SMCNetZero

Achieving Net-Zero through Innovation in Small and Medium sized cities

D2.2 Catalogue of 50 SMC innovation ecosystem best practices (“Use Cases”) and Solutions toward decarbonisation (“Buyer’s Guide”)

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Description of the related task and the deliverable. Extract from DoA & GA	**T2.2 Best Practice and Solution Curation (Leader: BAB, Duration: M5-M12, Contributors: all)** Building on the inputs collected and challenges identified through WP1, as well as leveraging on the networks of all partners, the project will collect and present a catalogue of best practices (i.e. use cases) from successful real-life innovation ecosystems in various SMCs toward achieving net zero goals. Similarly, a Buyer's Guide of Solutions, and broader recommendations for 'packaging' of solutions, will be prepared to offer scope for transformative steps toward net zero by highlighting, informing and facilitating a feedback mechanism from SMCs of the various features that need to be considered for specific solutions, particularly focusing on the topic of 'Mobility Islands' as a case example. The Mobility Islands solution leverages on the network and support of existing initiatives, as it has emerged from the EU funded smart city 'Lighthouse' Sharing Cities programme and already has committed interest from ca. 20 'small giant' cities from the EU Smart Cities Marketplace.				
Participants	All partners				
Comments					

V	Date	Authors	Description
1	06/11/2023	All authors	Working document ready for internal review
2	20/12/2023	All partners	Peer-review comments attended, finalisation
3	29/12/2023	PC	The coordinator submits the deliverable to the EU
4	20/01/2024	PC	Submitted again after following requested changes asked by Project Officer

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SEN	Sensitive	

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About SMCNetZero

SMCNetZero brings together six successful urban innovation initiatives in Europe with seven (7) regional and Pan European networks and their partners to create a **Satellite Network of innovation actors** to support public sector representatives from Small and Medium-sized cities (SMCs), SMEs, academia, NGOs, and investors across Europe to **facilitate decarbonisation in SMCs**.

The SMCNetZero consortium is composed of:

BABLE Smart Cities, Germany (BAB)
ODRAZ - Održivi razvoj zajednice, Croatia (ODZ)
Smart City Cluster, Spain (SCC)
Southern Regional Assembly, Ireland (SRA)
BLOXHUB, Denmark (BXH)
WE BUILD DENMARK, Denmark (WBD)
UrbanDNA, United Kingdom (UDNA)

This project is unique in that its diverse consortium partners and broad commitment from target stakeholders in the Satellite Network ensure **focus in regions with less innovation capacity**, with written confirmed commitment from nearly 100 innovation actors at the proposal stage, to participate in the activities- including an emphasis on largely underrepresented regions and stakeholders.

The project will leverage its diverse Satellite Network to:

- Gain an in-depth understanding of SMC needs and barriers towards achieving Net Zero emissions.
- Raise awareness and simplify access to existing successful initiatives supporting decarbonisation.
- Support matchmaking between supply and demand sides by linking SMEs, researchers, and investors with SMCs.
- Help identify and open access to funding for enabling innovation deployment in SMCs currently underrepresented in the European innovation ecosystem.

SMCNetZero's vision is to **create and strengthen local innovation ecosystems' interrelations in SMCNetZero regions** through brokerage and knowledge-building activities as well as digital resources to increase capacity **for planning, deploying, and**

scaling up of decarbonisation solutions, overall focusing on increasing the inclusivity of these innovation ecosystems and minimizing existing innovation divides.

To achieve this vision, SMCNetZero has the following primary strategic objectives:

- Open up opportunities and stimulate the dissemination of information and exchange of knowledge on best practices on decarbonization for SMCs (and as a result, SMEs).
- Increase implementation prospects between providers of zero-emission solutions and public authorities from SMCs by designing, developing and providing a digital space and accompanying toolkit for collaborating, learning and networking.
- Identify and engage innovation leaders from the public and private sectors from “strong” innovator regions and “moderate” to “modest” innovator regions within the project’s focus countries.
- Design and deploy engagement and knowledge-building activities for ensuring wide participation for SMCNetZero and maximum impact.
- Facilitate the understanding and implications of the implementation and scale-up of innovation projects in SMCs.

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Introduction to the Deliverable

Supporting SMCs with the necessary intellectual assets for decarbonisation innovation

The overarching goal of the SMCNetZero project is to increase the innovation capacity of the Quadruple Helix in small and medium-sized cities (SMCs) toward these cities attaining their net zero and climate neutrality targets. Specifically, the project seeks to strengthen and create long lasting interrelations for the planning, deploying and scaling-up of decarbonising innovations that will fuel and accelerate these journeys and transformations.

One of the most critical innovation dimensions for moderate and emerging innovators is having the correct intellectual assets in place. An intellectual asset is any result or product of research and development activities; therefore, they act as knowledge products providing insightful information facilitating future implementations.

To ensure that SMCNetZero participants are provided with the necessary intellectual assets for solving their innovation challenges, in this deliverable (and also on the SMCNetZero Digital Forum) the SMCNetZero project has collated relevant best practices, solutions, publications and learning materials based on the knowledge gaps identified through previous research and project activities, e.g. as outlined in the D1.1 Market Analysis Report.

This report includes two distinct yet relevant and both necessary publications that have been produced through the project: the catalogues of Use Cases ***50 SMC Best Practices for Decarbonisation*** and the ***Buyers' Guide of Solutions: Mobility Islands***. These two deliverables are meant to marketed and distributed independently yet are presented collectively here due to both of their importance for informing, inspiring and guiding SMCs in the implementation of specific solutions. An introductory overview for each of these publication is provided below.

Overview of the Catalogue of Use Cases: *50 SMC Best Practices for Decarbonisation*

The Use Cases (best practices) presented in this catalogue have been selected for their impact on decarbonisation in SMCs around Europe, as demonstrated through real-life implementations. In addition to being presented in this report, some of these Use Cases have already been digitalised in the SMCNetZero Digital Forum, while others will still be added to the Digital Forum throughout the remainder of the project and beyond. The

entirety of this catalogue will be publicised and shared as a PDF report within the Digital Forum, as well as on the project website and in other relevant materials of each project partner to ensure thorough dissemination.

The information presented in each Use Case is structured in alignment with the CWA 17381:2019 Description and Assessment of Good Practices for Smart City solutions standard (co-developed by SMCNetZero project partner BABLE), which evaluates smart city implementations through several viewpoints. The full detailing of this standard is fulfilled for the Use Cases presented digitally within the Digital Forum, while for the purpose of this report, the main focus areas of each Use Case are the identified Challenge, the Solution, the Impact of the implementation and the Lessons Learned during implementation. The Use Cases cover multiple sectors, particularly with a strength in mobility and energy efficiency topics toward net zero, and cover a geographical range of all across Europe and the UK, to inspire SMCs of similar geographies and who are also interested in these focus topic areas with concrete implementation examples.

Overview of the Buyer's Guide of Solutions: *Mobility Island Buyer's Guide*

Following from the SMCNetZero project's D1.1 Market Analysis Report, and with improvements in mobility having been identified as a major opportunity and challenge area for SMCs, the focus of this specific "Buyer's Guide" was determined to be specific to the solution of 'Mobility Island'. More specifically, the "Buyer's Guide" of Solutions for Mobility Islands seeks to:

- Provide easy-to-access information to inform city hall officers about how to go about advancing a specific solution – the 'Mobility Island' – with confidence as they ready to engage the provider market, and potentially investors
- Underpin collaboration amongst cities
- Progressively enrich a database of potential solution providers
- Strengthen capacity on the demand side, so that market engagement delivers better outcomes
- Build market knowledge about the Mobility Island solution across all sectors

This deliverable follows the Solution Packaging approach that won an EU DG RESEARCH Innovation Award in 2018. This was within the SCC01 Smart City Lighthouse Sharing Cities programme. It has since extended its traction through the EU Smart Cities Marketplace 'Small Giants' Focus Group and has now benefitted from further detailing and publication through the SMCNetZero project.

The information outlined in ANNEX of the Buyers Guide is gathered from our main database, designed for easy updates and sorting. It's important to note that this release doesn't cover the whole current database, which includes data from around 80 providers. Instead, we're focusing on presenting a clear picture of the fundamental ideas behind the database.

Future versions will include a confirmed list of providers, shaped by practical testing and feedback from demonstrator cities. This step-by-step process ensures that the final database meets real-world needs and expectations.

As such, our work seeks to collaborate with and build on past and ongoing EC investments to exploit prior deliverables and good practice, reduce confusion and complexity for city recipients, and maximise overall market impact. This is consistent with the 2023 ECA audit findings.

The Buyer's Guide in principle comprises two main blocks:

1. A discursive guide to help cities through the thinking process to tailor their thinking to local context and ready for market engagement
2. A tabular listing that captures potential solution providers for mobility island components

The former is considered to be well developed and will benefit from validation with cities. The latter part is less developed and will be significantly expanded through the life of this project.

Given this, the document is watermarked "50% Draft". This is a milestone stage within the packaging approach (now termed 'blueprinting') which assigns a status of being 'out for consultation'. This consultation is in process through a number of channels and will involve a variety of stakeholders, which will strengthen the content of the (second part of) document and support increased market use.

Firstly, the SMCNetZero project includes an important 'demonstration' strand, which is focused on the Mobility Island solution, as a means to keep the project very 'grounded' (essential to engage with smaller cities). Through this multi-city collaboration, we will consult, test the approach and add to the content of the Buyer's Guide. This we hope will help bring down some of the barriers observed in our market research.

The EU SMC “Small Giants” Focus Group will also be engaged to validate and build on the document. Once this step has been completed the platform communications team will be engaged to support dissemination

Additionally:

- We have engaged the SCC01 SCALABLE ‘Lighthouse Cities’ community through their Business Models and Financing Task Group, to socialise the blueprinting approach, and seek support to disseminate this specific deliverable
- We will also engage the NetZeroCities ‘Mission’ platform for which we have already made early contact, to explore synergies
- With the support of the EU SCM PO (who oversees Com & COC) we will seek to engage the EU Covenant of Mayors and Covenant of Companies to explore interest and synergies
- We also intend to approach some of the project development and investment-focused EC supported initiatives, like the EU City Facility
- Engagement with investment funds (that already support city projects), standardisation bodies, cluster organisations (that bring in an Industry perspective) is also planned.

An important and strategic question for later discussion is how best to sustain the content of this document. That can be set in the context of the overarching packaging / blueprinting approach – i.e. how we might see the EU-level market developing as regards common trusted guidance for cities. And at the tactical level of the content of this document.

It is perhaps worth noting that the current state-of-the-art, particularly in the case of smaller cities, is that staff too often rely on past experience, anecdotal information, best-endeavours experience sharing, unaffordable analyst reports, or just commencing from first principles to advance projects. This will not work moving forward given the pace of response required to deliver on net zero commitments. We must therefore do different things differently. This deliverable – the Buyer’s Guide – is one very practical example of doing so.

50 SMC Best Practices for decarbonisation

Innovative solutions toward net zero emissions

SMCNetZero

Achieving Net-Zero through Innovation in Small and Medium sized cities

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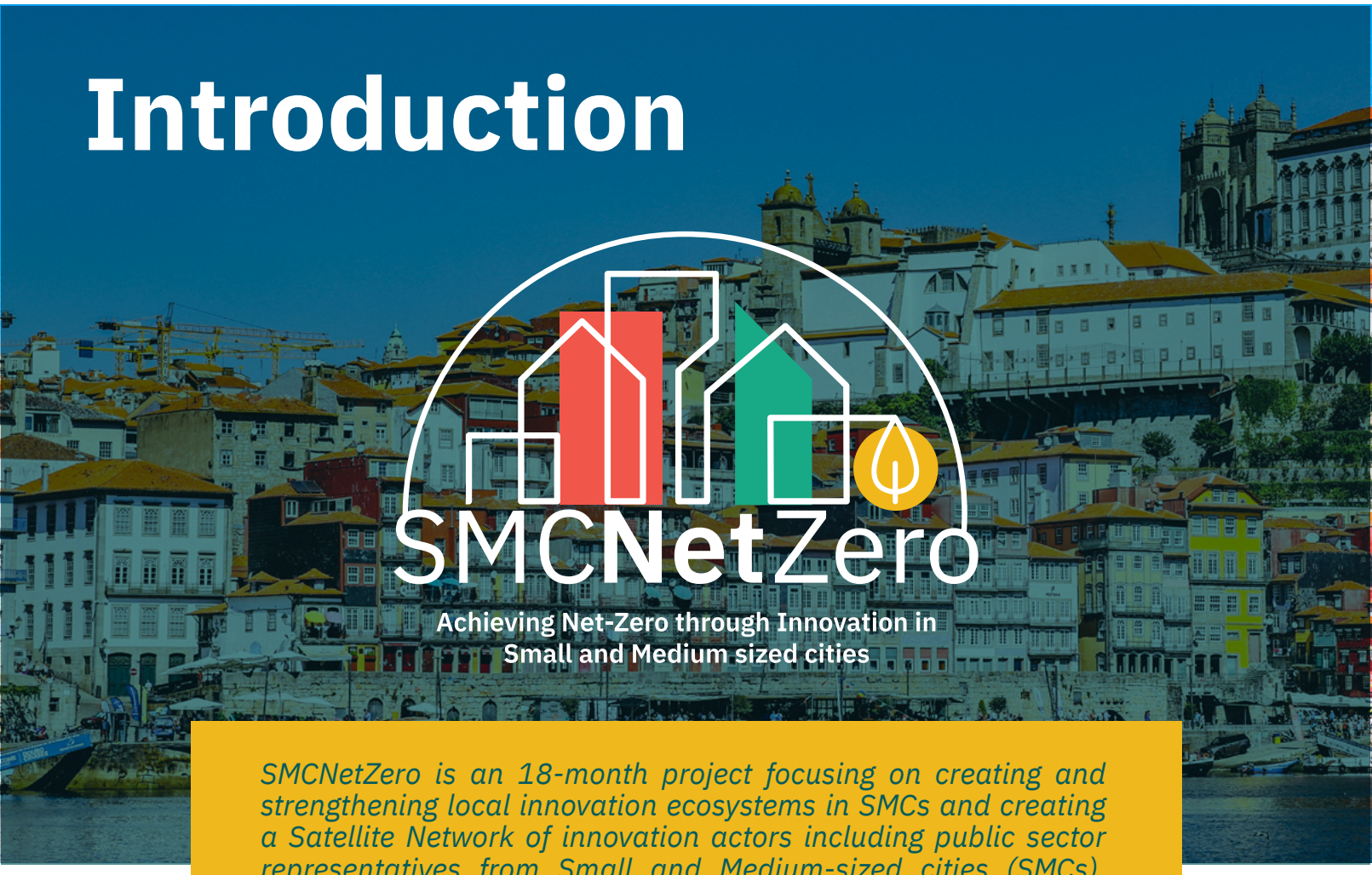
Introduction



SMCNetZero is an 18-month project focusing on creating and strengthening local innovation ecosystems in SMCs and creating a Satellite Network of innovation actors including public sector representatives from Small and Medium-sized cities (SMCs), SMEs, academia, NGOs and investors across Europe.

About SMCNetZero

SMCs face underrepresentation in the European innovation ecosystem, with larger cities accessing programs that often leave Small and Medium-sized Enterprises (SMCs) behind. In response, SMCNetZero partners with European experts to address SMCs' specific needs in accelerating their decarbonisation. The initiative involves multiple activities, including comprehensive desk research focusing on priority areas like energy efficiency, renewable energies, sustainable mobility and environmental sustainability.

The goal is to provide SMCs with essential resources, identify key actors, explore available tools, showcase best practices and highlight funding opportunities supporting Net Zero efforts, ultimately ensuring SMCs are actively supported in their sustainable transition within the European innovation landscape.

Project Objectives

- Enhance understanding of SMC needs and barriers, promoting awareness and facilitating access to successful decarbonisation initiatives.
- Bridge the gap between larger cities and SMCs by providing essential resources and support for planning, deploying and scaling up decarbonisation solutions.
- Showcase innovative approaches and success stories from SMCs, developing adaptable solutions for broader application.
- Strengthen local innovation ecosystems in SMCs by identifying leaders, fostering collaboration and facilitating knowledge exchange among diverse stakeholders in Europe.

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SMCNetZero in
Smart In The City-The Bable Podcast

Smart in the City – The BABLE Podcast was created in 2022 by BABLE Smart Cities and brings together top actors in the Smart City arena, sparking dialogues and interactions around the stakeholders and themes most prevalent for today's citizens and tomorrow's generations. It takes a holistic approach to urban collaboration, touching on subject matters around a vast array of topics. It aims to bring perspective and personal connection to the field while informing and inspiring action and partnerships. The first two SMCNetZero podcast epsiodes have already been released in 2023, with more to come during the remainder of the project.

Listen to the Smart in the City podcast on :

Spotify · Google Podcasts · Apple Podcasts · deezer · Overcast

#42 SMCNetZero: "Supporting Small and Medium-sized Cities in their Decarbonisation Journey"

In this first episode of the SMCNetZero podcast series, the guests Nikita Shetty, UK and Ireland Lead at BABLE Smart Cities; Graham Colclough, Partner at UrbanDNA, UK; and Rebecca Walsh, EU Projects Officer for the Southern Regional Assembly in Ireland, talk about the decarbonisation of SMCs as well as the project's opportunities, limitations and long term vision.

#51 SMCNetZero: "What Lessons Can Transfer from Larger Cities to SMCs?"

In this second episode of the SMCNetZero podcast series, Maria Vassilakou, Urban Strategist and Founder at Vienna Solutions and member of the EU Horizon Mission experts board on Smart & Climate-Neutral Cities, talks about the challenges and opportunities for Small and Medium-sized Cities in the context of decarbonisation.

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Discover SMCNetZero

Digital Forum

Visit & Join now!

The SMCNetZero Digital Forum is an online platform addressing challenges in Small and Medium-sized Cities (SMCs) and Enterprises (SMEs) pursuing decarbonisation. Focused on understanding SMCs' specific needs, it aims to create a dynamic space for knowledge sharing, connections and accelerated efforts in decarbonisation. The Forum seeks to streamline access to successful initiatives; raise awareness; and provide tailored support, capacity building, workshops and tools to foster sustainability within the SMC community through a connected network of initiatives and organizations.

The Digital Forum includes:

- Engaging forum posts with other SMCs and SMEs on decarbonisation goals
- Inspiring best practice Use Cases from other SMCs from all around Europe
- A decarbonisation toolbox with at least 5 tools for SMCs to plan, implement and achieve net zero goals
- Podcast episodes with leaders from innovative SMCs on the path to net zero
- Articles covering topics on green, digital and social transitions for SMCs

For Small and Medium-sized Cities SMCs

The Digital Forum assists Small and Medium Cities (SMCs) with real-world examples, tools for climate action, sustainable solutions, and access to financial resources.

For Small and Medium-sized Enterprises SMEs

The Digital Forum connects SMEs, showcases sustainability initiatives, curates best practices, and provides city climate action information, and knowledge sharing.

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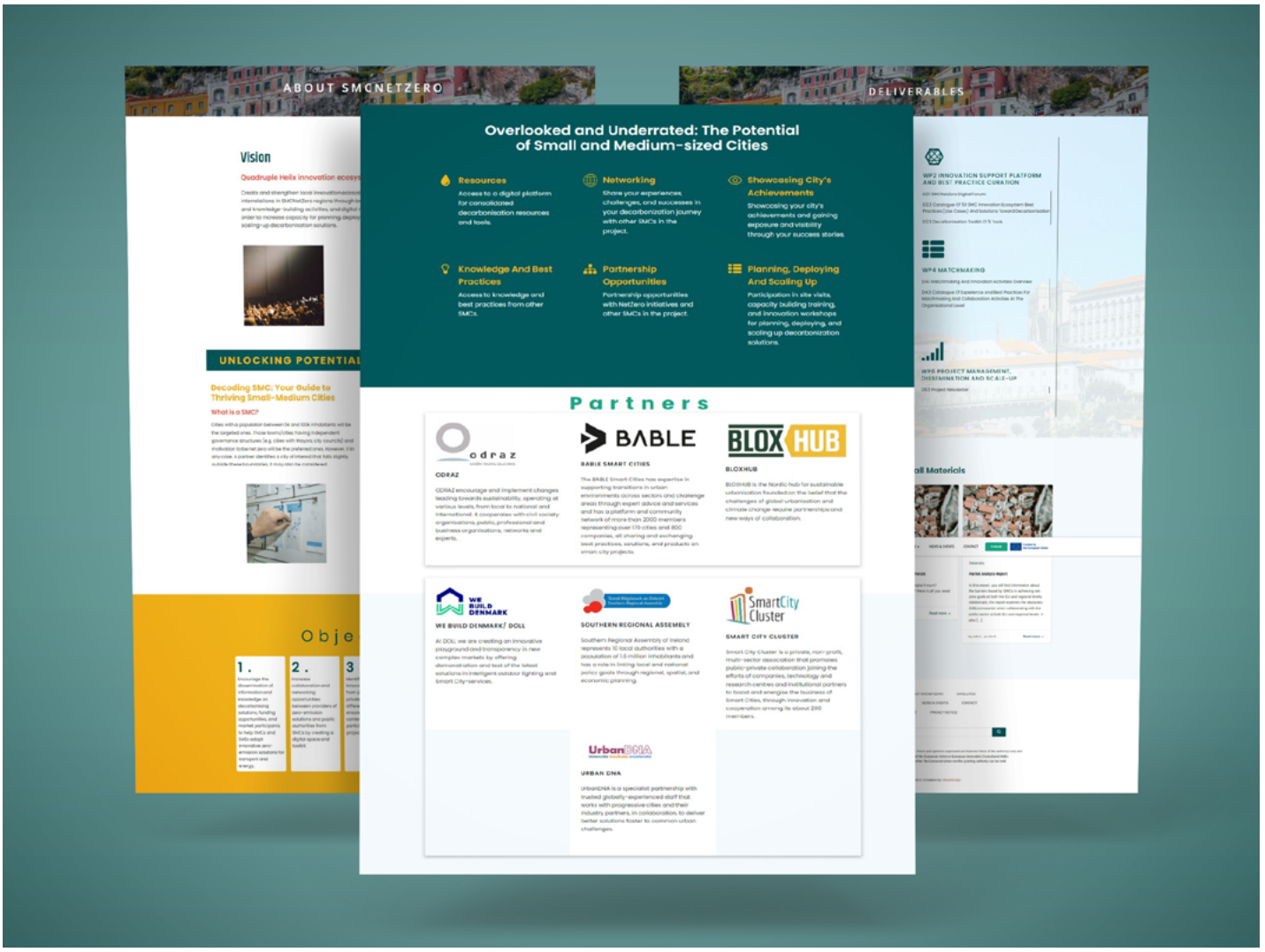
About This Report

This report stands as a testament to the collective dedication of cities, both large and small, toward achieving decarbonisation goals, aligning harmoniously with the broader EU directive to attain climate neutrality by 2050.

Small and Medium-sized Cities (SMCs) often find themselves in search of tangible, real-world examples to guide successful climate action initiatives within comparable urban landscapes. This report serves as a repository of best practices, offering a showcase of triumphant projects and strategies tailored specifically to the unique challenges and resources of SMCs.

The inclusion of 50 Use Cases highlights innovative practices from Small and Medium-sized Cities across Europe, delving into the details of the process, lessons learned and insights that other small to medium-sized cities can draw from.

Furthermore, this report complements the “Mobility Island Buyer’s Guide”, which provides city hall officers with accessible information on advancing a specific solution: the ‘Mobility Island.’ With a focus on confidence-building, this guide equips decision-makers as they prepare to engage with solution providers and potential investors. Emphasis is placed on strengthening capacity on the demand side, ensuring that market engagement yields optimal outcomes. The holistic approach of these two documents combined aims to empower SMCs in their pursuit of sustainable urban development and positions this best practices report as a valuable resource for navigating the evolving landscape of climate action.



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REAL LIFE USE CASES

“Navigating the Future: 50 Innovative Practices Towards Decarbonisation”

Improving CO_2 neutral communities

Kortrijk, Belgium (2016)
Solution: Energy efficiency

What was the challenge?

The goal was to transform existing neighbourhoods, primarily social housing areas, into CO_2 neutral communities. The main challenges were integrating renewable energy sources and enhancing energy efficiency while also engaging residents, improving their living conditions, and ensuring affordability.

How was it solved?

Within the scope of the ECO-Life project, Kortrijk focused on extensive renovations and new construction, implementing a “Whole Town Design Approach” that integrated innovative energy concepts and technologies. It implemented diverse renewable energy systems, including biomass boilers, solar collectors, PV technologies, heat pumps, and district heating networks. Additionally, residents were actively involved through meetings, assemblies, and continuous communication.

Lessons Learned

To achieve success, it was crucial not only to focus on technical or financial aspects but also to consider the perspectives of tenants — of all ages, cultural backgrounds, and genders. Moreover, collaboration among stakeholders — clients, designers, constructors, and researchers — was pivotal in realizing larger sustainable goals.

Impact

The project initiated a transformative journey towards sustainable living. Key outcomes were:

Achieved a 40% reduction in CO2 emissions, saving 476 tons, and recorded a 39% decrease in energy use compared to national standards, notably cutting space heating demand in new and refurbished buildings.

Transformed a depressed area into an eco-village, positively impacting occupants and providing affordable heating options.

Recognized as a benchmark project, attracting attention from stakeholders and policymakers for its innovative district heating approach.

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Urban Sustainability Gamification

Fundão, Portugal (2020)
Solution: Active Mobility

What was the challenge?

The challenge is to create a gamified experience that encourages participants to embrace sustainable and healthy mobility choices, ultimately contributing to positive changes in commuting habits. The game should blend digital and physical experiences, fostering collaboration among local communities, businesses, policymakers, and Open Data enthusiasts.

How was it solved?

The MUV (Mobility Urban Values) project was successful in leveraging a gamified approach, community engagement, open collaboration, and the release of Open Data to drive positive behavioural change in commuting habits. The emphasis on local communities, inclusivity, and data-driven decision-making contributed to the project's effectiveness in promoting sustainable and healthy mobility choices.

Lessons Learned

The MUV project demonstrated that a community-focused, gamified approach, empowered by open data and interdisciplinary collaboration, can effectively drive sustainable behavioral change in urban mobility, providing valuable lessons for future initiatives.

Impact

The impact of the MUV project can be evaluated across behavioural, environmental, social, and urban planning aspects:

- Successfully shifted communities towards sustainable and healthy commuting habits.
- Improved local air quality through eco-friendly transportation.
- Strengthened community bonds and increased awareness of sustainable mobility.
- Equipped policymakers with valuable data for informed decision-making process.
- Demonstrated potential for replication in diverse urban contexts.

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Autonomous Road Inspector

Cunit, Spain (2022)
Solution: Urban Mobility

What was the challenge?

Acquiring a comprehensive inventory of traffic signals and road markings, coupled with the analysis of degraded and misplaced signals, as well as a visibility assessment for road markings. Additionally, there is a need for the detection and classification of various pavement deteriorations and a comprehensive analysis of speed reduction elements.

How was it solved?

The city upgraded its road inspection strategy by deploying two Autonomous Road Inspectors in police vehicles, optimizing patrolling. The acquisition system transmitted videos and data to the cloud for centralized processing, including detections and classifications. ASIMOB's web interface was introduced to manage assets and incidents seamlessly. Cunit now has a complete inventory of all elements, with information shareable in Open Data format. The shift to data-driven decision-making is apparent, leveraging objective insights from comprehensive analysis.

Lessons Learned

ASIMOB's Autonomous Road Inspector, customized for urban use, successfully addressed challenges, including coordination with the police and adapting algorithms to unique driving patterns. Overcoming these obstacles within a three-month timeline opens opportunities for other cities to replicate the project using similar or alternative vehicles, ensuring comprehensive street coverage for precise analysis.

Impact

The ASIMOB-developed Autonomous Road Inspector has been tailored for urban use through this project.

Overcoming specific challenges, particularly in coordinating with the police and adapting acquisition algorithms to their unique driving patterns, was crucial.

Fortunately, all challenges were successfully addressed within the three-month project timeline. This success paves the way for other cities to replicate the project, either using similar vehicles or alternative types, as long as they cover every street for a comprehensive and precise analysis.

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Youth-Centric Urban Mobility

Fundão, Portugal (2021)
Solution: Citizen engagement

What was the challenge?

City planners and mobility experts are challenged to change ingrained habits, particularly the widespread use of private vehicles over the past 50 years, but there's an oversight regarding youth. Transitioning to sustainable mobility and creating livable cities necessitates understanding and prioritizing the preferences of children and young people. Success relies on empowering the new generation with skills and knowledge, emphasizing collective efforts from informed, engaged, receptive, and prepared individuals.

How was it solved?

The CES4Kids project, led by 13 schools, seeks to engage younger generations in promoting sustainable mobility. It involves developing educational content, hands-on activities, and awareness events to instill sustainable mobility principles in classrooms. The project also encourages collaboration among schools to propose improvements to public spaces and mobility services through the EIT Urban Mobility's DecidiUM platform. Workshops serve as testing grounds for innovative mobility solutions with the goal of improving daily school mobility and promoting social acceptance of change.

Lessons Learned

CES4Kids empowered children in co-creating mobility plans, traditionally led by adults. Addressing their often-overlooked perspective in urban planning, the project gave children a voice. Instructors translated digital content into engaging activities, some becoming permanent additions to school programs. Pupils showed enthusiasm in applying concepts to enhance sustainable mobility around schools, and experiential exercises boosted the program's impact.

Impact

CES4Kids collaborated with 13 schools in Spain, Portugal, Greece, and the Czech Republic, impacting over 800 students and teachers.

The key achievement is the development of 13 Sustainable Mobility Plans for each school. This process involved transferring knowledge from mobility technicians to school instructors and, importantly, engaging students interactively.

The plans follow a logical four-stage process: Information, Diagnosis, Proposal, and Prioritization. Notably, CES4Kids activities align with different stages of the decision-making process, resulting in tangible Sustainable Urban Mobility Plans crafted by students for each school.

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Electric bus fleet charging system

Děčín, Czech Republic (2021)
Solution: Urban Mobility

What was the challenge?

The overall goal was to transition the city's public transport fleet to electric buses, reducing emissions. A key challenge was choosing the right charging technology. Moreover, as part of the e-ULTIMATE project, the focus extended to developing a decision support system (DSS) that designs the optimal charging system for a given city and measures the electric service's effects on bus agencies and stakeholders.

How was it solved?

In Děčín, a systematic approach was taken, employing various strategies to enhance public transportation. Comprehensive data on electric bus performance, including technology, routes, and climate, was analyzed. Local tests evaluated noise and NOx reduction during the transition from CNG to electric vehicles. The city also determined the optimal charging system by balancing cost, public space utilization, and emissions. This reflects Děčín's commitment to informed decisions and improvements in its public transportation.

Lessons Learned

The integration of technical, social, economic, and geographic aspects is crucial for making informed decisions in complex projects such as electrifying bus fleets. This approach, combined with the collection of real data from pilot tests, has refined the decision support system.

Impact

The data generated and collected in Děčín provided valuable information that improved the e-ULTIMATE toolkit, facilitating the selection of appropriate charging systems and technologies for electric buses.

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Innovative energy and mobility services

Focșani, Romania (2022)
Solution: Energy efficiency and Urban Mobility

What was the challenge?

The main goal was to harness user-demand-driven energy and mobility services, fostering greater collaboration and efficiency in urban planning and governance. Additionally, as part of the IRIS project, the initiative aimed to validate innovative business models and technical advancements, fueling the realization of smart, sustainable cities.

How was it solved?

Focșani improved commuting and digital services, prioritizing international collaboration and sustainable infrastructure through several key measures. This included redesigning bus routes, implementing digital ticketing, and introducing eco-friendly transport options like electric buses and bike lanes. The city also digitized citizen services and converted public information screens into Wi-Fi hotspots. Actively participating in EU initiatives and programs for learning and innovation, Focșani upgraded energy systems, public lighting, and buildings to enhance sustainability.

Lessons Learned

The project underscored critical elements for successful smart city development, emphasizing the importance of collaboration and learning from successful city projects. It also highlighted the necessity of continuously adapting infrastructure to technological advancements and citizen needs. Additionally, prioritizing sustainable and eco-friendly initiatives was recognized as key to addressing traffic challenges and fostering environmental awareness in urban mobility.

Impact

The revamped bus network and digitization of transport services resulted in increased public transport usage, with demands from neighbouring villages to expand these services.

Moreover, the efforts toward smart mobility and digitization positioned Focșani as an emerging smart city, potentially boosting tourism and improving the overall quality of life for its residents.

Additionally, the city's participation in EU-funded programs facilitated the establishment of Wi-Fi hotspots and enhanced digital access for its citizens.

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Empowering energy efficiency

Ostend, Belgium (2022)
Solution: Energy efficiency

What was the challenge?

The challenges primarily involved inefficient energy usage, high carbon emissions from transportation, and a lack of citizen engagement in urban development initiatives. Under the project MAtchUP (MAximizing the UPscaling and replication potential of high level urban transformation strategies), the city aimed to become a more resilient, smart and sustainable future-proof city.

How was it solved?

Ostend aimed to cut energy demand by integrating renewables and enhancing building efficiency. Some measures involved offering credits to support renewable integration in private buildings. Formulating strategies to bridge the gap between technological advancements and public acceptance was also part of the solutions, seeking consensus and minor legal adjustments to facilitate implementation and using successful business models for replication.

Lessons Learned

Flexibility in legal frameworks is essential for the easier implementation of energy-efficient measures. Moreover, success models can expedite progress in similar areas.

Impact

Ostend experienced a reduction in the energy demand and overall mitigation of energy poverty. Additionally, the city progressed in understanding and addressing challenges in electric mobility and ICT-based interventions.

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Smart Public Mobility Hubs

Fingal, Ireland (2020)
Solution: Mobility

What was the challenge?

The Mobility Hub aims to encourage varied and sustainable types of transport in areas that are close to existing public transport links with a high concentration of employment, housing, shopping, amenities, and recreation. This allows a greater number of citizens, including the aged and those with accessibility issues to travel in a greater variety of ways, and advances Fingal's climate action goals in the process.

How was it solved?

The hub comprises of five parking bays with specific color-coordinated functions including age-friendly, disabled, electric vehicle charging, bike rack (bike share and public), and car sharing.

Lessons Learned

Mayor of Fingal Cllr. Eoghan O'Brien, said: "The Mobility Hub is a worthy initiative that shows Fingal's commitment to helping our people and environment to thrive "

Impact

The mobility hubs creation has allowed a greater number of citizens, including the aged and those with accessibility issues, to travel in a greater variety of ways, and advances Fingal's climate action goals in the process.

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Revitalisation of the city centre

Kozani, Greece (2022)
Solution: Sustainable environment

What was the challenge?

The Greenovate project aimed to revitalise and beautify Kozani's centre in a sustainable way. Challenges included changing the natural environment and promoting a new perception based on collectivity and a sense of belonging.

How was it solved?

The project seamlessly engaged local businesses, students, and citizens in the planning and preparation of green spaces. It adopted a multifaceted approach, including the provision of innovative lessons to students on circular economy principles and sustainability. The project utilized upcycled materials for crafting window boxes, planters, benches, and various other elements, contributing to both aesthetic appeal and ecological sustainability. Green elements were strategically positioned in key areas of the city center and pedestrian zones, enhancing the overall urban landscape. Additionally, the initiative prioritized the restoration of degraded spaces, transforming them into accessible and inviting areas tailored to diverse age groups within the community, fostering a sense of inclusivity and environmental stewardship.

Lessons Learned

Takeaways form this project emphasize the need to engage local stakeholders for project success. Innovative education fosters sustainability enthusiasm in younger generations. Thoughtful green space placement improves aesthetics and citizen well-being.

Impact

The project created a more visually appealing environment. Moreover, the strategic placement of green areas has effectively reduced temperatures, notably during summer, fostering a more comfortable atmosphere.

Engaging the community led to a sense of ownership, ensuring better care and preservation of these spaces. Additionally, the project used recycled materials, illustrating a practical implementation of circular economy principles.

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Elderly on Track

Rubí, Spain (2022)
Solution: Active mobility

What was the challenge?

The EITra project aimed to enhance active mobility among the elderly in Rubí. The challenge involved reconnecting seniors with their community, exploring the links between comfort/perception and physical/environmental parameters, and addressing age-friendly dimensions outlined in Rubí's Elderly Strategic Plan. The project aimed to tackle the broader challenge of "Re-gaining a sense of community and belonging" as part of the EIT Community New European Bauhaus Challenge.

How was it solved?

The project in Rubí aims to create safe, comfortable, and healthy walking routes for the elderly. This involves establishing secure paths, enhancing infrastructure, and incorporating health-focused design. Community engagement, environmental analysis, and technology integration will contribute to optimizing routes. Collaboration with age-friendly initiatives, including the Age-Friendly Cities Network and Rubí's Elderly Strategic Plan, will enhance overall well-being for the elderly in the community.

Lessons Learned

The role of community involvement and the importance of tailored solutions for the elderly in designing walking routes was essential. The development of a set of good practices provides a valuable framework for sustainability, and the integration of technology enhances project efficiency. Furthermore, the project underscores the positive impact of promoting active aging, and collaboration with existing age-friendly city initiatives contributes to broader success and long-term impact.

Impact

The ElTra project has significantly impacted the community by conducting two engaging workshops, resulting in the establishment of a network of tailored walking routes for the elderly in Rubí.

The project also developed a set of good practices, providing guidelines for designing and maintaining elderly-friendly routes.

As a result, an active community of elderly individuals has been cultivated, actively participating and enjoying the benefits of walking within the newly defined network of routes. As walking opportunities increase, emission reduction opportunities also increase, with seniors increasing their emission-free local travel and recreation.

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Inverness Smart Waste Project

Inverness, United Kingdom (2021)
Solution: Smart city

What was the challenge?

The goal is to reduce operational costs by decreasing miles traveled, maximizing stops and lifts per hour, balancing workloads, and reducing the requirement for overtime. The software also provides the ability to continually improve routing, including the ability to respond to population growth and new housing developments within the region.

How was it solved?

The project's primary innovation involved acquiring Route Optimization Software, facilitating the development of efficient waste collection routes. Following a thorough vendor's day and procurement process, the software enables the waste collection team to input various data sets and receive optimized routes in return. Key steps included procuring the specialized platform, hiring a temporary staff member to enhance datasets and manage the platform, and exploring opportunities for broader applications beyond waste collection.

Lessons Learned

Several required datasets held by the Council fell short of the necessary standard, necessitating extensive data cleansing. This observation aligned with advice from other councils engaged in route optimization software use. The Waste Team also recognized the need to balance the pursuit of perfection with the practicality of using sub-standard datasets, which inherently introduced inaccuracies. The significance of the desktop study and Vendors Day was invaluable, providing a comprehensive understanding of the market and achievable outcomes in the sector. These processes enabled the team to form a realistic view of software features, leading to an informed procurement decision.

Impact

Using 'Round Management' software with consistent, accurate datasets allows for more efficient routing of waste collection vehicles – bringing with it reductions in operation costs and the potential for the redeployment of valuable resources by decreasing kilometers traveled; maximizing stops and lifts per hour; balancing workloads across the week; and reducing the requirement for overtime.

Real-time statistics and custom reporting also provide opportunities for The Highland Council to continually improve the performance of rounds, further reducing costs and providing a better service to citizens through gradual, data and experience-led improvements.

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REMOURBAN

Seraing, Belgium (2019)
Solution: Energy, Mobility

What was the challenge?

REMOURBAN (REgeneration MOdel for accelerating the smart URBAN transformation) is a project that aimed to develop and validate a sustainable urban regeneration model, using energy, mobility and ICT solutions to improve quality of life, reduce emissions and increase efficiency.

How was it solved?

Addressing the challenge at hand involves a multifaceted strategy. Technologically, energy-efficient retrofits, electric vehicles, smart meters, sensors, and a city information platform have been integrated. Citizen engagement is a priority, with active involvement in designing interventions to foster awareness and sustainable behaviors. Innovative financing models ensure economic viability and scalability, establishing connections with other smart city initiatives. This comprehensive approach combines technology, citizen involvement, and creative financing to create a sustainable and resilient urban environment. Seraing (a city of ca. 64.000 population) was one of two follower cities in the project.

Lessons Learned

The REMOURBAN project has yielded valuable lessons for urban development, emphasizing the importance of aligning the diverse interests and expectations of stakeholders. Another crucial insight involves adapting solutions to the unique local context and regulations of each city while ensuring interoperability and integration. Clear and transparent communication about the benefits and risks of interventions is identified as a key factor for success. Additionally, the project underscores the need for establishing a common framework and methodology for the replication and scaling up of the model, fostering a systematic and efficient approach to urban innovation.

Impact

Some of the impacts of the REMOURBAN project are:

- More than 34% energy reduction and 50% CO2 emissions savings in the lighthouse cities, with follower cities then replicating similar interventions
- Improved quality of life and citizen satisfaction with the urban interventions.
- A replicable and scalable model for other cities to follow.
- Enhanced cooperation and knowledge exchange among smart city stakeholders.
- Increased awareness and engagement of citizens in sustainable behaviours.

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East Suffolk Smart Towns

Lowestoft & Felixstowe, England (2021)
Solution: Smart Towns

What was the challenge?

The East Suffolk market towns faced challenges arising from the impact of the COVID-19 pandemic, affecting local businesses and necessitating a recovery strategy. The goal was to digitally transform these towns to enhance economic sustainability, encourage business recovery, and adapt to the changing post-pandemic landscape.

How was it solved?

The East Suffolk Smart Towns project has secured £450,000 in funding, with £250,000 from the government and £200,000 from the New Anglia LEP's Innovative Projects fund. The initiative aims to implement digital town technology, such as free WiFi, footfall tracking sensors, analytics, and retail apps in Lowestoft and Felixstowe. Building on a successful trial in Framlingham, the project plans to extend to 11 market towns in East Suffolk, providing a digital infrastructure to support local businesses. The goal is to offer tools and assistance for these businesses to leverage the digital economy. The project aligns with the government's £900m Getting Building Fund, emphasizing digital platforms and economic recovery.

Lessons Learned

The collaboration between public funding and regional initiatives, particularly with the support of the New Anglia LEP, highlights the importance of partnerships to achieve ambitious projects. The focus on providing digital tools for businesses, such as enhanced websites and use of social media, serves as a model for other cities wishing to improve their digital infrastructure. The commitment to complete the project within two years reflects a dedication to rapid implementation for urgent economic recovery.

Impact

The introduction of free WiFi and footfall tracking will enhance visitor experiences, and data collected will enable towns to improve services and plan events effectively.

Local businesses will receive support through digital diagnostics, workshops, and coaching, fostering their adaptation to digital platforms and accelerating post-COVID recovery. The initiative aligns with broader economic goals.

The projects were expected to create 1,100 new jobs and safeguard an additional 2,900. They also set the towns up to access around £85m in private and public sector investment while providing more than 1,000 new broadband connections.

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Keynsham Town Centre Improvements

Keynsham, England (2022)
Solution: Active Travel

What was the challenge?

Keynsham Town Centre faced challenges related to the overall appeal, functionality, and heritage preservation of its High Street. Stakeholder engagement and public consultation identified the need for improvements to rejuvenate the town centre. Keynsham High Street Public Realm Improvements Phase 1 was initiated to address these challenges.

How was it solved?

The focus of Phase 1 was on the one-way system between Charlton Way and Bath Hill. It included footpath widening, resurfacing, improved signage, cycling and bus stop facilities, new street furniture, streetlights, landscaping, and trees. The enhancements aimed to create a more inviting and accessible public space. The project, initiated in June 2021, was completed in March 2022. Ongoing activities include the finalization of construction tasks and monitoring of public use. A Stage 3 Road Safety Audit was conducted, with recommendations to be addressed.

Lessons Learned

The iterative design changes based on feedback underscore the importance of community involvement in shaping public realm projects. The diverse funding sources, including partnerships with local councils and heritage-focused organizations, highlight the significance of collaborative efforts to execute complex urban improvement projects. The phased approach, with ongoing monitoring and assessments, allows for adjustments and ensures the success of the implemented changes.

Impact

The programme is expected to revitalise Keynsham Town Centre and contribute to a reduction in local emissions. The phase 1 improvements aim to enhance the overall aesthetic and functionality of the High Street, contributing to a thriving town centre for residents and visitors.

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Eco Roads: Recycled, Safer Travel

Alhendín, Spain (2023)
Solution: Sustainable environment

What was the challenge?

The challenge lies in addressing the substantial environmental impact of plastic waste in the EU, where an estimated 25 million tonnes of plastic waste is discarded annually. Despite the EU strategy on plastics in the circular economy and efforts to increase recycling rates, almost a third of this waste ends up in landfills, posing a threat to soil and water contamination. The low recovery rate of plastic, currently less than a third, indicates a significant gap in achieving recycling objectives.

How was it solved?

The LIFE4FILM project addresses the EU's plastic waste challenge, focusing on low-density polyethylene films. It proposes innovative recycling technologies, an optical separation technique, and advanced washing and extrusion processes to economically recycle these films. The project aligns with EU directives, aiming to enhance resource utilization. A pilot plant in Alhendín, Spain, is planned to produce over 500 kg of recycled polyethylene per hour, with an annual capacity of around 4,000 tonnes, demonstrating the project's viability.

Lessons Learned

The project teaches key lessons for sustainable road construction. It demonstrates the effectiveness of recycling materials, lowers asphalt temperatures for energy savings, underscores the importance of community engagement, emphasizes clear replicability guidelines, and advocates for a multidisciplinary approach to enhance overall project effectiveness.

Impact

The project has successfully demonstrated the feasibility of innovative porous asphalt pavements and low-noise surfaces. Utilizing recycled materials such as recovered pavements and crumb rubber from scrap tires, the initiative implemented these solutions in two pilot areas.

Through the design and testing of 12 new asphalt mixtures, incorporating recycled materials and employing lower process temperatures, the project achieved reduced environmental impact and lower emissions.

The constructed road sections not only showcased improved sound performance but also demonstrated enhanced safety features, including better water drainage and improved road/tyre adhesion.

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Shaping Cities, Sustainable Milestones

Laguna de Duero, Spain (2019)
Solution: Renewable energy

What was the challenge?

Over the intensive 5-year project period, CITyFiED (RepliCable and InnovaTive Future Efficient Districts and cities) faced challenges related to large-scale urban refurbishment, diverse building typologies, ownership models, district heating systems, and technological solutions for low voltage electricity distributed generation. Holistic interventions for district renovation needed to align with project objectives, emphasizing large-scale demonstration, replication potential, innovative methodologies, and effective dissemination.

How was it solved?

CITyFiED implemented tailor-made exploitation strategies, assessed the exploitation potential of results, and strategically deployed market-oriented approaches. In cities including Laguna de Duero, systemic approaches were employed for building retrofitting, district heating system upgrades, distributed low voltage generation, and monitoring. These comprehensive solutions are aimed at achieving substantial energy savings, very low energy buildings, and minimal CO2 emissions.

Lessons Learned

Comprehensive interventions in buildings, district heating, and monitoring are crucial for substantial energy savings. Community engagement and accessible documentation inspire other cities, while flexibility and global collaboration enhance impact. Continuous monitoring and knowledge exchange catalyze sustained change, promoting widespread adoption of sustainable practices in urban development.

Impact

The CITyFiED project successfully achieved a sustainable future for its demo sites, marked by substantial energy savings, very low energy buildings, and minimal CO2 emissions. The systemic approach in each city not only met ambitious energy targets but also held high replication potential.

CITyFiED's impact extended to a community of 59 European cities and organizations, fostering knowledge exchange and collaboration among citizens, associations, experts, and technicians. This collective commitment to sustainable urban development is documented in the CITyFiED Best Practice Book and CITyFiED monitoring platform, providing broader dissemination and inspiration.

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Sustainable energy and climate planning

Asenovgrad, Bulgaria (2022)
Solution: Energy Efficiency

What was the challenge?

The main objective of the SmartEnCity project was improve energy efficiency and increase supply of renewable energy by developing and implementing a highly adaptable and replicable systemic approach towards urban transformation through integrated planning and implementation of specific measures. The specific goals included enhancing building energy savings, improving street lighting, and harnessing biomass, solar, and wind energy.

How was it solved?

Asenovgrad participated in the SmartEnCity project and applied its framework. By using the project's methodology and Integrated Energy Planning (IEP), the city conducted thorough planning. It encouraged stakeholder involvement through workshops and discussions, engaging citizens in sustainable development planning. Additionally, Asenovgrad held individual meetings with representatives from residential buildings, offering guidance and support throughout administrative processes.

Lessons Learned

Involving citizens from the planning stage is crucial for successful project implementation. Regular participatory workshops and discussions enhance community understanding and acceptance of municipal initiatives. Aligning specific plans with broader municipal development strategies ensures better adoption and commitment from governing bodies.

Impact

Previous policy documents were updated and enriched. The city successfully integrated the Integrated Energy and Climate Plan into the Municipality's Development Plan, gaining approval from the Municipal Council.

Additionally, the creation of a clear roadmap for energy and climate objectives from 2020–2027 facilitated focused planning with specific targets and timelines. Citizen engagement led to the renovation of several residential buildings, demonstrating strong community involvement.

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MySmartLife

Palencia, Spain (2022)
Solution: Sustainable environment

What was the challenge?

The challenge was to make the cities more sustainable, inclusive and smart by reducing CO2 emissions, increasing renewable energy use, improving quality of life, and involving citizens in urban planning. The project aimed to achieve these goals through innovative technological and social solutions.

How was it solved?

The MySMARTLife project aimed to enhance sustainability, inclusivity, and smartness in cities through a holistic approach. Collaborating with city authorities, citizens, and industry partners, the project developed integrated urban planning strategies. Implementation involved introducing energy-efficient infrastructure, incorporating renewable energy sources, and deploying smart mobility systems. Citizen engagement played a key role, with residents actively participating in decision-making and co-creation of solutions. Continuous monitoring and evaluation assessed the impact on CO2 reduction, quality of life, and energy efficiency. The project also prioritized knowledge sharing, to enable other cities to replicate successful approaches.

Lessons Learned

Aligning the interests and expectations of diverse stakeholders such as city authorities, citizens, and industry partners proved essential for success. Adapting solutions to local contexts, regulations, and climate conditions was another key factor in ensuring effective implementation. The overarching lessons emphasize the significance of collaboration, adaptability, and transparency as fundamental elements for achieving sustainable urban transformation.

Impact

The MySMARTLife project key impacts include:

- Reduced CO2 emissions.
- Increased renewable energy use.
- Improved quality of life.
- Enhanced citizen engagement.
- Knowledge sharing for replication in other cities.

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Local Agenda 21 in Litoměřice

Litoměřice, Czech Republic (2022)
Solution:
Renewable energy, Citizen engagement

What was the challenge?

The challenge was to overcome the environmental and social problems caused by heavy industrialization in the past, such as air pollution, soil degradation, and low quality of life. The goal was to transform Litoměřice into a sustainable and attractive city, by implementing the Local Agenda 21 scheme and other actions.

How was it solved?

Through the implementation of a Local Agenda 21 scheme, the project devised a comprehensive local action plan, engaging citizens, businesses, and local authorities. Environmental remediation efforts targeted air pollution, soil degradation, and water quality issues, while urban regeneration initiatives revitalized public spaces, improved mobility, and enhanced green infrastructure. Community engagement played a pivotal role, involving residents in decision-making processes and awareness campaigns. The project also prioritized monitoring and adaptation, continuously evaluating progress and adjusting strategies as needed. Ultimately, the overarching goal of the STARDUST project was to create a resilient and vibrant urban environment, ensuring a sustainable legacy for both current and future generations.

Lessons Learned

The implementation of mobility solutions in Litoměřice concluded that the existing manual IT service system lacked proper processes, procedures, and systems, prompting the adoption of an automated ITIL solution that incorporated best practices for IT service management. Integration issues emerged during implementation, particularly in relation to Oracle fixed assets and discrepancies in financial data regarding assets.

Impact

The impact of the project on Litoměřice is as follows:

- Improved air quality: The use of electric vehicles and bicycles reduced the emissions of greenhouse gases and particulate matter in the city.
- Increased public awareness: The citizens were involved in the co-creation of the mobility solutions and learned about the benefits of sustainable transport.
- Enhanced urban mobility: The use of smart parking, car-sharing and bike-sharing improved the accessibility and efficiency of the transport system.

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City Changer Cargo Bike (CCCB)

Alba Iulia, Romania (2022)
Solution:
Sustainable Mobility

What was the challenge?

Alba Iulia aimed to address issues related to traffic congestion, environmental sustainability and efficient logistics, while aligning itself with its smart and green city goals. The aim was to present and promote cargo bikes as an alternative to urban transport. The challenges involved a lack of clear regulations and infrastructure for cargo bikes, as well as limited public awareness.

How was it solved?

In the City Changer Cargo Bike project, the city identified target user groups, conducted trials, and collaborated with local stakeholders to assess and support cargo bike viability. Strategic partnerships with the Ministry of Regional Development and Public Works resulted in the creation of cargo bike-specific regulations. The city also implemented essential infrastructure improvements, including bike lanes and charging stations, while organizing workshops and events with local influencers to promote the sustainability of cargo bikes.

Lessons Learned

Close collaboration with government bodies is key to establishing clear regulations and infrastructure for innovative transport methods such as cargo bikes. In addition, continuous evaluation of infrastructure, policies and user input is crucial to the success of such urban transport initiatives.

Impact

The initiative significantly increased cargo bike usage for logistics, tourism, and recycling activities.

It improved the city's transportation setup with better bike lanes, parking, and infrastructure, facilitating cargo bike integration. Specific regulations were established, ensuring legal, safe, and sustainable cargo bike operations.

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Stirling Station Redevelopment

Stirling, Scotland, United Kingdom (2023)
Solution:
Sustainable Mobility

What was the challenge?

Promoting safer pedestrian and cycling options to boost sustainable transport uptake, aligning with the Scottish Government's net-zero emissions goal by 2045. The redevelopment aimed to improve interconnectivity between active travel modes and public transportation, providing enhanced facilities and accessibility. Completed in time for the UCI Cycling World Championships in August 2023, the project contributed to both environmental objectives and overall station improvements.

How was it solved?

A secure CyclePoint was established, contributing 140 new cycling parking spaces to the station, bringing the total to over 200. Infrastructure improvements focused on safety and traffic flow, including the removal of a roundabout, the introduction of a new entrance, and upgraded parking systems. Internal upgrades within the station involved the installation of accessible toilets and improved customer waiting areas, collectively enhancing both the cycling facilities and overall functionality of the station.

Lessons Learned

The project's success was driven by effective collaboration among stakeholders, including the Scottish Government, Sustrans, Stirling Council, Network Rail Scotland, and Serco Group. The emphasis on sustainable transport aligns with broader environmental goals at different levels. Replicating the solution in other cities could involve partnerships, diverse funding sources, and integration with city development plans, emphasizingimportance of creating attractive spaces for pedestrians.

Impact

The impact of the use case was substantial. The redevelopment positively influenced the overall travel experience, making Stirling a more appealing destination.

The project aligned with the 'Walk, Cycle, Live Stirling' scheme, promoting active travel and contributing to a greener, healthier commuting approach.

The removal of the roundabout, addition of parking spaces, and upgraded customer facilities contributed to a safer, more accessible, and visually appealing station.

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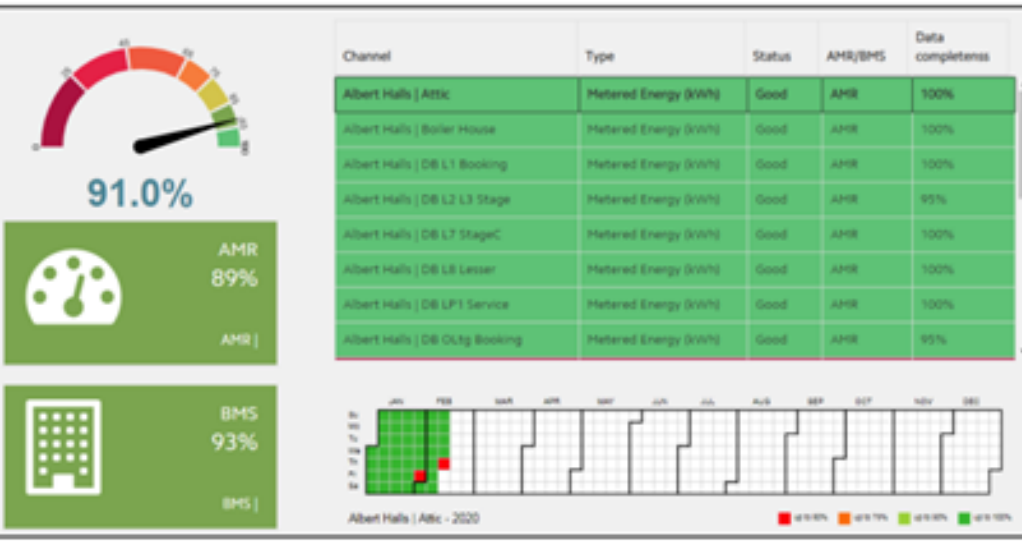
Stirling Smart Energy Project

Stirling, Scotland, United Kingdom (2019)
Solution: Energy



What was the challenge?

Gathering energy data from the variety of channels and sources operating within Stirling Council buildings and sites into one single repository is essential to improving the facilities, mechanisms, processes, and procedures used to identify energy wastage. This innovative service also supports work to identify opportunities for energy consumption reduction on a more timely basis.

How was it solved?

This project has enabled data generated from Stirling Council's energy monitoring assets to be captured on a central management platform – The Energy Hub.
The Hub operates as a single point for monitoring and reviewing peak energy use in addition to providing details of real-time renewable energy generation at Stirling Council buildings and sites. The Hub also supports the development of reliable and meaningful predictions on future energy consumption, resultant decreases in emissions, or any associated cost reductions.

Lessons Learned

Scoping for the Energy Hub, identifying what technology is needed, and interconnectivity between various hardware required seamless connection to the Energy Hub platform from onset. Some of the hardware could not directly interface with other software for data sharing and required additional hardware before data export was possible. This had direct cost implications. Project learning on best methods to identify and evaluate technological needs during project scoping, based on the type and format of data needed.

Impact

Energy budgets and energy consumption will be reduced for the 30 sites – however, this has been difficult to quantify due to the impact of energy price increases during 2021/22.

Reduced carbon emissions will be realized for the buildings on the Hub but staff resources are required to monitor and develop the reporting and alerts. With fewer emissions being produced our environment and air quality will improve. Air quality is monitored separately from this project.

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Cradlehall-Inverness Campus Active Link

Inverness, Scotland, United Kingdom (2023)
Solution: Active Mobility

What was the challenge?

This project builds on an existing path that already saw some use, thought it had only been a dirt track. Thus, it had been previously recognised as a possible opportunity in the Inverness East Masterplan. It serves to add a convenient connection in Inverness's already existing active travel network from the east, adding another car-free option so that people can choose among more sustainable transport options to complete their everyday journeys.

How was it solved?

The link was built as part of the Scottish Government-funded Low Carbon Travel and Transport Challenge. The route was selected as it was already in use to a limited degree and tied in well to existing paths. The new route connects the National Cycle Network in the East of Inverness directly into Inverness Campus, where people walking, wheeling and cycling can enjoy high-quality onward links with the city centre via the Golden Bridge and Raigmore Active Travel Link to Millburn Road, and to the employment, retail and leisure facilities located around Eastfield Way..

Lessons Learned

This project took advantage of a route that was already informally in use and upgraded it to make the route more accessible and safer so that more people choose to use the route.

Impact

The link was only recently implemented and as such there is not yet full data available on the impacts of the project.

Ideally, it will be used by people traveling for work and for leisure purposes, both for needed trips to the campus, city centre and retail park and for people wanting to spend more active time outdoors.

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Sustainable mobility and commuting

Växjö, Sweden (2020)
Solution:
Sustainable Mobility

What was the challenge?

Växjö targeted sustainable commuting and sought to enhance its transport planning by emphasizing citizen involvement and intermodal transportation.

How was it solved?

As part of the SUMBA project, the city undertook several strategic actions to enhance its transportation system. Firstly, it conducted a comprehensive analysis of its current status through benchmarking and SWOT analysis. Subsequently, the city collected relevant data and employed appropriate tools to plan and model its transport system effectively. This involved the development and updating of key components such as the Traffic Model, Transport Forecasting Model, Commuting Master Plan, and Transport Plan. Additionally, the city introduced an innovative initiative known as the Bicycle Library, offering residents a try-before-buy service to test various bikes, including cargo and electric assist options, for commuting or other transportation needs.

Lessons Learned

The successful implementation of innovative measures highlighted the potential for encouraging sustainable commuting habits. It also underscored the importance of ongoing evaluation and adjustment of transport models to align with changes in urban landscapes and transportation needs.

Impact

The initiative encouraged residents to opt for sustainable transport for commuting purposes, reducing car trips. Moreover, the introduction of the Bicycle Library was successful in engaging citizens and led to the development of a guide for other municipalities aiming to implement similar programs.

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Advancing Sustainable Mobility

Drama, Greece (2020)
Solution:
Sustainable Mobility

What was the challenge?

Promoting cycling in Greece faced hurdles due to a car-oriented culture, inadequate infrastructure, and geographical constraints like hills and heat. The goal was to promote cycling to reduce emissions and enhance urban sustainability.

How was it solved?

Under the Cyclurban project, a multifaceted approach was adopted to promote sustainable transport through cycling. Workshops were organized, engaging experts, citizens, and officials to comprehensively evaluate the existing cycling landscape, identify opportunities, and devise strategic plans. Surveys were conducted to gain insights into cyclist preferences, informing the development of targeted and cost-effective policy recommendations. These recommendations were specifically tailored for Greek decision-makers, aiming to provide practical support for the implementation of cycling initiatives and foster a more bike-friendly environment.

Lessons Learned

The Cyclurban project in Drama has made a significant contribution to the debate on cycling in Greece by addressing the national as well as the local level continuously highlighting the importance of sustainable mobility in workshops and consultation with ministries, municipalities and local stakeholders.

Impact

The initiative successfully proposed the National Policy Recommendations (NPR), advocating lower speed limits, traffic calming measures and improved infrastructure to promote bicycle use and shared road use policies.

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Solar power promotion hub

Poreč, Croatia (2023)
Solution: Energy Efficiency

What was the challenge?

Poreč aimed to increase solar energy use and facilitate the installation of new solar roofs. The challenge was the lack of accessible guidance for locals interested in installing their own solar power systems.

How was it solved?

The city recognized the gap and, under the Balkan Solar Roof campaign, launched the Poreč Sunny Office. This physical space provided citizens with free advisory support, educational workshops, and technical guidance regarding solar energy systems. Through the Poreč Sunny Office, individuals could obtain information on solar basics, installation procedures, and available funding sources.

Lessons Learned

The Poreč Sunny Office showcased the vital role of accessible, localized support in driving sustainable initiatives. It emphasized the value of direct, hands-on assistance in bridging knowledge gaps and encouraging community engagement with renewable energy solutions.

Impact

The city empowered its community to embrace sustainability, by raising significant awareness citizens were equipped to make informed choices regarding solar energy options.

Moreover, Poreč gained international recognition, spotlighting its commitment as a model city dedicated to sustainable energy practices.

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Renewable Power-to-Heat

Hajnówka, Poland (2023)
Solution: Energy Efficiency

What was the challenge?

The heating system in Hajnówka heavily depended on a CO2-intensive coal-based infrastructure. The challenge was to transition to an affordable and sustainable heat supply for the city.

How was it solved?

The city implemented the Renewable Power-to-Heat project. This initiative conducted a feasibility study to assess the potential of substituting coal-based heating with renewable energy sources and to identify existing barriers to this transition. Furthermore, the study proposed various solutions, including improvements in infrastructure planning and regulatory updates, alongisde strategies for attracting both public and private investments.

Lessons Learned

In-depth studies and collaborative efforts are crucial in navigating challenges linked to renewable energy adoption. Pilot projects that succeed can serve as practical templates for achieving sustainability on a larger scale.

Impact

The results of the feasibility study showed a potential reduction in CO2 emissions of up to 84%, with stable heating prices for consumers during the period of operation.

In addition, the study outlines a plan for the transition to a decarbonized heating system, intended to serve as a model for similar transformations in other Polish regions.

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Solar energy planning and development

Koper, Slovenia (2022)
Solution: Energy Efficiency

What was the challenge?

As part of the Solar Adria project, the aim was to promote the adoption of solar energy along the Adriatic coast. The challenges mainly centred around the lack of knowledge bases, tools and a support structure for developing solar energy projects in urban areas. The aim was to establish an inclusive and efficient planning framework to incentivise the deployment of solar energy projects while aligning with EU and national climate targets.

How was it solved?

Through participative planning, the city identified knowledge gaps and determined the essential tools needed for the successful implementation of solar initiatives. The local solar potential was then systematically mapped, gathering crucial data crucial for the deployment of solar projects. Subsequently, the city drafted vital project documentation, including feasibility studies and business models, to ensure the viability and sustainability of the endeavors. As part of a broader initiative, Koper also pioneered the development of an online platform facilitating partnerships in urban solar development across municipalities, fostering collaboration in the pursuit of sustainable energy solutions.

Lessons Learned

The implementation of national renewable energy policies at the local level depends on the central role of municipalities. The use of evidence-based strategies, such as the use of solar maps, is crucial for defining practical and achievable renewable energy goals customised to the local context.

Impact

The Solar Adria project established an online matchmaking platform that calculated solar production potential, estimated project costs, and facilitated necessary document downloads for urban solar project implementation.

This collaborative space enabled diverse stakeholders to engage, fostering increased acceptance and implementation of renewable energy solutions in Koper.

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Living Streets for Climate Engagement

Óbidos, Portugal (2022)
Solution: Energy Efficiency

What was the challenge?

Living Streets aims to transform urban planning by addressing challenges in citizen involvement and hierarchical structures, with a focus on sustainable mobility. The project seeks to bridge capacity gaps in local authorities and empower citizens in climate and energy problem-solving. Additionally, it collects citizen feedback to inform local spatial and mobility planning.

How was it solved?

Living Streets effectively transformed urban spaces by temporarily closing streets to motor vehicles, fostering social gathering places for citizens to engage with local climate projects. The initiative brought together elected representatives, civil servants, and citizens across 8 cities in Portugal, Croatia, and Greece, promoting a paradigm shift in mobility and urban planning. The Living Streets concept was disseminated through 15 workshops and webinars, training 335 representatives in citizen participation, fostering a culture of inclusivity in sustainable urban development.

Lessons Learned

Living Streets emphasized the importance of citizen involvement in driving enduring urban change through short-term initiatives. Leadership commitment, exemplified by 25 mayors, is identified as crucial, and knowledge sharing is highlighted for enhancing sustainable planning. Positive impacts on municipal development are observed through investments in sustainable mobility, as exemplified in Faro and Torres Vedras. The project's adaptability and replicability underscore the significance of flexible models for successful community-centric urban initiatives.

Impact

The Living Streets initiative gained strong support, with 25 mayors committed to replicating it. Knowledge from Living Streets influenced sustainable mobility plans in Corinth, Elliniko-Argyroupoli, Argos-Mycenae, and Aigialeia.

Faro's plan for a similar initiative and Torres Vedras' investments in sustainable mobility showcased enduring influence. Óbidos saw temporary changes become permanent, integrated into the Climate Change Action Plan, highlighting Living Streets' lasting impact on urban development.

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Urban Cycling for Climate Mitigation

Velika Gorica, Croatia (2020)
Solution:
Sustainable Mobility

What was the challenge?

Velika Gorica faced a significant challenge in establishing an effective cycling policy and infrastructure to mitigate greenhouse gas emissions in the transport sector.

How was it solved?

The Cyclurban project implemented various measures to enhance cycling as a sustainable mode of transport. Workshops were conducted with experts, citizens, and officials to evaluate the current cycling landscape, identify opportunities, and strategize for sustainable transport. Stakeholders were identified, and a Bicycle Policy Audit (BYPAD) was conducted, resulting in a consensus on the city's cycling policy score and pinpointing priority areas for improvement. The project further contributed by drafting tailored policy recommendations for Croatian decision-makers, aiming to provide practical support for the advancement of cycling initiatives in the region.

Lessons Learned

The BYPAD serves as a tool for authorities to assess and enhance the effectiveness of their cycling strategies. A low initial BYPAD score highlighted deficiencies in the city's cycling policy, requiring immediate action and coordination among stakeholders. This initiative stands as a model, motivating other cities to undertake comparable audits akin to BYPAD.

Impact

The initiative successfully set clear goals and proposed changes aimed at creating a supportive framework for cycling infrastructure, potentially impacting urban mobility nationwide.

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Demand-Responsive Transport

Osijek, Croatia (2020)
Solution:
Sustainable Mobility

What was the challenge?

The challenge in Osijek centred on the lack of an integrated and efficient transport system. The depopulation in certain areas and the absence of a framework for demand-responsive transport intensified the need for diverse and adaptable transport solutions.

How was it solved?

Within the framework of the SHAREPLACE project, the city undertook several key initiatives. Firstly, efforts were made to identify barriers and conditions that impede the widespread adoption of Demand-Responsive Transport (DRT) bus service. Subsequently, the city worked on developing comprehensive guidelines and recommendations for establishing a DRT bus service framework in Croatia. As part of a broader testing phase, a multimodal trip planning service was implemented, incorporating national railway, urban public transport (bus and tram), and the FlixBus GTFS database. This testing phase also involved exploring potential future integration possibilities for bike and car-sharing services within the overall transportation system.

Lessons Learned

The project highlighted how open-source solutions can effectively adapt and contribute to diverse mobility strategies. Additionally, it emphasized the need for cohesive planning frameworks to integrate new mobility services, underscoring the importance of strategic coordination for successful implementation.

Impact

Osijek significantly improved connectivity between different transport modes, facilitating smoother local, regional, and transnational movements. This addressed longstanding accessibility issues in the region.

The project's success provided replicable models and valuable insights for future mobility strategies and networks.

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Adaptive, Data-Driven Commuting

Weiz, Austria (2021)
Solution:
Sustainable Mobility

What was the challenge?

As cities grapple with daily congestion, air pollution, and traffic-related issues during peak hours, the SMART COMMUTING project undertakes the challenge of transforming commuting habits for a more sustainable urban transport system. The project recognizes the multifaceted reasons for car reliance, from cultural norms to inadequate infrastructure, and aims to pioneer a holistic planning approach for energy-efficient transport in collaboration with various stakeholders.

How was it solved?

In Weiz, the SMART COMMUTING project creatively addressed challenges by shifting focus to promote an existing railway service. The city-specific feasibility study led to tailored measures, such as improved timetables and access routes, resulting in reduced car traffic and CO2 emissions. The success in Weiz serves as a model for future transport strategies, including analyses of bus travel and other potential railway lines.

Lessons Learned

“SMART COMMUTING in Weiz taught us the value of adaptability, data-driven decisions, and community-centric approaches, demonstrating that positive outcomes, strategic investments, and stakeholder engagement are vital for successful and sustainable urban transport initiatives.”

Impact

- Successfully encouraged sustainable commuting, reducing car use and emissions.
- Increased railway usage and improved commuter access in Weiz.
- Implemented measures cutting local car traffic and CO2 emissions.
- Enhanced accessibility for businesses and schools, providing community benefits.
- Leveraged study insights for broader initiatives, including bus travel analysis.
- Stimulated practical investments, fostering positive infrastructure changes.

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Pioneering Mobility for Improved City Life

Banska Bystrica, Slovakia (2019)
Solution:
Sustainable Mobility

What was the challenge?

Banská Bystrica faces the global issue of increasing individual transport, compounded by daily traffic jams, a shortage of 10,000 parking spaces, and the complex task of shifting transport habits and motivating healthier lifestyles among City Office employees. Overcoming these challenges is vital for the success of the MOVECIT project and for setting an example that inspires broader organizational change.

How was it solved?

The initiative involved engaging employees through online surveys and interviews to gather insights on sustainable commuting measures. A thorough data analysis, considering internal and external mobility conditions and employee input, provided a clear understanding of the current state of mobility. Categorizing measures into “soft” and “hard” options, with consideration for financial aspects, aimed to balance feasibility. The overall focus was on enhancing accessibility and making sustainable commuting options more attractive for City Office workers.

Lessons Learned

Employee involvement in planning, including improved biking facilities, ensures effective measures. Aligning with European trends enhances the city’s reputation, while proactive support for carpooling addresses traffic issues. A holistic approach to traffic problems through sustainable mobility reflects forward-thinking strategies beyond road expansion. Fostering environmental awareness among self-government workers is crucial for sustainable commuting.

Impact

The MOVECIT project in Banská Bystrica successfully reduced car dependence, improved the quality of life for employees, and established the city as a pioneer in sustainable mobility, fostering a culture of environmental awareness and modern commuting trends.

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Low-Carbon Airport Accessibility

Dubrovnik, Croatia (2019)
Solution:
Sustainable Mobility

What was the challenge?

Improve the landside accessibility of its airport in the context of growing air traffic, involving issues related to energy consumption, environmental impacts, and mobility behaviors of airport passengers and employees. The challeng included optimizing transportation links, enhancing connectivity, and implementing low-carbon mobility solutions for the increasing number of passengers and employees in the airport system.

How was it solved?

The initiative adopts a multifaceted approach to promote sustainable transportation to and from the airport. This includes introducing electric mobility options, developing air-rail links, encouraging non-motorized transport like walking and cycling, implementing shared mobility services, integrating intelligent transport systems, improving airport wayfinding for streamlined passenger movements, and enhancing public transport options. These measures collectively aim to reduce carbon emissions associated with conventional transportation and foster a more sustainable travel experience.

Lessons Learned

Identifying infrastructure challenges is crucial as transport demand exceeds road capacity, leading to congestion and environmental issues. Recognizing the dominance of buses guides integration efforts, emphasizing the need for innovative solutions like integrated ticketing and strategic promotion of electric mobility to align with sustainability goals. Holistic approaches to integration and innovation are underscored, emphasizing the importance of a comprehensive Integrated Transport Study for understanding and improving transport systems systematically.

Impact

The initiatives in Dubrovnik-Neretva County, addressing transport challenges through innovations like car-sharing and electric mobility, aim to revolutionize accessibility.

Integrating diverse modes of transport and fostering sustainable practices are poised to significantly reduce reliance on private cars, promoting a shift towards eco-friendly alternatives. The proposed Integrated Transport Study further signifies a commitment to informed decision-making, laying the groundwork for an optimally integrated public transport system.

These endeavors collectively contribute to a more sustainable and efficient mobility landscape, aligning with global environmental objectives.

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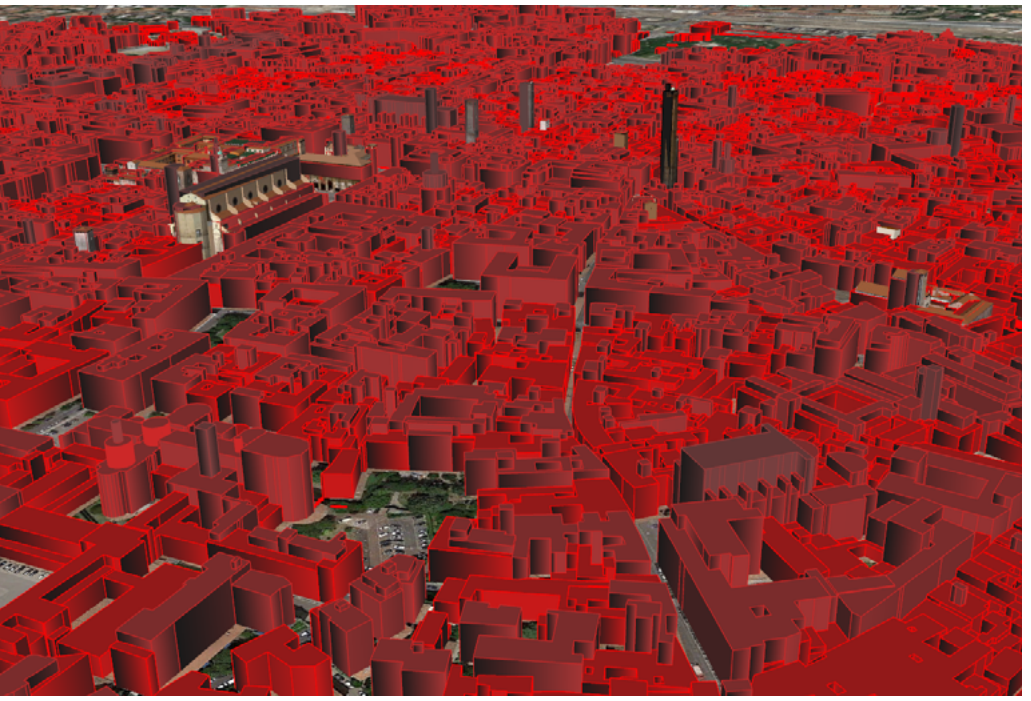
Building Energy Enhancement Strategies



Judenburg, Austria (2020)
Solution: Energy Efficiency

What was the challenge?

The challenges faced by the pilot action in Judenburg, summarizing the key aspects of balancing energy classes, integrating heating systems, preserving architectural integrity, ensuring long-term ownership, managing budget constraints, and minimizing disruptions. It conveys that these challenges are being navigated with the overarching objective of enhancing energy efficiency in a sustainable and effective manner.

How was it solved?

By investing in the automation of the heating control system, implementing smart metering, integrating the 3D Energy Management System, and conducting staff training, the pilot action has successfully addressed the agreed objectives. These solutions collectively contribute to the improvement of the energy system, effective monitoring of buildings' data, increased comfort, easier operation, and the promotion of knowledge about energy efficiency measures in buildings.

Lessons Learned

The project's impact spans energy efficiency, user satisfaction, streamlined operations, knowledge dissemination, and positive environmental contributions. A holistic strategy, including automation, smart metering, and training, proves beneficial for achieving energy efficiency and user satisfaction. Smart metering emphasizes data-driven decisions, and staff training fosters a culture of energy efficiency. Flexible automation adapts to diverse building structures, and regular data monitoring ensures maximum efficiency. Stakeholder engagement is vital, and long-term success depends on a balanced blend of technology, user behavior, and ongoing training.

Impact

The project's impact extends across various facets, including energy efficiency, user satisfaction, streamlined operations, knowledge dissemination, demonstration of best practices, long-term sustainability, and positive contributions to environmental goals.

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Sustainable Public Buildings Beacon

Chrastava, Czech Republic (2022)
Solution: Energy Efficiency

What was the challenge?

Chrastava faced the challenge of minimizing energy consumption in its public buildings, a common issue for many municipalities. The city needed reliable solutions and integrated approaches to achieve significant energy savings without resorting to extensive construction projects. The lack of readily available, tailored strategies and tools presented a hurdle in efficiently addressing energy efficiency concerns in existing public infrastructure.

How was it solved?

Chrastava addressed the challenge of enhancing energy efficiency through a comprehensive approach, combining technical solutions like GIS browser maps and energy efficiency smartphone apps with non-technical elements such as innovative financial models and renewable energy strategies. This holistic strategy streamlined efforts and provided a diverse toolkit for sustainable practices, contributing to the success of the TARGET-CE project.

Lessons Learned

Chrastava's involvement in TARGET-CE highlighted the significance of centralizing and sharing energy efficiency knowledge through platforms like OnePlace. The success of the OnePlace platform demonstrated that collaborative efforts in consolidating best practices, expert databases, strategies, and tools contribute significantly to effective energy management, fostering a culture of sustainability in public buildings and empowering local communities.

Impact

The TARGET-CE project successfully transformed energy practices in Chrastava and participating regions, implementing innovative ICT solutions, financial models, and strategies, fostering energy efficiency in public buildings and providing a model for sustainable development in the central European context.

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Unified Low-Carbon Energy Planning

Ludwigsburg, Germany (2019)
Solution: Energy Efficiency

What was the challenge?

The project faces the challenge of aligning diverse low-carbon energy strategies across seven countries, including Ludwigsburg. Tailoring Ludwigsburg's strategy to harmonize with the regional framework demands precision. Balancing local needs with the broader goal of enhancing low-carbon energy planning poses a nuanced challenge. Success hinges on ensuring Ludwigsburg's approach not only meets local nuances but also aligns seamlessly with regional efforts, fostering an integrated, collective impact for effective climate change mitigation in Central Europe.

How was it solved?

Through the CitiEnGov project, Ludwigsburg has strengthened its energy infrastructure by establishing and reinforcing energy departments, updating energy strategies, and developing an implementation plan for the Climate, Energy, and Europe Office. The city actively engages its community through events, including the "Sustainability (ba) rockt" competition, promoting ecological footprints reduction. A mobile energy-saving house educates citizens on sustainable practices. Financial support has been allocated for updating Ludwigsburg's energy concept through international exchange. The city has conceptually integrated climate protection and adaptation strategies, forming a comprehensive and promising overall strategy for sustainable development.

Lessons Learned

Succinct lessons highlight the importance of empowerment, strategic alignment, actionable plans, citizen engagement, competitions, education, international collaboration, and holistic integration for successful urban energy projects.

Impact

CitiEnGov transformed Ludwigsburg's energy landscape, empowering departments, optimizing strategies, raising public awareness, and fostering sustainability, resulting in a resilient and future-ready city.

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Photovoltaic system integration

Bračak, Croatia (2020)
Solution: Energy Efiiciency

What was the challenge?

Following from a full reconstruction and restoration project in 2017 (which followed best practices in renewing heritage on the principle of energy efficiency), the aim of the Bračak Manor pilot within the STORE4HUC project was the implementation of a central battery (bank) system, installation of a photovoltaic system, and integration of it to an advanced Energy management system (EMS).

How was it solved?

The meticulous integration process seamlessly combined new components with existing systems, including the wood pellet boiler, micro CHP, and air-water heat pump. The Central Energy Management System (EMS) aggregated data for real-time decision support, ensuring technological compatibility with historical preservation requirements. Economic and ecological optimization through energy management allowed for informed decision-making, minimizing environmental impact on historical sites. The project's successful implementation demonstrates the feasibility of integrating innovative technologies into historical urban sites, inspiring similar initiatives.

Lessons Learned

Successful energy management at Bračak Manor highlighted the critical lessons of holistic integration, emphasizing the pivotal role of an Energy Management System (EMS) for real-time coordination, predictive cost management, and the delicate balance between preservation and innovation in historical settings, emphasizing the importance of community engagement, continuous monitoring, and thorough documentation for future knowledge sharing.

Impact

The implementation of comprehensive energy management at Bračak Manor had a transformative impact, fostering seamless integration, optimizing cost management through predictive tools, and demonstrating the delicate balance between preservation and innovation in historical settings.

The project underscored the pivotal role of community engagement, continuous monitoring, and thorough documentation, leaving a lasting impact as a model for sustainable energy initiatives in similar historical contexts.

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Paraffin based latent storage

Lendava, Slovenia (2021)
Solution: Energy Efiiciency

What was the challenge?

The pilot in Lendava within the STORE4HUC project successfully integrated a paraffin-based latent storage system with a geothermal heating system in a historic library. Challenges included preserving the 1906 neo-baroque architecture, replacing an outdated heating boiler, and integrating the new system into the existing geothermal grid. Despite these complexities and the additional goals of achieving CO2 reduction targets and adopting innovative technology, the project succeeded in modernizing heating systems while maintaining the library's historical integrity.

How was it solved?

The project successfully connected the building to a geothermal district network using strategically installed pre-insulated pipes. Two 1000-liter steel storage tanks filled with paraffin-based phase-change material were installed for efficient energy storage. This resulted in a substantial 60 MWh reduction in fossil fuel consumption and a 16.8-ton reduction in CO2 emissions. The integration of geothermal energy contributed to the exploitation of 57 MWh of renewable energy, achieving a 5.5% or 3 MWh improvement in energy efficiency.

Lessons Learned

The project stressed the importance of real-time data and innovative energy storage solutions. Involving political decision-makers and the public sector was crucial for project promotion and policy integration. A central control system enhanced communication of energy outcomes, emphasizing the need for valid data. Establishing a culture of continuous improvement and clear communication of energy was a result.

Impact

The pilot project's comprehensive approach, incorporating data-driven decision-making, technological advancements, policy integration, transparent communication, enhanced credibility, a culture of continuous improvement, and increased stakeholder support, has collectively transformed energy management practices, setting a significant benchmark for sustainable initiatives.

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Inclined Lift Energy Efficiency Pilot

Cuneo, Italy (2022)
Solution: Energy Efficiency

What was the challenge?

Creating a seamless integrated system for the inclined lift in Cuneo posed challenges in coordinating various elements and constructing support structures. Optimizing energy efficiency, especially during braking and load imbalances, required overcoming technical hurdles. Additionally, integrating a small solar field demanded precise coordination within the system, addressing issues related to power supplementation.

How was it solved?

The STORE4HUC project pilot in Cuneo highlights meticulous system integration, leveraging construction expertise to address challenges, and implementing sophisticated energy storage systems for optimized energy utilization. The use of innovative technologies ensures the creation of a stand-alone system independent of the power supply network, enhancing operational flexibility and safety during network power failures. The project is aligned with sustainable mobility goals, demonstrating a commitment to optimizing energy resources and supporting the municipality's sustainable mobility strategy.

Lessons Learned

Integrating a photovoltaic field system highlighted crucial lessons for future renewable projects. Early authorization initiation, efficient documentation, and timely expert engagement were emphasized. Proactive communication, consideration of holidays, and streamlined data processes were identified to prevent delays. Continuous monitoring, sector collaboration, and holistic project planning, including post-construction tasks, were recognized as vital for success and efficiency in renewable energy endeavors.

Impact

This system enhances energy efficiency and reduces carbon emissions, positively influencing the public transport system's operation. It also improves safety during network power failures.

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EV Charging Installation and EasyGo

Carlow, Ireland (2022)
Solution: Urban Mobility

What was the challenge?

EV charging infrastructure can be difficult to find, especially in densely populated areas. This is a growing issue, as according to the Society of the Irish Motor Industry, in 2022 1 of 7 cars sold in Ireland was electric. Transportation also accounts for 20.6% of County Carlow's emissions as calculated in their 2018 BEI.

How was it solved?

Hundreds of former telephone booths across Ireland operated by Eir were planned to go out of service after Ireland lifted the Universal Service Obligation requiring that eir operate such booths in 2020, and EasyGo is working to convert these booths into 50kW DC fast chargers and Dual 22kW destination chargers. EasyGo and eir piloted this programme in County Carlow with the delivery of seven charging stations in Carlow Town, Bagenalstown, Borris, and Tullow.

Lessons Learned

To fit the relatively small footprint of the phone booths, smaller chargers had to be found. It took a significant amount of time to find the optimal locations for placing the charging bays. The project was led on the CCC side by the Roads Department and they worked with CCC's Active Travel and Public Realms teams and the Municipal District Area to avoid any conflicting projects in the potential locations.

Impact

There are now six additional charging stations for residents of and visitors to County Carlow. This has the effect of increasing confidence in choosing to use electric vehicles and reduces range anxiety.

There is the possibility of spillover increased footfall near the chargers while users wait for their cars to charge.EasyGo was responsible for the costs of the project outside of the time spent by Carlow County Council (CCC) staff in meetings and decision-making.

The data from the charging stations will be provided to CCC. Overall, this pilot is a further step towards reaching Ireland's emission reduction targets.

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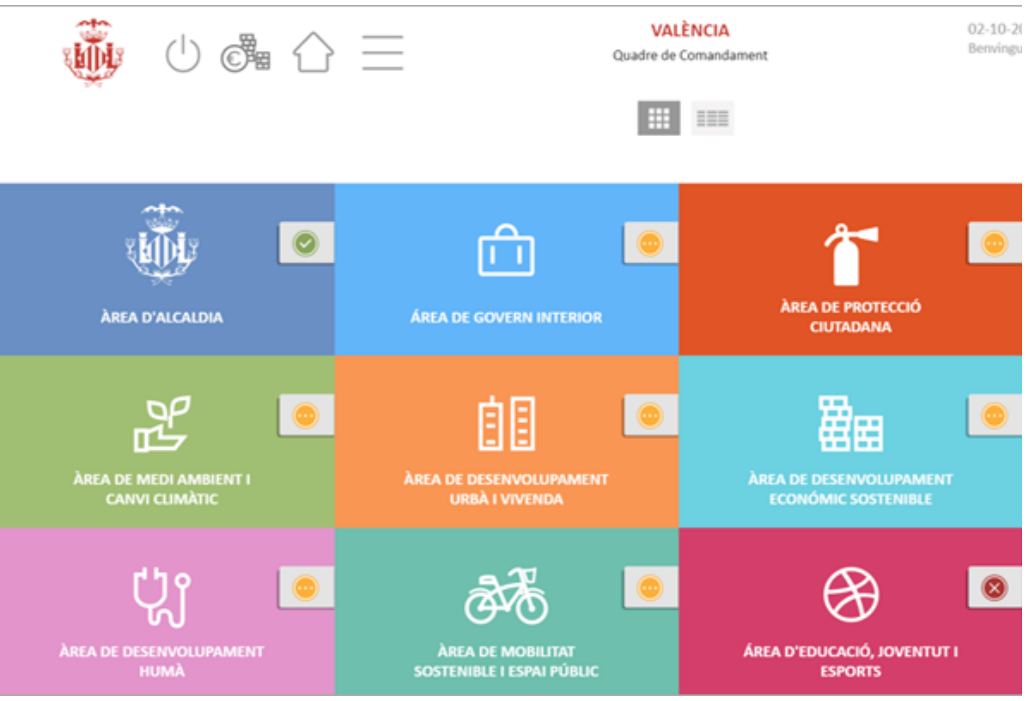
Electric vehicle recharging system



Valencia, Spain (2022)
Solution: Mobility & Energy

What was the challenge?

The project's mobility axis faced diverse challenges, including meeting citizen demand for electric vehicle charging, strategic acquisition of municipal vehicles with eco-sustainable contracts, expanding the electric and hybrid EMT fleet, creating synergies with lighting services, and adapting to regulatory changes, notably the "Entre Gestor de Cargas" outlined in Royal Decree-Law 15/2018.

How was it solved?

An intelligent and comprehensive electric vehicle charging management system will be developed and implemented in the city of Valencia. This action includes the supply and deployment of semi-fast charging posts (22 kW) and fast charging posts (50 kW), as well as the necessary software for their management (posts, electric vehicles, charges, etc.). The location of these posts will be carried out according to the needs proposed by the Sustainable Mobility Area of the València City Council.

Lessons Learned

The Impulso VLCi project's Critical Availability Service in the mobility axis yielded crucial lessons for future strategies. Key takeaways include acknowledging the unique demands of 24/7 critical availability services, necessitating distinct requirements and a robust municipal business management and maintenance strategy. The experience emphasized the need for new resources in economic management and invoicing, emphasizing seamless integration between municipal systems.

Impact

It has resulted in more electric car buyers in Valencia, with the demand for more public charging points. Interest in electromobility has increased, as seen at the 2022 Auto Show. In the Valencian Community, registrations of pure electric passenger cars has increased by 54.9% in 2022.

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Smart public parking

Meliana, Spain (2022)
Solution: Urban Mobility

What was the challenge?

Sensorize the parking lot of Plaza de la Libertad with 50 parking spaces with sensors in each space, warning signs at the entrances of the town and a real time app that warns of free spaces to reduce unnecessary emissions from cars.

How was it solved?

The system has intelligent parking sensors that detect vehicles parked in the spaces where it is installed to obtain real-time information on parking availability thanks to a magnetic detection system. The device is placed directly on the road surface so vehicles can be placed on the public sensor. It communicates with the electronic signage at the entrance of the locality and the APP notifying the parking spaces in real-time.

Lessons Learned

The implementation of parking facilities is a straightforward process, primarily reliant on the efficiency of the executing team. However, it becomes crucial to factor in meteorological conditions, particularly in regions prone to flooding during heavy rainfall. Remarkably, the current execution is seamless, requiring minimal and cost-effective maintenance. It is imperative to consider the existing connectivity infrastructure in the locality, such as LoRa, to ensure optimal functionality and integration with modern technologies. This holistic approach underscores the importance of both practical execution and thoughtful consideration of local environmental and technological factors in the project's success.

Impact

The project has demonstrated significant positive impacts on both social and environmental fronts. Socially, the integration of people with reduced mobility has been a key focus, contributing to a more inclusive and accessible urban environment. This has simultaneously alleviated parking stress, resulting in an enhanced overall user experience.

Environmentally, the project has made strides in reducing emissions, fostering cleaner air and a healthier, sustainable urban landscape. The combined social and environmental benefits underscore the project's commitment to creating a more livable and eco-friendly community.

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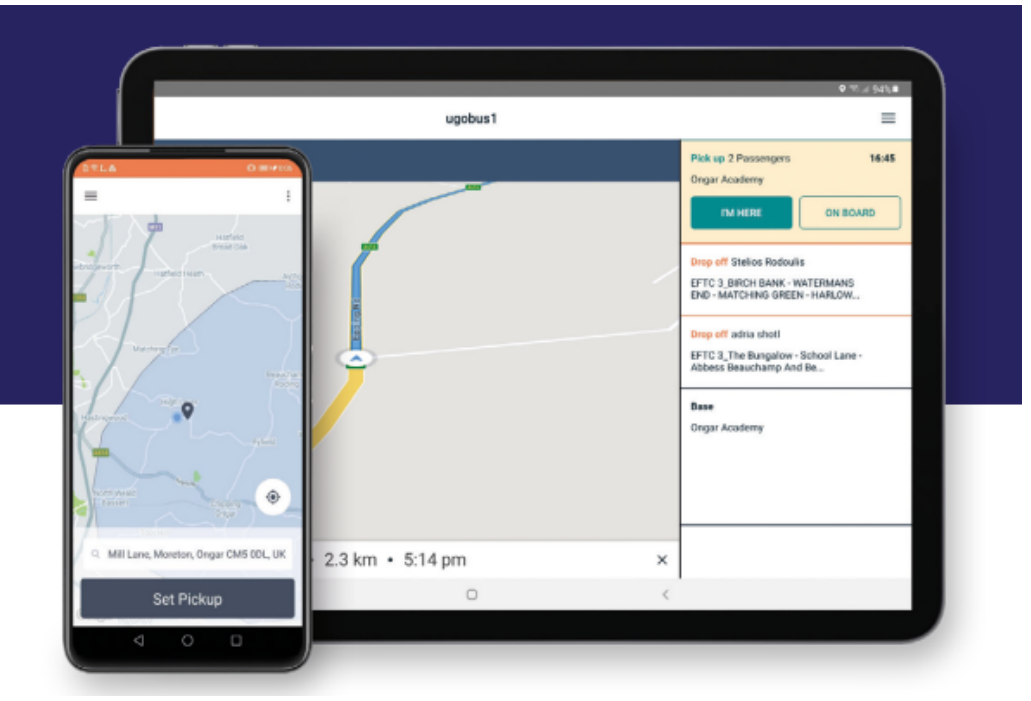
Enhancing rural school bus commutes



Epping Forest, UK (2019)
Solution: Urban Mobility

What was the challenge?

The Ongar Academy in Essex faces challenges with transporting over 130 students across a vast area of nearly 200 sq km using seven minibuses. This difficulty is common in rural areas with scattered populations, making route optimization and adhering to strict timetables challenging.

How was it solved?

During the first days, the solution just offered the regular on-demand service with the existing 7 minibusses. The algorithm and on-demand platform were adapted to meet the strict pick-up and drop-off-time requirements of the home-to-school transit. Rides were pre-programmed in bulk and students were collected from virtual stops placed at the optimal distance between each home. While monitoring the operation, Shotl's mobility experts realized that the service could be greatly improved by offering users (parents in this case) the additional opportunity to cancel rides using the Passenger App, which provided great flexibility.

Lessons Learned

A data-driven approach optimized home-to-school bus routes, with successful on-demand transit pilots indicating efficiency with fewer vehicles. Positive feedback on real-time ride tracking and improved driver familiarity streamlined operations for Essex County Council.

Impact

Ongar Academy benefits from a streamlined and convenient mobility solution, saving time and effort in organizing repeated rides while utilizing improved data for enhanced service to families. The bus operator enjoys a more efficient and cost-effective digital solution, establishing direct communication with users and gaining valuable data-driven insights.

The local council has successfully applied smart city technology in a rural area, providing improved home-to-school transport without extra costs, making Ongar a more appealing place for families. Parents, in turn, appreciate the instant communication channel with the bus operator, personalized services for their children, and the peace of mind that comes with real-time ride tracking.

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Autonomous shuttles

Lamia, Greece (2020)
Solution: Urban Mobility

What was the challenge?

The goal in this project was to test Iseauto in a different environment and gather valuable data, so we could develop our service even further. Additionally, the public transport reachability in the area could be improved. Another important aim was to test our shuttles in a completely different climate to prove our shuttles capability in different conditions.

How was it solved?

The electric and autonomous shuttle network connected Afetiria bus stop to Ari Velouchioti bus stop. The route was 3.1km long. Due to the heat in Greece during the project, the operating environment was very different from what we were used to. However, we played it in our favour. In cooperation with the Solaride's team, we placed solar panels on the roofs of the shuttles so that we could take advantage of Lamia's sun and the energy generated from it. The panels provided an additional source of energy for the shuttles.

Lessons Learned

Despite challenges like vandalism and COVID-19 restrictions, the project successfully transported a significant number of people. The solution, represented by the electric and autonomous shuttle Iseauto, offers a cost-effective and easily adaptable alternative for reducing congestion and pollution in larger cities. With Level 4 autonomy, capacity for 8 passengers, and centralized monitoring, the shuttle integrates well into existing infrastructures for use in public transport networks or as an on-demand system.

Impact

Considering the excellent feedback that we got from our customers, we can safely announce that the Lamia project was very successful. Our shuttles improved public transport reachability and we got back home with a lot of data to improve our shuttles further.

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Energy and Mobility Concept for Net Zero

Illustrative Spatial Framework Plan.

West Oxfordshire, UK (2021)
Solution: Energy & Mobility

What was the challenge?

Urbanomy develops an integrated vision to provide operational-ready recommendations at the planning phase to reach carbon neutrality for real estate projects. Planning processes have to be rethought to take into account energy and mobility from Day 1, in order to make the challenge of carbon neutrality achievable.

How was it solved?

A planning study for a new development with 2200 homes, a science park, school, health center, and park & ride analyzed future energy needs. The assessment included simulations of building and vehicle energy demand, solar potential, and flexibility using storage, batteries, and electric vehicles. The study explored potential revenues from grid services and assessed scenarios for achieving net-zero emissions. Key findings informed decisions on overall energy demand, self-consumption, peak demand reduction, cost savings, and revenue generation.

Lessons Learned

The assumptions accounted for changing trends, like the development of electric vehicle technology, as present day technology upgrades and uptake will not be representative in 5 or 10 years. Urbanomy has in-house models and tools to simulate this increasing demand and shape realistic futures.

Impact

The study supported the feasibility of a Net Zero Carbon development at Salt Cross Garden Village, by giving further quantification of various possible scenarios and providing insight to the Local Authority.

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Smart stop at the high school

Rafelbuñol, Spain (2022)
Solution: Urban Mobility

What was the challenge?

Install a smart parking stop for private bicycles and scooters in order to generate social mobiliento of adolescents in the municipality. In this way, to generate this change so that in a few years we can increase the number of anchor points in the community and promote sustainable transport among all.

How was it solved?

The Onroll system has intelligent stops with integrated locks 2 for each module, the system is accessed via APP. To register, I scan the QR to sign up with your name, a username and an email. Subsequently we enter a new QR to access the system,
select the stop “IES Rafelbunyol”, enter the padlock, and type the anchor code. It remains locked and only the user will be able to open the padlock again.

Lessons Learned

Localities require events and awareness initiatives to strengthen and complement ongoing projects. Ensuring a simple and functional installation is vital for the success of these initiatives. To guarantee the platform’s effectiveness, more projects are needed. The underlying belief is in empowering citizens to take the lead in driving positive change.

Impact

The proliferation of micromobility infrastructures drives positive social change by reducing emissions and promoting cleaner cities. Social awareness events amplify this impact.

Environmentally, these infrastructures significantly lower usage ratios, resulting in reduced emissions locally. This dual focus underscores micromobility’s transformative potential for sustainable and healthier urban living.

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Open Streets Pilot

Logroño, Spain (2020)
Solution: Urban Mobility

What was the challenge?

More than 60% of daily commutes in Logroño involve active mobility modes like walking and cycling. Given the city's size and compactness, and considering the importance of public transport, enhancing active mobility became crucial for ensuring safe distances. The Open Streets project aims to improve conditions for walking and cycling, promoting comfort and safety in road and health aspects.

How was it solved?

The Logroño City Council has undertaken strategic measures aimed at curbing the transmission of the COVID-19 virus while promoting sustainable and secure mobility for all residents. These interventions in street infrastructure include the establishment of exclusive pedestrian strips, dedicated cycle lanes with counterflow permissions, shared pedestrian/cyclist lanes, as well as shared carriageways accommodating both bicycles and motor vehicles. Moreover, the implementation of pedestrian priority carriageways, shared with vehicles in general, reflects the council's commitment to creating accessible and safe mobility solutions for the community, reinforcing the city's resilience against the pandemic.

Lessons Learned

Although the "Open Streets" strategy was accelerated by Covid-19 and its demand for distancing, the success of the project was mainly due to the minimal changes of the agenda that the municipal government already had in mind. That is why many of these actions, although carried out momentarily with a low budget and reversible means, are undoubtedly intended to be permanent.

Impact

The initial goals of Open Streets were met, as we demonstrated the benefits of a pedestrian and bike-centric urban model, and now Logroño counts with a strategy to transform Logroño's public space to facilitate active mobility.

Logroño Open Streets was recognised in May 2021 with the 1st National Mobility Award granted by the Ministry of Transport, Mobility and Urban Agenda, the CONAMA Foundation and the Royal Academy of Engineering.

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Public bike sharing system

Tartu, Estonia (2019)
Solution: Urban Mobility

What was the challenge?

Establishing a bike-sharing system has been a top mobility priority for the City of Tartu. Following a feasibility analysis in 2014, a business model was crafted, indicating a potential annual user base of up to 224,000 people. The primary goal is to promote bicycle usage as a significant alternative to cars, addressing environmental concerns like noise, air quality, parking, and traffic intensity. The bike-sharing system is envisioned as an integral part of Tartu's public transport network.

How was it solved?

As of 2021, Tartu's bike-sharing system, launched on June 8, 2019, comprises 750 bikes across 69 docks throughout the city. Two-thirds of the bikes are electric, with the rest being regular bikes. The system continually expands with new bikes and stations added yearly, reaching neighboring municipalities. To rent a bike, users need a valid Tartu bus season ticket or must purchase a bike-sharing membership. Account creation is required through the online portal (ratas.tartu.ee) or the mobile app (Tartu Smart Bike), connected to a credit card. An information hotline and email address are available for technical support and error reporting.

Lessons Learned

The project revealed the challenge of promoting biking benefits and persuading car users to switch. Lessons include the importance of targeted awareness campaigns, emphasizing health and environmental advantages. It highlights the need for holistic strategies combining infrastructure improvements with community engagement to foster a cultural shift towards sustainable transportation alternatives.

Impact

Micromobility solutions swiftly reduce traffic and parking demands, fostering positive behavioral change with efficient implementation. This results in reduced carbon emissions and noise, contributing to a greener urban environment while promoting autonomy from fossil fuels, improving citizen mobility and health.

Furthermore, these solutions increase data availability, creating new business opportunities like safety gear development.

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Reusing EV Batteries for Energy Storage

Tartu, Estonia (2020)
Solution: Energy

What was the challenge?

Tartu, with approximately 60 electric vehicles in OU Takso's taxi fleet, serves as an ideal test site for piloting solutions to repurpose electric vehicle (EV) batteries for energy storage. The aim is to give old EV batteries a second life, significantly benefiting the environment by reducing the need for new battery production and energy storage resources. This approach also promotes the use of renewable solar energy to charge the EVs.

How was it solved?

The system will consists of old EV batteries, PV panels, EV chargers and battery charging equipment. The latter is the most important part of the system as this equipment is currently not available on the market and was separately developed during the SEC project. The system allows for the full charging of around 30 Ev's in a sustainable way each day, depending on the location of the system. Also, depending on the climate conditions, surplus electricity produced by the PV panels can be used for other on-site purposes (e.g. lighting) or sold to the grid.

Lessons Learned

As the EV market grows, so does the potential for second-use EV batteries. This not only offers a lucrative business opportunity but also reduces waste and extends battery life by 5-10 years. Tartu's solution aligns with automakers' efforts in stationary energy storage. The easily replicable solution involves specialized equipment developed in collaboration with Tallinn University of Technology and the Estonian University of Life Sciences.

Impact

The implementation of this system brings about several significant advantages. It enhances resource efficiency by extending the lifetime of electric vehicle (EV) batteries, fostering independence in energy supply, and reducing the environmental impact associated with battery manufacturing and recycling processes.

Notably, the system's capability to operate in an off-grid mode adds a layer of autonomy, providing a sustainable and self-sufficient energy solution.

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SMCNetZero

Achieving Net-Zero through Innovation in Small and Medium sized cities

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2 Justify

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Mobility Island Buyer's Guide

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1 INTRODUCTION

This Buyer's Guide is intended for **city officers, project managers, procurement personnel, and nominated advisors** seeking to implement Mobility Islands – being one tangible smart city solution within the overall context of the transition to a new mobility model and contributing to achieving Net Zero.

The document was prepared in collaboration with the SMCNetZero project, the **'Small Giants'** Focus Group of the **European Smart Cities Marketplace** (SMC), collaboration with a number of **Climate-Neutral Smart Cities Mission** cities and the concept has its genesis from earlier EU investment as part of packaging activities from the SharingCities **Smart City Lighthouse** programme.

A **Mobility Island**, by design, brings together multiple mobility and related components in a new, integrated configuration which, when combined with different business models, presents an attractive and very visible means to stimulate transition to new mobility behaviours. The Mobility Island concept is captured in an expanding portfolio of guidance material, notably the Leadership Guide (link) and Mobility Island Playbook (link).

This Buyer's Guide seeks to bring greater consistency, certainty of information and confidence to market actors to underpin their actions as a result of ongoing collaborations. It counters the current norm whereby cities often act in isolation, spending considerable resource undertaking individual market analyses for solutions. The resulting structure invariably differs, resulting in minimal sharing of valuable market information which, in turn, is neither good for cities nor industry. Consequently, the current approach fails to deliver the potential scale transformation projects that investors seek and, consequently, the desired outcomes for society. The Buyer's Guide, alongside other blueprint materials, will change this. The Annex is live document and will be updated through use.

1.1 Objectives and Intent

The primary objective of this guide is to put clear concise information, in a consistent manner, at the fingertips of city officers and other target audiences. It addresses the common questions of:

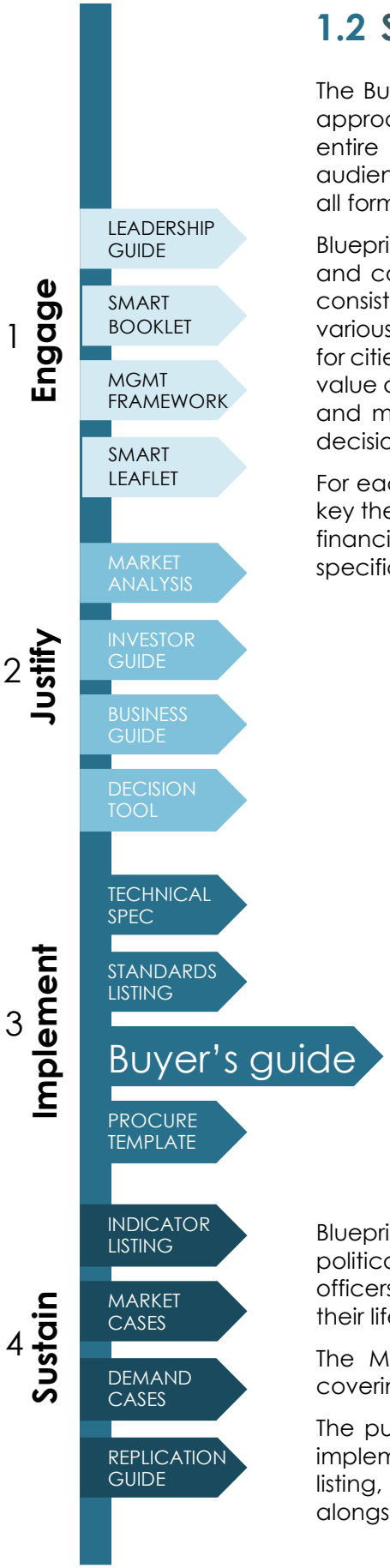
- **Which solution(s) is best suited to my (type of) city?**
- **Which best contributes to the city's Net Zero ambitions?**
- **Which solution providers should I consider?**
- **What features and functions do their products have?**
- **How do I judge which are best for our needs?**
- **How should I configure the various elements to create a coherent, functioning whole?**
- **How much do the solutions cost, and what range of returns will result?**
- **Which business model is most appropriate?**

The Guide provides objective market information on international and local solution providers (i.e. major companies, and niche SMEs). The intention is to publish and improve this database and document through ongoing collaborative use to expand and deepen the knowledge base.

More specifically, this Buyer's Guide informs cities in four main areas:

1. Offering **knowledge on which solution providers** are available in the market
2. Providing a **structured, component-based evaluation of different options** across a variety of use cases and criteria to support market engagement
3. Capturing indicative information to estimate **budgets** and clarify **business models**
4. Ensuring that **sustainable procurement approaches** are applied throughout in order that the MI concept contributes to the city's Net Zero targets.

The guide will help build familiarity and confidence to speed and strengthen decision making, inform tender document preparation and move the market towards a city-needs-led and demand-driven approach.



1.2 Solution Blueprinting

The Buyer's Guide is one document within a growing portfolio that captures approaches, methods, tools and knowledge, to support a city throughout the entire life cycle of a project; covering 4 discrete stages: engaging the audience, making the case, implementation, and sustaining value – including all forms of value (e.g. net zero)

Blueprinting helps cities make best use of scarce staff time, secure multi-level and community buy-in, speed the process, inform decisions, deliver greater consistency, reduce costs and add value from concept to operation. The various documents provide a trusted, familiar source of structured guidance for cities, based on the experience of various European programmes. This adds value at an individual city level, supports collaboration, and enables adoption and market scale-up of smart city solutions. It helps reduce risks by basing decisions on proven and tested methods.

For each solution, blueprinting addresses, in an integrated manner, the three key themes of (i) societal needs, (ii) technical options, (iii) business models and financing. Importantly, it also helps cities adopt or adapt solutions to their specific local context and needs (see figure 1).

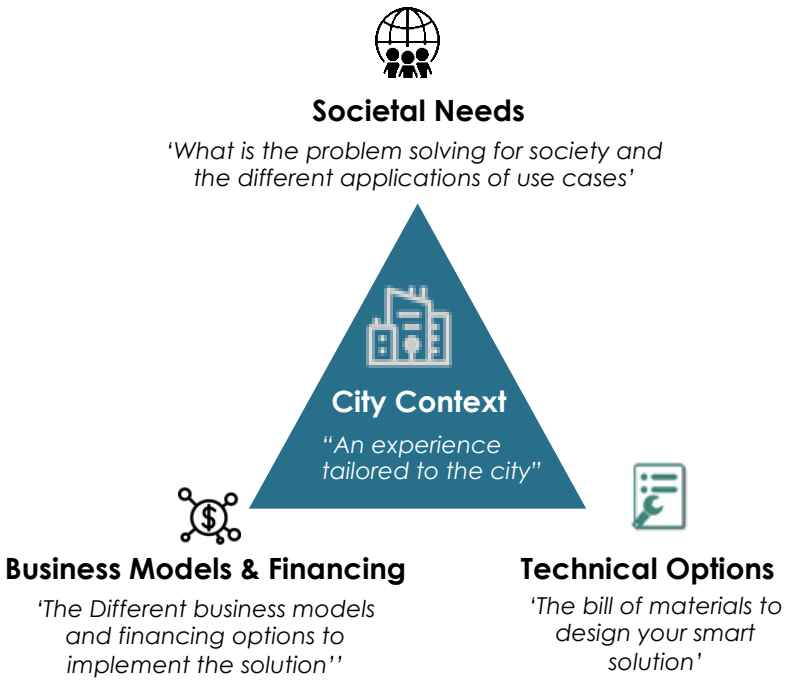


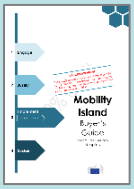
Figure 1: Blueprint Framework

Blueprinting addresses the specific needs of different stakeholder groups: political leaders, policy advisors, city officers, city technician, procurement officers, advisors, industry, investors and citizens, all as projects progress through their life-cycle stages.

The Mobility Island portfolio comprises a growing number of documents covering these 4 project stages (table 1). This Buyer's Guide being one of these.

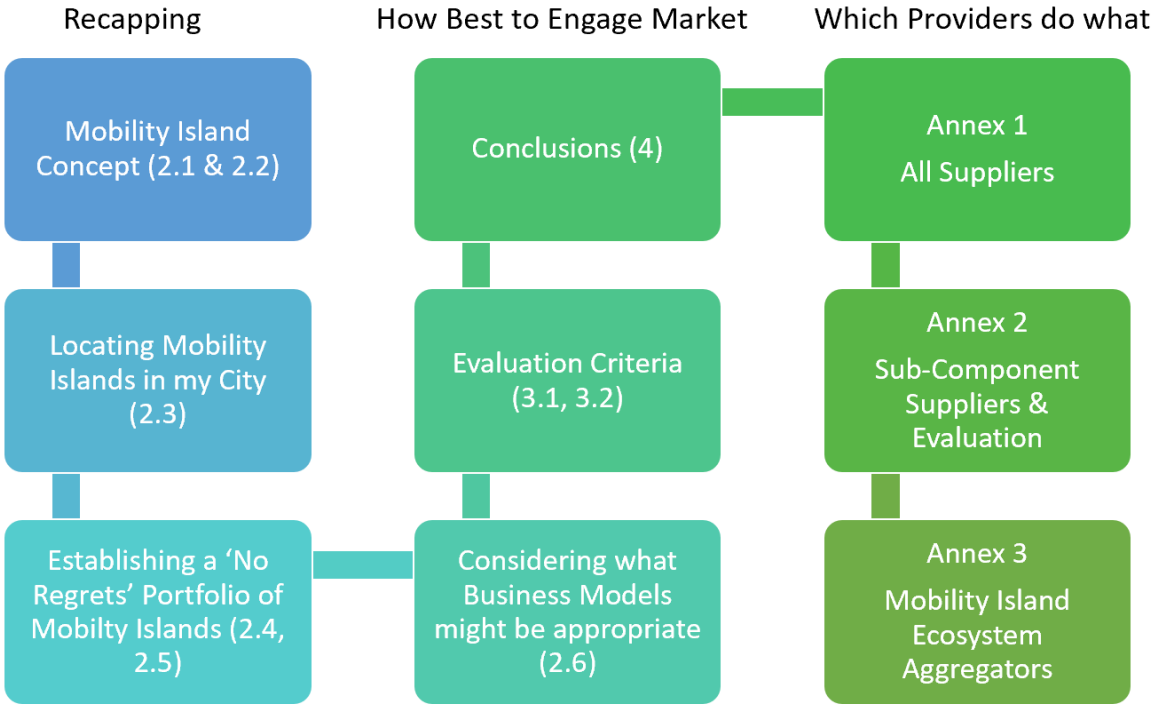
The purpose of the Buyer's Guide is to support decision making through to implementation. Additional emerging material e.g. procurement; standard listing, technical specifications, and the like, are anticipated to be used alongside this document.

Table 1: Mobility Island Emerging Portfolio of Documents

Stage 1: Engaging Stakeholders	 **Leadership Guide** A brief document clarifying for **politicians and city leaders** the concept of mobility islands and resulting impact. (Status: 100%)	**Smart Booklet** A brief easy-to-read engaging overview targeted at the **multiple city service owners** that could benefit, to provide a basic understanding of the key opportunities. (Status: 0%)
	Smart Leaflet A 1-page brochure to raise awareness in the communities who live and experience the city. (Status: 0%)	 **Framework / 'Playbook'** Supports project leads to align and integrate across the various service lines to support end-to-end delivery. *(Status: 100%)*
Stage 2: Making Case	 **Policy Guide** A guidance document that addresses policy issues and integration of mobility islands into the broader city strategic and operational context. *(Status: 50%)*	**Investor Guide** An easy read to raise confidence among investors and clarify the potential value of +44 (7824) 449659. Status: 80% draft
	 **Business Model & Investment Justification Guide** Document capturing the different business models, financing options and steps to justify a project. (Status: 20% draft)	**Market Analysis** A quick read capturing the market context for mobility islands. *(Status: 0%)*
Stage 3: Implementation	 **Buyer's Guide** A market catalogue to inform cities of the different mobility island providers. (Status: 50% Draft)	**Procurement Template** A structured procurement template for use by buyer, however known by suppliers to help expedite and improve procurement process. *(Status: No Draft)*
	Functional Requirements & Technical Specification Detailed specifications and tools; collaboration with Standards Bodies. (Status: 0%)	**Standards Listing** Identify the various applicable standards for design and procurement. (Status: 0%)
Stage 4: Sustaining Value	 **Value Monitoring Indicators** Listing indicators (financial and non-financial) relevant for mobility islands (Status: 20% Draft)	**Replication and Scale-Up Guide** Short guide including bench learning, collaboration and replication criteria. (Status: 0%)
	Demand Aggregation Case Studies Examples to support aggregation to access economies of scale and support replication from city to city. (Status: 0%)	**City Case Studies** Structured capture of different case studies to ensure awareness of market needs and innovation. (Status: 0%)

1.3 Using This Guide

This listing is structured in a self-explanatory and easy-to-use manner. It summarises some of the work that may have already been undertaken in developing the Mobility Island concept within a city, informed perhaps by other available blueprint materials. It discusses, in more detail, the options available and relative merits of engaging with the market. It then offers a listing of providers for the various elements of a Mobility Island.



The guide is designed to be relevant to multiple audiences in a variety of contexts. For example, the city officer may use it to inform the development stage, perhaps for advice on the choice of location and/or to determine the key components required for maximum impact in a chosen location.

The information presented can be used for in-house design, or for developing a specification for external procurement. Similarly, a contractor will find the Guide useful in responding to a request for quotation.

1.4 Limitations

This document is neither fully complete nor comprehensive. All information is based on best captured at the time of publication.

The information contained herein, by its very nature, will change regularly and substantially. Consequently, users should ensure that they are using the most up-to-date version (denoted by the cover title and footnote) as the information provided is up to date only at the time of publication.

Cities and other users remain fully accountable for validating the facts and figures provided in the Guide as they focus on their specific needs and for any decisions they may make as a result. That said, this does offer a fast start for cities. We are grateful for any feedback and updates. One means of doing so is through the EU Smart City Marketplace 'Small Giants' Focus Group.

2 MOBILTY ISLANDS

2.1 What is a Mobilty Island?

In short, society must change its travel habits. Transport is the second largest contributor to greenhouse gases (GHG) so this is a priority action that all cities, of all sizes, are concerned about as they grapple with achieving Net Zero targets. Increasing active travel and use of light, clean mobility modes, combined with increasingly integrated operations offering informed choice to travellers, can radically improve the citizen experience, deliver inclusive affordable accessibility in and around cities, support sustainability goals, and make communities healthier and visually more pleasant.

Approaching Net Zero targets and mounting concern regarding the impact of Climate Change effectively mean that the resulting transition must be delivered much swifter than we originally planned for. In this context, it is critical that each Mobility Island incorporates Net Zero considerations in its design, implementation and operation in order that it tangibly contributes to the overall city targets. This requires a clear, managed and integrated roadmap and full support from all stakeholders.

The term Mobility Island should not be regarded as simply another name for transport interchanges and hubs, though they may share many common characteristics. The key difference is that the starting point for Mobility Island thinking is a core focus on the city-goers experience, Net Zero, and health and wellbeing, rather than on improving mobility efficiency and access.

Mobility Islands provide a very visible, pleasant physical asset that offers informed choice of travel modes, potentially (with consent) specific to people's personal circumstances (e.g., commuters, people with disabilities, family outing, tourists and so on). **The vision is to locate Mobility Islands within a 5-minute walk of any point in a city.** By locating these facilities initially in obvious and logical 'no regrets' locations, a city can evidence and **steer swifter transition on a pan-city basis**. Importantly, Mobility Islands address a city users overall experience, considering pain points and wants and needs that extend well beyond the transport mode itself. As a consequence, they are '**place-making' assets.** If designed well, they can also serve as a showcase for sustainability, demonstrating the impact of integrating multiple Net Zero interventions.

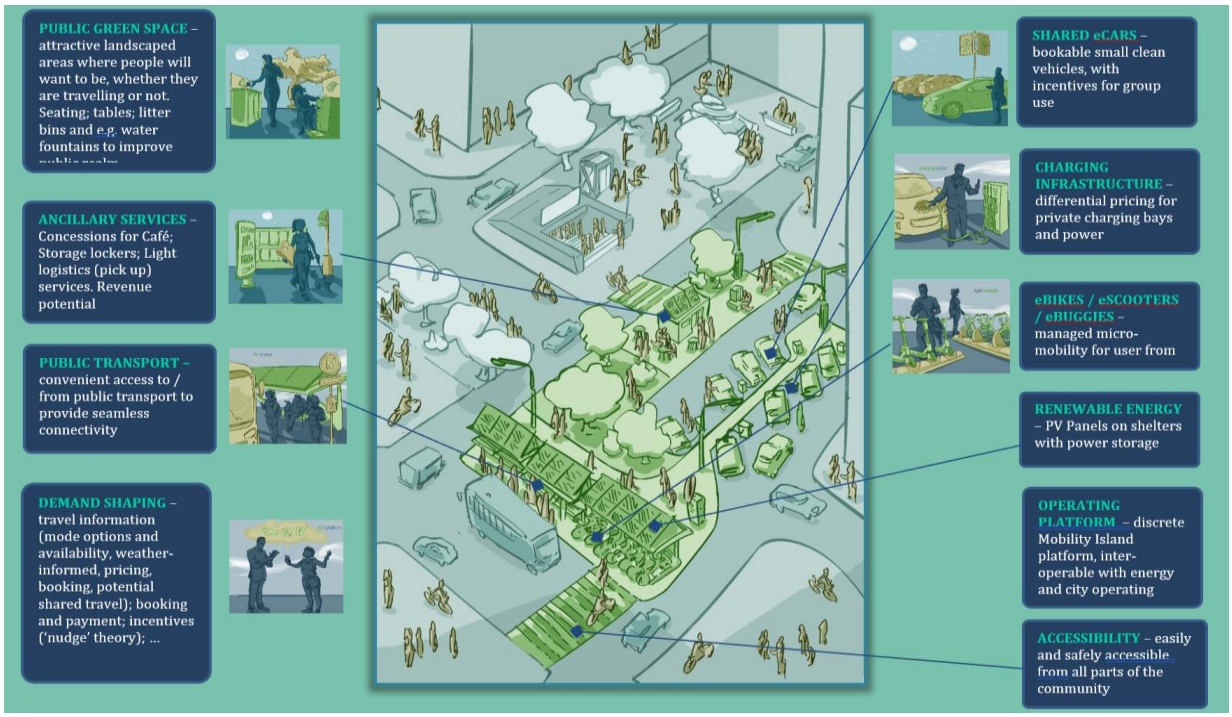


Figure 2: Mobility Island Concept

The genesis of the Mobility Island concept is the EU-funded 'Sharing Cities' smart city lighthouse programme. This involved 10 measures implemented within demonstration neighbourhoods in the lead cities of London, Lisbon, and Milan. Several of these measures related to the overall shift in travel habits – like, eBikes, eCargo bikes, Shared Cars, PV installations, Digital platforms, and Societal behaviour change. Learning during the programme highlighted the need for a fully integrated approach including addressing all modes of transport. However, the learning also highlighted and addressed the 'softer' aspects of place based change including design and social offerings. The Mobility Island concept was brought together during the latter stages of the programme, resulting in the publication of the Leadership Guide and Playbooks, which captured the approach at conceptual level, based on the various parts demonstrated in the lead cities. The Fellow Cities of Warsaw, Burgas and Bordeaux then addressed how best to implement the concept within their cities. These cases were also captured in the playbook.

Subsequent work of the EU Smart City Marketplace "**Small Giants" Focus Group** developed a visual **Mobility Transition Roadmap** which highlighted the important and interconnected role that Mobility Islands can play in securing a swift and high-quality transition from traditional 'transport engineering' thinking to a new mobility model.

Based on this prior development and solution blueprinting work, an **open, component-based approach and integrated, functionally common design** has been assumed. This neither limits design innovation, nor prescribes or forces 'one-size-fits-all' solutions. The intention of the component-based approach is to offer flexibility in design to support adaptation for different city contexts and needs. This ensures the solution is replicable and can support scale market adoption, making the approach and designs 'future proof'. The latter is important given the anticipated, ongoing and rapid technological advancement in relation to the various components of the solution.

2.2 Benefits of Mobilty Islands

Mobility Islands **fundamentally help stimulate the transition to Net Zero** in the area of mobility, whilst also supporting complementary transitions. They do so in a way that is **progressive and more affordable** than many other options.

The value of Mobility Islands can be considered in a number of broad areas which are individually focused on sustainability and achieving Net Zero. The resultant benefits can be grouped as shown in table 2.

Table 2: Mobility Island Benefits

Mobility Island impacts	Social Benefits	Environmental Benefits	Economic Benefits
Improving access to sustainable mobility services for all	○ Reduced commuting times ○ Inclusive affordable access ○ Improved public safety ○ Fostering a sense of place ○ Removing range anxiety of EVs ○ Improved health and wellbeing, particularly with regard to active travel choices	○ Reduced ownership and use of private vehicles ○ Reduced congestion	○ Increased attractiveness of neighbourhoods, ○ Increased property value ○ Increased tourism (where relevant)
Reducing congestion	○ Improved physical and mental health ○ More time to be productive	○ Reduced carbon emissions	○ Improved productivity ○ Increased business viability through easier customer access.
Reducing air pollution	○ Improved health and wellbeing	○ Improved air quality	○ Reduced burden on health services

			○ Increased tourism (where relevant)
Creating an intermodal mobility system	○ Reduced dependence on private car encourages physical activity & reduces car accidents ○ Choice of travel mode ○ Physical activity improves wellbeing, ups productivity, and reduces stress,	○ Reduced dependence on private car trips improves air quality	○ Improved attractiveness of city
Efficient energy consumption	○ Savings for individuals, and businesses	○ More efficient use of natural resources	○ More efficient use of money ○ Increased business viability
Generating economic opportunities	○ Increased access to services offered to the community	"Green" start-up and business expansion opportunities at and around MI locations.	○ Opening new market segments ○ Creation of local jobs ○ Increased tourism (where relevant)

As mentioned previously, it is implicit in the design, implementation and operation of Mobility Islands that they are, both individually and collectively, inherently sustainable. In other words, the choice of location and components together with factors such as the materials and equipment used must ensure that they demonstrably contribute to Net Zero by having the lowest practicable carbon footprint.

The relationships between the impacts set out in the above table, by type and timing, are, of course, complex to analyse and inevitably come at a cost. There are, however, synergies to be exploited both *within* a city in terms of how it configures its portfolio of Mobility Islands and *between* cities in terms of common specifications, procurement frameworks and/or innovative collaborative acquisition. For closely located cities, there may be potential for mutually beneficial city-to-city transport cooperation and connectivity.

The return-on-investment evaluation, in both financial and non-financial terms, is thus interdependent and complex and is dealt with in more detail in the Business Model and Investment Justification Guide[1].

2.3 Where might Mobilty Islands be located in my city?

Cities face broadly two choices when it comes to implementing a network of Mobility Islands:

1. **"Upgrade":** take what assets currently exist and adapt them to the new Mobility Island concept. These may be existing bus stops, parking lots, bike stands, green spaces and so on.
2. **"Build from New":** design location-specific facilities on land acquired for that purpose.

Given the natural development of any city, it is quite likely that the end result will be a combination of both options having regard to the environmental and carbon impacts in each case.

Starting with more than one Mobility Island is essential in almost all cases as people generally need to get from point A to point B, and returning a vehicle, such as a shared car or ebike, to the same location may not be convenient. A very limited number of Mobility Islands is also likely to make insufficient visible or environmental impact to stimulate wider adoption and drive changes in perspectives and behaviours. It is also unlikely to be sufficiently convenient for most travellers. The

[1] *The "Business Model & Investment Justification Guide" is at 20% draft (@ end 2023)*

question then is how many Islands, and where would make a significant impact to stimulate change, whilst being both affordable for investors (which for early stages is arguably best to come from City Hall) and provide the best opportunity to learn and localise further developments?

Each city will have variable levels of insight in terms of origins and destinations of their travelling public. If available, that is, however, a very helpful starting point. It should be remembered that such data will reflect the *current* mobility model, and this initiative is about developing the new model. Consequently, preferences and, therefore, underlying data will change markedly as a direct and indirect result of the transformation.

One of the early steps a city should take is to identify its '***No Regrets' portfolio*** of Mobility Islands. This seeks to identify the intuitively obvious locations where the risk of developing a 'white elephant' is low. The precise nature of the Mobility Island may, of course, be less clear; the number of shared cars, bikes, scooters, the potential for charging or local renewable power generation and the range of additional facilities and services that would best suit the specific location. It is through this pragmatic, experience-based exercise that agile change can occur. De-risking of further development is aided by a flexible, component-based ('Lego') design to Mobility Islands.

The nature of the No Regrets portfolio is dependent on several factors, including typical locations, the needs of specific communities and city size.

The Mobility Island 'playbook' identifies **8 typical locations** where some form of mobility island is likely to be valuable. These are:

1. University Campus
2. Parks, Culture, & Tourist Destinations
3. Public Transport Hubs
4. Shopping Malls
5. New Developments
6. Park & Ride
7. Large Housing Estates
8. Satellites and Rural Settlements

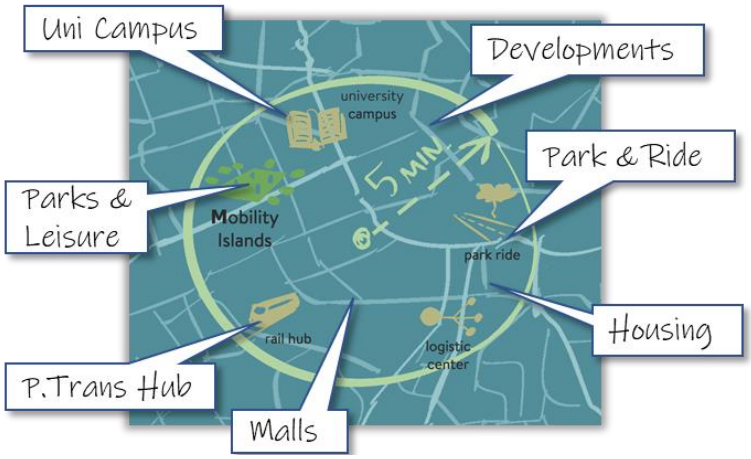


Figure 3: Typical Mobility Island Locations

Consideration should also be given to what **type of communities or districts** the city is comprised of. This will affect the needs and expectations of users, allocation of assets, and services that may be on offer. As a practical starting point, the characteristics of each location sites considered are outlined in the following table.

Table 3: Considerations for Matching Mobility Islands to Communities

District Type	Typical Characteristics
1.Central Business District	Predominantly offices, for example "the City" in London; usually experiencing high footfall during weekdays, with dense streets, some walkable spaces and few green spaces. Some, often high value, residential units may be part of the makeup.
2. Industrial	Factories and warehouses and warehouses with large site areas. , Low footfall with the exception of employees at commuting times with few walkable and green spaces but with some brownfield opportunity sites.
3. Retail	Commercial streets and shopping centres, including "out-of-town" locations. Usually, high footfall during opening hours, peaking at weekends. Some green spaces and moderate walkable spaces. Tourism based footfall in some cities and locations.,
4. Inner City Multi-tenant housing	Predominantly residential composed of larger blocks of residential units, including high rise, in some locations. Multi-resident buildings with significant social and low-income

	housing may form part of the mix. Typically, higher crime rates and may be associated with lower levels of, for example, electric vehicle ownership and shared mobility options.
5. Inner City residential	Mixed residential units with a predominance prevalence of private low-rise buildings. Typically housing a more affluent (comparatively) population with lower levels of crime and with higher levels of, for example , electric vehicle ownership.
6. Suburbs	Primarily residential and peripheral to the city. Typically, large daily in-surge of population to city centre. More green space, less densely populated with artery roads and highways and potentially poorer connectivity.
7. Culture and Green / Blue Spaces	Areas including cultural buildings and facilities, public realm, riverside, green spaces and parks etc. Usually, high footfall, including a high proportion of tourists in some locations/cities, peaking at weekends. Multiple, walkable spaces.
8. Satellites / Rural Settlements	Smaller developments surrounding urban conurbation, sometimes separated by open spaces or agricultural land and would benefit from connected planning and shared infrastructure services

Overall city size is also a critical factor that will determine how best to develop and deploy a 'No Regrets' portfolio.

Initial experience with both small and large cities suggests that a portfolio of 6-12 locations is desired, irrespective of city size, for the 'No Regrets' portfolio. However, mid- and longer-term phased developments and some of the other 'softer', financial, or underpinning infrastructures may well differ considerably between smaller or larger places.

Table 4: Applicability of & Considerations for Mobility Islands to Different Place Sizes

Village	Town	Small City	City	Metro Area
• Non-motorised travel may well be welcomed if not already normal, so this presents scope to embellish offer. • An 'all-in-1' move becomes more feasible, at least as regards locations, also for financial / bankability reasons • Only feasible if connections to a city or town is viable. • Potentially limited local financial control.	• Potential for multiple connected sites forming an initial network which can be expanded over time • Some financial control and capability to plan, either in-house or through contractual or partnership arrangements. transport infrastructure. XX Opportunities to commence the portfolio with several connected, high impact locations • A clear vision of subsequent locations and development phases.	• Significant Mobility Island potential also to connect suburbs etc. with city centre, leisure and cultural centres. • Financial autonomy with more capacity and expertise for driving forward transformation. • Heightened ability to attract investors, external funding and innovative big businesses.	• Scope for extensive Mobility Island networks connecting suburbs, commercial areas and transport facilities such as airports and ports. • Significant financial autonomy. • Extensive partnership and investor connections.	• Major opportunity to demonstrate a transformed mobility model, influencing the significant commuter community, and beyond. • Requires considerable integration with regional providers. • The scale also offers scope to engage private sector (large & SME) innovations.

2.4 Supporting a Logical Approach

Cities embarking on the design and development of a Mobility Island network have at their fingertips the evolving portfolio of documents mentioned previously and can use these to develop a logical roadmap, from concept to operational reality, namely: -

- Using the **Leadership Guide** to identify a political and/or leadership champion to drive the project at a high and influential level within the city, effectively becoming an ambassador for the transition.
- Using the **Policy Guide** to connect leadership intrigue to institutional strategies, plans and process.
- Undertaking a **Stakeholder mapping** exercise to identify those that matter most and understand the drivers and blockers at organisational and potentially individual levels. This is essential to build and maintain momentum and promoting the approach beyond City Hall.
- Undertaking a **'No Regrets' Portfolio Exercise** – to rapidly identify the basic configuration that could make a very visible difference, stimulate behaviour change, and show early evidence of value.
- Using this **Buyer's Guide** to align business models with the investor and supply market.
- **Discovery Project** – performing a swift and pragmatic 6–10-week project to outline the solution technically, assess business model and financing options in more detail, shape and make the investment and value case, mobilise the broader stakeholder group, and establish a solid forward plan.

A few examples of cities in action are captured in box-out inserts below.

"Spot the Difference"

Making places come to life!

An example of an 'upgrade' Mobility Island planned in Izmir (TK), combining a new mobility model, ancillary services, and quality of place interventions in an integrated manner as part of an overall 'no regrets' portfolio of Mobility Islands.

This example emphasises the place-making intentions and potential of mobility islands that goes well beyond just transport efficiencies, and addresses aesthetics, community support services, wellbeing – alongside a new mobility model.

A Modest-sized City 'No Regrets' Portfolio

Kranj in Slovenia has already made considerable advancement in terms of modernising its overall mobility system with public transport, taxi, bike, digital and other initiatives. The city also developed one central bike facility ('Mobility Island') with dedicated cycleways. The impact was modest, due in some part, to the fact that there was only one facility.

Kranj's 'No Regrets' exercise, as with many other 'Small Giant' citie,s proved to be pragmatic, intuitive, and swift, resulting in an initial portfolio of nine locations on which to further evaluate and consult.

2.5 Solution Framework for Mobilty Islands

The Mobility Island concept has been developed through **six major building blocks** as shown in the solution framework in figure 4. (Reference can also be made to the 'playbook').

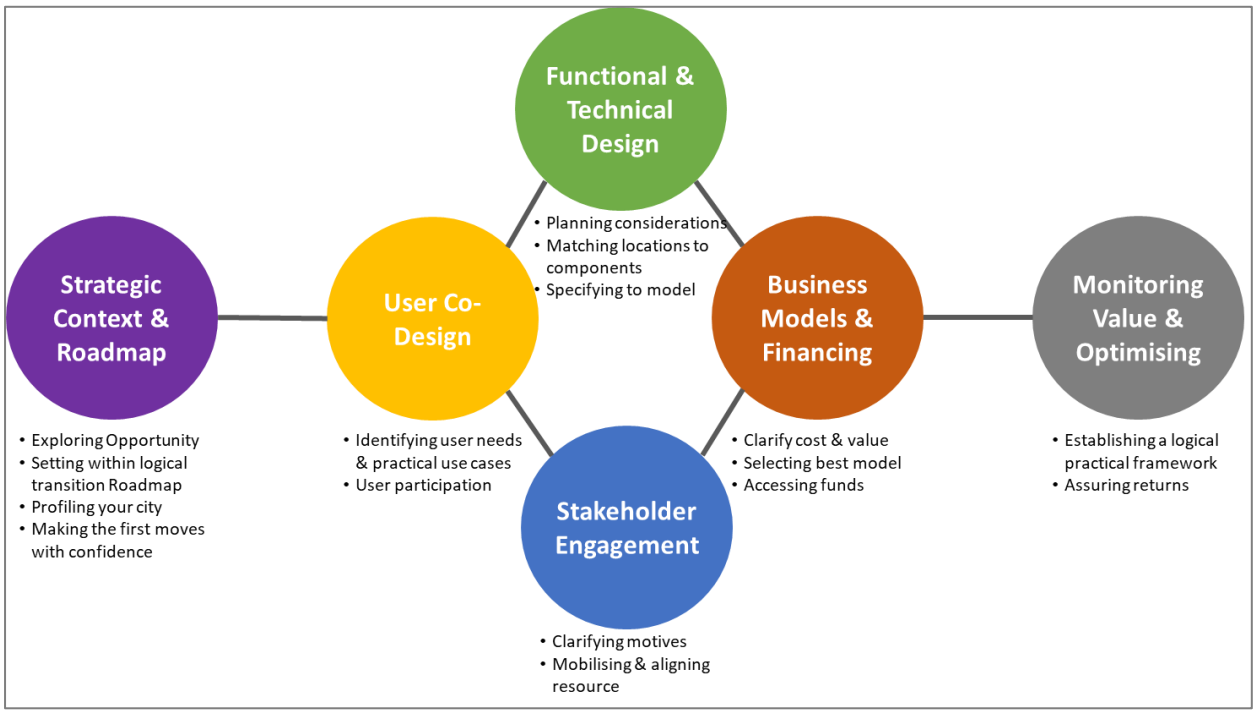


Figure 4: The six main building blocks of the Mobility Island Solution Implementation Framework

This framework helps to provide a **common language** for all sectors (cities, investors, industry, communities and citizens). Each component has then been broken down into components. The "**Functional & Technical Design**" component, which is the focus of this document, being the principal component that cities will require market information on. This component is further broken down into logical sub-components that follow, in broad terms, the different supply market structures and conditions.

It should be noted that approaches, methods and tools that support the other components of the Solution Framework are addressed in separate blueprint documents.

The **Functional & Technical Design** component will address the major infrastructures required and the services that will be on offer as a result. Six discrete, though inter-dependent, elements are considered:

Table 5: Mobility Island Components & Elements

Sub-Component	Elements for Consideration
Land	Footprint, ownership, state, environmental characteristics, planning factors,
Fixed Physical Infrastructure	Groundworks, charging bays, shade / shelter, street furniture, lockable micro-Mobility parking, smart lampposts/lighting and public green space (included planted areas and trees).
Ancillary Value-Added Services	Storage lockers, concession space(s); public conveniences; public information points, advertising facilities, smart device charging points, emergency services help points, WiFi nodes, defibrillators and other health and safety related interventions.

Mobile Assets & Services	Shared e-cars, e-bikes, e-scooters, delivery bikes, mobility vehicles and last-mile delivery vehicles
Power & RES Systems	Photovoltaic panels, battery storage, charging infrastructure, lighting infrastructure.
Digital Platform and Control Systems	Integrated operating platform, applications, island to island connectivity and networking, and digital behaviour change incentives

Cities will select components and elements which are affordable, practically suitable and relevant based on the geographic and socio-economic characteristics of specific locations and identified community needs. In doing so they should "design-in" the potential for additional services to be added at a future date, effectively "futureproofing" each facility.

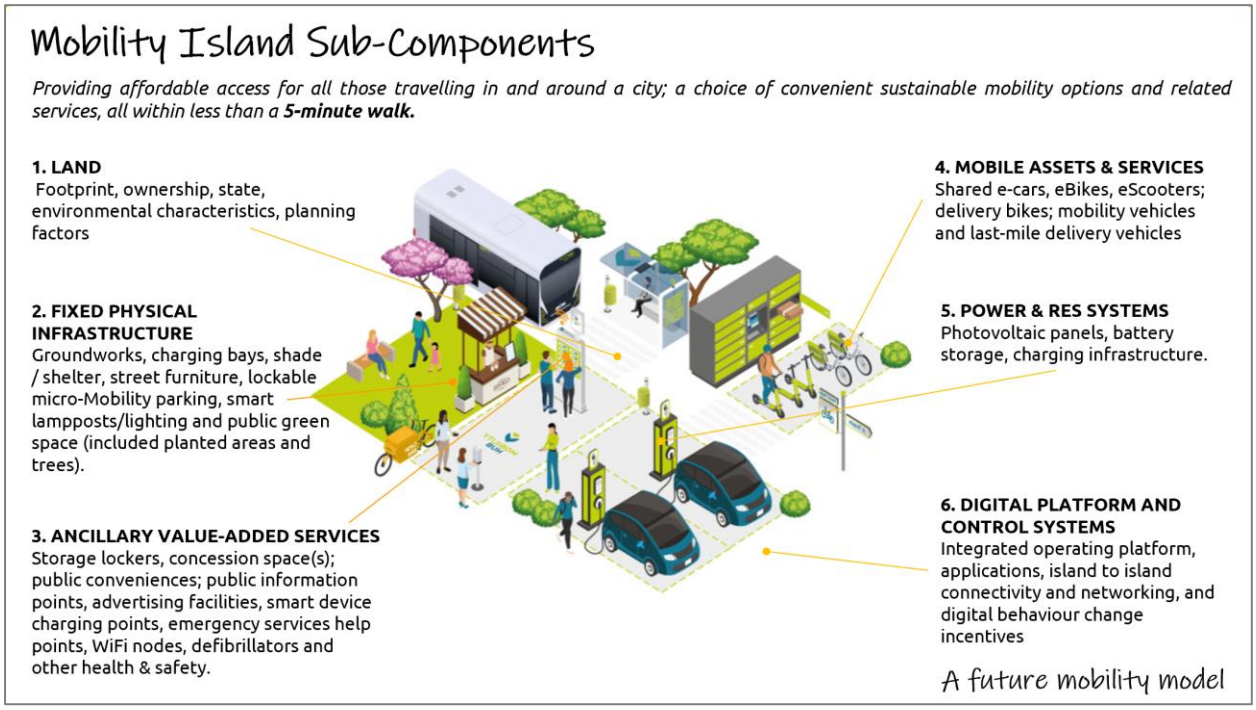


Figure 5: Mobility Island Sub-Components

The available markets for each element differ by maturity, geography, level of risk, sustainability performance, cost and value delivered, nature of the solution (e.g. the business model), operational complexity, supplier type (e.g. SME or international provider) and so on.

Cities may wish to consider these components as they construct their strategy for how they evaluate different business model options, and how they define 'lots' for procurement.

2.6 Business Models, Relative Budget, & Revenue Potential

The choices around ownership of all of the various assets associated with a typical Mobility Islands are not trivial and cover the following considerations: -

- the range of business models
- the rights and obligations, and
- the capital and operational costs

It is also likely that these considerations will differ somewhat between different Mobility Islands within a city's portfolio. For instance, a supermarket operator, university or developer may elect to position a Mobility Island within their own property with the city electing to provide the assets including e-bikes, Wi-Fi hubs and lighting. The city may also wish to consider offering an operational concession to the market, although this is perhaps a more appropriate choice once the concept has been tested within the city given the greater influence City Hall can have in ensuring that such as inclusiveness and affordability, are appropriately addressed.

Greater levels of ownership and control from City Hall afford the opportunity to influence: -

- planning, to align with other location-based and pan-city considerations
- branding, so that such new facilities build interest and appeal to the public
- design, to fit with the overall style and functionalities that will be well known in the city
- community involvement, so that adoption and any necessary incentives are considered
- links to transport and other public services
- public value outcomes (that sit at the centre of the development)
- inclusion, to ensure that it is comprehensively addressed
- (future) policies, so that an integrated evidence-based policy context is assured
- capture of learning regarding the operational and financial realities of Mobility Islands.

Given these complexities, and the implications on other city systems, it is recommended that City Hall prioritises public ownership and operational involvement and/or oversight, particularly for the initial phase(s) of portfolio development to establish the necessary learning required to inform and support successful scale-up.

In addition, business model choice is best addressed by considering an approach that is consistently suitable across the entire portfolio of Mobility Islands rather individual sites within it. Aside from the complexity of having to work with multiple providers, a mix of business models will subsequently present challenges in digitally connecting each Island and incorporating additional services at a future date. In addition, changing the business model approaches during the operational phase, in order to align under a single model, can be time-consuming and costly. Historic evidence of this can be found when looking at the city-to-city differences in waste collection container types and colours and the mismatch of power outlet configurations between countries. Making the right decision at the outset is, therefore, critical to overall success and consequently, it is recommended that city officials consider a variety of iterations using the range of business models and their respective characteristics set out in the table 6.

Table 6: Business Model Options for Mobility Islands

Business Model Type	Potential Actors involved	Business Model summary	Benefits	Drawbacks
Public Design, Build & Operate (DBO)	Local &/or Regional Authority Publicly owned Transport &/or Utility Provider	All lifecycle stages under public control. Public ownership, financing, operation and risk.	*Full development, legal, policy, pricing, and outcome controls.* *Public value outcome focus.*	*Potential capacity gaps; lack of agility; budgetary constraints; risk of (costly) bespoke solutions*
Public Ownership; Private Operation (POPO)	Public Authority City Service Provider(s) &/or Private (multi-) Utility	Public asset ownership; functional specification and service design. Concession or contracted operations. User-fees; potential external revenue (e.g. advert)	*Public control (of assets and service). Maximises core sector competences. Potential shared risk, e.g., through performance contact*	*Challenge in ensuring continuous inclusive service quality (risk of 'cutting corners')*
Public Launch & Transfer (DBOT)	Public Authority. Contractors. Private Owner/Operator	Public launch (design, build – e.g. Phase 1); then transfer to private own & operate – and potentially scale-out	*Public value-driven initial focus. Ability to address 'teething issues' prior to transfer. Later access to private investment for scale-up.*	*Degradation of public value focus, and public sector influence (e.g. affordability; locations; form-function)*
Special Purpose Vehicle (SPV)	Public Body/ies; Investor(s); Utility; Industry Service Provider; Mobility Operator	Public land/asset ownership or lease; or land/asset transfer to SPV. SPV mixed ownership. External service contracting also feasible to tactical providers.	*Asset & strategic control. Scale up potential. More nimble decisions. Alignment of motives. Maximises sector capacities.*	*Governance risks. Service performance risk and rectification if a provider is inadequate.*
Private Ownership & Operation (POO)	Developer; Market Investor; Utility; Mobility Provider; Service Provider(s)	Publicly held land/assets leased or sold to private sector. Public planning, taxes & rates. Full private control through life cycle.	*Agility & flexibility. Speed of implementation. Service mindedness. Innovation potential. Scale-up if financially viable.*	*Inclusivity at risk. Public value outcomes at risk. Loss of control of critical city service development.*
Community Ownership (CO)	Citizens; Housing Associations; potentially local small businesses	Private or Community (Trust) held land. Crowdfunded investment; commissioned (or community) operation.	*Agility & flexibility. Speed of implementation. Service mindedness. Innovation potential for new potential.*	*Inclusivity at risk. Public value outcomes at risk. Loss of control of critical city service development.*

Consistent with table 6, these business models also translate down to element level, as shown in table 7.

Table 7: Business model implications at Sub-Component level

	Maximum Public Control ⟷ *Increasing Community Ownership*					
Sub-Component	**DBO**	**POPO**	**DBOT**	**SPV**	**POO**	**CO**
Land	Public	Public	Public	Options	(Mixed) Private [1]	Community Trust (or similar)
Fixed Physical Infrastructure	Public	Public	Public → Private	SPV	(Mixed) Private [1]	Trust (or similar)
Ancillary Value-Added Services	Public	Public + Commiss. Service Provider(s)	Pub → Priv Or Private from outset	SPV	Multi-Private	
Mobile Assets & Services	Public	Public /Private	Pub → Priv + Mobility Provider(s)	SPV / Mobility Provider(s)	Private / Mobility Provider(s)	Community / Mobility Provider(s)
Power & RES Systems	Public	Public / Utility	Public → Private	SPV [2]	Private	
Digital Platforms and Control Systems	Public	Public	Public → Private [3]	SPV [3]	Private [3]	Community / Private [3]

Footnotes

1. *A developer may well seek to take a lead role in activities.*
2. *SPVs may include involvement of Private or Public Utility Companies.*
3. *Alignment between mobility operator and pan-city platform requires 'City Hall' convening.*

For the purposes of considering business model options, table 8 provides an overview of typical relative costs and revenue potential of the various elements of a Mobility Island facility. This is indicative only and is intended to stimulate local contextualisation and inform discussions.

Table 8: Relative Budget & Revenue Potential by Mobility Island Element.

Sub-Component	Elements	Relative Budget	Revenue Potential	Other Value Potential
Land		Variable	Potentially	Land ownership will vary; rental revenue may apply. Surrounding land/property value can benefit.
Fixed Physical Infrastructure	Charging Bays	Med	Yes	Charges may be built into shared mobility fees; &/or levied to private vehicles
	Shade / Shelter	Med	No	Quality of Place / Security. Sensors can help save energy costs for lighting & improve safety & security
	Lockable Micro-Mobility parking	Med	Minimal	QoPlace. More a means to secure (MI owner) assets. Option to charge private users.
	Smart Lampposts / Lighting	Lo	No	Safety/QofPlace. Efficiency savings however from LED
Ancillary Value-Added Services	Waste Bins	Lo	No	
	Storage Lockers / Logistics	Lo	Modest	
	Concession Space	Med	Significant	
	Benches & Tables	Lo	No	QoPlace/Channel for other revenue (e.g. café/advertising)
	Public Convenience	Med	No	
	Public Info / Advertising	Lo	Significant	
Mobile Assets & Services	eCars	Hi	Significant	Cost borne by service providers
	eBikes	Med	Significant	Public stimulus often valuable
	eScooters	Lo	Significant	Service provider(s) model option
Power & RES Systems	Photovoltaic panels Battery Storage	Med	Potentially	eBike/Scooter & Phone charging could be offered as an incentive to attract users.
Digital Platforms and Control Systems	Operating platform	Med/Lo	No	Operational productivity
	Applications & Integration	Lo	Potential	Aggregated user data offers scope for revenue

3 EVALUATION CRITERIA

This section addresses the more granular details of what a city should consider in designing and developing Mobility Islands across the 6 different sub-components. Provision and market engagement for these will vary, as will the relevance of particular business models.

The guidance below can be used in a variety of contexts. In almost all instances, cities will undertake a full procurement exercise in accordance with their own legal and policy requirements and approaches. These, in turn, are often informed by national requirements with the focus on demonstrably securing best value through the allocation of public funds.

The evaluation criteria can therefore be used to inform the design of the Mobility Islands enabling the city to prioritise its key requirements and parameters for subsequent use as part of the specification in a comprehensive tender to market.

Similarly, cities may wish to use the information in the design of the tender evaluation approach and criteria with weightings reflecting city priorities in terms of its desired outcomes.

3.1 General Criteria

The descriptions below and evaluation criteria are used to characterise each solution provider or manufacturer and their product(s) for each component.

Table 9: General criteria

General Parameters	Description
Sustainability / Net Zero performance	Provider's sustainability performance and supply chain management evidenced via policies and user references. The sustainability of the products provided including constituent materials and components, place of manufacture, reliability and end of life options.
Delivery Time	Lapsed time to deliver the solution component(s) and /or a solution on the ground and operational from the sign off of the contract
Standards relevance	The relevant product technical standard(s) used for manufacture
Capacity	User service capacity to deliver solutions in numbers (H/M/L)
Durability/Robustness	The life of the component and resistance to physical & natural impact (vandalism; climate; accidents)
Market Coverage	The breadth of geographical market coverage of the supplier
Integration	Working across a variety of supplier' categories to improve versatility of the offering
Future Proof Potential	The ability of the supplier to enable the updating of components and the addition of new services by them and/or another supplier.
Aesthetics	Attractiveness of design; branding consistency across the portfolio to indicate a clear thematic change of mobility model (whilst each location sympathetic to hyper-local context)
Value for money	Affordability; pricing; financial and non-financial enduring value

3.2 Component Criteria

Table 10 lists the main elements for each sub-component, providing descriptions that support specification to the market; and that can also be built into evaluation criteria.

Table 10: Sub-Component Detail

# 1 Land Criteria	Description
Ownership	Municipality or other public ownership; business / commercial; private party; trust; other. Tenancy/rental in place & terms.
Land Value	Book value; potential value through land value capture (upgrades)
Scale & Dimensions	Plot area and shape; ratio of overall land scale versus MI footprint
Condition	Soil quality; general surface tidiness; proximity of utility services etc.
Environmental characteristics	Proximity to residential and commercial properties may have implications due to increase footfall and transport movements and resultant increase in, for example, noise levels. Visual impact of the Mobility Island is also key here.
Planning factors	These will be city specific and location specific and include compliance with planning policies, environmental impact and the views of local citizens and communities.
Adaptability	Constraints posed or opportunities presented by surrounding land and facilities that would affect design and implementation of a mobility island.
Accessibility	Ease and safety of access for all users and potential users. Assessed at the feasibility and planning stages.

#2 Fixed Physical Infrastructure Elements	**Description** *(Note: Facilities with the lowest carbon footprint and highest environmental performance should be prioritised pre-procurement or specification development. Sustainability of the materials used should be researched at the planning stage)*
Groundworks/civils	The basic "hard" infrastructure from foundations and surfacing to utilities.
Charging Bays (for bikes, scooters, cars etc.)	The forms and layout of the various areas for charging in terms of design and shape; separation and safety; integration with greening and overall surrounds.
Shades & Shelters	Dependent on scale and location and enabling protection from the elements throughout the year. .
Street Furniture	Including benches, seating and tables as well as bike racks. Serviceable, easy to maintain and resistant to vandalism are critical factors.
Smart Lighting	Lowest practicable energy use with movement sensors and the ability for city officers to control remotely. Reliability and resilience are key factors.
CCTV	Wifi connected, with the ability to "hear" and enabling city officers to communicate through speaker system.

Public Green Space	"Greening" the facility through tree planting (for natural shade), green roofs, and planters are important from visual impact, biodiversity and climate change perspectives; although variable opportunities in each location.

#3 Ancillary / Value Added Services	Description
Waste and Recycling Bins	Consistent with achieving Net Zero targets, the focus here should be on zero waste with a visible emphasis on discouraging anything other than material separation for recycling and reuse. Functional, easy to use (and empty) and vandal resistance are key considerations.
Storage Lockers	Particularly aimed at commuters with sufficient volume to enable the secure storage of items such as cycle helmets, bags and clothing. Functional, lockable (using smart, e-locks) and crime resistance are key considerations.
Delivery/Collection Lockers	Enabling delivery of on-line purchases to a specific location for collection by commuters, local residents and so on.
Concession Space	Dependent on the scale and location of the Mobility Island but could include café space, vending machines, newspaper/book sellers and so on.
Public Conveniences	Only possible in larger scale Mobility Islands due to the space and services required. May be a required asset where seated food concessions are present. Accessible to all, secure and vandal resistant are important factors. Smart, automatically cleaned, unisex facilities should be prioritised.
Public Information and Advertising facilities	Useful for public, locational information such as maps and service provider contact details. Smart facilities enabling, for example, the download of guides to smart devices via QR codes, should be prioritised where practicable. Particularly relevant to tourist locations and close to city arrival points.
Smart device charging points	Providing a customer friendly service with a safety impact, ensuring Mobility Island users can remain connected via their mobile phones. (Security, purchasing and locational benefits for the individual).
Emergency services help points including, for example, defibrillators.	Accessible, easy to use "push to talk" facilities to enable contact with police, ambulance and fire services and providing a "safe haven" for vulnerable citizens. The needs of disabled users such as blind, partially sighted or aurally challenged should be considered to ensure access to all.
WiFi nodes	Enabling free (preferably) access to the internet within a defined range of the Mobility Island. Convenience and safety benefits for users.

#4 Mobile Assets & Services	Description
Shared eCars	Typically for larger Mobility Islands. The provision of parking spaces and charging points for e-bookable shared vehicles providing a collection and drop-off point, and modal change opportunity.
eBikes / eScooters	The provision of secure spaces and charging points for e-bookable shared e-bikes and scooters providing a collection and drop-off point.
Delivery eBikes / eVans	As above, but facilitating the provision of sustainable, last mile delivery to retail premises and/or for nearby home deliveries of on-line purchases including food.
Mobility vehicles	The provision of parking spaces and charging points for mobility vehicles, either privately owned or hireable. Providing a collection and drop-off point.

#5 Power & RES Systems	Description
Photovoltaic panels;	Roof mounted and providing the highest possible percentage of the energy requirements of the host Mobility Island with ability to move excess energy to battery storage for use at low generation times.
Battery storage	Linked to local renewable electricity generation enabling local power during times of low energy generation.
Integration with charging infrastructure	Openness and application of standards to support ease of integration between (external and site) power systems and charging facilities.
Lighting	Also see #2 above. Potential for solar lighting.

#6 Digital Platforms & Control Systems	Description
Operating platform	Quality, functionality, stability and interoperability of the mobility island operating system; and it's integration with other city mobility support systems.
Applications and Analytics	Functionality and level of sophistication of data analytics, visualisation, reporting systems (e.g. dashboards, AI, predictive capabilities, real-time operations etc).
Island to island networking & integration	Connectivity enabling digital connections between Islands. Useful to users for checking availability of facilities at destination islands including e-vehicles, parking spaces, lockers and charging points. Also enable monitoring using and functionality by city officers facilitating fault notification and efficient repair and maintenance.
Behaviour change incentives	Digital incentive mechanisms that support individual and group (e.g. shared housing; business) behaviour change.

3.3 Adapting Mobility Islands to Different City Locations

The process of asset landscaping, to determine what existing assets can be employed, or re-purposed to support Mobility Island roll-out will help a city maximise appropriate re-use of prior investments.

Alongside asset landscaping, is the process of **asset allocation**. In other words, determining what scale or number of assets within each of the 6 Mobility Island sub-components it would be appropriate to provide at each location.

There is no precise science to this, as it is an emerging concept. Flexibility is therefore an important principle to build into each location (although to different extents perhaps). This will ensure that the base footprint for any Mobility Island can cater for future growth and enhancement in terms of services offered.

What facilities may be beneficial in any one location can be informed by a variety of sources from conventional origin-destination transport data and survey results to existing public facilities mapping and social data feeds.

Thinking this through for implementation of the initial 'no regrets' portfolio offers valuable scope for learning. For instance, providing an excess of ebikes in a location is a low risk means to ensure those that wish to use that mode of travel are always afforded the opportunity; conversely limiting car charging can coach people to consider mode shift; or ensuring a pleasant look and feel and convenience services (lockers, café, socialisation green space, art) can help make Mobility Islands a 'trendy new idea' for city-goers.

Through managed experimentation, collaboration across service providers, and community engagement a city can learn to tailor future developments.

The list of 8 district types provides a useful structure to provide some basic parameters as to the size, scale, and facilities and services that may be allocated to each Mobility island.

1. Central Business District – likely to be footprint constrained, and perhaps should stimulate non-motorised or light mobility solutions
2. Industrial – may well have car share potential for employees
3. Retail – lock-boxes, café, and perhaps green space to relax may suit well
4. Inner City Multi-tenant (social) housing
5. Inner City residential – green space combined with light shared mobility modes
6. Suburbs – the information agenda is important here to offer information and incentives for those living in suburbs to shift habits
7. Culture and Green / Blue Spaces – a more relaxed and potential higher tourist location, with services consistent with that
8. Satellites / Rural Settlements – similar to suburbs; how to incentivise mode shift and shared transport

4 CONCLUSIONS

Mobility Islands present an affordable, flexible means by which a city can coordinate and accelerate its journey to Net Zero. That journey requires agility and collaboration in its execution.

Developed world cities have a unique opportunity to join forces and deliver better outcomes by implementing these new assets in collaboration. New-build and city re-developments, as well as emerging countries, can leap-frog and adopt such new mobility models from the outset.

This Buyer's Guide seeks to inform and support cities about the Mobility Island, and the emerging and different offerings available, in what is a nascent, growing and highly dynamic market.

The guide is not a complete capture of the worldwide market and will develop with collaboration amongst contributing cities, and with ongoing input from industry. The guide does, however, help inform and speed decisions and support scale adoption of mobility island solutions even in its current form. Managed collaboration amongst cities e.g. through EU-funded projects, and various EU City Platforms (EU Smart City Marketplace, NetZero Cities, Scalable Cities, EU City Facility) offers a basis to collect and curate knowledge in a structured and objective manner. Such coordinated activities will progressively improve the richness and quality of this Guide.

Cities, however, remain fully accountable for the actions and decision they take based on any of the information provided. In other words, it should only ever be regarded as providing informed guidance.

To accelerate the adoption at scale:

- **Cities** should seek to explore the business and broader value case and consider different financing options to speed and ease adoption. Cities must also actively engage with their communities – listening to needs, and developing solutions to meet them. Additionally, collaboration between cities (notably mid and smaller sized ones) to aggregate demand can bring the scale to market whereby value is substantially enhanced for all.
- **Industry** should continue to openly collaborate within and between sectors and segments to create supply ecosystems that can service the Mobility Island market.
- **Investors/Financiers** should continue the process already observed of building greater technical capacity to more legitimately provide advice and help to generate scale market adoption.
- **Standards Development Organisations** (national and international) should take a keen interest in supporting the process and work to capture and promote best practice as it develops.
- **Policy and Programme setters, at EU and National levels**, should actively seek to stimulate the market to accelerate the overall transition to a new mobility model – for which the Mobility Island is seen to be an anchor component
- **Society** – as the vital end users of these new facilities – also need to play an active part in actually changing habit and behaviours, and 'closing the loop' with their local public bodies, to support a swift transition to a new mobility model in support of Net Zero goals.

Service demand will change as user needs are shaped and as technologies evolve. For example, the current demand for connectivity and electric mobility; or connected automated driving and drone technologies that will have a marked mid/long-term impact on travel and transport.

We are also at the beginning of the solution blueprinting journey. This Guide should be used in that context, and contributions to its improvement actively proffered. One means of doing so is through the EU Smart City Marketplace 'Small Giants' Focus Group.

ANNEXES

1 GENERAL SUPPLIER INFORMATION

Having outlined the city's Mobility Island journey from concept, location identification and component selection through to the choice of business models, this section informs readers on some general facts about the market in terms of supplier options, market capacity, geography and the various mobility island components that suppliers offer.

The table below provides a overall listing of the current inventory of companies that provide component parts and specific software to support the Mobility Island market. Local Advisors and local project management implementation companies are generally not included.

The listing is shown sorted by country (in alphabetic order), recognising that cities may take an interest on local supply (for economic and circularity reasons), recognising that procurement may well require they source from further afield. Weighting of evaluation criteria can of course influence local supply ambitions.

The listing indicates the capabilities and coverage of suppliers as of the date of publication. Cities should use it as a useful (buyer's) guide, however should also ensure that they consider other sources and recognise their accountability towards the accuracy of what they use and publish.

Table 11: Total Supplier Listing, by principal country

MOBILITY ISLAND PROVIDERS	**~75** Suppliers have been identified and characterised			**Breadth of Mobility Island Offering**				
Alphabetic, by primary country of headquarter	Country Region or City	Region; Country; Internatnl; Global	SME, Large; Conglom-erate	✓= Supplier supports this / these sub-component(s) (NB Land not considered)				
Supplier	**HQ**	**Coverage**	**Scale**	**2** Infra	**3** VAS	**4** Mobile	**5** Power	**6** Digital
xxx	DE							
xxx								
xxx								✓
xxx								✓
xxx								
xxx								
xxx								
xxx								
xxx								✓
xxx								✓
xxx								✓
xxx					✓			

NOTE

This data is held in a master database to support efficient update and sorting.

This initial published version outlines the concept and intended elements of the database, rather than including the current database (which captures some ~80 providers).

The guide will be published with the initial validated inventory of providers following further testing and feedback from the demonstrator cities.

2 MOBILTY ISLAND COMPONENT PROVIDERS & EVALUATION

This section provides a detailed example of each group of suppliers per mobility island component following the frame of criteria seeing above. Only one example is provided per component. A full data set is held in a separate database.

#2 Fixed Physical Infrastructure

Providers are usually traditional and local suppliers.

Table 12: Sub-Component #2 Fixed Physical Infrastructure

Suppliers	Elements Supported (Civils & Greening excluded - assumed hyper-local)					Price (Range) - where feasible	NOTES	General Evaluation (Note: intention is tha this could be developed over time with market uptake and feedback)								Overall Rating
Alphabetic order	Charging Bays	Shades & Shelters	Street Furniture	Lockable micro-Mobility parking	Smart lampposts/ lighting			Technical Capacity	Experience	Sustainability	Pricing	Delivery	Durability/ Robustness	Warranty	Market Coverage	
Example - Supplier "X"		✓	✓	✓		*€500-€5,000*	*High quality bespoke solutions typically*	****	***	*****	*	**	*****	****	**	***

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3. Ancillary / Value Added Services

Storage lockers, concession space(s); public conveniences; public information points, advertising facilities, smart device charging points, emergency services help points, WiFi nodes, defibrillators and other health & safety.

Table 13: Sub-Component #3 Ancillary / Value Added Services

Suppliers	Elements Supported (Concession spaces, public conveniences assumed hyper-local supply)						Price (Range) - where feasible	NOTES	General Evaluation (Note: intention is tha this could be developed over time with market uptake and feedback)								Overall Rating
Alphabetic order	Storage Lockers	Public Information & Advertising	Smart Device Charge Points	Emergency Help Points	WiFi Nodes	Defibrillators			Technical Capacity	Experience	Sustainability	Pricing	Deivery	Durability/ Robustness	Warranty	Market Coverage	
Example - Supplier "X"			✓	✓			*€500-€5,000*	*High quality bespoke solutions typically*	****	***	*****	*	**	*****	****	**	***
		✓															
		✓															
		✓															

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4. Mobile Assets & Services

Shared e-cars, eBikes, eScooters; delivery bikes; mobility vehicles and last-mile delivery vehicles

Table 14: Sub-Component #4. Mobile Assets & Services

Suppliers	Elements Supported						Price (Range) - where feasible	NOTES	General Evaluation (Note: intention is tha this could be developed over time with market uptake and feedback)								Overall Rating
Alphabetic order	Shared eCars	eBikes	eScooters	Delivery Bikes	Mobility Vehicles	Last Mile Delievry Vehicles			Technical Capacity	Experience	Sustainabilitty	Pricing	Deivery	Durability/ Robustness	Warranty	Market Coverage	
Example - Supplier "X"			✓	✓			*€500-€5,000*	*High quality bespoke solutions typically*			*****	*	**	*****	****	**	***

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5. POWER & RES SYSTEMS

Photovoltaic panels, battery storage, charging infrastructure

Table 15: Sub-Component #5 5. Power & RES Systems

Suppliers	Elements Supported			Price (Range) - where feasible	NOTES	General Evaluation (Note: intention is tha this could be developed over time with market uptake and feedback)								Overall Rating
Alphabetic order	PV Panels	Battery Storage	Charging Infrastructure			Technical Capacity	Experience	Sustainability	Pricing	Deivery	Durability/ Robustness	Warranty	Market Coverage	
Example - Supplier "X"			✓	*€500-€5,000*	*High quality bespoke solutions typically*			*****	*	**	*****	****	**	***

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6. DIGITAL PLATFORM AND CONTROL SYSTEMS

Integrated operating platform, applications, island to island connectivity and networking, and digital behaviour change incentives

Table 16: Sub-Component #6 Digital Platform And Control Systems

Suppliers	Elements Supported				Price (Range) - where feasible	NOTES	General Evaluation (Note: intention is tha this could be developed over time with market uptake and feedback)								Overall Rating
Alphabetic order	Integrated operating platform	Applications	Connectvity & Networking	Digital behaviour change incentives			Technical Capacity	Experience	Sustainability	Pricing	Deivery	Durability/ Robustness	Warranty	Market Coverage	
Example - Supplier "X"			✓	✓	*€500-€5,000*	*High quality bespoke solutions typically*	***		****	*	**	*****	****	**	***

NOTE

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3 THE MOBILITY ISLAND ECOSYSTEM

At the time of writing, few, if any, single companies offer the complete portfolio of a Mobility Island, from advice through to financing. There is, however, a wide variety of companies that are broadening their activities to include a more complete proposition. In some cases, these are shifting from offering (pre-configured and/or installed) *solutions* to the provision of a complete *service* (including, for example, financing and data and/or system optimisation services).

Different providers are emerging from different sectors, and the landscape is assumed to remain quite dynamic over the medium term. The table below provides a frame of reference with some initial information that a city can use to reflect on a wider spectrum of options in terms of potential (full-)service providers (with requisite different business models and motives), to best inform their mid-to-longer term activities (i.e. beyond an initial 'no regrets' portfolio).

Table 17: Mobility Island Potential Ecosystem Aggregators

Company Sector / Type	The different role that a company may play in the mobility island ecosystem					
	System Advice	**Equipment Provision**	**Ecosystem aggregation**	**Integration**	**System Operation**	**Financing**
Role Description	*Provide comprehensive advice on the entire end-to-end service design*	*Provide hardware to enable infrastructure*	*Pulls together a suite of providers to offer a complete solution, or service*	*Combining physical and digital to ensure service operation and provide the capability to optimise it*	*provides operating services across different areas of the mobility network*	*provides business model, financing and funding services*
Original Equipment Manufacturers (OEM)						
Extended offering from the ba						
e.g. Automotive manufacturer						
Major Infrastructure Installer						
Focus on acquiring and instal						e
e.g. Parking Lot Operator	✓				✓	
Event / Venue Operator		✓		✓	✓	✓
City Mobility Service Providers						
Primarily focused on operating city infrastructure and services and may provide some basic installation and/or upgrade work. May be private, publicly owned, or a hybrid.						

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e.g. Bus Company					✓	
Utilities						
Typically providing and operating energy systems, though may provide multi-utility services. May be private, publicly owned, or a hybrid.						
Energy co x	✓				✓	
Digital Parking App Provider	✓		✓	✓		
PPP						
Public Private Partnership – focused on managing multi-modal mobility operations to optimise operational performance and financial outcomes; frequently with part public ownership.						
NewCo 'X'			✓	✓	✓	✓
Investors, Funds and project financiers						
Companies that only focus on pulling together the finance solutions for mobility island projects / networks.						
e.g. City Investment Fund	✓		✓			✓

1 Engage

2 Justify

3 Implement

Buyer's Guide

4 Sustain