# PROximity Without Density

PROWD

## WP1: Survey of existing innovative initiatives in EU

## D1.1: State of the Art report about 15mC and LDUAs


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*It is acknowledged that the author made use of Notebook LM (Google, notebooklm.google.com) to highlight main ideas from the sources cited during the literature review process. Notebook LM provided information solely based on the sources indicated by the author and referenced in the body of the text.*

# Project introduction

Research shows a need to address specific challenges in implementing the 15-minute City (15mC) concept in Low-Density Urban Areas (LDUAs). Conventional approaches, typically focused on dense city cores, are not easily applicable to LDUAs, as strategies like urban densification or large-scale infrastructure investments are costly, have significant environmental impacts, and are often ill-suited for these contexts. This mismatch contributes to persistent car dependency for daily needs in LDUAs and exacerbates challenges such as spatial fragmentation and limited social infrastructure. These systemic issues and the associated knowledge gap were the starting point of the PROWD initiative (PROximity Without Density).

The project's core mandate is to reflect on the principles of the 15-minute city (15mC) concept for application within the specific conditions of low-density urban areas located on the periphery of large European cities. This is also the target of the current report.

The strategic focus of the PROWD initiative shifts the debate from urban cores to outskirts, addressing distinct problems and identifying relevant solutions that impact millions across the European Union (EU). It combines academic research with practical implementation, involving testing innovative local solutions co-developed with residents and stakeholders. PROWD is based on a research-oriented approach (ROA) grounded in residential experiences across six dimensions of daily life - education/culture, employment, mobility, well-being/recreation, care/health, food/shopping (Moreno et al., 2023). It makes use of co-creative methods and emphasises capacity building. These initiatives, often provided by local residents, associations, and small enterprises, offer services and mobility solutions suited to low-density settings, aiming to reduce car dependency and foster social proximity.

The geographical scope of the pilot areas, aligned with the locations of the project partners, is across four European metropolitan areas—Rome, Lisbon, Bucharest, and Vilnius—selected for their diverse historical trajectories and urban structures, including patterns influenced by former Socialist regimes. The investigation is focused on specific low-density suburban demonstration sites within these areas, chosen based on facility geography across the six dimensions

and the presence of community initiatives and specific demographic needs. The project seeks to generate strategic knowledge that will inform 'collaborative pacts' between local administrations and stakeholders to support these innovative pathways.

The activities and analyses will address critical issues including spatial fragmentation inhibiting connectivity, reduced density of social infrastructure, diminished role of social relationships, and pressures from demographic growth and increasing welfare demands. These will strive to define solutions to enhance the '*daily ecosystems*' and improve how individuals coordinate essential aspects of life. Explicitly, it seeks to advance '*proximity rights*,' particularly for populations with limited mobility (e.g., caregivers, the elderly, disabled) who face constraints in accessing proximity needs.

PROWD explores 'non-conventional' initiatives which integrate multiple services at single locations with active local engagement, diverging from conventional 15mC strategies such as extensive densification or large-scale public transport investments. Examples include shared trade services, demand-responsive transport, and amenities integrated within private properties like farms, factories or large industrial parks. Emphasis is placed on 'hybrid proximity,' integrating both physical and digital access dimensions. Research aims to identify categories of citizens disproportionately affected by the lack of social proximity (groups such as children, the elderly, women, and newcomers).

The key research questions are designed to generate strategic knowledge concerning the suitability and networking of non-conventional initiatives for building daily ecosystems, strategies for reducing car dependence, the role of institutional support in enhancing multi-functionality and connectivity, and mechanisms for acknowledging the needs of diverse resident populations.

This report is part of the Work Package 1 (WP1), as first deliverable, providing a state-of-the art review of the current knowledge of the 15mC concept and the complexities associated with the implementation of the concept in Low Density Urban Areas. It concludes with an extensive list of 30 initiatives reflecting best practices examples, as a basis for further analysis of the success and challenges of implementation in LDUAs.

# Background of 15-minute city concept

## Concept development and early emergence

The term '15-minute city' was first formally introduced in 2016 by Carlos Moreno. The researcher is credited with coining and popularising the concept, framing it around the idea that urban residents should be able to access their daily needs and essential services within a 15-minute walk or cycling trip from their homes. This initial articulation linked the concept to aspirations for localised urban living, emphasising social dimensions, urban proximity, and diversity (Lima et al., 2022; Ramírez Saiz et al., 2022).

However, it is crucial to recognise that the 15mC was not conceived in isolation. It emerged from a long history of urban planning ideas centred on creating liveable, mixed-use communities at a human scale. Preceding and influential concepts include Ebenezer Howard's late 19th-century 'garden cities', which envisioned self-contained satellite towns (Büttner et al., 2022). In the 20th century, responses to car-oriented urban sprawl led to the 'compact city' and 'transit-oriented development' (TOD) models, focusing on density and accessibility via public transport (Ibraeva et al., 2020; Caprotti et al., 2024). The emphasis on active travel and urban health further contributed through concepts like the 'walkable city' and 'eco-neighbourhoods' (Allam et al., 2024). The German idea of 'Stadt der kurzen Wege' (city of short distances) and the polycentric city model also share foundational principles with the 15mC (Hamiduddin, 2018). Therefore, Moreno's contribution was in giving a contemporary label and renewed focus to the enduring principles of proximity and local access.

Following its initial articulation in 2016, the 15mC concept began to gain traction within academic and urban planning circles. A significant milestone in its early development was its adoption as a central tenet of Anne Hidalgo's re-election campaign for Mayor of Paris in 2020. The prominence of the 15mC in the political discourse of a major global city significantly raised its profile. Paris, under Hidalgo's leadership, became known as the '*Ville du quart d'heure*' (15-minute city), actively integrating the concept into its urban policy and development strategy (Ramírez Saiz et al., 2022). This early adoption by Paris provided a concrete example of how the 15mC could be envisioned and implemented.

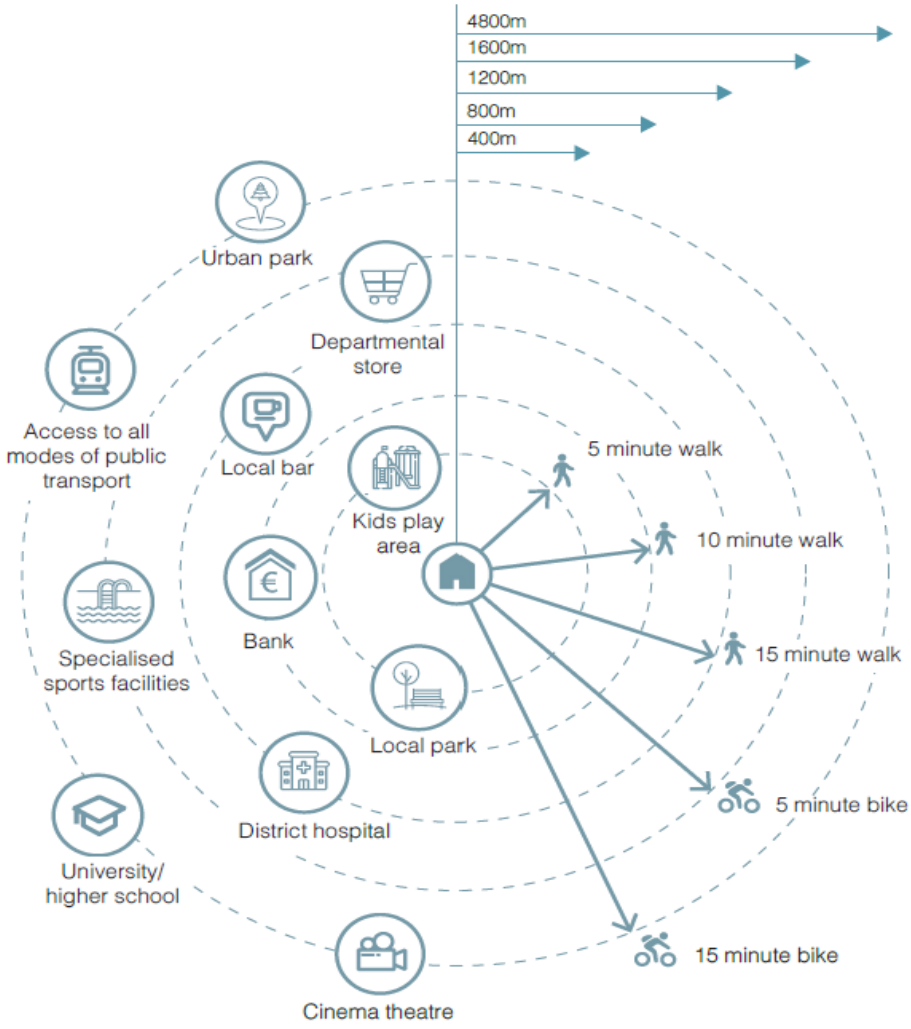


*Figure 1: Illustration of proximity of services. Source: A New Time-based Urban Agenda: Exploring the 15-minute city in concepts and practices (Tarwani, 2021)*

Following the lead of Paris, other European cities, such as Milan, also began to explore and develop adaptation strategies incorporating the 15mC principles as early as 2020 (Marchigiani and Bonfantini, 2022). Furthermore, the C40 urban network, a global network of mayors committed to addressing climate change, voiced support for the 15mC concept in 2020. This support from a prominent international city network further legitimised and disseminated the concept among urban leaders and policymakers (D'Onofrio and Trusiani, 2022).

In the academic sphere, the period following 2016 saw the initial scholarly exploration and definition of the 15mC. Publications began to analyse its theoretical underpinnings, its relationship to previous urban planning paradigms, and its potential benefits for sustainability, liveability, and social equity. Early

research also started to consider the practical implications and challenges of implementing the 15mC in diverse urban contexts. The concept was increasingly discussed as a tool for achieving sustainability transitions and reducing car dependence by promoting proximity to essential services.

Prior to the COVID-19 pandemic, while the 15mC had gained initial recognition and had been adopted by a few pioneering cities, it largely remained an evolving concept within urban planning discourse. Its operational definition was still somewhat vague, and its practical application was in its nascent stages, primarily exemplified by the initiatives in Paris. The pandemic, however, proved to be a significant catalyst, propelling the 15mC into the mainstream and accelerating its adoption and adaptation by cities worldwide.

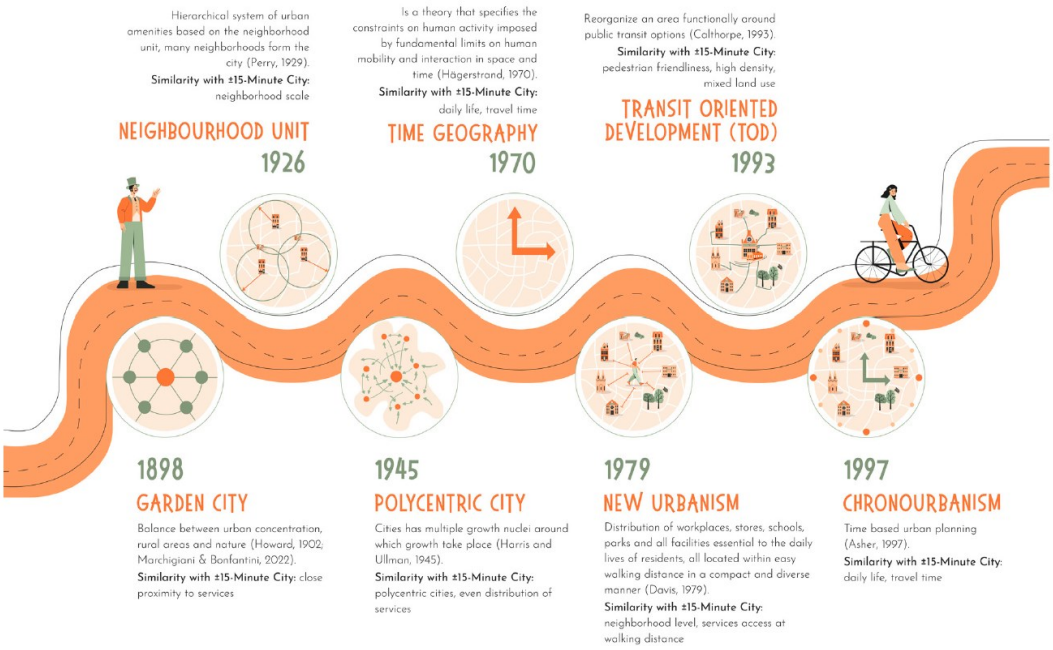


*Figure 2: Evolution of the 15mC concept. (Source: Buttner et al, 2022)*

## Aims

The core aim of the 15-minute city (15mC) concept is to create urban environments where residents can access most of their essential daily needs and services, such as housing, work, food, healthcare, education, culture, sports, and leisure within a 15-minute walk or cycling journey from their homes. It promotes the neighbourhood as the fundamental unit of urban organisation, fostering the development of complete, self-sufficient communities (Bruno et al., 2024).

The 15mC paradigm prioritises proximity, mixed land use, density, and ubiquity (availability and affordability for all citizens) as key planning principles to achieve this aim. It intends to reduce the necessity for private car usage by bringing destinations closer to residents, thereby encouraging more sustainable travel patterns and fostering healthier, more liveable, equitable, sustainable, and resilient cities (Vale and Lopes, 2023).

The concept aligns with the principles of chrono-urbanism, linking temporal aspects with spatial decentralisation (Graells-Garrido et al., 2021), and fits within broader contemporary policy contexts such as addressing the climate emergency, achieving national and global sustainability agendas (like the United Nations Sustainable Development Goals - SDGs, and shaping post-COVID-19 recovery strategies (Allam et al., 2024)). While not a strict set of urban development standards, the 15mC serves as a paradigmatic model for sustainably managing urban development and reconceptualising cities. It deliberately shifts emphasis onto the neighbourhood as an appropriate scale for urban innovation and community engagement, promoting non-car-dependent, mixed-use urban living.

## Objectives

The implementation of the 15-minute city concept is significant thanks to its potential to address a wide range of interconnected urban challenges and deliver substantial benefits to the community. Environmentally, it aims for an extensive reduction in $CO^2$ emissions and improved air quality by disincentivising short-distance car trips and promoting active and sustainable transport modes (Khavarian-Garmsir et al., 2023).

Socially, it seeks to combat the loss of community life and social interaction prevalent in many contemporary cities by fostering neighbourhood and community life, enhancing social cohesion, and improving personal well-being through increased opportunities for local interaction and reduced commuting time (Graells-Garrido et al., 2021; Lima et al., 2022).

Economically, the 15mC envisions the creation of local jobs, supports local businesses, and can lead to cost savings for both individuals (reduced car

dependence) and public entities (potentially reduced road infrastructure maintenance and public health costs associated with pollution and sedentary lifestyles) (Teixeira et al., 2024).

For the community, the benefits are multifaceted. Increased walkability and propensity to cycling enhance the social capital and generate a sense of place, as neighbours interact more frequently and feel a greater connection to their local area. Improved access to essential services and amenities within a short distance can enhance equity and inclusivity, ensuring that people of all ages and abilities can meet their daily needs without relying on private vehicles (Monechi et al., 2021; Teixeira et al., 2024). Furthermore, the creation of more liveable public spaces and the prioritisation of people-centred urban planning can contribute to a higher overall quality of life, increased leisure time, and improved physical and mental health. The 15mC can also empower communities through participatory planning processes, allowing residents to have a more active role in shaping their local environments. By fostering self-sufficient neighbourhoods, place-making and resilient local economies, the 15-minute city model aims to create more vibrant, equitable, and sustainable urban futures for all residents (Büttner et al., 2022; Vale and Lopes, 2023).

## Covid-19 influence, before / after COVID comparison

The COVID-19 pandemic served as a significant catalyst, profoundly shaping and tailoring the 15-minute city concept and accelerating its adoption and adaptation across diverse urban contexts. The pandemic brought to the forefront long-standing structural deficiencies in contemporary cities worldwide, including unequal access to urban amenities, a lack of basic services at the neighbourhood level, insufficient green and open spaces, and the negative impact of short distance commuting by car. The experience of lockdowns and travel restrictions forced urban populations to spend more time in their immediate vicinities, leading to a heightened awareness of the quality and functionality of their local environments. This period of restricted mobility highlighted the importance of having daily needs accessible within a short walk or cycle, directly aligning with the core principles of the 15mC (Pozoukidou and Angelidou, 2022; Allam et al., 2024).

The shift towards active mobility emphasised the relevance of the 15mC's for walkable and cyclable streets as crucial components of urban resilience and liveability. The closure of restaurants, bars, and small businesses prompted cities to experiment with solutions that supported local commerce within neighbourhoods. The implementation of parklets and pop-up markets aimed to bring essential goods and services closer to residents, directly reflecting the 15mC's goal of self-sufficient neighbourhoods (Monechi et al., 2021).

The COVID-19 pandemic also underscored existing social and spatial inequalities. Overcrowding in certain neighbourhoods, poverty, and a reduction of public space made it challenging for residents in less privileged areas to maintain physical distancing. This highlighted the importance of tailoring the 15mC concept to address these disparities, ensuring that the benefits of proximity and accessibility are equitably distributed across all socio-economic groups. This realisation has led to a greater emphasis on adopting a needs-based approach in redesigning 15mC initiatives to cater to diverse populations, including those with mobility impairments, and prioritising improvements in underserved neighbourhoods (Lu and Diab, 2025).

The pandemic also spurred innovation and experimentation in urban spaces. Cities around the world experimented with temporary redesigns of streets and public spaces to maximise their utility under lockdown conditions. These experiments, often involving the repurposing of car parking spaces for pedestrian use or outdoor dining, provided valuable insights into how urban space could be reallocated to better align with the principles of the 15mC, prioritising active mobility and quality of stay in local areas.

However, this concept has faced significant public backlash, fuelled by various theories against it, in the context of COVID-19 and subsequently. A major component of the opposition are conspiracy theories. These theories often portray the 15mC as a '*global plot*' or '*social engineering with hidden agendas to restrict private freedoms*'. Specific claims include that it is a '*climate change lockdown*' or part of a broader '*climate lockdown conspiracy*', designed to confine people to local '*Hunger Games–style districts*' and make them easier for authorities to control. Critics allege it is a strategy to deprive individuals of their cars and is linked to concepts like the Great Reset or Agenda 2030. It is sometimes framed as a

'*global socialist ideology*' or a governmental overstep infringing on individual freedoms (Marquet et al., 2025). A conspiracy theory website claiming the Oxford traffic plan was a lockdown plot went viral. Jordan Peterson's tweet describing the concept as a '*perversion*' garnered 7.5 million views. This has led to endless queries and threats directed at officials implementing related urban planning schemes, such as the traffic filters in Oxford (Reid, 2023; Walker, 2023).

This has led to civic demonstrations against urban planning strategies like the 15mC in cities worldwide. The backlash includes strong resistance, particularly from suburban, car-dependent residents who see policies reducing car dominance as an attack on personal mobility and freedom. The rise of these theories, amplified post-COVID-19, has eroded institutional trust and fostered intergroup hostility, making constructive dialogue difficult. These theories are embraced by a coalition that can include right-wing politicians, anti-lockdown activists, anti-vaxxers, climate deniers, and members of the far right, though some concerns also reflect distrust in elites or feelings of alienation (Mouratidis, 2024a).

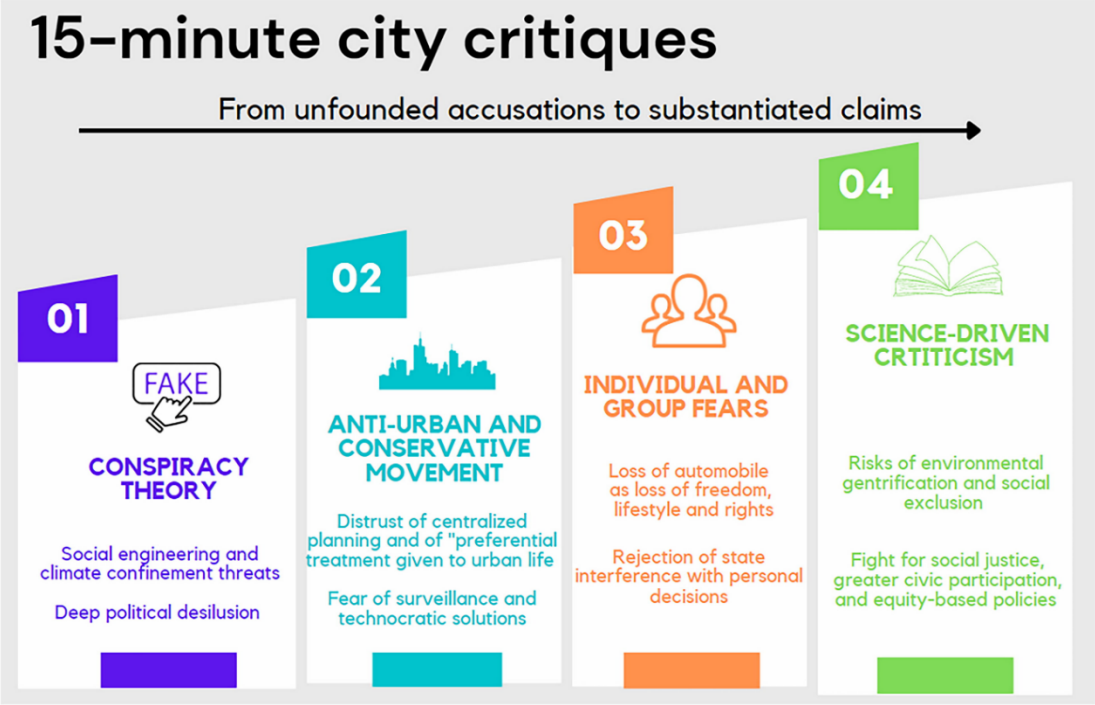


*Figure 3: The 15-minute city critiques in four tiers. Source: (Marquet et al., 2025)*

Backlash is also often associated with the emergence of gentrification evidence, leading to fears of change and distrust from the more vulnerable communities. Implementation of the 15mC model risks exacerbating existing socio-economic inequalities where investments focus on already well-served

areas under a purely capitalistic approach or where the changes push away the long-term residents due to increased cost of living (Zeisel et al., 2024; Caprotti et al., 2024).

There are risks of excluding essential workers and working-class residents who have less capacity to choose where they live and work amidst increasing urban housing inequalities. Potential unintended consequences include green gentrification, where urban greening measures reinforce social inequalities through rising rents (Tarwani, 2021; Mouratidis, 2024b).

Lack of consideration for people with mobility impairments could leave them behind if urban space primarily prioritises walking and cycling. For these categories of citizens, the consequences would likely be the continuation of the status quo or even a potential degradation of public space and amenity accessibility.

The focus on the local scale inherent in the 15mC concept risks divulging metropolitan-scale urban governance, which is crucial for enhancing liveability for lower-income groups.

Implementation risks mobilising capital through real estate can also lead to gentrification and displacement, leading to resistance from the local community. Experts note that the 15mC proposal oversimplifies the complexities of urban socio-economic processes and risks creating enclaves, potentially exacerbating inequalities (Marquet et al., 2025).

The question '*15 minutes for whom?*' explicitly raises concerns about inclusivity and distributional benefits (Zeisel et al., 2024). Effective implementation requires understanding these risks, ensuring social justice, and engaging with communities to build trust and address legitimate concerns about fairness and equity.

*Table 1: Perception changes pre-/post- COVID19. (Source: author's interpretation)*

| Aspect | Before COVID-19 | After COVID-19 |
|---|---|---|
| Stage of Development | Emerging concept; mainly theoretical and academic. | Widely adopted policy tool; accelerated global application. |
| Geographical Scope | Limited to pioneering cities (e.g., Paris). | Embraced by many cities worldwide across different urban scales. |
| Primary Motivation | Sustainable urban regeneration, $CO_2$ reduction, liveability improvement. | Urban resilience, equity, social well-being, and sustainability. |
| Policy Integration | Nascent policy direction; aspirational. | Mainstreamed into urban recovery plans and long-term strategies. |
| Public Awareness | Low; largely expert-driven discourse. | High; gained widespread attention due to lived pandemic experiences. |
| Spatial Strategy | Based on chrono-urbanism; focused on decentralising services. | Greater emphasis on hyper-locality and tailoring strategies to diverse urban morphologies. |
| Mobility Focus | Promoting walkability, cycling; reducing car dependency. | Same goals, with added support through remote work and digital connectivity. |
| Technological Enablers | Envisioned use of smart city technologies. | Active use of spatiotemporal data and digital tools for evaluation and implementation. |
| Implementation Tactics | Conceptual plans; limited empirical evidence or real-world trials. | Rapid trials (e.g., parklets, pop-up bike lanes); more empirical insights through experimentation. |
| Measurement & Evaluation | Debates on methodology and service scope. | Methodological advancements and data-driven assessment models. |
| Equity and Inclusion | Less focus on social/spatial inequalities. | Strong emphasis on inclusivity, participatory governance, and reducing inequalities exposed by the pandemic. |
| Public Sentiment | Generally positive within urban planning circles. | Mixed responses; rise of resistance and conspiracy narratives ('paranoid urbanism' (Caprotti et al., 2024)). |
| Temporal Accessibility Variants | Predominantly '15-minute' framework. | Expanded to include 10-minute towns, 20-minute neighbourhoods, reflecting flexible, localised approaches. |

# Dimensions

Within the 15mC framework, six key dimensions of daily life are often considered for evaluating and implementing the 15mC model, particularly in the context of planning and assessing demonstration sites, informed by implementation practices in various cities and relevant literature. The purpose of defining these dimensions is to provide a structured analytical backdrop for local urban development initiatives aligned with the 15mC concept. They are used to collect, map, and analyse existing initiatives and to assess the physical accessibility within demonstration areas. Their relevance lies in their direct connection to the core premise of the 15mC, ensuring that all citizens have equitable access to a wide range of services and amenities within their immediate vicinity.

## Education and culture

This dimension encompasses the accessibility of institutions and resources dedicated to learning and cultural enrichment within the local neighbourhood. It includes a range of facilities such as schools at all levels (pre-university), kindergartens and nurseries, libraries, and cultural attractions. Ensuring proximity to these amenities supports the development of human capital, lifelong learning, and community engagement in cultural activities. The strategic placement of educational facilities can also influence travel behaviour, with the closest schools mandating the nearest educational urban function to one's residence. Furthermore, the potential for shared use of educational buildings as community centres outside of school hours can enhance the efficient use of space and provide additional cultural and social opportunities. The integration of cultural connection points and public art also contributes to the overall liveability within this dimension (Allam et al., 2022; Szymańska et al., 2024).

## Employment

This dimension focuses on the availability of opportunities for work and economic activity within the 15-minute radius. The 15-minute city ideal seeks to

reduce the need for long-distance commuting by fostering local jobs creation and access to diverse employment options. This includes not only traditional workplaces but also co-working spaces, opportunities for remote work supported by local infrastructure (e.g., community centres with workspaces), and the promotion of local economies through initiatives that support local businesses and entrepreneurship. A productive mix of uses within neighbourhoods can secure local employment opportunities and create more vibrant and safer streets. Over the long term, this may require fundamental changes in employment allocation models, treating job provision at the local level as a key element of public policy (Ramírez Saiz et al., 2022; Pozoukidou and Angelidou, 2022).

## Mobility

This dimension addresses how residents can move within and beyond their local neighbourhood in a sustainable and efficient manner. It prioritises active transport modes such as walking and cycling through the provision of well-connected, barrier-free, and comfortable infrastructure. Public transport availability and accessibility are also crucial, ensuring that residents have options to reach areas outside the 15-minute radius without relying solely on private cars. This includes considering the frequency, capacity, and barrier-free access to rail and bus-based public transport. The concept also involves the redistribution of public space to favour pedestrians and cyclists, such as converting traffic lanes and public parking into walking and cycling routes. Furthermore, integrating mobility for both people and goods is essential, considering logistical needs and adapting to changing shopping habits (Graells-Garrido et al., 2021; Allam et al., 2022; Núñez et al., 2024).

## Personal well-being and outdoor recreation

This dimension emphasises access to spaces and facilities that contribute to the physical and mental well-being of residents and provide opportunities for leisure and recreation. This includes the availability of green spaces such as parks and playgrounds, sports facilities, and other recreational amenities. The quality of these spaces, including their accessibility, safety, and maintenance, is paramount.

Furthermore, the concept promotes the co-creation of public spaces with the community to strengthen local connections and identity. Initiatives that consider cultural connection points, public art, community performances, and street food also contribute to the overall liveability and well-being within this dimension. A focus on people-centred urban spaces and planning, integrating mixed-use developments and fostering community-oriented public spaces, underpins this dimension (Büttner et al., 2022; Bruno et al., 2024).

## Care and health

This dimension concerns the accessibility of healthcare facilities and services necessary for maintaining the health and well-being of the population within the local area. This includes access to primary care physicians, pharmacies, hospitals, medical offices, and other health-related amenities. Ensuring equitable access to these services for all residents, including older adults and those with mobility impairments, is a key consideration. This may involve strategic planning of service networks, considering long-term demographic projections, and potentially providing health services at home or in the proximity. Analysing the accessibility indicators to health services in relation to the urban context and transport networks is crucial for addressing potential inequities (Monechi et al., 2021; Barbieri et al., 2023).

## Food and provision of daily shopping

This dimension relates to the availability of goods and services required for daily life within a short travel time. This encompasses access to supermarkets, local food markets, bakeries, convenience stores, retail outlets, and other essential commercial establishments. Fostering self-sufficient neighbourhoods by supporting the local economy and promoting the consumption of locally produced goods are important aspects of this dimension. The strategic placement of these amenities aims to ensure that residents can meet their consumption needs locally, reducing the necessity for longer trips (Khavarian-Garmsir et al., 2023; Szymańska et al., 2024).

*Table 2: Visualising how different types of residents interact with their '15-Minute Cities', as identified by recent research – extract from. (Source: O'Dell and Ledermann, 2024)*

| SOURCE | AMENITIES |
|---|---|
| Pozoukidou & Chatziyiannaki (2021) | Healthcare Facilities; Preschools and Schools; Social Services; Commercial Services; Leisure; Culture and Entertainment; Parks and Natural Areas |
| Moreno, Allam, Chabaud, Gall, & Pratlong (2021) | Work; Commercial Areas; Education Centers; Health Facilities; Public Infrastructure |
| Khavarian-Garmsir, Sharifi, Hajian Hossein Abadi, & Moradi (2023) | Living; Working; Commercial (including Food); Health Care; Education; Entertainment |
| Akrami, Sliwa, & Rynning (2024) | Education; Kindergarten; Entertainment; Green Space; Healthcare; Commercial |
| Moreno, The 15-Minute City: A Solution To Saving Our Time & Our Planet (2024) | Schools; Health Center; Shops; Green Spaces; Cultural Facilities |
| Weng, et al. (2019) | Education; Medical Care; Municipal Administration; Finance and Telecommunication; Commercial Service; Elderly Care |
| Logan, et al. (2022) | Pharmacies; Supermarkets; Primary Schools; Parks |
| Glock & Gerlach (2023) | Kindergarten; Primary School; Playground; Public Park; GP – Doctor; Pharmacy; Grocery Store |
| Ferrer-Ortiz, Marquet, Mojica, & Vich (2022) | Health; Social Services; Day Centers; Preschool Education; Primary Education; Secondary Education; Supermarkets; Markets; Shows; Libraries; Civic Centers; Children Playgrounds; Sports Facilities; Rapid Transport; Shared Bike Stations |
| Abdelfattaha, Depontea, & Fossa (2022) | Food/grocery stores; Commercial stores (including clothes shops, electronics shops, etc.); Cultural venues; Educational facilities; Parks and green spaces; Restaurants; Health facilities; Sports facilities; Other |

## Geographic scales and functions

Low Density Urban Areas (LDUAs) are characterised by several key features:

- They are often situated as suburban areas surrounding city centres within larger metropolitan regions.
- They exhibit a lower population density when compared to the urban cores (i.e. European suburbs might have densities around 45 persons/ha, markedly lower than the approximately 120 persons/ha found in city centres) (Kompil et al., 2015)
- Their morphology is frequently described as spatially fragmented.
- They tend to possess a lower density of established social infrastructure and amenities compared to more compact urban areas.

LDUAs constitute the central focus and experimental context for the PROWD (PROximity Without Density) project due to their specific challenges and the need for tailored solutions. The project recognises that conventional approaches to achieving proximity, such as substantial investments in public transport infrastructure or broad urban densification, may be less viable, cost-effective, or environmentally appropriate in LDUAs. Their inhabitants may face limitations in accessing daily services and amenities within a convenient radius, potentially impacting their 'proximity rights'.

In acknowledging the above, this chapter is designed to compare and contrast the different scales at which the 15mC concept might be implemented, highlighting the increased difficulties associated with wider scales and lower densities.

## Geographical scales

The 15-minute city concept, at its core, advocates for the accessibility of essential urban functions within a 15-minute walk or bike journey. However, this concept's practical application and strategic focus vary significantly depending on the geographical scale under consideration.

### Neighbourhood scale

At the neighbourhood level, the emphasis is on creating self-sufficient and liveable local areas where residents can access their daily needs quickly. This often involves enhancing the mix of land uses, improving pedestrian and cycling infrastructure, and fostering community engagement. The concept deliberately shifts emphasis onto the neighbourhood as an appropriate scale for urban innovation and community engagement (Vale and Lopes, 2023).

The specific challenges and opportunities at this scale are often hyper-local, relating to the existing urban fabric, community demographics, and the availability of underutilised spaces. For instance, densely populated inner-city neighbourhoods might focus on enhancing the quality of existing public spaces and optimising the use of vertical spaces for services. In contrast, lower-density or suburban neighbourhoods might face challenges related to retrofitting existing infrastructure and achieving sufficient density to support local businesses and services. Concerns regarding gentrification and the equitable distribution of

benefits are particularly pertinent at the neighbourhood scale (Caprotti et al., 2024).

The development of '*Superblocks*' with restricted car access, the creation of '*Complete Neighbourhoods/Communities*' prioritising social aspects, and the implementation of 'Low Traffic Neighbourhoods' (LTNs) aimed at reducing motorised through-traffic are all examples of neighbourhood-scale interventions aligned with the 15-minute city concept. Paris's *'Pacte Proximité'*, empowering districts, also operates at this scale. Edinburgh's 20-minute neighbourhood strategy, guided by the Scottish Index of Multiple Deprivation, also targets the neighbourhood level (Marchigiani and Bonfantini, 2022; Teixeira et al., 2024; Núñez et al., 2024).

## City scale

At the city scale, the 15-minute city vision involves strategically planning and connecting multiple self-sufficient neighbourhoods to form a cohesive and polycentric urban structure. This requires a broader perspective on the distribution of services and employment opportunities across the city, as well as ensuring sustainable connectivity between neighbourhoods via public transport and active mobility networks. Cities often adopt the 15-minute city as a guiding principle in their overall urban policy and development strategies (Pozoukidou and Angelidou, 2022; Büttner et al., 2022).

The challenges at the city scale include coordinating planning efforts across different neighbourhoods, addressing existing spatial inequalities in access to services, and integrating the 15-minute city concept with broader city-wide transportation and economic development strategies. Cities must also consider the needs of transient populations and the connectivity between the city centre and suburban districts. Measuring and evaluating the 15-minute city at this scale requires sophisticated methodologies that can account for diverse urban forms and socio-economic patterns. The definition of 'essential services' may also be broader at the city level, including specialised facilities that cannot be viably located in every neighbourhood.

Paris's adoption of the 15-minute city as a central pillar of its urban policy, Barcelona's efforts to increase the availability and diversity of local urban amenities, and Milan's implementation strategies exemplify city-wide

approaches. The '5-Min Principal' in Copenhagen's Nordhaven neighbourhood, while focused on a specific area, contributes to the city's broader accessibility goals (Allam et al., 2024).

## Metropolitan scale

Extending beyond city boundaries, the metropolitan scale involves considering the interconnectedness of a central city with its surrounding suburban and peri-urban areas. The 15-minute city concept at this scale necessitates addressing issues of suburban sprawl, car dependency in peripheral areas, and ensuring equitable access to opportunities and services across the entire metropolitan region. Sustainable inter-neighbourhood connectivity becomes even more critical, requiring robust public transport networks and integrated land-use planning.

Implementing the 15-minute city at the metropolitan scale presents significant governance challenges, requiring coordination and alignment of policies across multiple municipalities and administrative jurisdictions. Addressing the predominantly mono-functional structures and high car dependency of suburban areas requires tailored strategies that might differ significantly from those employed in dense urban cores. Economic development strategies need to be carefully considered to avoid increased inequalities between central cities and suburbs. Defining the appropriate time threshold (e.g., 15, 20, or 30 minutes) might also vary across distinct parts of the metropolitan region based on existing infrastructure and population density (Graells-Garrido et al., 2021; Sharma et al., 2025).


*Figure 4: Priorities of Melbourne's 20-minute neighbourhood (Source: https://www.planning.vic.gov.au/guides-and-resources/strategies-and-initiatives/20-minute-neighbourhoods)*

## Contrasts across scales

The primary contrasts lie in the scope of implementation, the complexity of governance and coordination required, the specific challenges and opportunities presented by the existing urban fabric and socio-economic context, and the methodologies for measuring and evaluating success. The level of detail in planning and the definition of '*essential services*' also tend to become more generalised as the geographical scale increases. Furthermore, the potential for unintended consequences, such as gentrification, needs to be carefully considered and addressed at all scales, but the drivers and manifestations of these consequences may differ.

In LDUAs, the scale at which the 15mC implementation is tried or at which the functions and dimensions are evaluated are highly dependent on the need for personal cars. Low-density areas, often found in metropolitan peripheries and suburbs, are characterised by high car dependency and mono-functional structures. These areas typically exhibit unsustainable travel patterns with a high reliance on low-occupancy private cars, particularly representative for Eastern and Central Europe, with Bucharest presenting numerous evidence of this

(Burlacu, 2013; Merciu, 2020). Lack of adequate public transport in suburban regions often compels residents to use personal cars, despite falling under the lower income brackets. When considering more affluent areas, high car ownership is linked to personal choice and insufficient public transport (Tarwani, 2021; Grădinaru and Maricuț, 2024). This is correlated with the scale and area needed to be covered to access the essential services.

Increasing the number of clusters of micro-mobility services to open up access to all dimensions of daily life across wider geography scales faces challenges due to low population density affecting fleet distribution efficiency (Abdelfattah et al., 2022; Barbieri et al., 2023).

The analysis of the literature review by (Sepehri and Sharifi, 2025) also highlights micro-differences: 15mC versus an extended 20-minute version. These different variants showed distinct focuses: 15-minute cities research primarily concentrates on environmental, sustainability, and accessibility aspects, while 20-minute cities research mainly tackles socio-economic and human-related issues. This shows that even at neighbourhood level, the functions evolve and are sensitive even to small time differences.

## Functions at different scales

It is imperative to acknowledge the importance of the hierarchy of functions, services, and amenities to be provided within different areas or catchments. This hierarchical order ranges from local to regional scales.

A. Lower Order Facilities: Basic amenities and services, often considered daily needs, are suitable for localisation at a local or neighbourhood scale. These might include grocery stores or neighbourhood shops. Essential urban services within a neighbourhood unit context should ideally be available within a distance of 500 to 800 meters from a residence. Examples mentioned include (primary) schools, supermarkets, parks, playgrounds, health and care facilities, and leisure/recreational facilities.
B. Higher Order Facilities: Facilities that serve a larger population or require a wider catchment area ought to be provided at more aggregate city or regional levels. These could include institutions like hospitals or universities (Nared, 2019).

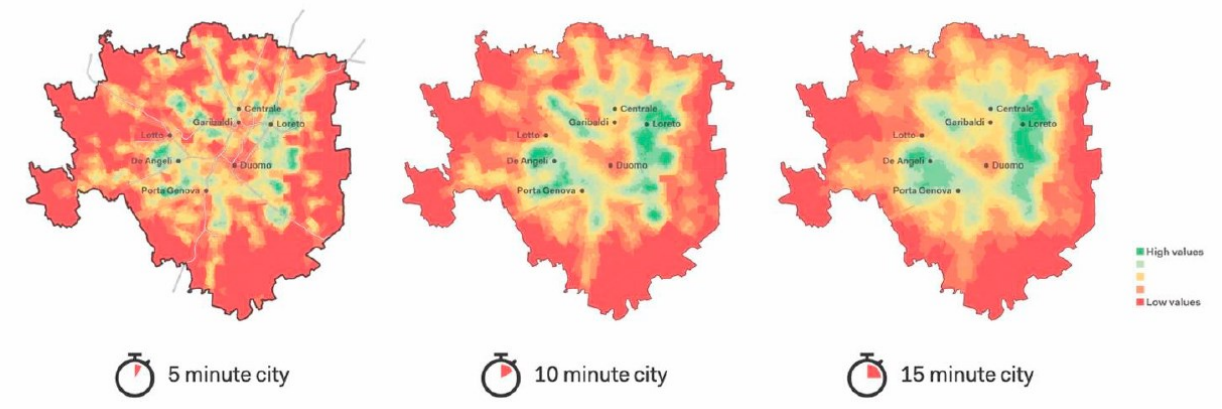


*Figure 5: Functions clustering in Milan, from hyper-local to 15 minutes. (Source: Abdelfattah et al., 2022)*

Neighbourhoods are perceived as part of a larger network of centres, not simply self-sufficient entities. They can be shaped around public transit and feature a descending order of density, mixed land use, and social/economic uses compared to higher-level centres.

Town/District Centres serve a wider area than individual neighbourhoods, accommodating a broader range of services and potentially specialised shops.

City/Regional Centres represent the highest level in the hierarchy, providing a concentration of major services, employment, and retail that attract people from across the city or region. They are connected to lower-level centres through a network of corridors and public transit. Planning at the functional urban area scale is important for transport planning and accessibility to services.

Applying the concept of proximity in urban space necessitates the redistribution of functions based on geographical, economic, and social principles like threshold population and market range. This often requires citywide policies for hierarchisation and relocation of public functions. The specific amenities considered essential can vary based on local socio-economic and political contexts (D'Onofrio and Trusiani, 2022).

# Social divides and fault lines

## Adoption in areas of different economic and development levels

Notable differences can be observed in response to and implementation of the 15-Minute City (15mC) concept between Western European countries and Central and Eastern European countries.

Western Europe demonstrates a significantly higher level of adoption and implementation initiatives. Based on the research of Allam et al. (2024), 37 initiatives have been identified, constituting 48% of the total mapped initiatives within the study as originating in the west. Specific countries with high activity include France (20 initiatives, 26%), the United Kingdom (8 initiatives, 10%), and Italy (2 initiatives, 3%). Belgium, Denmark, Finland, Ireland, the Netherlands, Spain, and Sweden each account for 1% of the total initiatives.

The 15mC concept's founding idea is often linked to the structure and setup of European city centres, suggesting a strong connection to Western European urban morphology. The concept is largely based in attempts to rethink cities in the Global North, where higher levels of urban development, emphasis on sustainability, and existing financial resources for urban sustainability measures and infrastructural reforms may facilitate the adoption and implementation of these concepts (Szymańska et al., 2024).

Central and Eastern Europe shows a considerably lower prevalence of 15mC initiatives compared to Western Europe. Central and Eastern Europe account for only two initiatives (3% of the total), specifically in Poland (1%) and Romania (1%). The concept is described by Allam et al. (2024) as '*not yet prevalent in Eastern Europe or as popular as in its western counterparts*'.

Despite lower overall adoption, the concept is being applied in some Central/Eastern European cities, such as in Slovak cities and Brno, Czech Republic, suggesting its potential is recognized as a sustainable urban development alternative (MOCÁK et al., 2022).

Differences in urbanisation trajectories, lower levels of existing urban development and emphasis on sustainability (compared to Western counterparts), and potentially a lack of financial means for urban regeneration

projects may contribute to the slower adoption rate. The distinct urban patterns created by former Socialist regimes may also present specific contexts for implementation.

### Low-income areas, peripheries and low-density areas

Implementing the concept in low-income areas, peripheries, and low-density urban areas presents significant challenges and requires specific approaches focused on inclusivity and adapting strategies to context.

These areas are often characterised by higher car-dependency and mono-functional structures, making the proximity principle harder to achieve than in dense urban spaces. Specific difficulties include strict zoning limitations that often restrict development primarily to residential uses, hindering the creation of mixed land use necessary for the 15mC (Nicoletti et al., 2023).

The morphological character of suburban areas, with residents spread out in single-family housing, poses a challenge for achieving the density needed to support local services and frequent public transport. Achieving the 15mC in these areas also involves complex issues related to territorial jurisdictions and coordinating interests between different administrative units (like municipalities and regions).

Smaller and potentially poorer communities may have limited funding available for the necessary modifications to implement 15mC practices. A significant portion of urban traffic originates outside city limits, highlighting the need for the 15mC concept to extend beyond municipal boundaries, which has been infrequently applied. Such examples are particularly relevant in Australian and North American settings (Pemberton et al., 2024), but European conurbations are also affected.

## Approaches and Solutions for Peripheral and Low-Density Areas

Solutions are being considered for peripheral areas, including setting up multimodal hubs that integrate shared mobility systems, micro-mobility, and public transport services. Development of pedestrian and cycling infrastructures and improving the reliability of mobility information using digital solutions are also regarded as essential for successful delivery. Scaling up the 15mC concept to

low-density and suburban areas implies a regional shift from centralisation to decentralisation (Damerau and Baston, 2020).

Peripheral locations often require mobility replanning and land-use reallocation between different 15mC areas to achieve efficient multi-directional public transport connections, which are critically needed to keep living and working areas interconnected beyond the walking/cycling range.

Implementing the 15mC in these contexts requires greater flexibility in zoning regulations (at the regional level), accommodating mixed-use developments (at the urban level), and allowing for the reallocation of road space (at the local neighbourhood level), (D'Onofrio and Trusiani, 2022).

### Implementation in Low-Income Areas and Focus on Inclusivity

Disadvantaged groups, including those with low incomes, from diverse social backgrounds or those with mobility impairments, are often not adequately considered in traditional city planning. The 15mC concept offers an opportunity to address this by ensuring access to essential services for all groups, regardless of socio-economic status. It is therefore desirable to implement the concept alongside socially inclusive development processes to prevent issues like gentrification, which can occur if investments disproportionately benefit wealthier areas. Targeting areas marked by higher deprivation indices is identified as a proactive measure to combat poverty and transport poverty and reduce socioeconomic disparities. However, it must be acknowledged that gentrification can also occur when investments focus on areas with lower socioeconomic status and drive housing prices up while also attracting wealthier residents.

Edinburgh is highlighted as a specific case study where the city uses the Scottish Index of Multiple Deprivation (SIMD[1]) to identify and prioritise areas of higher deprivation for implementing its 20-Minute Neighbourhood strategy. This approach is seen as a commitment to fair and equitable urban development, focusing on areas with greater needs. Concrete actions to improve accessibility and inclusivity for low-income areas include developing higher quality and

[1] https://simd.scot/#/simd2020/BTTTFTT/9/-4.0000/55.9000

accessible walking and cycling networks and ensuring connection via frequent and affordable public transport (Teixeira et al., 2024).

## Large cities vs small towns

### Implementation in Large Cities (Urban Centres/Dense Areas)

In the dense urban cores of large cities, the goal of achieving proximity to essential services within a 15-minute walk or cycle is often already largely met. Analysis of five European cities showed that large parts of them already function as 10 or even 5-minute cities in terms of proximity to services (Büttner et al., 2022).

Therefore, the focus in these areas is often less on creating proximity from scratch and more on improving the quality of active transport infrastructure (making streets more walkable and cyclable), enhancing liveable public spaces, and reallocating road space away from cars. The main priorities in such contexts are building on existing urban planning principles like polycentricity, mixed-use development, and established public transport networks.

### Implementation in Small Towns, Peripheries, and Low-Density Areas

These areas present significant challenges for implementing the 15mC concept. They are typically characterised by high car-dependency and mono-functional structures, making the proximity principle difficult to achieve through walking or cycling alone.

Specific difficulties include strict zoning limitations that often confine development to residential uses, hindering the necessary mixed land use. The morphological character of these areas, such as residents spread out in single-family housing, poses a challenge for achieving the density needed to support local services and frequent public transport. Limited funding available in smaller or potentially poorer communities can be an obstacle to implementing necessary modifications.

The 15mC concept needs to extend beyond municipal boundaries to address traffic originating outside city limits, requiring coordination and potentially a stronger role for metropolitan and regional governance structures. This role must reflect the duty of these superior structures to account for the decentralised

needs of the local communities, and to act as enablers and coordinators for delivery (this is perceived as opposing the traditional reasoning for developing metropolitan agencies – for transport or administrative roles, which usually seek cost savings, economic development and easier control. This coordination of interests and investments among different administrative units is a key challenge. The literature considers the following as key to address the discrepancies (OECD, 2020; Pozoukidou and Angelidou, 2022):

- Developing strategies that consider specific land-use, territorial jurisdiction, and morphological implications.
- Achieving greater flexibility in zoning regulations (at a regional level) and accommodating mixed-use developments (at a more local level).
- Establishing multimodal hubs integrating various transport modes like public transport, shared mobility, and micro-mobility.
- Improving connectivity via efficient multi-directional public transport connections to link living and working areas beyond walking/cycling range.
- Addressing the specific needs of residents, including those in rural parts of the city, through processes like public participation.

While the concept of '*10-minute Towns*' exists, suggesting application in smaller settlements, the sources highlight that implementation in low-density and suburban contexts has not been fully explored compared to urban centres. Examples like Fredrikstad (Norway) and Hailsham (UK) are worth mentioning in the context of smaller places adopting the concept.

While relevant in all urban contexts, addressing social justice and disparities is particularly highlighted when discussing low-income and disadvantaged areas. This involves considering the needs of vulnerable groups and ensuring policies benefit people of all backgrounds, ages, and abilities.

Citizen engagement and participatory planning are considered essential in all contexts to understand the diverse needs and to ensure effective, human-centred implementation.

## Formal vs informal 15mC

The implementation of the 15mC concept is multifaceted, involving both structured, official interventions and less codified, community-driven processes. While formal planning frameworks provide the necessary structure, informal measures contribute vital contextual understanding and foster local adaptation. Often, it can be observed that these processes, formal or informal, shape 15mC-style projects that do not directly refer to the concept itself, but embed numerous principles that define a 15-minute city (Biazzo et al., 2019; Szymańska et al., 2024).

## Formal Measures Supporting the 15mC Concept

Formal measures encompass the official policies, plans, strategies, regulations, and methodologies adopted by governmental or institutional bodies to define, implement, and monitor 15mC initiatives.

- Policy integration and planning frameworks: Cities integrate the 15mC concept or similar proximity-oriented approaches into their comprehensive urban plans and development strategies. This includes establishing official definitions, goals, visions, and strategic frameworks for implementation. Some national or regional strategies also exist.
- Defined metrics and measurement methodologies: Formal approaches involve defining specific temporal thresholds (e.g., 10, 15, 20 minutes) and spatial metrics (e.g., distance in meters, often based on pedestrian networks) to quantify proximity and accessibility. Various methodologies are employed, such as GIS analysis, network analysis, gravity-based modelling, and service intensity indexing, often using official data sources like census data and administrative records. Defined criteria are used for evaluating strategies and practices.
- Service categorisation and provision targets: Formal plans often categorise essential amenities or urban functions (such as those related to education, employment, mobility, well-being, care, health, food, and shopping) that should be accessible within the defined time/distance threshold. Cities may aim to localize specific amenities, often focusing on basic services within the 15/20-minute radius. However, the lack of a standardised hierarchy or clear prescriptive elements in the foundational concept can lead to ambiguities in defining modules and features (Büttner et al., 2022).

- Infrastructure development and spatial reorganisation: Formal measures include concrete actions such as investments in alternative transport infrastructure (e.g., cycling networks, pedestrian areas), improvements to public transport frequency, reorganization of urban spaces to support mixed-use development, and development of mobility hubs. Policies promoting sustainable transportation, reducing car use, or reclaiming space are often associated with 15mC practices.
- Implementation and monitoring processes: Formal frameworks outline implementation timelines, funding mechanisms, and monitoring processes. Cities develop tools and indicators to track the provision and quality of services/amenities and overall neighbourhood development. Classification typologies can serve as monitoring tools to identify areas needing improvement.
- Institutional structures: The adoption and implementation of the concept can involve specific institutional roles, such as city managers or designated commissioners for the 15-minute city, indicating a formal commitment at the city scale, even if not fully codified in all planning documents initially. Engaging a higher number of institutions is required for integrated planning, especially at the functional urban area level (OECD, 2020).

## Informal Measures Supporting the 15mC Concept

Informal measures encompass the diverse inputs, perceptions, and actions stemming from communities, citizens, stakeholders, and public discourse that shape the understanding, acceptance, and local adaptation of the 15mC.

- Community engagement and consultation: Gathering insights from residents through focus groups, surveys, interviews, and workshops is a crucial informal measure. These processes help identify community preferences, needs, definitions of amenities, general attitudes towards the concept, concerns (e.g., regarding equity or potential resistance), and daily mobility patterns. This qualitative data provides context that official surveys might miss.
- Stakeholder collaboration and co-design: Engaging a range of stakeholders beyond governmental bodies, including individuals,

organizations, and institutions, is key. Collaborative efforts, such as local workshops and 'urban talks,' facilitate co-designing scenarios and developing 'collaborative pacts' that outline collective action and cooperation towards 15mC objectives.

- Public discourse and narrative shaping: Media analysis and the broader public sphere contribute to shaping the narrative around the 15mC concept, including the emergence of critical voices, controversies, and even '*paranoid urbanism*' narratives that can influence public reception and policy feasibility. Addressing these narratives and fears is identified as an open challenge. The concept itself can function as a communicative tool and a vision.
- Local adaptations and citizen initiatives: Informal processes allow for context-dependent interpretations and adaptations of the concept based on local realities, demographics, socio-economic structures, and morphology. This can include community-based initiatives or practices implemented under different, long-standing neighbourhood-oriented approaches. Supporting citizen-led initiatives is noted as a policy brief objective.
- Experiential understanding and perception: Understanding the concept from the perspective of residents and users, including their perception of walkability, distance tolerance, and the impact of physical barriers (e.g., highways, rail lines, parks), provides essential informal feedback on the lived reality versus planned intentions. Leveraging personal stories and diverse perspectives can increase awareness and highlight potential benefits for various groups.

## Comparison and Interrelation

While formal measures provide the systematic framework and resources for implementing the 15mC, they often lack the detailed local context and understanding of diverse community needs. The fundamental concept itself can be vague, contested, and lack consistent prescriptive elements, leading to varied interpretations in formal plans.

This highlights the critical role of informal measures in:

- Grounding the concept: Informal inputs help geographically ground the concept, moving beyond generic blueprints to inform policies based on specific urban realities and diverse socio-economic contexts.
- Informing and refining formal measures: Community-informed data and qualitative insights gathered through informal processes can directly inform the selection of amenities, define region-specific accessibility measures, influence equity assessments, and highlight the impacts of physical barriers, thereby refining formal planning and measurement methodologies.
- Ensuring inclusivity and addressing equity: By incorporating community views, especially from equity-deserving populations, informal measures help reveal disparities and inform policies aimed at ensuring the 15mC benefits are distributed equitably.
- Facilitating acceptance and adaptation: Engaging stakeholders and addressing public discourse helps navigate controversies and build acceptance for policy changes, facilitating local adaptation and successful implementation on the ground.

Effective 15mC development necessitates a deliberate and integrated approach that leverages both the systematic capacity of formal planning and governance structures and the contextual richness and democratic legitimacy provided by informal community engagement and local adaptation processes. The discrepancies and challenges observed in the application of the 15mC underscore the need for continuous assessment, dynamic planning, and a collaborative ecosystem involving authorities, academia, practitioners, and citizens.

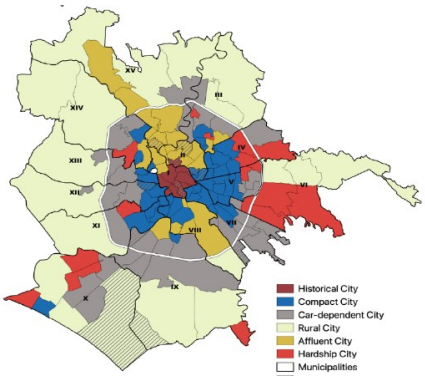


*Figure 6: Types of urban environment, Rome (Source: Chiaradia et al., 2024))*

# The role of transport

The 15-minute city concept is fundamentally linked to urban planning and design, positioning proximity as a core principle to enable residents to meet most daily needs within a short walk or cycling trip from home. This approach aims to align city design with movement patterns and reconsider planning in a more integrated manner.

## Active mobility

Active transport modes, including walking and cycling, are considered paramount in strategies to reduce car dependence and are often prioritised. The 15-minute city model explicitly aims to enable access to essential services within approximately 15 minutes on foot or by bicycle. Planning favouring active transport involves focusing on accessibility, connectivity, and integrated public and open spaces. Building dedicated walking and cycling infrastructure (e.g., pavements, cycle lanes, cycle parking) is a key practice associated with promoting sustainable urban mobility within 15-minute city approaches (Pozoukidou and Chatziyiannaki, 2021; Vale and Lopes, 2023).

Examples of practices promoting active mobility include creating networks of walking and cycling routes and improving walkability and cycling infrastructure in cities such as Bremen, Bristol, Poznan, Fredrikstad, London, Rome, Thessaloniki, Valladolid and Vienna (Shoina et al., 2024; Teixeira et al., 2024; 15m Cities SPECIFIC, 2025b; 15m Cities SPECIFIC, 2025a).

Pedestrian-friendly, barrier-free, and connected streets are seen as essential components. Research indicates a positive correlation between walkability, the diversity of land use mix, the availability of local amenities, and the likelihood of people walking and cycling for transport. Studies highlight the importance of physical accessibility analysis based on network analysis considering different modes, including walking and cycling, for various functions.

## Public transport

Providing convenient access to public transport is a key element, ensuring near and varied connections. Improving Public Transport (PT), such as increasing service frequency, is identified as a practice for promoting sustainable urban mobility (Ramírez Saiz et al., 2022).

Developing mobility hubs that offer multiple sustainable transport modes in one location is also a relevant practice. In a 15-minute city context, Transit-Oriented Development (TOD) and access to high-quality public transport remain important, with a focus on optimising services and land uses near interchange hubs rather than solely maximising density (Pozoukidou and Angelidou, 2022).

Cities such as Vienna and Valladolid (Spain) routinely incorporated improvements or prioritisation of public transport in their practices, but examples like Zagreb stand out. Within the post-earthquake reconstruction program for the historic city centre, Zagreb implemented an urban mobility development program to improve conditions for pedestrians and cyclists, addressing issues like narrow traffic corridors and low non-motorised mobility historically prevalent in the dense urban fabric. This represents a highly relevant example of achieving the positive effects of designing a 15mC, but without incorporating the concept at the core of the planning practices (Majstorović et al., 2022).

Sustainable Urban Mobility Plans (SUMP) are often used as tools to facilitate modal shift towards public transport and active mobility. Planning mobility at the functional urban area level necessitates collaboration among stakeholders to overcome geographical and administrative barriers, often focusing on public transport as the backbone of the mobility system. In Lisbon, the Plano de Ação Mobilidade Urbana Sustentável (PAMUS) is explicitly connected to the 15mC concept due to its role in making transport modes like cycling viable through infrastructure development (Büttner et al., 2024).

In Brno, the SUMP Action Plan includes measures aimed at tackling commuting flows within the FUA (Functional Urban Area) through strengthened cooperation and a shared mobility vision. Specific objectives include increasing train stops that respect distance standards from origins/destinations to public transport stops, establishing multimodal hubs (including park & ride) connected

with high-capacity public transport, and increasing the share and use of public transport and P+R facilities (Damerau and Baston, 2020).

In Koprivnica, the FUA-based SUMP aims to create a single overarching public transport system covering commuting flows and increasing sustainable transport modes like cycling. Measures focus on expanding the public transport system at the FUA level and integrating it with a wider cycling network (Damerau and Baston, 2020).

Accessibility studies often analyse public transport networks to quantify efficiency and opportunities. While the ideal of a proximity-based city is emphasised, reliable public transportation services are crucial for addressing disparities in peripheral areas.

## Car dependency

Current mobility patterns in cities, particularly in the Western world, show an elevated level of car dependence. The 15-minute city model aims to use built environment design to encourage more sustainable travel patterns and reduce car dependence. Reducing car use is highly relevant in the discourse around 15-minute cities, and anxieties related to this goal have become prominent criticisms (Núñez et al., 2024).

Extensive car usage, implicitly associated with the extensive use of public space (as traffic lanes and parking) is linked to negative externalities such as traffic congestion, acoustic and air pollution, increased traffic accidents, and plays a significant role in greenhouse gas emissions. The concept's core principle of reducing distances is anticipated to reduce car usage and Vehicle Kilometres Travelled (VKT). Practices identified include reducing car use, implementing car restrictions, and undertaking traffic calming measures.

Cities like Barcelona have implemented strategies, such as Superblocks, to restrict vehicular traffic and reclaim public spaces, though daily car use for internal trips within municipal boundaries remains notable despite extensive multimodal networks (Ajuntament de Barcelona, 2016). Similarly, Ghent's Circulation Plan presents a comprehensive urban mobility strategy, introduced in

April 2017, to improve traffic flow, reduce congestion, and promote sustainable transport within the city centre. The plan fundamentally reorganised how people and vehicles move through Ghent, prioritising public transport, cycling, and walking, while restricting car traffic in the historic core (Ghent Administration, 2025). Shifting away from car-oriented mobility towards more sustainable provisions like improved public transport and sharing options is necessary. Planning and infrastructure development investments should be aligned with transport strategies that decrease the need for private car-dependent mobility (Nared, 2019).

## Daily ecosystems and proximity rights

The 15mC concept deliberately shifts emphasis onto the neighbourhood as the appropriate scale for urban innovation and community engagement. It promotes human-centred urbanism where aspects like socialisation and cultural demand are accessible via short commutes, shifting focus from vehicular flow to urban life planning.

The model seeks to foster a sense of place and belonging, to promote social cohesion, and to enhance overall well-being through compact, mixed-use neighbourhoods that prioritize local living. It aims to develop forms of '*proximity economy*' and rethink urban design from the inclusive, collaborative perspective of '*people-smart sustainable cities*', as seen in the case of Milan (Abdelfattah et al., 2022).

Lisbon's '*Uma Praça em Cada Bairro*' (A Square in Every Neighbourhood) initiative implemented the principles of the 15mC by organising meeting points and micro-centralities for local communities in public spaces that prioritise active transport (Büttner et al., 2024; Hoogenboom, 2024).

It is particularly relevant in addressing social polarization, spatial segregation, and gentrification by aiming to create more equitable and resilient urban environments that cater to diverse needs. The concept raises the crucial question: '*The 15-minute City, for whom?*' highlighting the need for inclusivity. Researchers and policymakers are advised to seek input from equity-deserving residents, who may be more significantly affected by urban design choices and are often not consulted (DUT, 2023; Zeisel et al., 2024).

While proximity planning, central to the 15mC, is significantly more feasible in dense, multifunctional urban spaces than in peripheral, low-density areas, suburban contexts present specific challenges for implementing the 15mC concept.

The paradigm may need to be rethought in areas with lower urban densities, such as suburban or intermediate zones. A strategic reallocation of services or increasing their penetration can improve accessibility. Applying the concept requires defining how different neighbourhoods, both within and outside the city centre, interact with each other (Bruno et al., 2024).

Adaptations of the concept exist globally, such as the 20-minute neighbourhood adopted in Scotland and Melbourne, the 10-minute city in Utrecht, and China's 15-minute Community Life Circle, indicating the need for flexibility in the time threshold based on local context (Allam et al., 2024; Teixeira et al., 2024).

Bologna's emphasis on service decentralisation is one example of a strategy that can resonate with meeting the needs of territories, which may include less dense areas, as identified in their Municipal General Plan (Büttner et al., 2024).

# Governance

## Policy evaluation

The implementation of 15-minute city policies reveals stark disparities in outcomes, driven by governance frameworks and resource allocation. Paris exemplifies policy success, with 50 operational 15mC districts, achieved through Mayor Anne Hidalgo's integration of the concept into the 2020–2026 Urban Plan (Moreno et al., 2023). This top-down approach leveraged existing dense, mixed-use neighbourhoods and prioritised pedestrianisation (e.g., converting 50% of on-street parking to green spaces). Conversely, Melbourne's 20-minute neighbourhood policy struggled in low-density suburbs, where retrofitting amenities required AU$2.1 billion in infrastructure upgrades, highlighting funding gaps in decentralised governance models (Pemberton et al., 2024).


*Figure 7: Melbourne's 20-minute neighbourhood vision. Source: https://www.planning.vic.gov.au/guides-and-resources/strategies-and-initiatives/plan-melbourne/the-plan*

The DUT Partnership's global mapping of 400+ practices identified systemic shortcomings: only 23% of cities had binding land-use regulations mandating mixed-use zoning, while 67% relied on voluntary developer contributions, resulting in fragmented implementation (Büttner et al., 2024). In Thessaloniki, SWOT analyses revealed that narrow streets and aging infrastructure delayed 15mC projects, despite strong community support (Shoina et al., 2024). Policy failures often stem from misaligned incentives: in Edmonton, Canada, a lack of fiscal tools to penalise car-centric development undermined the city's 15mC vision, forcing reliance on grants from the Federation of Canadian Municipalities (Anchan, 2024). This is in contrast to the experiences of Ghent or other European cities, where, even despite lacking a dedicated 15mC-specific policy, the authorities managed to reallocate space, financial resources and support which overall led to comparable outcomes as where 15-minute city policies have been applied.

## Transferability

The 15-Minute City (15mC) concept has gained global prominence as an urban planning approach aimed at enhancing accessibility, sustainability, and liveability through proximity to essential services. However, its transferability and

effective implementation require careful consideration of diverse local contexts. Numerous cities worldwide have embraced the 15mC or similar concepts, particularly in Western Europe and North America. Cities such as Paris, London, Rome, Portland, Melbourne, and Barcelona have engaged with the idea. Approximately one hundred cities are identified as planning or implementing the concept (Teixeira et al., 2024; Lu and Diab, 2025)

In the process of policy transferability, diverse interpretations and operationalisations means that cities have implemented the concept differently, using varying temporal thresholds (e.g., 10, 15, 20 minutes) and including diverse types of destinations (Allam et al., 2022). Many cities have implicitly applied similar principles under different names for decades or adopted new names following the public backlash (i.e. Leeds (UK) changed from Low Traffic Neighbourhoods to Active Travel Neighbourhoods).

Numerous cities are still in the initial stages of executing their 15mC strategies, with a majority of practices remaining in the planning phase. Some initiatives are declarative policy announcements, while others have been formally voted on in local councils. These usually make clear associations of what elements of the concept have been targeted by the transferability process, as a manner to demonstrate that the concept has already been validated (Khavarian-Garmsir et al., 2023; Bruno et al., 2024).

While the policy itself is often adapted and tailored to the community needs, challenges include the need to address physical barriers like highways and rail lines, which can negatively impact the probability of achieving 15mC goals. Discrepancies exist between intended plans and actual outcomes due to rapid urban transformation. Continuous assessment and dynamic planning are required. Learning from the implementation of the concept in specific urban contexts is vital. There is a clear continuous further need for policy transfer and inter-city cooperation to disseminate good practices (OECD, 2020; Marchigiani and Bonfantini, 2022).

## Mapping and evaluation tools

Good governance requires solid tools to assess the success of the initiatives. Evaluating the 15-Minute City concept necessitates robust mapping tools and

analytical methods to inform urban planning and decision-making. Key approaches involve leveraging GIS software and models to examine accessibility and proximity conditions. These tools facilitate quantitative analysis by utilising distances on urban graphs to calculate pedestrian travel times and define proximity. Such methods enable the assessment of access to essential amenities, identification of areas requiring improvement, and comparison of different urban areas. Mapping also extends to documenting the diversity of implementation practices and monitoring ongoing progress. Ultimately, these tools provide critical data and insights, contributing to a detailed understanding of existing conditions and supporting the strategic planning of proximity-based urban development.

A list of identified tools is presented below as a starting point for evaluating the results of current policies and identifying opportunities, as well as means to validate the success of areas where the 15mC concept (implemented or not under this label), created vibrant and accessible local community environments.

*Table 3: Tools mapping the potential of 15mC across the world*

| Tool name | Location | Range | Website |
|---|---|---|---|
| City Access Map | Global | Global to City Block | https://www.cityaccessmap.com/ |
| The 15mC | Global | | https://www.15mincity.ai/ |
| Do you live in a '15-minute' city? | United States | Neighbourhood (Address Based Walkshed) | https://app.developer.here.com/15-min-city-map/ |
| Travel Time | Global | Neighbourhood (Address Based Walkshed) | https://app.traveltime.com/ |
| Lisbon 15-Minute City Map | Lisbon (Portugal) | City to Neighbourhood (Address Based Walkshed) | https://manuelbanza.github.io/Artigos/15min/Mapa_15Mins_v2.html |
| What If...15mC? | Global | | https://whatif.sonycsl.it/15mincity/index.php |
| The X Minute City | New Zealand | Country to Suburban Block Level | https://research.uintel.co.nz/x-minute-city/ |
| Map4Citizens | Munich (Germany) | City to Building | https://citizens.plan4better.de/ |
| Cleveland's 15 Minute City Planning Introduction | Cleveland Ohio (USA) | City | https://storymaps.arcgis.com/stories/6d5563926ef3449fbcbaf73d00eeac66 |
| Map of 15 Minute Cities in Spain | Spain | Country to Municipality | https://www.datacentric.es/en/geomarketing-en/map-of-15- |

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| | | | minute-cities-in-spain-find-out-your-accessibility/ |
| Seattle Walkability Map | Seattle, Washington (USA) | City to Census Block | https://nathenry.com/writing/2023-02-07-seattle-walkability.html |
| La Ville Du Quard D'Heure - 'The quarter of an hour city' | Paris and Surrounding Suburbs (France) | City | https://www.apur.org/sites/default/files/documents/cartefichiers-attaches/accessibilite_5minutes_boulpharmalibr_correction.pdf?token=Fg5stmBs |

International tools like the European Union's Urban Audit (launched by Eurostat[2]) and the Urban Barometer of Inequalities combine objective statistics with subjective well-being measures (Jany-Catrice and Méda, 2013).

City rankings also play a role, with early academic models based on socio-economic conditions. Methodologies like the Happy Citizen Hexagon[3] shift the focus from technology to human needs—adding aspects like green space, clean air, and social ties – all highly relevant for the 15mC concept. In France, the Association des villes et villages où il fait bon vivre[4] ranks towns based on 182 weighted indicators, while Métroscope offers a more nuanced typology-based view of metropolitan dynamics, avoiding traditional ranking systems (Epures, 2020). Territorial ecosystems and private platforms have created additional tools: Cittaslow promotes sustainable well-being through a certification system; the Liveability Index[5] aggregates living standard data into a single score; and State of Place[6] uses big data to measure walkability and public space quality. Nevertheless, in defining a methodology to assess the 15mC implementation in a low density, peri-urban setting, one must note the importance of subjective perceptions, highlighting 'sensitive maps' that express users' lived experiences in urban spaces.

Building on these foundations, (Moreno et al., 2023) introduced the High Quality of Societal Life (HQSL) methodology to operationalise the 15-minute City and 30-minute Territory concepts, directly relevant to the future shortlisting

[2] https://ec.europa.eu/eurostat/web/gisco/geodata/statistical-units/urban-audit
[3] www.happycitizendesign.com
[4] www.villesetvillagesouilfaitbonvivre.com
[5] www.eiu.com/n/campaigns/global-liveability-index-2024
[6] www.stateofplace.co

exercise. It focuses on the same urban functions mirroring the dimensions introduced at the beginning: Living, Working, Getting Supplies, Enjoying, Learning, and Caring/Being Healthy. HQSL combines objective data (collected at fine spatial scales) with qualitative inputs from participatory workshops and surveys. It produces sub-indices for each function, which are then combined into a composite HQSL score—measured by proximity, accessibility, and infrastructure quality. HQSL offers a unique, integrated framework to assess and support the implementation of proximity-based urban models rooted in ecology, equity, and participation.

## Driving forces (community vs political leadership, top-down vs bottom-up)

The tension between bottom-up activism and top-down policymaking defines 15mC outcomes. Newham, London demonstrated community-driven success: participatory budgeting allocated £4.2 million to co-design 15mC features like pop-up health clinics and pedestrianised school zones, increasing walking trips by 44% (Clough, 2024). Conversely, Ottawa's technocratic approach—led by public health officials—focused on metrics like '5 Cs' (compact, connected, convivial, etc.), which improved accessibility indices but saw 32% resident pushback over perceived 'forced localisation' (City of Ottawa, 2021).

Hybrid models are also emerging- Copenhagen's 'Urban Labs' program empowers neighbourhood councils to approve 15mC projects under municipal oversight, accelerating implementation timelines by 18 months (Lu and Diab, 2025).

## Role of local actors

Local businesses and civic groups disproportionately influence 15mC viability. In Lisbon, a coalition of small retailers blocked car-free zones until the municipality introduced grants for storefront upgrades, illustrating the need for economic safeguards (J Lopes Balsas, 2000).

Low-density adaptation requires rethinking mobility hierarchies:

- Germany's 'Kleinzentren' policy (small geographical centres supplying the basic daily needs of the population and providing a minimum of public and private infrastructure): Bavaria's 2023 Regional Plan designates 47 Kleinzentren to address rural depopulation. These centres receive state grants for upgrading schools and healthcare facilities, ensuring compliance with the State Development Program (Pahl-Weber et al., 2008).
- Glasgow's Liveable Neighbourhoods model acknowledges that where populations and services are distributed more widely, a networked approach can support local living within settlements. Local hubs with good transport links and improved digital infrastructure and connectivity can provide local employment opportunities, support remote and home working and technology-enabled or remote services, helping to reduce the need for rural communities to travel longer distances and the associated costs, time, and environmental impact (Scottish Government, 2025).

# From physical to social proximity. A critical approach to the 15-minute city model

## Approach

The 15mC model is based on three key assumptions: high urban density, mixed use and a widespread and diversified presence of services, and easy connections between different parts of the city by foot, bike and public transport (Moreno et al., 2021). In contexts where these conditions are not met, the model proposes physical and functional interventions to modify the urban structure.

In this final part of the critical analysis of the 15mC model, we considered studies that presented critiques moving away from destructive narratives and conspiracy theories, as well as the underlying fear of change. These studies provide valuable insight on some of the relevant issues pointed out in the Position Paper provided by the DUT Partnership (2024): contextual factors, social justice, involvement of people, and "from local to big picture" (how might the 15-minute

City look in low-density and suburban neighbourhoods and what is needed for implementation).

Most of them focussed on issues such as physical determinism, lack of consideration for housing issues, and possible gentrification implications (Khavarian-Garmsir, Sharifi, & Sadeghi, 2023). Mouratidis (2024), by analysing about 100 studies, highlighted seven pitfalls of the concept, such as: overstatement of its originality, unrealistic, unnatural, and unsustainable polycentrism and decentralisation, self-sufficiency of neighbourhood facilities (what and for whom), urban hierarchy of facilities, weak consideration of nature, the role of public transport, walking and cycling issues. Additionally, the location of the workplace is key in defining the "main and most inelastic everyday trip" (Pozoukidou, 2021); lack of affordability in the provision of services could affect equitable access (Biraghi et al., 2025).

Among the main criticisms found in the literature, our main concern is the relationship between physical (geographic) proximity and social interaction. Specifically, the points raise below emerge.

While it is true that social relationships are built on frequency and physical presence, social proximity does not automatically result from spatial closeness. On the contrary, even in dense urban environments—those offering optimal conditions for geographic proximity—phenomena such as disorientation, anonymity, and alienation can be observed (Bince, 2022; Pasqui, 2021). One may have all essential services within reach (or even delivered at home: groceries, books, medicines) and yet experience low levels of social interaction. Even the next-door neighbour may remain a stranger. Gentrification, ghettoisation and socio-spatial segregation can undermine spatial-related inclusiveness (Pozoukidou, 2021).

The idea of a self-sufficient neighbourhood risks reinforcing the difficulty of engaging with the city. It may exacerbate urban fragmentation, and it fails to account for the fact that relational *'bubbles'* (temporary, fragile or conflictual) could be present in the same neighbourhood. Beyond segregation and gentrification, even a socially mixed population tends to create worlds within the world (Casarin et al., 2023): existing residents vs newcomers, higher income people vs lower income people, elders and youngers. Social interactions follow

more complex geographies than those determined by geographic proximity or population density (Mecca, 2023; McFarlane, 2016).

Finally, contemporary urban structures are often characterised by low-density configurations, where large portions of the population live and work (Brenner, 2013). The idea of a compact city clearly separated from rural or natural areas no longer reflects current realities. Extended metropolitan regions, patchwork cities (Neutelings, 1991), and in-between territories are not exceptions or anomalies—they are stable configurations that cannot be radically transformed to fit the ideal type of the 15-minute city, even by reshaping morphology or extending public transport (particularly during off-peak hours, nighttime, weekends and holidays) (Green et al., 2021; Wang et al., 2025; Mouratidis, 2024).

For these reasons, PROWD neither aims to optimise the application of the 15mC model in low-density areas nor does it intend to offer a purely theoretical critique. Its goal is to study parts of the city where the model cannot be implemented, to understand how public and private, formal and informal initiatives contribute to building and reproducing social proximity. Based on this strategic knowledge, PROWD seeks to identify practical solutions to support proximity-generating practices even in the absence of urban density that can be supported over time by local institutions and third sector organisations: proximity without density.

The following sections provide conceptual clarifications on the relationship between physical and social proximity that could inform case study analyses.

## Two dimensions of proximity: physical and social

### Physical (geographic) proximity

Geographic proximity (defined as closeness among target points) can be measured using tools such as GIS and catchment area analysis (Megahed et al., 2024; Lima et al., 2023). In the 15mC model, distance is often viewed through the lens of time to reflect the quality of connections between amenities, and research has largely focused on accessibility analyses to measure cities' compliance with the concept (Baquero Larriva et al., 2024). Human-centred approaches, however, suggest considering perceived proximity, which is shaped by factors such as age, gender, personal experience, and sense of safety (Mecca, 2023). Moreover, recent

studies have shown that perceived proximity also mediates the relationship between actual distances and social cohesion: the effect of physical distance on social relationships is significantly influenced by how close or far people feel destinations are (Mombelli et al., 2025).

Geographic proximity is frequently used as an indirect indicator of social interaction in the 15mC framework (Moreno et al., 2021, p. 98).

Local contexts significantly affect social relationships (Marchigiani & Bonfantini, 2022); for this reason, applying a uniform distributive model based solely on geographic distance is poorly suited to the specificity of places.

Chrono-urbanism evaluates travel exclusively in terms of the time needed to move from point A to point B. This approach tends to marginalise the experiential and relational dimensions of urban journeys. In this sense, the experience of a journey should not be reduced to travel-time efficiency (Jacobs, 1961) but recognised as habitable space, where perception, human contact, and environmental quality deeply impact urban well-being (Gehl, 2021). While advocating for a re-territorialisation of urban proximity, the 15mC model is anchored in a logic of functional optimisation focused on reducing travel time. A more radically relational perspective—closer to psychogeography and tactical urbanism—calls for a re-signification of movement through space as an opportunity for encounter and coexistence, valuing the unexpected, the pause, and the complexity of urban life.

Adopting this different perspective allows us to question the oversimplifications of urban complexity and the challenges of engaging with the city as a whole. Instead of expecting reality to conform to the model, we should ask which best fits the observed reality.

## Social (relational) proximity

Social proximity is grounded in affective, cognitive, organisational, and institutional relationships (Boschma, 2005; Hansen, 2014). It is connected to key dimensions of social cohesion: interdependence, solidarity, trust, sense of belonging, and cooperation (Schiefer & Van der Noll, 2017).

## Relationship between physical and social proximity

Analysing social proximity helps reveal key questions underlying the 15mC model, especially in its more reductive applications:

- Social proximity arises through in-person practices. Digital technologies may enrich the experience but cannot replace direct human interaction (Manzini, 2021).
- Social proximity values autonomy and personal identity; it differs from forced forms of contact, including those induced by digital hyper connection. The ability to maintain a certain distance is a value worth protecting. (Mecca, 2023)
- Social proximity develops through socially motivated activities (public or private), as distinct from those driven by profit or exclusion.
- Social relationships are often fostered by actors embedded in multi-level networks (urban, regional, national, international) (Jessop, Jones, Brenner, 2008). In peripheral metropolitan areas, interactions with actors from the main city and supra-local circuits are possible.

## Social proximity and international frameworks

Physical proximity is implicitly addressed in many policies linked to key international sustainability frameworks (Mecca, 2023). Social proximity, too, can contribute to the achievement of the Sustainable Development Goals (SDGs) outlined in the 2030 Agenda and fit within broader programs such as One Health, the New European Bauhaus, and the post-COVID Green New Deal (C40).

# Spaces of social proximity

## Collaborative services

Analysing social proximity helps orient case study research toward specific activities and types of spaces.

Urban areas have seen the emergence of collaborative services (Cipolla & Manzini, 2009; Manzini, 2024), often initiated by active citizens, in response to the structural and policy limitations of traditional welfare systems. Collaborative services complement existing offerings, blur the traditional boundaries between

promoters, funders, providers and beneficiaries, and bridge the gap between public institutions and private actors. They often give rise to purpose-driven communities.

Collaborative services are built on trust, resilience and social capital. They are typically low-profit or non-profit initiatives where profit is a means to remunerate work and ensure continuity, not an end in itself. For this reason, they are among the primary generators of social proximity.

Collaborative services often extend beyond the realm of public welfare, encompassing internet cafés, bookshops, markets and social farms, for example. These 'third places' differ markedly from profit-oriented neighbourhood services (e.g. supermarkets, pubs and arcades) (Oldenburg & Brissett, 1982; Lee & Tan, 2019).

*Mapping collaborative services outside urban centres can provide valuable insights into their adaptability to low-density contexts, the urban configurations in which they operate, and the conditions of the transport system.*

## Alternatives to homogeneous service distribution

In low-density areas, service distribution does not adhere to the uniform, widespread criteria of the 15mC model.

The presence of *'social condensers'* (De Carlo, 1975) is more akin to the facilities that were historically found along travel routes in sparsely inhabited areas, such as oases, refuges, ports, post stations and caravanserais. These condensers may appear as clusters of services and/or multifunctional spaces, for example in schools that host extracurricular activities. These social condensers can be public facilities. They can also be private places. These are designed and managed for community use. The existence of these everyday infrastructures, protected from market dynamics, provides the most vulnerable members of society with a sense of security.

*Analysing the spatial distribution and typology of collaborative services can help to identify alternative configurations to the compact city model. At the same time, this approach reveals the vulnerabilities associated with their rarity and lack of substitutability.*

## Mapping

The main descriptors of the 15minC interpret accessibility according to the geographical distribution of points of interest and the distance, time and quality of routes: High Quality of Social Life (ETI Chair, 2019), 15 Minute City Index – Enel X Innovation Smart City[7]; Inclusive Accessibility by Proximity Index (Lanza et al. 2023), EXTRA project (Experimenting with City Streets to Transform Urban Mobility[8]; NEXI Index – Landscape Metropolis and Air Break projects (Olivari et. al 2023), Dedanext – Legambiente[9].

These indices overlook the intangible dimensions of social proximity. To study the latter, alternative mappings based on social practices are needed—capable of measuring the impact and quality of relationships (Polyak, Bod and Brody, 2021). Some digital platforms—such as Wemi[10]—use this type of mapping as an informative tool for citizens (e.g., "who does what, near me"). These platforms are often supported by collaborative networks and intermediary actors (e.g., foundations, institutions).

*Analysing places can be a first step in constructing alternative forms of mapping.*

# Long-list 15-minute city case studies

## Proposed Selection Methodology

1.Determining the search scope and parameters

*Geographical focus*: Primarily European Low-Density Urban Areas within metropolitan contexts, acknowledging the diversity of urban patterns.

[7] https://www.enelx.com/it/it/istituzioni/sostenibilita/open-data-pubblica-amministrazione/15-minutes-city-index?ecid=Display-PressRelease-IT_eCity_2021_IT-link15min-CircularCityIndex

[8] https://ex-tra-project.eu

[9] https://www.dedanext.it/topic-citta-15-minuti

[10] https://wemi.comune.milano.it

*Thematic scope:* Initiatives, policies, and concrete actions that implement 15mC principles, with a specific emphasis on non-conventional solutions suitable for LDUAs. These should address at least one of the six key dimensions of daily life. Prioritise initiatives that have been implemented/delivered and that have received support or been promoted through EU-funded projects (e.g., H2020, Horizon Europe, UIA, URBACT).

2.Conduct a multi-source literature review

Perform a comprehensive review of academic literature using databases such as Scopus, Web of Science, Google Scholar, and Transport Research International Documentation. Seek advice from consortium partners for the most relevant research, possibly with direct involvement.

Systematically review grey literature, including reports, whitepapers, and policy documents from public agencies, intergovernmental organisations (IGOs), non-governmental organisations (NGOs), and private organisations.

Employ search word combinations related to '15-minute City', '20-Minute Neighbourhoods', 'Superblocks', 'proximity', 'local services', 'walkable cities', 'sustainable mobility', 'shared mobility', 'urban outskirts', 'suburbs', and 'low-density urban areas'. Combine these with terms related to the six dimensions of daily life. Perform searches using Google and institutional websites to identify cities, regions, or local initiatives that self-advertise or report on implementing 15mC or similar proximity-based concepts, specifically looking for examples in suburban or low-density settings.

3. Leverage project partner prior knowledge and networks

Use the shared knowledge within the consortium to gather information about implemented projects or locations in the study area that match the specifications of the 15mC in a LDUA context, as described by the PROWD proposal. This is particularly valuable for identifying community-based or non-conventional initiatives that may not be widely documented in traditional

literature. Capitalise on the existing expertise and networks of project partners who are active in the case study metropolitan areas (Lisbon, Rome, Bucharest, Vilnius).

4.Initial mapping and screening of initiatives

Compile a comprehensive list of 30 identified initiatives. Screen the initial list against the defined scope, focusing on relevance to LDUAs, alignment with the six dimensions, and the presence of non-conventional approaches. Based on the project objectives and the initial mapping, define specific criteria to select the final 20 'lighthouse' initiatives for in-depth analysis. Criteria should ensure a diverse and representative sample.

Potential criteria to include:

- Demonstrated relevance and potential for adaptation/replication in LDUAs.
- Coverage of different dimensions of daily life (aiming to represent initiatives across the six dimensions).
- Diversity in the type of initiative (e.g., policy, specific project, community-led action, social enterprise).
- Geographical distribution across European countries, reflecting different planning contexts and development trajectories.
- Presence of documented outcomes or lessons learned (including bottlenecks and mistakes).
- Initiatives investigated or supported by EU-funded programs.

For subsequent stages, various tools and methodologies could be used to inform the assessment of urban quality of life, with growing attention to well-being, sustainability, and the concept of proximity. It is recommended that the examples below be considered as stepping-stones for the definition of the criteria for in-depth assessment of the 15mC within the project areas, as these will need to be tailored to LDUAs and to reflect the aims of the PROWD project.

*Table 4: Selection methodology summary*

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| Scope & Parameters | • Geographical focus on European LDUAs<br>• Thematic focus on 15mC principles<br>• Emphasis on non-conventional solutions<br>• Cover at least two of six key dimensions of daily life<br>• Prioritise EU-funded or supported initiatives |
| Multi-Source Search | • Academic literature (e.g., Scopus, Google Scholar)<br>• Grey literature (e.g., NGO, IGO, policy docs)<br>• Use inclusive search terms (e.g., LDUA, suburbs, superblocks, mobility)<br>• Web searches, including multilingual queries |
| Initial Mapping & Screening | • Compile list of initiatives<br>• Screen for LDUA relevance<br>• Assess alignment with key dimensions<br>• Identify non-conventional practices |
| Define Selection Criteria | • Based on PROWD goals and intended outcomes<br>• Ensure diversity and inclusion<br>• Consider status, scale, and EU-support<br>• Include relevance to LDUAs, key areas, justice, and innovation<br>• Aim for min. 3 examples per pilot city/country (3X4) |
| Select Lighthouse Initiatives | • Apply criteria to shortlist initiatives<br>• Document rationale and selection process<br>• Ensure balance across contexts and scales, prioritising pilot cities |

| | Initiative | Location, Country | Dimensions (in order of importance) | Summary | Delivered (Y/N) | Key references (hyperlinks) |
|---|---|---|---|---|---|---|
| 1 | Superilles/ Superblocks | Barcelona (L'Eixample, Poblenou)<br><br>SPAIN | Mobility<br><br>Well-being & Outdoor Recreation<br><br>Food & Daily Shopping | The main goal is to reclaim public space from private vehicles for citizens, becoming a model for transforming the entire city. This initiative aims to create a network of green hubs and squares where pedestrians have priority, fostering a healthier, greener, fairer, and safer public space. The program seeks to promote social relations and the local economy, placing citizens at the centre by offering safer, less-polluted places for interaction and activities, ultimately improving the quality of life and allowing people to reclaim their place in public space. | Y | Barcelona - Superilles L'Eixample Poblenou |
| 2 | Ville du quart d'heure | Paris (Olympiades, Vaugirard, Place des Fêtes, Porte de Montmartre)<br><br>FRANCE | Mobility<br><br>Well-being & Outdoor Recreation<br><br>Employment | It aims for residents to be able to find daily essentials – such as groceries, work, culture, sport, and healthcare within reach. This accessibility should be possible within 15 minutes on foot or 5 minutes by bike. The concept seeks to end the fragmented city reliant on car travel, limit polluting displacements, and improve the living environment and quality of life. It involves rethinking existing spaces and is seen as a response to health and climate challenges. | Y | Paris - Ville du quart d'heure |
| 3<br>4<br>5 | 15-minute n'hood<br>20-minute n'hood<br>Low traffic n'hood | London<br><br>UNITED KINGDOM | Mobility<br><br>Employment<br><br>Well-being & Outdoor Recreation | Increasing walking and cycling in the borough, and improving air<br>quality; supporting active travel, shaping urban design to enable a healthier borough, with new cycle routes and low-traffic neighbourhoods; expanding the school streets programme to reduce air pollution around schools. | Y<br>Y<br>Y | Waltham Forest – 20-minute neighbourhood<br>Newham – 15-minute neighbourhood<br>Hackney – low traffic neighbourhood |
| | 15-minute n'hood | Oxford<br><br>UK | Mobility<br><br>Well-being & Outdoor Recreation | Not delivered.<br>Vision is that access to facilities for health, fitness and leisure, shopping and work helps to ensure that people's basic health needs are met without having to travel large distances. The city seeks to ensure that everything needed to live well can be accessed within 15 minutes by walking or cycling. | Ongoing, 2040 | Oxford Local Plan |
| 6 | 10-minute town | Hailsham<br><br>UK | Mobility<br><br>Employment | Sets out the local community's aspirations and policies related to land use and development. It aims for Hailsham to become a truly 'great place' and a 'ten-minute' town, providing easy | Pending Council Approval | Hailsham Neighbourhood Plan<br><br>https://www.tcpa.org.uk |

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| | | | | access to services and diverse opportunities. The plan helps determine the type of housing and infrastructure built in the parish, guiding development to be integrated and protecting green spaces. | | /resources/hailsham-the-10-minute-town/ |
| 7 | SUMP (PMUD) | Bucharest | Mobility<br><br>Employment | The PMUD aims to create an efficient, integrated and sustainable transport system for Bucharest and Ilfov by 2030. It includes metro expansion, tram and bus modernization, new cycling infrastructure, dedicated PT lanes, Park&Ride facilities and digitalization of traffic management. The plan aligns with 15mC principles by improving proximity and accessibility to essential services and opportunities. | Ongoing, 2030 | PMUD |
| 8 | Cycling masterplan (Masterplan Velo) | Bucharest | Mobility<br><br>Well-being & Outdoor Recreation | The cycling masterplan aims to connect residential areas with workplaces, schools, commercial zones, and public institutions, while also building supporting facilities like bike racks and dedicated parking. It is designed to promote sustainable mobility, reduce car dependency, improve air quality, and enhance access to daily services which are all key pillars of the 15-minute city model. | Y | Masterplan Velo |
| 9 | Urban regeneration guide for District 6 | Bucharest<br><br>ROMANIA | Mobility<br><br>Well-being & Outdoor Recreation | The urban regeneration guide for District 6 focuses on improving public spaces and the built environment, particularly in the Drumul Taberei neighbourhood. The guide provides practical tools and recommendations for local authorities and planners to rehabilitate and activate public spaces, enhance green areas, support local commerce, encourage social interaction and ensure accessibility for all based on the resident's needs. This is highly relevant in the 15mC framework as it aims to transform monofunctional residential districts into multifunctional, functionally holistic and accessible communities. | Y | Urban regeneration guide for District 6 |
| 10 | Informal application of concept | Coresi (BV)<br><br>ROMANIA | Food & Daily Shopping<br><br>Employment<br><br>Mobility | Coresi can be seen as aligning with the concept of a 15-minute neighbourhood as groceries, work, culture, sport, and healthcare are within walking/cycling distance. It brings together residential areas and workspaces, along with leisure/entertainment within the same development, which | Y | Coresi Housing<br><br>Coresi workspaces<br><br>Administrator of commercial area |

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| | | | | directly addresses the integration of key daily activities central to the 15-minute concept.<br>It focuses on lifestyle, aiming to create a living environment where daily needs are met locally, reducing the reliance on extensive travel. While not explicitly a 15mC, it resonates with the 15-minute city's aim to place citizens at the centre by providing easier access to services and by improving quality of life locally. | | |
| 11<br><br><br><br><br><br><br>12<br><br><br><br><br>13 | City of short distances – St. Pölten | Vienna / Wien (St. Pölten)<br><br>St. Paul in Lavanttal<br><br>Ottakring district (Vienna)<br><br>AUSTRIA | Education & culture<br><br>Mobility<br><br>Food & Daily Shopping | St Pölten plans to strengthen city district centres, improve walkability and cyclability to essential destinations like education, leisure, public transport, and health facilities, and enhance the quality of infrastructure for active mobility. The goal is to increase the share of walking and cycling in the modal split by 2034, emphasising that the Umweltverbund (walking, cycling, public transport) should form the backbone of urban mobility<br><br>The 15mC concept is already a reality in the St. Paul town centre; 90% of everyday errands can be completed within the town centre. The goal is to achieve further densification within the town, which makes it viable to provide necessary infrastructure like bus stops and playgrounds, further supporting local accessibility.<br><br>Pocket Mannerhatten Ottakring is a research project (2016 and 2021). Its focus was investigating the 'neighbourly networked use of spaces, areas, and infrastructures' in a specific block in Vienna-Ottakring. It is framed around the idea of 'Sharing as a Strategy for Urban Renewal'.<br>It deals with local interaction and the use of nearby resources, connecting this to the broader goal of creating a city or area where daily needs are better met. | Y<br><br><br><br><br><br>Y<br><br><br><br>TBC | St Pölten plans<br><br><br><br>St. Paul in Lavanttal<br><br><br><br>Ottakring Urban Renewal<br><br>Ottakring Pocket Mannerhatten (Wien Smart City) |
| 14<br><br>15 | The community of Naujoji Vilnia city<br><br>City+ | Naujoji Vilnia<br><br>Karoliniškės) (Vilnius) LITHUANIA | Well-being & Outdoor Recreation<br><br>Mobility | Although not directly associated with the 15mC concept, these initiatives address the challenges and potential improvements in the New Vilnius area, such as issues with parks, waterfronts, | On-going | Naujosios Vilnios miesto bendruomenė<br><br>(Miestas+) |

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| | | | | streets, bicycle paths, and the potential conversion of industrial areas into public spaces, to generate proximity to daily needs. | | |
| | The Plan | Milan<br><br>ITALY | Mobility<br>Employment<br>Education & culture | Milan envisions a human-scale city that respects citizens' time and promotes equity by decentralising services and economic opportunities throughout the metropolitan area. It seeks to become a 'city of neighbourhoods' where energy permeates every part, reducing reliance on the city centre. The city aims to balance sustainability, social cohesion, and economic vitality | TBC | The Plan |
| 16 | 15 projects for the 15-minute city - Projects for the regeneration of urban spaces in the 15 Municipalities | Rome<br><br>(incl. outskirts of Rome)<br><br>ITALY | Mobility<br>Employment<br>Education & culture | Aims to transform Rome into a relational ecosystem where citizens can easily reach their daily needs, by leveraging the proximity of services and necessary infrastructure. The plan involves implementing 15 distinct urban regeneration projects, one in each Municipality. These projects prioritise the enhancements of public spaces, focusing on green areas and improving the overall quality, liveability, usability, accessibility, and enjoyment of these spaces, particularly in suburban areas to address urban degradation. | On-going | 15 Municipi 15 Progetti per la Città in 15 Minuti<br><br>Integrated urban plans |
| 17 | Urban CostellAzioni - Geography of Social Innovation | Rome<br><br>ITALY | Well-being & Outdoor Recreation (Social aspects) | Research regarding social innovation initiatives in the metropolitan area, which is part of the strategic plan, and that could be target initiatives for the implementation of the plan. | | Web platform |
| 18 | Zagreb's Lower Town plan | Lower Town - Donji Grad (Zagreb)<br><br>CROATIA | Mobility<br>Well-being & Outdoor Recreation<br>Education & culture<br>Employment | Zagreb's Lower Town plan, as part of reconstruction program following the 2020 earthquakes, aims to embed the 15mC practices in the planning processes. This ambition is framed by the need for improved mobility and a reshaped transportation system, prioritising cost-effective technical solutions, proximity and green mobility. The quality of life is to be improved through regenerating neglected areas and planning new public spaces. It is proposing the 'superblock' model as an innovative intervention to reclaim space for people, reduce motorised transport, and promote active lifestyles. Plans include expanding pedestrian and bicycle networks, converting parking areas to green corridors, integrating public transport, and replacing street parking within superblocks with garages to free up local streets for pedestrians and cyclists. | Y | Government directions<br><br>Research |

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| 19 | Strategy for food planning at the city-region scale | Lisbon | Food & Daily Shopping | This aims to make healthy, sustainable food more accessible and reduce dependence on long, vulnerable supply chains.<br>Key aspects that contribute to this goal include supporting local production areas and fostering short distribution circuits, generating increased proximity. The strategy involves initiatives such as remodelling local markets and promoting the consumption of local and proximity products. A concrete target is to ensure that 15% of food consumed by residents by 2030 is sourced locally within the metropolitan area. These efforts, by focusing on providing essential daily needs (food) through localised networks, support the broader principle of reducing travel distances for citizens. | | Estratégia para a Transição Alimentar na AML |
| 20 | PMMUS Sustainable Urban Mobility Plan | Lisbon Metropolitan Area | Mobility | The Metropolitan Sustainable Urban Mobility Plan (PMMUS) is a planning exercise for metropolitan mobility aligned with the needs of the population. Developed and guided by TML, in conjunction with AML and the Municipalities.<br>It aims to promote sustainable, safe and efficient mobility for people and goods, addressing climate and energy aspects, as well as issues of safety, inclusion and universal accessibility.<br>Thus, the PMMUS seeks to define a new mobility paradigm in the metropolitan region, promoting a more humanised, sustainable, territorially structured, green, equitable, accessible, rational, positive, integrated, innovative, competitive and participatory approach. | Y | https://pmmus.tmlmobilidade.pt/ |
| 21 | Uma praça em cada bairro | Lisbon city<br><br>PORTUGAL | Mobility<br>Well-being & Outdoor Recreation | From a square, a street, a shopping area, a neighbourhood garden, or an existing or planned public facility, it is proposed to organise a meeting point for the local community, a microcenter that concentrates activity and employment, that is established as a public space of excellence and a place to be, where soft modes of travel, walking and cycling, public transport and where car traffic will be conditioned are favoured. | | https://www.lisboa.pt/temas/urbanismo/espaco-publico/uma-praca-em-cada-bairro |

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| 22 | | Hammarby Sjöstad (Stockholm)<br><br>SWEDEN | Mobility<br>Well-being & Outdoor Recreation<br>Care and Health<br>Food & Daily Shopping | Hammarby Sjöstad embodies the 15mC principles through its urban design and infrastructure. The district features pedestrian-friendly pathways strategically placed to connect residential areas with key amenities such as shops, recreational areas, and public transportation. This intentional design facilitates easy access to daily needs within a short walk or wheel from home, encouraging outdoor activities and community engagement. It provides extensive public transport options, which, alongside the walkable pathways, helps reduce reliance on cars. By ensuring proximity to services, incorporating green spaces, and emphasizing non-motorised transport connections, the district supports the core 15mC goal of enabling residents to meet most of their daily needs and engage in their community conveniently and sustainably within their immediate neighbourhood. | | Urban Design Lab article |
| 23 | 10-minute district of short distances | Grasbrook (Hamburg)<br><br>GERMANY | Mobility<br>Well-being & Outdoor Recreation<br>Care and Health | Grasbrook's ambition is to become a '10-minute district of short distances,' ensuring that essential services-such as schools, shops, healthcare, recreation, and workplaces-are accessible within a 10-minute walk or bike ride. This vision aligns with the core tenet of the 15-minute city: proximity to daily needs, supporting sustainable, inclusive, and vibrant urban life. | Y | Grasbrook plans |
| 24 | Eco-district | GWL-terrein Amsterdam<br><br>THE NETHERLANDS | Mobility<br>Well-being & Outdoor Recreation<br>Care and Health | GWL-terrein, described as the first eco-district in the Netherlands, embodies principles aligned with the 15mC concept through its fundamental design and community infrastructure. As a car-free residential neighbourhood built according to sustainable principles, it directly supports the 15mC goal of reducing reliance on private vehicles and promoting walking and cycling for local accessibility.<br>The district features a community centre which acts as a focal point for residents, hosting regular events like coffee mornings, drop-in sessions, and community association hours. This provides easily accessible social spaces and local interaction points within the neighbourhood. By integrating a car-free environment with dedicated community spaces and local services, GWL-terrein supports the broader 15mC principle of enabling residents to meet many of their daily needs and | Y | https://gwl-terrein.nl/ |

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| | | | | engage with their community conveniently and sustainably within their immediate area. | | |
| 25 | 15-minute community life circle | CHINA | Food & Daily Shopping<br>Well-being & Outdoor Recreation | The origin of the 'life circle' can be traced back to 'the third National Development Plan' initiated by Japan in the 1970s, which emphasizes the spatial scope of community residents' daily activities, such as shopping, leisure, commuting, and socialising by walking around their residences.<br>The '15-minute community life circle' is defined as approximately 1 km walking distance (covering 3–5km$^2$ ideally) where residents can conveniently access essential daily service facilities, including education, healthcare, and leisure. Urban planning is increasingly adopting this 'human-oriented' focus, with Chinese megacities explicitly engaging in '15-min life circle community planning' to ensure the rational allocation and accessibility of public services within this defined radius. Thus, the 15-minute city concept, as discussed in this paper, represents the practical application and evaluation of the broader life circle idea within a specific, measurable time and distance framework for modern urban development. | Y | Shanghai action guidance of 15-minute community life circle<br><br>Research 1 – (Jiang et al., 2025)<br>Research 2 - (Ma et al., 2023) |
| 26 | 20-minute neighbourhood | Edinburgh UK | Mobility<br>Well-being & Outdoor Recreation<br>Employment | Edinburgh's 20-minute neighbourhood concept has a vision to enable a net zero city where everyone can live well locally. The core aim is to create places where most people's daily needs can be met within a short walk, wheel or bike ride of their home, specifically within a 20-minute round trip. This level of ambition is deemed necessary to create good places to live and work, end poverty, and achieve net zero by 2030. | On-going | Edinburgh 20-minute neighbourhood plans |
| 27 | 20-minute neighbourhood | Melbourne AUSTRALIA | Mobility<br>Employment<br>Education & culture | Victoria's strategy, embedded within Plan Melbourne 2017–2050, centres on creating '20-minute neighbourhoods'. This means accessing destinations within a 20-minute return walk, which is approximately 800 meters each way for the average person. The core aim is to support 'living locally,' ensuring convenient access to essential services and amenities like health facilities, schools, and supermarkets among others.<br>This strategy aligns with 15mC principles by emphasizing safe, accessible, and well-connected environments for pedestrians and cyclists. The approach involves revitalising Neighbourhood | Y | 20-minute neighbourhood strategy |

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| | | | | Activity Centres, which provide local daily needs, and integrating this concept into major infrastructure projects through place-based planning and community partnerships. | | |
| 28 | 15-minute city | Buenos Aires Argentina | Mobility Well-being & Outdoor Recreation Care and Health | Under the global leadership of the Head of Government Horacio Rodríguez Larreta, the city aims to offer residents more and better public and green spaces, businesses, services, and health centres close to their homes, along with sustainable mobility options. This strategic transformation is intended to improve quality of life and positively impact climate indicators. Key initiatives and their implementation include:<br>• Public and green space: Buenos Aires has significantly expanded its green areas, adding 110 hectares of new public green space and 16 new squares since 2016. The city's objective is that, by 2025, no resident will be more than 400 meters from a green space.<br>• Micro–macrocentro project: This initiative focuses on reconverting the Central Business District (Microcentro) into a multifunctional living area, providing quality public spaces and nearby businesses that are welcoming day and night. Its existing interconnectivity makes it ideal for the 15-minute city concept.<br>• Nearby businesses and services: To promote local economies and accessibility, Buenos Aires supports street markets offering fresh, affordable produce, outdoor food courts that foster communal eating and employment, and enhances the value of old markets for quality products and direct producer-trader interactions. Additionally, Green Points serve as 24-hour recycling facilities across all municipal urban divisions.<br>• Health Accessibility: The city is committed to ensuring all families have access to a Health and Community Action Centre within a 15-minute public transport ride from their homes. There are currently 44 such centres providing primary care and various health programs.<br>•Cycling: Cycling has seen a 1,000% increase in daily trips between 2009 and 2019, supported by 267 km of cycle paths | Y | ICLEI references<br><br>C40 Knowledge Hub references |

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| | | | | and the "Ecobici" public bike-sharing system. The city targets one million bike trips per day by 2023.<br>•Pedestrian Areas: New exclusive pedestrian zones have been created, particularly in the historic city centre. The Microcentro, with 259 car-free streets, is now one of the world's largest car-free zones.<br>•Metrobus Network: This system of exclusive bus lanes has reduced travel times by over 40% and fuel consumption by more than 20%, significantly improving public transport efficiency and environmental performance. | | |
| 29 | 20-minute neighbourhood | Portland USA | Well-being & Outdoor Recreation<br>Care & Health<br>Mobility<br>Employment | The Climate Action Plan, as well as many other City and County Plans including the Portland Plan and the Comprehensive Plan, seek to prioritise actions and investments in support of the 15-minute city initiative.<br>The most notable initiatives addressing the concept are:<br>•Community Involvement: Emphasising transparent and inclusive decision-making frameworks for infrastructure, transport, land use, and community development projects, involving residents in the process.<br>•Active Mobility Networks: Improving bike lanes, pedestrian areas, and public transport access to promote walkability. This includes investment in cycling infrastructure, such as new lanes and bike-sharing programs, to foster economic growth and a modal shift to cycling.<br>•"Anti-displacement" Action Plan: Recognising that prosperous neighbourhoods can lead to gentrification, Portland developed a joint plan with residents to ensure equitable development and reduce involuntary displacement of residents, tradespeople, and cultural organizations. | Y | https://www.portland.gov/sites/default/files/2019-07/cap-summary-june30-2015_web.pdf |
| 30 | 20-Minute Towns and a 45-Minute City | Singapore | Well-being & Outdoor Recreation<br>Care & Health<br>Mobility<br>Employment | The core strategy is to make Walk-Cycle-Ride modes the preferred way to travel, through concerted government efforts to prioritise and seamlessly integrate these options. The plan proposes:<br>•Expanding the active mobility network to over 1,000km of cycling paths by 2040, improving first- and last-mile | N | Land Transport Master Plan 2040 |

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| | | | | connectivity and making it more convenient to reach everyday amenities by walking and cycling.<br>•Improving bus speeds by progressively implementing Transit Priority Corridors, which are expected to save commuters an average of 10 to 15 minutes. Singapore is also exploring autonomous, dynamically-routed bus services.<br>•Bringing jobs and amenities closer to homes through new employment centres outside the Central Business District, thereby shortening daily commutes.<br>•Developing Integrated Transport Hubs that offer seamless connections between bus and train, integrated with malls for convenient access to amenities. | | |

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