



D2.1 Portfolio of Successful 15minC Strategies in Urban Areas

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Document Information

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Table of abbreviations

15mC	15-minute City	ULLs	Urban Living Labs
B2B	Business-to-Business	KAs	Key Areas of Actions
B2C	Business-to-Customers	MaaS	Mobility as a Service
BRT	Bus Rapid Transit	P&R	Park and Ride
CI	Critical Issue	PT	Public Transport
DRT	Demand Responsive Transport	SLZ	Smart Loading Zone
KPI	Key Performance Indicator	SUMP	Sustainable Urban Mobility Plan
LaaS	Logistics as a Service	TOD	Transit Oriented Development
LEZ	Low Emission Zone	WP	Work Package
LMD	Localised Mobility Domain		

1. Introduction

Overview project

FORTHCOMING (FOsteRING THE City Of proximity through Maas InteGration) aims to identify 15mC strategies and practices taking place in urban cores and test how the model of 15mC can be adapted in suburban areas characterised by low and mid-density. The objectives of the project are twofold:

- foster the **successful transfer of central city strategies to the suburbs**, boosting the transition to climate-neutral, liveable, and inclusive cities
- **test ICT MaaS & LaaS tools** that provide solutions to site-specific problems found in peripheral areas

The project builds on six case-studies as shown on the map below:

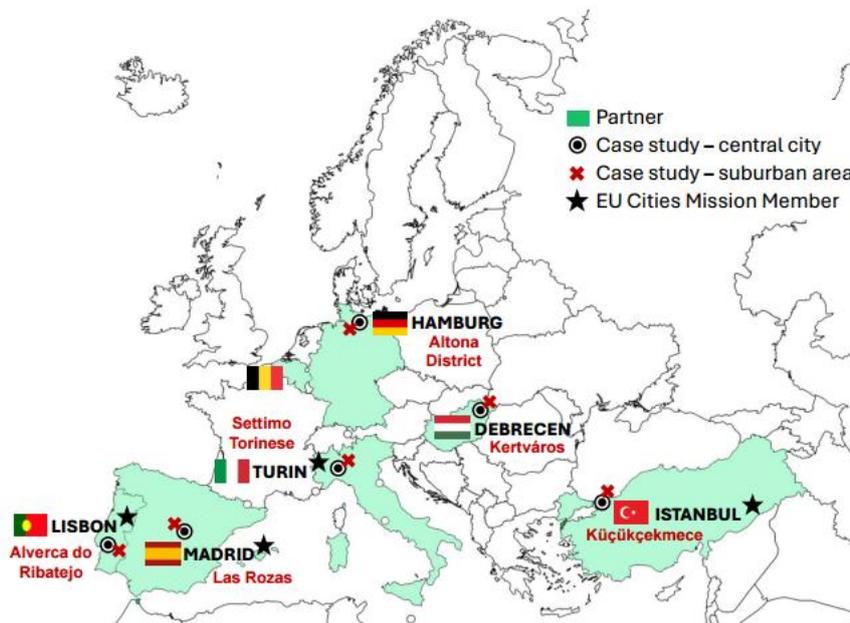


Figure 1: Map of FORTHCOMING case-studies and partners

Each case-study includes two components: one central area where 15-minute city measures being implemented and a suburban area in the metropolitan area in need of improvement where an Urban Living Lab (ULL) has been set up.

Core city- ULL	Common actions	Specific actions
Madrid- Las Rozas	<ul style="list-style-type: none"> - Park & Ride - Bike & Ride - Shared and micro-mobility schemes 	<ul style="list-style-type: none"> - Safe parking for bikes. 15 new facilities in the proximity of shopping centres, sports halls, rail stations, etc. - Digital twin for mobility management and Low Emission Zone (LEZ) monitoring
Hamburg- Altona District	<ul style="list-style-type: none"> - Bike lanes and priority 	<ul style="list-style-type: none"> - LMD link to public transport (MaaS application) - Micro-hubs - Climate-safe concept
Debrecen - Kertváros	<ul style="list-style-type: none"> - Improving public space /pedestrian priority 	<ul style="list-style-type: none"> - Shared Mobility - Network of sensors to count pass. in real time

Turin-Settimo Torinese		- Demand Responsive Transport (DRT) - Car sharing strategy within the city and in the Unione NET area - Bike and scooter sharing - New and refurbished bike lines - Safe parking for bikes
Lisbon-Alverca do Ribatejo		- Lisbon Metropolitan Area Tariff System – Single public transport pass - Shared electric scooters Pilot Project
Istanbul - Küçükçekmece		- Intermodal hub for freight. “Logistic Village” - Digital Twin Pilot Project for LEZ

Table 1: Scope of FORTHCOMING ULLs

The first half of the project (M1-M12) consists in analysing best practices in city central areas to identify the key success factors underlying the implementation of 15mC strategies and initiatives as well as the lessons that cities have learnt through this process (WP2). In parallel, the project is also conducting an in-depth analysis of the relevant local strategies in each ULL to identify the specific needs related to mobility, urban amenities, digital solutions and/logistics in each context and define a set of relevant solutions for each ULL (see Table 1). The project will then build on these insights to define how to adapt 15mC strategies to suburban contexts with special focus is placed on digitalisation.

Purpose of the deliverable

The deliverable presents a **detailed portfolio of 15 best practices implemented in urban areas** which are relevant to 15mC planning and to the six FORTHCOMING ULLs. The portfolio has been developed under Work Package 2 led by Eurocities and will feed into the other WPs of the project (see Figure 2).

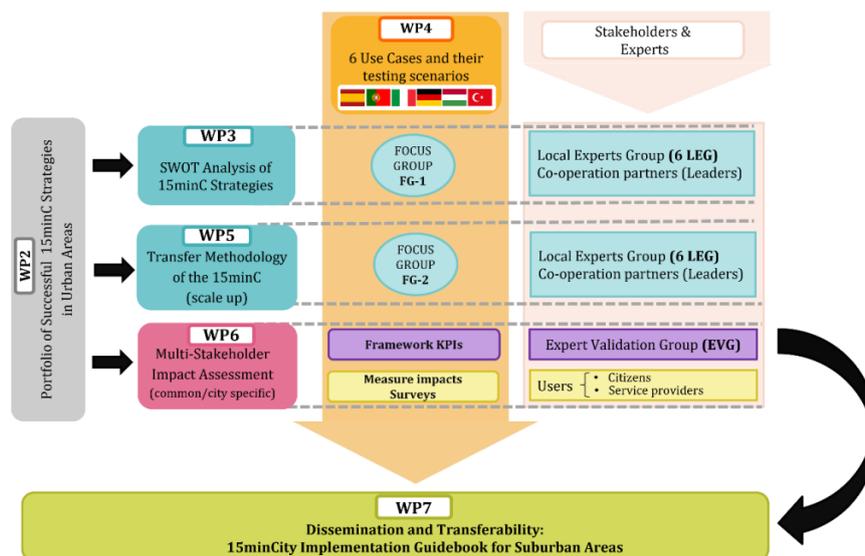


Figure 2: Structure of FORTHCOMING work programme

The portfolio is structured in three key sections as follows:

1. A brief **overview of relevant literature** on the 15mC including the definition of the concept, its limitations, existing strategies and the critical issues and key success factors underlining its implementation.
2. A summary of the **conceptual framework** developed, and **methods used** to develop the portfolio
3. The **portfolio** itself which describes each best practice, identifies the key factors that enable its successful implementation as well as the lessons learnt, and challenges experienced by cities through the process.

The work of WP2 (i.e. the state of art and definitions of the four dimensions of 15mC) has fed into **WP3** and in particular the development of Key Performance Indicators (KPIs) categorised in eight clusters. The first four clusters draw on the four dimensions defined by Moreno: 'Proximity', 'Density and Land Use', 'Inclusivity', 'Digitalisation'. These were complemented by four more clusters: 'Sustainability and Climate Action', 'Governance', 'Economic Impact', and 'Modal Share' (work-in-progress). The KPIs will be validated by stakeholders during focus groups alongside a SWOT analysis of 15minC strategies in the six case-studies. In addition, the measures of success and lessons learnt identified for each best practice in the portfolio will support the work of **WP4** by providing a repository of concrete examples of 15mC practices carrying in urban cores in Europe alongside the analysis of the relevant local strategies in each ULL, and the identification of the needs in each context in terms of mobility, urban amenities, digital solutions and/logistics performed in WP3.

The results of the portfolio will also feed into the frameworks developed in **WP5** (Transfer Methodology), and **WP6** (Multi-Stakeholder Impact Assessment). Together with the experiences in the six ULLs, the information collected in the portfolio of best practices will form the basis of the main legacy report of the project: '15mCity Implementation Guidebook for Suburban Areas' (Deliverable 6.2).

2. Background

This section provides a brief overview of relevant literature on the 15mC including the definition of the concept, its limitations, existing strategies and the critical issues and key success factors underlining its implementation. A longer report on the state-of-the-art related to the 15mC (task 2.1) has been published separately.

Definition

The 15-minute city (15mC) is an urban concept where residents can fulfil their daily needs and **access essential services within 15 minutes walking and biking distance from their home**. The concept was originally coined by Moreno in 2016 (see also Moreno et al 2021; Allan et al 2022). According to him, a 15mC should provide for **six urban social functions** which are seen as essential to sustain a decent urban life. These are: living, working, commerce, healthcare, education, and entertainment

It is important to highlight that the 15mC concept draws on well-established urban planning concepts and ideas. These include for example the neighbourhood unit concept developed by Clarence Perry, the mixed-use urban development approach advocated by Jane Jacobs, the compact city model advocating for dense, mixed-use, and walkable districts, and more recently, the people-centred approach to urban planning advocated by Jan Gehl or the transit-oriented development approach (Bibri et al 2020; Buttner et al 2022; Staricco, 2022; Khavarian-Garmsir et al 2023; Mouratidis 2024).

Through the framework of the 15mC, urban planners and policymakers are encouraged to follow a set of urban principles centred around four pillars: proximity, diversity, density and digitalisation. Moreno et al define **density** as the ‘optimal number of people that a given area can comfortably sustain in terms of urban service delivery and resource consumption’ (Moreno et al, 2021, p102) while **proximity** is understood as the coupling of spatial and temporal dimensions in understanding and planning for urban living. **Diversity** put an emphasis on mix land-use and mixed functions in a specific area as well as on diversity in culture and people. Lastly, **digitalisation** is seen as an enabler of the three other dimensions, via the use of digital technology such as smart city management tools, digital platforms, digital participation tools or end-user applications (see Khavarian-Garmsir et al 2023b for an overview).

The 15mC and related urban planning strategies are associated with **numerous environmental, social, and economic benefits**. These include a better quality of life as well as increased social cohesion and sense of place, better health outcomes by encouraging active traveling and reducing air pollution, a reduction of carbon emissions in the transport sector by cutting down travel distance and developing sustainable modes of mobility, a decrease in urban heat island effects and more broadly a way forward to climate neutral and more liveable cities. (Allam et al 2022 ; Buttner et all, 2022 ; Moreno et al 2021, Pozoukidou & Angelidou, 2022).

Depending on the specific objectives underlying the adoption of 15mC planning and initiatives, **measures of success** include an increase in proportion of space allocated to social activities, better accessibility to identified urban amenities, active mode infrastructures and green spaces as well as land-use mix. Other measures of success can be the increased of active mode users

(e.g. pedestrians/ cyclists in area), the increase in public transport usage as well as better public transport accessibility and multi-modality (e.g. accessibility of buses and metro lines, availability and uptake of DRT, tiered pricing schemes, uptake in MaaS services). Reduction of car trips and congestion, decrease of vehicle speed as well as reduction of air and noise pollution are also commonly used indicators of success. More qualitative indicators of success include increase desirability of walking, cycling, and use of public transit, perceived meaningfulness of community engagement and participatory process, and high level of acceptance of implemented measures/solutions.

Limitations of the concept

The academic literature on the 15-minute city highlights numerous limitations to the concept as well as important challenges in terms of using it in urban planning processes and implementing it in cities (see Khavarian-Garmsir et al., 2023b, Mouratidis 2024; Sdoukopoulos et al 2024). The concept has been criticised for its ‘one-size-fits-all’ approach which can overlook the specificities of neighbourhoods, communities and local heritage, or the complex political and social structures in which places are embedded.

Specific limitations include:

- Studies tend to put an emphasis on proximity and most specifically on the numbers of urban amenities reachable within a catchment area (quantity) without necessarily providing a **clear hierarchisation of amenities** or considering the **specific needs of each neighbourhood** (qualitative) while often overlooking the other dimensions of the concept (Marchigiani & Bonfantini 2022, Mouratidis, 2024, Poorthuis and Zook, 2023).
- **Public transit network** is not always considered or sufficiently addressed as part of the 15mC framework (Mouratidis 2024). Here scholars argue that the concept of 15mC should be complemented with the well-established **Transit-Oriented Development (TOD)** approach (Abdelfattah et al 2022; Borghetti, 2021; Staricco & Vitale Brovarone, 2020; Wolański, 2023). TOD focuses on fostering mixed-use communities centered around a high-quality public transit option (e.g. train station, underground, etc), a core commercial area and nearby public space (see Ibraeva et al 2020 for a comprehensive overview). Approaching the 15mC from a TOD approach allow to take into account **work commutes** in industrial zones, and business districts as well as **other trips taking place outside of the neighbourhood** which can be done by public transport and increase the catchment area. Importantly, it would also address questions of **connections with urban centres and peri-urban areas** which tend to be overlooked in the 15mC concept (Pozoukidou & Angelidou, 2022; Wolański, 2023). As Abdelfattah et al pointed out public transit networks ‘will continue to provide the backbone at the inter-neighbourhood scale, connecting it to the city/region’ (2022:2).
- Research is pointing to limitations in terms of the **participatory approaches in decision-making** which often are at the core of 15mC implementation. These include limited representativeness of groups engaged, use of the process in a tokenistic way, and power imbalance and equity concerns embedded within participation (Anguelovski et al., 2023; Casarin et al., 2023).
- Furthermore, the **needs of different population groups** should be more actively considered to ensure **equity of opportunities and social justice** (Buttner et al 2024; Calafiore et al 2022; Khavarian-Garmsir et al., 2023b; Knap et al., 2023; Olsen et al, 2022). Here existing research on proximity-centred accessibility, mobility justice and transport poverty should be taken

into account (Buttner et al 2024, Kuttler & Moraglio, 2021; Silva et al 2023; Verlinghieri & Schwanen, 2020).

- Research has also documented **gentrification dynamics** linked to urban planning and greening initiatives (Anguelovski et al., 2022; Gould and Lewis, 2016). Here it would be important to develop clear mitigation strategies to prevent gentrification and social displacement.
- It is also important to highlight that the 15mc concept can be used as branding strategy as shown by Gower and Grodach (2022)'s study where they examined planning documents in 33 cities and found a **scarcity of implementation combined with a lack of statutory policy weight and planning legislation**.

Finally, the state of art identified two significant gaps in the 15-minute literature:

1. Lack of research and initiatives about **the role and impact of urban logistics** in relation to the 15mC (Teixeira et al 2024).
2. Strong emphasis on strategies and implementation of the 15minute city concept in urban cores with limited research and understanding of how these can be transferred to **peri-urban contexts** (Buttner et al 2024; Poorthuis & Zook, 2023). There are several obstacles that make it difficult to implement the 15mC urban planning to peri-urban areas (see Poorthuis & Zook, 2023; Vitale Brovarone, 2022) including:
 - lower population density, higher proportion of single-family housing and in some cases higher proportion of lower income households
 - more limited infrastructures and access to public transport and active travel modes (e.g. lack of cycling lanes, lack of transport connectivity or low frequency) and therefore higher car dependency
 - more limited access to services; and finally in some cases, strict zoning restrictions.

Existing strategies

A large number of cities across the globe have adopted a 15mC or associated strategy (see Buttner et al 2024 for an overview and Appendix 2). These strategies are broad-ranging and cuts across numerous domains such as urban planning, transport planning, health, local economy community engagement, and education. Recurring measures include the reconfiguration of urban spaces in favour of people and local community life (e.g. redesign of local squares, accessibility and proximity to urban amenities, creation of school streets) and to make cities more sustainable and liveable (e.g. creation of green spaces). These measures work hand-in-hand with traffic management and mobility interventions such as the development of circulation plans and traffic calming measures and the development of infrastructures and promotion of active modes of transport (e.g. cycling infrastructures, mobility hubs) (Bertolini 2020; Buttner et al 2022, 2024; Leonardi & Distefano, 2024; Pozoukidou, & Angelidou, 2022).

Table 2 detailed the key elements of well documented 15mC or associated strategies in six cities (see also Marchigiani & Bonfantini, 2022; Pozoukidou, & Angelidou, 2022). This shows the variety of initiatives and domains which fall under the umbrella of 15mC and related strategies.

City	Strategies	Description x-minute policy	Key elements and initiatives
Barcelona	<p>Superblocks¹ (Supermanzanas / Superillas)</p> <p>Barcelona Climate Plan 2018 – 2030</p>	<p>‘The Superblock is a variable grouping of urban fabric with residential streets of between 300 and 500 metres on each side. The main traffic and public transport is redirected to the roads around the perimeter. [...] Kerbside parking spaces are eliminated (which can be replaced by underground parking) and the space is redistributed with pedestrian areas, squares, and spaces for meeting and playing, reconfiguring them into unique platforms with no architectural barriers, and creating green areas’.²</p>	<ul style="list-style-type: none"> - Circulation plan at neighbourhood level (superblock with only residential access and no traffic through) - Participatory approach (e.g. citizen participation processes for each stage of the project, Decidim) - Use of tactical urbanism: provisional and affordable measures which are easy to implement, such as strips of colours, urban furniture, moveable plant beds and games painted on the ground. - Creation of meeting places/ shared spaces, often with kerb less paving to foster social use of these streets - Increase in greenery - Improvement or creation of cycling and pedestrian infrastructures
Bogota	<p>Vital neighbourhoods³ (Barrios Vitales)</p> <p>Proximity City⁴ (Ciudad de proximidad)</p>	<p>The program is aiming to ‘transform the existing nature of streets in Barrios Vitales by filtering through traffic and increasing space for pedestrians and active modes at the expense of space dedicated to car mobility and parking. In addition to enhancing walkability in the neighbourhoods, traffic speed and flow reductions will allow cyclists to move safely and comfortably through Barrios Vitales, thus</p>	<ul style="list-style-type: none"> - Citizen participation (Public consultations, Co-creation workshops, Green Séptima Campaign, Use of the Streetmix platform) - Circulation plan at neighbourhood level (superblock with only residential access and no traffic through) - Creation green corridors and spaces, road space reallocation & public space redesign at neighbourhood level (e.g. redesign local squares, increase of green space, pedestrianisation, reorganisation parking spaces) - Development of children priority zones

¹ <https://www.barcelona.cat/pla-superilla-barcelona/en>

² https://www.edcities.org/en/wp-content/uploads/sites/2/2021/02/Experiencia-destacada-36_BCN_ENG_30-aniv.pdf#p2-3

³ <https://documents1.worldbank.org/curated/en/099060123135042769/pdf/P1778510058dd905808852025216be0f230.pdf>

⁴ https://c40.my.salesforce.com/sfc/p/#36000001Enhz/a/1Q000000MyfB/AhVvyoij5okHvQUKEWxONZ0JRJG_que4WwKAXFutnW

		providing connectivity to Bogota’s robust cycling infrastructure network’. ⁵	<ul style="list-style-type: none"> - Open street initiatives and tactical urbanism (e.g. San Felipe Open) - Land planning reform, with creation of 33 Local Planning Units (UPLs)—30 urban and three entirely rural—that enable the consolidation of the '30-minute Bogotá.
Edinburgh	20-minute neighbourhood The City Mobility Plan ⁶	‘The 20-minute neighbourhood concept is about making inclusive places where everyone can have better access to essential local services, facilities and open spaces, while enjoying excellent transport and active travel links to the rest of the city.’ ⁷	<ul style="list-style-type: none"> - Community engagement (e.g. Place standard tool), see Appendix 3 - Access to essential services and community assets (e.g. libraries, community centres, green spaces) - Development of city-scale heatmap drawing on GIS data, identification of 19 strategic focus areas - Town centre project (priority areas with high level of deprivation) - Development of low traffic neighbourhoods (LTNs)
Melbourne	20 minutes neighbourhood ‘living locally’ ⁸ Plan Melbourne	‘The 20-minute neighbourhood is all about ‘living locally’ — giving people the ability to meet most of their daily needs within a 20-minute walk from home, with access to safe cycling and local transport options.’ ⁹ (see Appendix 3)	<ul style="list-style-type: none"> - Use of temporary road closures and tactical urbanism, especially during Covid (e.g. parklet, temporary bike lanes, pop up parks, etc) - Participatory approach (e.g. Little Street transformations programme, Croydon CrowdSpot, Community workshops) - Activation of local neighbourhood via community and art programmes - Improvement of active travel infrastructure (cycling infrastructure, wider paths, raised pedestrian crossings)

⁵ <https://thedocs.worldbank.org/en/doc/c6de7aa3e8b4b081029f639767c1486c-0190062021/original/TDI-paper-Investing-for-Momentum-in-Active-Mobility-October-2021.pdf> P20

⁶ http://www.spokes.org.uk/wp-content/uploads/2022/03/City_Mobility_Plan_2021.pdf

⁷ <https://www.edinburgh.gov.uk/future-council/need-20-minute-neighbourhoods>

⁸ <https://www.planning.vic.gov.au/guides-and-resources/strategies-and-initiatives/20-minute-neighbourhoods>

⁹ https://www.planning.vic.gov.au/data/assets/pdf_file/0022/653125/Creating-a-more-liveable-Melbourne.pdf (p.22)

Paris	<p>15-minute city ('ville du quart'heure')</p> <p>'Paris en Commun'</p> <p>Proximity Pact</p>	<p>The 15-minute city is about supporting the idea that everything essential for life should be available close to home: shopping, working, having fun, learning, exercising, getting healthcare... all within a 15-minute walk or a 5-minute bike ride. ¹⁰ (see Appendix 3)</p>	<ul style="list-style-type: none"> - Road space reallocation & public space redesign at neighbourhood level (e.g. redesign local squares, increase of green space, pedestrianisation) - School street programme (rues aux écoles), schools as central hubs in neighbourhoods - Improvement & creation bike lanes - Neighbourhood participatory programme (e.g. citizen kiosks) - Multi-purposes places and building (e.g. Cours Oasis) - Access to urban amenities and essential services (including cultural and sport activities such as artist open stages, sports social clubs) - Support local economy (e.g. made in Paris, eat, and buy local)
Portland	<p>20-Minute Complete Neighbourhood</p> <p>Portland Climate Action Plan 14</p> <p>The Portland Plan¹¹</p>	<p>"20-minute complete neighbourhoods" [are]—places where residents can safely walk a relatively short distance from home to most of the destinations and services they use every day. Fundamentally, the 20-minute neighbourhood concept is another way to talk about or describe walkable, bikeable environments and vibrant, human-scale neighbourhoods—in essence, complete neighborhood communities.'¹²</p>	<ul style="list-style-type: none"> - Development of neighbourhood hubs - 'Neighbourhood greenways', a network of walking and cycling routes - Community engagement in decision-making - Development of mobility hubs & improvement of active mobility networks: bike lanes, pedestrianised areas, and access to public transport - "Anti-displacement" Action Plan - Development of 20-minute neighbourhood index

Table 2: Examples of existing 15mC strategies & their characteristics

¹⁰ <https://www.paris.fr/dossiers/paris-ville-du-quart-d-heure-ou-le-pari-de-la-proximite-37>

¹¹ <https://www.portland.gov/bps/planning/about-bps/portland-plan>

¹² https://www.portland.gov/sites/default/files/2019-08/cap_may_2010_web_0.pdf p40

Critical issues & success factors

The review of relevant academic and grey literature shed light on four critical issues and related challenges (in addition to the limitations of the concept identified above) that urban planners, city officers and politicians need to address:

Critical Issue	Challenges
Involvement of Citizens & Diverse Communities	<ul style="list-style-type: none"> - Meaningful participation of diverse communities and citizens throughout the lifecycle of the project (Anguelovski et al., 2023; Casarin et al., 2023) - Opposition from different groups including car owners, local retailers, local politicians and residents (Brovarone et al., 2023; Verlinghieri et al., 2024; Zografos et al., 2020). - Existing opposition fuelled by the media backlash against road closures to create space for social distancing and active travel at the time of the COVID-19 pandemic (Nello-Deakin, 2023) and by significant misinformation and conspiracy theories against the 15-minute city more broadly (Marquet et al., 2024).
Social Justice	<ul style="list-style-type: none"> - Ensuring inclusivity in the design and implementation of measures, not only in terms of physical accessibility (e.g. barrier-free, universal design), but also in terms of socio-economic spatial inequalities. This means addressing the needs of different social demographic groups such older adults, children, disabled people, women, people with a migrant background, carers, and low-income groups (see Buttner et al 2024; Calafiore et al 2022, Olsen et al, 2022) - Addressing social justice concerns and developing strategies around well-documented dynamics of gentrification (e.g. exclusion low-income population, increase in housing prices, overtourism) (Anguelovski et al., 2022; Cocola-Gant et al., 2020; Gould and Lewis, 2016)
Integrated Urban Governance	<ul style="list-style-type: none"> - Developing a model of multi-level/cross-organisational (local, regional, national) and multi-stakeholder (public, private, community) governance - Implementing measures in the context of municipal austerity and neoliberal governance (Casarin, 2023 Verlinghieri et al 2024). This includes limited financial resources, limited capacity (time, staff, expertise) and lack of investment in infrastructures - Connecting local urban transformation (at neighbourhood level) to city-wide infrastructure and strategies - Monitoring and evaluating impacts of interventions (Gower & Grodach, 2022)
Beyond Urban Cores	<ul style="list-style-type: none"> - Adaptation of 15mC strategies for peri-urban areas characterised by one or several of the followings: lower population density, higher proportion of single-family housing and in some cases higher proportion of lower income households; low accessibility to services, low accessibility to public transport and active modes infrastructures and in some cases, strict land-use and zoning restrictions (Poorthuis & Zook, 2023; Vitale Brovarone, 2022)

Table 3: Critical issues in 15mC strategies

A number of enabling factors for the development and implementation of 15mC also emerged from the review of the relevant literature:

Level	Success factors
Strategic (including municipal/ district level)	<ul style="list-style-type: none"> - Incorporating 15mC planning principles, strategies and practices in a broader strategic vision (e.g. SUMPs, strategy to reach climate neutrality by 2030) - Securing political buy-in and having a strong political leadership - Integrating different levels of planning/ governance (neighbourhood, city, regional) and ensuring coordination and cooperation (e.g. land use and transport planning) - Ensuring appropriate resourcing (financial, staff capacity, time) and access to relevant technical expertise at local level - Ensuring institutional support (e.g. buy-in from executive board, designating a project champion internally) - Including and engaging communities and citizens in urban planning through meaningful participatory processes - Identifying relevant stakeholders and fostering collaboration (e.g. early dialogue, definition of cooperation framework) - Encouraging a culture of experimentation/ risk taking
Intervention / project	<ul style="list-style-type: none"> - Including and engaging communities and citizens through a meaningful participatory process throughout the lifespan of project - Defining from the outset the scope and objectives of the intervention - Investing in communication and campaigns to inform stakeholders (e.g. tailoring messages to relevant stakeholders & communicating through appropriate channels, clear identity, focus on benefits) - Defining processes to collect information and data (quantitative & qualitative) for understanding the specific context and evaluate interventions

Table 4: Success factors 15mC strategies

3. Methods

The outputs presented in this deliverable result from the work and activities undertaken under Tasks 2.1 and 2.2 (Figure 3). This section details the methods used and activities conducted.

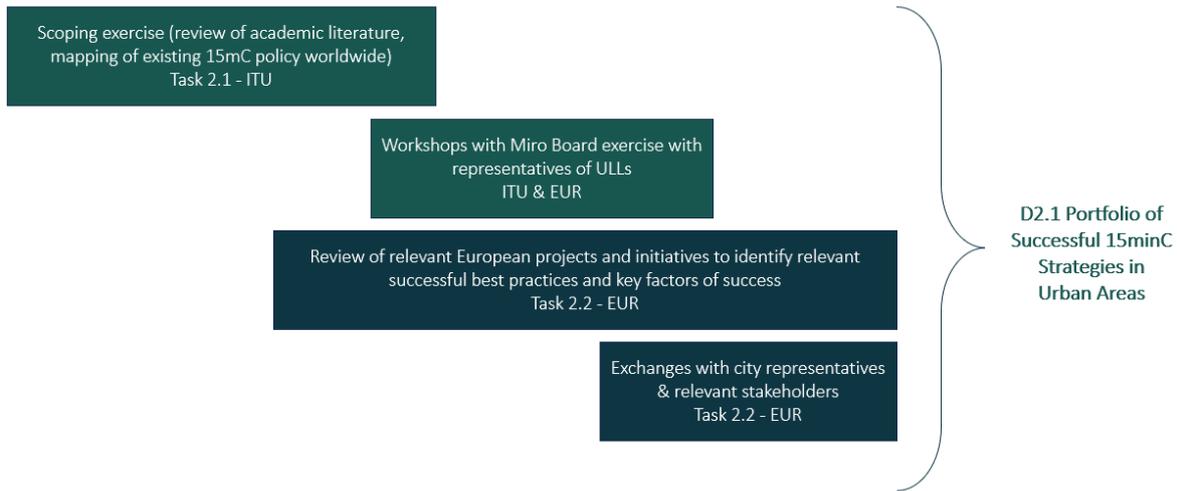


Figure 3: Overview WP2 methodology

We started the project by conducting a in depth scoping review to assess the state of the art and existing 15mC and associated practices and policies in Europe and globally including:

- Review of academic literature (15mC definition and dimensions, limitations of the concept, challenges, success factors)
- Mapping of existing 15mC strategies to provide an informed overview of the current state, geographical distribution, and scope of x-minute city initiatives worldwide (see Appendix 2)
- In depth review of city strategies and policies related to 15mC (e.g. Melbourne, Paris, Portland, Barcelona, see Table 2)
- Review of relevant European projects and initiatives (e.g. European Mobility Week, Cities4People, CIVITAS Handshake, Move21, VCity, Share North, Raptor, etc) to identify relevant successful best practices and key factors of success.

Drawing on the work conducted for the state of art, we organised a first online workshop with ULL representatives to identify the relevant aspects of the 15mC’s four dimensions (i.e. proximity, density, diversity, digitalisation) (See Figure 4). Each dimension of the 15mC was discussed and adapted to suit the objectives of the project. Participants also identified limitations of the concept and related key questions in the context of the project (see Appendix 1). Following the workshop and iterative feedback from consortium partners, the four dimensions of the 15mC concept were revised as per Figure 5.

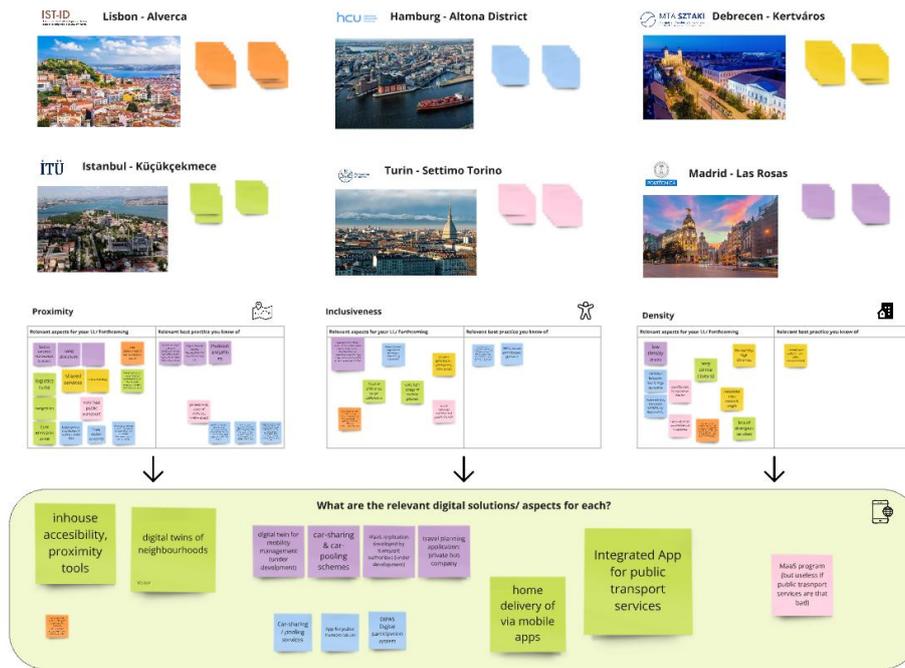


Figure 4: Miro board from the first workshop with ULLs

Proximity refers to the spatial and temporal accessibility to opportunities related to transportation, employment, healthcare, education, entertainment, access to green spaces, and retail for every resident through active or sustainable transportation modes. These opportunities are associated with various catchment areas, which include various types of amenities, each with a hierarchy and a level of relevance based on the user's preferences, and the scale can vary, encompassing neighbourhood, city, or metropolitan levels.

Inclusiveness refers to addressing everyone's needs and experiences in relation to the opportunities offered by the 15mC, regardless of economic means, age, gender, disability, diversity, race, or ethnicity. Mobility justice, accessibility, social cohesion, and participatory decision-making are at the heart of inclusiveness as well as assessing cautiously the risks of exclusion and gentrification.

Density & land-use are viewed in terms of mixed land use in a built environment (e.g., retail, residential, offices, leisure & green spaces, etc.), where the number of people in a given area can comfortably sustain the urban service delivery, opportunities, and resources. In the context of FORTHCOMING which focuses on urban outskirts, density is the most difficult pillar to achieve and leverage.

Digitalisation refers to the enabling of the proximity, diversity, and density's dimensions using digital technology (such as smart city management tools, digital twins, end-user applications). Digitalization should facilitate and ensure equal access for all individuals while considering privacy concerns.

Figure 5: Dimensions of 15mC, adapted for FORTHCOMING

Given the all-encompassing nature of the 15mC concept, we decided to use the four Key Areas of Action (KAs) developed by DUT in their recent position paper ‘Navigating the 15-minute City’¹³ to structure the portfolio of best practices. Each area is defined as follow:

1. **Sustainable Urban Mobility:** developing eco-friendly, efficient transportation alternatives to decrease dependency on private vehicles, including enhancing public transport, cycling, and walking infrastructures.
2. **People-Centered Urban Spaces and Planning:** organizing urban environments to prioritize residents’ well-being and needs, integrating mixed-use developments, and fostering community-oriented public spaces.
3. **Smart Urban Logistics, Production, and Service Sites:** improving the efficiency and sustainability of urban logistics and production through technology, optimizing supply chains, and supporting local production to reduce transportation demands.
4. **Urban Governance for Mobility Transition:** establishing policies and governance frameworks that facilitate sustainable urban mobility and planning, involving various stakeholders in collaborative decision making and policy implementation¹⁴.

The KAs offer a working framework to categorise initiatives and practices falling under the umbrella of 15mC policies. Drawing on this typology we identified specific types of interventions in each key area of actions (e.g. cycling parking, pedestrianisation, citizen participation in urban planning, last-mile delivery solutions, digital nudging, development of MaaS application, etc.) (see Table 5). It is important to recognise that given the all-encompassing and cross-domain nature of 15mC policies, best practices identified are likely to be associated with several KAs. Therefore, assigning an intervention or best practice to a specific KA should be seen as highlighting the primary focus of the best practice, rather than treating it as disconnected from the other areas of actions.

¹³ https://dutpartnership.eu/wp-content/uploads/2024/04/DUT_Partnership_15-minute_City_PositionPaper.pdf

¹⁴ https://dutpartnership.eu/wp-content/uploads/2024/04/DUT_15-minute-City-Mapping_04-2024.pdf

<p>KA1: Sustainable Urban Mobility</p> <ul style="list-style-type: none"> • Public Transport network (e.g. Bus rapid transit, public transport priority, connection with train stations) • Cycling infrastructures (e.g. cycling highways, cycling parking facilities) • Walkability (e.g. pedestrianisation, improvement pedestrian crossings) • Shared mobility solutions (e.g. carpooling, e-bike and scooter sharing scheme) • Multi-modal solutions (e.g. mobility hubs, integrated ticket, Park and Ride scheme) • Accessibility (e.g. Door to door services, Demand responsive transport, barrier free infrastructures) • Affordability & economic/social incentives (e.g. pricing schemes, discounted e-bike purchase scheme) • End user applications (e.g. integrated mobile app) 	<p>KA2: People-Centered Urban Spaces and Planning</p> <ul style="list-style-type: none"> • People centred urban design (permanent redesign of public spaces with a focus on people’s needs and climate transition) • Tactical urbanism (temporary and low-cost initiatives to modify street space allocation in a street/ neighbourhood) • Diversity & social cohesion (e.g. affordable and collective housing initiatives, community centres, community gardens) • Mixed land-use & built environment (e.g. temporary use of building) • Greening, nature-based and climate adaptation solutions (e.g. pocket parks, green programmes, green rooftops)
<p>KA3: Smart Urban Logistics, Production, and Service Sites</p> <ul style="list-style-type: none"> • Logistics hubs & depots (e.g. consolidation centres) • Last mile delivery solutions (e.g. last mile delivery solutions, micro logistics hubs) • Technologies for managing urban logistics (e.g. curb management platform) • Initiatives to support local economies (e.g. community wealth building, city centre revitalisation) 	<p>KA4: Urban Governance for Mobility Transition</p> <ul style="list-style-type: none"> • Citizen engagement & participation (e.g. co-creation workshops, citizen assemblies, participatory budgeting) • Mobility campaigns & nudging interventions (e.g. cycle to work campaigns, nudging and gamification) • Mobility & traffic management strategies (e.g. circulation plans) • Urban space strategies (e.g. urban planning and zoning strategies) • Funding innovations • Digital solutions & management tools to support decision making (e.g. digital twins, Intelligent Transport Systems)

Table 5: Types of interventions for each key area of action

The KAs and typology of interventions enabled us to engage with FORTHCOMING stakeholders during a second Miro exercise. During this session, we define with them the most relevant areas of actions and identify in more granularity the types of interventions that were relevant in their specific case-study and Urban Living Labs (Figure 6).

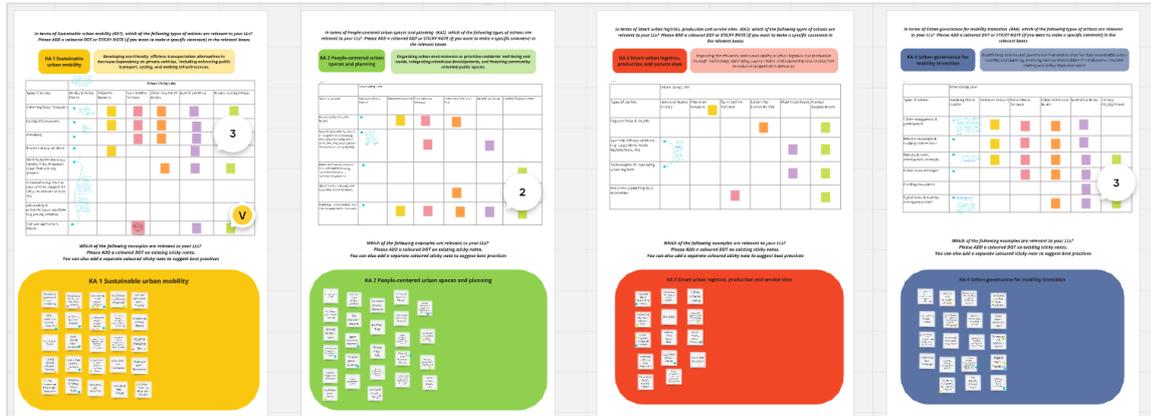


Figure 6: Miro board results from second workshop with ULLs

The results of the workshop highlighted the differences between ULLs; for example, the ULL in Istanbul expressed a strong interest in logistics while the ULL in Madrid focused on MaaS, digital twins and cycling infrastructures. These differences are part of the design of the proposal and will enrich the results of the project. Overall, the most relevant KAs were ‘sustainable urban mobility’ and ‘urban governance for mobility transitions’ (Figure 7) which aligns with the proposal.

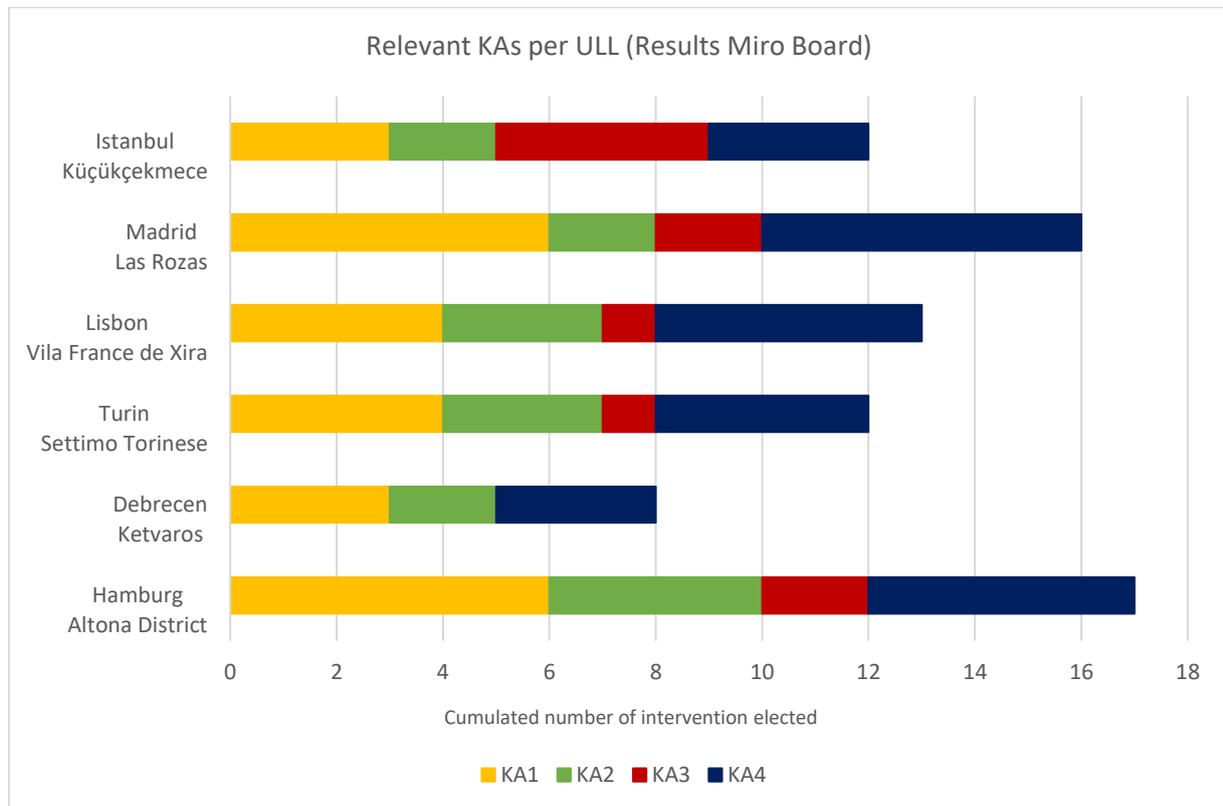


Figure 7: Relevance of each KA per ULL

Drawing on the results of the workshops and the material we collected from the state-of-the-art, the mapping of 15mC strategies and relevant projects, we identified a first selection of best practices for the portfolio with the following criteria:

- Reflect the relevant KAs and types of interventions as expressed by ULLs representatives
- Pay attention to the critical issues identified in the literature
- Keep a geographical spread and have different sizes of cities

We then organised one-to-one exchanges with city representatives and relevant stakeholders in charge of each of the best practices identified in order to validate them as well as assess the impacts of the intervention and identify key success factors and lessons learnt. Finally, it is important to note that while each of the best practices outlined in the portfolio addresses the aims and urban planning principles underlying the concept of 15mC, they were not always officially labelled under the umbrella of 'x-minutes'. The portfolio is presented in the next section.

4. Portfolio Overview

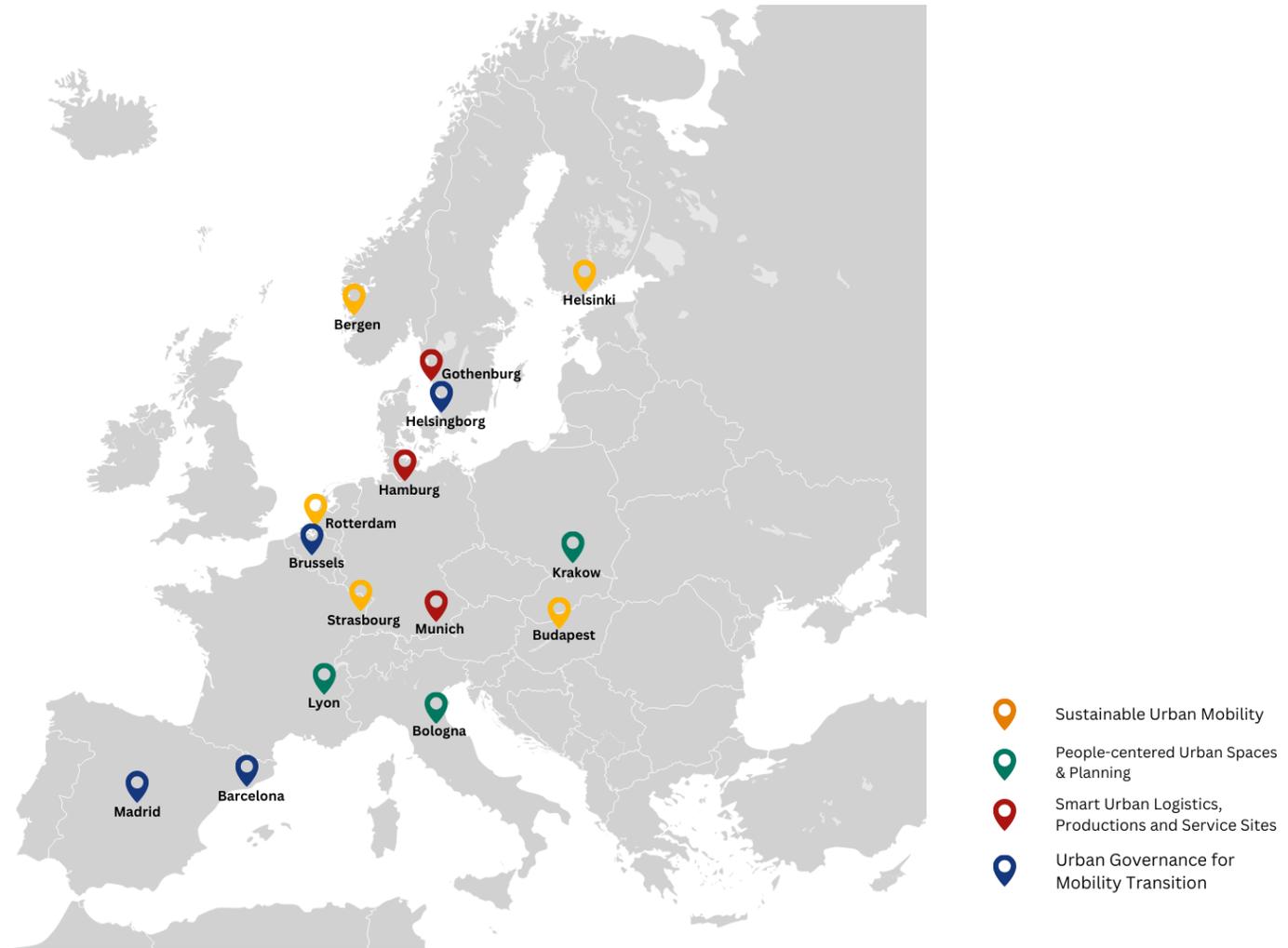


Figure 8: Map of selected best practices

Best practices		Main Key Area of Action	Description intervention	Strong focus on
Barcelona	Digital Twin for Climate Shelters	Urban governance for mobility transition	Data collection Visualisation of access to destinations Focus on vulnerable groups	Social Justice
Bergen	Mobil Punkts	Sustainable urban mobility	Mobility hubs Shared mobility solutions (incl. electric shared cars)	Integrated Urban Governance Beyond Urban Cores
Bologna	Tactical urbanism & pedestrianisation	People-centred urban spaces and planning	Tactical urbanism Pedestrianisation Citizen participation methodology	Involvement of Citizens & Diverse Communities Social Justice Integrated Urban Governance
Budapest	Micromobility Points Network	Sustainable urban mobility	Micromobility management (e-scooters, bikes) End user applications (i.e. MaaS app)	Involvement of Citizens & Diverse Communities Integrated Urban Governance
Brussels	Sustainable mobility for companies: cAIRgo Bike & the Bike project	Urban governance for mobility transition	Mobility management for companies Nudging and campaigns E-cargo bike for logistics, last mile delivery solution	Involvement of Citizens & Diverse Communities Integrated Urban Governance
Gothenburg	Mobility Hotel	Smart urban logistics, production and service sites	Consolidation hub for logistics	Integrated Urban Governance
Hamburg	Smart Loading Zones	Smart urban logistics, production and service sites	Technologies for managing logistics/curb management End user application	Integrated Urban Governance Beyond Urban Cores
Helsingborg	Smart Nudges for Active School Mobility	Urban governance for mobility transition	Nudging / behavioural change campaign End user application	Involvement of Citizens & Diverse Communities Integrated Urban Governance
Helsinki	Cycling infrastructures	Sustainable urban mobility	Cycling highways and inner-city network Cycling infrastructures (parking, P&R)	Integrated Urban Governance Beyond Urban Cores

Krakow	Pocket Parks	People-centred urban spaces and planning	Nature- based solutions & greening Community engagement	Involvement of Citizens & Diverse Communities Social Justice
Lyon	School Streets Programme	People-centred urban spaces and planning	Community engagement, co-design methodology Traffic calming, pedestrianisation	Involvement of Citizens & Diverse Communities Integrated Urban Governance
Madrid	Madrid 360	Urban governance for mobility transition	Intelligent Transport System End user applications (i.e. MaaS app)	Integrated Urban Governance Beyond Urban Cores
Munich	Cyclelogistic Hub	Smart urban logistics, production and service sites	E-cargo bike for logistics, last mile delivery solution	Integrated Urban Governance
Rotterdam	Green Connections Programme & Pedestrian Infrastructure	Sustainable urban mobility	Community engagement Walkability Focus on health	Integrated Urban Governance Involvement of Citizens & Diverse Communities Social Justice
Strasbourg	Chrono'hop & Flex'hop Public Transport Offering	Sustainable urban mobility	Bus rapid transit Demand response transport End user applications (i.e. MaaS app) Intelligent transport system algorithm	Integrated Urban Governance Beyond Urban Cores

Table 6: Detailed overview of selected best practices

City's Best Practices (alphabetical order)			Most Relevant 15mC Dimension(s) in best practice				Most Relevant Key Area of Action			
			Proximity	Density	Diversity (Inclusiveness)	Digitalisation	KA1	KA2	KA3	KA4
Barcelona	Digital Twin for Climate Shelters	ES	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				x
Bergen	Mobil Punkts	NO	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x			
Bologna	Tactical urbanism & pedestrianisation	IT	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		x		
Budapest	Micromobility Points Network	HU	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	x			
Brussels	Sustainable Mobility for Companies: cAIRgo Bike & the Bike project	BE	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				x
Gothenburg	Mobility Hotel	SW	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			x	
Hamburg	Smart Loading Zones	DE	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			x	
Helsingborg	Smart Nudges for Active School Mobility	SW	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				x
Helsinki	Cycling Infrastructures	FI	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x			
Krakov	Pocket Parks	PL	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		x		
Lyon	School Streets Programme	FR	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		x		
Madrid	Madrid 360	ES	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				x
Munich	Cyclelogistic Hub	DE	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
Rotterdam	Green Connections Programme & Pedestrian Infrastructure	NL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	x			
Strasbourg	Chrono'hop & Flex'hop Public Transport Offering	FR	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	x			

Table 7 Overview of most relevant 15mC Dimensions and KAs per best practice

KA1 - Bergen: Mobil Punkts

In 2018, the City of Bergen opened their first ‘mobil punkt’ (mobility point), supported by the Share North Project¹⁵. Each point links electric shared cars to other mobility modes (public transportation, cycling routes).

Today, the city counts 14 mobil punkts, mostly in urban residential areas. More mobil punkts are planned with a new focus on suburban areas as well as on temporary hubs (5-10 years) in locations with redevelopment plans foreseen in the next decade.

Mobil punkts are part of the city's green strategy and parking management policy. For each point, the city adopts a holistic and integrated approach to meet the specific needs of a neighbourhood and its inhabitants. In this perspective, the city considers a range of interventions alongside the implementation of a mobility point. This includes greening solutions, improvement of infrastructures such as the widening of pavement, the provision of underground trash collection facilities and bicycle hangars, the installation of places to rest or the upgrading of street lightning. One example is the mobil punkt created at Anna Kreetz plass in 2021 (see Figure 9). The city installed four electric shared cars (including the first dedicated charging bay for disabled parking) and redesigned the square to provide more space to rest and greenery. The mobility point is near public transport (tram stop nearby) and also includes shared bikes.



Figure 9: Mobil Punkt, Bergen (Credits: City of Bergen, Share North Project)

¹⁵ <https://share-north.eu/2018/05/bergen-celebrates-the-grand-opening-of-the-citys-first-mobilpunkt/>
<https://share-north.eu/2019/07/bergen-a-city-dedicated-to-mobility-hubs-emissions-reduction-and-transnational-learning/>

Impacts

- ✓ Uptake of car sharing by residents, after initial skepticism;
- ✓ Visible decrease of parked cars on the streets in the areas with mobil punkts, corroborated by a drop in number of street parking licences;
- ✓ Reduction in emissions from road traffic.

Lessons learnt & success factors

- ✓ Careful planning and involvement of stakeholders is required (especially with the power grid company).
- ✓ Communication is key, including strong and recognisable visual identity for the mobility points.
- ✓ Direct dialogue with the communities in the neighbourhood is crucial. When facing resistance, it is important to continue the dialogue and show not only the social and economic benefits but also the benefits in terms of space gained on street ('1 shared car removes 10 to 15 cars on the street'). It is thus a win-win for everyone. It is also key to reiterate that car sharing is not for everyone.
- ✓ Good knowledge is essential: the city conducted a mapping exercise of grid capacity, private car ownership rate per household and number of parking permits to support informed decision making.
- ✓ Start with a location where shared cars are already implemented or where existing local demand can be conciliated with the mobility point (e.g. demand for safe cycling parking or charging infrastructure).
- ✓ There is no need for fast charging at mobility points for the shared cars: 3,6 - 7,4 kW (230V) is enough.

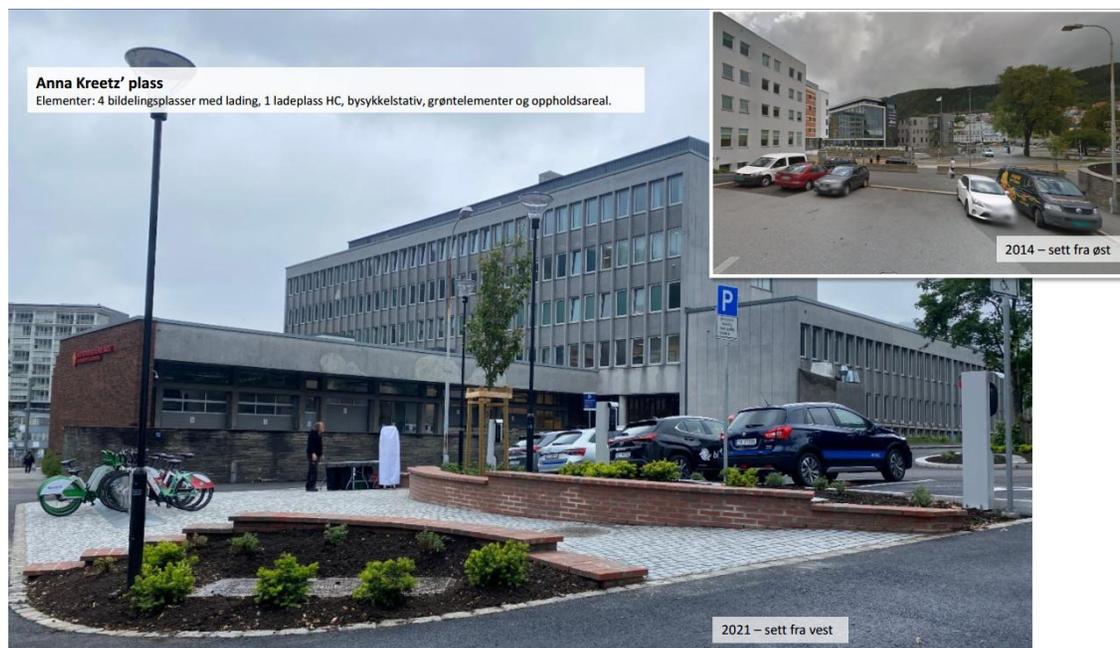


Figure 10: Before & after view of Anna Kreetz with new Mobil Punkt (Credits: City of Bergen)

KA1 - Budapest: Micromobility Points Network

In June 2020, Budapest inaugurated their first micromobility point at Magyar tudósok körútja. This was the result of the three years project Cities-4-People¹⁶ during which numerous participatory and co-creation activities with citizens and stakeholders were organised in order to identify and develop jointly shared mobility solutions for the city (Budapest Citizen Mobility lab¹⁷).

Micro-mobility points are dedicated spaces in the city where users can pick up and drop off shared scooters and bikes. Mobi-points can be reached within a 1–2-minute walk in the downtown area of Budapest and are easily recognisable thanks to dedicated signage, green markings and scooter sign painted around the parking lot (Figure 11). Operators use geofencing technology to create a virtual fence around the point area to regulate parking.



Figure 11: Micromobility Point, Budapest (Credits: BKK and City of Budapest)

The city aims to have micromobility points approximately every 150m across the city centre, creating a comprehensive coverage. As of today, more than 820 micro-mobility points have been implemented over the city. Micromobility points are part of a broader multi-modal and last-mile solutions network deployed by the city and are complemented by bigger mobility hubs which also provide shared cars and mobility stations near public transport hubs. Additionally, micromobility services are integrated into a unified MaaS platform, BudapestGo.

¹⁶ <https://cities4people.eu/en/pilot-areas/budapest-hu/index.html>

<https://cities4people.eu/en/2020/07/17/opening-ceremony-for-the-mobility-point-network-in-budapest/index.html>

¹⁷ <https://cities4people.eu/en/c4p-mobility-labs/citizen-mobility-lab-budapest/index.html>

<https://cmk.cities4people.eu/>

Impacts

- ✓ The micromobility network spreads across the city with 820 points, often implemented on former parking spaces.
- ✓ Since the city implemented the mobility points, the parking of scooters has become more orderly and do not obstruct the movement of pedestrians. The compliance rate of correctly parking on Mobi-points is around 70-80% (depending on the area) in Budapest.
- ✓ Development of partnerships with shared mobility providers (e.g. Donkey Republic, Lime).
- ✓ Integration of mobility points into BudapestGo through API. Customers have access to the locations of Mobi-points, however data on number of vehicles or free bike racks available at mobility points has not yet been incorporated.

Comprehensive network concept



Figure 12: Concept mobility network, Budapest (Credits: BKK)

Lessons learnt & success factors

- ✓ Strategic piloting to prove the concept¹⁸, including ensuring that the pilot areas are incorporated in the shared bike provider app (MOL Bubi app) and other apps of shared mobility providers.
- ✓ Utilising the learnings and methods developed as part of the Cities4People project, and in particular the participatory approach for reallocating public space and place-making (Budapest Citizen Mobility lab).
- ✓ It was crucial for the success of the network to develop design standards as well as a unified branding identity for the hubs. BKK developed a design manual with recommendations for partner districts for the placement and detailed design of the Mobi-points. It helped consistency across different districts while keeping a level of flexibility.
- ✓ BKK acted as a trusted intermediary and collaborated with different districts of Budapest as well as with different shared mobility provider companies (which compete with one another).
- ✓ Resistance and challenges related to converting parking spots (owned by local districts) to micromobility points.

¹⁸ <https://bkk.hu/en/news/2021/07/pilot-micromobility-points.6602/#:~:text=Budapest%2C%209%20July%202021%20%E2%80%93Pilot,mobility%20and%20a%20liveable%20city.>

KA1 - Strasbourg: Chrono'hop & Flex'hop public transport offering

The Metropole of Strasbourg, in its recent strategy 'Mobility Revolution'¹⁹ puts a strong emphasis on an integrated and multimodal approach to mobility with public transport at its centre. This includes specific offers for dense urban zones (inner ring) and for peri-urban areas (outer-ring). To improve connectivity, the metropole created six bus lines with extended timetables and increased frequency of services (Chrono'hop) and optimised the provision of a Demand Responsive Transport (DRT) in peri-urban areas (Flex'hop).

Flex'hop²⁰:

- Piloted in 2019 and launched in 2021, Flex'hop is an all year long on demand transport solution for peri urban zones. Users can book a ride between 15days and 30 minutes prior departure on an application or via a phone booking system.
- The service operates every day from 5 am to midnight with 20 electric vehicles across 25 local districts, serving more than 250 stops and providing over 4,000 route options. The service is structured around 12 key transfer points connected to the wider transport network (e.g. tram stop, chrono'hop stop).
- The service uses an algorithm developed by PADAM Mobilité which matches different rides together and optimises the service.

Chrono'hop²¹:

- Creation of six new bus lines in 2023 which run from 5:30am to half past midnight from Monday to Saturday and from 6am to half past midnight on Sundays. Increased in frequency to ensure a maximum of 8 minutes

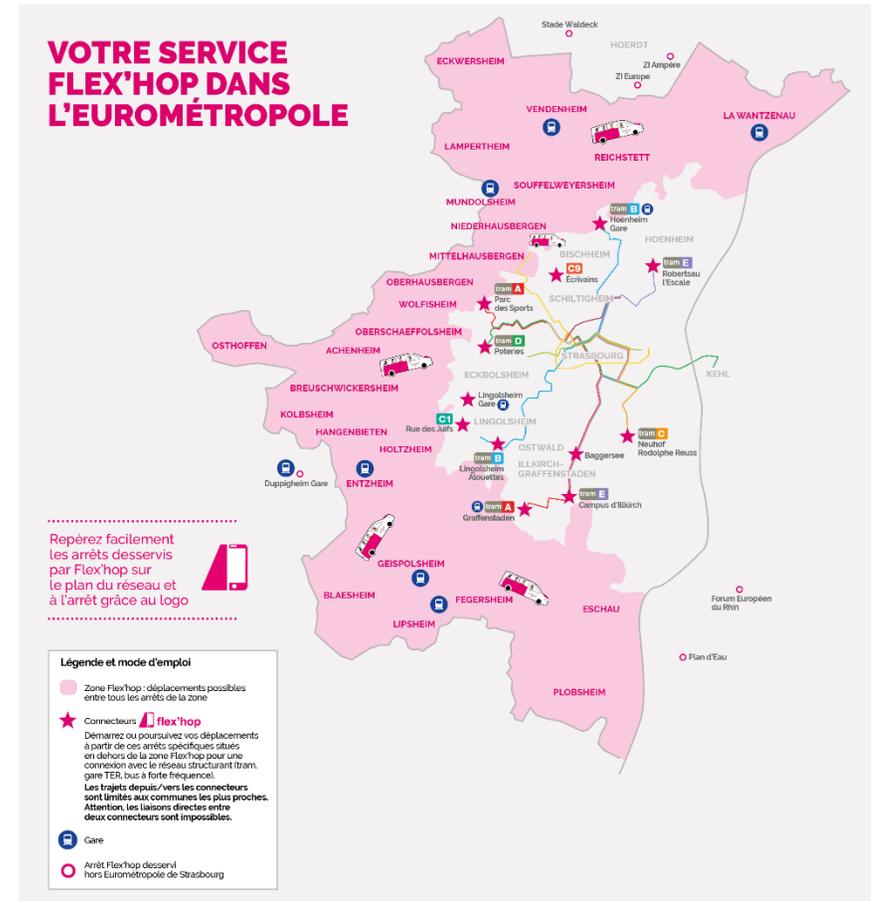


Figure 13: Map of Flex'hop DRT services, Strasbourg (Credits: Strasbourg Eurometropole)

¹⁹ <https://timeuse.barcelona/good-practices/revolution-of-mobilities/>

²⁰ <https://www.padam-mobility.com/en/success/strasbourg-flexhop>

²¹ <https://www.cts-strasbourg.eu/fr/se-deplacer/lignes-de-bus-chronohop/> (In French)

- wait during peak times and 10 minutes in off-peak hours.
- The bus lines use the same route in both directions and have a consistent and recognisable visual identity to make them easily identifiable.
- Urban spaces have been adapted to ensure that buses do not get stuck in traffic (e.g. creation dedicated lanes, move of bus stops, etc). When necessary, traffic light priority has been installed in black spot intersections. This involves using detectors which recognise GPS devices in buses and give them priority.

Impacts

- ✓ In 2022, 207 903 trips were conducted through Flex’hop, an average of 620 trips per day;
- ✓ The PADAM algorithm helped optimising Flex’hop trips, resulting in more than 50% of users of the service shared the vehicle with another person in 2022;
- ✓ Figures for the usage of chrono’hop lines are not yet available as it is a new service;
- ✓ Installation of dedicated lanes and rearrangement of public spaces for Chrono’hop lines.



Figure 14: Branding identity of Chrono’hop line, Strasbourg (Credits: Strasbourg Eurometropole)

Lessons learnt & success factors

- ✓ Adoption of a holistic approach of mobility provision to ensure the best coverage possible at metropolitan level. Concretely this means identifying gaps in the offer, developing a clear hierarchisation of the network taking into account the complementary of modes and clarifying the different offers.
- ✓ Importance of visual / branding identity of each offer.
- ✓ Clear definition of directing principles (e.g. Chrono’hop: one bus every 8 minutes) to support decisions further down the line.
- ✓ Technical work conducted on the location of bus stops, distances between stops, reorganisation of intersections to ensure bus priority.
- ✓ For DRT, the service requires an investment from the metropole to sustain it as part of the PT offer and maintain the cost of the ticket at the same price as other forms of public transport.

KA1 - Helsinki: Cycling infrastructures

Since 2010s, Helsinki has been actively working on enhancing its cycling infrastructure such as for example by developing a comprehensive inner city target cycling network and a network of bicycle superhighways in the outer areas (the Baana network)²². The city released its first Cycling Design Manual and Action Plan in 2014 which was then embedded in the city strategy. In 2020, Helsinki introduced a second Bicycle Action Plan, detailing 34 initiatives aimed at promoting cycling, boosting investment and integrating cycling as a functional part of the transport system and other modes of mobility (including walking)²³.

Helsinki which historically adopted an infrastructure of shared paths used by both pedestrians and cyclists, decided to adopt unidirectional bike lanes where bicycle and pedestrian traffic are separated from each other whenever possible. The city also focusses on providing year-round maintenance of the cycling routes and developing better and safer cycling parking opportunities (e.g. provision of frame-locking options, adequate lighting and canopies for shelter).

Additionally, Helsinki City Transport is developing, and investing, in P&R facilities. For example, the recently opened Bicycle Garage located underneath the main train station in central Helsinki (Kaisantunneli tunnel) provides nearly 900 parking spaces for cyclists in a secure indoor secure space (Figure 16)²⁴. In 2023, the Metropolitan Area Transport Ltd conducted a survey with cyclists to identify their needs and refine the service concept and design of the bicycle garage. Security emerged as the most important aspect for users. To meet these needs, the garage provides frame-locking racks suitable for various bike types, along with additional security measures like camera surveillance, security guarding,

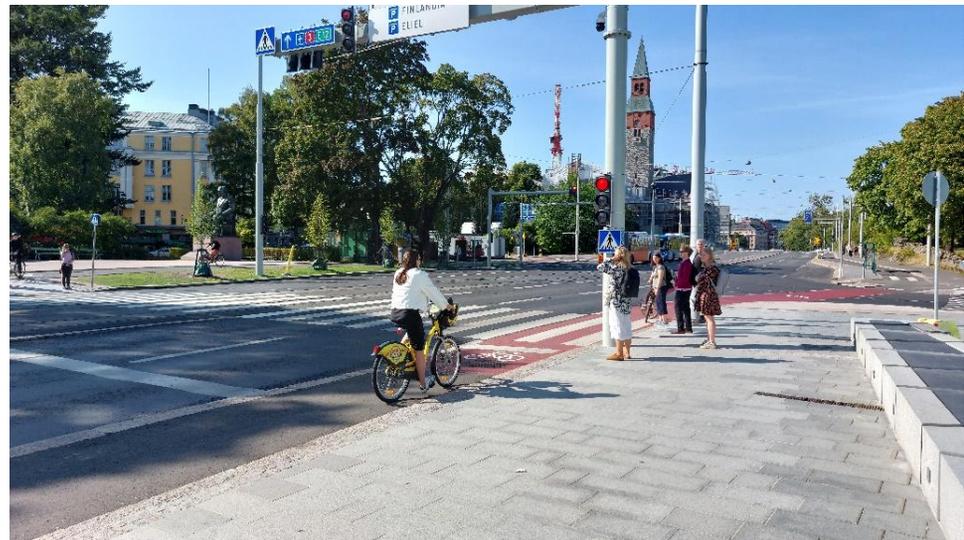


Figure 15: Newly refurbished cycling lane, junction of Mannerheimintie and Töölönlahdenkatu, Helsinki (Credits: Oskari Kaupinmäki)

²² <https://www.hel.fi/en/urban-environment-and-traffic/cycling/construction-of-cycle-paths>

²³ <https://www.hel.fi/static/liitteet/kaupunkiymparisto/julkaisut/julkaisut/julkaisu-32-20.pdf>

²⁴ <https://kaupunkiliikenne.fi/en/transport/by-bike/kaisantunneli-bicycle-garage/>

and an high-security locking solution based on user registration. The garage also includes a maintenance station equipped with tools as well as charging infrastructure for electric bikes²⁵.

Impacts

- ✓ Overall positive perception of cycling strategy by citizens and satisfaction with infrastructure;
- ✓ Increase of catchment area by improving parking facilities and cycling connections with public transport nodes
- ✓ Integrated planning approach where cycling is one part of a sustainable mobility mix.

Lessons learnt & success factors

- ✓ Start with and focus on dialogue with relevant stakeholders in city administration.
- ✓ Think about the cycling approach which would best address the specific issues faced by your city (e.g. unidirectional lanes to address concerns related to safety and comfortability of cycling).
- ✓ Develop a comprehensive action plan for cycling with specific and measurable targets.
- ✓ Encourage people to cycle all year round by addressing issues related to weather (e.g. maintenance).
- ✓ Build your case by demonstrating social and economic benefits of cycling solutions and create a constant dialogue.
- ✓ Get inspiration from what exists elsewhere but adapt it to the specific context of the city, its existing infrastructures and existing communication/ storyline.
- ✓ Importance of promoting new cycling infrastructures (e.g., P+R) and combining physical interventions with behavioural ones.



Figure 16: Newly opened Bicycle Garage in Kaisantunneli tunnel, Helsinki (Credits: Helsinki City Transport)

²⁵ <https://www.hsl.fi/en/hsl/news/news/2024/07/polukupyorien-kaisantunneli-bicycle-garage-opened-on-1-julymaara-kasvaa-helsingin-keskustassa-reilusti-kaisantunnelin-pyoraparkin-ansiosta>

educational garden and allotments as well as involves various stakeholders such as social entrepreneurs, nature conservation organisations and the local Cyclist Union. Nienke Bouwhuis, one of the founders of the Green Connection Delfshaven has organised several workshops with local stakeholders in Overschie, which created a sense of ownership among the community.

The results are also used within the municipality to make more targeted investments in public space and pedestrian infrastructure as well as identify quick wins which make a real difference to people’s experience of walking in the neighbourhood. Examples of changes include the repair of pavement tiles on routes where the walking groups often come, the clearing off outgrown vegetation from a staircase giving access to the tram or the installation of school master button on traffic lights to prolong crossing time for school children.

Impacts

- ✓ Increased cooperation within the municipality whereby the departments of City Development, Social Development, City Maintenance and City Districts worked together as well as actively collaborated with local communities.
- ✓ The programme is used as a way to start the discussion in the community and within the municipality and to put pedestrian infrastructure on the agenda (e.g. map, awareness and knowledge of missing links, case for investment in infrastructures)
- ✓ The Green and Healthy Connection maps are provided to GPs in the community, enabling them to prescribe walking, cycling or going outside into green areas.

Lessons learnt & success factors

- ✓ Create momentum with events (e.g. The conference Walk 21 hosted by the city in 2019 was a springboard for the ambition and action plan Rotterdam Walks).
- ✓ Start working with likeminded peers with shared goals within the municipality
- ✓ Identify the local heroes in communities and initiatives that are already working to collaborate with.
- ✓ Quick wins are possible and very important in order to build trust and achieve long-terms goals.
- ✓ Green and Healthy Connections is not a rigid blueprint but a way of approaching collaborations, engaging with bottom-up initiatives and connecting people at both district and community levels.



Figure 18: Citizen participation for Green Connection in Overschie (Credits: City of Rotterdam)

KA2 - Krakow: Pocket Parks

The idea of pocket parks in Krakow emerged from the observation that high quality public spaces were located predominantly in the city centre. Outside it, public and green spaces were often neglected which discouraged people from using them. The project ‘Ogrody Krakowian’ (Krakow’s Gardens) aimed to change this situation by creating pocket parks across the whole city, democratising access to a well-maintained, modern urban environment²⁹. The first pocket park was created in 2016. The programme, run by Krakow Greenspace Municipal Authority, became very popular and after two years was assigned a higher budget to accelerate the investments. Today, Krakow counts 44 different pocket parks.

Pocket Parks are being built in the close proximity of residential buildings. They are designed to foster socialising outside and encourage residents to spend more time in green places. The parks have ecological benefits, helping bees and wildlife, absorbing excess rainwater and reducing air pollution. As such, the project is embedded within the city’s Green Strategy. Furthermore, the transformation of inaccessible neighbourhoods and streets into pocket parks has also contributed to the elimination of unwanted behaviours and increased the residents’ sense of security. Ultimately, the project aims to give access to each resident to a pocket park not further than 500 m away from home.

The locations of pocket parks are selected by residents. They can also play a more active role in creating new ones by running online fundraising or voting for pocket parks in the annual Participatory Budget. The parks are designed together with residents during design workshops and public consultations. First, residents indicate what their needs, expectations and dreams are regarding the pocket park. Then a conceptual design is created, which is presented to the local community who provides feedback for the final version. The entire process takes about 1 to 2 years. If possible, the opening a new pocket park takes the form of a neighbourhood picnic.



Figure 19: Pocket park, Krakow (Credits: Krakow Greenspace Municipal Authority)

²⁹ <https://culturalheritageinaction.eu/pocket-parks/>

Impacts

- ✓ 44 pocket parks created since 2016.
- ✓ Social benefits: Increased sense of neighbourhood around a place for meeting, activation of local communities (e.g. collaboration between children and older adults in running a community gardens), increased sense of security.
- ✓ Ecological benefits: increased wildlife, rainwater absorption, increased air quality;
- ✓ High demand for new pocket parks across the city.
- ✓ In places where there is a very close-knit community, an additional function is increasingly becoming community gardens, where residents grow their own vegetables.



Figure 20: Cross generational community garden (Credits: Krakow Greenspace Municipal Authority)

Lessons learnt & success factors

- ✓ It is key to adapt the project to the needs of residents and build a specific identity which reflects the neighbourhood' s identity.
- ✓ Pocket parks can be built quickly, taking into account the design solutions suggested by residents. This is extremely important in order to encourage and inspire residents and show them that they have an impact.
- ✓ The average cost of building a pocket park is approximately 200 000 euros making it affordable also to less wealthy, smaller cities.
- ✓ It is better to use high-quality materials, unique urban furniture (e.g. swings, different types of seatings), perennial flower beds, etc.
- ✓ If you want different user groups to use the park (e.g. children, girls, seniors), you have to design for them and ensure that there are dedicated spaces for each group.

KA2 - Lyon: School Streets Programme

Since 2020, Lyon's city and metropole have partnered on an ambitious "School Streets" program ("rues des enfants") to create safer, greener, and more inclusive areas around schools³⁰. Each intervention involves co-design workshops with students, consultation with relevant stakeholders (i.e. teachers, parents, residents), traffic calming measures, planting vegetation and providing green spaces, and the reallocation of urban space from cars to pedestrians and cyclists.

One example is the rue des enfants inaugurated in September 2023 in the VI district of Lyon (Figure 21). The street hosts the primary school Louis Pradel, the nursery school Jean Coutier and the childcare centre Cuvier with a total number of 322 children. The street was pedestrianised and redesigned with the children (i.e. street lightning, drawings and selection of words displayed on the floor, ladybird-shaped blocks).



Figure 21: School entrance in VI district, Lyon (Credits: REALLOCATE)

Trees and plants were also planted with children at different places on the street (adding 423m² of greenery and a total of 14 new trees). A qualitative survey was conducted after the implementation of the new design which showed that parents, children and local residents were in large majority satisfied with it (80% of children were happy with the street, more than 80% of parents described it as safer and more pleasant while 85% of residents declared being satisfied with the street).

³⁰ <https://www.lyon.fr/mobilites/la-ville-apaisee/rue-des-enfants> (in French)

Impacts

- ✓ So far, over 60 school streets at primary and secondary schools have been implemented in the city and broader metropolitan area.
- ✓ In total, 15,000 children have participated in activities like planning, greening their school surroundings, and designing street art and light fixtures.
- ✓ Of all the sites, 22 have been fully pedestrianized, while the rest have been converted into shared zones with traffic calming measures, such as 20 km/h speed limits and one-way streets.

Lessons learnt & success factors

- ✓ Establishing a clear need assessment for each location (e.g. safety, access, high level of traffic, etc) is key and will provide the basis to define intervention accordingly (e.g. pedestrianisation, shared zone, traffic calming, speed limitation, etc).
- ✓ Creating an active dialogue with school staff and administration, parents and local residents early on is essential to obtain support and increase acceptance of measures.
- ✓ Actively involving children in design of urban spaces and its implementation (e.g. planting greenery, fresco, design of street lightning) is crucial and will allow them to take ownership of the street.
- ✓ Initiatives build on a partnership and close collaboration between city and metropole as well as on the involvement of different departments in each institution (e.g. 16 department in the city of Lyon are involved).
- ✓ It is also important to address in the design questions such as access for residents and emergency services as well as specific requirements for each area (e.g. street furniture requirements under the ‘Vigipirate’ national security alert system or requirements connected to cultural heritage protection).



Figure 22: Close-up ladybird-shaped blocks in front of school entrance, Lyon (Credits: REALLOCATE)

KA2 - Bologna: Tactical urbanism & pedestrianisation

Piazza Rossini is a public square in the middle of the university historical area of Bologna. It has been transformed into a parking lot decades ago and for a long time was a place of disconnection whereby conflicts could arise between students, residents and passersby and where the cultural heritage surroundings were not valorised.

Piazza Rossini was the focus of the U-Lab 2018 Laboratory (local neighbourhood lab³¹) conducted by Fondazione for Urban Innovation (FIU) during which more than 250 people participated. The lab discussions identified the need to restore a dimension of sociality to the square. Following on these results and as part the of ROCK project, the city, university and FIU installed a temporary green space called green meadow (Figure 23) which lasted two weeks³². The idea of having a lawn in the middle of the square was born during the co-design workshop with university students and inspired by consulting historical archive material.



Figure 23: Green Meadow in Piazza Rossini, Bologna (Credits: Margherita Capirilli for Fondazione IU, Rusconi, Ghigi)

The installation was soon followed by another temporal re-design of the square including a soil and irrigation system to maintain the lawn, the installation of a ramp to make it accessible, and the addition of wooden planters and lightning elements. This design is still in place today, pending the definition and approval of the final and permanent design of the square.

³¹ <https://oecd-opsi.org/innovations/laboratori-di-quartiere-neighbourhood-labs/>

³² <https://rockproject.eu/news-details/189>

https://www.fondazioneinnovazioneurbana.it/images/1A_Federico/ENG_ROSSINI_Cultural_Heritage_in_action_.pdf

Impacts

- ✓ Large participation building on the existing neighbourhood lab implemented in this specific area (involvement of over 250 people) and on the collaboration with university and local organisations.
- ✓ The first temporary installation was very successful, with an average daily presence of over 27,000 and a peak of 36,000 visitors, monitored through crowd analysis sensors³³. It led to the decision from the Municipality to pedestrianise the square and turn the design into a permanent solution.

Lessons learnt & success factors

- ✓ It is key to engage the dialogue early with different departments within the city and with institutional stakeholders (e.g. road authorities) to obtain support.
- ✓ Social dialogue with different communities is crucial for the success of the intervention (e.g. neighbourhood lab with residents, university students).
- ✓ It is important to have a trusted intermediary between institutional actors and local associations and citizens, collecting needs and expectations and coordinating the co-design process.
- ✓ FIU brought expertise in participatory, and design methods. It is also well implemented locally via the neighbourhood labs and proximity agents.
- ✓ Tactical urbanism is a useful tool to demonstrate what a place could look like and engage local communities while allowing changes/adjustments to respond to feedback.
- ✓ It is key to develop a monitoring method to measure and evaluate impact. In this case, quantitative and qualitative methods were used including crowd analysis sensors, surveys, interviews.



Figure 24: View from above, Piazza Rossini, Bologna (Credits: Margherita Capirilli for Fondazione IU, Rusconi, Ghigi)

³³ <https://culturalheritageinaction.eu/bologna-italy-a-new-life-for-piazza-rossini-from-a-parking-lot-to-a-pedestrian-green-space/>

KA3 - Gothenburg: Mobility Hotel

As part of Move21³⁴, the City of Gothenburg’s Urban Environment Administration, Business Region Göteborg and Nordstan’s business centre developed a hub or ‘Mobility hotel’, combining micromobility and micro-logistics services to transport people and goods around the city. The mobility hotel is located in Nordstan³⁵, a large shopping and business centre where approximately 6,000 people work and 70,000 pass through every day. Nordstan benefits from close access to public transport connections (main train station, trams and buses) and is served by an underground loading street for larger vehicles which enables efficient reloading for last-mile delivery of goods via bicycle and light electric vehicles in central Gothenburg.

The Mobility Hotel offers a range of B2B and B2C including a shared fleet of vehicles and bikes for service providers, a shared store where different mobility companies sell and serve bikes and electric scooters (BikeFixx, Urban Corner), a battery swap station for electric mopeds (GoCiklo), a food delivery company (Foodora), a cargo bike hub for goods consolidation and last-mile delivery (Pling), and a 24/7 unmanned warehouse for craftsmen (AhlSell).

The Mobility Hotel benefits the different stakeholders involved including the front-end and backend companies which have easy access to a central location to unload deliveries and reload them on bicycle and light electric vehicles. Companies also gain from proximity to services of maintenance and reparation for these vehicles. The business centre profits from these new services which attract footfall as well as makes use of under-occupied parking spaces. Customers get access to multiple



Figure 25: Mobility Hotel in Nordstan, Gothenburg (Credits: Suzanne Green)



Figure 26: Stakeholders using the Mobility Hotel, Gothenburg (Credits: Philip Liljenberg)

³⁴ <https://move21.eu/>

³⁵ <https://zagdaily.com/places/sweden-opens-first-mobility-hotel-to-accelerate-green-transport/>

mobility services in one premise in a convenient location. Finally, the hub aligns with the municipality's strategy and broader vision by reducing LDV traffic in centre, reduce air pollution, foster sustainable last-mile delivery).

Impacts

- ✓ Collaboration between public and private sectors bringing together the region, the city and local commercial interests (Urban Environment Administration, Business Region Göteborg and the Nordstan centre as well as local innovation ecosystem with micro logistics and micro mobility actors).
- ✓ New business model where different companies share space, risks, success, customers and competences as well as develop new collaborations and services together.
- ✓ Companies signed lease agreements for multiple years ensuring mid-term sustainability of project.

Lessons learnt & success factors

- ✓ A key success factor was to identify the needs of each stakeholder and develop a model that created a win-win situation where interests aligned. This was done through meetings between stakeholders as well as through workshops during which the concept case was co-designed by all participants to develop a common vision and make it tangible.
- ✓ Communication and collaboration between stakeholders have been at the centre of project, enabling to create the trust needed to share spaces and to develop and offer joint services.
- ✓ Location is key: the Mobility Hotel is located in a dense area and relies on flows of people and goods. It is also near a public transportation hub as well as a shopping mall which attracts footfall.
- ✓ The development of the Mobility Hotel builds on existing infrastructures (e.g. pre-existing cargo bike hub) which facilitates its deployment by augmenting something that exists already rather than starting from scratch.
- ✓ It was crucial to connect the Mobility Hotel with the broader vision and mid-terms goals of the municipality (Co2 emission reduction, new regulation on urban access regulations, etc) to ensure support.
- ✓ The project acted as a catalyst providing budget, expertise and resources to conduct the legwork and test the concept.
- ✓ The pilot shows that mobility hubs can be augmented to include supporting services with possibility of envisioning other services which are not part of the transport domain.



Figure 27: Stakeholders using the Mobility Hotel, Gothenburg (Credits: Philip Liljenberg)

KA3 - Munich: Cyclelogistics Hub

The city of Munich opened its first logistics hub at the Viehhof in August 2023³⁶. The hub is part of the city’s strategy to foster sustainable mobility (including its commercial transport strategy and urban logistics), relieve residential areas for car traffic, improve air quality as well as develop the attractiveness of Munich as a business location by guaranteeing logistics supply in high-density city centre areas.

The hub brings together five logistics companies and provides them with a space and container facilities. They can use the facilities to unload their goods and reload them on cargo-bike for zero emission last-mile delivery of parcels to private households and of goods and pallets to commercial enterprises, craft businesses and construction sites. The development of the hub built on the experiences of two projects; CIVITAS Fasttrack³⁷ and Move21³⁸ and was supported by the Chamber of Industry and Commerce and the Bavarian State Ministry of Housing, Construction and Transport (StMB). The space belongs to P+R GmbH, a public management company, which acts as operator and facility manager. The city administration is a client and rents the space at a standard market price. The city of Munich and StMB carried the initial investment (e.g. containers, floor adaptation to support heavy loads). The operation of the hub is covered by rental income.



Figure 28: Cyclelogistics hub, Munich (Credits: LHM, DobnerAngermann)

Impacts

- ✓ Five logistics companies use the hub: two B2C (Hermes, UPS) and three B2B (Citylog, B4B Logistics, Interkep);
- ✓ Development of a second hub learning from this experience (bigger space of about 3000 m²) with new European funding as part of the metaCCAZE project³⁹.

³⁶ <https://muenchenunterwegs.de/angebote/der-erste-radlogistik-hub-muenchens-am-viehhof> (in German)

³⁷ <https://civitas.eu/resources/fasttrack-factsheet-sustainable-and-clean-urban-logistics>

³⁸ <https://move21.eu/>

³⁹ <https://www.metacaze-project.eu/>

Lessons learnt & success factors

- ✓ Close cooperation with logistics companies. One logistic operator acted as a champion and spokesperson for the project as well as supported other operators in the hub which helped initial buy-in and daily operational running of the hub.
- ✓ The hub was used as a showroom to promote cycle logistics and was visited by planners as well as political delegations and potential funding bodies. The project created a momentum (e.g. launch event) and obtained political support.
- ✓ The hub and its success also provide good arguments in favour of good cycling infrastructure, especially wide cycle paths (1.20m to 1.30m wide vehicles).
- ✓ Developing a sustainable business model is a key aspect to ensure the success of the hub. The operational running costs of the hub are covered by the rent provided by the companies which make the hub sustainable after the ending of the project. The initial investment was made by the city (approx. 300 000 euros and covers the containers).
- ✓ Containers were quite expensive (limitation during tendering process). Additionally, the costs of installing them and adjusting the space underneath to support heavy bikes were unforeseen. When possible, it is more efficient to build on existing facilities rather than install containers from scratch.
- ✓ Hubs provide an attractive offer for logistic companies in Munich, because some are planning the transition from van to cargo bikes. Thus, companies are willing to pay market rent.
- ✓ Each hub has its specificities and thus it is crucial to conduct an in-depth need assessment with all stakeholders. Certain services are key for companies (i.e. repair facilities, storage).
- ✓ The project provided insights into the range of different business models as a basis for expanding the network (e.g. added services such as storage of tools for trade companies).
- ✓ Difficulty of finding an appropriate space due to scarcity in city centre. At the end the space selected was quite limited and did not accommodate all the functionalities planned (e.g. parcel lockers).



Figure 29: View from above, Cyclelogistics hub, Munich (Credits: LHM, DobnerAngermann)

KA3 - Hamburg: Smart Loading Zones

Since 2020, the city of Hamburg has tested the concept of Smart Loading Zones (SLZs) in real-life traffic conditions as part of the SmaLa project⁴⁰. The aim of developing SLZs is to reduce traffic looking for parking spaces and double parking as well as to increase traffic safety and reduce environmental pollution. The SmaLa project is co-funded by the Federal Ministry for Digital and Transport (BMDV) and the city of Hamburg.

Smart loading zones are dedicated spaces for delivery that can be reserved for a timeslot via the SmaLa app using a cloud-based booking system. The first SLZ in Hamburg became live in 2021 enabling registered delivery traffic transporters (couriers, parcel services, and small goods



Figure 30: Smart Loading Zone concept, Hamburg (Credits: Martin Dolk, SmaLa project)

transporters, including pizza delivery services) to book a space via the app. In total, 20 SLZs have been created across Hamburg. The location for the zones were decided in collaboration with delivery companies, district authorities and the police.

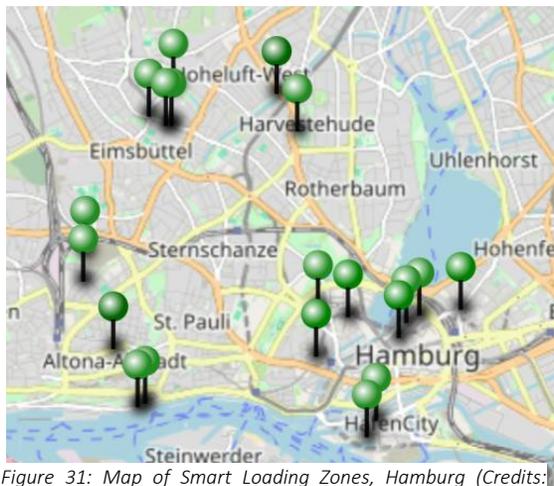


Figure 31: Map of Smart Loading Zones, Hamburg (Credits: Martin Dolk, SmaLa project)

The zones can only be used by delivery companies. They have a consistent visual identity (signage, paint on the floor, blue light markers) and are equipped with ground sensors to track occupancy. The newest SLZs are also equipped with a geofencing system allowing to identify when a vehicle enters the zone, how long it stays for and when it leaves using detection around 50m, 200m and 300m. The impacts of the project are currently evaluated by an independent company which will be the basis for the adaptation and taking up of the concept of SLZ in Hamburg.

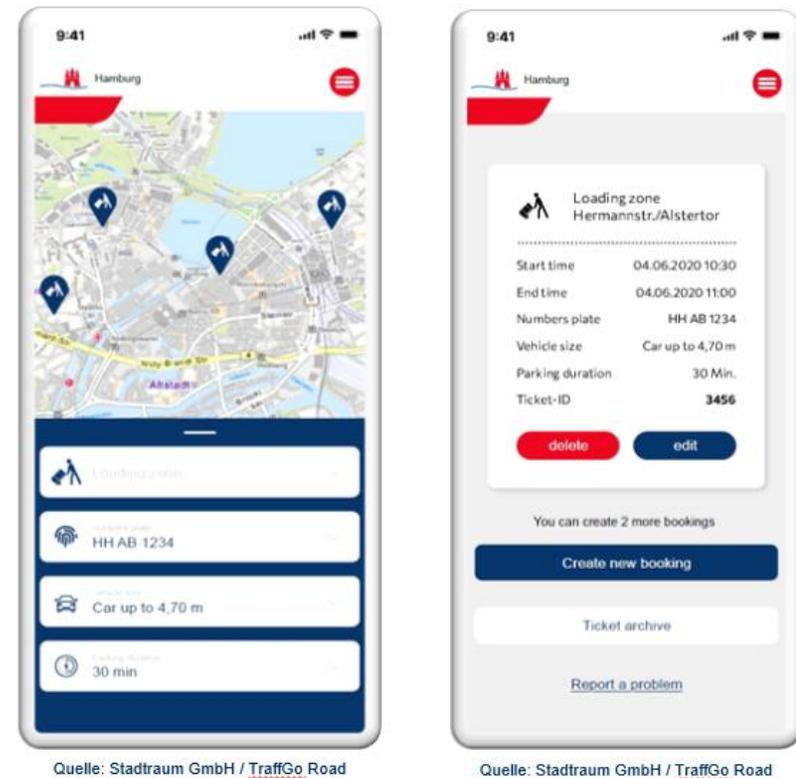
⁴⁰ <https://www.hamburg-logistik.net/blog/urbane-logistik-transport-mobilitaet/ausbau-hamburgs-smarter-liefer-und-ladezonen-smala/> (In German)

Impacts

- ✓ The project enabled a real-condition test of the SLZs and proof of concept. It also validated technical solutions (e.g. booking system put in place worked).
- ✓ Ongoing evaluation (due at the end of Q4 2024).

Lessons learnt & success factors

- ✓ Exploration of different technical solutions including intelligent bollards (rejected as it was costly while also not practical to implement due to possibility of parking smaller cars between bollards and an increase of safety risks for road users).
- ✓ Importance of strong identity of zones (signage, floor marking) and communication (sign with information on booking).
- ✓ Identification of uses of SLZs thanks to ground sensors/ geofencing system as well as possibility to match occupancy data (sensors) with reservation data to identify misuse of SLZs.
- ✓ Important challenge around illegal parking and lack of capacity to enforce legislation. This means that users of the app cannot be sure that the spot they booked will really be free.
- ✓ Lessons learnt in terms of implementation of the first four SLZ: high costs due to digital screens which required electricity from the ground
- ✓ Challenges of finding appropriate locations as there are physical and design requirements that can be difficult to meet (2m50 wide minimum, only for transporter companies, requirement to have a commercial building in the vicinity which does not work for amazon type deliveries).



Quelle: Stadtraum GmbH / TraffGo Road Quelle: Stadtraum GmbH / TraffGo Road

Figure 32: Smart Loading Zone application (Credits: Martin Dolk, SmaLa project)

KA4 - Barcelona: Digital Twin for Climate Shelters

In 2019, Barcelona city council launched a network of climate shelters. These shelters provide refuge from extreme temperatures and protection for vulnerable groups, including older people, babies, people with chronic illnesses and those with limited resources. The network comprises a range of indoor locations such as libraries and civic centres, as well as outdoor spaces such as parks and gardens. The network guarantees that 98% of residents are within a 10-minute walk of a climate shelter⁴¹. However, this strategy does not explicitly address the accessibility of shelters for heat-vulnerable groups, such as older adults and young children.

The vCity project⁴², a collaboration between the Barcelona Supercomputing Centre and the City Council of Barcelona, aimed to assess whether climate shelters were accessible to those who need them most. BSC mapped the distribution of vulnerable residents in Barcelona and then calculated the accessibility of climate shelters based on the walking speed of older adults and young children using an average speed of 3.28 km/h (the general adult average is 5 km/h). Several datasets were used, including census social demographics data (age, income, gender) per 100 square metres, number and type of amenities, and closing times.

The results⁴³ show that over 90% of the most vulnerable residents can reach a climate shelter within a 10-minute walk. BSC also analysed the availability of climate shelters over the summer months, taking into account closures. In August, 40% of the climate shelters close, but the

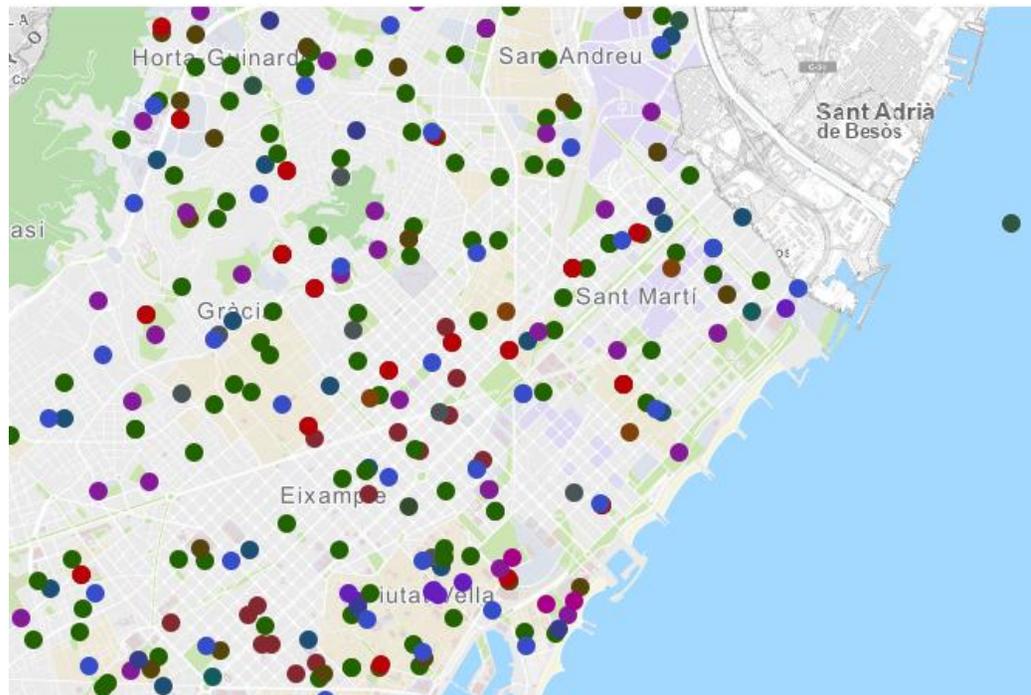


Figure 33: Map of climate shelters in Barcelona (Credits: Barcelona City Council)

⁴¹ <https://www.barcelona.cat/barcelona-pel-clima/en/specific-actions/climate-shelters-network>

⁴² <https://www.vcity.tech/>

⁴³ <https://www.vcity.tech/studies/shelters/>

remaining shelters still provide support to 75% of vulnerable people. Coverage therefore drops significantly in the summer due to facilities closure. This shows that the city needs to better understand the interconnections between factors such as opening hours, diversity and suitability, and shelter capacity and then relate them to the needs of vulnerable populations.

Impacts

- ✓ Identifying gaps in coverage over the summer months, helping the city to target interventions;
- ✓ Opportunity to explore other factors that may affect access to the shelters and/or focus on other vulnerable populations (e.g. women);
- ✓ Demonstrate the concrete use of spatial analysis in policy and decision-making, which can be used strategically to obtain political and/or operational support for digital solutions and the use of digital twins at municipal level.

Lessons learnt & success factors

- ✓ It was key to define performance indicators based on the people impacted by the policy. Instead of quantifying the area of the city covered by the network of climate shelters, the results of the intervention were measured based on the vulnerable population served. This simple change in the performance indicator becomes a major shift towards people-centred evaluation of public policies.
- ✓ Open data and collaboration with City Council to obtain relevant datasets, expertise of Barcelona Supercomputing Centre, vCity)
- ✓ Challenges of integrating this spatial analysis into existing Digital Twins of the city.
- ✓ Challenges around data processing and missing data (e.g. capacity for each shelter).

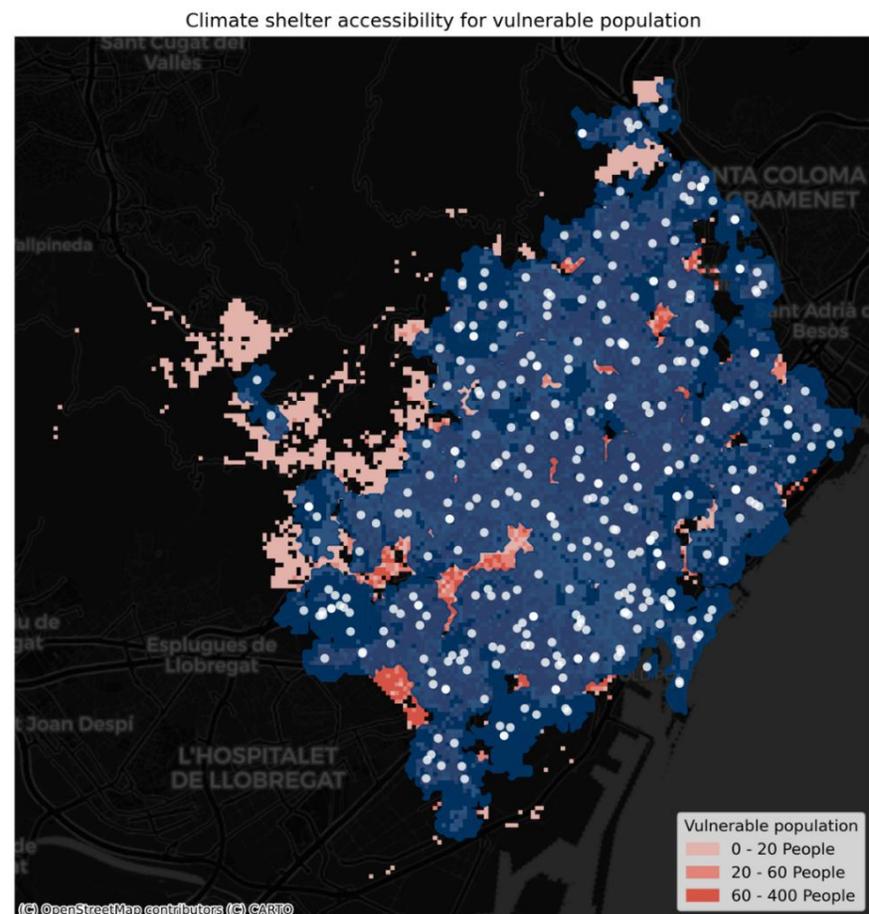


Figure 34: Accessibility to climate shelters for vulnerable groups (Credits: Barcelona Supercomputing Centre, vCity)

KA4 – Madrid: Madrid Mobility 360

Madrid Mobility 360⁴⁴ is a MaaS solution, developed by EMT (Madrid’s Municipal Transportation Company) and first launched in 2020. Recently the application was relaunched in 2024 with new functionalities and a new governance approach which shifts the model of the app from customers/business focused to a service focused model. A marketing campaign will follow in Autumn 2024 to foster user adoption and behavioural change.

The application includes a route planner with information on bus occupancy (MRoute), and provides information on public transport operators, such as EMT city buses, metro, light rail, commuter train and intercity buses as well as on shared mobility operators such as BiciMAD bike services, scooters, cars and motorcycles. Using algorithmic calculations, the application offers

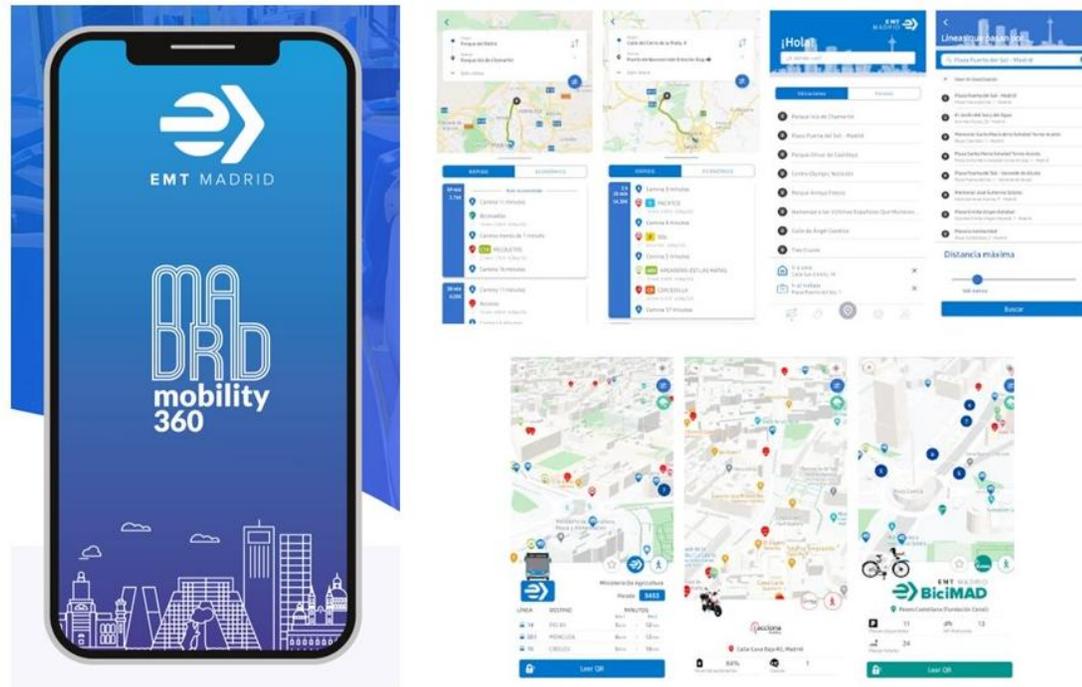


Figure 35: Screenshots of MaaS application (Credits: Madrid Mobility 360)

users different routes according to preferred modes, estimated time of traveling, bus occupancy, etc. Madrid Mobility 360 also reports the estimated CO2 emissions generated by the trip to improve citizen awareness and when possible, make more conscious mobility decisions.

The application also allows the reservation and payment of municipal transport (bus system, BiciMAD services) via an integrated booking platform (MPass). EMT is currently working on integrating smart cards payments into the application. Citizens can also make use of P&R discounts via the application.

⁴⁴ <https://www.madrid.es/portales/munimadrid/es/Inicio/El-Ayuntamiento/Digital-Transformation/Highlights/Madrid-Mobility-360/Madrid-Mobility-360/?vgnnextfmt=default&vgnnextoid=f0bc526c4cb88810VgnVCM1000001d4a900aRCRD&vgnnextchannel=94f0c437eb8e5810VgnVCM2000001f4a900aRCRD>
<https://oecd-opsi.org/innovations/madrid-mobility-360/>

Impacts

- ✓ Public and private operators' services integrated in app;
- ✓ 24 000 downloads and more than 10 000 users in 2021;
- ✓ Increased awareness of mobility options (providing alternative routes with lower occupancy, estimated Co2 emissions).

Lessons learnt & success factors

- ✓ It is not all about technical solutions, but it is a question of governance and behavioural change (hence importance of marketing campaign for the relaunch of the app).
- ✓ Importance of governance model for collaboration with private operators: recently the application was renewed/relaunched with a new governance approach which shifts the model of the app from customers/business focused to a service focused model.
- ✓ Adoption of a truly bidirectional system: visibility, possibility of booking services for third party operators on the 360 app and conversely customers of third-party operator can book public transportation services.
- ✓ Close collaboration with Madrid city council which supported EMT with geoportal/ data sharing and thus allowed the application to have services related to city council data (e.g. air quality). In exchange EMT also shares data on traffic/ trips so it can be incorporated into the city data lake.
- ✓ Payment system: not yet fully integrated in app (exclude smart card). It is ongoing including the creation of a digital wallet system to have an integrated common mode of payment with different operators.
- ✓ Importance of managing older existing applications carefully and approaching Madrid 360 as ecosystem of apps rather than one app. Different scenarios depending on user profiles. E.g. Existing bus application with limited functionalities used by older users which will stay life with nudges to move to MaaS app for more features. Differently BiciMad app: functions will be transferred to MaaS app and the app will be maintained for a period of time before phasing out.

KA4 - Helsingborg: Smart Nudges for Active School Mobility

In the past years, the city of Helsingborg has significantly invested in its cycling infrastructures including in dedicated bike lanes and bike parking facilities. The city has also run initiatives to promote cycling to work and support bike-friendly workplaces. However, the cycling modal share of trips conducted in the city remained around 11% and did not increase as much as expected. As part of Raptor project⁴⁵, the city of Helsingborg – in collaboration with Nudgd, decided to explore possible incentives to increase the uptake of cycling in the city, and particularly focusing on families and children’s commuting trips to school. The idea was also that there will be a domino effect by changing behaviours for one commuting trip and that staff and parents would be more likely to bike to the office, or when doing short trips to the city.



Figure 36: Active school mobility (Credits: City of Helsingborg)

Facilitated by EIT Urban Mobility’s Rapid Applications for Transport (RAPTOR) programme, the Smart Nudges Mobility platform developed by Nudgd, was adapted to encourage shifting the commuting habits of elementary students, parents and staff. Parents and staff were invited to join the project through the school's digital platforms. They first completed a brief survey before accessing a page featuring personalised and engaging content, such as an interactive map, educational resources, quizzes, and more, all carefully designed using principles from behavioural psychology and nudging to promote sustainable mobility habits. A follow-up survey was later conducted via the school platform.

⁴⁵ <https://raptorproject.eu/2023-city-challenge-helsingborg/>

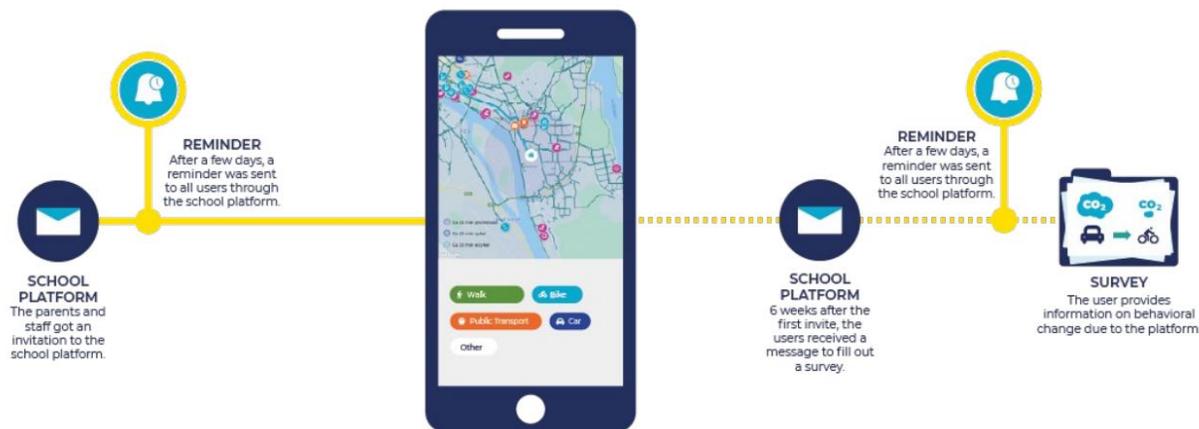


Figure 37: Smart Nudges for School Mobility (Credits: Nudgd)

Impacts

- ✓ The city actively encouraged participation from all primary schools in Helsingborg, encompassing 18,000 pupils along with more than 1,000 staff;
- ✓ 25 schools participated, reaching parents of 8,850 pupils and 980 staff members. Over 2,400 parents, guardians, and staff actively engaged in the pilot testing. Of these, 850 unique users completed the survey;
- ✓ 39% of participants stated that they already have changed to, or plan to change to, more sustainable mobility behaviours for school mobility.

Lessons learnt & success factors

- ✓ School staff only needed to send a predefined message with a link to parents and staff, making participation easy and efficient.
- ✓ The active involvement and support of city officials were crucial to the project’s success, ensuring schools were encouraged and resources were effectively deployed.
- ✓ The project was executed within a very short timeframe, from initiation to implementation. As a result, interventions were communicated during late fall, a period with unfavourable weather conditions. Some schools also faced challenges with sending out the invitations on short notice. Despite these hurdles, the project managed to move forward and produce good results, with potential to produce even more impact.

KA4 - Brussels: Sustainable mobility for companies: cAIRgo Bike & the Bike project

Brussels-Capital Region adopted in 2020 its Regional Mobility Plan called Good Move⁴⁶. The plan incorporates measures to encourage users to select the most appropriate and sustainable mode of transportation for each journey, aiming to reduce private car use in urban areas and to promote walking and cycling for short- and medium-distance trips.

The Cairgo Bike project⁴⁷, coordinated by Brussels Mobility and financed by Urban Innovative Actions, is aiming to encourage the use of cargo bikes to transport goods and passengers while reducing Co2 emission and improve air quality in Brussels. This includes providing training and test ride sessions or working on parking facilities, rental options and shared bike schemes with relevant stakeholders (e.g. Cambio, Remorquable, Urbike, BePark, Parking Brussels). For professionals, the cAIRgo bike project offers a dedicated programme led by the cyclo-logistics company Urbike⁴⁸ in order to meet the needs of each organisation (e.g. independent, small and medium-sized enterprises large companies or municipalities).



Figure 38: Cargo bike user (Credits: Urbike, cAIRgo bike project)

Additionally, companies and public authorities based in Brussels with over 100 employees are required by law to implement a mobility plan every three years to encourage transportation shift and promote sustainable mobility⁴⁹. In this context, the Bike Project⁵⁰ supports companies to put in place measures to encourage cycling to work. The Bike Project offers companies a 10-month support program including three internal workshops (awareness raising, review of how to cycle safely and traffic rules, practical training with bikes), a biking test where employees can try, and then borrow for three weeks, a range of different bikes (e.g. e-bike, cargo bikes, folding bike, etc), and communication tools. The bike

⁴⁶ <https://mobilite-mobiliteit.brussels/en/good-move>

⁴⁷ <https://cairgobike.brussels/en/what-is-cairgo-bike>

<https://www.uia-initiative.eu/en/uia-cities/brussels-capital-region-0>

⁴⁸ https://urbikecoop.wpenginepowered.com/wp-content/uploads/2023/05/Final-report-cAIRgo-bike-for-pros-a-conversion-journey-to-cargo-bikes-for-Brussels-professionals-2_compressed.pdf

⁴⁹ https://epomm.eu/sites/default/files/Fact%20sheets/MM%20for%20companies/MM%20for%20Companies_Belgium.pdf

⁵⁰ <https://thebikeproject.brussels/home/>

project first collaborates with the company to run an audit of the current situation regarding cycling take-up, facilities and opportunities. The audit serves as a basis for discussion within the company to develop an action plan with concrete measures to encourage cycling to work.

Impacts

- ✓ From 2020 to 2023, the cAIRgo bike project has assisted 220 organisations, including 40 large companies. More than 330 professionals have been trained in the practical use of cargo bikes while more than 150 professionals had the opportunity to directly experience the effectiveness of cargo bikes in their work context. 51 Companies involved represented various types of activities: logistics, trades, construction sector, public authorities and hospitality demonstrating the high potential for conversion to cargo bikes.
- ✓ In 2023, the Bike Project has supported 10 companies with over 100 employees and 83 small and medium enterprises.



Figure 39: Practical training delivered by the Bike Project (Credits: the Bike Project)

Lessons learnt & success factors

- ✓ Importance of legal incentives (i.e. requirement of having a corporate mobility management plan for companies over 100 people, cycling parking requirements) .
- ✓ It is important to tailor and offer attractive activities to encourage modal shift (e.g. biking test, training for staff, awareness raising tools). Both cAIRgo bike and the Bike Project provided support material, information and training to encourage modal shift, raise awareness of the different bike options and support individuals in learning how to ride safely and efficiently. Both organisations also provided users with the possibility to try bikes in real life conditions.
- ✓ There are several incentives for companies to switch to cargo bikes: lower costs compared to motorised vehicles, greater agility in traffic as Congestion and lack of parking spaces have little impact on cargo bike mobility, and environmental benefits such as reducing pollution and CO2 emissions.

⁵¹ <https://www.uia-initiative.eu/en/news/how-brussels-leveraging-cargo-bike-potential-delivery-and-service-trips>

5. Conclusions & next steps

This deliverable presented a portfolio of 15 best practices related to four main key areas of actions on 15mC policies in urban cores. Best practices cover the depth of actions and initiatives relevant for each of the ULLs including shared and micromobility schemes (Bergen, Budapest), bike infrastructures including P&R (Helsinki), improvement of public spaces and pedestrian priority (Rotterdam, Krakow, Lyon, Bologna), public transport infrastructure and connections with other modes (Strasbourg), nudging interventions to encourage modal shift (Brussels, Helsingborg), digital and MaaS solutions to manage flows (Hamburg, Barcelona, Madrid) as well as intermodal hubs centering on logistics (Gothenburg, Munich).

In addition, Table 8 provides initial reflections, which emerged from the exchanges conducted with city representatives and relevant stakeholders, on the elements in each best practice that have relevance for lower density and suburban contexts.

City	Best practice	Relevant elements for low density/ suburban contexts
Barcelona	Digital Twin for Climate Shelters	<ul style="list-style-type: none"> - Data analysis & visualisation of accessibility and proximity of urban amenities - Focus on vulnerable groups - Analysis conducted at metropolitan level - Use of data to support decision making
Bergen	Mobil Punkts	<ul style="list-style-type: none"> - Implementation in a city with relatively low density and in urban residential areas - More punkts are planned with a new focus on suburban areas and on collaborating with regional public transport authority to expand mobility hub network and create new ones around stations/ public transport as well as in the outskirts - Test temporary hubs (5-10 years) that can be easily moved/reconverted located on sites which will be redeveloped in the next decade - Includes car-pooling, especially relevant for areas with limited PT, corporate mobility management
Bologna	Tactical urbanism & pedestrianisation	<ul style="list-style-type: none"> - Community engagement and citizen participation methodology - Pedestrianisation / improvement of infrastructures - Lessons learnt from tactical urbanism
Budapest	Micromobility Points Network	<ul style="list-style-type: none"> - Community engagement and citizen participation methodology - Micromobility hubs including management of parking for e-scooters - Integrated MaaS solution
Brussels	Sustainable Mobility for Companies: cAIRgo Bike & the Bike project	<ul style="list-style-type: none"> - Mobility for companies, especially relevant in outskirt areas where commercial zones and office buildings can be situated - Last mile delivery logistics

Gothenburg	Mobility Hotel	<ul style="list-style-type: none"> - Logistics hub near train station and inside shopping mall (relevant for outskirts areas, draw on transit-oriented development) - Reloading for last-mile delivery of goods via bicycle and light electric vehicles - Inclusion of other services (bike repairs, cargo bike test)
Hamburg	Smart Loading Zones	<ul style="list-style-type: none"> - Piloting of smart loading zones beyond city centre - Lessons learnt & practical limitations/challenges
Helsingborg	Smart Nudges for Active School Mobility	<ul style="list-style-type: none"> - Nudging intervention and community engagement - City-wide approach, applicable in low density contexts -
Helsinki	Cycling Infrastructures	<ul style="list-style-type: none"> - Comprehensive metropolitan approach to mobility - P& R initiative and cycling parking
Krakow	Pocket Parks	<ul style="list-style-type: none"> - Community engagement and citizen participation methodology - Green-based solutions - Replicable outside urban cores (examples in residential areas)
Lyon	School Streets Programme	<ul style="list-style-type: none"> - Community engagement and co-design with children - Diversity of school streets – deployed in city and metropolitan area, traffic calming or full pedestrianisation
Madrid	Madrid 360	<ul style="list-style-type: none"> - MaaS and mobility management solutions - Multi-stakeholder data collaboration and sharing
Munich	Cyclelogistic Hub	<ul style="list-style-type: none"> - Reloading for last-mile delivery of goods via bicycle and light electric vehicles - Sustainable business model for the hub
Rotterdam	Green Connections Programme & Pedestrian Infrastructure	<ul style="list-style-type: none"> - Community led initiative facilitated by city - Connections between health, urban space and mobility - Incorporation of pedestrian needs across existing strategies and awareness raising at municipal level
Strasbourg	Chrono'hop & Flex'hop Public Transport Offering	<ul style="list-style-type: none"> - Improvement of public transport infrastructures and multimodal coverage at metropolitan level (connections with key public transport transfer points) - DRT – suitable for low density areas

Table 8: Relevant elements in best practices for low density / suburban contexts

The measures of success and lessons learnt identified for each best practice in the portfolio, alongside the analysis of the relevant local strategies in each ULL and KPIs developed in WP3, will support the project's ULLs to further define solutions and x-minute city strategies relevant to the context of their living lab and test how to adapt these solutions to suburban contexts (WP4). The results of the portfolio will also feed into the subsequent frameworks developed in WP4 (Cross Sectional analysis), WP5 (Transfer Methodology), and WP6 (Multi-Stakeholder Impact Assessment).

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Appendix 1

Results of the first Miro Board workshop during which FORTHCOMING partners discussed and defined the four dimensions of the 15mC based on Carlos Moreno's concept (Moreno et al 2021).

Limitations highlighted:

- How do we define 'essential' services and for whom?
- Hierarchisation of urban amenities (i.e. higher education facilities, etc) / different degrees of 'proximity' needed
- Differences in 'daily needs' related to specificities of places/locations
- Need for a multi-level approach: neighbourhood level, city level, regional level.
- Importance of context and specificities of each neighbourhood in defining and implementing the concept of 15mC
- Limitations related to measuring proximity (quantitative and qualitative data)
- Participation and accessibility depend on factors such as age, gender, capacity, class, etc. The definition of 15mC is very generic and does not address this
- Risk of gentrification not addressed in the concept
- Does everyone want to live in a 15-minute city?
- What is optimal density and who defines it?
- How density translates to Forthcoming? Is it relevant?
- Accessibility/capabilities/literacy to use to digital tools. How do we solve the digital divide? -building only on digital can be exclusive.
- "15min cities" is a trend and an intangible goal to have multifunctional and decentralized neighbourhoods against the current centralized and monofunctional areas in our cities (e.g. shopping malls, pure residential areas)

Definitions of each dimension after discussion:

Proximity:

Proximity refers to the spatial and temporal accessibility to opportunities related to transportation, employment, healthcare, education, entertainment, access to green spaces, and retail for every resident through active or sustainable transportation modes. These opportunities are associated with various catchment areas, which include various types of amenities, each with a hierarchy and a level of relevance based on the user's preferences, and the scale can vary, encompassing neighbourhood, city, or metropolitan levels.

Inclusiveness:

Inclusiveness refers to addressing everyone's needs and experiences in relation to the opportunities offered by the 15mC, regardless of economic means, age, gender, disability, diversity, race, or ethnicity. Mobility justice, accessibility, social cohesion, and participatory

decision-making are at the heart of inclusiveness as well as assessing cautiously the risks of exclusion and gentrification.

Density & land-use:

Density is viewed in terms of mixed land use in a built environment (e.g., retail, residential, offices, leisure & green spaces, etc.), where the number of people in a given area can comfortably sustain the urban service delivery, opportunities, and resources. In the context of FORTHCOMING which focuses on urban outskirts, density is the most difficult pillar to achieve and leverage.

Digitalisation:

Digitalization refers to the enabling of the proximity, diversity, and density's dimensions using digital technology (such as smart city management tools, digital twins, end-user applications). Digitalization should facilitate and ensure equal access for all individuals while considering privacy concerns.

Appendix 2

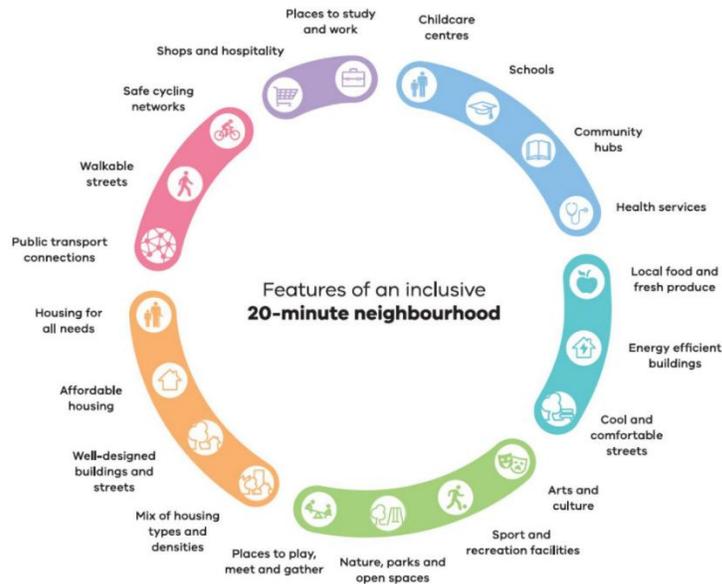
The following city strategies were identified using keywords associated with the 15-Minute City concept (e.g., x-minute city, x-minute neighbourhood) in open-access academic repositories and European project databases, supplemented by snowballing techniques. The mapping exercise was not intended to be exhaustive, as this is a rapidly evolving field (see also mapping by Buttner et al 2024). Instead, its purpose was to provide an informed overview of the current state, geographical distribution, and scope of x-minute city initiatives worldwide. Additionally, the sample is likely limited by language barriers and access to relevant documents in local languages. Finally, it is also important to note that while the strategies identified explicitly reference to 'x-minute' goals, this does not necessarily imply that these strategies and goals have been implemented (see Gower & Grodach, 2022).

Country	City	Strategy
Europe		
AUSTRIA	Vienna	Supergrätzl/ 15 minuten stadt City of short distances
BELGIUM	Brussels City	Bruxelles ville 10 minutes
DENMARK	Copenhagen	5-minute district in port area of Nordhavnen
FINLAND	Helsinki	15-minute city
	Tampere	15-minute city
FRANCE	Mulhouse	Ville du quart d'heure
	Nantes	Ville du quart d'heure
	Paris	Paris ville du quart d'heure
	Vitry sur seine	15-minute neighbourhood
GERMANY	Hamburg	10-Minuten-Quartier/Stadtteil
HUNGARY	Budapest	Healthy superblocks
IRELAND	Cork	15-minute city
	Dublin	Dublin: The 15 Minute City
ITALY	Milan	Milan adaptation strategy: 15-minute city development strategy
	Rome	Città dei 15 minuti
NETHERLANDS	Utrecht	The 10-minute city of Utrecht/ Spatial strategy 2040
NORWAY	Oslo	15-minute city
POLAND	Pleszew	15-minute city
SPAIN	Barcelona	Superblocks/ Supermanzanas
	Valencia	Ciudad de 15 minutos/ Supermanzana
SWEDEN	Stockholm	Streets Move/ 1-minute city
SWITZERLAND	Zurich	15-minute city
United Kingdom	Birmingham	15-minute transport plan
	Bristol	x-minute neighbourhoods / One city plan
	Edinburgh	20-minute Neighbourhoods/ Liveable Neighbourhoods

	Glasgow	20-minute Neighbourhoods/ Liveable Neighbourhoods
	Hailsham	10-minute neighbourhood town
	Leeds	20 Minute neighbourhood
	London	Healthy streets
	London (Waltham Forest)	15-minute neighbourhood
	Milton Keynes	15-minute neighbourhood
	Oxford	15-minute city / Local Plan 2040
	Salford	15-minute neighbourhood
	Scotland	Local Livand and 20-minute Neighbourhood as a national wide urban planning principle
	Sheffield	15-minute city
International		
ARGENTINA	Buenos Aires	Ciudad de 15 minutos/ Human scale city
AUSTRALIA	Greater Newcastle	30-minute region
	Melbourne	20-min neighbourhoods
	Sydney	30-minute city/ Greater Sydney region plan
CANADA	Edmonton	Community of communities
	Montreal	15-minute city
	Ottawa	15-Minute Neighbourhoods Complete streets and the 15-minute city
	Surrey	15-Minute Neighbourhoods Complete streets and the 15-minute city
	Vancouver	5-minute city Complete Neighbourhood
CHINA	Shanghai	15-minute life circles
COLOMBIA	Bogota	30-minute city/ Ciudad de proximidad Barrios Vitales
SINGAPORE	Singapore	20minute towns & 45-minute city/ Land Transport Master Plan 2040
SOUTH KOREA	Seoul	10-minute city
USA	Charlotte	10-minute neighbourhood
	Detroit	20-minute neighbourhood
	Denver	Sheridan Station 20-Minute Neighbourhood
	Eugene	20-minute neighbourhood
	Houston	Complete communities
	Kirkland	10-minute neighbourhood
	Montrose	20-minute neighbourhood
	Portland	20-minute complete neighbourhoods
	San José	20-minute neighbourhood

Appendix 3

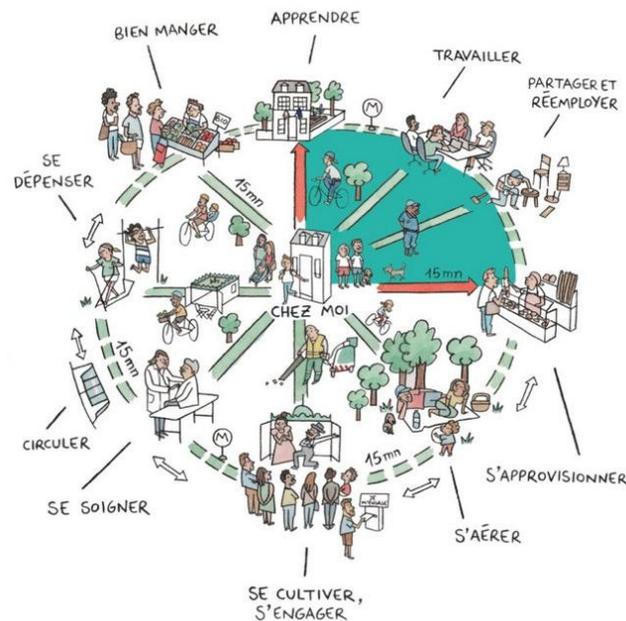
Melbourne Plan: urban and social functions of 20-minute neighbourhood



Features of a 20-minute neighbourhood

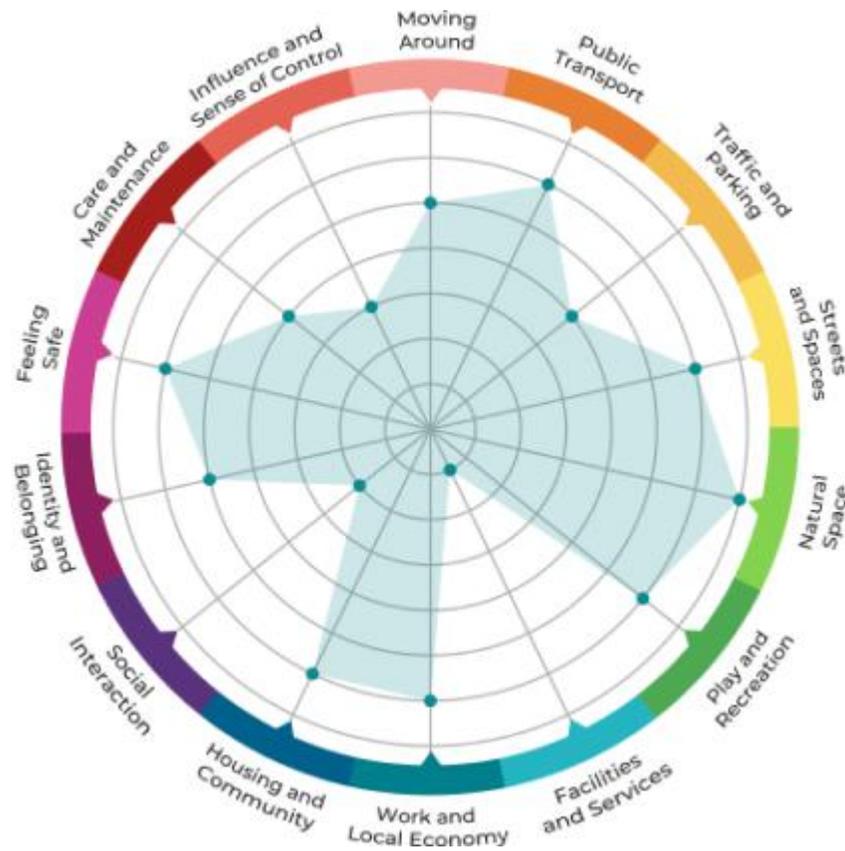
https://www.planning.vic.gov.au/data/assets/pdf_file/0022/653125/Creating-a-more-liveable-Melbourne.pdf

Paris En Commun – Urban and social functions of 15-minute city



<https://www.paris.fr/dossiers/paris-ville-du-quart-d-heure-ou-le-pari-de-la-proximite-37>

Scotland- Place based framework used to assess 20-minute neighbourhoods



<https://www.improvementservice.org.uk/products-and-services/planning-and-place-based-approaches/planning-for-place-programme/place-based-approaches>
<https://www.ourplace.scot/About-Place-Standard>