide turnstiles help caregivers easily pass through with goods or a toddler. Source: Carlos Felipe Pardo. RIGHT: Nantes BRT system uses ticketing machines for passengers to buy their tickets before they enter the bus. Source: Karl Fjellstrom.



4.3. Ensure fare compatibility and integration across multiple services:

- Common fare medium
- Integrated fare policy

An integrated approach to fare policy simplifies the payment process, facilitates trip chaining, and potentially reduces the cost of travel for caregivers. Fare compatibility means that one card or payment method can be used on multiple services and modes, making it more convenient for the passenger, but the pricing of the fares is not necessarily integrated. Fare integration implies that a customer pays for a multimodal fare for either no additional payment or a discounted payment for changing from one mode to another. The first level of fare integration simplifies payment by using a common ticket or card to access multiple modes. The second level lowers costs and can facilitate trip chaining.



LEFT: The integrated fare policy in Fortaleza, Brazil, combines public transit and bikeshare and, together with physical integration, contributes to higher modal share of travel via sustainable modes. Source: ITDP. RIGHT: The Orca card in Seattle, USA, allows people to access local and regional transit, from buses to light rail to commuter rail to water taxis. Source: ITDP.

5. Integration: Increase accessibility and ease of use through integrated transport systems that facilitate trip planning and navigation.

5.1. Colocate multiple services and modes to increase options for caregivers:

- Clear, close, and easy walk connections
- Short transfer time



Ecobici, Mexico City's bikeshare, is located near the BRT station so that passengers can easily transfer. Source: Luc Nadal.

The more integration, the more benefits that passengers and cities receive. Caregivers may arrive at stops, stations, and terminals using a mode other than walking if the distance is too long or the walking conditions too poor or may need to transfer to a different mode to reach their final destination. Stops and stations need to accommodate these connections safely and with adequate space. Safe bike parking should be near stops and stations. Connections to other services, from bikeshare to shared two- and three-wheelers to other forms of public transport, should be close, protected, and easy and safe to walk to with clear guidance from wayfinding.

Often, caregivers have multiple destinations during one trip and will need to use multiple services to complete the trip. Integration helps the caregiver make these more complicated trips by facilitating quick and close transfers. The convenience of the transfer will impact the caregiver's decision on whether to take a particular mode or trip. This convenience depends on two main things: the wait time for the next service and the physical connection, including level changes, walking distance, and ambiance of the transfer (being protected from rain, climate controlled, etc.). The transfer wait time should follow the 10-minute rule (no longer than a 10-minute wait for service), and for caregivers the physical connections need to be short and universally accessible.

The physical and fare integration of modes in Jakarta, Indonesia, allows caregivers seamless transfers for trips near and far. The wayfinding system helps them navigate the station and informs them of the available services.
Source: ITDP.



5.2. Integrate information and wayfinding in the system and to connect to other modes:

- Maps: digital, static, route strips
- Station and stop identification: totems, signs
- Announcements on vehicle and at stations
- Wayfinding
- Real-time information
- Online tools, such as social media and SMS

Information is key to making it easier to use the system and needs to be available in multiple formats, including static, online, mobile, and real time. Clearly marked information in the vehicle about the service, route, and stops, such as system maps, route strip maps, and driver announcements, helps the caregiver follow the trip, while being able to focus more on engaging with babies and toddlers. Clearly marked stops and stations, such as with a totem or name, can help a caregiver find the stop when they are approaching it before boarding and also help caregivers—once they are on the vehicle—know when they have reached their destination. In stations and at stops, network maps, route maps, local area maps, emergency indications, wayfinding signage, and information about the fare and connections help a caregiver use the system and reach their destination. Real-time passenger information, based on GPS data, includes electronic panels, digital audio messaging (e.g. “next bus” at stations, “next stop” on buses), and/or dynamic information on handheld devices. Social media and SMS are increasingly important for conveying information to customers, as well as receiving feedback and addressing problems, especially using social media to engage with customers or SMS texting to alert the passenger when the next vehicle is arriving.



Metrobus Line 4 in Mexico City has clear signage to identify the station, including a totem that has route maps and local neighborhood maps, along with a ramp onto the station platform to allow for universal access and a shelter for waiting passengers. Source: Héctor Ríos.

5.3. Facilitate integrated trip planning through static, online, and real-time information:

- Online trip planning tools using GTFS (General Transit Feed Specification) data
- Maps of the integrated public transport system online, in stations, and on paper for riders to take home

Unlike a commuter, who memorizes a daily route to and from work, caregivers visit different and new destinations to carry out household activities and responsibilities for their babies and toddlers. More and more customers are accessing information online, including route maps, arrival times and schedules, and service alerts. A variety of means for online information sharing and trip planning exist, including websites and apps. This type of information should be part of a complete passenger information system and can help integrate multiple modes to determine the possibilities for the complete journey. Agencies should provide apps and websites with real-time GTFS data publicly when possible to facilitate complex trip planning. The adoption of this global standard will provide passengers with more accurate information to better time the trip with a baby or toddler and help online tools provide integrated planning options.



Real-time information shows the many services that intersect at this stop, with clear signage and totems and ample space for waiting. Seattle, Washington, USA. Source: ITDP.

Additional Resources

- [Infant, Toddler, Caregiver-Friendly Neighbourhood \(ITCN\) Framework and Guidelines for Indian Cities](#), Bernard van Leer Foundation
- [Gender Sensitive Mini-Bus Services and Transport Infrastructure for African Cities: A Practical Toolkit](#), Flone Initiative
- [Access for All: Access and Gender](#), ITDP
- [The BRT Planning Guide](#), ITDP
- [The BRT Standard](#), ITDP
- [First Steps: Urban Mobility in Early Childhood](#) (in Portuguese), ITDP Brazil
- [Safe Routes to Education](#), ITDP Brazil
- [Vision Zero for Youth](#), ITDP Mexico
- [Transportation for Livable Cities](#), Center for Urban Policy Research

POLICIES AND PROCESSES FOR IMPLEMENTATION

Participatory planning workshop in Addis Ababa, Ethiopia, brought together women, youth, local grassroots, partner organizations, and municipal officials to discuss aspects of cycle network planning as part of support for the Non-Motorized Transport Policy. Source: ITDP.



The 15-minute neighborhood and 10-minute public transport are the key frames for improving the well-being of babies, toddlers, and their caregivers by improving access, reducing stress, and creating learning and playful environments. They can be used to evaluate and diagnose neighborhoods to understand their strengths and their gaps. Once that evaluation is done, though, the work to improve the neighborhood and its connections needs to begin.

Below are the main recommendations for how to implement changes to enhance access and well-being for caregivers, babies, and toddlers through the integration of mobility and land use:

- 1. Participatory planning:** Plan with the community, specifically incorporating the perspectives, needs, and interests of babies, toddlers, and their caregivers
- 2. Data:** Collect qualitative and quantitative data for care trips and travel patterns
- 3. Capacity building:** Provide opportunities for decision makers, transport and city agencies, and operators to learn about the needs of young children and their caregivers
- 4. Test and revise:** Produce pilots and generate community input and buy-in around programming for babies and toddlers in order to scale up to larger projects
- 5. Scale:** Implement sustainable urban development and mobility policies, plans, and programs that institutionalize the needs of caregivers, babies, and toddlers

1. Participatory planning: Plan with the community, specifically incorporating the perspectives, needs, and interests of babies, toddlers, and their caregivers.

- Focus groups
- Design workshops
- Gender audits
- Neighborhood-based planners
- Citizen advisors

While these recommendations are meant to be broad and inclusive, the details and priorities will differ by community. The community needs to be involved to understand the biggest challenges faced and what needs to be prioritized. The experience of community members needs to be included as part of the analysis, and this can be done by implementing a participatory planning process. The stakeholders for this process need to include the affected community, especially families and caregivers, advocates of certain constituencies, technical specialists (e.g. planners, early childhood development specialists, public health experts), and decision makers (public agencies, the private sector, civil society organizations). Tactics such as gender audits, targeted focus groups, and design workshops with the community can illuminate different problems that young children and their caregivers face. This information can help define challenges and develop innovative solutions. Longer term, building up the community to be able to advocate and plan for themselves, so that participatory planning is not ad hoc and intermittent, should be the goal. Assigning planners specific neighborhood responsibilities or forming formal citizen advisory groups are some ways to approach longer term investments in community planning, such as Atlanta's neighborhood planning units.

2. Data: Collect qualitative and quantitative data for care trips and travel patterns.

- Surveys: census, passenger counts, transfer surveys
- Qualitative surveys
- Intersectional analysis

Capturing disaggregated data for care trips is difficult, but the lack of data on this subject prevents better planning. Collecting data beyond the head of household or main income generator in typical household surveys, such as the census, enables a more comprehensive understanding of each family unit. Demographic data is essential too. Data collection can include types and timing of trips, lengths of trips (both in distance and time), trip chaining, the quality of travel, and access to essential services such as medical appointments and childcare facilities. Demographic data should include gender, race or ethnicity, income, ability, and other relevant information. Data analysis needs to understand how intersectionality (i.e. gender-income, gender-race/ethnicity, ability-income) affects travel patterns and needs. Understanding how families spend time outside the home and levels of caregiver isolation and stress provides a broader picture of early childhood development and urban environments. This also allows a baseline and targets for interventions to be set, as well as illuminating gaps and priorities. Setting specific targets and benchmarks, such as gender- and child-focused indicators, for walking, cycling, and transit enables a more inclusive planning approach for data.

Kampung Kota Bersama is a community-focused program piloted in Sunter Jaya urban village, Jakarta, Indonesia to elevate participation of vulnerable groups and bring attention to their mobility needs. Through methods like mobility surveys, women, youth, and older people shared their mobility concerns and prioritized intervention sites. Source: ITDP.



3. Capacity building: Provide opportunities for decision makers, transport and city agencies, and operators to learn about the needs of young children and their caregivers.

- Training
- Study tours
- Walkshops
- Refresher courses

Incorporate education and awareness about early childhood into training for transportation and urban development agencies and operators from the beginning. Technocrats need to include care trips as an important element of the planning process and potentially rethink the frame of planning from economic activity and efficiency to health and well-being, including creating environments for brain building. This can be done by experiential learning, like walkshops, where planners go to neighborhoods and navigate through and engage with public spaces and streets through the eyes of babies, toddlers, and those who care for them. Peer-to-peer learning and study tours, as well as traditional workshops and refresher courses, are other ways to build capacity. Staff of public transport agencies and operators, especially drivers and public-facing employees, should be trained on caregiver needs. This will help them understand why caregivers may need more time to board or alight, among other considerations.

Awareness should be accompanied by inspiration. Taking teams of planning professionals on study tours so they can see the physical expression of good public space for children and meet their planning peers who have designed and implemented these spaces is particularly effective.

Having more women working in the transport field, from decision makers to transport professionals and operators, adds their perspectives to the decision making process and to planning and operations. Boston, Massachusetts, USA. Source: ITDP.



4. Test and revise: Produce pilots and generate community input and buy-in around programming for babies and toddlers in order to scale up larger projects.

- Tactical urbanism
- Pop-ups
- Temporary street closures

Implement low-cost, high-impact pilots to produce quick wins and build consensus around sustainable transport and urban development interventions for young children and their caregivers. Pilots can include adding pop-up play areas, activating existing and underused spaces, providing street furniture, and instituting temporary street closures. To ensure that pilots are successful and become permanent, key actions are to (1) establish and communicate clear project goals, (2) build early and consistent collaboration with the community and key stakeholders, (3) anticipate resistance and engage with those stakeholders, (4) generate excitement around project implementation, and (5) demonstrate impact through data collection and storytelling. It is crucial to make sure babies, toddlers, and caregivers are centered in the pilot process through either incorporation into the planning process or explicit target setting related to their needs.

Tactical urbanism projects such as this one in the José Bonifácio municipality of São Paulo, Brazil, help enforce slower speeds, facilitate safer crossings, and—most of all—change the mindset of drivers about streets as spaces for all.

Source: Viviane Tiezzi.



Tactical urbanism projects can also reallocate space from cars for recreation, socialization, and play, such as this pop-up plaza in Istanbul, Turkey. Source: Pinar Gediközer.

5. Scale: Implement sustainable urban development and mobility policies, plans, and programs that institutionalize the needs of caregivers, babies, and toddlers.

- Street design guidelines
- Land use policies
- Building codes
- Transport plans, policies, service standards
- Budgets and capital plans
- Cross-agency task forces

Participatory planning, data collection, capacity building, and pilots should all lead to implementing inclusive sustainable urban development and mobility frameworks. Based on that work, cities should update street design guidelines, land use policies, and building codes to promote the needs of babies, toddlers, and caregivers, such as inclusive mixed-use developments. Local area plans should be framed and informed by transit-oriented development concepts to reclaim more space for the public realm where all families, including those with young children, can access high-quality built environments. Streets should be designed and retrofitted to prioritize non-motorized modes (walking and cycling) and public transit, and this should be reflected—with an intentional focus on babies, toddlers, and caregivers—by creating or updating non-motorized transport plans and policies, and policies on road safety, like Vision Zero. Cities should consider institutionalizing these recommendations in service standards and policies for transit and updating transit plans and service schedules, as well as capital plans for updating or creating new services, stations, and stops.

Because the needs of babies, toddlers, and caregivers cut across many areas, planning for them offers the opportunity to bring together different, typically siloed, agencies such as public health, parks, urban development, and—of course—transportation. Working links need to be defined between transport and childcare services, jobs, education, health, and air quality goals, and these principles for babies, toddlers, and their caregivers need to be mainstreamed into standards. Activities and programs should be well funded and include explicit targets to meet the needs of young children and those who care for them. Policy frameworks, especially climate change and public health plans and policies, should incorporate transportation and include advocates for babies, toddlers, and women. The mainstreaming of policies should be creative, and widespread internal communications via quick videos and short content should inform staff about these initiatives. Lastly, the mobility of young children and those who care for them should be elevated as it relates to and aligns with larger goals, such as equitable public health, air quality, gender action, and road safety. Babies and toddlers are a unifying theme and a relatable cause to mobilize political and public will, and their needs can serve as mitigation strategies that cut across agencies and stakeholders.



TransMilenio, the BRT system in Bogotá, Colombia, has level boarding and off-board fare collection as part of its system design, which helps caregivers use the system. Source: Carlos Felipe Pardo.

A CALL TO ACTION: REDEFINING “THE PUBLIC” TO INCLUDE BABIES AND TODDLERS

By Daniella Ben-Attar, Bernard van Leer Foundation

Pilots that include the local community as an essential stakeholder in the planning and implementation process help strengthen the outcomes and create more public buy-in. Local community participates in the upgrading of footpaths and pedestrian stairways in a hilly neighborhood of Lima, Peru. Source: Asociación Proyecto Alto Perú



The quality of public spaces and public life as a key indicator for successful cities has gained increasing recognition in recent years, including as a key part of the United Nations’ New Urban Agenda, underscoring its importance for community life, livelihoods, access to services, civic identity, and more. Little of this broader discussion, however, has taken into account the youngest residents of cities. As this paper has discussed, babies and toddlers have traditionally not been on the radar of those planning, designing, and implementing public spaces. Indeed, historically and almost universally, they are somehow seen as an extension of their mothers and are relegated to the private realm. Barring a recognized need to access some basic health services, young children are considered exclusively a subject of parental concern until they enter public preschool, typically anywhere from age three to five (depending on the national policy), when they begin to count as consumers of municipal services. Following this logic, most municipal governments do not consider babies and toddlers when designing and planning public life.

This gap has translated into a lack of urban planning practices designed to meet the needs of young children and caregivers. As one professional explained to me, “children under the age of three are the black hole of urban planning.” While there are guidelines and recommendations for older children who require planning for independent mobility, for safe routes to school, and for sports and play areas, there are almost no guidelines for the youngest children. In recent decades, the environmental and gender movements have succeeded in gaining seats on planning committees to ensure environmentally friendly and gender-sensitive spaces. But what about babies, toddlers, and their caregivers?

The goal of this paper is to change this by articulating and elevating the needs of babies and toddlers from their urban environments in terms of access and mobility and ensuring that this group is represented at the table when planning our cities and is visible in our public realm. But to truly transform our cities and the lives of babies and toddlers, we need to do much more, and it starts with recognizing that infancy is the most critical period in human development, that public space plays an important role in shaping that development, and that “the public” needs to be redefined to intentionally include and actively support babies and toddlers.

How Public Space Helps Build Brains

We know that brain development in the first years of life is shaped by experience, both with caregivers and with the surrounding environment. Research shows that in the first years of life, our brains make as many as one million new neural connections per second. Connections between nerve cells in the brain are formed every time a child interacts with their environment, including their caregivers and other people. Over time, the most frequently used of these connections are strengthened, and those that are not used are gradually pruned and disappear. This means that the quality of experiences during the first 1,000 days of life establishes either a strong or fragile foundation for everything that follows.

Public spaces have a key role to play in influencing caregiver well-being and shaping caregiving behaviors. If caregivers use streets and spaces that are highly dangerous, polluted, and noisy, they will be less likely to have these moments of positive interaction with the children in their care. Alternatively, access to safe, stimulating green spaces to play and connect with other families can provide important opportunities for quality interactions, learning, growth, and community building. These are elements that help caregivers, babies, and toddlers thrive.

Beyond Playgrounds: Redefining Public Space for Children

Public space for children is typically perceived as playgrounds—separate areas specifically for play. Yet bringing children into the public realm means that we must go far beyond the concept of sanctioning them off to their own spaces. Children experience the entire city: they travel together with their parents to reach services, the supermarket, bridges, plazas, parks, commercial centers, and friends’ houses. The whole city belongs to these young residents, just like everyone else. Making public space work for them means thinking of their needs and experiences throughout their daily lives and not only when they are taken to the designated playground. To integrate young children and caregivers into public space, we need to make sure urban spaces are safe, accessible, stimulating, and comfortable.

As the movement to make cities for people expands, there is increasing awareness that the needs and characteristics of children should be taken into account. Private firms, such as ARUP and Gehl Architects, have begun developing these approaches; global organizations such as UNICEF and the National Association of City Transportation Officials are developing guidelines for children; and city governments, such as Tirana (Albania), Tel Aviv (Israel), Bogotá (Colombia) and Boa Vista (Brazil), are making this part of their urban strategies.

The Call to Action: Building Capacity for Child-Friendly Public Spaces

This paper sought to add to these works by laying out the access and mobility needs of babies, toddlers, and caregivers, as well as guidance and recommendations for what to do and how. But to translate this guidance into changes in the built environment, we need to support urban planning professionals in shifting their approach to begin to make babies, toddlers, and caregivers a priority when designing public space. The essential building blocks for this shift include:

- **Awareness:** Urban planning professionals need to understand that they have a role to play in fostering healthy child development. Understanding the way that the built environment shapes behaviors and experiences for young children and caregivers enables these professionals to recognize their role as “brain builders.” We have found that this often gives new meaning to their work, particularly as many urban planners are parents or grandparents. The “black hole of urban planning” turns out to be a blind spot that planners did not realize they had. As mentioned earlier, awareness needs to be accompanied by inspiration, and as the adage says, seeing is believing. Study tours and meeting with peers is one of the most effective ways to achieve this. Copenhagen, Denmark, has been a natural lab for learning, and exploring best practices in different contexts, such as Bogotá (Colombia), Tirana (Albania), and Tel Aviv (Israel), would also be extremely beneficial.
- **Practical ideas:** Once past the “why” to generate motivation for action, the next step is to answer the question of “what.” If we want to improve the lives of young children and caregivers, what are the most important, cost-effective things we can do? Cities often do well learning from one another, sharing good ideas that have worked and adopting them to local contexts through peer learning workshops and networks. Universal planning principles can be used and tailored. However, when seeking a more comprehensive, long-term planning approach, specific planning guidelines can be useful. For example, the India Smart Cities Mission developed a set of guidelines on planning for infants, toddlers, and caregivers.⁹⁵
- **Implementation of quick wins:** Making progress toward scale first requires quick wins in the form of experiments and temporary interventions such as pop-up play areas, activation of existing spaces, paint, street furniture, and street closures. While research and data collection are essential, they should be done quickly to inform initial actions and then parallel to small-scale implementation. The building of political will needed for long-term action at scale will come from the responses, insights, momentum, and resident demand built by acting in the short term. While urban planners and decision makers may think public spaces for children sound like a good idea, it is only when they see the change in families, hear from parents how their daily lives have changed, and see communities coming together that they can fully appreciate the impact, which then provides the case for investment to continue, adjust, and scale.

95 Bernard van Leer Foundation et al., *Infant, Toddler, Caregiver-Friendly Neighbourhood: Policy Framework*, 2019.

- **Integration and scale:** Once successful implementation has taken place, a key pathway toward scale is to embed the principles of quality spaces for babies, toddlers, and caregivers into the standard working methodologies and design codes of the relevant municipal departments: parks and recreation, transportation, strategic planning. We should avoid well-meaning calls for a separate child-friendly planning effort but, rather, aim to mainstream this approach as a key driver in planning processes. Another pathway to scale will come through institutionalized integration with other sectors, such as social or health programs that can work to shape and activate public spaces toward shared city goals and a holistic approach to improve urban life for young families.

Public space matters for babies, toddlers, and caregivers. By redefining “the public” to include babies and toddlers, the public realm—from public space to public transport—can address the needs of the youngest residents and can help them thrive in urban environments. But the benefits are much broader. Designing urban spaces with young children in mind brings them into the public realm, paving the way for more comprehensive policies that can help ensure a prosperous, creative, healthy generation of urban residents today and tomorrow.



Parklets, tactical urbanism, and play elements in the streetscape are the different tactics applied in Tel Aviv, Israel, to promote play and physical activity in children and to increase the use of public space by all citizens. Source: Courtesy of Nadel Roizin Architects.



BIBLIOGRAPHY:

1,000 Days. 2018. Nutrition in the first 1,000 days: A foundation for brain development and learning.

2030 Palette. 2020. Urban bikeways. Accessed July 1, 2020.

Agnello, Kristin. 2017. Strollers and scooters: Perspectives of a millennial planner living in a retirement community. Plan Canada (fall). Accessed May 10, 2021.

Allen, Heather. 2018. Module 7a: Approaches for gender responsive urban mobility. In Sustainable Transport: A Sourcebook for Policy-makers in Developing Cities. GIZ-SUTP, Bonn.

Alter, Lloyd. 2018. New study shows urban cycling is faster than driving. Treehugger, October 11.

American Association of State Highway and Transportation Officials. 2015. Commuting in America 2013. AASHTO, Washington, DC.

American Lung Association. Living near highways and air pollution. Accessed November 1, 2020.

Andersson, Cecilia. 2016. Public space and the new urban agenda. Journal of Public Space, 1(1), 5–10.

Bagul, Tushar R., et al. 2018. Analysis of autorickshaws as an intermediate paratransit system. International Journal of Pure and Applied Mathematics, 118(24), 1–10.

Berman, Marc G., John Jonides, & Stephen Kaplan. 2008. The cognitive benefits of interacting with nature. Psychological Science, 19(12), 1207–12.

Bernard van Leer Foundation et al., 2019. Infant, Toddler, Caregiver-Friendly Neighbourhood: Policy Framework.

Bernard van Leer Foundation. 2019. Creating a safe walking route in hilly Lima.

Bernard van Leer Foundation. 2020. Cycling cities for infants, toddlers, and caregivers.

Bliss, Laura. 2020. Across the globe, urban sprawl is spreading. CityLab, February 5.

Bouchard, Mikayla. 2015. Transportation emerges as crucial to escaping poverty. New York Times, May 7.

Brown, Caroline, et al. 2019. Special issue: Child-friendly cities. Cities & Health, 3(1-2), 1–7.

Canadian Council of Motor Transportation Administrators. 2013. Countermeasures to improve pedestrian safety in Canada. Accessed May 10, 2021.

Caring for our Children. 2018. Chapter 3: Health promotion and protection: 3.1 Health promotion in child care.

- Center on the Developing Child. 2007. The science of early childhood development (InBrief). Accessed November 1, 2020.
- Child Mobility. Planning process. Accessed November 1, 2020.
- Crenshaw, Kimberlé. 2019. On intersectionality: Essential writings. New Press, New York.
- Ducharme, Jamie, and Elijah Wolfson. 2019. Your zip code might determine how long you live—and the difference could be decades. Time, June 17.
- Ellingrud, Kweilin, and Liz Hilton Segel. 2021. COVID-19 has driven millions of women out of the workforce. Here's how to help them come back. Fortune, February 13.
- Flone Initiative. 2019. Gender sensitive mini-bus services and transport infrastructure for African cities: A practical tool. UN Habitat, Nairobi.
- Garijo, Belén. 2020. COVID-19 highlights how caregiving fuels gender inequality. World Economic Forum, April 24.
- Global Designing Cities Initiative. 2016. Global Street Design Guide.
- Global Designing Cities Initiative. 2020. Designing streets for kids. National Association of City Transportation Officials, New York.
- Godoy, Maria, and Daniel Wood. 2020. What do coronavirus racial disparities look like state by state? National Public Radio, May 30.
- Healthbox. 2019. Root causes of health.
- Healthy Children. 2020. AAP schedule of well-child care visits. Accessed November 1, 2020.
- Human Transit. 2010. Cul-de-sac hell and the radius of demand.
- International Labour Organization. 2018. Recognizing the rights of domestic workers.
- International Transport Forum. 2019. Transport connectivity: A gender perspective.
- ITDP. 2016. The Bus Rapid Transit (BRT) Standard.
- ITDP. 2017. The online BRT planning guide.
- ITDP. 2017. TOD Standard 3.0.
- ITDP. 2019. Opportunities for increasing sustainable transport: Spotlight on Dallas, Denver, Nashville.
- ITDP. 2019. Pedestrian bridges make cities less walkable. Why do cities keep building them?
- ITDP Indonesia. 2018. Sunter Jaya, Jakarta urban village: Pilot for improved accessibility.
- Jaffe, Eric. 2015. The (pretty much totally) complete health case for urban nature. CityLab, October 20.

- Jaffe, Eric. 2020. The most important bike technology is ... street design. Medium, July 22.
- Karsten, Lia, and Willem van Vliet. 2006. Children in the city: Reclaiming the street. Children Youth and Environments, 16(1), 151.
- Krysiak, Natalia. 2019. Child-friendly high density neighbourhoods. Cities for Play, Canberra.
- LACGIL (Gender Innovation Lab for Latin America and the Caribbean). 2021. The gendered impacts of COVID-19 on labor markets in Latin America and the Caribbean. World Bank, Washington, DC.
- Larusdottir, Aldis Run. 2014. and A. S. Dederichs, Evacuation Dynamics of Children - Walking Speeds, Flow through Doors in Daycare Centers. Technical University of Denmark.
- Lehigh University. 2019. Pregnant women with long commutes to work at increased risk of adverse birth outcomes. ScienceDaily, April 1.
- Lufkin, Bryan. 2020. Heat gap: Why some city districts are hotter than others. BBC, December 17.
- Love 30 Canada, Why 30 km/h?
- Malley, Christopher S., et al. 2017. Preterm birth associated with maternal fine particulate matter exposure: A global, regional and national assessment. Environment International, 101, 173–82.
- March of Dimes. 2018. Nowhere to go: Maternity care deserts across the U.S.
- Metro Los Angeles. 2019. Understanding how women travel.
- Moore, Dasia. 2019. Women love bikes—so why don't they cycle to work? Quartz, December 8, 2019.
- Muth, Natalie. New report guides physical activity counseling in pediatric clinical settings. AAP News, February 24.
- National Association of City Transportation Officials. Urban street design guide. Accessed November 1, 2020.
- National Institute of Urban Affairs. 2017. Compendium of best practices of child friendly cities 2017.
- National Institutes of Health. 2020. What is prenatal care and why is it important? Accessed November 1, 2020.
- National Partnership for Women & Families. 2018. The female face of caregiving.
- Newton, William Isaac, and Sara Candiracci. 2019. Proximity of care. ARUP, London.
- No Small Matter. n.d. Why early learning? Accessed November 1, 2020.

Oxfam International. n.d. Why the majority of the world's poor are women. Accessed November 1, 2020.

Pinheiro, Abel Táiti Konno, Akihiko Hokugo, and Tomoaki Nishino. 2014. Walking speed of children by age under the lead of nursery school teacher on a sidewalk and overpass bridge stairs during an urban evacuation drill. *Journal of Architecture and Planning*, 79(697), 583–88.

Poon, Linda, Laura Bliss, and Marie Patino. 2020. The great global child care crisis. CityLab, April 2.

Pulido, Daniel, et al., eds. 2018. The urban rail development handbook. World Bank, Washington, DC.

Raman, Aishwarya, and Sonal Shah. 2019. OLA Mobility Institute, New Delhi.

Raphael, Steven, and Michael Stoll. Job sprawl and the suburbanization of poverty. Brookings Institution, March 30.

Reuter, Suzanne, et al. 2014. Respiratory distress in the newborn. *Pediatrics in Review*, 35(10), 417–28.

Rickin, Anna, and Nick Kushner. 2020. Healthy plan making. American Planning Association, Washington, DC.

Roerty, Sharon. 2020. How can urban planning contribute to building health equity? *BMJ Opinion*, April 16.

Sagaris, Lake. 2019. New urban planning horizons from a gender perspective. MOBILIZE 2019. Fortaleza, Brazil, June 26.

Saha, Pritam, et al. 2018. Impact of maternal air pollution exposure on children's lung health: An Indian perspective. *Toxics*, 6(4), 68.

Sánchez de Madariaga, Inés. 2016. "Mobility of care: Introducing new concepts in urban transport." In Fair shared cities: The impact of gender planning in Europe. Taylor & Francis, London.

Scharf, Rebecca J., et al. 2016. Growth and development in children born very low birthweight. *Archives of Disease in Childhood. Fetal and Neonatal Edition*, 101(5), F433–38.

Schmitt, Angie. 2019. How our transport system is biased against women. *Streetsblog USA*, August 29.

Schulz, Richard, and Jill Eden. 2016. Families caring for an aging America. National Academies Press, Washington, DC.

Scruggs, Gregory. 2015. How much public space does a city need? *Next City*, January 7.

Seto, Karen, Burak Guneralp, and Lucy Hutyrá. 2012. Global forecasts of urban expansion to 2030 and direct impacts on biodiversity and carbon pools. *PNAS*, 109(40), 16083–88.

Sevtsuk, Andres et al. 2017. Patronage of urban commercial clusters: A network-based extension of the Huff model for balancing location and size. Accessed August 10, 2021.

Shah, Sonal, Kalpana Viswanath, Sonali Vyas, and Shreya Gadepalli. 2017. Women and transport in Indian cities. ITDP India, New Delhi.

Steiden, Bill. 2019. Governing from a child's perspective: Recife, Brazil, works to become family friendly, 2017–2019. Innovations for Successful Societies, Princeton University.

Surico, John. 2020. The power of parks in a pandemic. CityLab, April 9.

Sustainability Info. n.d. What is the average speed for urban cycling?

Timsit, Annabelle. 2019. We're facing a global childcare shortage—and women and children are paying the price. Quartz, September 11.

Tiwari, Geetam. 2014. Planning and designing transport systems to ensure safe travel for women. International Transport Forum, Paris.

UNEP (United Nations Environment Programme). 2019. Air pollution hurts the poorest the most.

UNHCR (Office of the United Nations High Commissioner for Refugees). 2016. Frequently asked questions on climate change and disaster displacement.

UNICEF. 2018. Shaping urbanization for children: A handbook on child-responsive urban planning.

UNICEF. Early Childhood Development: Building your baby's brain. Accessed July 13, 2021

UNICEF. n.d. Growing cities. Accessed July 28, 2020.

UNICEF. 2013. Why early childhood development? Accessed November 1, 2020.

United Nations. 2019. Make cities and human settlements inclusive, safe, resilient and sustainable.

United Nations Department of Economic and Social Affairs. 2018. Around 2.5 billion more people will be living in cities by 2050. UN News, May 16.

United Nations Department of Economic and Social Affairs. 2019. World population prospects 2019: Highlights.

UN Women. n.d. In focus: Climate action by, and for, women. Accessed November 1, 2020.

UN Women. 2015. Chapter 1, Substantive equality for women: The challenge for public policy. Progress of the World's Women 2015–2016. New York.

Urban95. 2019. An Urban95 starter kit: Ideas for action. Bernard Van Leer Foundation, The Hague.

US Council of Economic Advisers. 2015. The economics of early childhood investments.

Valentino-DeVries, Jennifer, Denise Lu, and Gabriel J.X. Dance. 2020. Location data says it all: Staying at home during coronavirus is a luxury. New York Times, April 3.

- Venter, Christo, Anjali Mahendra, and Dario Hidalgo. 2019. From mobility to access for all: Expanding urban transportation choices in the Global South. Working paper. World Resources Institute, Washington, DC.
- Viet, Susan Marie, et al. 2014. Assessment of noise exposure to children: considerations for the national children's study. Journal of Pregnancy and Child Health, 1(1), 105.
- Walker, Jarrett. 2010. The power and pleasure of grids. Human Transit, February 23.
- Walker, Jarrett. 2011. Transit's product: Mobility or access? Human Transit, January 26.
- Walker, Jarrett. 2020. In a pandemic, we're all 'transit dependent. CityLab, April 7.
- Weru, Jane. 2020. COVID-19 and the city: It's smart to be dense. Webinar. ITDP, July 30.
- WHO (World Health Organization). Number of deaths in children aged <5, by cause. The Global Health Observatory.
- WHO (World Health Organization). n.d. Social determinants of health. Accessed November 1, 2020.
- WHO (World Health Organization). 2004. Road safety-speed. Accessed November 1, 2020.
- WHO (World Health Organization). 2009. "Session 1: The importance of infant and young child feeding and recommended practices" in Infant and young child feeding.
- WHO (World Health Organization). 2018. 9 out of 10 people worldwide breathe polluted air, but more countries are taking action.
- WHO (World Health Organization). 2018. More than 90% of the world's children breathe toxic air every day.
- WHO (World Health Organization). 2019. Children: Reducing mortality.
- WHO (World Health Organization). 2019. To grow up healthy, children need to sit less and play more.
- WHO (World Health Organization). 2020. Children and road traffic injury. Accessed November 1.
- WHO (World Health Organization). 2020. Road traffic injuries.
- Wilson, Kea. 2021. Study: Cycling rates low unless women are riding. StreetsblogUSA, May 13.
- Women in Informal Employment: Globalizing and Organizing. n.d. Domestic workers. Accessed July 29, 2020.
- Wu, X., et al. 2020. Air pollution and COVID-19 mortality in the United States: Strengths and limitations of an ecological regression analysis. Science Advances, 6(45).
- Zuegel, Devon. 2018. We should be building cities for people, not cars. Strong Towns, July 3.