INTERNATIONAL URBAN AND REGIONAL COOPERATION

2024 - 2025

IURC North America

INTERNATIONAL URBAN AND REGIONAL COOPERATION

Funded by the European Union

About IURC NA

The European Union's International and Regional Urban Cooperation (IURC) programme is the world's largest city-to-city cooperation programme and an international network of reference for urban innovation and sustainable urban development. IURC North America partners European cities with Canadian and USA cities to facilitate knowledge exchange through online tools and face-to-face support such as study visits, participation in thematic and networking events, and capacity building.

Cover Photo: Delegates from cities across the EU, the United States, and Canada gather in Montreal for the IURC North America Circular Economy Event, April 2025.

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During the San Francisco study visit on October 2024, delegates from Dublin and San Francisco explored the renovation of Levi's Plaza, highlighting a sustainability approach.

City Pairings

North America	European Union
Calgary, Canada	**Anci Lazio-Roma**, Italy
Halifax, Canada	**Braga**, Portugal **Viana do Castelo**, Portugal
Nanaimo, Canada	**Pavlos Melas**, Greece
Toronto, Canada	**Hamburg**, Germany
Albuquerque, USA	**Murcia**, Spain
Atlanta, USA	**Sofia**, Bulgaria
Massachusetts Department of Transportation, USA	**Rotterdam**, Netherlands **Stuttgart**, Germany
San Francisco, USA	**Dublin**, Ireland

Delegates from Anci-Lazio Rome and Calgary during the study visit in Calgary, Canada, July 2024.

CANADA

Areas of Cooperation

NA City/Metro Area	EU City/Metro Area	Thematic Area	Topics
Calgary, Canada	**Anci Lazio-Roma,** Italy	**Nature Based Solutions** **Energy Efficiency in Buildings** **Urban Planning**	• Urban agriculture and food systems • Energy communities and social/ affordable housing policies • Innovative urban development policies based on ancient ways of life
Halifax, Canada	**Braga,** Portugal **Viana do Castelo,** Portugal	**Urban & Regional Renewal – Urban Poverty** **Innovative, Sustainable & Carbon Neutral Ecosystems & Strategic Sectors**	• Economic development, investment and talent attraction • Off-shore and coastal green energy
Nanaimo, Canada	**Pavlos Melas,** Greece	**Urban Planning** **Innovative Strategies for Economic Development**	• Redevelopment of abandoned or underused areas • City governance, development of strategic city plans, and project management • Public space activation and management
Toronto, Canada	**Hamburg,** Germany	**Urban Planning** **Cross-sectoral administration**	• Data platforms and tools; Digital processes & infrastructure in planning processes for urban development • Role of information management and cooperation between specialist municipal departments

Calgary - Anci Lazio - Rome, Italy

Delegates from Rome & ANCI Lazio visiting Calgary's Highfield Farm on Food Resilience, July 2024.

Areas Of Cooperation

- **Nature Based Solutions**
- **Energy Efficiency in Buildings**
- **Urban Planning**

- Urban agriculture and food systems
- Energy communities and social/affordable housing policies
- Innovative urban development policies based on ancient ways of life

Sustainable Development Goals

EU Urban Agenda Topics

- Culture/Cultural Heritage
- Sustainable Land Use and NBS
- Energy Transition
- Urban Poverty
- Housing

EU Green Deal Policy Areas

- Clean Energy
- Building and Renovation
- Farm to Fork
- Biodiversity

The exchange with Calgary inspired Rome to rethink cultural inclusion and resilience leading to new project initiatives and stronger transatlantic collaboration.

Claudio Bordi & Andrea Vignoli,
Anci Lazio, Rome

The cooperation between Anci Lazio–Rome and Calgary centred on nature-based solutions for sustainable urban development, particularly clean energy communities, food system resilience, and socially inclusive planning inspired by ancient and Indigenous ways of living. Through a series of technical calls and reciprocal study visits, both partners explored each other's models: Anci Lazio–Rome showcased its community gardens, food policy framework, and the integration of energy communities into neighbourhood revitalisation, while Calgary introduced its food resilience strategies, urban agriculture programs, and Indigenous-led approaches to climate, land, and water management. These exchanges created a strong foundation for adapting successful practices across both regions.

Site visits deepened practical learning. In Calgary, Rome delegates examined Highfield Farm, the city's food resilience initiatives, and strategies for integrating Indigenous knowledge into urban planning. In Rome and Lazio, Calgary explored community-managed gardens such as Parco Ort9, the new regulation for urban community gardens, and regeneration projects in medieval villages that repurpose heritage landscapes for sustainable development. Calgary identified potential to merge Rome's models of community gardens and energy communities into an integrated pilot, while Rome explored how Indigenous stewardship principles could strengthen its own cultural inclusion and resilience strategies.

The cooperation produced tangible results with clear opportunities for long-term impact. Calgary launched the development of a pilot project—Empowering Local Energy Solutions—which integrates a community association, school, and greenhouse into a combined renewable energy, food production, and educational initiative, directly inspired by Rome's experience. Influenced by Calgary's Indigenous inclusion approach, Rome and Anci Lazio joined a Horizon Europe project proposal on intangible cultural heritage, focused on cultural rights and amplifying the voices of marginalised communities.

Overall, the partnership has generated a highly productive and forward-looking collaboration, producing results that exceeded initial expectations. Both sides gained valuable lessons on integrating community-driven energy and food systems, strengthening cultural and social inclusion, and linking environmental sustainability with citizen participation. Calgary's engagement in EU-funded consortia (including mobility nudging initiatives) and Rome's plans to expand citizen-science approaches using sensors demonstrate how the cooperation is catalysing new innovation pathways. Both partners expressed a strong interest in continuing the collaboration through future EU programmes, building on a shared long-term vision of resilient, inclusive, and community-empowered urban development.


Calagary delegates visit the Ex-Porto Fluviale (Former River Harbour) in Rome, October 2024.

Our partnership with Rome has shown us the power of integrating energy and garden communities to build resilience at the neighborhood scale.

Dick Ebersohn,
City of Calgary

You can read the case study from the cooperation between Anci Lazio - Rome and Calgary on Nature-Based Solutions on page 176.

Halifax - **Braga**, Portugal & **Viana do Castelo**, Portugal

Portuguese delegates visiting the Halifax Port Authority, October 2024.

Areas Of Cooperation

- **Urban & Regional Renewal – Urban Poverty**
- **Innovative, Sustainable & Carbon Neutral Ecosystems & Strategic Sectors**
  - Economic development, investment and talent attraction
  - Off-shore and coastal green energy

Sustainable Development Goals

EU Urban Agenda Topics

- Energy Transition
- Jobs & Skills in the Local Economy
- Inclusion of Migrants & Refugees

EU Green Deal Policy Areas

- Clean Energy
- Sustainable Industry

IURC has provided Braga with a valuable international learning platform. The cooperation with Halifax and Viana do Castelo allowed us to connect innovation ecosystems and exchange practical solutions to make our cities more sustainable, resilient, and inclusive.

Nuno Gouveia, Senior Advisor, Mayor´s Office

The cooperation between Viana do Castelo- Braga and Halifax focused on sustainable economic development, talent attraction, innovation ecosystems, and emerging climate- and ocean-related industries. Through technical calls, study visits, and ongoing digital exchanges, the cities explored models for attracting talent and investment, with Braga and Viana presenting their platforms, university partnerships, and business incentives, while Halifax showcased its economic strategy, innovation district, and climate action framework. Early exchanges helped identify shared strengths as coastal communities and clarified opportunities in offshore energy, maritime industries, and IT development.

Study visits offered hands-on learning. In Portugal, Halifax delegates examined the Tech Accelerator of Viana do Castelo, the International Iberian Nanotechnology Laboratory (INL) in Braga, and other initiatives that blend public–private funding, advanced research, and partnerships with universities. Conversely, the Portuguese delegation's visit to Halifax included meetings at VOLTA—Atlantic Canada's key startup hub—and the Centre for Ocean Ventures & Entrepreneurship (COVE), where they learned about Canada's marine sector innovation, technology testing infrastructure, and models supporting ocean-related industries. Both sides gained insights into accelerators, startup coaching, innovation support systems, and economic strategies connected to marine, digital, and climate-aligned sectors.

The exchange produced concrete cooperation outputs and mutual inspiration. Braga expressed strong interest in Halifax's Nova Scotia Health Innovation Hub and began exploring replicable tools for startup acceleration and health innovation. Halifax, in turn, found value in Braga's Startup Braga model, its talent attraction portals, and the region's leadership in ocean energy and blue-economy technologies. The Halifax Partnership model—particularly its integrated approach to investment attraction—became a reference for Braga as it redefines its own international cooperation strategy. Technical exchanges on low-carbon technologies, climate adaptation, and circular economy models further reinforced shared learning.

Overall, the partnership strengthened international networks and set the foundation for future joint initiatives. The cooperation enhanced the visibility of Braga and Viana as innovation hubs and enabled Halifax to establish deeper global connections through IURC events, technical workshops, and sector-specific collaborations. Concrete follow-up actions include continued engagement between Startup Braga, VOLTA, and the Nova Scotia Health Innovation Hub; and potential joint EU–Canada project proposals.

Halifax representatives were received by Luis Nobre, Mayor of Viana do Castelo, and Ricardo Rio, Mayor of Braga, during their study visit in Portugal, June 2024.

Through IURC, Halifax strengthened its international connections and cooperation while both sharing and learning actionable best practices for sustainable urban development with private, public, post-secondary and non-profit leaders with our local and global partners. International collaboration and knowledge exchange are essential to tackling shared urban challenges, fostering innovation, and accelerating the transition to more resilient, inclusive, and sustainable cities.

Nancy Phillips, VP Investments, Halifax Partnerships

Nanaimo - Pavlos Melas, Greece

Representatives from Pavlos Melas at GRT Regenerock on Vancouver Island, September 2024

Areas Of Cooperation

- ■ **Urban Planning**
- ☐ **Innovative Strategies for Economic Development**

- Redevelopment of abandoned or underused areas
- City governance, development of strategic city plans, and project management
- Public space activation and management

Sustainable Development Goals

11 SUSTAINABLE CITIES AND COMMUNITIES

13 CLIMATE ACTION

EU Urban Agenda Topics

- Security in Public Spaces
- Sustainable Land Use and NBS
- Public Procurement

The City of Nanaimo was honoured to be part of the International Urban and Regional Cooperation program, and fully appreciated our pairing with Pavlos Melas, along with the opportunity to connect with other EU and US cities. The deep personal and professional connections and relationships developed serve to strengthen and build a positive global society, so necessary in today's fractious world. The learning and exchange of ideas helped broaden our own vision and contribute to an international foundation for a more sustainable world.

Bill Sims, General Manager, Engineering and Public Works,
City of Nanaimo

The cooperation between Pavlos Melas and Nanaimo focused on shared challenges in urban regeneration, adaptive reuse of abandoned spaces, and sustainable planning. Through technical calls, workshops, and study visits, the cities exchanged practical methods for revitalizing underused buildings, such as Pavlos Melas' former tobacco warehouses and Nanaimo's underutilized downtown areas. Nanaimo's experience with large-scale redevelopment and investment strategies helped inform Pavlos Melas' approach to repurposing industrial sites and preparing a new strategic framework for their reuse.

A key outcome was the influence of Nanaimo's City Plan, monitoring tools, and doughnut economics model on Pavlos Melas' long-term planning. These exchanges led Pavlos Melas to strengthen its own City Plan with an expanded chapter on long-term visioning and to explore a monitoring system to support implementation. The Greek delegation also drew lessons from Nanaimo's governance practices, including its coordinated project management and data-driven decision-making, which they aim to adapt to enhance internal efficiency.

Discussions on parks, public spaces, and community engagement offered further value. Visits to Nanaimo's parks system provided Pavlos Melas with insights on volunteer-based maintenance, transparent fees and charges, and different co-management models. These learnings guided the development of a comprehensive park management plan for the Metropolitan Park, including new governance structures and cost-recovery strategies. In return, Nanaimo was inspired by Pavlos Melas' nature-based designs in Nikopolis and Evkarpia, as well as the transformation of the former military camp into a metropolitan-scale green and cultural hub.

Overall, the cooperation produced concrete results and strengthened institutional capacity on both sides. Pavlos Melas is advancing the reuse strategy for its tobacco warehouses and finalizing a management plan for the Metropolitan Park, while Nanaimo gained global visibility and reinforced its expertise in sustainable planning. Both cities benefited from comparative analysis, shared methodologies, and hands-on learning, establishing a solid foundation for continued collaboration and demonstrating the value of international exchange in driving local innovation.

Delegates from Nanaimo next to Evkarpia Park in Pavlos Melas, May 2024.

All in all, our cooperation with the City of Nanaimo has been a truly rewarding and meaningful experience. Beyond exchanging technical knowledge, we had the privilege to work with highly skilled and genuinely kind professionals who welcomed us with generosity and openness. Their expertise, guidance, and hospitality made a lasting impression on us, both as municipal professionals and as individuals committed to public service. We are also deeply grateful to the IURC program team, whose coordination, insight and encouragement helped us bring out the best of our city. Despite the clear differences in scale and background between our municipalities, the program created a common space of trust, learning and mutual respect that we will carry forward into our future work.

Anastasia Dimitriadou, Director of Urban Development and Funding Strategies,
City of Pavlos Melas

You can read the case study from the cooperation between Pavlos Melas and Nanaimo on Urban Planning on page 58.

Toronto - Hamburg, Germany

The Hamburg delegation visiting the Toronto Waterfront Revitalization project, June 2024.

Areas Of Cooperation

- **Urban Planning**
- **Cross-sectoral administration**

- Data platforms and tools; Digital processes & infrastructure in planning processes for urban development
- Role of information management and cooperation between specialist municipal departments

Sustainable Development Goals

7 AFFORDABLE AND CLEAN ENERGY

10 REDUCED INEQUALITIES

11 SUSTAINABLE CITIES AND COMMUNITIES

EU Urban Agenda Topics

- Urban Mobility
- Digital Transition
- Housing

EU Green Deal Policy Areas

- Building and Renovation
- Eliminating Pollution
- Sustainable Mobility

The IURC partnership with Hamburg and thematic activities have been a transformative experience. It has not only broadened our perspective on urban data platform and European cities' best practices but also reinforced our commitment to inclusive and data-informed planning as Toronto embarks on the journey for governance improvement and digitalization.

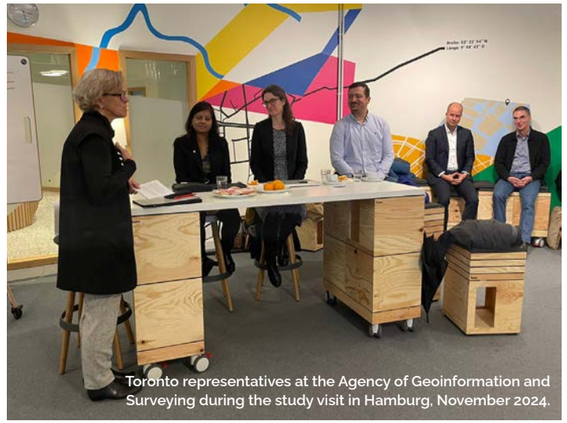
Aretha Phillip,
Toronto Chief of Protocol
& External Relations

The cooperation between Hamburg and Toronto focused on advancing data management and digitalization for sustainable urban planning, with both cities exchanging methodologies on data platforms, governance, AI applications, and cross-sectoral coordination. Through technical calls and study visits, the cities examined each other's legal, institutional, and technical approaches to managing urban data. Hamburg shared its long-standing Urban Data Platform and the impact of its Transparency Law, while Toronto presented its Connected Community framework, Open Data Master Plan, and Data for Equity Strategy, deepening mutual understanding of open data policies, ethical considerations, and public engagement practices.

Study visits significantly strengthened the partnership, enabling hands-on exchanges on emerging technologies and data-driven urban tools. In Toronto, Hamburg explored AI-supported urban modelling at TMU's Creative AI Hub, as well as transportation survey methodologies and large scale redevelopment projects including the waterfront revitalization. In Hamburg, Toronto saw advanced applications of digital twins, automated data integration, mixed-reality urban planning tools, and AI-driven mobility management systems such as TRANSMOVE, alongside innovations in port operations, mobility digitalization, and drone traffic management. These engagements exposed each city to operational examples of cutting-edge digital infrastructure.

Delegates from Toronto at the Urban Data Analytics demonstration and Experience Exchange in Hamburg, November 2024.

Hamburg delegates visiting the Development at Don Mills & Eglinton in Toronto, June 2024.



Toronto representatives at the Agency of Geoinformation and Surveying during the study visit in Hamburg, November 2024.

This cooperation produced several concrete results. Hamburg opened access channels for Toronto to explore its Urban Data Platform and connected tools (CoSI, DIPAS, ROADS), shared the DIN specifications on Urban Digital Twins, and began developing a Python-based ETL framework inspired by Toronto's open-source processes. Both cities expressed strong interest in jointly applying for Horizon Europe funding to advance AI for urban data management. Toronto, in turn, generated valuable reflections on digital governance, survey design, public transparency, and the integration of socio-demographic data, offering practical insights that have influenced Hamburg's evolving data management strategies.

Overall, the partnership proved highly productive and mutually beneficial, generating lasting professional connections and a shared commitment to continue collaborating beyond the IURC programme. Both cities reported strengthened internal capacities—Hamburg through enhanced automation and data governance models, and Toronto through exposure to European digital twins, urban modelling tools, and real-time mobility systems. The cooperation fostered deeper interdivisional collaboration, inspired new innovation formats, and encouraged joint exploration of future research opportunities, laying a strong foundation for continued engagement through EU Cities Gateway and other EU-funded initiatives.

You can read the case study from the cooperation between Hamburg and Toronto on Urban Planning on page 50.

USA

Delegates from Stuttgart Region and Rotterdam during the study visit in Massachusetts led by the Massachusetts Department of Transportation, September 2024.

Areas of Cooperation

NA City/Metro Area	EU City/Metro Area	Thematic Area	Topics
Albuquerque, USA	**Murcia,** Spain	**Circular Economy and Waste Management** **Nature-Based Solutions**	• Waste Reduction • Food Rescue Best Practices • Food Waste Diversion Challenge • Urban Tree Planting and River Rehabilitation
Atlanta, USA	**Sofia,** Bulgaria	**Nature-Based Solutions**	• Urban Agriculture and Food Systems; Urban Forests & Carbon Credits
Massachusetts Department of Transportation, USA	**Rotterdam,** Netherlands **Stuttgart Region,** Germany	**Sustainable Urban Mobility & Transport**	• Traffic Safety • Shared mobility • Active mobility and modelling/simulation • Transit oriented development • Public outreach and engagement
San Francisco, USA	**Dublin,** Ireland	**Circular Economy & Waste Management** **Innovative Strategies for Sustainable Economic Development/ Sustainable Urban Mobility and Transport** **Renovation Wave**	• Circular Economy City Plans • Connecting Culture and Circularity • Transport for Stadium Events • Heat Pump Program

Albuquerque - Murcia, Spain

Delegates from Murcia at the Petroglyphs National Monument in Albuquerque, October 2024.

Areas Of Cooperation

- **Circular Economy and Waste Management**
  - Waste Reduction
  - Food Rescue Best Practices
  - Food Waste Diversion Challenge
- **Nature-Based Solutions**
  - Urban Tree Planting and River Rehabilitation

Sustainable Development Goals

EU Urban Agenda Topics

- Sustainable Land Use and NBS
- Public Procurement
- Circular Economy
- Air Quality

EU Green Deal Policy Areas

- Farm to Fork
- Eliminating Pollution
- Biodiversity

Albuquerque's community-based approach to sustainability and circular economy showed us how civic engagement and education can drive real transformation. We return to Murcia with renewed inspiration and concrete ideas to strengthen our own initiatives.

Manuel Valls, Deputy Head & Municipal Engineer of the European Programmes Department, City of Murcia

The cooperation between Murcia and Albuquerque focused on preventing and reducing food waste and on nature-based solutions related to river restoration and urban tree planting. Through technical calls and study visits, both cities compared policies, tools, and community-based approaches to waste reduction, composting, and environmental education. Despite differences in administrative context, the cities identified strong common ground in climate resilience, circular economy goals, and citizen engagement, which shaped a practical and collaborative exchange.

A major result of the cooperation was the mutual strengthening of school-based food waste prevention programs. Albuquerque shared its EPA-funded, three-year school food waste and composting initiative, including educational materials, curriculum design, and bilingual outreach tools, which Murcia incorporated into the design of its own LIFE GreenMe5 school program launched in autumn 2025. Murcia contributed its experience with detailed food waste audits in school canteens, supplier engagement, and data-driven diagnostics, offering Albuquerque insights into systematic measurement and optimization. Although implementation delays in Murcia postponed a joint student challenge, both cities agreed to continue developing this initiative beyond the life of the programme.

The partnership also generated tangible learning on community composting and municipal waste prevention. Site visits in Albuquerque showcased scalable models such as the Barelas Senior Center community composting site, the Explora Science Museum food scrap pilot, and Polk Middle School's integrated farming and composting program. These experiences inspired Murcia's rollout of its brown bin for organic waste and its interest in piloting community composting schemes. In parallel, Murcia shared its Circotronic project, demonstrating how corporate waste can be transformed into educational and social value—an approach that reinforced Albuquerque's efforts to link circular economy actions with public engagement and learning.

Nature-based solutions formed the second pillar of cooperation. Albuquerque drew inspiration from Murcia's Segura River rehabilitation, which combines biodiversity restoration, flood resilience, and public space creation using native species and citizen engagement. In turn, Murcia gained insights from Albuquerque's data-driven urban forestry approach, particularly the Let's Plant ABQ platform and GIS-based tree inventory, which informed potential enhancements to Murcia's own greening programs. Overall, the cooperation strengthened both cities' capacity to implement circular economy and climate-resilient initiatives, built long-lasting professional links, and laid a solid foundation for continued collaboration on food waste prevention, urban greening, and future joint funding opportunities.

Representatives from Albuquerque visiting the regeneration project alongside the Segura River, May 2024.

To find a city - a continent and an ocean away - with similar environmental challenges and a commitment to climate mitigation and adaptation that matches Albuquerque's restores our faith in the shared global climate experience. The people, projects, and shared ideas help us dream big and go farther than we would go alone.

Ann Simon, Deputy Director, Sustainability Officer,
City of Albuquerque

You can read the case study from the cooperation between Murcia and Albuquerque on Circular Economy on page 97.

Atlanta - Sofia, Bulgaria


Delegates from Sofia visiting the city of Atlanta, September 2024.

Areas Of Cooperation

- **Nature-Based Solutions**
  - Urban Agriculture and Food Systems; Urban Forests & Carbon Credits

Sustainable Development Goals

EU Urban Agenda Topics

- Sustainable Land Use
- Energy Transition
- Circular Economy
-
- Urban Poverty
- Housing

EU Green Deal Policy Areas

- Clean Energy
- Farm to Fork
- Eliminating Pollution

Our partnership with Atlanta has shown how neighbourhoods and local communities can become active drivers of sustainability and innovation. Community engagement is the foundation for resilient cities and a shared urban future.

Ivan Goychev, Deputy Mayor for Digitalization, Innovation and Economic Development, Sofia Municipality

The cooperation between Sofia and Atlanta focused on nature-based solutions, with particular emphasis on urban agriculture and food systems and urban forest management. The two cities exchanged practical approaches to sustainable food production, food waste reduction, community engagement, and climate resilience. Despite different administrative and socio-economic contexts, both cities identified common challenges related to food security, environmental sustainability, and equitable access to green spaces, which shaped a highly applied and mutually beneficial exchange.

In the field of urban agriculture and food systems, Atlanta and Sofia shared concrete policy tools, programs, and operational models. Sofia presented initiatives such as community-run urban gardens, school-based green education, and an advanced food waste management system supported by biological treatment plants producing compost and energy. Atlanta contributed strong policy frameworks addressing food equity, including the AgLanta platform, the Grows-A-Lot land program, MARTA Markets, and a citywide food systems vision targeting universal access to fresh food. Study visits in both cities reinforced learning, directly influencing Atlanta's interest in Sofia's composting business model and supporting Sofia's expansion of community-based food initiatives.

Urban forest management and green financing represented one of the most impactful cooperation results. Atlanta shared its Urban Forest Master Plan, smart tree inventory systems, and its innovative Forest Carbon Credit program, which generates long-term funding for conservation, climate resilience, and community green projects. Sofia drew directly on this experience to explore similar green financing mechanisms linked to its flagship "New Forest of Sofia" reforestation programme. The exchange strengthened Sofia's capacity to link biodiversity, climate mitigation, and ecosystem services with sustainable financing models, while positioning Atlanta as a reference city for climate finance innovation.

Overall, the cooperation delivered tangible outcomes for both cities. Sofia enhanced its knowledge in sustainability governance, community-based food systems, digital tools, and green financing, while Atlanta gained valuable insights into large-scale organic waste management and circular economy practices. The partnership strengthened institutional capacity, expanded international visibility, and resulted in follow-up technical exchanges and commitments to continued collaboration beyond IURC. Both cities confirmed that neighbourhood-level engagement, cross-sector partnerships, and international exchange are powerful drivers for resilient, inclusive, and climate-adaptive urban development.


Delegates from Atlanta visiting Sofia's Khan Bogrov biological treatment plant (BIT), May 2024.

International cooperation is central to Atlanta's identity. The IURC Program provided City of Atlanta the opportunity to demonstrate our climate action leadership globally and to learn new innovations from the international IURC community that can help advance our shared sustainable development aims.

Chandra Farley, Chief Sustainability Officer, City of Atlanta

You can read the case study from the cooperation between Sofia and Atlanta on Nature-Based Solutions on page 184.

San Francisco - Dublin, Ireland

Delegates from Dublin and San Francisco during the walking tour of sustainable Chinatown in San Francisco, October 2024.

Areas Of Cooperation

- **Circular Economy & Waste Management**
- **Innovative Strategies for Sustainable Economic Development/ Sustainable Urban Mobility and Transport**
- **Renovation Wave**

- Circular Economy City Plans
- Connecting Culture and Circularity
- Transport for Stadium Events

- Heat Pump Program

Sustainable Development Goals

11 SUSTAINABLE CITIES AND COMMUNITIES

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

EU Urban Agenda Topics

- Energy Transition
- Urban Mobility
- Circular Economy

EU Green Deal Policy Areas

- Building and Renovation
- Sustainable Mobility

The IURC programme has been invaluable in allowing us to learn from San Francisco, With sharing experiences and seeing first hand how different cities are tackling similar challenges. It has reinforced the importance of collaboration and continuous learning for building a more sustainable and inclusive Dublin.

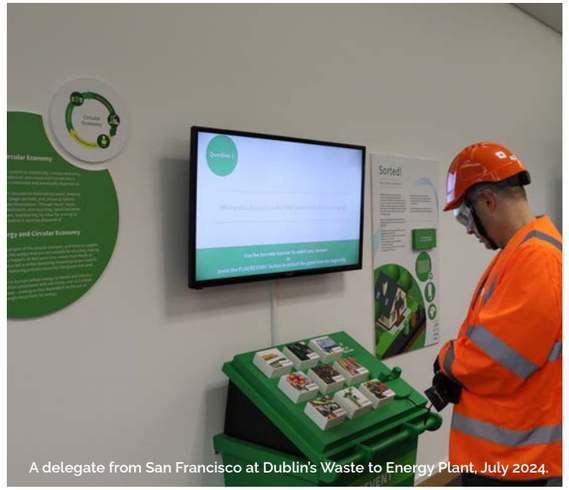
Alan Sherry, Senior Executive Officer - Climate Action, City of Dublin

The cooperation between Dublin and San Francisco centred on advancing circular economy practices, sustainable mobility, and residential retrofitting. Through technical calls, study visits, and community-focused site visits, both cities exchanged detailed insights into food systems, waste reduction, consumption-based emissions, and community-based climate action. Dublin shared the full development process of its Circular Economy Plan—already a national and European reference—while San Francisco presented its evolving strategy to shift from a linear model to a comprehensive circular framework. Visits to the Rediscovery Centre, the Edible Dublin launch, and reuse-based urban projects demonstrated how Dublin embeds circularity in neighbourhoods, inspiring San Francisco's own planning approach.

Mobility and event-based transit integration emerged as another major cooperation area. San Francisco showcased the innovative Muni–Chase Center Transit Program, where event tickets include free public transport access and service enhancements, dramatically reducing private car use. Dublin, facing congestion challenges during major events, is exploring how this approach could be adopted for sporting and cultural events that attract large numbers of people into the city.

The renovation wave and heat pump collaboration allowed San Francisco to learn directly from Ireland's large-scale deployment of heat pumps and its regulatory, training, and grant structures. Technical exchanges with the Sustainable Energy Authority of Ireland helped San Francisco refine its own approach, particularly around natural refrigerants, workforce skills, and building envelope requirements. As a result, San Francisco is now working to secure state and regional funding to install heat pump water heaters and pilot next-generation refrigerant systems.

Overall, the partnership produced concrete results: San Francisco is incorporating lessons from Dublin into its upcoming 2027 Circular Economy Roadmap, updating aspects of its Climate Action Plan, and exploring the creation of a Building Resource Innovation Center modeled after Dublin's circular hubs. Dublin gained new mobility solutions, expanded its international network, and strengthened its Climate City Contract with ideas from San Francisco's integrated transit and sustainability programs. The cooperation deepened technical knowledge on both sides and demonstrated how international exchange can inspire new approaches and unlock practical, scalable sustainability initiatives for both cities.



A delegate from San Francisco at Dublin's Waste to Energy Plant, July 2024.

International cooperation is one of the most productive ways that cities around the world can learn from each other to create more sustainable cityscapes and a better global environment for all," said San Francisco Environment Department Energy Program Manager, Lowell Chu. "San Francisco has gained valuable insights and practical hands-on knowledge from the sustainability initiatives the SF delegation was able to witness firsthand in Dublin. We hope the Dublin delegation found its tour of San Francisco and subsequent webinars as equally thought-provoking for their current and future environmental initiatives.

City of San Francisco

You can read the case study from the cooperation between Dublin and San Francisco on Circular Economy on page 89.

Massachusetts DOT - Rotterdam, Netherlands & Stuttgart Region, Germany

Delegates from Stuttgart Region and the City of Rotterdam learning about CityScope at the MIT City Science Lab in Boston, September 2024.

Areas Of Cooperation

- **Sustainable Urban Mobility & Transport**
  - Traffic Safety
  - Shared mobility
  - Active mobility and modelling/simulation
  - Transit oriented development
  - Public outreach and engagement

Sustainable Development Goals

11 SUSTAINABLE CITIES AND COMMUNITIES

13 CLIMATE ACTION

EU Urban Agenda Topics

- Urban Mobility

EU Green Deal Policy Areas

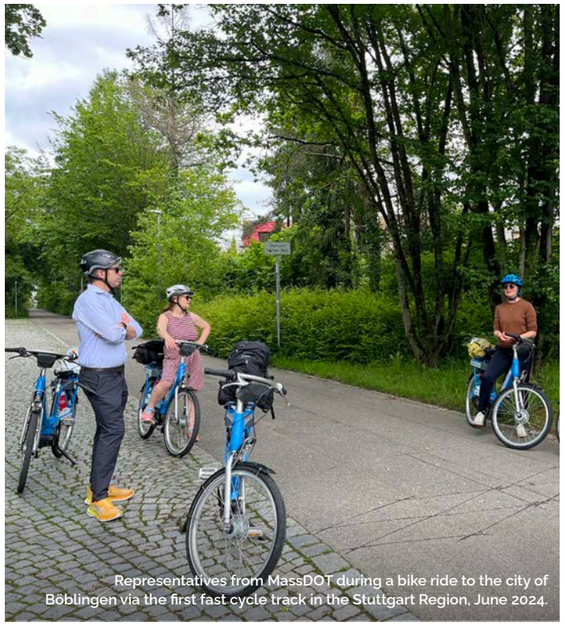
- Sustainable Mobility

> As Stuttgart region, we will always benefit from and be proud of having gained such a large network of outstanding experts and personal connections through the IURC program. For us Europeans especially the glance across the Atlantic is vital to keep a broader perspective on how mobility planning is being shaped.

Stuttgart Region

The cooperation between Stuttgart Region, Rotterdam, and the Massachusetts Department of Transportation (MassDOT) centred on advancing sustainable mobility through shared learning on bike-sharing systems, bicycle access, multimodal travel, household surveys, and traffic safety. Through technical calls, in-person study visits, and ongoing exchanges, the three partners compared operational models, management systems, and procurement strategies for bike-sharing. Rotterdam's experience with vendor management and infrastructure design informed Stuttgart Region's transition to a new bike-share provider, while Boston's BlueBikes model provided insights into public ownership, e-bike integration, and equitable access. These discussions helped Stuttgart refine specifications for a more cost-efficient and sustainable shared-mobility system.

A significant result of the cooperation was MassDOT's adoption of new measures inspired by German and Dutch mobility practices. After studying Stuttgart's bike-trailers for buses and bike carriages on trains, MassDOT identified opportunities to expand public-transport access to natural areas, resulting in the launch of its first "Fall Rail Ride", a seasonal train offering high-capacity bike transport and guided cycling tours. Rotterdam and MassDOT gained mutual insights on integrating cycling with transit, regulating shared-mobility modes, and improving user experience during peak demand.



Representatives from MassDOT during a bike ride to the city of Böblingen via the first fast cycle track in the Stuttgart Region, June 2024.

Representatives from MassDOT visiting the S21 railway project underconstruction in Stuttgart, June 2024.

Delegates from Stuttgart Region and the City of Rotterdam visiting MassDOT´s Lab, September 2024.

> Our participation in the International Urban and Regional Cooperation program helped spark ideas for new projects that have already come to life, supported our staff in learning from peers around the world, and provided a platform to share some of our best practices and expertise here in Massachusetts. We gained a great deal from participating in this program.

MassDOT


Visiting the Future Mobility Park during the study visit in Rotterdam, June 2024.


Delegates from MassDOT and Stuttgart Region inside the a Hyperloop segment at the Future Mobility Park in Rotterdam, June 2024.


The Director of the Future Mobility Park welcoming delegates from Stuttgart Region and MassDOT during the study visit in Rotterdam, June 2024.

Through our collaboration with Massachusetts, Stuttgart, and Toronto, we gained valuable insights into their approaches to smart mobility, active travel, and traffic safety. The exchange of knowledge and best practices is crucial as we continue to refine our own strategies for sustainable urban mobility and prepare for future challenges in transportation.

City of Rotterdam

Household travel surveys formed another core pillar of cooperation. Stuttgart Region and MassDOT—both conducting major surveys after more than a decade—exchanged methodologies on procurement, modelling, outreach, and data collection. These exchanges helped both entities anticipate challenges such as low participation rates and survey fatigue. While both struggled initially with engagement, they committed to continued collaboration through 2026 to share progress, compare results, and strengthen their travel demand models.

Traffic safety and micro-mobility regulation produced another of the partnership's most significant outcomes. Drawing on legal requirements observed in Germany and the Netherlands, MassDOT created a new Car Safety Kit program to reduce nighttime accidents involving passengers exiting stopped vehicles. The program distributes LED flares, high-visibility vests, a basic first aid kit, and a safety tip sheet to new drivers and includes a statewide awareness campaign. Rotterdam and MassDOT strengthened their exchange on micro-mobility governance by comparing technical standards, rules for e-scooters and fat-tire bikes, insurance and licensing issues, and emerging concepts such as micro-ID systems. Stuttgart, Rotterdam, and MassDOT all benefited from hands-on learning during infrastructure visits and agreed to continue cooperating on traffic safety, access to recreational areas, and regulation of evolving micro-mobility modes.

You can read the case study from the cooperation between Stuttgart Region & MassDOT and Rotterdam & MassDOT on Sustainable Urban Mobility and Transport (SUMT) on page 131 & 138.

URBAN PLANNING

Delegates from EU countries, the US, and Canada, during the IURC NA Urban Planning event in Barcelona, November 2024.

Webinars

Affordable Housing: Shifting the Paradigm

June 20, 2024

Recording & Presentations

Revitalizing Underutilized Areas for Social, Environmental, and Economic Transformation

February 19, 2025

Recording & Presentations

Factsheet

Affordable Housing: Shifting the Paradigm

A sustainable and socially responsible approach

The Barcelona Metropolitan Area (AMB) focuses on sustainable and socially responsible approaches to the design of affordable housing by emphasizing flexibility, inclusivity, and a better quality of life. To achieve these innovative housing designs, IMPSOL, the Metropolitan Institute of Land Development and Property Management from AMB, launches a competition to attract talented architects and invites them to challenge traditional models by conceiving non-hierarchical spaces or chained rooms to enhance inclusivity, quality, energy efficiency, and a gender balance, giving spaces for house chores the same quality as the rest. Affordability and long-term social impacts are also addressed in this innovative projects by involving inhabitants in the design process and explaining responsible and sustainable living approaches. Long-term social impact is addressed by engaging communities throughout and collecting ongoing feedback to help build ownership, address any issues, and continuously improve projects to maintain affordability and quality of life over time.
IMPSOL is a non-profit institution that doesn't receive funding from the administration. Through the European Investment Bank, they obtained financing with low interest rates to develop the projects. In order for the financial model to work, there is a balance between dwellings for sale and for rent.

Key recommendations from AMB

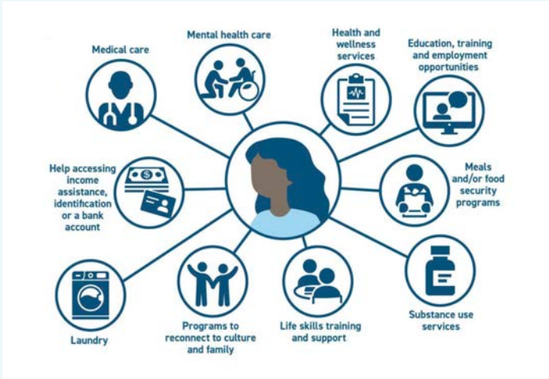
- Engage communities throughout the planning and development process to understand their needs and build a sense of ownership.
- Contract innovative + experienced architects through an open competition boosting high-level designs for affordable living models.
- Explain cooling systems and responsible living approaches to new inhabitants in detail to ensure comfort and sustainability.
- Consider long-term affordability and social impacts when designing affordable housing projects to prevent displacement over time.
- Clearly communicate efforts around quality, sustainability, and how to address crises to maintain community trust and support.
- Guide residents to understand it is a win-win approach; they get a uniquely designed dwelling, and in return, they support their community and the city by behaving responsibly.
- Collect feedback from current residents on their experiences and any issues to continuously improve projects.

▶ Cornellà de Llobregat | **Peris + Toral Arquitecte**

▶ Gavà | **Harquitectes**

New construction methods and supportive housing

Toronto is addressing its housing crisis, marked by 11,000 homeless individuals and long waits for subsidized housing, by focusing on supportive housing, especially during the pandemic. Since 2020, over 1,000 new supportive housing units have been created through government partnerships. Innovative construction methods, such as modular and mass timber, are being utilized for their speed, cost savings, and environmental benefits. The city collaborates with non-profit organizations to manage these units, providing financial incentives for compliance. Flexible, adaptable interior spaces are highlighted as beneficial for changing household needs and overall community sustainability.



Key recommendations from Toronto

- Supportive housing is an effective model to help people experiencing homelessness transition to permanent affordable housing.
- Wraparound support services provided within supportive housing buildings are critical to helping residents live independently and improve their health and well-being.
- Integrate sustainability features like energy efficiency, renewable energy, and green building materials into new affordable housing developments right from the start.
- Modular and mass timber construction methods can help accelerate the development of affordable housing while reducing costs and providing environmental benefits compared to traditional construction.
- New construction methods should be piloted, and the data gathered will help better define annual cost savings.
- Incorporate flexibility and adaptability into housing unit designs to accommodate changing household needs over time. This allows units to be reconfigured as families grow or shrink.
- Partnerships between different levels of government and the nonprofit sector are essential to funding and developing supportive housing at scale. Involving nonprofit organizations in supporting housing models helps ensure units remain affordable and accessible over the long term.
- Explore incentives and funding models to encourage the conversion of vacant commercial properties like offices into affordable residential units.

This factsheet was based on the webinar **Affordable Housing: Shifting the Paradigm**, where **Josep Maria Borrell**, Technical Coordinator at IMPSOL, and **Mercedeh Madani**, Acting Director for Housing Policy & Strategy in the City of Toronto, presented new approaches to designing and building affordable housing. All photos on pages 31 and 32 are from the presentation by **Mercedeh Madani.**

Factsheet

Revitalizing Underutilized Areas for Social, Environmental & Economic Transformation

Cities around the world face the challenge of underused and abandoned spaces, from vacant buildings to disused industrial sites which contribute to urban decline, social segregation, and environmental degradation. However, when strategically transformed, they can become engines of cultural, economic, and environmental regeneration.

1. Identifying and understanding the problem

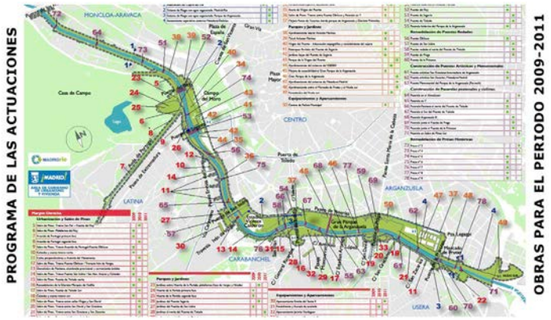
- The first step in any transformation process should be to recognise the specific characteristics and challenges of the underused space, considering the local context. Each of the cases showcased, highlighted a different typology of area which will require a tailored strategy. “Matadero” in Madrid was a large-scale industrial site, once a slaughterhouse, that became obsolete due to urban expansion and public health concerns.
- Dublin struggled with high commercial vacancy rates, leading to economic stagnation and urban deterioration.
- Rome’s community gardens were a response to abandoned urban lands and lack of green spaces, particularly in peri-urban areas.
- Toronto’s Downsview Runway was a massive, single-purpose infrastructure, whose closure created an urban void.
- Pavlos Melas Military Camp became a safety and environmental hazard after being abandoned, requiring intervention for sustainable redevelopment.

2. Strategic approaches to transformation

Once an underused space is identified, a strategic plan must consider urban planning principles, stakeholder engagement, and financial viability through an integrated approach. These strategies illustrate how adaptive reuse projects must align with broader urban policies and initiatives such as the New European Urban Agenda or the New European Bauhaus, while ensuring economic, social, and environmental sustainability.

- **Policy and regulatory frameworks**

  - Dublin's Adaptive Reuse Programme required municipal policies to facilitate the conversion of commercial buildings into housing.
  - Rome's citizen-led projects were strengthened by the introduction of urban garden regulations in 2015 and 2024.
  - Matadero Madrid's transformation was enabled by a municipal commitment to cultural infrastructure development.

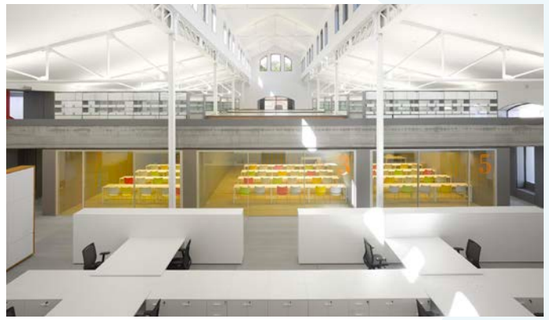


- **Stakeholder engagement and innovative governance models**

  - Rome and Pavlos Melas demonstrated the power of bottom-up advocacy, where citizen-driven projects played a central role in re-shaping transformation.
  - Matadero Madrid and Toronto involved extensive consultations with artists, planners, and cultural organizations to define the vision for these spaces.
  - Dublin's model relied on public-private collaboration, engaging architects and conservationists in feasibility studies before acquisition.

- **Temporary activation and phased development**

  - Toronto's Downsview Runway will employ a gradual, 30-year approach, using temporary activations like cultural events and sports activities to generate public interest and investment attraction.
  - Matadero Madrid allowed for a step-by-step transformation, ensuring that renovations matched evolving cultural needs while ensuring environmental integration in the new Madrid Río Park.



- **Heritage preservation and sustainability considerations**

  - Matadero Madrid and Pavlos Melas prioritized heritage conservation, balancing historic integrity with modern urban functions.
  - Dublin's adaptive reuse strategy aimed to reduce embodied carbon emissions, aligning with climate action and energy targets.
  - Rome's urban gardens demonstrated environmental rehabilitation, restoring contaminated soil and improving air quality, while fostering local food production.

3. Impact and outcomes of transformation

The successful revitalization of underused spaces is an opportunity to transform cities and communities **creating new centralities, connecting neighbourhoods or enhancing solid participatory structures.**

- **Social inclusion and community engagement**

  - Rome's urban gardens provide social integration, engaging diverse communities in environmental management.
  - Matadero Madrid's cultural spaces is a new meeting point for artists, residents, and tourists, redefining the cultural map of the city and reactivating the surrounding neighbourhoods.
  - Pavlos Melas Metropolitan Park fosters community well-being by creating inclusive green spaces.

- **Economic revitalization and real estate value**

  - Dublin's commercial-to-housing transformations contributes to cost-effective urban density, making housing more accessible.
  - Toronto's Downsview project aims to create a mixed-use neighbourhood, combining housing, retail, economic development and recreation.
  - Matadero Madrid's cultural-led regeneration increases real estate values and boosts local businesses, while establishing new synergies with other local, national and international initiatives.

This factsheet was based on the webinar **Revitalizing Underutilized Areas.** All photos on pages 33 - 35 are from the presentations from **Federico Manzarbeitia, Fiona Craven, Sarah Phipps, Marios Asteriou** and **Claudio Bordi.**

- **Environmental and climate benefits**

  - Dublin's reuse model reduces carbon footprint by converting existing buildings instead of constructing new ones, while promoting the 15-minute approach.
  - Rome's green spaces and Pavlos Melas Park improve biodiversity, air quality, and urban cooling.
  - Toronto's pedestrian-focused development promotes low-carbon mobility and active transportation.

4. Lessons learned for replicability

Based on these different case studies, several overarching **best practices** emerge for cities seeking to revitalize abandoned spaces:

1. Engaging citizens, policymakers, and private sector players ensures long-term project success.
2. Clear policies and incentives, such as adaptive reuse programs, urban garden regulations, or cultural funding, drive implementation.
3. Spaces should serve multiple purposes, integrating housing, culture, recreation, and sustainability.
4. Temporary and phased approach activations allow for better implementation, adaptation, engagement and continuous improvement.
5. Projects should reduce environmental impact while preserving cultural identity.

Networking Event & Takeaways

Innovative Urban Planning:

Insights from affordable housing strategies and urban data platforms

The recent Urban Planning Cluster visit to Barcelona on November 4-5, part of the EU-funded IURC-NA programme, brought together 14 cities from Europe, Canada, and the USA for a focused, thematic event. Over two days of intensive collaboration through field visits, discussions, and participation in the Smart City Expo, participants addressed two critical urban challenges: affordable housing and urban data management. They explored innovative solutions and shared best practices summarized in key takeaways.

Affordable housing, shifting the paradigm

Affordable housing is a shared challenge across North America and Europe, as it plays a crucial role in promoting social equity, economic stability, and community well-being. Cities face rising property prices, growing populations, and limited housing supply, making it difficult to ensure accessible, affordable homes for all residents. Addressing these challenges requires innovative approaches to balance development with inclusivity, ensuring that urban areas remain vibrant, resilient, and liveable for diverse communities. This approach and the experiences tackled during this visit are aligned with the housing component of the Urban Agenda for the EU's objective to address affordable housing through knowledge creation and funding conditions to invest in new and renewed affordable housing.

Promoted by AMB - IMPSOL
Project: Peris + Toral Architects

Metropolitan Area of Barcelona (AMB)-IMPSOL[i]: Community-centered, adaptative and sustainable housing solutions

1. Collaborative planning with municipalities
AMB works closely with municipaliies from the start, sharing project plans and seeking their input. This makes the municipality feel invested in the project. The municipality also decides who will occupy the housing, ensuring alignment with local needs.

2. Flexibility, adaptability, and gender perspective in the design
To adapt to changing demographics over time. Whether housing for young people today or elderly residents in the future, the design allows for adjustments in unit sizes and uses, making it sustainable and responsive to evolving community needs. It also includes gender-sensitive design, providing equal-quality workspaces within homes (work or domestic tasks).

3. Community and intermediate spaces
The importance of communal spaces where residents can gather, especially for those who may feel vulnerable or isolated. These spaces promote social interaction, safety, and a sense of belonging among residents.

4. Bioclimatic design is a priority in the investment
Projects integrate bioclimatic principles, creating energy-efficient buildings while encouraging residents to live responsibly. The priority is to invest in high-quality elements with a high impact on energy efficiency and reduce other costs linked to internal functionalities. Key aspects of the design include:

- **Cross-ventilation:** All units are designed for natural airflow, improving comfort and reducing reliance on active cooling systems.
- **Public and communal spaces:** The layout fosters social interaction and community building through strategically designed public areas.
- **Thermal inertia:** Construction materials, such as ceramic facades, help maintain stable indoor temperatures, reducing the need for heating and cooling.
- **Energy-saving features:** Passive solar systems and careful insulation improve efficiency, ensuring low energy consumption for residents.

These bioclimatic principles support the European Green Deal's decarbonization objectives by focusing on energy-efficient buildings.

5. Financial sustainability
IMPSOL has a 150M€ credit from the European Investment Bank, which may be used only for social housing rental developments. They receive disbursements of 25M€ for groups of developments and must return the loan in 3 years. When IMPSOL owns the land, it can develop affordable housing for rent. Housing is kept affordable by ensuring rent is capped at 30% of residents' incomes. Those without sufficient income must seek support through social services.
Design is prioritized through a fixed-price competition to ensure quality, while construction is awarded through standard tenders (lower price). The entire process, from promotion to construction, can take up to four years.
The AMB-IMPSOL experience is changing the paradigm of how affordable housing must be understood as a tool to change behaviours. With this transformative view, the projects support the philosophy of the New European Bauhaus, achieving the Green Deal objectives by transforming lifestyles and therefore societies into more sustainable, inclusive, and aesthetic environments.

The Basque country[ii] housing policy: Affordable housing as a right. Research-Driven Industrialized Construction

1. Affordable housing as a right
The Basque Government's Social Housing Pact views housing as a fundamental right. Its long-term goal is to increase the availability of two types of housing: affordable rental housing, which cannot be rented above 30% of the tenant's income, and VPOs (Vivienda Protección Oficial), protected housing that must be kept permanently affordable for low-income groups and may not be resold at a market rate. This reflects a solid commitment to ensuring housing for vulnerable groups and the middle class.
This fundamental principle is aligned with the Revised European Social Charter, where The Right to Housing (Art. 31) incorporates the foundation for a right to adequate housing.

2. Industrialized construction to address demand
The industrialization of construction is central to the Basque approach. Prefabricated housing modules built in factories allow for faster, more cost-effective construction, addressing the pressing need for affordable homes.

3. Innovative collaboration with industry
The BuildInn Cluster plays a key role in driving innovation across the construction industry in the Basque Country. They aim to modernize the construction process through digitalization (BIM methodology) and sustainable practices. This collaboration between the public and private sectors ensures that innovation in industrialized housing is aligned with the region's broader sustainability and economic competitiveness objectives.

4. Land availability challenges
Land availability is a significant obstacle, especially in one of the areas with the highest density in Spain. However, the Basque Government is actively collaborating with municipalities to streamline land access through initiatives like the Strategic Land Reserve and repurposing underused spaces for housing development.

5. Regulating housing costs
The 2023 national law allows municipalities to designate "stressed areas" where demand for housing exceeds supply, enabling rental price controls.

6. Energy efficiency and modernization
Nearly half of the Basque housing stock is old and energy-inefficient. The government focuses on renovating and modernizing these homes to improve energy efficiency, supporting green economy goals, and creating new jobs in the construction sector. This objective supports the EU's green transition and the goals outlined in the Renovation Wave Strategy under the European Green Deal.

7. Encouraging rental market participation
To increase the availability of homes for rent, the government is considering tax policies and incentives for property owners. If owners keep properties off the market, higher taxes could be imposed to encourage renting, aiming to unlock unused housing stock.

The New York City housing authority[iii]: Securing affordable housing through community-driven renovation (PACT)

1. Funding gaps and PACT
The PACT programme responds to the federal government's inadequate funding for public housing. Converting buildings into Section 8 housing enables private financing for repairs while maintaining tenant protections.

2. Community engagement and tenant rights
Residents retain key rights, such as paying only 30% of their income toward rent, receiving relocation assistance, and having the right to return after any temporary relocations due to renovations. Tenant protections align with EU values of inclusion and equity in urban development, as emphasized in the New Leipzig Charter.

3. Security and accessibility challenges
NYCHA's investment in security, such as installing 24/7 security cameras and upgraded access control, aims to address safety concerns in specific neighbourhoods. Additionally, the growing senior population in public housing presents accessibility challenges.

4. Land and land reuse development
NYCHA is exploring redevelopment on its land, using underutilized spaces for new affordable housing. This strategy, combined with private-public partnerships, helps expand housing options without displacing current residents.

5. Public-private partnerships for funding
NYCHA funds development and repairs through federal, city, and state funding, supplemented by conventional bank loans and tax credits. This highlights the importance of diversified funding sources for public housing initiatives.

Smart City Expo in Barcelona.

Urban data: Unlocking the power of open data for urban planning

Urban data management is becoming increasingly critical as cities grow more complex and interconnected. It is a core topic in the European Data Strategy, which promotes open data to enhance decision-making and service delivery. With vast amounts of data generated daily from various sources—such as transportation systems, environmental sensors, and public services—cities face the challenge of effectively integrating, managing, and utilizing this information. Historically, data has been stored in isolated silos across different departments, limiting its potential for city planning and decision-making. To overcome this, cities are moving towards integrated data platforms that unify diverse data streams, making them accessible, transparent, and usable across multiple sectors. The experience of Hamburg supports the alignment with the Urban Agenda for the EU Partnership on Digital Transition (Hamburg is one of the members), aiming to provide better public services to citizens, support European cities in exploiting the possibilities of digitalisation, and help European businesses to develop new innovations and create new business opportunities for global markets.

Urban data platform Hamburg: Enabling Integrated Data Exchange to Improve City Services and Support Decision-Making

1. Data integration and standardization
To overcome silos in data systems, Hamburg's platform uses standardized APIs to enable integration across different departments and stakeholders. This allows data to be accessed easily, regardless of the software each department uses, ensuring a smoother flow of information and facilitating innovation.

2. Data governance and quality control
Establishing a clear data governance structure is essential. Each department should be accountable for the quality of its data. A data catalogue can help ensure that data is properly organized, well-documented, and easily accessible, helping to address challenges with inconsistent data quality.

3. Balancing transparency with privacy
While the transparency law mandates public data sharing, the platform must balance openness with privacy and security concerns. Sensitive data must be protected, but clear policies should be developed to maximize transparency without compromising security.

4. Collaboration and stakeholder engagement
Collaboration between departments and external stakeholders is vital for the platform's success. Regular workshops, cross-departmental meetings, and external collaborations ensure that the platform evolves in response to user needs and fosters better decision-making and planning across the city.

[i] The Barcelona Metropolitan Area (AMB) is the public administration of the metropolitan area of Barcelona, which occupies 636 km² and encompasses 36 municipalities with more than 3.2 million inhabitants. AMB exercises competencies in land and housing policies, among others, through the Metropolitan Institute of Land Development and Property Management (IMPSOL).

[ii] The Basque Country is one of the 17 Autonomous Communities (regions) in Spain in addition to the two autonomous cities of Ceuta & Melilla. It includes the provinces of Alava, Gipuzkoa and Vizcaya which include worldwide recognized Green Capital Vitoria-Gasteiz, also member of the IURC network.

[iii] The New York City Housing Authority (NYCHA), is the largest public housing authority in North America providing affordable housing for low- and moderate-income New Yorkers. NYCHA is home to 1 in 17 New Yorkers, providing affordable housing to 528,105 authorized residents through public housing and Permanent Affordability Commitment Together (PACT) programs, as well as Section 8, which provides rental housing assistance to low-income households.

* All photos from pages 36-39 are from the event on Innovative Urban Planning in Barcelona, November 2024.

Best Practice

Vienna´s Housing Policy:
A master class in affordable housing

Vienna's housing strategy exemplifies how addressing complex issues in public policy can lead to positive and meaningful results for everyone. Through the effective implementation of this strategy, Vienna has ensured broad access to affordable housing, helping to stabilise market costs, particularly for low- and moderate-income individuals.

While affordable housing alone cannot make the entire housing market accessible to everyone, it plays a crucial role in maintaining affordability and preventing extreme price fluctuations. As a result, Vienna remains one of the most accessible housing markets in the world and a model for admired urban housing policies globally.

The City's strategy combines public and social housing, strict rent controls, and residency security, becoming a living lesson for cities facing affordability crises. A key feature of Vienna's approach is the clear and structured allocation of public housing. Applicants must meet specific criteria, including age, residency duration, citizenship status, and income limits, to qualify for subsidised or municipal flats. This transparency ensures equitable access and fosters public trust in the housing system. By balancing diverse housing needs across income levels using innovative and integrated policies, Vienna ensures long-term sustainability and inclusivity.
Vienna's strategy also aligns with and inspires the Urban Agenda for the EU Partnership on Housing, acting as coordinator. [1]

Key elements of Vienna's housing market structure success:

a) It is predominantly a rental market

Vienna's housing market is predominantly rental based, with 78% of the housing stock dedicated to rentals. Public housing plays a key role, accounting for 58% of the rental market. Vienna has two types of public housing:

1. Community-owned flats: built before the 1980s and directly owned by the city, they form the backbone of the city's historic commitment to affordable housing.

2. Cooperative flats: constructed through public-private partnerships since the 1980s, involving nonprofit housing corporations and offer affordable units to various income groups.

These models ensure that 60% of Vienna's residents live in publicly supported housing. Unlike other cities, Vienna's public housing policy does not segregate tenants based on their income but instead encourages socioeconomic diversity, ensuring inclusion and promoting cohesion between different demographic groups.

b) Strict regulation of private and for-profit rentals

In Vienna, 77% of private rentals are subject to rent controls, which reduce excessive rent increases and maintain affordability. These controls are based on key factors such as construction date, size or location.

A significant portion of Vienna's housing stock has benefited from government-funded renovations, with rent controls imposed to prevent excessive landlord profits. This innovative strategy has modernised over 170,000 units while maintaining their affordability.

c) Effective tenure security

Vienna boasts some of the strongest tenant protections globally, offering long-term security to renters. Until recently, indefinite leases were standard practice, and even now, landlords must provide discounts for fixed-term contracts. These protections foster tenant stability, as leases can often be passed down to family members, promoting generational security.

d) Public renovations and rent control integration

As mentioned, Vienna's public renovation programmes have been transformative, with over 170.000 private housing units upgraded using public funds. These renovations modernized the housing stock while preserving affordability by imposing rent controls that prevent landlords from exploiting the improvements for profit. Integrating public investment with affordability safeguards is a cornerstone of Vienna's housing policy.

The strategy behind: Vienna's integrated approach to housing policy

Despite its complex regulations, Vienna's overarching goal is clear: to limit profit-driven housing while ensuring inclusivity and long-term affordability. Having a low percentage of the city's housing operating free of rent controls means that affordable options dominate the market and set competitive pricing standards.

Vienna's success stems from its ability to leverage federal laws, some dating back to the Hapsburg era, alongside progressive municipal policies. The city's integrated approach—where every reform complements others—ensures coherence in housing policy and delivers results that are admired globally.

Vienna's strategy demonstrates that the profit motive and housing affordability are fundamentally incompatible. By minimising profit as the driving force in most of its housing stock, the city has proven that long-term affordability is achievable. This model underscores the potential for other urban centres to address housing crises by prioritising public good over market-driven solutions.

Vienna's housing policy sets a compelling precedent for cities worldwide, especially those facing affordability challenges. Its integrated approach—combining strong tenant protections, public investment, and rent controls—offers a practical, sustainable path to creating inclusive and affordable urban environments.

Strategic objectives

1. Providing affordable and quality housing, since the 1920s. Vienna has prioritised social housing construction to ensure its residents have access to dignified and affordable homes. Approximately 60% of the population lives in high-quality social housing, including middle-class families and young professionals.

2. Preventing social segregation through an integrative model which includes diverse social groups, avoiding ghettos and promoting social cohesion. Historic complexes like the Karl-Marx-Hof house a mix of residents, fostering harmonious relationships between different classes.

3. Regulating and reducing the demand pressure on the private housing market, by maintaining a vast supply of public housing and an affordable public housing stock. Vienna mitigates housing market imbalances, ensuring that the entire city remains accessible to all residents, regardless of their financial status.

4. Enhancing sustainability and environmental standards. Many new public housing projects incorporate energy-efficient designs, green spaces, and environmentally friendly technologies. The goal is to reduce the city's carbon footprint while creating healthier living environments for residents.

5. Supporting mixed-income communities within its public housing schemes. This approach reduces economic segregation and fosters diversity, helping residents from various income levels live together, strengthening social ties, and reducing inequality.

6. Encouraging public-private partnerships, particularly in developing cooperative flats. This allows for innovative affordable housing solutions, while maintaining public control over its affordability and quality.

7. Combatting homelessness by providing supportive housing solutions for vulnerable populations. This includes social housing initiatives to ensure that even those facing economic hardship or at risk of social exclusion can secure long-term accommodation.

MAIN OUTCOMES
Vienna's housing policy has led to a 58% public housing rate, ensuring affordability and quality for diverse groups (Source: Social Housing in Vienna).
Rent controls cover 77% of private rentals, stabilising the market (Source: City of Vienna - Housing Information).

The integration of various income groups promotes social cohesion and prevents segregation (Source: Social Housing in Vienna).

Vienna's commitment to long-term affordability is exemplified by over 170,000 renovated units under public funding (Source: Vienna Housing Authority).

AWARDS
UN-Habitat Scroll of Honour Award (2010); European Housing Award (2021); Vienna Housing Award (2024).

1. You can learn more about the results of the Housing Partnership through this Policy Guidelines for Affordable Housing in European Cities including more good practices and an overview of actions and recommendations https://www.urbanagenda.urban-initiative.eu/partnerships/housing

Best Practice

Belval: A model of industrial transformation in Luxembourg

The EU's industrial transformation, driven by policies like the **Green Deal and the New European Bauhaus (NEB)**, is reshaping its market and fostering international collaboration. By advancing sustainable green and digital solutions such as clean energy and smart city technologies, Europe provides valuable models and partnership opportunities through initiatives like IURC, supporting global cities' climate and innovation ambitions.

Belval, located near Esch-sur-Alzette in Luxembourg, ***is a striking example of successful industrial transformation.*** Once home to one of Europe's largest steel production sites, Belval has been redeveloped into a dynamic urban quarter that blends historical industrial heritage with contemporary cultural, educational, and residential spaces. This ongoing project represents a major step in Luxembourg's urban and economic development, making it a reference for post-industrial regeneration in Europe.

From industrial decline to economic diversification

The transformation of Belval brought multiple benefits to Esch-sur-Alzette and the broader Luxembourg region. The decline of the steel industry left Belval with an economic slump and rising unemployment. By transitioning towards a knowledge-based economy, the redevelopment introduced new industries, businesses and research institutions, fostering job creation and increased economic activity. ***This diversification reduced dependence on a single sector and ensured long-term economic stability.*** Today, Belval hosts various enterprises and technology startups, positioning itself as an innovation hub. This approach aligns with the key objectives of the EU Cohesion Policy, which aims to support regional economic diversification and innovation to reduce disparities across European regions.

From monofunctional to new mixed-use spaces with strong heritage focus

One of the most significant achievements of the Belval transformation is the complete renewal of its urban landscape. ***The district has been reshaped into a dynamic district featuring modern residential areas, office spaces and diverse cultural offerings.*** Belval is not just a workplace but a thriving community where people can live, work and socialise. This reflects the principles of the New European Bauhaus initiative, which promotes aesthetic, inclusive and sustainable urban design.

Belval has successfully integrated its industrial past into a new identity. Key steel industry structures, such as the iconic blast furnaces, have been carefully preserved and incorporated into the urban design. These landmarks serve as visual reminders of the area's history, while being reused as cultural and educational spaces.

Sustainability and quality of life in the new Belval

Belval has been developed with a strong focus on sustainability. ***Green buildings with energy-efficient designs, smart water management systems and eco-friendly public transport options are essential in its urban planning.*** The area also promotes alternative mobility solutions such as cycling paths and electric vehicle infrastructure, contributing to reduced emissions in line with the European Green Deal objectives.

A critical aspect of Belval's redevelopment has been the creation of an ecosystem that fosters education, research, and entrepreneurship. The presence of the University of Luxembourg has been pivotal in this transformation. ***The university, recognized for its strong focus on interdisciplinary research and innovation, attracts students and academics from around the world***, further reinforcing Belval's role as a centre for knowledge and economic growth.

The process to transform Belval began in the late 1990s, after the steelworks definitively closed. From the beginning, strong political intervention was essential, which is why the Luxembourgish government, and the City of Esch-sur-Alzette, made a joint long-term commitment to a redevelopment vision. In 2000, a public-private partnership, Agora, was established as a dedicated public development agency to manage the planning and execution of the project.

Public consultations to engage with the local community to ensure the regeneration, reflected historical identity and future needs. Key champions included national and local political leaders, urban planners and cultural stakeholders, all of whom helped to keep the project on track despite considerable challenges.

The project was financed through a mix of public and private investment, making Belval a flagship example of coordinated urban regeneration in Europe.

Objectives and key actions towards a cultural and innovation hub

The redevelopment project of Belval was guided by several key objectives:

- Transforming industrial spaces into modern, functional infrastructures for living, working and enjoying cultural activities.
- Fostering economic growth by attracting businesses, research institutions and startups.
- Enhancing quality of life including green spaces, cultural facilities and high-quality housing.
- Promoting sustainability by implementing environmentally friendly urban solutions, such as energy-efficient buildings and alternative mobility options.

Preserving cultural and industrial heritage reshaping historical structures into new developments to maintain a link with the past. The key actions implemented reflect a vision of innovation, sustainability and cultural preservation, ensuring the area remains at the forefront of urban development.

- ***Construction of modern buildings for housing,*** research centres, cultural venues, and offices including the Kirchberg residential complex and Luxembourg's Research & Innovation Campus.
- ***Creation of the Cité des Sciences*** by hosting the University of Luxembourg and research centres such as The Luxembourg Institute of Science and Technology (LIST), both of them key drivers of innovation in sectors like material science, engineering and ICT.
- ***Restoration of Blast Furnaces*** which were preserved and transformed into a historical and cultural landmark housing, the Musée de la Sidérurgie, dedicated to the region's industrial heritage.
- ***Development of Parc Um Belval*** creating green areas with walking paths, playgrounds, and pedestrian zones, reducing environmental impact.
- ***Hosting art exhibitions, music festivals and events*** that celebrate the city's industrial past and contemporary creativity like the Flow Music Festival and the Luxembourg Art Week.

Main Outcomes

- The area has evolved into an innovation hub, fostering new industries beyond steel manufacturing. As of April 2021, approximately *€260 million* had been spent out of the initial *€1.169 billion* allocated for the Cité des Sciences project.
- The revitalisation has significantly boosted its residential and business appeal. As of July 2017, approximately *12.000 people lived* or worked in Belval, with *2.400 individuals* having purchased or rented flats in the area.
- The presence of the University of Luxembourg and other institutions has established the area as a centre for knowledge and innovation. The Cité des Sciences houses *over 7.000 students and 3.000 teachers* and researchers.
- Belval's transformation contributed to Esch-sur-Alzette being designated the European Capital of Culture in 2022, highlighting its success as a *cultural and urban regeneration model.* The Esch2022 program, spanning *170 square miles,* included over 2.000 events, such as 310 performances, 137 exhibitions, 141 concerts, and 360 participatory workshops, celebrating the city's cultural renaissance.

The introduction of green spaces, public transport systems and cultural amenities have improved the district's liveability and environmental quality. Belval serves as a model of post-industrial redevelopment, demonstrating how former industrial sites can be reimagined into contemporary urban quarters. Looking ahead, continued investments in research, sustainability, and cultural initiatives will ensure Belval remains at the forefront of urban transformation and economic diversification in Europe.

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- Research Luxembourg: https://www.researchluxembourg.org/en/belval-the-innovation-campus/?utm_source=chatgpt.com

Best Practice

Chicago´s Open Data Portal: A gateaway to smarter city planning

Digitalization and open data strategies have become key enablers for smarter and more resilient city planning across North America and Europe. In the United States, the Federal Data Strategy and initiatives at the municipal level promote the use of interoperable, machine-readable data to enhance transparency, civic engagement, and data-informed decision-making. Canada's Digital Government Strategy similarly emphasizes open-by-default data policies and modern digital infrastructure to support efficient and accountable governance. In the European Union, the newly adopted International Digital Strategy (June 2025) marks a significant evolution in external digital action, positioning the EU as a global partner in promoting inclusive, secure, and human-centric digital transformation. This strategy builds on previous frameworks such as the Digital Decade Policy Programme 2030 and the Digital Compass, while placing stronger emphasis on trusted data flows, digital cooperation, and alignment of values with international partners.

As digital transformation accelerates globally, cities are becoming key players in driving innovation at the local level. Moving beyond broader national or regional plans, they are actively shaping digital progress through local regulations, smart city projects, and innovation support. By staying close to citizens, cities are able to create inclusive, people-focused digital solutions, aligning with the EU's principles of subsidiarity and multilevel governance. This highlights the essential role of local governments in making digital policies more responsive and relevant to everyday needs.

A new paradigm from Chicago

In this context, Chicago has developed the Chicago Data Portal, an open-source, public-facing platform launched in 2012. It represents a new paradigm around "government as platform" whereby the city creates readable data to provide infrastructure for developers and civic innovators. In 2011, Chicago was among the first large cities in the U.S.A. to appoint a Chief Data Officer, signalling a formal, lasting commitment to data-driven government. Forming the basis of the Portal is Chicago's Executive Order No. 2012-2 calling for timely release of public data in machine-friendly formats and making available channels for public input on the quality of city data.

Shortly after the portal's launch, the city and civic developers partnered with the MacArthur Foundation to organise an "Apps for Metro Chicago" (2011-2012) design competition. During this event, developers created and produced over 70 civic applications, from bilingual park maintenance to automated reminders for residents when their street is being swept, showcasing both developer engagement and the practical use of open data.

Nowadays it hosts over 600 datasets presented in easy-to-use formats about City departments, services, facilities and performance, covering various civic domains: housing, zoning, public health, crime, transportation, and more, allowing people in Chicago to improve their communities. It lets people find city data, facts about neighbourhoods, create maps and graphs about the city, and download the data for further analysis.

One of the most remarkable milestones along this journey into the Portal's history was the publication of daily incident-level crime data, over five years of daily reports. This dataset was one of the first ones actively published and opened by a city government in the U.S.A., providing much more meaningful access to information than traditional aggregated crime data. Its release paved the way for the openness of crime and other civic data to journalism, research and/or community groups.

After recognising the barrier that data can be to usability, the Portal is now equipped with OpenGrid integrated with GitHub for API code samples and civic tech collaboration. An interactive mapped interface successfully combines spatial datasets (building permits, potholes, transit feeds, etc.) to make them more accessible to non-technical users and also enabling neighbourhood-level measurements.

The Data Portal is updated daily with new and revised figures on its various sets. This transparency-driven initiative supports civic innovation, third-party apps, academic research, and evidence-based policymaking.

Strengths and challenges of the Chicago Data Portal

The Chicago Data Portal is a model of transparency and accessibility. This transparency encourages evidence-based decision-making, fosters civic engagement, and holds public accountability.

One of the biggest advantages of the portal is its interoperability. Data is machine-friendly or human-readable to provide a wider access to a range of users, including policymakers, planners, and developers (CSV, JSON, APIs). The portal also facilitates civic innovation. It powers tools like the Affordable Requirements Ordinance (ARO) compliance dashboards, the Chicago Health Atlas, and flu-shot locators. These examples illustrate how data informs real-world applications within public service and urban planning.

However, the portal is still facing challenges. Users of the ARO Dashboard have no access to unit-level rental availability or precise geolocation data; also, data quality issues (lack of information related to the age, height or footprint of buildings), limit its use.

Strategic objectives and use cases

The Chicago Data Portal has a strategic role in many areas of city planning and civic life. One of its main objectives is to inform about zoning and housing policy.

The Portal helps to make developer compliance and ARO data publicly available for policymakers to evaluate their present practices, assess gaps, and develop data-driven reforms such as the "Development for All" agenda.

Regarding public health planning, the availability of neighbourhood-level demographic and health data allows planning to be more equitable and more focused on real necessities. It allows city officials allocate resources more efficiently and develop interventions based upon specific community needs.

Civic engagement is also fostered by the Portal facilitating access to public data for residents, researchers, and developers who can create their own tools to track initiatives in their city and hold government officials accountable through public data.

Finally, making interoperable datasets publicly allows the development of new and innovative urban tools, such as flu-shot locators, building-age mapping, and real-time performance dashboards for transit and municipal services.

Main outcomes

- The Portal hosts over 600+ datasets, updated
- It has tracked $124M in in-lieu fees.
- The development of 444 affordable housing units built via ARO addressing the city's housing crisis.
- The portal supports a range of data driven tools: CHI Health Atlas, CTA performance dashboards, flu-shot locators apps.
- Regular civic audits support data transparency and equity (Employee Equity Dashboard, Violence Reduction Dashboard).

Developer tools and civic innovation

APIs and Data Access: the Portal uses the Socrata SODA API, offering interactive tools (e.g., City API console, sample code, GitHub examples) for direct querying and bulk downloads. This infrastructure has enabled third-party projects such as Chicago flu shot locators and building-age visualizations.

Community Engagement: users are encouraged to suggest datasets and share use-cases via GitHub or social media. Developers and planners use this data for civic hacking, academic analysis, and municipal dashboards.

Coming next!

Stay tuned for our next featured Best Practice from Montreal, Canada, highlighting the internationally acclaimed Grow Home model—an innovative, adaptable, and affordable housing solution that has influenced sustainable urban development around the world. This upcoming case will broaden the series' scope and reinforce our commitment to showcasing diverse experiences across North America and Europe.

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University of Chicago: Chicago Data Portal | Chicago Studies | The University of Chicago
Key Public Health Indicators Data & Reporting

Best Practice

Montreal's "Grow Home": A pioneering model for affordable, flexible and sustainable housing

"Bridging the affordable housing gap in North America and Europe"

Addressing housing affordability in Montreal

During the late 1980s, Montreal experienced rapid suburban expansion, rising land prices, and a shortage of affordable housing options for young families and first-time buyers. Average house prices had nearly doubled over the previous decade, while urban policies at the time encouraged low-density development that consumed large amounts of land and infrastructure.

The Grow Home emerged as an innovative option that challenged conventional planning norms and was designed to reintroduce compact, cost-effective housing within the city fabric. It offered families with low or moderate incomes the opportunity to enter the property ladder at a low cost, while gradually building equity and adapting the home to their needs over time.

Unlike conventional suburban homes, the Grow Home stood out because of its flexible design, modular pricing, and incremental approach to construction. These features resonate strongly today, as cities across Canada, the United States, and Europe struggle with rising housing shortages, construction costs, and land-use constraints.

Affordable housing in the transatlantic context

The Grow Home's philosophy aligns closely with current international efforts to rethink housing affordability, sustainability, and density.

- **European Union**: The Affordable Housing Initiative (AHI), launched under the EU's Renovation Wave, and the New European Bauhaus (NEB), support innovative, modular and community-driven housing—a philosophy at the heart of the Grow Home model. The Renovation Wave Strategy seeks to double renovation rates by 2030, focusing on energy-efficient and affordable housing stock, while the Affordable Housing Dialogue aims to create a comprehensive EU Affordable Housing Plan by 2026.
- **United States:** Incremental housing strategies consider initiatives such as Habitat for Humanity's "sweat equity" model (Habitat for Humanity), where families contribute labour to reduce construction costs, and with efforts to promote Accessory Dwelling Units (ADUs) in cities like Portland or Los Angeles to expand affordable stock (Urban Institute).
- **Canada:** Current strategies under the National Housing Strategy echo the Grow Home approach by combining low-cost ownership models, community partnerships, and sustainable design.

The grow home initiative

Launched in the late 1980s by **McGill University's School of Architecture in Montreal,** this pioneering housing programme emerged as a response to rising urban sprawl and the shortage of affordable housing for low- to moderate-income households. Over time, it has proven to be a cheap, adaptable, and eco-friendly replicable housing solution. With more than 6,000 homes built in Montreal and thousands more across North America, the model has become a landmark in making affordable housing a reality.

The design, originally conceived as a prototype, consisted of a narrow-fronted row house measuring approximately 14 feet (4.3 metres) in width and 36 feet (11 metres) in depth. This approach made it possible to construct homes at half the typical cost of suburban houses. A key innovation was delivering the property partially finished—most often the upper floor or basement—so residents could expand and personalize the space according to their budget and evolving needs.

The model also pushed the boundaries of Montreal's building code, which at the time required wider house frontages. After securing an exception for narrower plots (less than 18 feet, 5.48 metres), developers were able to increase the number of homes per site, significantly reducing land consumption and infrastructure costs. This translated into an impressive 60% reduction in street and utility expenses compared to standard housing developments.

Affordability through design and co-creation

According to McGill University, the first prototype, completed in June 1990, cost around €30,600 (approximately US $36,000 at the time). In contrast, the average price of a suburban house in Montreal was €140,000. The reduced cost was largely achieved by limiting the overall floor area and delivering part of the dwelling—often the upper level—unfinished, leaving residents free to complete it at their own pace.

Another measure to keep expenses low was the introduction of a "base model plus options" approach. Purchasers could select from a catalogue of 33 optional features, ranging from exterior balconies and decorative elements to kitchen upgrades, each priced between €170 and €460. This system enabled gradual investment in upgrades and finishing works, with many households carrying out improvements themselves or relying on support from relatives and neighbours.

Environmental and social benefits

The compact, high-density layout of the Grow Home created an accessible pathway to homeownership for lower-income households while minimizing land consumption. The shared-wall construction not only allowed more units to be built in urban areas but also improved energy efficiency. Heating costs, for example, fell dramatically—from about €1,100 to just €400 per year—making the homes more affordable to operate as well as to purchase. The smaller urban footprint also reduced pressure on infrastructure and contributed to more sustainable patterns of land use compared to detached suburban housing.

Beyond environmental advantages, the initiative had important social outcomes. Approximately 70% of purchasers were young couples, many starting families, and the incremental nature of the design encouraged a sense of participation. Homeowners often undertook finishing works themselves or with the support of relatives and neighbours, which fostered stronger community ties. This hands-on approach promoted both individual pride of ownership and collective identity within new neighbourhoods.

In addition, the concentration of Grow Homes within specific districts created opportunities for denser, mixed-income communities, reducing the isolation often associated with suburban developments. This combination of affordability, ecological efficiency, and participatory construction helped position the model as not only a housing solution but also a tool for social integration and resilience.

Replicability and scaling up the model across the Atlantic

Since the first prototype in 1980, approximately 6,000 Grow Homes have been built in Montreal, with an additional 4,000 units developed elsewhere in Canada and across North America. The concept also inspired variations such as the **Green Grow Home** and the Next Home, designed to address diverse demographic and environmental needs.

The **Affordable Homes Program (AHP)**, created in 1989 at McGill's School of Architecture, supported the model through research, design studios, and knowledge transfer. Active until 2009, this postgraduate initiative trained a generation of architects in affordable housing design and embedded the Grow Home philosophy into wider debates on sustainable urban development.

Comparable initiatives have since emerged across the globe highlighting how Grow Home is not an isolated experiment but part of a broader global movement towards affordable, flexible, and sustainable housing models.

- **In the United States**, the Katrina Cottages were introduced after Hurricane Katrina as small, expandable, and affordable alternatives to mobile homes, reflecting similar principles of incremental growth and resilience. In parallel, cities such as Portland and Los Angeles have encouraged the use of Accessory Dwelling Units (ADUs), compact and flexible extensions to existing properties that expand affordable housing options.
- **Across Europe,** Vienna's long-standing cooperative housing system provides high-quality, affordable apartments with strong community involvement, while Germany's Baugruppen (building groups) allow households to co-develop housing projects, lowering costs through collective design and construction.
- **In Canada**, principles of adaptability and sustainability continue to shape national policy through the National Housing Strategy, which supports affordable, energy-efficient, and inclusive housing developments across the country.

Outcomes and impact

- Over 6,000 units were built in Montreal between 1990 and 2005, and an additional 4,000+ units across Canada and the United States during the same period, with adaptations later trialled in Latin America and Europe.
- Construction costs were reduced by up to 50% compared to conventional single-family dwellings, making homeownership accessible to low- and middle-income families.
- Infrastructure costs decreased by approximately 60%, thanks to compact lots, efficient land use, and shared-wall designs that required less road, sewage, and utility extension.
- The Grow Home received international recognition, including the prestigious World Habitat Award in 1999. The award cited the project's innovative affordability strategy, energy efficiency, adaptability to family growth, and contribution to sustainable urban development.

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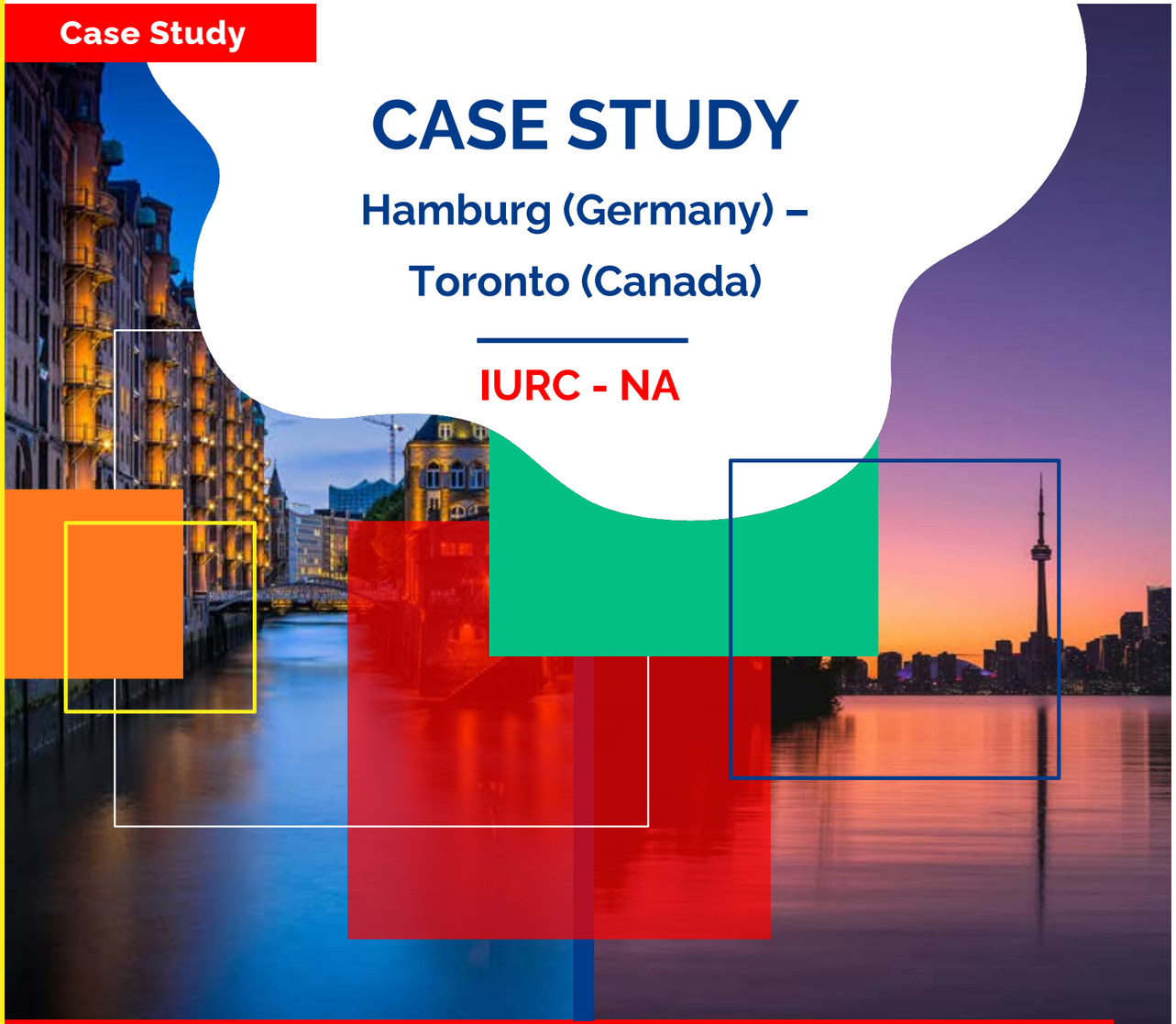
Case Study



CASE STUDY

Hamburg (Germany) – Toronto (Canada)

IURC - NA

OCTOBER 1, 2025

Thematic Network(s): Urban Planning
Topic keywords: Smart City, Urban Data Platform, Open-Source, Data Workflows, Digital Transformation

HAMBURG– TORONTO

IURC – CASE STUDY

Leveraging Open-Source Tools and Centralized Governance to Automate Urban Data Workflows and Advance Smart City Innovation

EXECUTIVE SUMMARY

As part of the International Urban and Regional Cooperation (IURC) North America programme, Toronto (Canada) and Hamburg (Germany) engaged in a mutual learning exchange focused on automating and standardising data provision through urban data platforms. Hamburg brought their robust Urban Data Platform (UDP_HH), which integrates data across multiple agencies whilst transitioning from commercial software like FME toward open-source solutions. Toronto demonstrated how Apache Airflow, a modular Python-based open-source workflow orchestration tool, can automate data publishing pipelines.

The collaboration provided both cities with practical tools and strategic insights: Hamburg gained an understanding of scalable open-source automation, whilst Toronto found a model of centralised data governance and open standards. This case study highlights how city-to-city cooperation can unlock innovation, reduce vendor lock-in, and foster sustainable digital transformation.

CHALLENGES AND SOLUTIONS

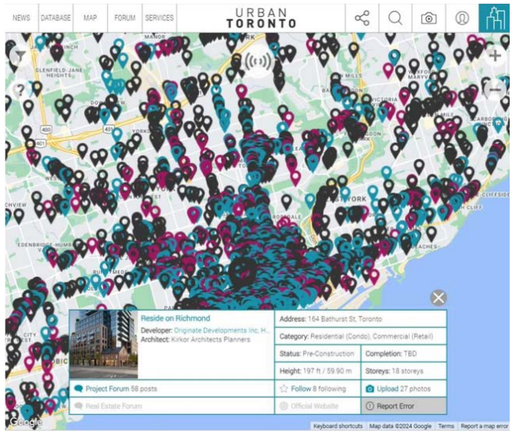
Modern cities generate vast amounts of data daily, ranging from traffic patterns and public health monitoring to environmental sensors and infrastructure management. The challenge lies in making this data available in timely, accurate, and standardised formats that support both internal decision-making and public accountability.

Urban data platforms serve as critical infrastructure for smart city initiatives, consolidating and sharing information across departments whilst enabling public access. However, developing these platforms presents complex challenges: data pipelines must be automated and yet flexible, scalable yet secure, with underlying tools that adapt to rapidly evolving technological and policy requirements.

Many municipalities face vendor lock-in due to their reliance on commercial software tools, such as FME (Feature Manipulation Engine). Whilst these tools deliver functionality, they create significant long-term costs beyond licensing fees. Vendor dependency limits municipal autonomy over updates and customisations, whilst proprietary architectures restrict flexibility and interoperability.

This aligns with the "Public Money, Public Code" philosophy, which states that publicly funded software should prioritise open, transparent, and reusable solutions. Hamburg has embraced this concept, recognising that proprietary tools generate recurring costs whilst limiting the ability to share solutions or collaborate effectively with other cities.

Hamburg's data provision traditionally relied on FME, with each dataset requiring custom-designed ETL (Extract, Transform, Load) processes that limited scalability, were time-consuming to maintain, and demanded specialised knowledge. Recognising the need for greater efficiency and the constraints of vendor lock-in from expensive commercial tools, Hamburg began exploring open-source alternatives. The exchange through IURC NA introduced Hamburg to Toronto's Apache Airflow implementation. This modular, Python-based open-source workflow orchestration tool automates complex workflows through reusable Python scripts, enabling scheduling and monitoring with greater transparency. On the other hand, Toronto recognised in Hamburg's data platform a successful model of centralised governance with standardised interfaces, open-data principles, and APIs serving city departments, researchers, developers, and the public. Both cities discovered that modularity, reusability, and openness were key principles for developing sustainable data platforms. Hamburg's emphasis on open standards and geospatial APIs inspired Toronto to strengthen similar principles in its enterprise data platform development.



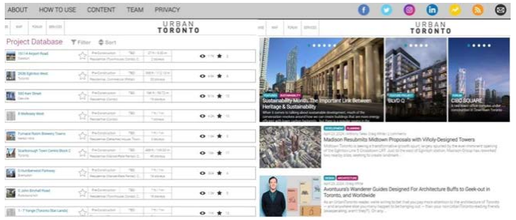


Figure 1. Toronto Open Data Platform. From presentation IURC Technical Exchange: Open Data Program Technology Services Division

RESULTS AND IMPACT

The Toronto-Hamburg collaboration generated substantial advancements in both cities' data strategies and urban innovation capacities.

In Hamburg, Apache Airflow exploration has become central to their Data Automation Project, with the city actively assessing how to integrate this tool while reassessing its dependency on FME. Airflow has emerged as a viable open-source alternative offering greater adaptability and cost-effectiveness. Hamburg's teams are developing modular, Python-based automation pipelines with enhanced flexibility. Significantly, neighbouring municipalities have begun implementing exchange insights, demonstrating the scaling potential of these lessons and creating regional momentum toward open-source, interoperable urban data systems.

Toronto has drawn inspiration from Hamburg's centralised model and open-source values to shape its enterprise data platform, continuing to advance with enhanced focus on consistency and accessibility across 40+ departments. The exchange reinforced Toronto's "Public Money, Public Code" commitment whilst validating their strategic decision to prioritise open-source tools like Apache Airflow and Apache NiFi.

Toronto's Open Data Portal represents a tangible manifestation of this philosophy in practice. The portal now provides access to over 470 datasets comprising approximately 2.000 data files. In 2023 alone, the platform facilitated 174.593 user sessions, averaging about 500 dataset visitors daily, not including automated API usage. Significantly, half of the catalogue is now published through automated or semi-automated processes, demonstrating the practical success of the city's automation initiatives.

The portal incorporates several innovative features that enhance usability and accessibility: dynamic data conversion to multiple formats (both tabular and geospatial), comprehensive data quality scores for every dataset, dataset preview functionality that enables informed selection, access through both download and API methods, and data storytelling capabilities that make technical information more accessible to diverse audiences.

These improvements have catalysed broader civic engagement by activating technology communities, enhancing government transparency, and reducing manual workload for municipal staff. The practical impact of open data becomes visible through public-facing applications such as "RocketMan," which provides real-time transit tracking capabilities, and "Waste Wizard," an intuitive tool that helps residents navigate recycling and waste management requirements. These applications utilize the city's open datasets to deliver daily utility to residents, demonstrating how strategic data management can generate practical community benefits.

The combined results from both cities illustrate how international cooperation can accelerate digital transformation initiatives. The Toronto-Hamburg exchange not only catalysed internal policy developments but also contributed to building ecosystems where public data becomes accessible, actionable, and beneficial to society broadly.

An additional outcome of the cooperation of the two cities is the access of Toronto to the DIN SPEC, a preliminary standard developed collaboratively by a consortium of experts and stakeholders under the German Institute for Standardization (DIN).

It provides a reliable and transparent framework that promotes interoperability, reduces complexity, and accelerates the implementation of digital twin solutions for cities and municipalities while paving the way for future national and international standards. The city of Hamburg has worked on the translation of the DIN SPEC 91607, making it available at: https://www.dinmedia.de/de/technische-regel/din-spec-91607/384414386

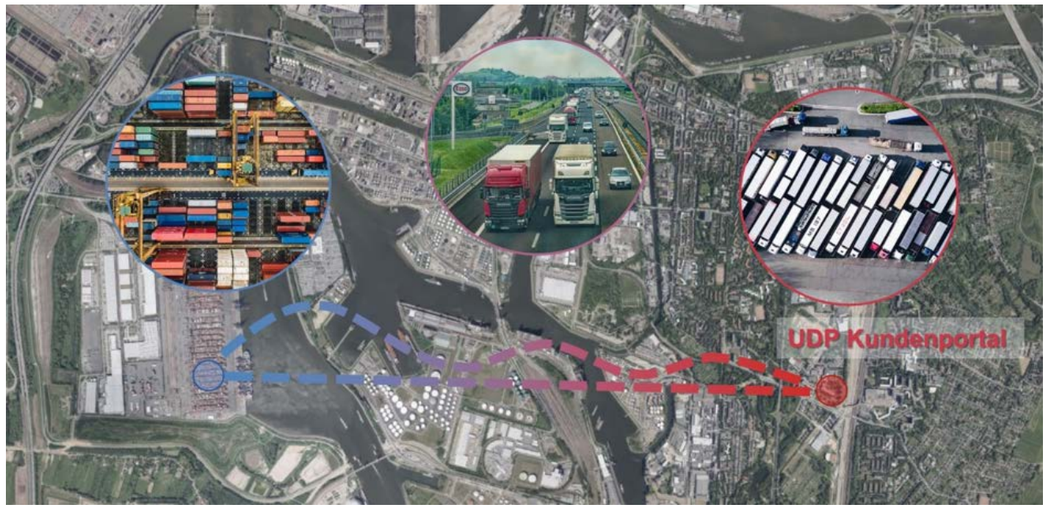


Figure 2. UDP KUNDERPORTAL Hamburg Data Platform. From Hamburg presentation: DP KUNDERPORTAL - DATA AUTOMATION 18.11.2024.

KEY FIGURES

45+
datasets and approximately 2.000 data files available through Toronto's Open Data Portal

175.593
user sessions recorded in 2023 (approximately 500 dataset visitors daily)

50%
of Toronto's open data catalogue is published through automated or semi-automated processes

40+
city divisions contributing data to Toronto's integrated open data platform

85%
of Hamburg's Urban Data Platform content is accessible via standardized APIs

Multiple
neighbouring municipalities in the Hamburg region are implementing exchange insights in their own data projects

2
flagship public applications in Toronto (*RocketMan* and *Waste Wizard*) powered by open data

1
comprehensive Data Automation Project initiated in Hamburg, directly inspired by Toronto's approach

LESSONS LEARNED

Process sharing generates more value than product sharing. The Toronto-Hamburg exchange demonstrates that cities benefit most when they share not only outcomes but also methodologies and decision-making processes. Understanding how another municipality approaches a problem often proves more valuable than simply adopting their specific technical tools or solutions.

Open-source tools enhance municipal autonomy and scalability. Tools like Apache Airflow provide cities with greater independence, flexibility, and growth capacity compared to commercial platforms. The shift toward open-source solutions enables municipalities to customize functionality, control upgrade timelines, and collaborate more effectively with other cities facing similar challenges.

Federated governance models can inspire the development of platforms. Hamburg's Urban Data Platform demonstrates how centralized coordination can coexist with distributed data ownership, providing a valuable model for cities in early stages of data platform development. This approach strikes a balance between standardization and departmental autonomy, while maintaining system coherence.

"Public Money, Public Code" principles advance multiple municipal objectives. The commitment to open-source development serves to promote transparency, cost efficiency, and collaboration simultaneously. Cities that embrace these principles not only reduce long-term costs but also contribute to broader public benefit through shared technological development.

International cooperation catalyses systemic transformation. When cities approach collaboration with openness and genuine curiosity, the outcomes extend beyond knowledge exchange to encompass tangible organizational and technological transformation. The Toronto-Hamburg partnership demonstrates how strategic city-to-city learning can generate lasting change that benefits both municipal operations and civic engagement.

THE INTERNATIONAL URBAN AND REGIONAL COOPERATION PROGRAMME IN NORTH AMERICA

The International Urban and Regional Cooperation program in North America (IURC NA), funded by the European Union, partners European cities with Canadian and USA cities to facilitate knowledge exchange through online tools, face-to-face interactions, study visits, participation in thematic and networking events, and capacity-building initiatives. Its activities support the achievement of policy objectives as well as major international agreements on urban development and climate change, such as the EU Urban Agenda, the UN Sustainable Development Goals, and the Paris Agreement. The program is part of a long-term strategy by the European Union to foster sustainable urban development in cooperation with the public and private sectors, researchers, innovators, community groups, and citizens. IURC NA is financed under the EU Foreign Policy Instruments and benefits from the strategic support of the Directorate-General for Regional and Urban Policy of the European Commission.

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Links to related outputs:

Translation of the DIN SPEC 91607

Case Study

CASE STUDY

Pavlos Melas (Greece) – Nanaimo (Canada)

IURC - NA

SEPTEMBER 22, 2025

Thematic Network(s): Urban Planning
Topic keywords: Park Management, Community Engagement, NBS, Sustainable Governance, Public Space Activation

NANAIMO – PAVLOS MELAS

IURC – CASE STUDY

Innovative approaches to urban park management, featuring practical tools such as leases, licenses, and co-management agreements, as well as nature-based solutions for transforming large parks.

EXECUTIVE SUMMARY

As part of the IURC North America programme, Nanaimo (Canada) and Pavlos Melas (Greece) engaged in a knowledge exchange focused on parks management. Both cities brought unique approaches: Nanaimo with its advanced systems of leases, licenses, and co-management agreements, and Pavlos Melas with its ambitious project of transforming a former military camp into a thriving Metropolitan Park. The reciprocal technical calls, visits, and hands-on site walks fostered mutual understanding and allowed both cities to extract applicable models and tools for local adaptation. This cooperation also brought the cities closer together, demonstrating the value of learning through real experiences and planning with community engagement.

CHALLENGES AND SOLUTIONS

Cities today are rethinking how they care for parks, not just as green spaces, but as essential infrastructure for community wellbeing, climate resilience, and cultural life. As urban areas become more densely populated and land use pressures increase, managing parks effectively is no longer just about maintenance. It's about creating systems that can support diverse uses, foster social connection, and respond to changing community needs. Municipalities must balance these different aspects alongside long-term environmental goals while building flexible, inclusive frameworks that allow cities to share responsibility with local organizations, residents, and other partners. This requires governance models that are not only flexible but also equitable and community-centred.

The City of Nanaimo in Canada offers a compelling solution, having developed a highly structured, collaborative approach to parks management through a combination of leases, licenses, co-management agreements, and a transparent fees and charges framework.

In Nanaimo, park governance is embedded within a legislative and policy framework that enables a diverse range of users, non-profits, sports clubs, cultural organizations, and even commercial entities to access and co-steward public land. The city manages a significant number of formal agreements across its parks, recreation, and culture portfolios, each tailored to different operational, community, and partnership models. This system allows for both long-term leases and short-term licenses, with co-management agreements used for joint oversight of key facilities such as stadiums, art galleries, and tracks.

Figure 1. Delegates from Pavlos Melas and Nanaimo visiting the Q'UNQ'INUQWSTUXW Stadium premises at the City-managed Stadium district. The name q'unq'inuqwstuxw (pronounced ki-KIN-ish-TOOK) means to "return/give back," which honors the land, becoming a reminder to give back more than what they take from the land, September 2024.

To guide the process, the city has established a clear internal workflow: applicants submit proposals, which are reviewed through inter-departmental referrals, followed by negotiation of terms, legal drafting, and council or delegated approvals as required. Importantly, agreements are actively monitored, with systems in place for renewals, payments, and compliance.

Complementing this governance structure is a rationalized fee system designed to balance cost recovery with accessibility. A key innovation was the simplification of user group classifications into four main types: two non-profit categories based on age group, private users, and commercial entities. Discounts are applied accordingly: up to 50% off for youth-oriented nonprofits (NP1) and 20% for adult/mixed-age nonprofits (NP2). A further policy revision introduced a two-tiered impact system for park bookings, distinguishing between low-impact community use and high-impact events, accompanied by adjusted discounts of up to 75% for NP1 and 50% for NP2, ensuring affordability for grassroots and civic groups.

This approach is not only fiscally responsible but also socially equitable. By embedding park access within a legal and financial structure, Nanaimo can leverage public land for the common good while ensuring consistency, transparency, and long-term sustainability. This system offers valuable insights for cities like Pavlos Melas, where large-scale green redevelopment projects, such as the Metropolitan Park, seek replicable governance and partnership frameworks that can activate public space through shared responsibility and community engagement.

Figure 2. Delegates from Pavlos Melas and Nanaimo visiting a playground managed by the City of Nanaimo, September 2024.

RESULTS AND IMPACT

By developing a structured, inclusive framework for park governance, Nanaimo has created a model that supports both public access and long-term sustainability. Through a blend of leases, licenses, and co-management agreements, the city enables community organizations, nonprofits, and even private entities to participate in the life of public green spaces. This model does more than manage land—it builds shared responsibility. With over 85 formal agreements across its parks, recreation, and culture portfolios, Nanaimo has successfully activated its public spaces in ways that are community-driven, legally sound, and financially viable. The introduction of a simplified rental classification system and tiered fee structures has also helped improve transparency, reduce barriers to access, and increase revenue, projected to grow by €509.000 ($822.000 CAD) over four years. These funds are reinvested into park infrastructure and programming, reinforcing a cycle of care and use.

For the municipality of Pavlos Melas, park management is a critical challenge as they prepare to open the renovated Metropolitan Park and must regulate its future uses, including recreational and cultural activities, partnerships with the private sector, maintenance, and other related aspects. From their cooperation with Nanaimo, and through a series of technical calls, study visits, and meetings facilitated by IURC NA, invaluable insights emerged. Pavlos Melas staff learned how Nanaimo adjusts rates based on the type of group requesting park space, and how years of experience have shaped a robust and adaptable regulatory framework, which they hope to use as a model when designing their own.

But beyond policy and revenue, the most profound impacts emerged through the collaboration itself. When Nanaimo staff visited Pavlos Melas, they were invited to walk through the vast Metropolitan Park. This former military camp is being transformed into green and mixed-use spaces through adaptive reuse of historical buildings. This experience echoed a guiding principle in Nanaimo's approach to land: in British Columbia, Canada, Indigenous peoples teach that walking together on the land is a way to show respect and healing, both from and for the land. During the site visit, this philosophy came to life. As Nanaimo and Pavlos Melas staff walked side by side through the park, a deeper understanding emerged, not only of the land's possibilities, but also of the people and communities who might inhabit and shape it. The shared walk became a moment of connection, trust, and mutual insight that helped cement the relationship between the two cities.

Figure 3. Delegates from Nanaimo walking through the Metropolitan Park with the City of Nanaimo representatives, explaining the future use of the abandoned buildings, May 2024.

Figure 4. Aerial image of the future Metropolitan Park in Pavlos Melas.

The exchange continued when Pavlos Melas visited Nanaimo and explored parks that had already undergone transformation, from industrial brownfields to vibrant, community-centred natural spaces. Discussions around fees and charges, licensing processes, co-management models, and the participation of volunteers for park upkeep gave Pavlos Melas a concrete framework to draw from as they look to operationalize and activate their own Metropolitan Park. They were also inspired by the way Nanaimo implements and monitors its sustainable strategic plan, using data and digital tools to remain accountable and agile, with mechanisms in place to make course corrections when needed. Particularly striking was Nanaimo's long-range planning approach, anchored in a 25-year vision, which encouraged Pavlos Melas to integrate long-term scheduling into their own emerging plan.

On the other hand, Nanaimo learned from Pavlos Melas how they balanced political, religious, and community interests while planning for the redevelopment of the park with input from the different groups, as well as the value of strengthening personal relations amongst City workers, which facilitates the advancement of interdepartmental City projects.

This reciprocal learning, facilitated by the IURC NA programme, has created lasting value for both cities. For Nanaimo, it was an opportunity to share and reflect on their approach; for Pavlos Melas, it offered adaptable tools, validated strategies, and a deeper sense of readiness for what comes next.

KEY FIGURES

85+
formal park use agreements in Nanaimo (leases, licenses, co-management).

10,000+
community inputs used to develop Nanaimo's comprehensive City Plan – Nanaimo Reimagined.

€509.000
($822.000 CAD) estimated increase in rental revenues over four years through fee system reform.

LESSONS LEARNED

Parks are more than green space; they are systems of shared care: Successful parks management requires more than infrastructure; it depends on frameworks that support stewardship, participation, and long-term community engagement. Nanaimo's structured approach demonstrates how legal agreements and policy tools can be leveraged to create inclusive, vibrant public spaces.

Pricing policies can promote equity: By implementing a tiered fee structure based on user type and event impact, Nanaimo created a fairer system that encourages community use while maintaining financial sustainability. Discounts for nonprofits, particularly youth-oriented groups, help make park spaces more accessible to those who need them most.

Governance matters: Formalizing relationships through leases, licenses, and co-management agreements gives cities the flexibility to engage a wide range of partners, from nonprofits to private actors, while ensuring accountability, transparency, and consistency over time.

Walking the land together builds more than knowledge, it builds relationships: The site visit to Metropolitan Park in Pavlos Melas revealed the power of a shared experience. Inspired by Indigenous teachings from Canada, the act of walking the land fostered deeper understanding, trust, and cultural exchange, key ingredients in any meaningful cooperation.

THE INTERNATIONAL URBAN AND REGIONAL COOPERATION PROGRAMME IN NORTH AMERICA

The International Urban and Regional Cooperation program in North America (IURC NA), funded by the European Union, partners European cities with Canadian and USA cities to facilitate knowledge exchange through online tools, face-to-face interactions, study visits, participation in thematic and networking events, and capacity-building initiatives. Its activities support the achievement of policy objectives as well as major international agreements on urban development and climate change, such as the EU Urban Agenda, the UN Sustainable Development Goals, and the Paris Agreement. The program is part of a long-term strategy by the European Union to foster sustainable urban development in cooperation with the public and private sectors, researchers, innovators, community groups, and citizens. IURC NA is financed under the EU Foreign Policy Instruments and benefits from the strategic support of the Directorate-General for Regional and Urban Policy of the European Commission.

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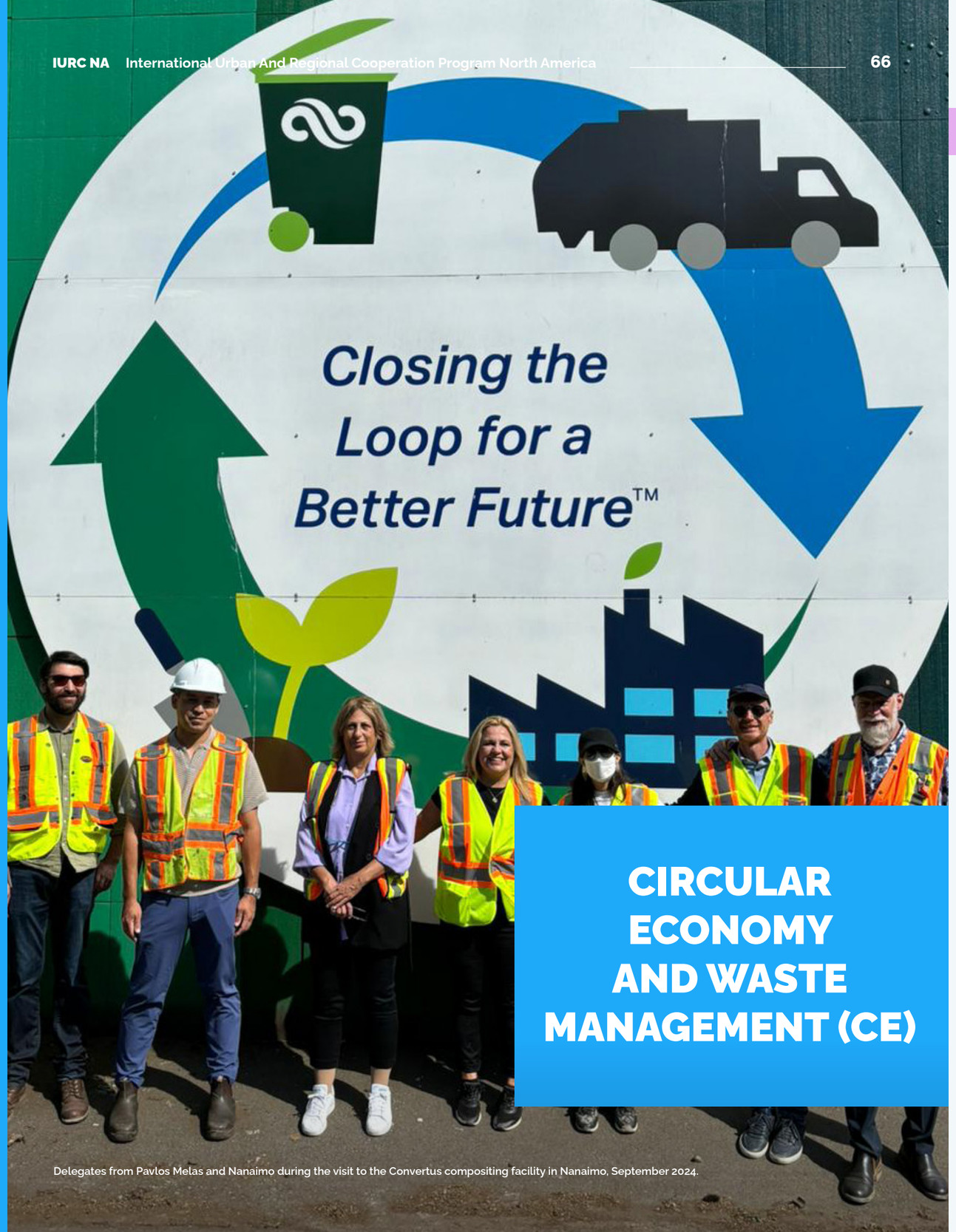
For more information, please contact us at info-na@iurc.eu

Acknowledgments: Thanks to **Darcie Osborne**, Director of Parks, Recreation and Culture and **Bill Sims**, General Manager for Engineering & Public Works, both from the City of Nanaimo, and to **Anastasia Dimitriadou**, Director of the Independent Unit for Development Planning, Programme Management & Quality, **Marios Asteriou**, Department of Urban Policies and Funding, and **Styliani Bampatziani,** Business Administration, Department of Urban Development and Funding Strategies from the City of Pavlos Melas for always identifying valuable lessons, adapting them to their context and sharing their experiences.

Links to related outputs:
Nanaimo's City Plan
Nanaimo's 2023-2026 Council Strategic Framework
Nanaimo's Integrated Action Plan



CIRCULAR ECONOMY AND WASTE MANAGEMENT (CE)

Delegates from Pavlos Melas and Nanaimo during the visit to the Convertus compositing facility in Nanaimo, September 2024.

Webinars

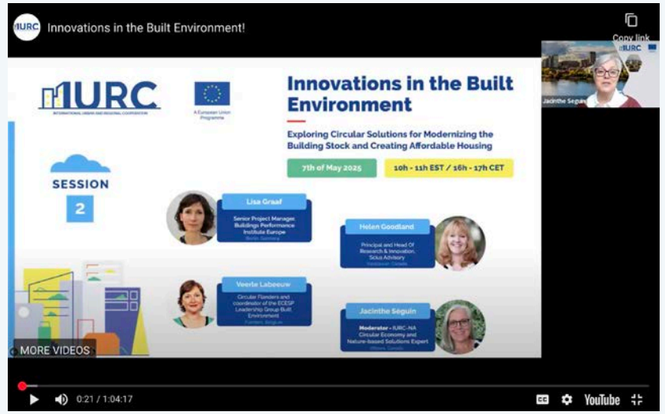
Circular Public Procurement in Action

September 25, 2024

Recording & Presentations

Innovations in the Built Environment:
Exploring Circular Solutions for Modernizing the Building Stock and Creating Affordable Housing

May 7, 2025



Recording & Presentations

Factsheet

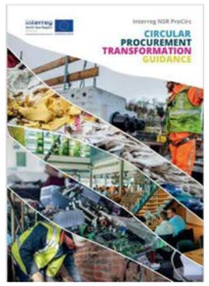
Circular Public Procurement in Action

Circular Flanders is leading the way

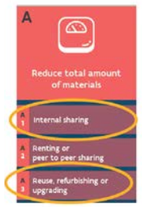
Flanders, the self-governing northern region of Belgium, is a frontrunner in circular economy. Circular procurement is an integral part of its comprehensive strategy to reduce material footprint by 30% and decouple it from consumption by 2030. The government's approach is to build partnerships with civil society, local governments, businesses, research, and financial sectors to reach this goal.

A strong policy research capacity, https://ce-center.vlaanderen-circulair.be/en, supports the ambitious agenda by conducting various analyses and tracking overall progress through indicators.

The experiences are supporting the development of new specifications and collaborations such as joint statements of demand. The success of Circular Flanders is also leading other European efforts through the European Stakeholders Platform and also the Circular Procurement Learning Network on LinkedIn where professionals can ask questions and support each other in their functions.



Resources to promote what local authorities can do to become circular are promoted. Specific to public procurement, guides were also created for cities to transform their practices. Procurement specialists and departments can access templates for assessing needs and opportunities. Case studies and pilot projects from cities and the Flemish government are also well detailed and shared broadly.



The Flemish government's Facility Services Agency opts for circular office furnishings

Flanders's keys to circular procurement success

- **Circular objectives for all departments:** cross-organisation integration is essential, and a coordination function can bring information and people together and help overcome challenges.
- **Develop guidance:** assessment tools are useful for identifying bottlenecks and solutions and improving the support base within your organization. Other resources should be assembled to assist in identifying needs and setting purchasing criteria.
- **Monitor contracts and learn from each other:** checking that contracts meet expectations, reporting results, and sharing lessons are crucial.
- **Engage the marketplace:** dialogue with suppliers to find out what is possible now and in the future helps set expectations and criteria, along with broader research resources.

Richmond: Bold vision, strategic plan, and practical approach

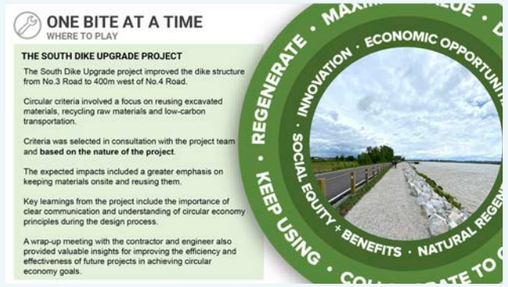
Richmond, British Columbia, Canada, with a population of 209,000, has implemented a Circular Vision and Principles in its procurement activities. While the City's Strategy is all encompassing, their approach is pragmatic, backed by thoughtful analysis and engagement.

The 'One Bite at a Time' tool guides the practical approach to collecting the appropriate data, determining where value is lost or at risk, identifying opportunities and ways to close loops, determining who benefits from the value, and establishing criteria. This exercise helps focus efforts and orient engagement.

Elements of success from Richmond, BC

- **A clear vision sets directions and 30 goals drive action:** 5 simple principles guide city decisions - design clean, keep using, collaborate to co-create, regenerate and maximize value.
- **Circularity** is examined at the system, supplier, and product level.
- **An adapted and practical tool:** the One Bite at a Time tool was adapted from the Ellen MacArthur Foundation to help city departments identify circular opportunities.
- **Engage, communicate, and share:** employ various strategies to talk with suppliers, break down silos, and collaborate with peer cities to support the co-creation of solutions.

Richmond has applied its approach to deliver circular solutions in varied sectors, such as a dike upgrade project, synthetic turf replacement, and office furniture management.

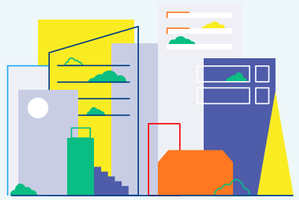


Sharing results with the community ensures that their plan continues to engage the community in co-owning the transformation process, testing ideas, and innovating.

This factsheet was based on the webinar Circular Procurement in Action. All photos on pages 68 and 69 are from presentations by **Veerle Labeeuw**, Circular Flanders, Lead, Circular Procurement Leadership Group, the European Circular Economy Stakeholder Platform; and **Marcos Badra**, Program Manager, City of Richmond, British Columbia, Canada.

Factsheet

Circular Innovations in the Built Environment



From think tanks to business sector practitioners, policy makers and local governments, innovations are underway to influence more sustainable building practices to deliver social, environmental and economic benefits and meet the needs of growing and evolving urban populations. Cities hold a unique influential role in this transformation despite known challenges. There is a wide array of tools and resources available to support their efforts in this area.

Prioritizing existing buildings for people and planet

Applying sufficiency principles to address housing needs can be done through an array of strategies. European case studies have demonstrated that reusing and retrofitting existing buildings can avoid significant greenhouse gas emissions and achieve up to 60% resource savings compared to new construction. This approach also enables the delivery of adequate housing, unlocks investment opportunities, and enjoys higher public acceptance than often anticipated.

Sufficiency is defined as: "...
a set of measures and daily practices that avoid demand for energy, materials, land and water, while delivering human well-being for all within planetary boundaries" (IPCC AR6 WGIII, p. 957).

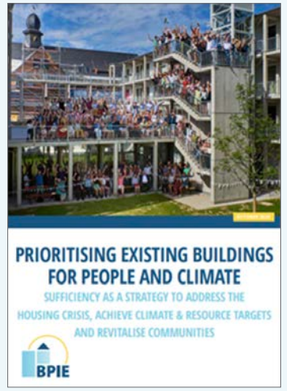
Countries like Belgium, France, Germany, Poland and Ireland are already implementing diverse mechanisms to encourage and support reuse and retrofitting of buildings to meet housing needs. These efforts yield multiple co-benefits: conserving scarce resources, preserving cultural and historical heritage, reducing the need for new infrastructure, fostering community and inter-generational ties, revitalizing neighbourhoods and regions, and creating more affordable housing options.

Examples of sufficiency initiatives from Europe:

COUNTRY	INITIATIVE	MECHANISM	CURRENT OUTCOMES	ESTIMATED POTENTIAL (max)	
				Avoided new construction	Avoided embodied emissions
	1TOIT2AGES Brussels and Wallonia	Mobilise 'invisible living space'	Facilitated 604 matches in 2023	26.800 m^2	15.000 tCO_2
	Plan lutte contre les logements vacants National	National strategy to map vacancies and making them habitable	1,1 Mio vacant buildings; over 6.000 "exited" vacancy status	20.190.000 m^2	9.500.000 tCO_2
	Aus Alt mach 2 .. Oder mehr Pilot project Ravensburg	Premium for consultation for reconstruction of single-family buildings	A quarter of homeowners considers a reconstruction	23.526.000 m^2	11.200.000 tCO_2
	Empty Spaces for affordable houses National	Mapping vacancies and making them habitable	Estimates of 215.000 usable units after renovation	12.106.000 m^2	5.750.000 tCO_2
	Parkwest Dublin 12 The Plaza Office building in Dublin	Conversion of offices into housing units	86 social housing units created	5.800 m^2	2.759 tCO_2 (- 82% less embodied carbon compared to new built)

Recommendations for sufficiency in the building sector

1. Make best use of vacant or underoccupied buildings by collecting data.
2. Prioritize and incentivize the preservation, repurposing and reuse of the existing building stock ahead of new construction.
3. Support experimentation of sufficiency initiatives, exchange of experiences and awareness raising.
4. Use synergies with other policy fields and forge new alliances.
5. Invest in research on the qualitative and quantitative impacts of sufficiency initiatives.



Insights from the city of Atlanta

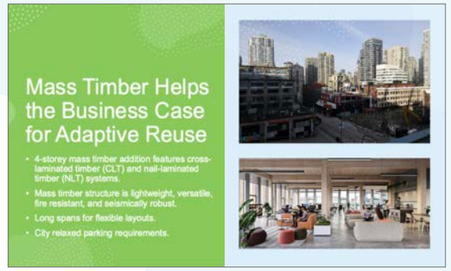
- We are starting to implement circular approach in the sector.
- Focus is on how to use data to manage the built environment.
- Retrofitting and using existing infrastructure is becoming an appealing option due to current economic situation.
- Can use spaces in different ways than originally designed for.
- Diverting materials from waste stream.
- Building retrofits help create community buy-in.

Policies and standards for circularity in the built environment

The pursuit of Circularity in the Built Environment (CBE) is a multifaceted undertaking that must adapt to market conditions while embracing societal goals and incorporating technical norms. Navigating the increasing array of national and local building codes, energy and green building policies, deconstruction policies, voluntary program certifications, green procurement and other types of guidance is a time-consuming challenge for architects, project developers and other practitioners, not to mention market readiness for such innovations. Cities can play a useful role in providing one-stop shop or consolidating the guidance for the sector.

Some cities are leading the way such as Calgary's 2021 downtown development incentive program which offers financial incentives for building conversions to housing. Vienna is implementing its bold vision for site and use-appropriate planning and construction for maximum resource conservation from 2023 onward and 80% reuse or recycle rate for materials from demolished buildings by 2050.

The **Carbon Risk Real Estate Monitor (CCREM) Risk Assessment** is a useful tool that helps asset owners and investors to understand the carbon risk inherent ton their real estate portfolio. The tool also benchmarks the portfolio against CCREM pathways and peers. The results can be used to plan and prioritize retrofits, conversions and adaptive reuse strategies.



Guidance, from technical standards to policies focuses on practices from cradle-to-grave: **circular design, construction, deconstruction** and **life extension strategies**.
Despite challenges, many examples of new construction techniques and collaborations are emerging from which we can all learn.

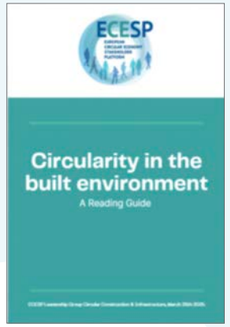
Successful design approaches incorporate:

- Simple configurations.
- Clean & uncontaminated materials.
- Componentized construction.
- Design for disassembly.
- Planning for reverse logistics.

Navigating the circular built environment – a reading guide

The European Circular Economy Stakeholders Platform (ECESP) (#CEstakeholder) is an active platform accessible to all for exchanging and learning from practices. Their collective work features many case studies, detailed reports for cities, policy makers and the business community. Regular #EUCircularTalks feature leading practitioners from many sectors.

The ECESP released in 2025 a comprehensive guide to resources addressing circularity in the built environment.
It covers:



- Introduction.
- Circular design principles.
- Materials and resource efficiency.
- Standardization and digitalisation.
- Policy and regulation.
- Economic and environmental benefits.
- Best practices.
- Publications and resources.

This factsheet was based on the webinar Innovations in the Built Environment. All photos on pages 70 - 72 are from presentations by **Lisa Graaf**, Buildings Performance Institute of Europe, **Helen Goodland**, Scius Advisory Inc., and **Veerle Labeeuw**, Circular Flanders and European Circular Economy Stakeholder Platform.

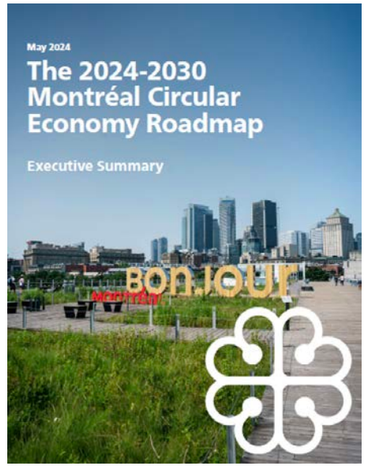
Networking Event & Takeaways

Successful Circular Economy Solutions for Urban Leaders

On April 14-15, 2025, 19 cities from Europe, Canada, and the USA gathered in Montreal for the Circular Economy thematic visit, part of the EU-funded IURC-NA programme. The event combined local site visits, workshops, and participation in the Canadian Circular Economy Summit, offering city leaders a unique opportunity to exchange experiences, explore successful solutions, discuss challenges and connect with leading innovators. Through two days of intensive collaboration, participants gained knowledge and inspiration to advance circular practices in their cities.

The transformative power of the circular economy

The opportunities for applying **circular economy approaches** at the local level are wide-ranging while delivering diverse benefits from environmental protection and resource conservation to local business growth, job creation, social cohesion, and community building. Local governments are increasingly advancing **the circular economy** by serving as role models, **facilitating connections** and establishing multi-level governance to ensure aligned priorities and policy coherence. They are also **enabling effective conditions for businesses, organisations and individuals to effectively engage in this transformation** by mobilizing resources, adapting regulatory frameworks and public procurement, supporting innovations and outreach programs. In sum, cities are leveraging their unique assets to foster circular economy in their city and trailblaze in this transformation.



1. Roadmaps and action plans guide cities and bring stakeholders together

Circular strategies and plans are showing how to mobilize city actions to address many different changes such as climate resiliency, population growth, food security and meeting the needs of diverse communities.

Montreal: a circular economy leader

Montreal has adopted a vision to become a circular metropolis. The comprehensive Roadmap (2024) and accompanying Action Plan (2025) were developed following extensive consultations and baseline study to characterize the situation and potential. **Having already doubled its circularity index to 6%**, the city aims to improve its performance to **17% by 2050**. Montreal has accelerated its transition by **leading through example, maximizing the levers.**

In April 2025 it launched its first **3-year action plan** outlining 20 concrete actions & 5 flagship initiatives focusing on priority sectors: **food, construction, textiles, plastics, mobility and logistics**. With investments of CAD7 million leveraging over CAD100 million in municipal funds, the plan will use municipal levers to act on four main axes:

1. Facilitate business transition to circular economy.
2. Act on priority value chains.
3. Drive the development of promising circularity strategies.
4. Lead by example and raise Montreal's profile.

The Master Plan to rehabilitate the former quarry and landfill site to create the Parc Frédéric Back in a densely populated neighbourhood included the use of renewable energy and recycled waste to develop the park's new infrastructure. The development of Montreal's second largest urban parc on 192 ha is still ongoing but completed sectors provide year-round activities and serve as an educational vehicle for zero-waste goals.

Key takeaways from Montreal's experience:

- The political commitment in Montreal established a strong mandate to influence the reversal of the linear economy by designating the **Economic Development unit** in Montreal to lead the circular economy work.
- The focal point from the Economic Development unit enables the outreach to diverse sectors of the economy and effective coordination of engagement of many other areas of action of the city.
- The municipal roadmap and subsequent action plan developed through public consultations by the Economic Development unit is an important means to **define and communicate the city's role and prioritize its actions.** The 2-3 year timeframe for the action plan provides needed flexibility for the city to adjust its activities in response to varying factors.
- The measurement of progress through a circularity index from an initial comprehensive baseline developed for the city is an outstanding element that speaks to the depth of their political and organisational commitment.
- The province of Quebec was also instrumental in allocating funding to the city that was in turn leveraged towards strategic support and **incentives to circular hubs** that invest in innovations and organizations working to change practices and mindsets in strategic priority sectors for the city - food, cultural, construction, textiles.
- The business, research and non-profit sectors' engagement in these strategic priority areas is evident with many diverse and highly engaged organisations.

2. Cities must invest in local stakeholders

A rich ecosystem of engaged businesses and social organisations is essential for advancing circular economy initiatives and achieving tangible results. Circular economy solutions depend on stronger connections within and across value chains and regions, as well as partnerships and collaborative efforts that integrate social considerations.

While intersectoral approaches are still in their early stages, local governments can foster those connections and collaborations. The social economy, in particular, stands out as a driving force for implementing circular practices—an insight echoed in the experiences shared by many participating cities.

- Both **Toronto and Atlanta** are pursuing circular economy goals with social justice goals and sustainability objectives. Toronto is putting its reconciliation with indigenous peoples into practice while Atlanta elevates inclusion into policies and practices.
- In **Calgary** the circular economy grants for non-profit helped re-think the municipal role, connect in community and catalyse actions towards common goal.
- **Murcia's** Circular Hub helped more than 45 start-ups since 2022 to implement innovative ideas by providing space, project assistance and economic support.
- **Halifax** leverages collaborations form many sectors and social organisations including academia who contribute to research on policy, data and program implementation.
- **Rome's** Food Council is a governance and engagement mechanism for social partners in the delivery of a broad ambitious initiative to address food related issues.

3. Every city has assets to build upon

All cities possess a foundation of assets that can be leveraged to advance circularity within their territories. While the leading practices offer valuable inspiration, many cities encounter obstacles such as limited human and financial resources, lack of political commitments or competing priorities. . Participants reflected that when city-wide or comprehensive initiatives are not immediately feasible, it is important to start with smaller scale initiatives (e.g., pilot projects, supporting local reuse initiatives and repair hubs, food waste reduction campaigns), improve progressively, and aim for more comprehensive plans when the conditions are right.

The Montreal Baseline Assessment (https://www.circle-economy.com/resources/circular-montreal-baseline-assessment) provides useful insights for shifting municipal practices towards greater circularity and realizing social, economic and environmental objectives as well as providing a springboard for experimenting circular solutions and systems.

The way forward:

- Political endorsement and collaboration
- Clear governance
- Coordination among stakeholders
- Improving data availability
- Leaving no one behind

Circular Montreal Baseline Assessment (2022)

Cities acknowledge their circular economy assets:

Zero-waste strategies

- **Edmonton** has a zero-waste framework, and many city departments have circular economy initiatives.
- **Milan** joined the 85% separate collection challenge by 2033 and aims to recycle more wastes, improve public education and community composting programs.
- **Sofia** focuses on separate collection of different waste streams (textiles, food, packaging) and needs to continue working with various sectors, stakeholders and citizens.
- **San Francisco** is reframing its long tradition of zero waste programs into circular economy practices and mobilizing engaged city staff to lead change.

Community investments

- **Austin** hosts repair and reuse fix it clinics to build skills in the community; supports furniture reuse warehouse to help workforce development, and partners for deliver transitional housing options.
- **Ottawa** is one of the sponsors of repair cafés led by the Ottawa tool library to develop repair skills, and build community across generations and cultures.
- **Essen** employs repair cafés in select neighbourhoods to provide longer life to electronic devices and provide connections for senior citizens.
- **Braga's** re-store stands as a social innovation where used textiles are reused to make clothes and accessories.

Food waste reduction

- In **Albuquerque**, the city is supporting and collaborating with community organizations in the food system to reduce food waste and turn organic waste into compost. This is supporting the City's 2021 Climate Action Plan to become a more climate resilient city. to reduce food waste.
- In **Famaliçao**, where there is a concentration of textile and agri-food industries, companies are encouraged to work with the technologies centre to develop circular solutions.
- **Valencia** provides compost boxes to schools to introduce children to composting and use the product in school gardens.
- **Dublin** partnered with Belfast to identify options and advance the city's Food Strategy.

Business support

- **Montreal** supports Synergie Montreal as platform to support SMEs, piloting innovations and the implementation of new circular businesses and collaborations.
- **Nanaimo** partnered with the Vancouver Island Coast Economic Developers Association and Synergy Foundation to deliver the Circular Economy Accelerator Program and has a Business Guide to the Circular Economy.

4. Beyond a starting point: monitoring progress to improve

A challenging aspect of any comprehensive initiative is to select a set of priority actions that will address well the city's circumstances (e.g., stakeholders' concerns and interests, issues to be addressed, financial means, broader policy environment at the national or sub-national scale, etc.), track progress and measure outcomes. Methodologies can be complex and involve new data generation. The investment is worthwhile to sustain commitments and adapting directions over the long-term. Many cities already have waste reduction goals and metrics that can serve as the foundation for wider circularity assessments.

Montreal's baseline assessment was instrumental in mapping which sectors play a major role in accelerating the transition to a circular economy, providing a snapshot of current state of circularity, developing scenarios for higher impact actions, defining a measurement framework and outlining key policy implementation considerations.

Indicator (unit of measure)	Does the city measure it?	Does the MFA measure it?	Calculated indicator
Number of circular food iniciatives in the city (#)	No	No	Not currently measured. Could be measured through an industry survey
Urban Agriculture (measured in number of urban agriculture enterprises, and total area of cultivated land within the city)	Yes	No	• 55 companies • 120 ha cultivated
Total food waste generation (tonnes). • Edible food lost or wasted • Associated inedible parts (peelings, bones, etc.)	Yes	Yes	• 761 kt • 368 kilograms per capita
Food redistribution (% or tonnes)	Yes	Yes	15 kt per year
Food waste diverted from landfill (% and tonnes)	Yes	Yes	84%

In 2028 Montreal will conduct an assessment for the period of 2025-2027 and adopt their 2nd Action Plan. It is predicted to conduct a final assessment in 2030 to evaluate the impact of the initiative.

Insights from cities and speakers during the event:

- Strong political commitment and engagement provides necessary direction and support for the mobilisation of resources and engagement from stakeholders.
- **Roadmaps or plans** are useful to define path forward, prioritize actions and clarify expectations on the municipal role.
- Map and **engage stakeholders** on the value chain and in various sectors early and continuously. Invite unlikely coalitions bringing together unrelated stakeholders.
- Look for **diverse incentives or programs** to support innovation from social enterprises as they will redefine a new circular culture.
- Start wherever you are and make sure you are noticed. When it is challenging to achieve a best practice or comprehensive initiative, **start with smaller scale projects or pilots**, then collaborate and improve the practice, and consider larger plans when ready to do so.
- **Acknowledge leadership and commitment** to innovating new practices from which all can learn.
- Onboard adjacent agendas (e.g., social housing plans, social justice and community integration objectives, climate resilience, etc.) and **build on existing momentum.**

* All photos from pages 73-78 are from the Circular Economy Event in Montreal, April 2025.

Best Practice

Planning to Unlock the Potential of Circular Cities

Cities are increasingly turning to more systemic and integrated planning to build their resilience and capacity to address challenges such as climate change, population growth, food security, and meeting the needs of diverse communities. The **circular economy is an approach** that has gained popularity because its basic principles can be applied at various scales, and the potential benefits are broad. Unlocking the **potential of a circular economy** to generate positive environmental impacts, provide job opportunities, and support local businesses and social cohesion requires a plan. There are already leading examples of municipal planning and innovation that prove that cities are part of the solution and leading the way in this transformation.

Principles of a circular economy

1. Designing out waste and pollution;
2. Keeping products and materials in use; and
3. Regenerating natural systems.

Expectations and opportunity

Considering their core competencies such as solid waste, water management, the built environment, land use and energy management, the OECD emphasized that cities can play a well-rounded role in the circular economy by: **promoting the circular economy** and acting as a role model, **facilitating connections** and establishing multi-level governance to align priorities and policy coherence; **enabling appropriate governance conditions** by mobilizing resources and adapting regulatory frameworks and advancing public procurement and information systems[1] . The Ellen MacArthur Foundation also reflects on the multi-faceted role that municipalities play and the opportunities they can harness particularly in buildings, mobility, and products (Circular economy in cities: Policy levers; The Circular Economy in Cities: resources suite).

Planning, measuring and reporting

A Checklist for Action with guidance and a Scoreboard on the Governance of the Circular Economy for governments to self-assess conditions for a circular economy, identify challenges and set priorities towards a circular-economy transition is available with the report The Circular Economy in Cities and Regions - OECD.

Many cities begin their circular economy journey testing new approaches through pilot projects driven by waste management objectives. For example, A guide to catalyzing a circular economy in your community (fcm.ca) and ICLEI USA The Circular Pathway Starter Pack | ICLEI USA promote how to get started in your community at a manageable scale.

Zero Waste Europe (ZWE) provides tools, best practices, case studies and a certification programme for zero waste cities. Under The Zero Waste Masterplan - Zero Waste Cities, 13 Zero Waste Certified Cities in Europe have undergone an independent audit to verify their zero waste performance. While certification may not be suitable for every municipality, other smaller scale solutions can be pursued through ZWE programs such as Elevating Reuse in Cities, Life Biobest, and #ForkToFarm: Zero Waste Cities - A continuous effort to phase out waste; Learn - Zero Waste Cities.

The **best plans** are developed with input from and in collaboration with a wide range of departments, stakeholders, and communities. **A long-term system shift will eventually require a fulsome plan or a succession of plans that will act like building blocks:**

- With a clear and broad vision, goals, and measurable targets;
- A governance mechanism to coordinate across departments and engage stakeholders;
- A process to develop skilled resources and secure financial resources;
- A commitment to implement, report, adapt, and continue.

1 OECD (2020), The Circular Economy in Cities and Regions: Synthesis Report, OECD Urban Studies, OECD Publishing, Paris, https://doi.org/10.1787/10ac6ae4-en.

- The **city of Paris** introduced its Circular Economy Plan 2017-20, which contained 65 action proposals based on 7 strategies. Their second Roadmap was adopted in 2018.
- "**Circular Amsterdam**" was first adopted in 2016 with a focus on two sectors: construction and organic residual streams. With the renewed **Amsterdam Circular 2020-2025**, the city now aims to use 50% fewer primary raw materials by 2030 by focusing on three value chains to shape circular actions in the city: food and organic waste; consumer goods; and built environment.

On this journey, cities will encounter many challenges. **A plan can secure the engagement of various departments and establish strategies to work on:**

- Ensuring coherence across regulations, policies and programs;
- Developing synergies between areas and initiatives;
- Securing financial resources and participation of the community and businesses;
- Acquiring training and skilled resources;
- Overcoming cultural barriers;
- Collecting data to measure progress against your goals.

The Circular Economy and Innovation Unit at the **City of Toronto, Canada** formed a Working Group of 11 divisions to co-ordinate and increase the capacity to implement circular economy initiatives. The Metropolitan Area of Barcelona, Spain, created a "Roundtable for the circular economy" where the City and the Metropolitan Area co-ordinate actions.

While the identification of priority areas for action is the result of both public consultations and technical studies, **targets and measurable objectives** rely on the availability of baseline data and information collection systems.

The **city of San Francisco, USA** developed a rigorous baseline from which they will measure progress of their circular economy initiatives. Such data is key to the long-term success of a plan, to get business buy-in, create awareness, and engage participation in new practices. In its report, the OECD compiled a range of possible indicators of circular economy at the local level.

Finally, cities learn best from their peers. **Many resources and networks are available** to share experiences, gain insights and inspire to take the first steps to bring about sustainable change.

- Circular Cities and Regions Initiative | Circular Cities and Regions Initiative (europa.eu)
- Canadian Circular Cities
- ICLEI Circulars - ICLEI
- Circular Cities Summit 2.0 | Sustainable City Development (circular-cities-network.org)
- Association of cities and regions for sustainable resource management ACR+: Home (acrplus.org)

Best Practice

Public Procurement for Circular Cities

Context & challenges

Public procurement in the European Union, United States and Canada totals several trillion dollars of expenditures annually. The opportunity to leverage procurement as a catalyst for market transformations, innovation, and sustainable supply chains is enormous. Some municipalities have begun to tap into the potential of public procurement to transform their local economy and achieve social, and environmental gains. Realizing this potential is now possible through a growing array of tools adapted for cities, training opportunities, buyers' networks and innovations in the marketplace.

The purchasing power of local governments is influential and an important strategy to reach circular economy goals. **Every purchasing decision has an impact.**

Opportunities

The environment that cities work in today is complex, dynamic and challenging. However, there are several areas of responsibility where a local government can apply circular procurement practices.

Introducing circularity in municipal areas of responsibility can deliver a range of strategic benefits for the city:

- New local markets and jobs;
- Increase in reuse, repair and refurbishment of products through service-based businesses;
- Reduction of waste, energy consumption and other environmental impacts;
- Savings on waste management costs;
- Gains in social integration and addressing social inequities by making better use of resources and supporting regional employment.

Areas where government procurement can influence outcomes:

1. Procurement of products in city operations
2. Procurement criteria in the renovation and maintenance of city-owned buildings and infrastructure
3. New developments on city-owned lands
4. Supporting innovation (e.g. circular business models), local employment and social enterprises
5. Promotion, business & citizen education

How it works

Circular procurement must be looked at as an innovative approach to public procurement. Key features for success are:

1. **Adopting a systems approach:** considering the entire life-cycle of the product, project or service and collaboration within various segments of the organization is critical.
2. **Starting simple:** go for easy wins or focus on priority issues, then scale up gradually; early wins will build confidence within the organization and gain support for tackling more complex buy categories. Assess what will be the progression in your city and develop a plan.
3. **Engaging suppliers early:** talking with businesses will inform how far you can set your criteria and what you may expect from innovation, identify who might benefit and the impacts.
4. **Broadening your practices:** tools such as environmental or circular procurement criteria, reputable certification or labelling programs, science-based studies, life-cycle studies and experience of other cities will help set new

1. standards and practices; assess in what areas your city is ready to adopt new levels of performance.
2. **Joining buyers' groups or networks:** many groups are forming around the world to develop criteria, joint tendering proposals and information sharing networks.
3. **Enhancing human resource assets:** learn from others and share your lessons; ongoing training targeted to the various functions and responsibility of staff in your organization is critical to success. Everyone in your organization needs to buy into circular goals and principles and contribute their knowledge.
4. **Monitor your progress:** Measure your results, communicate progress and outcomes, identify lessons and adjust strategies for future procurement activities.

The budget for circular procurement should be based on life cycle costs rather than just the initial capital expenditure. A focus away from 'low price' to incorporate life-cycle costs in procurement options will take time and effort. Various circular business models can support circular cities goals. Some may be widely available in a region while others may require incentives or policy support to scale up or meet a growing demand.

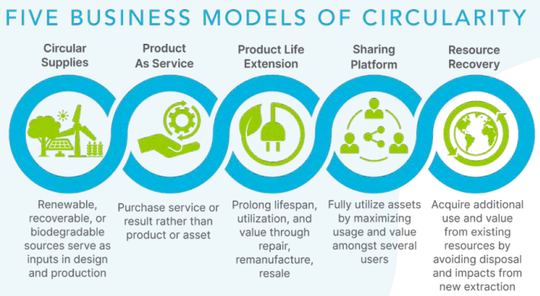


Figure with permission from Circular Innovation Council

Successes and Resources

Many local governments have shared **how they are harnessing** public procurement to support **environmental and social goals**. Here are some **cities and regions** to watch for their leading practices:; New York City, USA for their Environmentally Preferrable Purchasing Law and standards; Richmond, **British Columbia**, Canada for its practical step-wise Circular Strategy, Circular Procurement Policy and harnessing market opportunities through pilots **and the North Sea Region in Europe for their ProCirc project which carried out some 30 pilot projects in various sectors such as textiles, clothing, construction, ICT, and furniture from 2018 to 2023 leading to the establishment of the C-PRONE network, and Madrid, Spain for the promotion of labour markets inclusion (WISE) as part of their Strategy of Waste Prevention and Management. Take the time to be inspired to begin or expand your journey in circular procurement - consult resources, participate in training, join procurement and buyers' networks.**

References, Networks and Guides

- EU Procurement for a Circular Economy (switchtogreen.eu)
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- Product-Service Systems and Sustainability: Unep-imp 7

Best Practice

Harnessing Reuse Opportunities for Local Benefits

Local governments are playing an important role in the reuse of materials by enabling the development of infrastructure and creating favorable conditions for the uptake of circular solutions. Communities of all sizes are becoming reuse innovation hubs, supporting refurbishment and repair enterprises, adopting reusable takeaway packaging solutions, facilitating construction materials exchanges and connecting residents and businesses to more sustainable products and services.

Reuse models offer important environmental, economic and social benefits (e.g. local jobs and businesses revenues, reducing waste, resource utilization and carbon emissions)[1] . Cities that develop a comprehensive plan and monitor results can orient their investments and realize important gains[2].

Local government actions can deliver strategic benefits:

- Setting clear reuse policies and city targets, monitoring and reporting results.
- Procurement of products in city operations, in the renovation and maintenance of city-owned buildings, events and infrastructure.
- Funding or facilitating reuse hubs, repair clinics or small-business grants.
- Investing in or supporting quality collection points or reuse infrastructure.
- Promoting, raising awareness and creating a culture of reuse in the community.

Measuring and sharing progress
First European Reuse Barometer was released in 2024
https://zerowasteeurope.eu/library/european-reuse-barometer/

Cities making it work

Two leaders with long-standing reuse commitments, the region of **Flanders, Belgium and New York City, USA** showcase how to make reuse part of their broader sustainability plan, measure its impact and drive the way forward with planned actions and investments.

Flanders: from waste management to material management

Flanders *(pop. 6.8 million in 2024)* is a circular economy leader in Europe. The densely populated and highly industrialized region began the ambitious transformation of its traditional waste management approach into a model of sustainable materials management in **2011** backed by the Materials Management Act. The Local Materials Plan **2023-2030**[3] maintained the focus on waste prevention, closing materials loops, eco-efficient production and eco-design, including amplifying actions on reuse with a new goal of 8 kg of reuse per resident from 6kg/person reached in **2022**[4].

Enabling various reuse channels to thrive is an important part of their approach. Today **a network of approximately 138 accredited reuse centres (De Kringwinkel)** offer jobs and training to unemployed people, operating alongside other reuse channels that include private second-hand shops, on-line platforms, fairs and charity events, and family exchanges. De Kringwinkel are distinct because of their focus on social employment, sustainable activities and offering consumer goods at low prices. Their role is embedded in waste and material policies and in local governance bodies[5] .

Success factors of Flanders' Reuse Centers

1. Linking reuse & social employment: most reuse centers receive subsidies.
2. Embedding reuse centres in waste policies: integrating centers in Extended Producer Responsibility and take-back obligations.
3. Federation of centres: supports professional-ization and representation to authorities.
4. Continued professionalization: creation of strong brand, standards and marketing.

In Flanders **to measure is to know**. Their **Circular Economy Monitor**[6] presents more than 100 indicators with accompanying analyses, including for reuse. Their experience

shows how reuse channels co-exist, how government policies enable growth and contribute to waste diversion and social objectives, and the evolving consumer preferences.

Reuse a vital part of New York City's Sustainability blueprint OneNYC[7]

New York City's Department of Sanitation **(DSNY)** leads the city's waste diversion efforts, monitors results and reports on diversion rates as per local laws. Their Reuse Sector Assessments which started modestly in 1995 and evolved into valuable in-depth reports 2017 and 2019[8] inform meaningful actions to grow the reuse economy. The 2019 report highlighted the progress made in each of the eight areas of reuse for potential growth flagged in 2017: (1) repair, (2) food rescue, (3) sharing economy, (4) donation model, (5) disaster response planning, (6) distribution of reuse outlets throughout the city, (7) new technology and (8) reuse and exchange of surplus goods.

From savvy **donateNYC[9]** campaigns, to food rescue technology platforms, ReFashion week and annual conferences, **NYC** takes reuse seriously as a means to achieve their zero waste target. City operations are also not exempt from doing their share. Since 2017, **DSNY** has piloted new ways to relinquish surplus goods and donate stocked supplies for disaster response to vetted agencies through the **donateNYC** program. This collaboration has become a model for city agencies managing stock supplies and surpluses. **DonateNYC** also provides a searchable map of close to 1,000 locations where residents can donate and procure gently used items. In addition, refashion **NYC** provides convenient in-building donations bins for clothing, textiles and shoes. **Today there are some 2,503 buildings participating in refashionNYC** and in 2024, **DSNY held 38 reuse and recycling events collecting over 93,500 pounds of reusable goods .**

There is a lot to learn from **DSNY's** engagement on reuse, their work to characterize the sector and track progress. The methodological details presented in the 2019 report (e.g. quantitative profiling, new mass balance) set a high standard but also provide useful guidance for any city that wants to advance reuse practices[10].

There are many other leading examples of reuse and guidance available. Learn and be inspired by their commitment and actions:

- **RREUSE**: international network for social enterprises active in re-use, repair and recycling : https://rreuse.org/ and https://rreuse.org/research-study-on-developing-re-use-networks-in-europe/
- **The ReUse Vanguard Project:** https://zerowasteeurope.eu/project/reuse-vanguard-project-rsvp
- **Putting second-hand first to create local jobs – guidance for municipalities to develop local re-use strategies:** https://www.circularity-gap.world
- WEF_Consumers_Beyond_Waste_Summary_Document_Reuse_Metrics_Measurement_2022.pdf (weforum.org)
- **Circular Innovation Council:** https://sharereuserepairhub.ca/

1.https://rreuse.org/wp-content/uploads/2022/10/just-transition-briefing-rreuse-2022.pdf
2.https://zerowasteeurope.eu/wp-content/uploads/2024/06/ZWE_June24_Report_InOff-plastic-european-reuse-barometer-.pdf
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5. https://transition-pathways.europa.eu/best-practices/de-kringwinkel-model-social-and-circular-economy-through-second-hand-shops; https://ce-center.vlaanderen
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Best Practice

Funded by the European Union

Food Waste Reduction: Local actions & education

In 2022, the **United Nations (UN)** reported that food loss and waste reached an astounding 1 billion tonnes globally, worth an estimated **USD 1 trillion dollars**[1]. Along with these values we must account for the associated waste of resources (e.g., land, water, energy, labour and capital), greenhouse gas emissions and impact of these losses on food insecurity worldwide. Progressing towards the **UN SDG target 12.3** of **halving food waste by 2030** and building a sustainable food system will require collaboration across the whole chain of activities. Investments in reducing food loss and waste, as well as promoting low-carbon diets, are emerging, but many opportunities remain untapped.

Every year, one third of all food produced globally is **lost or wasted**

- Around 13.2 percent is lost between harvest and retail.
- About 19 percent is wasted by households, the food service and retail sectors.

United Nations Food Loss and Waste Reduction

Many cities are already actively engaged in initiatives aimed at engaging residents and improving practices in areas where local governments hold unique influence -such as public procurement for schools and hospitals, operators' agreements, awareness campaigns, and training programmes. These efforts are often driven by commitments to reduce waste, lower GHG emissions, improve public health outcomes and address food inequities within their communities. Some cities have gone further, launching ambitious agendas that demonstrate how they are shaping the future of food systems to deliver tangible benefits: enhancing people's well living, protecting the environment and fostering economic prosperity. Food Councils, multi-stakeholder collaboratives, and other governance mechanisms are helping to identify challenges across the entire food chain, mobilise resources to develop solutions, and support stakeholders in taking meaningful action.

We showcase the outstanding work of cities with bold goals and highlight the resources they are using to innovate and lead by example.

C40 Good Food Cities Accelerator

16 cities have committed to tackling emissions from food by implementing these measures by 2030.

Planetary Health Diet for all by 2030

MILAN URBAN FOOD POLICY PACT

In 2014, the Mayor of Milan launched an international protocol aimed at tackling food-related issues at the urban level.

The declaration is accompanied by a concrete Framework for Action with 37 actions across 6 categories, including indicators to monitor progress.

Today, there are 280 cities worldwide that have adopted the Pact. The Milan Pact Awards recognised actions that cities are implementing in each of the 6 Pact categories.

Copenhagen: Reducing food waste to achieve climate neutrality

Copenhagen is a signatory to the **C40 Good Food Cities Declaration**, setting ambitious targets for achieving a Planetary Health Diet for all by 2030, and working to be the first carbon neutral city by 2025. With ambitious plans supporting these goals, notably the **Copenhagen 2025 climate plan** and Circular Copenhagen as the city's Resource and Waste Management Plan (2019-2024), efforts to reduce food waste and loss are directed by a comprehensive **Food Strategy (2019).**

Since 2017, most Copenhagen residents have benefitted from residential organics collection in dedicated containers and, **in 2019, roughly 25% of biodegradable waste was collected** for treatment at a biogas facility producing electricity and heat, used locally.[2]

Under the **Food Strategy,** Copenhagen has been a hub of initiatives. ***The EAT – Shifting Urban Diets***[3] project also helped the city establish a science-based target for Copenhagen's **GHG footprint from food**, reflecting food consumption in the city as a whole. Other recent actions include:

- **Training kitchen staff in shifting to nutritious, organic**, and more climate friendly meals in over **546 public kitchens, out of approximately 1,000.**
- Launching **over 900 climate friendly recipes** (publicly available) for kitchens **(from 20–100 servings)**, tailored to three different groups – children, adults, and the elderly.
- Launching a strategy requiring large events hosted or supported by **the city to provide a vegetarian meal option**, a higher percentage of organic food, and present measures to reduce food waste.
- Introducing innovative procurement criteria, **opening its food tenders to small and medium-sized enterprises** and farmers, linking food supply to education.

COPENHAGEN AS A FOOD CITY

A vision to transform a food culture and a strategy to drive systemic change and reduce food waste

"With this strategy, we plan a new and ambitious direction for how food and meals of high culinary quality can contribute to a healthier and more climate-responsible city for all Copenhageners."

- Between 2018 and 2022, it reduced CO_2 emissions associated with public meals by 17.6%.
- In 2022, City Council approved a new goal to reduce food waste from public kitchens by 50% by 2030, with an interim target of a 15% reduction by 2025.
- A 2022 report established the food waste baseline followed by pilot projects to test various ways of reducing food waste in its institutions.

To further boost its efforts, Copenhagen joined the **Food Trails Project** and established a Living Lab, developing pilot actions aligned with the **EU Food 2030 Strategy**, aiming to leverage the potential of the public food procurement process to implement food policy goals and drive sustainability within food systems.

- **Pilot 1** – Public Food Procurement Roadmap for procurement policy development.
- **Pilot 2** – The Price of a Meal - A financial model to ensure that sustainable meals can be provided within the budget of the municipality.
- **Pilot 3** – Food Education Kit for pupils aged from 10 to 12 on sustainable farming.
- **Pilot 4** – Kitchen App to support communication between kitchen staff and procurement officers

Stop Wasting Food is a co-founder of the **REFOOD label**, a **national certification for foodservice sector**, such as canteens and restaurants, to highlight their work towards less food waste and more recycling.

Copenhagen's efforts are now further supported by the Danish Strategy on Food Waste 2024-2027, which will serve to implement the provisional EU targets agreed to in February 2025.

These include the setting of national food waste reduction targets by 31 December 2030: 10% in food processing and manufacturing, and 30% per capita in retail, restaurants, food services, and households.

IURC-NA member Halifax in action!

The province of Nova Scotia (Canada) has been a forerunner in the diversion of waste, with mandated source separation of recyclables and organics since 1995, including a ban on organics in landfills. The robust provincial measures created and ideal backdrop for further innovations from the municipality of Halifax (HRM).

Since 2023, HRM has worked to develop a comprehensive **JustFOOD Action Plan for the Halifax Region** (Parts A and B) in consultation with stakeholders, and became a signatory to the Milan Urban Food Policy Pact.

The Plan is accompanied by a practical implementation document (Part B) that is being used to advance the priority recommendations, including milestones, roles, partners, outcomes, performance measures, and resourcing requirements. The first status report was issued in February 2025. **This plan, along with the development of the Halifax Regional Food Hub aim to increase the region's food security and economic resiliency**. The hub initiative was developed based on a business plan to identify the opportunities for greater efficiency, collaboration and scale of impact to connect and support producers, buyers and food hubs throughout mainland Nova Scotia. Products produced in rural regions will be transported to one central location in the Halifax region, where they can be aggregated, stored and distributed to wholesale buyers. Both are initiatives to watch!

JustFOOD
Action Plan for the Halifax Region
PART B - DECEMBER 2023
HALIFAX

Cincinnati: Comprehensive plan and creation of a food Council

Also a member of the Milan Food Policy Pact, Cincinnati (USA) has been working to address food waste through policy initiatives, programmes, and partnerships in a comprehensive, interdisciplinary and inter-institutional manner since 2016. The Green Cincinnati Plan, adopted in 2023, now guides the city's sustainability efforts, and includes goals of access to healthy food, diversion of organics from landfills, and reduction of food waste.

Utilizing the **USEPA Wasted Food Scale**, *Cincinnati Food Waste* has created partnerships and solutions to maximise impact while promoting inclusivity and regional cooperation. Examples of their accomplishments to date:

1. **PLANNING/POLICY**: Food waste summits, a regional food waste plan, data analysis, creation of the Food Policy Council, Table Guidance for schools and local implementation support, Mayor's endorsement of the Conference of Mayors Food Waste Resolution.
2. **PREVENTION:** Partner funding, awareness campaigns on buses, business waste audits, and the residential food waste prevention campaign Food Waste Stops With Us.
3. **RECOVERY:** Stakeholder analysis, City/County funding to partners, Health Department Inspector training, educational materials to support restaurant donations, and collaboration with non-profit organisations to transport and repurpose donated food to the food insecure.
4. **RECYCLING**: Anaerobic digester exploration, revision of Municipal Code to promote composting, creation of the Cincinnati Community Composting Collaborative, USDA award to create food waste drop-off points and medium-scale composting sites, and a food waste composting pilot at a city recreation facility.

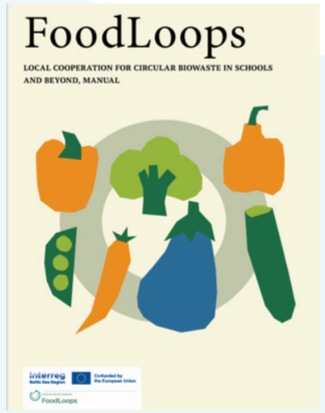
Greater Cincinnati Regional
Food Policy Council

Lesson learned

"Often the best innovation and most nimble responses occur with community stakeholders. La Soupe, an organization started in 2015 with a mission of Rescue-Transform-Share, has used a chef-based model, multiple innovative programs and a variety of in-person & virtual culinary education opportunities to rescue 3M lbs. of food & provide close to 2M restaurant quality meals".

Cincinnati Food Waste

https://www.epa.gov/sustainable-management-food/



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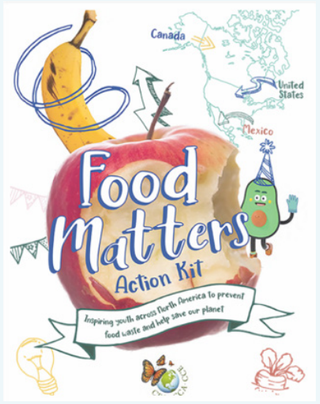

Commission for Environmental Cooperation:
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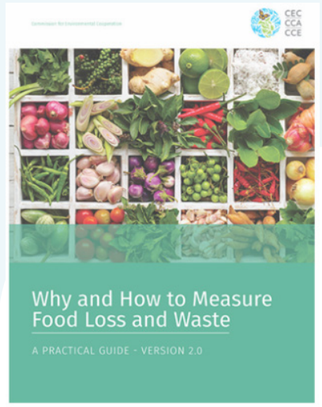
https://www.cec.org/flwy/



Why and how to measure food loos and waste
https://www.cec.org/flwy/

LOVE FOOD hatewaste

Love Food Hate Waste / Preventing food waste : https://www.lovefoodhatewaste.com/

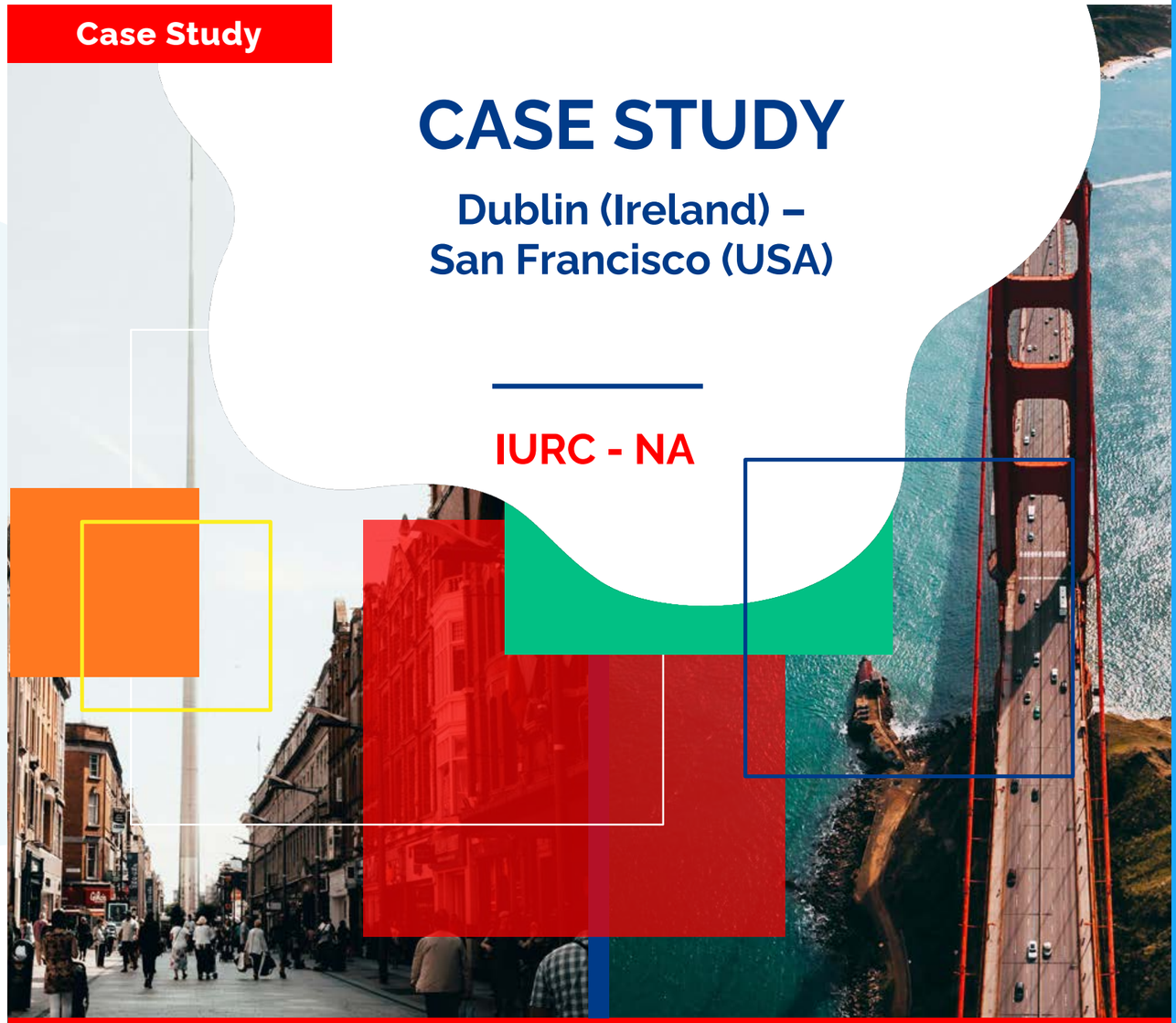
1.Food Waste Index Report 2024. Think Eat Save: Tracking Progress to Halve Global Food Waste
2.cph-2025-climate-plan-roadmap-2021-2025-_2062.pdf
3.EAT_Shifting-Urban-Diets_Project_Report.pdf

Case Study

CASE STUDY

Dublin (Ireland) – San Francisco (USA)

IURC - NA



OCTOBER 1, 2025

Thematic Network(s): Circular Economy
Topic keywords: ***Circular economy, food systems, community engagement, climate action, sustainable governance, urban innovation, SME support, public participation.***

DUBLIN (Ireland) – SAN FRANCISCO (USA)

IURC – CASE STUDY

Leveraging cultural identity and circular economy approaches to achieve ambitious climate goals

EXECUTIVE SUMMARY

The cities of Dublin, Ireland, and San Francisco, USA, engaged in an 18-month cooperation under the International Urban and Regional Cooperation (IURC) North America programme, focusing on circular economy (CE) practices as a cornerstone of their respective climate action strategies. Both cities have committed to bold climate neutrality targets—Dublin through the EU Mission for 100 Climate Neutral and Smart Cities by 2030, and San Francisco through its Net Zero Strategy adopted in 2021.

With strong identities as “water cities”, Dublin (population 1.3 million) and San Francisco (population 769,000) have demonstrated how investing in cultural identity and empowering champions drives progress in implementing circular practices across strategic sectors such as food systems, organics management, construction, and infrastructure. Their approach emphasizes nurturing cultural heritage, fostering public participation, supporting community organizations, businesses, and innovation hubs, and grounding action in evidence-based reporting.

Through study visits, video conferences and discussions, the 18 months cooperation between the two cities explored policies, governance models, and results from on-going programs, highlighting how circularity is operationalized with a strong cultural dimension—transforming heritage, arts, and storytelling into powerful tools for public engagement and behavioural change. This peer learning highlighted the cross-sectoral nature of CE strategies, the important role of champions, and the necessity for robust data and transparent monitoring to guide effective decision-making. The collaboration also revealed challenges related to fragmented initiatives and complex regulatory environments, emphasizing the need to break down silos and streamline rules. Capacity building across public agencies and communities remains essential to fostering a shared vision for circular, inclusive, and climate-resilient urban futures.

CHALLENGES AND SOLUTIONS

Dublin and San Francisco recognize that addressing the impacts of a changing climate is one of their most complex and pressing challenges. Therefore, both cities have adopted ambitious net-zero targets supported by multi-sectoral plans, though they face a common challenge: **how to embed circular economy (CE) principles into broader climate and social agendas**. Integrating CE requires not only new policies but also shifts in culture, regulation, and market practices. Through the IURC programme, the cities have been able to compare approaches, identify gaps, and exchange lessons that enrich their local strategies.

Key barriers they have confronted include:

- Fragmentation of initiatives, which risks creating silos instead of synergies.
- Communicating CE to citizens and businesses, making it tangible enough to influence behaviour.
- Complex regulatory frameworks, where overlapping requirements can discourage innovation.
- Transforming construction practices, still hampered by limited incentives, data gaps, and legacy standards.

Dublin has built its CE agenda by reconnecting with cultural traditions and linking circularity to local economic opportunities. In partnership with Belfast, the city developed Connected Circular Economy Hubs, designed to support SMEs and social enterprises in scaling circular business models. These hubs complement training and funding programmes such as MODOS, Green for Micro, and SoCircular.

Food systems have also become a testbed for circularity. The Edible Dublin: Food Strategy, aligned with the Milan Urban Food Policy Pact, sets out a vision where all residents can access healthy food locally by 2030. With initiatives such as the Eat the Streets festival, Dublin not only reduces waste but also strengthens community connections and food literacy. These efforts illustrate how CE can be framed as a social as well as an environmental agenda.

San Francisco, meanwhile, has drawn on its longstanding leadership in waste reduction and environmental justice. The city’s 2021–2025 Climate Action Plan integrates CE into policies ranging from toxics reduction to building decarbonisation. A defining element of its approach is the inclusion of consumption-based emissions (CBE) in its monitoring framework, supported by academic partners. This advanced methodology—published in concert with the 2021-2025 Climate Action Plan—has positioned San Francisco as one of the first cities to adopt legally binding CBE reduction targets (40% by 2030, 80% by 2050).

The upcoming 2025 Climate Action Plan Update, now under consultation, includes a dedicated CE chapter with 24 actions across five areas: construction, food systems, reuse and repair, aviation, and a comprehensive CE roadmap. This evolution reflects a shift from individual initiatives towards a systemic and measurable circular economy agenda.

Mutual learning through IURC has been central to these efforts. Dublin has been inspired by San Francisco’s evidence-based monitoring and its innovative CBE inventory, which offers a replicable model for tracking consumption-related emissions. San Francisco, in turn, has looked at Dublin’s cultural framing of circularity to engage residents and businesses in practical, everyday actions. The dialogue has highlighted how technical innovation and cultural engagement are both essential to advancing circularity, offering complementary lessons that strengthen each city’s ability to deliver on climate commitments while fostering inclusive, local benefits.

RESULTS AND IMPACT

Through their IURC cooperation, Dublin and San Francisco have gone beyond advancing their individual circular economy agendas to exchange practical lessons, governance models, and technical know-how. This collaboration demonstrates how cities with distinct contexts, but strong cultural identities, can adapt each other's approaches to accelerate progress towards climate neutrality.

Dublin's initiatives—such as building food resilience through the Edible Dublin Food Strategy, supporting SMEs via Connected Circular Economy Hubs, and engaging communities through creative tools like the Eat the Streets festival—provide models that San Francisco is examining as it looks to embed equity and neighbourhood-based strategies into its own CE plan. Conversely, San Francisco's pioneering work on consumption-based emissions (CBE) and its robust monitoring and evaluation system offers Dublin concrete methods for impact measurement and cross-departmental coordination.

"Looking to the past, Dublin City's rich history is evident. Growing around the River Liffey and its tributaries, residents of the City flourished harvesting vegetables in the hinterlands, trading livestock at marts in the City, and bringing spices into the City at the port. The City's social and economic life was defined by food."

Edible Dublin

For **San Francisco**, measurable results are already visible. According to its public Climate Plan Dashboard and the EcoData Lab CBEI Dashboard, the city reduced CBEs by 20% between 1990 and 2022. The largest reductions came from Housing (-31%), Transportation (-29%), and Food (-26%). These reductions were driven by energy efficiency and electrification, the shift from fossil fuels to renewables, lower car ownership and vehicle miles travelled, diversion of organic waste, and shifts in dietary habits. San Francisco's evidence-based approach highlights how consumption-focused accounting broadens the scope for circular interventions. This monitoring system has informed the city's 2025 Climate Action Plan Update. The Circular Economy chapter of the 2025 update now reflects new circular projects such

as updating low carbon material specifications for infrastructure agencies including Public Works, SFO (Airport), and Port of San Francisco. Existing private and non-profit programs indicates an appetite for circular innovations already underway. For example, YesSF, a public–private innovation hub revitalising downtown with sustainable start-ups, and the transformation of flood-prone spaces like Treat Plaza through community-driven green infrastructure. These initiatives reflect a deliberate effort to connect CE with economic revitalisation and resilience planning.

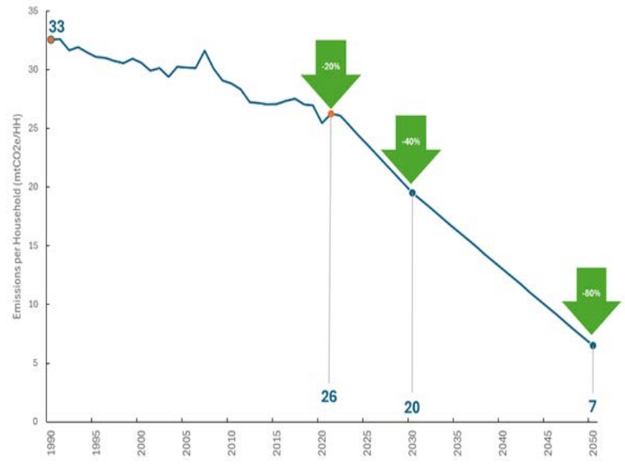


Figure 1. Consumption-Based Emission Reductions from 1990-2022 and Future 2030 and 2050 Targets (Data extracted from EcoData Lab SF CBEI Dashboard, graphic created by Brian Reyes SF Environment Department, 7/17/2025)
Photo Credit: Provided by Brian Reyes

National, statewide and local actions likely drove San Francisco's reduction trends[4] including the following:

1. Reduced energy use through energy efficiency and electrification policy, programs, and incentives for residents and businesses.
2. Shift from fossil to renewables and reduced carbon intensity of fuels to power homes and vehicles.
3. Reduced vehicle ownership and vehicle miles travelled due to increased density, an aging population, declining household size, carpooling, teleworking, and use of non-vehicle forms of transport.
4. Reduced organics to landfill.
5. A combined reduction in the carbon intensity of meat produced and consumer diet shifts away from red meat, poultry, fish, eggs, and dairy.

Dublin, while earlier in its CE journey, began reporting milestones in 2024 through the Climate Neutral Dublin Annual Report. Early achievements include the launch of Edible Dublin, the creation of circular hubs with Belfast, and high levels of civic engagement—over 1,300 participants joined the 2024 Eat the Streets festival. The programme's launch gathered more than 250 stakeholders and featured cultural elements such as an artist-in-residence scheme that promoted biodiversity and circularity through community cookbooks, audio tours, and urban agriculture initiatives.

These examples underline Dublin's distinctive approach: embedding CE in cultural identity and community empowerment.

Both cities have acknowledged how these different strengths are complementary. Dublin is drawing inspiration from San Francisco's systematic use of indicators and transparent reporting, recognising that quantifiable metrics help rally public and political support. San Francisco, in turn, sees value in Dublin's cultural framing of CE, particularly around food systems, to bring abstract concepts into everyday life.

By combining rigorous measurement with community-driven engagement, Dublin and San Francisco are charting locally relevant but globally significant pathways to climate neutrality. Their cooperation within IURC has reinforced that while contexts differ, the challenges—and many solutions—are shared. The mutual learning generated ensures that progress is not only accelerating in each city, but also contributing to a wider body of knowledge that other cities worldwide can adapt and replicate.

KEY FIGURES

-20%

Reduction in San Francisco's consumption-based emissions compared to 1990 levels (as of 2022)

50+

community groups Funded by Dublin's Community Climate Action Fund to implement grassroots circular and climate projects

LESSONS LEARNED

Importance of cultural identity and community involvement.
Leveraging unique cultural and historical assets—such as Dublin's connection to water and agriculture and San Francisco's parks and community gardens—strengthens public engagement and aligns environmental, social, and economic goals with community values.

Breaking down silos and simplifying complex policy environments.
Addressing regulatory friction by streamlining codes, permits, and standards is critical to enabling transformative shifts in construction, infrastructure, and circular practices.

Leveraging champions.
Building on successful practices recognises the leaders and can create broader momentum across city agencies and private industry practitioners (e.g., SFO airport). It can be a source of pride, but it must also be leveraged for future innovations and investments.

Circular economy strategies are flexible and cross-sectoral.
CE approaches can be integrated into climate agendas, delivering economic, social, and environmental benefits. San Francisco reoriented their zero-waste strategy to focus on upstream actions and reoriented communications to improve citizens' engagement. Both cities recognize and value the contribution of staff and local expertise.

Leveraging climate accelerator/incubator capital.
Both cities are working to leverage public and private investments to advance CE best practices and achieve maximum impact (e.g., airport, port resiliency and revitalisation, public works streets and roads) and nurturing an ecosystem of SMEs with existing programs (e.g. Dublin's Circular Hubs).

Ambitious targets require rigorous measurement and reporting
Robust tools like emissions inventories and public dashboards are essential for tracking progress, guiding priorities, and fostering accountability; setting ambitious targets—such as embodied carbon reduction—can catalyse systemic change.

THE INTERNATIONAL URBAN AND REGIONAL COOPERATION PROGRAMME IN NORTH AMERICA

The International Urban and Regional Cooperation program in North America (IURC NA), funded by the European Union, partners European cities with Canadian and USA cities to facilitate knowledge exchange through online tools, face-to-face interactions, study visits, participation in thematic and networking events, and capacity-building initiatives. Its activities support the achievement of policy objectives as well as major international agreements on urban development and climate change, such as the EU Urban Agenda, the UN Sustainable Development Goals, and the Paris Agreement. The program is part of a long-term strategy by the European Union to foster sustainable urban development in cooperation with the public and private sectors, researchers, innovators, community groups, and citizens. IURC NA is financed under the EU Foreign Policy Instruments and benefits from the strategic support of the Directorate-General for Regional and Urban Policy of the European Commission.

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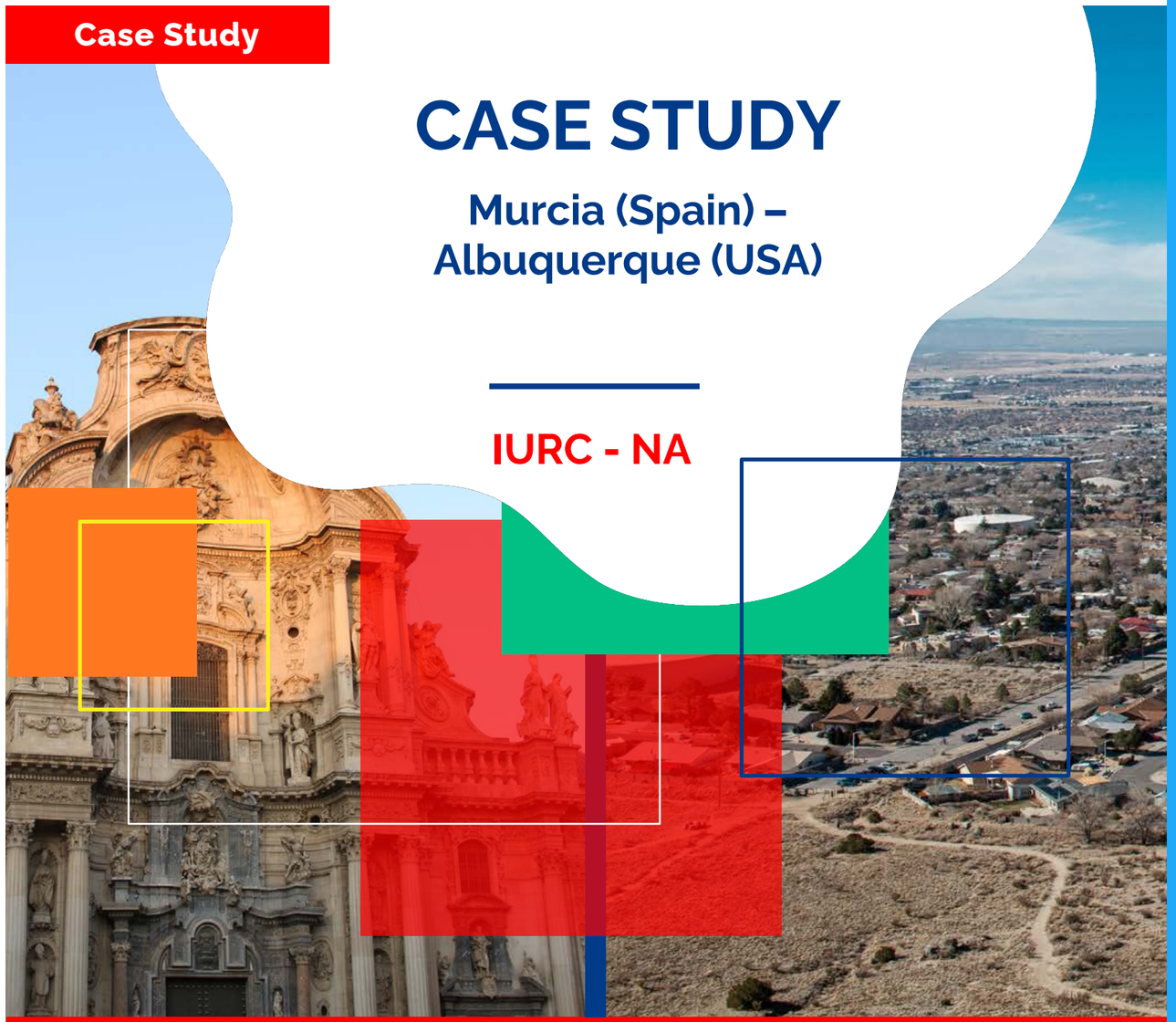
Links to related outputs:
Edible Dublin: Food Strategy
Eat the Streets

Case Study

CASE STUDY

Murcia (Spain) – Albuquerque (USA)

IURC - NA



NOVEMBER 8, 2025

Thematic Network(s): Circular Economy
Topic keywords: ***circular economy, organics management, community composting, school composting, biowaste, waste reduction***

MURCIA (Spain) – ALBUQUERQUE (USA)

IURC – CASE STUDY

The cities of Albuquerque, USA, and Murcia, Spain, are both committed to advancing circular economy (CE) practices in their community. Waste measurement, innovative organics management approaches, and education solutions, including the engagement of local organizations, are cornerstones of their approach. Through the IURC cooperation, they exchanged tools that can serve as models and committed to continue working together to advance their respective community priorities.

EXECUTIVE SUMMARY

Both Murcia (Spain) and Albuquerque (USA) boast similar-sized populations (~ 500,000) and climate characteristics. While Albuquerque is a hub for technology, fine arts, and media companies, Murcia's economy is strongly influenced by its agricultural traditions, referred to as the "Orchard of Europe". Both cities have enthusiastic governments with supportive leadership that share comparable challenges in managing diverse waste streams. Murcia embraced its role in driving the transition to a circular economy and adopted a comprehensive Circular Economy Strategy in 2021 with six priority areas that integrate their values, affirming that one must "*Look back at our traditions to look at the future*". Albuquerque established the Sustainability Office in 2019 and released the community-driven 2021 Climate Action Plan, which includes 10 goals related to food systems, including food waste reduction.

Despite differing contexts (environmental, social, and resource-related) and policy approaches, the cities acknowledged their similar challenges relating to waste diversion. Through study visits, video conferences, and discussions, the 18-month cooperation between the two cities explored policies, data tracking, and a variety of pilot programs addressing organic waste diversion and management. The cooperation helped Albuquerque take a broader view of how to tackle waste diversion and integrate its waste objectives into city systems, while Murcia gained ideas and practical resources to undertake composting pilots in the community and advance food waste reduction initiatives in schools.

CHALLENGES AND SOLUTIONS

Waste management is both a public service and a business. Cities' responsibilities in waste management have evolved into a multipronged role, as they are expected to drive efforts to reduce waste, educate citizens and businesses, create incentives for new behaviours, understand markets and local business opportunities, choose systems that will meet various city objectives, and oversee relevant infrastructure investments. While Albuquerque and Murcia have followed different paths, both reveal common global challenges—**limited financial resources, infrastructure constraints, and the need for sustained citizen engagement.** Public education and community participation are central to solutions in both contexts.

In Albuquerque, low landfilling costs and limited financial resources hinder the implementation of expansive waste reduction programs. An estimated 112,000 tons of food is wasted annually, representing not only a cost for the city but also an opportunity to address food insecurity through prevention and rescue programs. Household savings from waste prevention could be significant, up to $728 per capita per year. While they recognize the need for a multi-faceted approach, they are building their foundation for organic waste management using pilot projects and public education and engagement.

Their starting point is educational facilities and Community Composting Coop Sites. They aim to increase opportunities to help educational facilities (schools and universities) divert organics and teach the next generation about its benefits (sharing resources and technical assistance). The new policy resource focused on supporting community scale composting is providing a necessary direction for these efforts, and the city is leveraging existing resources, such as a community composting best practices guide developed in a wetter climate (the eastern US), to orient their community engagement and coordination approach.

While **Murcia** benefits from momentum emerging from an ambitious circular economy frameworkand external financing sources (NextGenerationEU funding program), its diverse waste reduction initiatives revealed similar challenges encountered by Albuquerque with respect to engaging sectors of the economy, citizens, and other organisations in waste reduction practices. It introduced the collection of organic waste through the installation of dedicated brown containers in various neighbourhoods. The collected organic waste is processed at largescale facilities such as the **VALUEWASTE pilot plant**, where it is transformed into biogas, compost, and other biobased products (protein and fatty acids for livestock). In 2025, Murcia is working to complete the deployment of organic waste containers across the entire city in line with their biowaste collection goal of 60% in their Circular Economy Action Plan accompanied by a communication campaign to promote participation.

Through the GreenMe5 project funded by LIFE PROGRAMME EU, Murcia is also targeting public schools as key intervention points. The project will also explore potential avenues for repurposing surplus food, including its redistribution or transformation for alternative uses. Composting in public urban gardens or within the schools themselves will be explored as outlets for unavoidable food waste, fostering a circular approach and supporting local urban agriculture.

[1] https://www.estrategiamurcia.es/upload/2021/11/Murcia-s-Circular-Economy-Strategy.pdf
https://iclei-europe.org/member-in-the-spotlight/murcia

Taken together, Albuquerque and Murcia illustrate shared barriers faced by cities worldwide: financial constraints, the need to expand infrastructure, fragmented participation, and behavioural challenges at the household level. Albuquerque's community-based composting and school initiatives are in contrast with Murcia's large-scale, EU-backed infrastructure, highlighting different pathways, both of which require local engagement and participation. Both cities demonstrate the importance of coordinated policies, public education, and innovative solutions supporting environmental, social, and economic goals.

Murcia also highlights specific organics collection challenges at the household level (**HOOP Project report**):

- Limited space at home: Smaller households struggle to accommodate multiple bins.
- Lack of information: Clear instructions and better labelling are needed for proper separation.
- Distrust: Nearly 16% of residents are sceptical that separated waste is treated correctly.
- Systemic issues: The prevalence of single use packaging complicates separation.
- Motivational barriers: While environmental concerns exist, some residents are not sufficiently motivated due to logistical difficulties or unclear benefits.

RESULTS AND IMPACT

The collaboration between Murcia and Albuquerque has not only supported the advancement of ongoing initiatives but also created a shared learning space that is guiding the next generation of waste reduction initiatives. By focusing on schools, public facilities, and community composting models, both cities are demonstrating how international cooperation can help translate pilot projects into scalable solutions with tangible climate and social benefits.

In **Murcia**, a new initiative to fight food waste in schools was launched in July 2025. The programme will begin with an audit in six schools that reflect the city's diverse contexts and operational models. The exercise combines two dimensions: (1) a technical audit that traces food flows from procurement and daily menu planning to organic waste management, and (2) a behavioural analysis using citizen science methods to capture the practices of students, staff, and families. Inspired by **Albuquerque's Community Composting Co-op model** and results achieved at the **Barelas Senior Centre**, Murcia is assessing the potential to compost organic waste directly within schools or nearby community gardens. Since many of these gardens are managed by senior citizens, the exchange is reinforcing intergenerational collaboration while closing the organic waste loop locally.

Albuquerque also provided concrete tools to accelerate Murcia's school programme. Its partner, the **Ciudad Soil and Water Conservation District**, developed and shared an *Outline of How to Start a School-Wide Composting Initiative*, enriched with the **US EPA guide** *Conducting Student Food Waste Audits*. The City also shared its **Community Compost Operations Plan**, which details procedures for managing compost systems on public property while mitigating nuisances—a valuable operational reference for Murcia's pilots.

Knowledge exchange was reciprocal. Murcia's experience with materials recovery, including real-time data collection optimization and tracking, —provided Albuquerque with concrete examples of how integrated, real-time data can inform waste and circular economy programming. This exposure is now driving Albuquerque to explore opportunities for embedding waste metrics (e.g., tonnage of green waste diverted, number of audits, food waste recovered) into their similar system, the **Balanced Resource Acquisition and Information Network (B.R.A.I.N.)**—a platform currently

focused on energy efficiency that gathers all smart systems in the city and that has generated significant operational savings —unlocking greater efficiency and accountability.

Looking forward, Albuquerque has drafted a checklist of potential next steps that includes:

- Developing a **Rethinking Municipal Waste Roadmap** that aligns local action with regional and state climate action plans (Resilient Futures, New Mexico Climate Action Plan) and paves the way for a Municipal Waste Guide.
- Piloting **lead-by-example initiatives** in municipal facilities, such as food rescue apps that provide real-time statistics and lay the groundwork for a Universal Recycling Ordinance.
- **Improving waste data systems**, working across departments to expand their B.R.A.I.N. platform to include waste-related data, and exploring funding mechanisms for systematic audits and reporting.
- **Reducing food waste in schools**, building on Murcia's cafeteria-side data collection apps, and sharing lessons from Albuquerque's own prevention and reporting pilots.

Together, Murcia and Albuquerque are charting a pathway where **data-driven systems**, **community composting models**, and **education-led initiatives** reinforce each other. Their cooperation highlights a broader lesson: tackling food and organic waste requires not only technical solutions, but also cultural change, citizen engagement, and governance tools that cut across silos. By combining European circular economy strategies with U.S. community-driven innovation, the two cities are shaping a transatlantic model for waste reduction and climate action.

KEY FIGURES

1,800 tons

were processed in Murcia's VALUEWASTE pilot plant, to generate bio-based products (feed the black soldier fly larvae to obtain animal protein and struvite for the fields).

112,000 tons

of food is wasted each year in Albuquerque. 3 pilots started the process to recover the organic waste through community composting, drop-off site collection, and restaurant and concessions collection.

LESSONS LEARNED

The cooperation between Murcia and Albuquerque highlighted how different contexts can converge around shared goals for reducing and managing organic waste and advancing circular economy practices. Despite following distinct pathways—one driven by large-scale EU frameworks and the other by community pilots and school composting programs—the exchange demonstrated the value of sharing technical resources, practical experiences, and cultural approaches.

Data drives effective action.
Real-time data integration can inform waste programs, enhance coordination across city departments, and generate operational savings. Murcia's exemplified how waste data collection can help optimize and increase materials recovery and inspire Albuquerque to strengthen its own data platform, the Balanced Resource Acquisition and Information Network (B.R.A.I.N.).

Cultural acceptance matters.
Solutions must be tailored to local behaviours and perceptions. Both cities recognized that cultural acceptance of waste sorting programs is critical to reduce contamination, prevent illegal dumping, and encourage sustained participation.

Technology expands possibilities.
Observing practical applications, from food waste valorisation pilots to treatment technologies for waste contamination, provide inspiration for future system improvements. Targeted pilots can build momentum for broader adoption.

Leveraging community participation.
Harnessing local assets—from neighbourhood pilots and senior centres to community gardens and schools —creates strong ownership and opens new opportunities for circular initiatives.

Single waste stream-focus.
Focusing limited resources on food waste prevention proves to be an effective way of delivering benefits across climate action (e.g., greenhouse gas reduction, financial savings, community engagement, etc.). Additionally, concentrating staff and funds on one waste stream helps mobilize municipal operations, residents, and businesses around a shared priority.

THE INTERNATIONAL URBAN AND REGIONAL COOPERATION PROGRAMME IN NORTH AMERICA

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Links to related outputs:

Albuquerque's Food and Agriculture Action Plan
Albuquerque's Climate Action Plan 2021
Albuquerque's Sustainability Resources
Murcia's Circular Economy Strategy

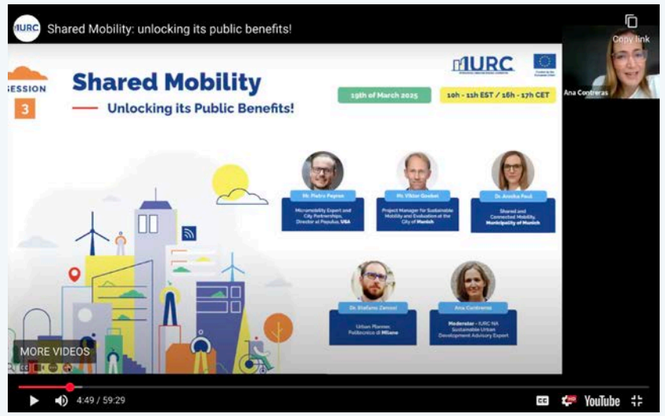
SUSTAINABLE URBAN MOBILITY AND TRANSPORT (SUMT)

Delegates from MassDOT, Stuttgart Region and Rotterdam during a cycling infrastructure tour in Rotterdam, June 2024.

Webinars

Shared Mobility:
Unlocking Its Public Benefits

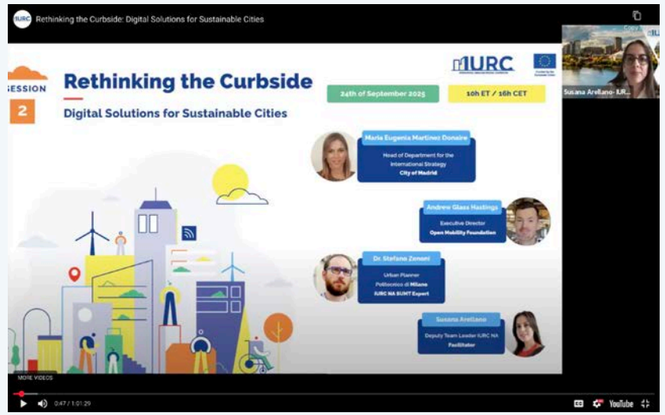
March 19, 2025



Recording & Presentations

Rethinking the Curbside:
Digital Solutions for Sustainable Cities

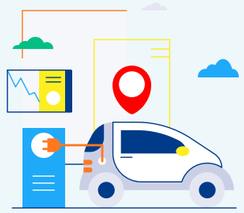
September 24, 2025



Recording & Presentations

Factsheet

Shared Mobility: Unlocking its public benefits



Shared mobility: An important part of urban mobility strategies and Sustainable Urban Mobility Plans (SUMPs)

In Europe, the European Union strongly promotes sustainable mobility, digital innovation, and climate resilience. The European Green Deal, in its ambitious attempt to achieve climate neutrality by 2050, emphasises the importance of repurposing urban areas for both communities and nature, reinforcing the shift towards climate-neutral and more adaptable cities. Consequently, the EU Urban Mobility Framework encourages cities to implement Sustainable Urban Mobility Plans (SUMPs), which integrate transport systems with urban planning and environmental strategies to create more inclusive and enjoyable public spaces. Furthermore, financial backing from the European Regional Development Fund (ERDF) and Horizon Europe provides cities with opportunities to trial smart curbside management solutions and adopt nature-based urban interventions. While SUMPs are primarily a European policy tool, their principles may resonate beyond the EU, forming part of the external dimension of the Green Deal.

At the same time, several cities worldwide are reassessing the role of shared mobility services considering the quantified benefits and assessing the possible challenges in terms of public space management and overall road safety. Shared mobility needs to be guided and regulated to actively contribute to the innovative and sustainable evolution of urban mobility. It can serve as an essential resource in reducing dependence on private motor vehicles and can enhance the potential of public mass transit, helping to decrease congestion and achieve decarbonization goals in the transport sector. In order to be successful, public authorities must establish clear governance frameworks, make use of digital tools, and utilise real-time data from operators to inform policy-making and assess the outcomes of implemented measures. By leveraging digitalization cities can also monitor the quality of services provided by operating companies.

Necessary regulations: Potential and effects learned from Munich

With 1.6 million inhabitants, the city of Munich is at the centre of a metropolitan area of 4 million people. It is a highly attractive city for both residents and visitors, hosting major global companies and offering a high quality of life and urban environment. However, mobility in Munich presents various challenges, including congestion, overload on public transport networks, an incomplete cycling network, and a lack of digitalization in transport services. In 2021, the city adopted the **"Mobility Strategy 2035"**, with a primary goal of ensuring that 80% of urban trips were made through environmentally friendly modes of transport—a crucial step toward achieving climate neutrality.
In this context, Munich exemplifies effective shared mobility through its strong coordination of a long-term strategic vision with ambitious urban mobility objectives. Shared mobility plays a key role alongside other transportation options, ensuring a well-integrated system. The city prioritizes widespread service availability, covering all neighbourhoods through interchange hubs. Additionally, advanced digitalization tools enable continuous monitoring and assessment of mobility policies, enhancing efficiency and adaptability.

Key learnings

- Shared mobility is necessary "to bridge mobility gaps", as it complements mass public transport and active mobility, making it easier for certain segments of the population to give up private motor vehicles (it has the potential to account for 8% of all urban trips).
- In order to achieve a more rational use of urban space, the proper organisation of sharing services also enables a rethink of curbside management by redistributing space, reducing private car parking, and prioritising collective services.
- Developing shared mobility systems is faster and more cost-effective than large-scale infrastructure projects aimed at covering the entire city comprehensively.
- To promote different forms of shared mobility, it is crucial to establish mobility hubs where citizens can switch between various transport options. These hubs should be accessible within five minutes from any point in the city (Munich plans to create 200 hubs for multimodal transport exchanges and 675 dedicated to micromobility).
- Shared micromobility also presents significant challenges, such as the uneven distribution of vehicles, disorderly parking and improper use.
- Clear regulations are needed to address these issues. Public authorities must establish obligations for vehicle relocation, enforce the prompt removal of improperly parked vehicles, and set limits on the number of vehicles in specific areas, among other measures.
- To monitor compliance with regulations and assess their effectiveness, a real-time control and monitoring system should be implemented and managed by public authorities. This requires a digital service partner to analyse data provided by operators.

The Importance of data to improve shared mobility: Changing the way we move

Shared mobility plays a crucial role in the urban mobility mix, helping to achieve decarbonization goals, reduce traffic congestion and lower dependence on private motorized vehicles. Over 1,000 cities worldwide have active shared mobility services and the SUMPs in European cities have often provided momentum for their consolidation in recent years. Studies highlight their positive impact in reducing CO_2 emissions, contributing to the overall decarbonisation goals set by the EU Green Deal for the transport sector.[1] However, some cities perceive challenges in managing shared mobility systems—especially micromobility—and, lacking the proper tools, they are tempted to ban these services altogether.

[1] INTEREGG 2 SEAS – MOBI-MIX

Key learnings

- According to the International Transport Forum, 43% of public entities feel lagging behind in terms of data and technology, while 80% of European cities with shared mobility services either misuse or do not use the available data at all.
- The proper use of data allows for effective monitoring of ongoing shared mobility services and ensures compliance with regulations and policies, improving efficiency and mitigating issues.
- The intelligent use of georeferenced data from shared micromobility services helps assess the effectiveness of mobility policies by tracking increased movement along roads affected by temporary or permanent interventions in favour of active mobility (impact assessment).
- Georeferenced data can also identify high-demand streets and zones, guiding future investment decisions toward the most utilized areas (priority setting).
- A well-structured policy consists of three continuous and iterative phases:
  1. Cooperation – engaging with operators to understand how to achieve together mobility goals.
  2. Implementation – selecting the correct operators, establishing policies and regulations, and requiring transparent data sharing.
  3. Monitoring – assessing the impact of policies and adjusting them accordingly.

Some lessons learned and highlights for replicability

- Cities are not all the same: large, medium and small cities have different cultural paradigms and characteristics. Some are highly dense, while others are more spread out. Shared mobility can play different roles in different contexts, adopting varied models based on local needs and, in some cases, drawing on public-private partnerships.
- In areas with poor accessibility and/or limited infrastructure, shared mobility can provide a quick and cost-effective solution.
- Fragmented administrative regions require regional-level coordination to develop integrated mobility systems.
- Concerns remain high regarding the negative effects of shared mobility on urban space and road safety. Citizen awareness and engagement through comprehensive campaigns and structured feedback collection is essential to increase public acceptance.
- User feedback and analysis should be utilized to improve mobility services and tailor them to citizens' needs.
- A balance must be struck between environmental goals, improving citizens' accessibility and ensuring economic sustainability for both individuals and public resources.

This factsheet was based on the webinar Shared Mobility: Unlocking its public benefits. All photos on pages 106 - 108 are from presentations by **Mr. Pietro Peyron, Mr. Viktor Goebel, Dr. Annika Paul and Dr. Stefano Zenoni.**

Factsheet

Rethinking the Curbside Digital Solutions for Sustainable Cities

Public space in cities is an extremely scarce and limited resource. Within this, the curbside represents an even narrower and highly contested strip of land, where the greatest number of needs, uses, opportunities, challenges, and projects converge. Cities face numerous reasons to manage the curbside effectively, including the ambition to strengthen sustainable mobility infrastructure (such as walking, cycling, and public transport), the need for increased road safety, the growing pressure of logistics, the demand for outdoor spaces for social interaction, and even the need to increase public revenues.

Forward-looking cities are also reimagining their public spaces to make them more resilient to climate change. Only through digital, advanced, and efficient management is it possible to pursue multiple objectives simultaneously, particularly those related to mobility. This significant challenge calls for the exchange of lessons among practitioners, drawing on both the expertise of those developing dedicated technologies and the real-world experiences of selected cities – diverse in size and context – from Europe, the US, and Canada.

Photo from presentation by Andrew Glass Hastings

The Open Mobility Foundation experience

The Open Mobility Foundation (OMF) is a nonprofit organization founded in 2019 by cities that develops open-source tools for urban mobility. By providing a shared governance framework, OMF creates a trusted environment where cities, companies, technical experts, policymakers, and civil society can collaborate to design digital solutions that support public mobility goals. More than 300 cities and public agencies worldwide are currently utilizing digital tools and open data standards developed by the OMF. Among these, the Curb Data Specification (CDS) enables cities and private operators to create a digital image of the public space to test and scale dynamic curb zones, offering a standard way to express both static and real-time flexible regulations, monitor curb activity, and inform policies aimed at making curb space more accessible, efficient, and responsive to urban needs.

Key lessons from OMF

- Digital infrastructures enable the effective management of public space and the pursuit of the public good, moving beyond an approach still reliant on analogue tools (such as physical signage or painted markings).
- The use of an open data specification enables the creation of permanent collaborative networks among cities and public institutions engaged in curbside management, providing a platform for evaluating, improving, and further developing digital tools.
- Collaboration between the public and private sectors – that is, between institutions and operators – through stable networks allows for the effective co-creation of open-source data standards and digital tools that are both efficient and economically sustainable.
- Cross-sector relationships create opportunities to build a shared vision for mobility, involving multiple institutional actors united by common objectives.
- Digital tools should also develop user-facing interfaces (for citizens, stakeholders, workers), to facilitate awareness and understanding of the policies and rules implemented.
- Sharing a standard open-data format among different institutions and operators enables the comparability of effectiveness and outcomes across various contexts, including at the international level.

The logistic plan of Madrid (SPA)

The Spanish capital has developed an ambitious urban sustainability strategy, Madrid 360, in which mobility policies play a leading role. In the city, logistics account for 20% of traffic congestion, 17% of accidents, 21% of NOx emissions, and 74% of illegal parking; therefore, digital curbside management is essential. The logistics plan (Estrategia de distribución urbana de mercancías – DUM), active in the central area (SER), combines real-time monitoring technologies, flexible and variable pricing, and user apps capable of providing dynamic information, finalising payments, and booking loading/unloading spaces. The digitalisation of the curbside is also highly beneficial for citizens, including both residents and commuters, as it allows for the flexible specialisation of parking spaces and increased turnover, serving a wide range of needs.

Key lessons from Madrid

- Logistics and parking management are connected processes and must be administered simultaneously to ensure widespread benefits.
- Differentiated pricing and the use of pricing as a lever are essential to organizing public space, facilitating virtuous choices in parking behavior, and prioritizing solutions that can reduce congestion in the most central and exposed areas.
- Once an initial start-up phase has been completed, participation in logistics management platforms may become mandatory for commercial operators. It is essential to maintain an open forum for addressing issues and implementing further measures that arise from dialogue with the sector.
- The strong digital infrastructure across the territory (cameras, sensors) enables the municipality to manage a large amount of data, useful for monitoring the situation in real time and for developing strategies that can be adapted along the way.
- The idea of developing an app to facilitate interaction between stakeholders and operators in the sector and the DUM system has been successful. The app offers advanced features such as booking loading/unloading spaces and making digital payments. These functions can also be extended to individual citizens.

Roundtable discussion: Cities dealing with curbside pressure

The roundtable discussion compared the real-life experiences of cities far apart and different from each other regarding the needs, opportunities, and challenges of implementing digital curbside management policies. San Francisco (USA), St. John's (CAN), Vitoria-Gasteiz (SPA) and San Diego (USA) took part, also revisiting the challenges of urban logistics and focusing on the electrification of the curbside.

Key lessons from cities

- Curbside management is a vital component of new sustainable urban mobility plans. It can be presented to the public as a set of strategies aimed at creating side "service lanes" where various mobility services are concentrated, such as shared mobility services, logistics parking, charging infrastructure, or even ecosystem services, including adaptation measures.
- The curbside management plan and the climate action plan should be aligned to broaden the opportunities for expanding the on-street charging network for electric mobility.
- It is easier to install charging systems off-street, in parking facilities, but in medium- to high-density areas, where homes often lack garages, it is necessary to support residents' transition to electric vehicles with on-street systems.
- Digital monitoring of parking occupancy during loading and charging operations is crucial to ensure turnover in the use of spaces throughout the day.
- Curbside electrification can represent an opportunity, but if left uncontrolled, it may also pose a threat to public-space transformation policies in favour of people, road safety, and alternative mobility.
- Subject to national legislation, it is possible to allocate loading/unloading bays to groups of local businesses and prevent their generalised use. This enables further optimisation of curbside management.
- Dynamic pricing policies are worth considering even in low-density cities or areas without intense pressure on the curbside or on electrification.

This factsheet was based on the webinar Rethinking the Curbside: digital solutions for sustainable cities. All photos on pages 109 and 110 are from presentations by **Maria Eugenia Martinez, Andrew Glass and Dr. Stefano Zenoni.**

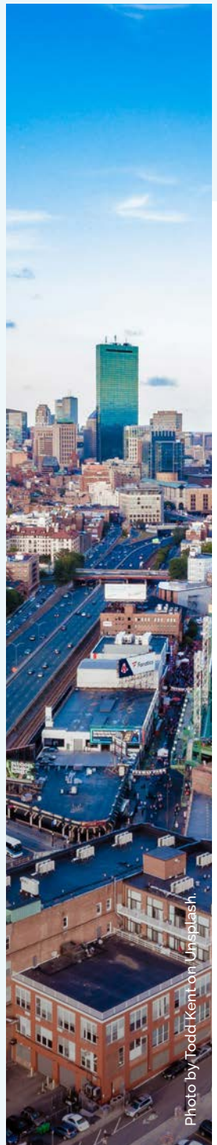


Photo by Todd Kent on Unsplash.

Networking Event & Takeaways

Connecting Mobility Solutions Across The Atlantic

IURC NA Event on sustainable urban mobility and transport infrastructure | Boston, USA

On June 16-17, 2025, the Massachusetts Department of Transportation (MassDOT) welcomed in Boston representatives from cities and regions across Europe and North America for a thematic exchange on sustainable urban mobility and transport (SUMT). The event brought together over 40 delegates from 17 cities and regions across the U.S., Canada, and the EU, under the framework of the International Urban and Regional Cooperation North America (IURC NA) programme.

Boston served as an ideal backdrop for the exchange. A historic city shaped by successive waves of transport infrastructure, Boston now stands at the forefront of efforts to repurpose and reintegrate mobility with the contribution of various stakeholders such as MassDOT and the Massachusetts Bay Transportation Authority (MBTA), each within their respective competencies, considering both the broader scale of urban transformation and the fine-grained detail of neighbourhood streets.

The two-day exchange featured workshops, peer-learning activities and on-site visits exploring how Boston is adapting transport infrastructure to new environmental, social, and technological demands, dealing with economic barriers . With a particular focus on climate adaptation and resilience of mobility infrastructure, urban reconnections and community empowerment, decarbonisation, efficiency and equity of public transport, as well as road safety and curbside management, the event offered a platform for discussing long-term strategies and exchanging experiences and best practices to make streets safer, more equitable and efficient. The event was further enriched by specific sessions dedicated to exploring projects and programmes currently underway by the participating cities under guidance from the European Union.

Figure 1 – Representatives from the European Union, United States and Canadian cities and regions, the hosts from MassDOT and the IURC NA team in front of Stony Brook subway station (Orange Line), along the Southwest Corridor – June 16th, 2025. © Stefano Zenoni

[1] In Boston the responsibility for infrastructures, public transport, and, more generally, mobility policies are shared among different actors such as the Federal Government, the Commonwealth of Massachusetts, State Agencies, the City of Boston, and public transport operators.

The host: MassDOT bridging governance and innovation

The Massachusetts Department of Transportation (MassDOT), as a state agency, is responsible for road safety, the enforcement of vehicle safety standards, the design and delivery of road infrastructure, as well as the planning and coordination of public transport across the state, through the Massachusetts Bay Transportation Authority (MBTA) and other local agencies. As a division of MassDOT, the MBTA provides subway, bus, Commuter Rail, ferry, and paratransit service to eastern Massachusetts and parts of Rhode Island.

To ensure rapid and flexible action within the Department, a dedicated unit called MassDOT-Lab was established, to assess and prototype new services, policies, and ideas through small-scale pilots that foster rapid learning, adaptation, engagement with external partners and communities, and close cooperation with other agencies and public authorities. The approach is collaborative and experimental, with a strong focus on swift implementation. Through MassDOT-Lab pilot projects, the Agency can test initiatives that may later serve as the foundation for long-term, larger-scale strategies.

The overall framework is represented by the Massachusetts 2050 Transportation Plan of the Commonwealth of Massachusetts, the State's strategic planning document that sets out the main objectives for the next 25 years. Approved in 2024, the Plan highlights particularly the following themes, in coordination with the Federal Level:

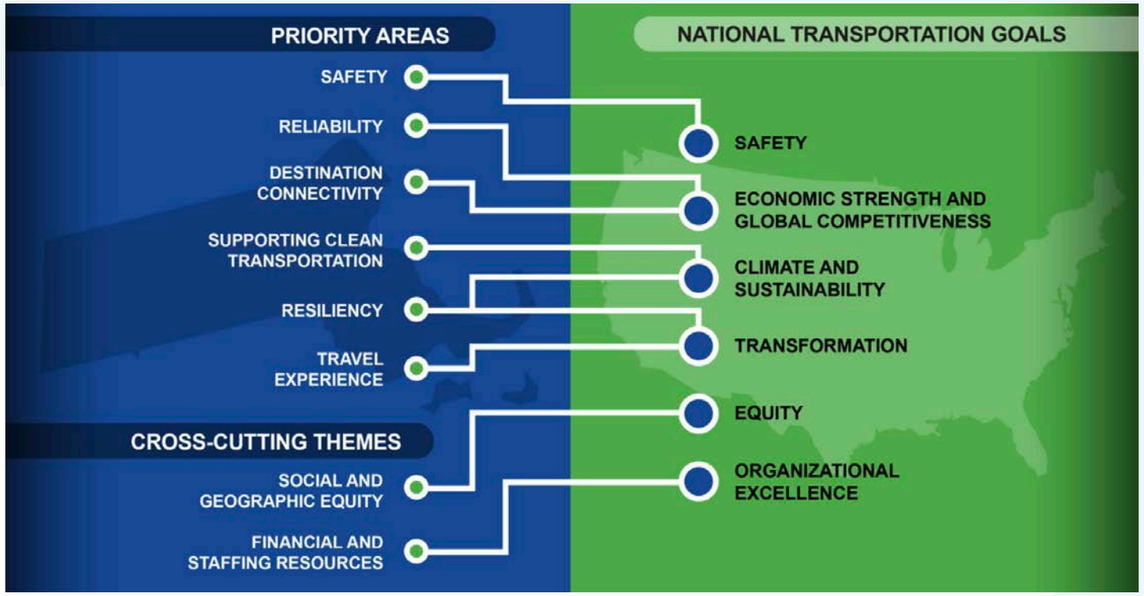


Figure 2 - Diagram of the Massachusetts 2050 Transportation Plan illustrating the relationship between priority areas, cross-cutting themes, and national transportation goals

For each one of these themes, the document provides analyses, specific objectives, timelines, and sets out the standards that state agencies are required to pursue.

Consequently, the participants in the thematic event organised by IURC NA and MassDOT had the opportunity to gain an understanding of the agency's priority issues, as well as to explore ongoing projects in the Boston area, ranging from small neighbourhood-scale initiatives to more ambitious global programmes.

The following table, based on the overarching objectives of the Massachusetts 2050 Transportation Plan, presents some of the topics selected for the thematic event and the related projects examined on site.

Challenges & topics derived from the Massachusetts 2050 Transportation Plan	Related MassDOT's vision and goals presented during the IURC NA event	Related projects in Boston visited and/or selected and presented during the event
Resilience	Designing mobility spaces and infrastructure to integrate climate adaptation solutions at every scale, including enhanced green spaces, support for biodiversity, reduction of ground-level temperatures, and stormwater management.	• The Southwest Green Corridor, a linear park adjacent to public transport services, featuring a cycle path through green spaces, tree planting, and integrated water management. • Green roofs on bus shelters along Bus Route 28, improving climatic comfort for passengers, while also supporting water management, biodiversity, and pollinating insects.
Destination Connectivity – Social and Geographic Equity – Financial and staffing resources	Repurposing space occupied by major road infrastructure by covering it to create new land for collective use, enhance sustainable mobility connections, and generate revenue to reinvest in public transport. Involvement of stakeholders and communities in the processes.	• The Parcel 12/Lyric project involving the decking over of the Massachusetts Turnpike, in collaboration with private developers and the City of Boston, to generate revenue, provide public spaces, improve access to public transport, and enhance the comfort of transit stops. • "Reconnecting Chinatown" project, to create an "attractive connection between the two sides of the open-cut Massachusetts Turnpike (I-90) in Chinatown".
Reliability, Destination Connectivity, Travel Experience	Strengthening the public transport network through the introduction of high-capacity bus corridors, by adopting lane prioritisation measures inspired by Bus Rapid Transit systems, improving the efficiency and appeal of public transport.	• Columbus Avenue redesign project, with the first centre-running bus lane in New England, providing a fast connection from Downtown to southern neighbourhoods. • Washington street Silver Line dedicated lane.
Supporting clean transportation	Progressive electrification of both road-based and rail systems, contributing to the reduction of greenhouse gas and pollutant emissions. The Commonwealth of Massachusetts has set a general decarbonisation target of an 85% yearly emission reduction by 2050 compared to 1990 levels through the 2050 Decarbonization Roadmap. With the Clean Energy and Climate Plan for 2050, it has also established specific targets for the transport sector: 34% reduction by the end of 2030; 86% reduction by the end of 2050 (equivalent to a decrease of 4.1 million tons of CO_2eq).	• New Silver Line hybrid vehicles • Electrification of the Fairmount Commuter Rail Line.
Safety	Redesigning the layout of neighbourhood streets by introducing measures to enhance bike ridership, calm traffic, and improve the safety of pedestrian crossings, and additionally managing curbside use flexibly to respond to the needs of businesses, commercial activities, and residents, through a community engagement process.	• Curbside redesign of Tremont Street to "prioritize safety and comfort for people walking, manage curb access, and make dedicated space for people on bikes."

Figure 3 - The Parcel12/Lyric project with the green plaza over the Massachusetts Turnpike – © Google Maps content - Google

Figure 4 - Columbus Avenue with the first centre-running bus lane in New England - © Stefano Zenoni

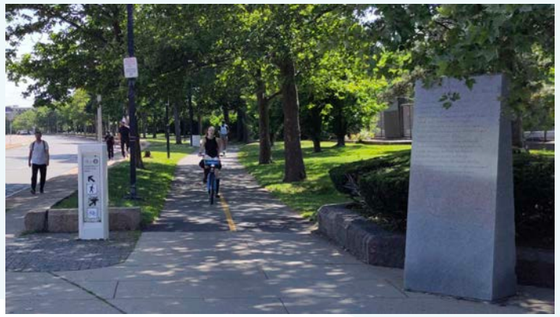


Figure 5 - The South West Green Corridor, a sustainable mobility infrastructure - © Stefano Zenoni

The European approach: Sustainable Urban Mobility Plans (SUMPs)

For over twenty years, the European Union has designed overall mobility strategies intended to be adopted by Member States and subsequently implemented at the local and urban scale. The comparison with the planning model of the Commonwealth of Massachusetts was one of the most interesting aspects of the thematic event. The EU has identified SUMPs as a key tool for managing urban mobility in the cities of its Member States. The EU supports their development and implementation through dedicated programmes, funding (i.e.: CIVITAS Initiative, ERDF & Cohesion Fund), Connecting Europe Facility (CEF-Transport), Horizon Europe & Mission Cities, EIB's ELENA facility, JASPERS Advisory (EIB). Interreg, URBACT), and methodological guidance (i.e.: SUMP Guidelines (2nd Edition, 2019), SUMP Topic Guides, ELTIS / Urban Mobility Observatory).

SUMPs are strategic plans designed to satisfy the mobility needs of citizens and businesses, while improving the quality of life in urban areas, through an integrated approach. They play a central role in achieving the EU's objectives in terms of road safety, environmental sustainability, emissions reduction, improved public space, and social inclusion. The alignment between the European objectives and those highlighted in the Massachusetts context made it possible to foster a dialogue between these two models.

More than 500 European cities from 27 Member States have adopted a SUMP, thereby committing to a continuous and virtuous governance process based on needs assessment, community engagement, the search for sustainable solutions, and the monitoring and evaluation of results. Thanks to the implementation of SUMPs, European statistics show widespread improvements across many cities, with positive trends observed in several key indicators, including modal share, emissions reduction, and road safety improvements.

Linking the European framework to local implementation: Madrid's 360° Sustainable Strategy

The European framework of Sustainable Urban Mobility Plans (SUMPs) provides a strategic umbrella under which cities can design integrated mobility policies. To illustrate how this translates into concrete action at the local level, the City of Madrid offers a particularly advanced example. Building upon the principles embedded in SUMPs—such as reducing emissions, improving accessibility, and fostering social inclusion—Madrid has developed the Madrid 360 Environmental Sustainability Strategy, an ambitious plan launched in 2019 that places sustainable mobility at its core, including 200 initiatives.

Two major infrastructure projects stand out within this initiative:
- The ongoing construction of the new Metro Line 11, the first in Madrid not oriented towards the city centre, but aimed at reconnecting peripheral neighbourhoods.
- The undergrounding of the A5 motorway, which formerly acted as a significant urban barrier, creating a green boulevard with 33 new at-grade pedestrian crossings, 2,884 metres of cycle lanes, and 7 hectares of green space created above the covered section.

Madrid has also made considerable progress in real-time mobility management. Through partnerships with telecom providers, the city collects anonymous data from 60 induction-loop stations, 120 AI-enabled traffic cameras, and 145 roads monitored for vehicle speed. Pedestrian and cycling flows are tracked via a dedicated network of sensors and video monitoring. Artificial intelligence plays a key role in generating real-time dashboards that visualise modal share and traffic dynamics. These dashboards support both macro- and micro-simulations, allowing the city to optimise vehicle rerouting in response to roadworks, unexpected incidents, or planned changes in circulation.

Exploring climate adaptation and challenges: Lessons from San Francisco

Although climate adaptation was not the core focus of the event, the discussions highlighted the importance of resilience and the opportunities arising from addressing climate-related challenges in cities. In this context, San Francisco was presented as a reference case, especially as key transport infrastructures are located along the shoreline, illustrating how urban adaptation strategies can turn pressing challenges into pathways for innovation, collaboration, and long-term sustainability.

The U.S. Army Corps of Engineers (USACE), in collaboration with the city of San Francisco, has developed a strategic response: the Waterfront Resilience Program. This initiative aims to redesign San Francisco's waterfront to withstand the impacts of climate-related impacts, particularly rising sea levels. Proposed interventions include nature-based solutions, raising the shoreline, retrofitting historic waterfront structures and public spaces, and developing flood-resilient piers and buildings. The Planning Department has also developed an Adaptation Strategy for the Islais Creek area, which forms part of the waterfront.

Another notable example comes from Ocean Beach Great Highway Project, where a coastal highway at risk of inundation was closed to vehicular traffic at weekends during the pandemic and temporarily turned into a pedestrian promenade. In November 2024, following the approval of a Proposition, this closure was made permanent, converting a two-mile stretch into a public space for walking and cycling. In this case, the decision was made not to invest in adapting a motorway to changing environmental conditions; instead, the apparent 'abandonment' of the infrastructure becomes a deliberate choice, capable of giving new life to the area and repurposing it to meet new climate adaptation objectives. Today, the area functions as a linear park, enhancing public access to the coast while reducing infrastructure exposure to flooding. It also supports climate resilience by mitigating coastal erosion and the effects of sea level rise. The project is the result of collaboration between the San Francisco Municipal Transportation Agency and other public entities.

Key learnings for greater impact

The successful projects implemented in the Boston context, along with the experiences shared by participating cities during the collective activities and discussions, made it possible to identify several emerging cross-cutting key lessons in sustainable urban mobility that are shared across cities to achieve successful projects and policies.

1) Mobility is a key driver for sustainability goals, but also for climate adaptation and urban resilience.

Achieving climate targets in the transport sector requires the continuous improvement of public transport services in terms of accessibility and efficiency, the decarbonisation of vehicles, and the promotion of sustainable mobility. While mobility policies focus on the movement of people and goods, they also have a significant spatial impact on the city. Mobility inevitably occupies public space, a scarce resource in urban areas. Adaptation policies must therefore redesign these spaces to mitigate the effects of climate change, making every mobility intervention an opportunity to enhance urban resilience.

Key takeaways:

- **Context-sensitive solutions** are essential. Although approaches are widely transferable, urban density and mobility patterns vary, not only between cities but also within neighbourhoods. Therefore, only a combination of targeted solutions, integrating public transport, shared mobility, and active travel, can ensure equitable access to mobility services. Integration can be supported by the creation and mapping of mobility hubs, even at the neighbourhood scale.
- **Public transport competitiveness** hinges on prioritisation in street design. Dedicated lanes for buses—such as those seen in Bus Rapid Transit (BRT) systems—are critical for improving travel times and reliability in comparison to private car use.
- **Progressive decarbonisation of public transport networks** must be planned strategically. A phased approach using a mix of technologies (e.g. hybrid buses, full electrification, hydrogen) allows cities to maximise cost-effectiveness, prioritising high-frequency, high-demand corridors to amplify impact.

Mobility infrastructure must embed climate adaptation measures. Examples include cycle paths functioning as green corridors with permeable surfaces and shade trees, and bus stop networks reimagined as microclimate shelters. These interventions require cross-sectoral collaboration—urban mobility, environment, public health—from the earliest design stages.

DO: Developing Mobility as a Service (MaaS) systems by digitally integrating various public and private mobility services, with the aim of improving efficiency in travel choices.

DON'T: Designing mobility projects solely from a functionalist perspective, as if they concerned only mobility, fails to recognise their broader impact. An intersectoral approach, by contrast, allows each intervention to become a building block for enhancing the quality and sustainability of urban spaces.

The reconfiguration of public transport priority corridors along Columbus Avenue and Washington Street in Boston demonstrates how reorganising spatial hierarchy within roadways can improve efficiency, accessibility, and competitiveness relative to private car use. Introducing buses with varying levels of electrification, alongside a project to repurpose a former railway line, helps reduce greenhouse gas and pollutant emissions in line with available funding. In the MBTA Climate Assessment published in 2024, the agency estimated a 44% reduction in GHG emissions since 2009 in the public transport sector.

The Southwest Corridor project combines public transport, cycling infrastructure, and shared mobility services such as bike-sharing stations, offering an integrated model adapted to urban areas with varying population densities. This integration is facilitated through the development of small-scale intermodal hubs.

Additionally, the same corridor, together with the green bus shelter roof initiative, exemplifies how climate adaptation measures can be incorporated into mobility infrastructure to enhance resilience.

2) The seamless integration of urban mobility infrastructure into urban spaces is a key factor for the quality of urban life, and also a potential source of economic value for public authorities.

Cities on both sides of the Atlantic are struggling to mitigate the legacy of past transport planning decisions, especially those that prioritised vehicular traffic over community cohesion, leaving behind "scars" within the urban fabric and increasing dependence on private car use. The most pursued solutions include covering such infrastructures to create new public space or converting them into areas dedicated to sustainable mobility.

Key takeaways:

Air-rights projects to yield transformative urban benefits require:

- **Long-term planning tools**, such as Urban Masterplans and Sustainable Urban Mobility Plans (SUMPs), are essential to implement large-scale infrastructure projects. These plans must be aligned across departments and political cycles to ensure continuity and reduce disruptions from changing administrations.
- **Stable, broad-based stakeholder coalitions** —including public–private partnerships—are crucial. Their success hinges on strong public-sector leadership from a central coordinating body that can function as a bridge between actors and ensure alignment over time.
- **Flexible and resilient funding mechanisms** are needed to manage investment risks, accommodate market fluctuations, and sustain stakeholder commitment throughout long implementation periods.

DO: Leverage air rights to create urban value, but only after extensive stakeholder and community engagement, grounded in a clear strategic vision and thorough technical feasibility assessments, to manage the long-term nature of such transformations.

DON'T: Underestimate the time, coordination, technical complexity, and cost involved in implementing these projects. Offering to the private investors an incomplete or shifting regulatory and decision-making framework.

Figure 7 - View of Boston's urban landscape, marked by the presence of major road infrastructures, from the top of the Parcel 12 project building
© Stefano Zenoni

3) Street redesign and curbside management as a key factor to manage the scarcity of public space in urban areas.

Redesigning public space at the street level can enhance safety, equity, and functionality by optimising curbside use to meet competing demands. In all urban contexts, street space is a limited resource. The convergence of multiple users—pedestrians, cyclists, scooters, EV charging stations, delivery services, public transport, and private vehicles—intensifies the challenge. To address this, local authorities are rethinking both the physical design and regulatory framework of streets to manage conflicting needs more effectively.

Key takeaways:

• **Clear project priorities and achievable objectives** should be established from the outset -placing **road safety** at the core of every design decision.
• **Climate adaptation solutions**, such as stormwater management, tree planting, and permeable surfaces, can be integrated into street design to deliver co-benefits beyond mobility.
• **Community engagement** must guide the development of project goals, ensuring that redesigns are not driven solely by technical criteria but reflect local needs and values.
• **Monitoring and evaluation systems**, including the use of real-time technologies, are crucial to assess performance and adjust strategies as needed.
• **Curbside reallocation** and reduced carriageway width demand tailored parking strategies, with dynamic regulations and pricing models adapted to different times of the day, ideally supported by sensor-based technologies.

DO: Pilot small-scale interventions, even using tactical urbanism, to evaluate public support and performance, while clearly communicating the overall objective and envisioning a phased, incremental implementation.

DON'T: Street redesign and regulation projects should not be approached as old-fashioned "traffic engineering" exercises that fail to integrate multiple areas of expertise. Instead, they should bring together engineers, architects, urban planners, agronomists and botanists, climatologists, and community practitioners to ensure a comprehensive approach capable of addressing diverse and interconnected objectives.

The redesign project of Boston's Tremont Street *enabled the transformation of a neighbourhood street through active community involvement and the use of a practical toolkit of well-known road safety solutions (such as raised crosswalks, traffic calming islands, narrower traffic lanes, and the introduction of protected cycle lanes). This was complemented by the reorganisation of loading/ unloading areas and the introduction of new parking regulations.*

4) Community engagement, participation, communication, and outcome monitoring are essential pillars of effective mobility planning.

At both the neighbourhood and city-wide levels, the active involvement of citizens and stakeholders is essential for the success of mobility policies and projects. Participatory processes ensure that interventions respond to real needs, foster trust, and maintain long-term support—especially when change affects how people move and use urban space.

Key takeaways:

• **Public participation** at the strategic level is crucial for shaping high-level frameworks such as Sustainable Urban Mobility Plans (SUMPs). These processes help define collective goals and a shared vision of the future city, connecting individual projects to broader urban narratives and enhancing public understanding and ownership.
• **Local-scale/ neighbourhood engagement**—even when not legally required—is vital for understanding the real needs of local communities, building mutual trust, overcoming biases and barriers—especially with more sceptical or change-resistant groups—and avoiding endless cycles of opposition-led consultation.
• **Clarity and transparency** at the outset are essential. Every efective participatory process should begin with a clear presentation of the project's purpose, the promoter's goals, the resources available, and any constraints or limitations (e.g., regulatory, technical, or financial).
• **Well-designed, inclusive participation processes** require adequate funding and skilled facilitation. Formats and materials must be accessible across educational levels, languages, income groups, and digital literacy, ensuring no one is left out of the conversation.
• **Communication is not an afterthought—it is a core component.** Dedicated communication strategies and budgets should be part of every project, supporting the development of websites, informative materials, visual aids, and channels for ongoing updates.
• **Monitoring outcomes** builds accountability and sustained support. Clear indicators should be established to measure success (e.g., reduced traffic collisions, modal shifts, increased ridership, emissions reductions, improved parking turnover, or public revenue). Data collection methods—like sensors and user feedback platforms—must be prioritised as a core activity, not a secondary task.

DO: Allocate a dedicated share of resources to participation and communication in every project, setting—at municipal or agency level—a variable percentage target, even if not required by current legislation.

DON'T: Dismiss public opposition by relying solely on technical arguments or overly specialised language. Doing so alienates citizens and weakens public ownership of the project.

*Both large-scale and smaller projects - such as **Parcel 12 and the Tremont Street redesign of Boston** - provide a valuable model of early and sustained engagement. In both cases, structured public processes were developed over time, including public meetings, workshops, the preparation of dedicated information materials, and opportunities to meet directly with planners and public officials. MassDOT's planning framework demonstrates a strong institutional commitment to equitable access and inclusive mobility, placing particular emphasis on communities historically underserved due to their location or socio-economic status.*

A technical session with cities from the EU, US and Canada during the IURC NA Sustainable Urban Mobility and Transport Event in Boston, June 2025.

Best Practice

Promoting Bike Ridership: bergamoinbicicletta.it

AmericaFor decades, urban mobility challenges have been closely linked to environmental concerns, and recently, the transport sector's contribution to **CO2** emissions has become central to public debate. In the European Union, **the transport sector accounts for approximately 25% of total CO2 emissions, with 70% coming from road transport[1].** Despite varying contexts, public administrations continuously strive for the right balance between different modes of transport, such as public transportation, light mobility, shared mobility, and private vehicles. One of the most effective proven policies is strengthening bike ridership.

Many municipalities study successful models from Northern Europe to find their path to more sustainable mobility. For example, Copenhagen boasts an impressive modal split, with **63% of trips made by bike or on foot[2].** However, for countries like Italy, where many cities still heavily depend on private cars, this goal remains a challenge, resulting in northern Italy being one of the most air-polluted regions in Europe[3].

Bergamo, a small city of **120,000 inhabitants** in a larger province of **1.1 million inhabitants in 2,722 km²**, also confronts the challenge of a complex topography that significantly impacts local mobility. According to the latest studies, the province records **1.85 million daily trips: 70% by private car**, often with just the driver onboard; **16% by public transport**; and **2.5% by bicycle.** Within the city, there is a better balance: **50% by private vehicles, 14% by public transport, 21% by bicycle, and 9% on foot, although private vehicles still dominate[4] .**

As part of its overall strategy for renewing urban mobility, the Municipality of Bergamo approved the General Mobility Plan (PUMS 2030) in 2023, which strongly supports policies promoting bike ridership. Bergamo also integrates these policies into its Climate City Contract 2030 as part of the global strategy to reduce CO2 emissions for the EU's NetZero Cities mission and to improve air quality.

A CYCLING ECOSYSTEM

In 2022, the Municipality launched the bergamoinbicicletta.it project as the focal point of its new agenda. The idea is straightforward: bike ridership can only be increased by treating this form of mobility as a "system" or "ecosystem."

As a result, effective policies must address numerous interconnected elements, with parallel progress in all areas necessary for overall success. The public debate often revolves around a single main topic: the demand for new infrastructure and the expansion of dedicated cycling paths. While infrastructure is crucial, it requires time and financial resources and, most importantly, should be complemented by other equally significant actions. Furthermore, it's essential to provide citizens with a comprehensive overview of initiatives, as demonstrated by several online polls conducted by the municipality over the last four years.

Bergamoinbicicletta.it is not a single project but a combination of many. It is a "project of projects" and serves as the framework for several actions. It represents the municipality's general policy to increase bike ridership. It is also a website, a portal specifically created to engage citizens in a shared vision, providing live updates, practical information, FAQs, documents, maps, and more.

OBJECTIVES

Various areas of intervention have been identified to enhance bike ridership. The selection of these areas stems from both scientific literature and direct consultations with citizens. The main sectors are:

- Increasing safety through dedicated routes and paths;
- Expanding clear and legible road signage;
- Providing digital navigation tools and dedicated software;
- Building bicycle parking services andenhancing theft prevention;
- Promoting riding responsibly and safely;
- Offering financial incentives and rewards forsers;
- Introducing shared mobility services.

Consequently, bergamoinbicicletta.it includes the following specific actions which are replicable in different cities, incremental, inclusive, always adaptable, and interconnected:

- The new Biciplan (Strategic Municipal Plan forCycling Mobility), approved in 2022, outlinesthe future development of the cycling network, with the ambitious goal of creating 23 km ofbike paths and 40 km of bike lanes within threeyears;
- New dedicated signage across the city, designed for cyclists, featuring both largepanels ("totems") and smaller signs;
- New maps for navigating the bike network,including route-planning software and onlinemap services;
- New parking structures (two "Velostations"for 250 bikes and 40 bike boxes) offering safeparking for private bicycles near railway andtram stations;
- A promotional campaign on social media andbillboards to raise awareness of the benefitsof cycling (less traffic, reduced pollution,improved health, cost savings, etc.);
- A social media campaign to educate citizenson the proper use of e-scooters;
- The PinBike project, which offers monthlyfinancial rewards for bike-to-work users basedon the distance covered (€2 per day and €30per month maximum);
- The creation of an integrated sharing system, including both bicycles and e-scooters.

MAIN OUTCOMES

- Bike ridership within the municipal areaincreased by 38% from 2019 to 2023 (excludingthe pandemic), reaching a 29% share of themodal split[5] ;
- Over the same period, the bike-sharing systemexpanded from 24 to 70 stations, from 100 to450 bikes, and from 4,000 to 15,000 daily uses[6] ;
- The e-scooter system achieved nearly 2,000daily uses[7] ;
- The city added 30 km of new bike lanes and 10km of dedicated paths over the last two years,with the network now totaling 93 km (0.77meters per inhabitant)[8] ;
- Over 2,500 citizens (3.3% of the active population) participated in the financial reward program [9].

- Bergamoinbicicletta.it was selected by ANCI (National Association of Italian Municipalities) and won the Urban Award 2022 as the best project for Sustainable Urban Mobility in Italy.

1 European Environment Agency - 2019
2 Mobility facts and figures - City of Copenhagen - 2021
3 European Environment Agency - 2024
4 PUMS of Bergamo (Sustainable Urban Mobility Plan) - 2023
5 According to a survey by ATB, the municipal mobility company, and L'Eco di Bergamo, a local newspaper - 2024
6 Data from NextBike
7 Data from Bit Mobility and Lime
8 Data from Biciplan monitoring - 2024
9 Data from PinBike final report - 2024

Best Practice

The Impact of Deliveries on Urban Public Spaces

Cities around the world are reimagining streets and public spaces by prioritizing curbside management—reducing parking spaces to improve urban infrastructure for sustainable and active mobility while integrating climate-adaptive solutions. The EU promotes these actions as a key component of policies on sustainable mobility, digitalization, **and climate resilience.** For instance, the **EU Urban Mobility Framework** encourages cities to develop **Sustainable Urban Mobility Plans (SUMPs)** that integrate transport, land use and environmental goals to create more liveable and accessible urban spaces. Additionally, the **European Green Deal and the Urban Greening Initiative** advocate for reclaiming public areas for people and nature, reinforcing the transition towards climate-neutral and more resilient cities. Funding from the **European Regional Development Fund (ERDF)** and **Horizon Europe** further enables cities to test smart curbside management solutions and nature-based interventions.

In this context, **the International Urban and Regional Cooperation (IURC) programme** continues to play a key role in supporting cities by facilitating exchanges on best practices and fostering collaboration to address these challenges effectively.

As e-commerce and urban logistics continue to expand globally—driving increased competition for curb space and impacting urban mobility—the need for integrated sustainable curbside management solutions becomes even more critical. **In the third quarter of 2024, U.S. retail e-commerce sales totalled $288.8 billion**, representing a **7.5% increase** compared to the same period in 2023[1] . **In 2022, over 27 million Canadians, accounting for 75% of the population**, engaged in e-commerce activities. This figure is projected to **rise to 77.6% by 2025[2] .**

Meanwhile, in Europe, **e-commerce is expected to reach €958 billion (approximately $1 trillion), with an 8% increase compared to 2023[3] .** In the world's top 100 cities, the World Economic Forum anticipates a 36% increase in the number of delivery vehicles on the roads by 2030 compared to 2019 levels[4]. The increasing demand for home deliveries, combined with the evolving needs of the increasing local business sector, is putting significant strain on urban mobility: curbside spaces, once primarily used for loading and unloading, now serve a multitude of functions, including parking, bus stops, passenger pick-up/drop-off, cycling infrastructure, outdoor dining, pedestrian access, and accessibility enhancements.

These spatial conflicts can reduce the quality of urban spaces (a scarce resource), especially for residents and end users, decrease economic value for local businesses, and limit their growth opportunities. They can also increase safety risks and reduce available and accessible outdoor space. **Looking at the bigger picture, logistics also represent a considerable increase in emissions derived from transport**: in the **U.S.**, last-mile delivery operations in cities can account for up to 20-30% of CO_2 emissions related to urban transport[5] ; in **Canada**, GHG emissions from on-road freight vehicles experienced a slight 1% increase between 2005 and 2021, rising from 36.1 to 36.5 megatons, while still representing 5% of total national GHG emissions[6] ; in Europe they generate 40-50% of NOx and 8-10% of CO_2 emissions in urban areas[7] .

CURBSIDE MANAGEMENT

Despite evolving needs, curbside management often relies heavily on static signage and numerous physical barriers, such as medians, parking deterrents, etc. **New curbside designs that integrate urban planning and tactical urbanism** bring spaces closer to the end user by creating flexible and well-defined pathways for diverse functions. The inclusion of nature-based solutions and digital technologies further advances these efforts, equipping local authorities with more effective tools for effective regulation and management.

Considering the current challenges and existing issues in understanding urban spaces, the process can be simplified into four main phases:

- **First,** digitally mapping curbside areas by analysing both quantitative factors-such as the number and location of spaces- and qualitative factors, including existing regulations and time based usage patterns.
- **Second,** implementing real-time monitoring of curbside activity to establish a data-driven foundation for regulation, using parking payment systems, ground sensors, and cameras.

- **Third,** developing dedicated applications for road users, enabling direct interaction with the curb management systems set by local authorities.
- **Finally,** redefining the curbside by integrating tactical urbanism and improved urban planning to create more human-centred, adaptable spaces.

In the **US**, to help authorities achieve dynamic curb management, **the Open Mobility Foundation (OMF)** introduced the **Curb Data Specification (CDS)** in 2021. The CDS is a digital tool designed to express static and dynamic curbside regulations, measure activity, and facilitate data-sharing between curb managers and users. The most important goals of an advanced digital curbside management system for regulatory authorities may include:

- **Optimizing** the use of public space, by introducing dynamic and flexible regulations that adapt throughout the day to meet different user needs.
- **Increasing revenue**, where advanced technologies allow the introduction of customized pricing models.

The involvement of key stakeholders -from residents to economic operators- in the co-creation process is essential, as curbside management directly impacts urban quality and accessibility. **A well-implemented curbside management system benefits all stakeholders.** For delivery companies and suppliers, real-time updates and clear curbside usage guidelines improve efficiency and reduce costs, as time is a critical factor in the sector. **Citizens and communities also gain from reduced congestion, lower pollution, improved traffic safety**, and better public spaces that support sustainable mobility and climate adaptation.

LEARNING FROM RELEVANT CASE STUDIES

NORTH VANCOUVER (CAN)

Since late 2023, the municipality of North Vancouver has been working on developing a Curb Access and Parking Plan. The process began with mapping the city's needs and inefficiencies, collecting input from residents, business owners, logistics operators, and city users. The municipality emphasized a specific focus on potential spaces for active mobility, **the creation of accessible parking, and the expansion of charging infrastructure for electric vehicles**, particularly for urban logistics. Based on this information, optimization proposals were developed in the first half of 2024, including: dynamic pricing in certain areas, considering different time slots and days of the week; reserved parking spaces for residents; **logistics management through micro-hubs, also equipped for EV charging; dedicated curbside parking for bicycles and cargo bikes**. All proposals were compiled into a document that was once again subject to public consultation. **The goal is to finalize the general plan and begin implementing the various solutions by late 2025.** The bottom-up approach is particularly noteworthy: starting with citizen engagement and industry dialogue to develop a shared and transparent curb management strategy, into which technological solutions can then be integrated—ensuring that technology serves practical needs rather than being implemented for its own sake.

PITTSBURGH (USA – PA)

Since 2022, the City of Pittsburgh, through its Department of Mobility and Infrastructure and the Pittsburgh Parking Authority, aims to create Smart Loading Zones (SLZs). **The project focuses primarily on downtown Pittsburgh and the Oakland neighbourhood**, where curbside regulation plays a key role in the Oakland Plan, a broader mobility and urban planning strategy adopted that same year. Pittsburgh's approach stands out for its extensive engagement with local logistics operators. By prioritizing a data-driven approach, the project aims to:

- **Improve the efficiency of available curbside space**, ensuring better turnover and accessibility.
- **Provide real-time information** on curbside availability to logistics operators.
- **Introduce a dynamic pricing system**, adjusting curbside parking rates based on factors such as duration and demand.

As part of the pilot program, **SLZs have been mapped and equipped with cameras capable of monitoring real-time occupancy and identifying end users**. Delivery drivers can register their license plates through a dedicated web app, allowing them to check curbside availability in real-time and reserve spaces. Unregistered users face significantly higher parking rates as a deterrent against unauthorized curbside use.

The benefits for the city in the pilot areas include a **60% decrease in average parking duration and a 70%** increase in turnover directly benefiting small businesses that rely

on efficient delivery logistics. **The model estimates a 20% reduction in traffic congestion** caused by drivers searching for parking spaces, 30 metric tons of CO2 emissions, and over $9 million dollars in driving time value per SLZ. In addition, by collecting real-time curbside data, public authorities gain greater flexibility in managing the space allocation throughout the day. This could lead to dynamic curbside zoning, whereby areas serve different functions—regular parking, loading zones, or other uses—at different times of the day.

MADRID (SPAIN)

Madrid's Urban Freight Distribution Strategy (DUM 360), launched in March 2023, is a program designed in response to Madrid's 80,000 daily delivery operations. The city has implemented the project in 2,660 loading and unloading zones, covering a total of 8,219 designated parking spaces on the central curbside areas of Madrid, within the Regulated Parking Service Area (SER). These spaces have been equipped with sensors and a dedicated app has been developed to help commercial delivery operators manage the curb more efficiently by providing:

- **Differentiation** of wax usage based on time.
- **Real-time occupancy** monitoring and digital booking for operators.

Dynamic pricing policies, encouraging the use of low-impact vehicles and off-peak deliveries. Moreover, Madrid has established a permanent urban logistics forum, which brings together municipal officials, logistics providers and other stakeholders to continuously evaluate and refine the system. Initially, the use of the app was optional for delivery operators. However, from September 2023, the city introduced a **45-minute free parking** allowance for deliveries. Beyond this time limit, fines are automatically applied. To date, **75 large logistics operators** have joined the system, **representing more than 20,000 deliveries per day**.

The Madrid DUM 360 initiative has also introduced complementary solutions to further optimize last-mile logistics, such as publicly accessible smart lockers and micro-hubs for last-mile deliveries. These aim to reduce the number of individual trips and **facilitate the use of small, environmentally friendly vehicles.**

1. www.census.gov
2. www.trade.gov
3. www.reuters.com
4. www.weforum.org
5. www.transportation.gov
6. www.canada.ca
7. www.eea.europa.eu

Best Practice

Heavy Vehicles and Vulnerable Road Users, a Conflict to be Solved

TOWARDS ZERO: THE EU'S ROAD SAFETY AMBITION BY 2050

"Vision Zero" is the ambitious road safety goal adopted by the European Union (EU) to eliminate all road traffic fatalities and serious injuries by 2050. This target aligns with the broader EU commitment to protecting citizens' health and wellbeing, as embedded in the European Pillar of Social Rights and the Sustainable Development Goals (notably SDG 3.6 on halving road traffic deaths). As early as 2018, the EU set an interim milestone **to reduce road fatalities by 50% by 2030**, reinforcing its commitment through the European Commission's[1] Strategic Action Plan on Road Safety and the EU Road Safety Policy Framework 2021–2030. These frameworks are deeply embedded within key EU mobility and urban development policies, including the Sustainable and Smart Mobility Strategy, the revised TEN-T Regulation, and the **Urban Mobility Framework**, which together aim to create a safer, greener, and more efficient transport system. In parallel, since July 2022, the new General Safety Regulation (GSR) has mandated the integration of advanced safety technologies—such as intelligent speed assistance and emergency braking systems—into all new vehicles sold in the EU . **Furthermore, the IURC North America (IURC-NA) programme actively contributes to these objectives by facilitating peer learning on sustainable and safe mobility solutions between EU[2]** and North American cities, placing traffic safety at the core of its thematic cooperation.

GRIM NUMBERS BEHIND THE WHEEL

Despite progress, road traffic remains a leading cause of preventable death in both the European Union and North America. **In 2024, the EU recorded 19,800 road fatalities, equal to 44 deaths per million inhabitants**, with notable disparities across its Member States[3]. Encouragingly, this figure **reflects a 3% reduction compared to 2023 and a 15% drop from the pre-pandemic average (2017–2019)**, indicating a slow but steady move in the right direction.

Across the Atlantic, **the United States registered 39,345 road deaths in 2024, a 3.8% decrease from 2023** and—crucially—the first time in recent years that fatalities dropped below 40,000[4]. However, with an estimated 115 deaths per million inhabitants, the U.S. rate remains significantly higher than the EU average. Canada, meanwhile, recorded an **estimated 1,964 fatalities in 2023, with a rate of approximately 50 per million inhabitants**, slightly above the EU average but below that of the U.S., and showing an upward trend in recent years[5]. The specific structure of these vehicles results in numerous blind spots for drivers.

URBAN DANGER ZONES: THE HEAVY VEHICLE THREAT

Cities, as dense and dynamic environments, present a disproportionate share of road traffic risks. **In the EU, 38% of road fatalities occur in urban areas[6] —a figure mirrored by 33% in Canada and dramatically exceeded by the 59% reported in the United States[7]** . Within these urban fatalities, vulnerable road users (VRUs) including pedestrians, cyclists, users of powered two-wheelers (PTWs), and personal mobility devices—represent nearly **70% of total deaths** in the EU[8]. The risk to VRUs is exacerbated by their interaction with heavy vehicles, particularly large trucks, which account for a disproportionate number of fatal collisions due to visibility limitations and vehicle mass.

In 2023 alone, 7% of urban road deaths in the EU involved heavy vehicles colliding with VRUs[9]. In the U.S., while trucks represent just **4% of vehicles** on the road, they were involved in **8% to 11%** of pedestrian and cyclist fatalities, according to federal data from 2021[10] . The challenge lies not only in vehicle size but also in vehicle design, especially limited driver visibility due to blind spots and high cabs. For this reason, since 2022, the European GSR has introduced new safety features required for trucks, including detection and alert mechanisms for identifying nearby pedestrians or cyclists. Looking ahead, between 2024 and 2029, the GSR will also require direct vision improvements through design changes and advanced sensor technologies, echoing objectives outlined in the **Urban Mobility Framework and the Vision Zero strategy.**

LEARNING FROM SUCCESFUL CASE STUDIES

MILAN – SAFETY BY ENFORCEMENT

In 2023, after several incidents resulting in the deaths of five cyclists due to collisions with heavy vehicles caused by drivers' limited visibility from blind spots, the City of Milan (Italy) decided to anticipate some of the provisions

introduced by the European Union. As of 1st October 2023, all heavy vehicles operating within the municipal territory were required to be fitted with "acoustic, visual, or tactile warning systems capable of alerting the driver to the presence of pedestrians and cyclists in front of the vehicle or on the pavement side" (**ADAS – Advanced Driver Assistance System**), or at least to have ordered them for later installation by 31 December 2024[11]. The measure was strongly opposed by transport associations (such as Assotir), as the municipality was accused of attempting to regulate a matter that falls under national jurisdiction[12]. Subsequently, the municipal decision was overturned by the Administrative Court (TAR) in November 2023. However, the City of Milan later prevailed in the appeal to the Council of State, reintroducing the obligation from 1st January 2025 to incorporate the measure into the traffic regulations of Area B (the Low Emission Zone covering most of the municipality) and Area C (the Congestion Charge Area in the city centre). The Court essentially acknowledged that municipalities may regulate specific, urgent road safety issues as part of their **Sustainable Urban Mobility Plan (SUMP)** policies, such as **Low Emission Zones (LEZs) and cycling uptake**[13]. This case represents a significant example of how regulatory conflicts can be challenged to accelerate the path towards Vision Zero, in accordance with EU legal provisions. The delay caused by the legal proceedings prevents a full assessment of the measure's effectiveness at this time, but the case stands as an important precedent for cities wishing to take firm action on road safety in Europe.

BOSTON – SAFETY BY KNOWLEDGE

With the Direct Vision Study (DVS), the Massachusetts Department of Transportation (MassDOT) and the Volpe Center of the US Department of Transportation (USDOT), conducted a detailed **analysis of 60 different vehicle types** (light, medium, and heavy) in the fleets of the State of Massachusetts and 10 municipalities[14]. **The DVS deliberately uses the term "blind zones" instead of "blind spots" to emphasise the extent of the problem.** The vehicles' characteristics were measured in three phases:

- Field measurements with a custom rig to simulate standard eye height.
- Post-processing using an open-source program from the Insurance Institute for Highway Safety (IIHS) called OGRE.
- Creation of blind zone polygons using ArcGIS.

The study produced a five-star rating system, assessing both front and passenger-side direct vision in terms of how far a child could be seen by the driver. **Only 27% of heavy vehicles analysed scored three stars or higher for front vision, and just 9% for side vision.**

The study has strong educational and awareness value and has been presented through several public initiatives (e.g. the Truck's Eye View experience and the Try-and-Drive campaigns organised by MassDOT). The rating system also has practical applications: **fleet managers can assess their current situation and adopt "countermeasures" such as cameras, specific mirrors, and sensors. It also serves as a guide for future vehicle purchases.** As a result, the State of Massachusetts has approved the **"Act to Reduce Traffic Fatalities",** which now makes it mandatory for state-owned, leased, or contracted vehicles to be equipped with four types of safety devices: lateral protective devices, convex mirrors, crossover mirrors, and a backup camera[15].

TORONTO VISION ZERO – SAFETY BY NUDGING

Toronto is one of the North American cities that has invested the most effort and resources into urban road safety at both a strategic and operational level. **Since 2019, it has adopted the Vision Zero Road Safety Plan**[16], an operational document outlining various types of interventions, including redesigning dangerous intersections and roads, creating safety zones around sensitive areas, introducing speed limits and traffic-protected zones, raising awareness about risky driving behaviour, and educating road users to respect VRUs. A constantly updated dashboard enables monitoring of the achieved results, including the establishment of **1,156 community safety zones and 629 school safety zones**[17]**.**

Regarding cyclists and the risks posed by heavy vehicles, the Toronto plan includes several educational initiatives. The **"Bumper Magnets"** campaign involved producing vehicle interior magnets to remind drivers of safe behaviours towards cyclists and pedestrians. **This was followed by a public and social media campaign titled "Driving Safely Near People Cycling,"** aimed at spreading tips and best practices for drivers, especially those operating the most dangerous types of vehicles when distracted. In the absence of specific federal or provincial laws, and as part of its nudging strategy, Toronto has also recommended that all heavy vehicles operating in the city be fitted with side guards by 2026, already implementing this requirement for its municipal fleet. The actions laid out in Toronto's Vision Zero strategy are consolidating a clear downward trend in pedestrian and cyclist fatalities, **which decreased from 43 in 2015 to 39 in 2019 (the first year of the plan) and to 30 in 2024**[18]**.**

1. The European Commission is the main executive arm of the European Union (EU). Like a federal government department in Canada or a U.S. federal agency, it is responsible for proposing new laws, enforcing EU treaties, and making sure all EU Member States follow agreed-upon rules and policies. The Commission also manages the EU's overall budget and represents the EU in negotiating international agreements.
2. New rule on vehicles safety and automated mobility
3. European Commission – Mobility and Transport
4. National Highway Traffic Safety Administration (NHTSA)
5. "The year 2023 saw increases in the number of fatalities and serious injuries (compared to 2022), while the number of total injuries decreased. The 1,964 fatalities in 2023 marked the highest count in the past 10 years, the 9,261 serious injuries marked the highest count in the last 5 years, while the total injuries were around the average for the past 5 years" - Government of Canada - Transport Canada.
6. European commission – Mobility and transport
7. Fatalities Facts 2022 – Urban/rural comparison
8. European Road Safety Observatory
9. European Road Safety Observatory
10. Pocket Guide to Large Truck and Bus Statistics
11. Comune di Milano
12. News from Assotir website (language: Italian)
13. News from Assolombarda website (language: Italian)
14. Direct Vision Study
15. MassDOT - Truck Safety Devices
16. Toronto Vision Zero Road Safety Plan
17. Vision Zero Dashboard
18. Vision Zero Dashboard

Best Practice

The Explosion of Last-mile Food Deliveries: A growing challenge for urban mobility

In the world's top 100 cities, the **World Economic Forum** anticipates a **36% increase** in the number of delivery vehicles on the roads by **2030**, compared with **2019 levels**[1] . Within this sector, **food home-delivery services** (B2C) represent a rapidly expanding segment. The restrictions introduced during the pandemic further accelerated the growth of turnover among companies providing home-delivery services. Growth figures for the value of the online food-delivery market show similar trends across different regions:

- **Europe: USD 56 billion in 2024 - USD 91.2 billion by 2030 (CAGR[2] of +8%)**
  EURO ≅48.1 billion in **2024**- EURO ≅78.4 billion in **2030**
- **US: USD 52.6 billion in 2024 - USD 93.3 billion by 2030 (CAGR of 9.6%)[3]**
  EURO ≅45.2 billion in **2024**- EURO ≅80.2 billion in **2030**
- **Canada: USD 20.2 billion in 2024 - USD 32.3 billion by 2030 (CAGR of 7.6%)**
  EURO ≅17.3 billion in **2024**- EURO ≅27.7 billion in **2030**

The rise in home-delivery services has caused a steady increase in workers in this sector and, as a result, more cars and vans on city streets, especially delivery riders on motorcycles, bicycles, e-bikes, e-scooters, and mopeds. These are often electric micromobility vehicles, making this segment generally more environmentally friendly than the overall logistics sector. Conversely, since these workers spend most of their time on the road, safety and well-being have become key issues in the public debate.

They are often non-specialised workers with limited protections and precarious contracts. These working conditions frequently lead to non-compliance with traffic regulations and a higher risk of accidents: the pressure and stress associated with their work can affect workers' decision-making; low remuneration frequently leads delivery workers to rely on non-certified or non-compliant vehicles, increasing safety risks. While contractual issues fall under labour legislation at higher administrative levels, many cities have taken steps to improve riders' working and travel conditions by implementing safety protocols for companies, developing dedicated infrastructure and support services, and promoting educational programs.

The EU's response: integrating mobility, labour, and food systems

The European Green Deal provides an overarching framework to make Europe's economy resource-efficient, low-carbon, and socially inclusive. Within this agenda, urban mobility and sustainable food systems are strongly interlinked. The Sustainable and **Smart Mobility Strategy (2020)** and the **Urban Mobility Framework (2021)** advocate for cleaner, more efficient, and inclusive transport systems, while the **Farm to Fork Strategy** calls for resilient local food value chains and shorter distribution circuits.

Last-mile delivery systems, particularly in food distribution, serve as a vital link between these two policy areas. They affect not only urban traffic patterns but also the competitiveness of local products, the carbon footprint of consumption, and the overall liveability of cities. Supporting local logistics hubs, zero-emission delivery zones, and coordinated urban planning can help cities align mobility needs with environmental and economic goals.

Generally, the **Urban Mobility Framework (2021)** and the EU Road Safety Policy Framework 2021–2030 emphasize protecting vulnerable road users, including pedestrians, cyclists, and micromobility users, a group that includes many riders. These frameworks guide local policies on infrastructure, education, and enforcement.

Additionally, the European Agency for Safety and Health at Work (EU-OSHA), promotes the initiative **"Safe and healthy work in the digital age" (2023–2025)** , which includes dedicated sections on the risks associated with platform work (such as stress, delivery times, use of bicycles and e-bikes, and battery management), as well as case studies on couriers and related prevention recommendations. In particular, the recommendations issued by the French Agency for Food, Environmental and Occupational Health & Safety (ANSES) are cited as a good practice example. These include making employment protections mandatory for this category of workers, ensuring the effective implementation of Directive (EU) 2024/2831 on platform work, and continuously collecting detailed information on their health conditions and exposure to occupational risks[4] .

In terms of labour regulation, the European Parliament and the Council adopted in 2024 the **Platform Work Directive**, which aims to address the false self-employment status of delivery workers, introduces transparency and human oversight in algorithmic management, and strengthens access to rights and protections, including information, representation, and social security.

In the **United States**, initiatives such as the **Department of Transportation's Smart City Challenge** and the **Urban Freight Lab at the University of Washington** explore new ways to integrate last-mile logistics within broader sustainable mobility strategies, focusing on congestion management, zero-emission zones, and equitable access for delivery workers. Several U.S. cities, including San Francisco[5] and New York, as outlined in the following section, have launched pilot programmes to regulate delivery platforms and to improve riders' rights and infrastructure.

In **Canada,** the federal government is advancing decarbonisation strategies aligned with the 2030 Emissions Reduction Plan, which includes national funding streams that support cities in decarbonising transport at the urban level. This objective can be pursued, for instance, through the development of zero-emission delivery fleets and urban-logistics innovation hubs at the municipal scale. These programmes show a strong alignment with European goals under the Green Deal, indicating a growing transatlantic convergence on sustainable urban logistics and the regulation of digital platforms.

Learning from Cities

Florence, Italy - "Casa Riders" project

Since February 2025, the Municipality of Florence has made available municipal premises to create a multifunctional centre dedicated to last-mile delivery workers. In this space, delivery riders can rest indoors, access toilets and drinking water, recharge their phones or e-bike batteries, and use a small workshop for basic bicycle repairs, so that they can travel in the safest possible conditions. The centre also offers information desks and training activities – for example, on road safety, occupational health and safety, and workers' rights.

The project, co-designed with the riders themselves and funded through public crowdfunding, as well as municipal support, provides a space for socializing and assistance, affirming in Florence the "right to rest" and to adequate working conditions for delivery cyclists – elements that ultimately translate into greater road safety.

The entire policy was developed in close collaboration with trade unions such as the Italian General Confederation of Labour and NGOs. This approach highlights the importance of collaborating with professional associations, unions, and local community organizations to address complex issues that intersect social and economic dimensions, particularly those related to the working conditions of specific worker categories and their broader impact on road safety. The risks associated with intense work rhythms, stress, and the use of unsuitable vehicles primarily affect the workers themselves. Still, in the case of road safety, since any potential accidents involving them may also affect other road users, they also pose a danger to the broader community.

New York, USA - Street Deliveristas Hubs

Since 2022, New York City has launched the pilot programme "Street Deliveristas Hubs", the first of its kind in the United States. In collaboration with the riders' union and supported by federal funding, the city is converting former unused kiosks (such as old newsstands) into well-equipped rest areas.

These hubs provide riders with a place to shelter from severe weather, take a break, and recharge both e-bike batteries and phones, as well as access bicycle repair stations. The idea is to offer "couriers", who ride through New York in all weather conditions every day, a kind of public "break room" similar to what regular employees have in their current workplaces. It is estimated that more than 65,000 app-based riders work in New York City, compared to a total of about four million private-sector jobs[6] — that is, roughly 1.6 percent of the city's entire workforce.

The *"Deliveristas Hubs"*, co-designed with the riders themselves, also include information points on workers' rights and safety (e.g. traffic safety, safe battery charging). This innovative model of urban infrastructure, designed with solar panels and featuring green roofs, reflects NYC's commitment to improving the safety and comfort of delivery workers while reducing the environmental impact in the city.

After initial delays and the need for approval by the Landmarks Preservation Commission, construction of the first hub began in 2024 near City Hall Park.[7]

Since 2023, New York City has also promoted a pilot initiative called **E-Bike Trade-In** , allowing riders to exchange uncertified e-bikes or batteries[8] (often modified or untraceable) for new, safe, and certified ones, provided free of charge by the municipality, alongside the installation of the first city-operated public e-bike charging stations, aimed at reducing the risk of fires caused by unsafe batteries . The programme has enabled the replacement of more than 400 unsafe vehicles[9] .

Delivery rider in New York City, USA. Photo by Robinson Greig

Toronto, Canada – A Micromobility Strategy

In 2024, Toronto adopted a Micromobility Strategy aimed at safely integrating low-emission two-wheeled vehicles (bicycles, e-bikes, cargo bikes, and e-scooters) into the city's urban mobility network. Last-mile delivery plays a crucial role within this strategy, which aims to make deliveries safer and more efficient by creating logistics "micro-hubs" in high-volume areas. These sites enable couriers to operate micromobility vehicles, particularly cargo bikes, for the final leg of delivery routes.[10]

In practical terms, after amending municipal regulations to authorise the use of large cargo-bikes on city streets (electric scooters remain prohibited on public roads and cycle lanes)[11], the municipality designated several on-street parking spaces and installed temporary logistics containers on public land. These micro-hubs may also include vehicle maintenance and repair services, as well as rest areas for riders.

Furthermore, the strategy places strong emphasis on safety and compliance with traffic regulations by all road users, including last-mile delivery riders. In the summer of 2025, the city launched an educational campaign targeting urban cyclists and delivery riders to reinforce key traffic rules. In particular, the Toronto Police Service conducted a three-week "Safety Blitz" focused on riders and micromobility users: additional patrols were deployed at intersections and in high-delivery areas, combining enforcement of illegal behaviours with the distribution of informative leaflets.[12] The city is also considering making road-safety training courses mandatory for all bicycle delivery workers as an additional accident prevention measure.

Rethinking the urban delivery cycle in this way contributes to both improving road safety for riders and enhancing overall urban liveability.

1. https://www.weforum.org/press/2020/01/urban-deliveries-expected-to-add-11-minutes-to-daily-commute-and-increase-carbon-emissions-by-30-until-2030-without-effective-intervention-e3141b32fa/
2. CAGR = compound annual growth rate
3. https://www.grandviewresearch.com/industry-analysis/online-food-delivery-market-report
4. https://www.anses.fr/en/content/working-conditions-food-delivery-couriers-digital-platforms-are-damaging-their-health
5. https://www.sfenvironment.org/ebike-delivery-pilot
6. https://dol.ny.gov/labor-statistics-new-york-city-region
7. After initial delays and the need for approval by the Landmarks Preservation Commission, construction of the first hub began in 2024 near City Hall Park, alongside the installation of the first city-operated public e-bike charging stations, aimed at reducing the risk of fires caused by unsafe batteries.
8. https://www.nyc.gov/html/dot/html/bicyclists/ebikeprograms.shtml
9. https://www.nyc.gov/html/dot/html/pr2025/nyc-dot-e-bike-trade-in-program.shtml
10. https://nacto.org/latest/urban-delivery-by-bike-microhubs-replaced-delivery-trucks-in-toronto/#:~:text=In%202022%2C%20the%20City%20of,street%20microhub%20pilot%20program
11. https://www.toronto.ca/legdocs/mmis/2021/ie/bgrd/backgroundfile-167154.pdf
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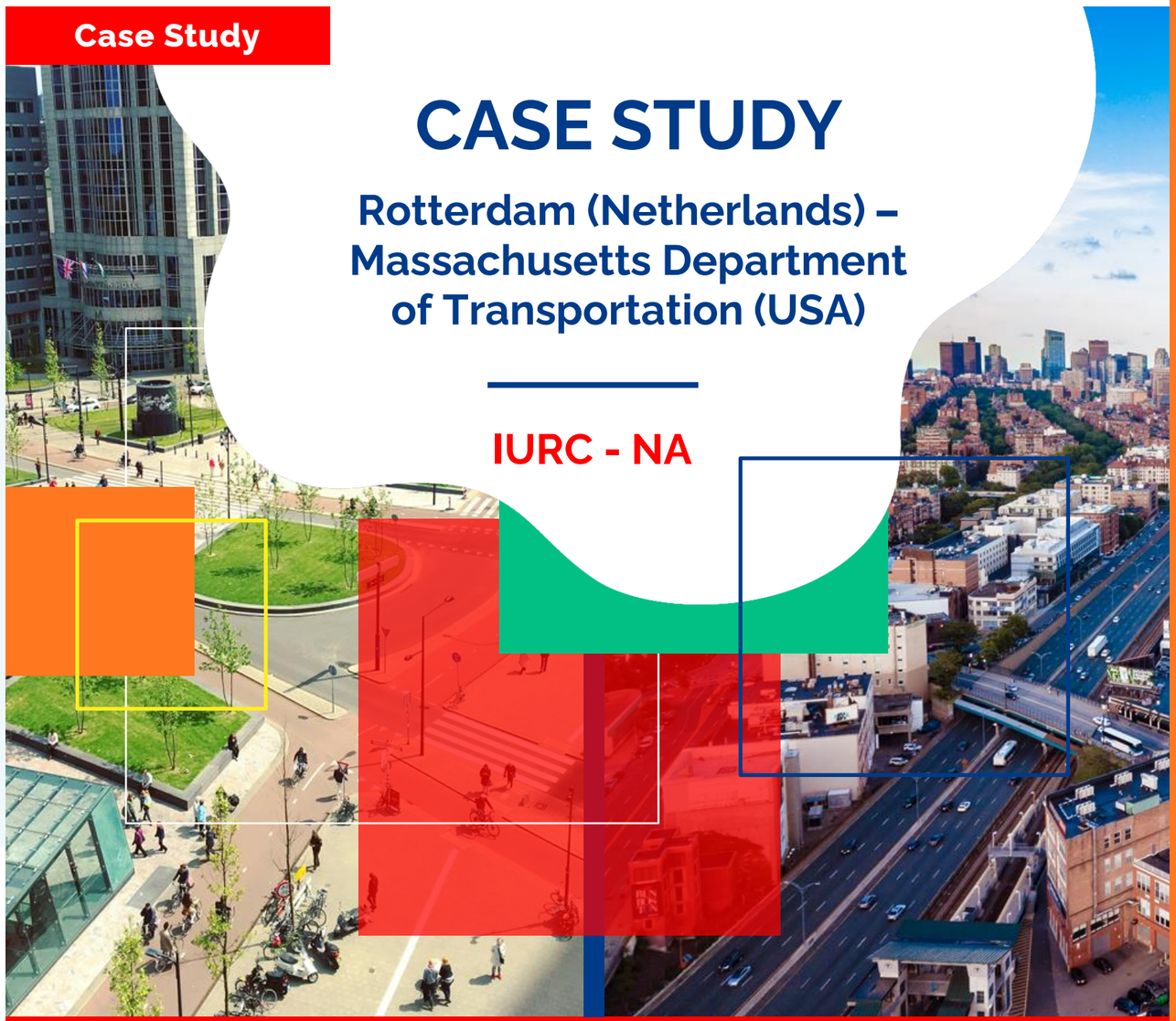
Case Study

CASE STUDY

Rotterdam (Netherlands) – Massachusetts Department of Transportation (USA)

IURC - NA



DECEMBER 20, 2025

Thematic Network(s): Sustainable Urban Mobility and Transport
Topic keywords: ***sustainable mobility, micromobility, multimodal travel, e-scooters, regional mobility, road safety, mobility governance, user behaviour***

ROTTERDAM (Netherlands) – MASSACHUSETTS DEPARTMENT OF TRANSPORTATION (USA)

IURC – CASE STUDY

By addressing the challenges of emerging urban micromobility from different perspectives and institutional responsibilities and competencies, the City of Rotterdam and the Massachusetts Department of Transportation (MassDOT) are shaping a governance approach that blends regulation, oversight, and responsible user education. Through their transatlantic cooperation, they are helping chart a path toward better integrating micromobility as a cornerstone of efficient, sustainable, and safe urban mobility.

EXECUTIVE SUMMARY

Since 2023, within the framework of the International Urban and Regional Cooperation – North America (IURC-NA) programme, the Massachusetts Department of Transportation (MassDOT) and the City of Rotterdam have been exchanging strategies to advance sustainable urban mobility, with a strong focus on micromobility governance.

The cooperation has explored MassDOT's role as a state-level authority developing new regulatory tools for micromobility and encouraging responsible user behaviour, alongside Rotterdam's hands-on experience managing micromobility daily as a major European city implementing rules set by higher institutional levels. Their discussions highlighted a shared goal: to make micromobility safer, better regulated, and more effectively integrated into broader urban mobility systems.

CHALLENGES AND SOLUTIONS

Cities face an ongoing challenge: providing mobility that is efficient, fast, and sustainable for their residents. Public transport networks remain central to reducing reliance on private vehicles, and they are increasingly complemented by active mobility options. Over the past fifteen years, this is where the most significant innovations have emerged—most notably the rapid expansion of electric micromobility vehicles and the rise of shared-mobility services.

These developments have broadened opportunities for integrated and multimodal travel, but they have also introduced new challenges. Governments at both national and local levels must now regulate these innovations in ways that prevent negative externalities—such as non-compliant vehicles, reduced road safety, rising crash rates, or the disorderly use of public space—from undermining their intended benefits.

In Boston, the Massachusetts Department of Transportation (MassDOT) plays a central role in the Special Commission on Micromobility1, established by the state legislature in 2023. This consultative, cross-sectoral body reflects a statewide approach to policy learning and coordination, bringing together 15 representatives from public agencies, municipalities, the private sector, and the industry. Its mandate is to review existing laws, clarify vehicle definitions, and propose recommendations to the state legislature that support innovation while enhancing safety.

MassDOT—through its Registry of Motor Vehicles and with support from MassDOT's internal innovation unit, The Lab2—is exploring a "micro-ID" system, a lightweight digital registration method (such as QR-code decals) designed to help identify vehicles, improve crash reporting, and facilitate insurance coverage. The approach seeks to provide traceability without the administrative burden — for both agency staff and micromobility device users — of current licensing frameworks. MassDOT is also developing a behaviour-based education initiative that uses sensors to alert riders when they exceed context-appropriate speeds, integrating technology and awareness to promote safer riding habits.

Figure 1. Bike Lane in Boston, Massachusetts. Photo by Aaron Doucett

[1] https://www.mass.gov/info-details/special-commission-on-micromobility
[2] https://www.mass.gov/the-lab-massdot

In Rotterdam, the City Government operates within the framework of Dutch national law, where vehicle approval and technical standards are overseen by the Netherlands Vehicle Authority (RDW) under the Ministry of Infrastructure and Water Management. Although the Netherlands does not have a national micromobility commission comparable to the Massachusetts model, consultation among the Ministry, municipalities, and mobility operators is standard practice when shaping new regulations—as demonstrated by the national process leading to the legalisation of e-scooters from July 2025.

Clear definitions and identification requirements for micromobility vehicles are central to Dutch policies on safety, liability, and data collection. Speed-pedelecs (up to 45 km/h) and throttle-based e-scooters or mopeds must be approved by the RDW and display a licence plate, while pedal-assist e-bikes (up to 25 km/h) are classified as bicycles and do not require registration. From July 2025 onwards, e-scooters will be permitted on public roads only if they are officially approved and registered, ensuring compliance with safety and battery standards.

The City of Rotterdam has also implemented awareness campaigns on e-scooter parking behaviour and adherence to cycling-path rules, often in collaboration with shared-mobility operators and universities.

Figure 2. Bike lane in Rotterdam.Photo by Eryk Piotr Munk.

RESULTS AND IMPACT

The resulting convergence led to the identification of key areas where joint work could yield valuable, comparative insights. The two entities involved commit to maintaining regular contact and to keeping each other informed about the work of the commissions and networks currently addressing the overall framework for micromobility vehicles. The hierarchical difference between the two bodies, together with their distinct competencies, could have increased the complexity of the collaboration; instead, it becomes an opportunity to develop meaningful and innovative policy initiatives.

The strength of the Massachusetts Special Commission model lies in its ability to bring together a wide range of perspectives, integrating voices from both the public and private sectors and convening, in a single forum, state agencies, municipalities, stakeholders, and operators. The City of Rotterdam could take the lead in establishing, at the municipal level, a commission on micromobility management involving different tiers of government and private-sector actors, or alternatively propose a similar model to higher administrative levels to reinforce existing practices at the national and regional levels. Conversely, MassDOT can rely on a direct connection with a European municipality that has made micromobility a central element of its mobility policies, within a country, the Netherlands, that for decades has been considered a benchmark for active-mobility development, and has exceptionally high micromobility usage. This direct link provides a valuable source of specific information and insights relevant to the Special Commission's work in Massachusetts, broadening its understanding of municipal-level issues. This exchange enables both parties to reflect on the opportunities of combining formal and institutional governance structures with more flexible, agile collaborative networks closer to everyday operational challenges involving operators and users, ultimately strengthening their capacity to manage micromobility effectively.

A first concrete area in which this collaboration can be applied concerns vehicle identification. The shared objective is to regularise the circulation of micromobility vehicles on the road and enable accurate recording of road traffic incidents, as well as the identification of vehicles involved in collisions. MassDOT can gain insight from the Dutch system of precise, clearly defined vehicle classifications, supported by an effective regulatory framework, and may consider developing more structured forms of vehicle classification and identification to propose to the Special Commission. The City of Rotterdam could, in turn, explore how future digital micro-ID approaches might support real-time data collection and enforcement at the municipal level, complementing national legislation for regulated vehicles, but mainly those currently outside the formal registration framework.

Both partners recognise that infrastructure and regulation alone are not enough to ensure safe micromobility, particularly as the sector continues to evolve rapidly. Education and user behaviour are essential to reducing crashes and fostering responsible riding. Their collaboration therefore also focuses on co-designing education and awareness strategies. This joint effort not only allows them to exchange approaches but also illustrates how multi-level cooperation can deliver tangible improvements in user safety. The partners aim to jointly develop a road-safety education campaign and to define a set of concrete actions and technologies that can be adapted and implemented within their respective territorial contexts.

KEY FIGURES

15 partners

Comprise the Massachusetts Special Commission on Micromobility. Through MassDOT's contribution, it benefits from the experience and expertise of a major European municipality.

LESSONS LEARNED

Micromobility is a valuable asset that expands options for active travel and plays a central role in shared-mobility systems

Innovation in the sector evolves quickly, with new vehicle types emerging each year, requiring regulatory frameworks and classifications that can be updated rapidly.

Multiple levels of government play essential roles: national and regional authorities set regulatory and legislative parameters, while municipalities manage day-to-day operations and implementation.

Effective governance models integrate institutional actors, stakeholders, and operators, combining formal structures with flexible, operational collaboration.

Clear vehicle definitions and classification systems are essential for producing reliable data. When formal registration is not feasible, flexible identification methods can serve as effective alternatives.

Managing micromobility requires more than regulation and enforcement; information and education are vital. Well-designed campaigns can encourage safe, responsible riding and proper road use.

THE INTERNATIONAL URBAN AND REGIONAL COOPERATION PROGRAMME IN NORTH AMERICA

The International Urban and Regional Cooperation program in North America (IURC NA), funded by the European Union, partners European cities with Canadian and USA cities to facilitate knowledge exchange through online tools, face-to-face interactions, study visits, participation in thematic and networking events, and capacity-building initiatives. Its activities support the achievement of policy objectives as well as major international agreements on urban development and climate change, such as the EU Urban Agenda, the UN Sustainable Development Goals, and the Paris Agreement. The program is part of a long-term strategy by the European Union to foster sustainable urban development in cooperation with the public and private sectors, researchers, innovators, community groups, and citizens. IURC NA is financed under the EU Foreign Policy Instruments and benefits from the strategic support of the Directorate-General for Regional and Urban Policy of the European Commission.

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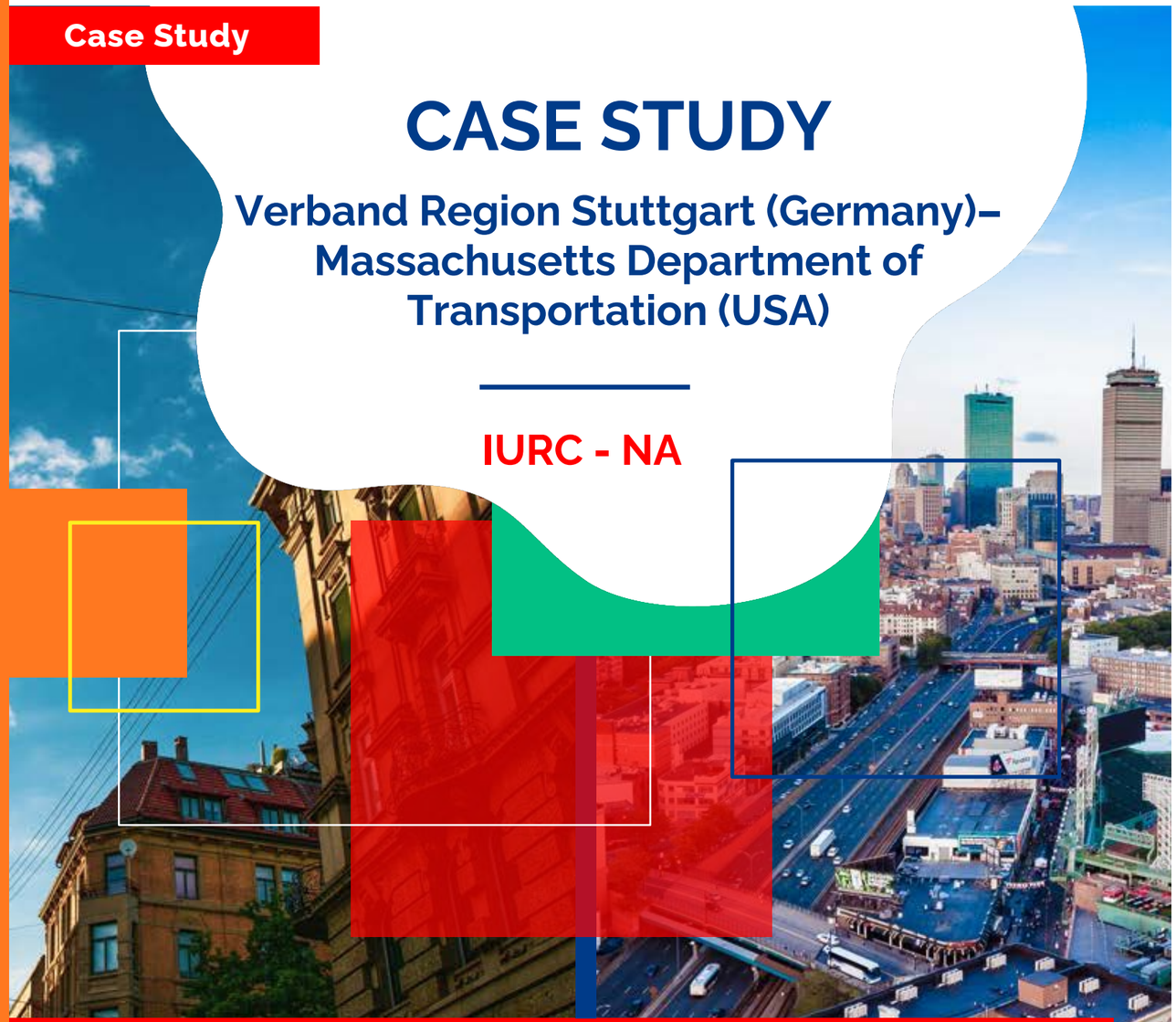
The contents of this case study do not necessarily reflect the latest data from the City of Rotterdam.

Case Study

CASE STUDY

Verband Region Stuttgart (Germany)– Massachusetts Department of Transportation (USA)

IURC - NA



SEPTEMBER 22, 2025

Thematic Network(s): Sustainable Urban Mobility and Transport (SUMT)
Topic keywords: *Sustainable Mobility, Bike Ridership, Mass Transit, Integration of Public Transport and Bicycle Use, Regional Mobility, Leisure Mobility*

VERBAND REGION STUTTGART[1] – MASSACHUSETTS DEPARTMENT OF TRANSPORTATION[2]

IURC – CASE STUDY

By reimagining regional bus services to accommodate bicycles, the Stuttgart Region and the Massachusetts Department of Transportation (MassDOT) are transforming leisure mobility into a driver of sustainable transportation. Through transatlantic cooperation, both are paving the way for more accessible, low-carbon, and inclusive access to nature.

EXECUTIVE SUMMARY

Since 2022, Verband Region Stuttgart (VRS), Germany, and the Massachusetts Department of Transportation, USA, have cooperated under the International Urban and Regional Cooperation (IURC) North America programme, focusing on strategies to improve sustainable urban mobility, including integrating bicycles into public transport systems. With shared goals of decarbonising mobility, improving access to natural areas, and promoting equity beyond city centres, both regions explored practical solutions that expand multimodal travel for leisure and tourism purposes. The exchange centred on Stuttgart's pioneering "Fahrrad2Go[3]" model—buses equipped with systems for transporting bicycles—and how it could be adapted to the Massachusetts context, particularly in support of the Unlocking the Blue Hills pilot project. The cooperation has yielded immediate insights and concrete proposals for enhancing bicycle capacity on regional transit and sets the stage for future experimentation and knowledge transfer. It also demonstrates how user-focused design, participatory planning, and shared data frameworks can shape inclusive and sustainable transport policies across continents.

[1] https://www.region-stuttgart.org/de/
[2] https://www.mass.gov/orgs/massachusetts-department-of-transportation
[3] https://www.ovr-bus.de/de/ueber-uns/fahrzeuge/fahrrad2go-deutschlandweit-einmaliges-innovatives-klimaschutzprojekt-startet-im-busverkehr-des-rems-murr-kreises

CHALLENGES AND SOLUTIONS

Reducing reliance on private motorised vehicles, limiting emissions, and ensuring equitable access to transport services are challenges that go beyond city centres, reaching provincial and regional levels. The travel demand driven by leisure and tourism activities is of particular interest, demonstrating that transporting bicycles on mass transit provides an effective solution by greatly expanding the range of sustainable mobility options during weekends and supporting tourism-related travel.

However, the limited space on public transport vehicles, especially buses, can make it hard to accommodate both passengers and bicycles. This issue exists on both sides of the Atlantic. In Boston, the Massachusetts Department of Transportation (MassDOT), which oversees statewide planning and infrastructure, is exploring ways to better incorporate active mobility into regional and rural bus services, mainly to increase access to open spaces and improve mobility equity in underserved communities.

In the Stuttgart Region, VRS, the regional transportation planning authority that oversees S-Bahn rail services and specific bus routes in areas not served by rail, has implemented practical and effective solutions to facilitate the transportation of bicycles on public transport (trains, trams, rack railroads, and buses). VRS is also the majority shareholder in the *Verkehrs- und Tarifverbund Stuttgart* (VVS), the Stuttgart Transport and Tariff Association[4].

The *Fahrrad2Go* programme, launched in 2013 by transport operators under the supervision of VVS, introduced bicycle transport solutions on selected suburban lines. The modifications involved both interior and exterior changes to the buses. Inside, three seats were removed to create a multifunctional area that can hold up to five bicycles. Externally, a vertical bike rack, designed by students from Hochschule Esslingen, was mounted at the rear, with capacity for an additional five bicycles. Bicycle loading is managed by a staff member, which slightly increases dwell times. The overall investment is approximately €25,000–30,000 ($29,200- 35,000 USD) per bus, around €6,000 ($7,000 USD) for the interior reconfiguration, and €25,000–30,000 ($29,200- 35,000 USD) for the rear rack.

Figure 1. Improved bicycle transport through project Fahrrad2Go. Special bracket for the rear of standard buses. Image courtesy of VVS.

Figure 2. Improved bicycle transport through the project Fahrrad2Go. Brackets inside buses. Image courtesy of VVS.

[4] http://vvs.de/

Special services for leisure activities, such as dedicated weekend routes designed for recreational and tourist travelers, have also been introduced. Buses are fitted with bicycle trailers attached to the rear, capable of carrying up to 15 bikes. Some services operate seasonally from spring to fall on selected routes, while others run year-round. The trailers, costing about €25,000 to €30,000 ($29,000 to $35,000 USD), are compatible with various bus types, and bicycles are loaded directly by the cyclists themselves.

Figure 2. Special bus services for leisure activities. Image courtesy of VVS.

Thanks to the Unified Fare System initiative by the State of Baden-Württemberg, bicycle transport fares have been standardised across the region, regardless of the operator. Bicycles can be brought on buses free of charge on weekends and after 18:30 hrs. Additionally, the Deutschlandticket, introduced in 2023, provides nationwide access to local public transportation in Germany for €58 ($68 USD) per month. It excludes long-distance trains but covers all regional services, including the buses featured in this case study.

These German experiences are informing MassDOT's ongoing work towards innovative, cost-efficient solutions that could bridge the gap between public transit and active travel in less densely populated areas.

RESULTS AND IMPACT

As the main state-level transportation agency, the Massachusetts Department of Transportation (MassDOT) manages road safety, enforces vehicle standards, designs infrastructure, and coordinates public transit across the Commonwealth, working with the Massachusetts Bay Transportation Authority (MBTA) and 15 Regional Transit Authorities (RTAs). Within MassDOT, *The Lab* has taken a leading role in exploring international best practices—showing strong interest in the Stuttgart Region's innovative approach to bicycle transport on buses. These German solutions could serve as models for new strategies to improve weekend and leisure access to natural areas across Massachusetts via public transit. One example of this potential is the pilot project Unlocking the Blue Hills, led by the Boston Region Metropolitan Planning Organization (MPO) in partnership with the MBTA and MassDOT. This pilot seeks to enhance public transit access to the Blue Hills Reservation, a 30 km² natural area featuring over 160 km of trails, lakes, picnic spots, and sports facilities, located less than 16 km from downtown Boston.

In 2021, the project was developed in response to strong community advocacy and a participatory planning process. Stakeholders identified a major obstacle: although two MBTA bus routes serve peripheral parts of the park, they are distant from its main attractions. Travel times can take up to 75 minutes by bus—compared to only 25–40 minutes by car from much farther locations. In spring 2024, the MBTA changed services to better connect Mattapan, a historically underserved neighborhood in Boston, with more central park entrances. The pilot is designed to be replicated for other recreational destinations across the Commonwealth.

If extended into summer 2026, Unlocking the Blue Hills could serve as a platform **to test the integration of bicycles on mass transit**, drawing direct inspiration from the Stuttgart Region's Fahrrad2Go programme and recreational bus services. Currently, MBTA buses offer front-mounted bike racks that can carry just two bicycles, which may not meet the growing demand. The lessons from VRS bicycle and public transport offerings could also be used by the 15 Regional Transit Authorities.

Learning from **VRS**, which operates weekend bus services with rear-mounted racks and detachable trailers capable of carrying up to 15 bicycles, **MassDOT** and its partners are exploring options to retrofit MBTA vehicles. A prospective pilot on **Route 716** to the Blue Hills would focus on external solutions, avoiding complex interior modifications. Options under review include:

- Rear-mounted bike racks with capacity for five bicycles.
- Towable trailers that can accommodate 10–15 bicycles.

This feasibility study—conducted in collaboration with the Department of Conservation and Recreation (DCR) and the MBTA—will evaluate equipment costs, technical compatibility, and regulatory requirements. It also aims to determine a feasible implementation timeline based on stakeholder involvement and funding availability.

MassDOT and VRS have been cooperating on topics related to sustainable urban mobility and transport since January 2024. The exchange of experiences and lessons has occurred through technical calls, study visits in both regions, and in-person meetings. This case has laid the foundation for a rich exchange of technical expertise and governance practices. Beyond technical solutions, the structured community engagement around *Unlocking the Blue Hills* provides a model that could inform public outreach strategies in the Stuttgart Region, especially as it develops a regional recreation concept involving broad-based citizen participation. Conversely, Massachusetts can benefit from

the performance monitoring and tariff integration frameworks already in place in Stuttgart. The collaboration also creates space for structured evaluation of pilot results, allowing both sides to iterate based on real-world data.

The pilot's success and scalability depend on the creation of a **robust monitoring and evaluation framework**. This would include:

- Passenger numbers on modified bus routes.
- Number of bicycles transported; occupancy rates of racks/trailers.
- User travel origins and socio-demographic data.
- Feedback from user satisfaction surveys.
- Visitor increases at key facilities or trailheads.
- Economic indicators (e.g., sales in local businesses along routes).
- Modal shift and estimated CO_2 savings.
- Comparison of travel times before and after pilot improvements.
- Manual counts or sensor data at trail access points.
- Online engagement metrics (e.g., website visits, map/app usage).

Both VRS and MassDOT use household-based demand models to monitor mobility patterns. These can help capture trip purposes, distances, and user behaviour, and support broader efforts to manage leisure-related travel sustainably.

KEY FIGURES

15 bicycles
planned expansion capacity of MBTA bike racks (currently two bicycles).

€25,000–30,000
($29,000 to $35,000 USD) investment per bus for bicycle transport solutions in Stuttgart

LESSONS LEARNED

Integrating bicycles enhances modal connectivity: Facilitating bicycle transport on buses expands the functional reach of public transport networks, particularly for leisure and tourism-related travel in peripheral areas.

Fare clarity and communication are key enablers: A harmonised, transparent fare system, combined with targeted public communication, significantly improves user uptake and operational coherence across operators.

Robust monitoring supports evidence-based decision-making: Continuous evaluation through demand modelling, user feedback, and performance indicators is essential to refine service delivery and assess replicability in other contexts.

Adaptable and scalable vehicle solutions are critical: Infrastructure modifications—such as external racks or trailers—must be cost-efficient, context-sensitive, and minimally disruptive to other transit users.

Participatory processes strengthen service design: Engaging communities in planning, as demonstrated in Boston, ensures services address real user needs, improve equity, and foster behavioural change.

THE INTERNATIONAL URBAN AND REGIONAL COOPERATION PROGRAMME IN NORTH AMERICA

The International Urban and Regional Cooperation program in North America (IURC NA), funded by the European Union, partners European cities with Canadian and USA cities to facilitate knowledge exchange through online tools, face-to-face interactions, study visits, participation in thematic and networking events, and capacity-building initiatives. Its activities support the achievement of policy objectives as well as major international agreements on urban development and climate change, such as the EU Urban Agenda, the UN Sustainable Development Goals, and the Paris Agreement. The program is part of a long-term strategy by the European Union to foster sustainable urban development in cooperation with the public and private sectors, researchers, innovators, community groups, and citizens. IURC NA is financed under the EU Foreign Policy Instruments and benefits from the strategic support of the Directorate-General for Regional and Urban Policy of the European Commission.

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Links to related outputs:

VVS Freizeitbussen
MBTA
The Lab @ MassDOT
Unlocking the Blue Hills

NATURE-BASED SOLUTIONS (NBS)

A technical session with delegates from Calgary during the study visit in Rome, October 2024.

Webinars

Circular Economy Primer: Promoting and Facilitating Change in Your City

January 24, 2024

Recording & Presentations

Mitigating Urban Floods with Nature-based Solutions

September 10, 2025

Recording & Presentations

Factsheet

Mitigating Urban Floods with Nature-based Solutions

Innovating with green infrastructure to address climate risks

Cities are leaders and innovators when it comes to utilizing Nature-based Solutions (NBS) to manage risks from extreme rainfall, surface water flooding, shortages, and water quality. In addition, cities adopting these solutions seek benefits on multiple fronts, such as improving quality of life in neighbourhoods lacking natural elements, diversifying landscapes, and providing recreational opportunities. There are varying experiences of how cities are integrating NBS to mitigate flooding risks, experimenting with different techniques, and involving communities to design, implement, and maintain the infrastructure. Peer networks for NBS, strong policy frameworks, and guidelines are helping to advance these practices.

The European Union has adopted robust policy frameworks to guide climate adaptation and Nature-based Solutions, such as the **EU Adaptation Strategy**, the **EU Biodiversity Strategy for 2030**, and the **European Green Deal**. EU initiatives, such as **Horizon Europe** pilot projects, NetworkNature, the New **European Bauhaus**, the **EU Green Infrastructure Strategy**, and the new **Urban Agenda for the EU**, are helping cities across Europe and internationally to test, scale up, and mainstream NBS. International cooperation and knowledge sharing through the IURC North America programme promote innovations and the implementation of a range of best practices to improve community resilience.

Boston leads the way with a Street Green Infrastructure Policy

Boston's implementation of green infrastructure is a comprehensive set of measures that begins with clear policy requirements, includes science-based designs, the selection of competent expertise and contractors for project designs and construction, community involvement in implementation, and maintenance and monitoring approaches that integrate community volunteers. Their approach is driven by three key goals: (1) Revenue generation; (2) assistance from the public; and (3) municipality-wide behaviour change. For the city, NBS also supports equity and environmental justice goals by prioritizing neighbourhoods that have been historically underserved by green infrastructure. Their **Street Green Infrastructure Policy** integrates stormwater management into public works and planning. Financing is secured through a **stormwater fee system**, supported by a **credit and grant program** to incentivize private property owners. The Boston Water and Sewer Commission issues permits with specific technical requirements and compliance with the Massachusetts Wetlands Regulations (**Stormwater Handbook**).

Key Lesson: Managing stormwater is expensive. Stormwater Utilities creates a designated funding source that ensures better stormwater management and more green infrastructure by employing a 'carrot' and 'stick' approach.

Figure 1. East Boston Early Education Center in Kate England's presentation from the IURC NA webinar Mitigating Urban Floods with Nature-based Solutions

Maintenance is addressed through dedicated contracts for landscape and porous paving, highlighting that green infrastructure also requires consistent and specialized care. However, **community engagement** is central to the approach. The Green Infrastructure Volunteer Program is a city-sponsored program, with City-branded gear, tools, and supplies. Volunteers receive maintenance training and resources from the City's Office of Green Infrastructure, enabling them to perform cleanup and beautification tasks on their own schedule. Programs like **"Thursdays with PowerCorps"** build green jobs while ensuring long-term maintenance. A digital application is also used for volunteers to report their observations by uploading photos and actions performed at the site. This is an integral part of the city's monitoring system, ensuring strategic and efficient use of resources.

Figure 2. Mary Ellen Welch Greenway in Kate England's presentation from the IURC NA webinar Mitigating Urban Floods with Nature-based Solutions

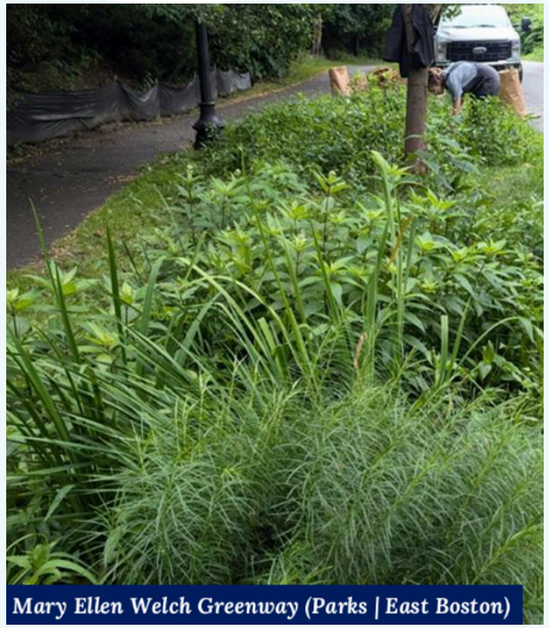


Figure 3. Mary Ellen Welch Greenway in Kate England's presentation from the IURC NA webinar Mitigating Urban Floods with Nature-based Solutions

Key lesson: Integrate and support volunteers as part of your system and provide a variety of tools, opportunities, and support programs to maintain their engagement and sense of ownership.

Calgary integrates nature-based solutions in its Stormwater Strategy

Calgary is a large city located at the confluence of two small rivers: the Bow and the Elbow Rivers. Wetlands historically provided natural flood control, but the vast majority have been lost to urbanization. Their 2023 Stormwater Strategy incorporates green stormwater infrastructure, aiming to mitigate the risks associated with high-intensity summer storms and prevent discharges to rivers and creeks that support sensitive aquatic ecosystems. The implementation of various techniques, such as naturalized wet ponds, constructed wetlands, bioretention, and resilient landscaping, aims to reduce flooding, improve water quality, and enhance watershed health. **Calgary's approach to stormwater** sets the long-term direction for proactive and collaborative stormwater management actions; they publish useful resources for homeowners as well as regulatory requirements and, the stormwater plan and budget.

Dale Hodges Park is a large project that integrates art, ecology, and engineering by transforming a gravel pit into a stormwater treatment park featuring wetlands, a forebay, and multi-use trails. It treats an impressive 1,800 hectares of neighbourhood runoff before it enters the Bow River.

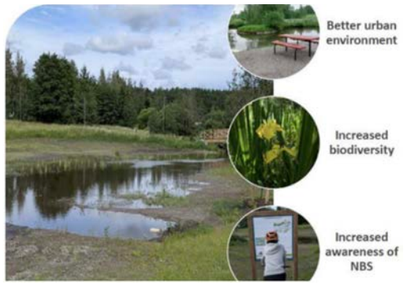
Figure 4. Calgary's Dale Hodges Park in Brier Reid's presentation from the IURC NA webinar Mitigating Urban Floods with Nature-based Solutions.

An interesting aspect of their approach is how they are looking to measure performance of the green infrastructure through targets adapted to climate change, including: peak flow rate, annual volume control, and water quality.

Key lessons:

- Policies require developers to maintain **pre-development release rates**, ensuring construction does not worsen flood risk.
- **Wetlands are both ecological and social assets**, embedded within stormwater planning and asset management systems.
- **Indigenous communities** were acknowledged in the Strategy, embedding cultural reconciliation into environmental planning.
- **Sediment removal and long-term wetland maintenance** are important for dynamic systems stewardship.
- **Governance innovation** is necessary: some NBS are maintained by city services, while others are entrusted to **neighbourhood volunteer programs,** supported by mobile apps and guidance.

The City Blues Project tests solutions in five countries bordering the Baltic Sea to guide cities



This unique project brought together five cities from Finland, Sweden, Estonia, Denmark and Norway to pilot different NBS that prevent flooding and make cities more liveable by bringing back nature into the city. The project's results and lessons are well documented and available on the **project's website** under the Solutions tab. They will be integrated into a web-based tool to assist cities in engaging stakeholders and managing stormwater through NBS.

The Tampere (Finland) project aimed to reduce flooding near Lake Iides, increase biodiversity and reduce invasive species, enable reproduction of the endangered brown trout, and create recreational value for residents. The project relied on studies and modelling to assess the impact of the proposed design, collaboration with the Finnish Wild Zone group, and voluntary events

Figure 5. Alluvial Meadow in Anna Vilhula's presentation from the IURC NA webinar, Mitigating Urban Floods with Nature-based Solutions.

Factsheet

Financing Urban Forests: How cities are leveraging carbon credits for greener futures

Cities have established themselves as pioneers in the deployment of nature-based solutions (NBS), utilising diverse strategies and techniques to achieve social and environmental goals. Increasingly, urban centres are exploring voluntary carbon markets as a novel mechanism to secure funding for conservation programs and climate mitigation initiatives. Through active participation in these markets and collaboration with certification organisations, municipalities are able to enhance the impact of their conservation investments by generating additional revenue streams.

Innovative approaches to Nature-based Solutions in cities

Achieving ambitious sustainability and urban forestry targets requires significant resources. The maintenance and stewardship of the urban forests is often underfunded, highlighting the need for alternative and innovative funding mechanisms. A carbon credit programme provides an opportunity to generate new revenue streams specifically earmarked for these essential activities. While only a small number of cities have developed operational strategies that formally integrate voluntary carbon markets within their wider sustainability agendas, many others are considering the opportunities to leverage their environmental assets. Voluntary carbon markets provide a platform for entities to buy and sell carbon credits, enabling the offsetting of emissions outside of mandatory regulatory frameworks. The role of certification organisations is crucial, as they validate that the carbon credits correspond to verifiable and quantifiable emissions reductions.

The European Union (EU) has adopted robust policy frameworks to guide climate adaptation and nature-based solutions such as the EU Adaptation Strategy, the EU Biodiversity Strategy for 2030, and the European Green Deal and the EU Urban Agenda. EU initiatives such as Horizon Europe pilot projects, NetworkNature, the EU Green Infrastructure Strategy, and the Urban Agenda for the EU, are helping cities across Europe and internationally to test, scale up, and mainstream nature-based solutions. International cooperation and knowledge sharing through the IURC promote innovations and the implementation of a range of best practices to improve community resilience.

Atlanta's leadership in climate action and community engagement

Atlanta is widely recognized as a global leader in environmental action, transparency, and its commitment to addressing the needs of marginalized communities. The city has established ambitious goals that are supported by several strategies (Clean Energy Plan, Resilient Atlanta Strategy, Climate Action Plan, 2020 Fresh Food Access Report, EV Readiness Ordinance). More recently, Atlanta is creating its first Climate Resilience Plan building on their information baseline and incorporating input from citizens, communities of interest, stakeholders, and city departments to ensure a holistic approach. This input is providing insights into how Atlanta's three primary climate challenges — extreme heat, drought, and flooding — affect the city's different populations and provides recommendations on how the city can respond at municipal and neighborhood levels to make the city more equitable and more resilient.

Atlanta's goals

1. **Clean Energy** – 100% Clean Energy for All Atlantans by 2035
2. **Climate** – Reduce Greenhouse Gas (GHG) emissions by 59% by 2030
3. **Community** - Reduce Energy Burden for 10% of the Most Energy Burdened Households
4. **Transportation** - Fully Transition Municipal Fleet to Zero Emission Vehicles by 2040
5. **Urban Agriculture & Food Systems** – Fresh, Healthy Food Access within .5 accessible mile of ALL Atlantans by 2030

The Climate Resilience Plan will broaden Atlanta's focus beyond clean energy, integrating additional critical objectives to better address the ways in which Atlanta is being affected by climate change. Atlanta's approach emphasizes "multi-solving"—the principle that effective climate and sustainability strategies must deliver multiple co-benefits. This means not only tackling the direct impacts of climate change but also generating positive outcomes for health, social equity, and community resilience.

Figure 1: Presentation from Chandra Farley, Chief Sustainability Officer at the City of Atlanta, for the IURC NA webinar Financing Urban Forests: How Cities are Leveraging Carbon Credits for Greener Futures on November 20th, 2025.

A carbon credit program: innovative revenue generation

Atlanta values urban forests and green infrastructure for stormwater management, air quality, and biodiversity. The city seeks to provide every resident with greenspace access within a half-mile walk, supporting equity and community health. Revenue from the carbon credit program contributes funds towards urban forestry, climate resilience, and community projects, ensuring sustainable investment in green initiatives and broader social benefits.

Atlanta partnered with City Forest Credits, a national nonprofit carbon registry that manages carbon and impact standards for metropolitan areas in the US. They connect conservation and urban forest leaders to a new source of funding; empower companies to invest in local climate action, and develop national carbon protocols with leading national urban forest and forest carbon scientists and professionals. The organisation provides **the Impact Scorecard**, a science-based and quantification tool to help design projects with communities, ensuring their needs are met and benefits maximised.

Rule book for verified carbon projects

- Expert forest scientists and urban forest professionals on protocol drafting group
- 26 - year commitment for planting
- 40 or 100- year commitment for preservation
- Rules for location, site ownership, quantification, third-party verification, monitoring, and more
- Robust and secure system to issue and track credits

The city's first carbon credit project was **the Lake Charlotte Nature Preserve**, which safeguards nearly 200 acres of forested land, ensuring protection from future development within the city limits. The Conservation Fund saved the property from industrial development by purchasing it from Waste Management and selling it to the City of Atlanta for permanent protection. This purchase marked the first time the tree recompense fund was used to protect trees, instead of planting new ones.

Key project metrics include the generation of 36,365 tons of CO_2 carbon credits and projected revenue of approximately $1 to $1.2 million (858,000-1 million Euros), based on a sale price of $30–$35 (26- 30 Euros) per ton. Additionally, the project offers an estimated $4 million (3.43 million Euros) in ecosystem services over 40 years. **Once the process is established to sell the carbon credits, a percentage of the revenue stays for other sustainability projects, and the rest goes to the Department of Parks and Recreation for preservation and development.**

Public education material has also been developed to profile the work and benefits of the Lake Charlotte project, including easily accessible detailed reports on the project design and verification.

The City Forest Credit (CFC) process

Figure 2: Presentation from Chandra Farley, Chief Sustainability Officer at the City of Atlanta, for the IURC NA webinar Financing Urban Forests: How Cities are Leveraging Carbon Credits for Greener Futures on November 20th, 2025.

Scaling up Atlanta's carbon credit program

The success of the Lake Charlotte project allowed officials to propose the expansion of the program to include four new sites that will add over 200 acres of mature forest (Southwest, Utoy Creek, Mount Zion, and South River). The Mayor's Office of Sustainability and Resilience has been working with Sustainable Capital Advisors, and the City's procurement department to sell carbon credits and create a model process that would apply equally to the city's other environmental attributes such as renewable energy credits).

Sharing lessons with peer cities

Toronto, Canada shares similar goals and challenges. City council has adopted the Offset Credit Policy to govern its approach for achieving the Net Zero corporate emissions by 2040. They are working to secure innovative financing to increase tree canopy to meet their goal of 40% tree cover by 2050. More recently, it has adopted its first 10-year Circular Economy Roadmap that will orient how it uses and manages resources in the future.

Securing dedicated funding to preserve and maintain the extensive ravine system and existing tree canopy is a challenge. The experience from Atlanta provides a valuable template and identifies opportunities.

Toronto : A city within a ravine

- 11.5 million trees covering 28% of territory
- 11,000 he of ravines covering 17%
- Invested CAD92M (56.58 M Euros) in 2025 for urban forestry
- Ravines are estimated to contribute 822M (505.6 M Euros) in ecosystem services and 2.4M (1.5 M Euros) in carbon sequestration

Key learnings on setting and scaling a city-led carbon credit program

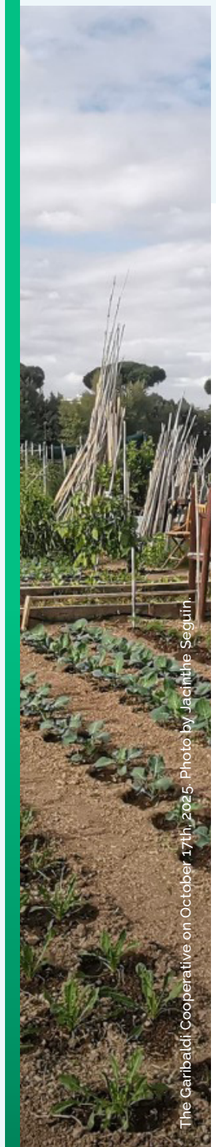
- Collaboration with a **certification organisation** is required, and all established protocol standards relevant to the project type must be met.
- Developing broad, robust **partnerships across internal departments** is critical for ensuring projects fulfil certification requirements and establishing an appropriate legal framework for contracts.
- **A long-term commitment** to conservation and maintenance (e.g., 40 years) is mandated by certification protocols, necessitating annual reporting within this period. Securing city buy-in may be challenging, but it remains vital.
- It is imperative to **articulate the economic rationale**, with benefits quantified as part of the process. Initial costs include application, verification, third-party certification, and the establishment of the legal framework; additional costs payable to the third-party partner occur at the point of sale.
- Legislating the **distribution or use of revenues**, alongside clearly defining partners' responsibilities to ensure compliance, is considered best practice.
- **Quantification and reporting** are integral to the process: appropriate tools are required for measuring benefits, and regular reporting is necessary.
- **Cross-sector benefits** must be addressed: certification of carbon credit projects demands the quantification of a variety of potential advantages, including impacts on human health, equity, and the environment, beyond CO_2 credit generation alone.
- Engaging the **community and stakeholders** in project design is recommended to maximize overall benefits.
- The ultimate revenue stream is contingent on market forces; however, engaging sustainability consultants to conduct outreach to the **business community** and leveraging major events (such as the FIFA World Cup) can enhance outcomes.

This factsheet was based on the webinar Circular Economy Primer: Promoting and facilitating change in your city All photos on pages 151 and 154 are from presentations by **Joanne Gauci, Oriana Romano, Jacinthe Seguin and Françoise Bonnet.**

Networking Event & Takeaways

Striving For Sustainable, Inclusive And Resilient Food Systems

Lessons from Rome and IURC urban leaders



In collaboration with the region of Anci-Lazio - Rome and its partners, the IURC-NA programme organized a thematic event focused on the leadership of cities to create more inclusive, resilient and sustainable urban food systems. On October 16-17, 16 delegates from cities in Canada, the United States, and Europe gathered to learn about the ambitious and comprehensive undertaking of the Anci-Lazio - Rome region to enhance access to affordable and nutritious food and support the viability of a regional agricultural system. Participants also shared their own experiences in establishing governance and regulations, mobilizing stakeholders, educating communities, supporting producers, and cultural practices to create more sustainable and resilient food systems. In doing so, participants also reflected on how they can connect and collaborate with each other to advance their own work on local or regional food systems.

Strategic policies, tools and initiatives for a sustainable food system in the European Union

The European Union's (EU) strategy for maintaining a reliable and accessible food supply through sustainable agricultural practices is grounded in key frameworks such as the Common Agricultural Policy (CAP). The CAP advances objectives including food security, stable farm incomes, environmental stewardship, and the development of rural communities. The Farm to Fork Strategy launched in 2020, part of the European Green Deal, advances a fair and sustainable food system while the EU Biodiversity Strategy for 2030 and the European Climate Law further promote biodiversity and climate resilience in farming.

Aligned with its foundational policies, the Sustainable Food Systems Framework Initiative plays a pivotal role in shaping the future development of Europe's food systems. Key financial instruments, including the European Regional Development Fund, Cohesion Fund, and Horizon Europe, provide critical support for sustainable agricultural practices and sector-wide innovation. The Food 2030 initiative is the EU's main research and innovation framework for promoting sustainable, healthy, and inclusive food systems. It uses a multi-stakeholder approach across the entire food value chain, from production to waste management. A recent report Shaping the future of food research and innovation was commissioned to identify gaps and opportunities and recommend improvements for a future program.

This comprehensive approach has informed the establishment of the Horizon Europe Sustainable Food Systems Partnership for People, Planet and Climate and directly contributes to the aims of the EU Mission: A Soil Deal for Europe. Many projects are supporting new regional and urban approaches. For example, the EU's Urban Agenda Food Partnership enables cities to support sustainable food systems. Globally, the Milan Urban Food Policy Pact engages cities in efforts to share and promote best practices for food system sustainability. These and other collective initiatives and targeted projects are essential for driving the transformation towards sustainable agriculture and resilient food systems in Europe.

Rome Food Policy: Community activism, political engagement and multistakeholder governance to transform the region's food system

> **Cities must stop being passive centers of consumption and become active agents of change**
>
> **Sabrina Alfonsi,**
> **Councilor for the Environment,**
> City of Rome

Rome made a commitment to develop an integrated food policy under the Milan Urban Food Policy Pact, a global initiative which it signed in 2016. In 2018, a group of stakeholders mobilized their efforts to raise awareness and explore solutions, leading to the identification of gaps and priority areas for intervention. The mapping and analysis of Rome's food system provided a framework for development of the integrated food policy by giving a better understanding of challenges, key issues to address and the priority actions that need to be taken by the city and its network. The **Food Atlas** served as an initial step in creating a collective path involving all 121 municipalities within the metropolitan area.

In 2021, the city of Rome adopted a Food Policy for metropolitan Rome, establishing three key instruments: the **Food Council,** the **Food Plan**, and the **Technical Office**, which is responsible for implementing the food policy. This resolution represented a "landmark achievement of a bottom-up process involving over 50 organisations, that sought to secure buy-in from policy makers to develop an integrated food policy that both addresses food-related challenges and leverages existing food system strengths to help tackle other urban challenges"[1].

The conceptual framework behind the Rome food policy process is the city-region food system approach referring to a large urban centre or conglomeration of smaller urban centres and their surrounding peri-urban region and rural hinterland. The City-Region Food System (CRFS) seeks to convene all the actors, processes and relationships that are involved in food production, processing, distribution and consumption in the defined area and foster linkages across key challenges such as food security, economic development, water and waste management, energy, transport, health, climate change, governance and spatial planning.

Proposal and priority areas

The food system mapping identified ten priority areas for action:

1. Access to land, water and agro-biodiversity
2. Support for sustainable agriculture, organic farming and agro-ecology
3. Short supply chains and local markets
4. Supply chain integration & green public procurement
5. Labelling & traceability of supply chains
6. Waste management, food redistribution, recovery of surpluses
7. Promotion of multi-functionality
8. Food & environmental education
9. Curbing land consumption and degradation
10. Resilience planning: green infrastructures and services

[1] www.foodactioncities.org/case-studies/bottom-up

In recent years, a succession of events (the pandemic, Russia's war of aggression against Ukraine) and mounting climate stresses among others, have exposed the vulnerabilities of the regional food system and eroded the relationship between the consumers and their food sources. The work of the Food Council in implementing the Food Policy is critical in addressing these vulnerabilities. **The Food Policy Council** consists of non-governmental stakeholders along with representatives from pertinent municipal departments. Characterised by inclusive governance and collaborative frameworks, Rome's Food Policy is designed to promote sustainability, embed circular economy principles, and strengthen resilience within the city's food system.

The Council has organised its work according to seven directing issue tables that reflect the goals of the resolution: (i) food governance, (ii) access to resources, local production and agroecology, (iii) markets, local food and logistics, (iv) solidarity economy and alternative food networks, (v) combating food waste and poverty, (vi) school catering, public procurement and food education, and (vii) food culture, catering and food processing. The City of Rome for its part works on developing tools and supporting local boroughs' priorities. Municipal leverage includes: procurement, regulations and policy framework, financial tools and incentives, leadership by examples and supporting social organisations and business ecosystems.

Key messages

+ A genuine food policy must include a focus on supporting local agriculture at its core.
+ Treating food as a public good prevents reliance solely on market forces, which may overlook wellbeing and environmental sustainability.
+ While long-term change takes time, we can begin by:

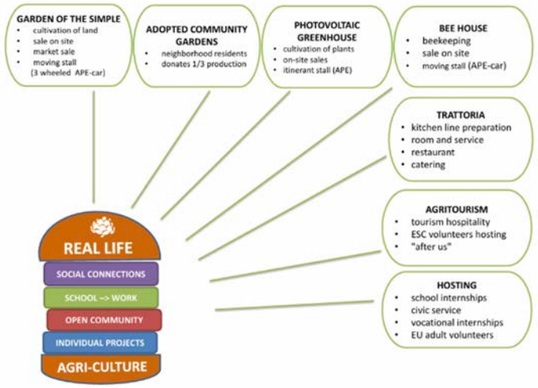
- Strengthening local supply chains
- Investing in processing and distribution infrastructure to support farmers
- Linking agriculture to local markets like restaurants, schools, and public institutions
- Expanding community-supported agriculture and farmers markets
- Including local and organic products in school and public tenders
- Using public lands as incubators to train and support new farmers with mentorship and credit access

+ An effective food policy should integrate **land, training, local production, public procurement, and fair markets.**

Field visits highlights

Guiseppe Garibaldi: Social Integrated Agricultural Cooperative

Founded in 2010, the **Garibaldi cooperative** is owned by students with autism spectrum disorder and their families. It is a farm, type B cooperative, and a workplace for its members. Members also receive individualised support they need in order to be productive through educational operators and peer mediators paid for by each family. The site has diverse operations (Figure 1) that are multidisciplinary and multidimensional that contribute to productive activities, social relationships, active inclusion, and quality of life. The cooperative is an innovative model of social integration and urban agriculture. Participants experienced a delicious three-course luncheon at the cooperative's restaurant operated by its members.



Source: Presentation by Andrea Messori, Replay Network

Delegates from the EU, US, and Canada visiting the Garibaldi Cooperative on October 17th, 2025. Photo by Blerina Qerimi and Jacinthe Seguin

Urban Community Gardens as a common good

Rome is home to a network of community gardens, known as Orti in Comune. Through the European project RU:RBAN 2nd wave, a proposal for new regulations is being considered through various deliberative processes (https://gardeniser.eu/en/resources/romes-urban-community-gardens-regulation-proposal). Land is usually entrusted to community gardens free of charge, and projects engage the local community in defining its own targets and how it will operate, focusing on sustainable urbanisation, increased community resilience, intergenerational dialogue, and intercultural dialogue.

Urban Community Gardens are accessible spaces that foster neighbourhood interaction, self-governance, and a sense of community. While they promote sharing and learning, they tend to be less efficient than commercial agriculture due to higher water use, faster tool wear, limited expertise, and sometimes unsuitable crop choices. In an urban community garden, the Gardeniser (garden + organiser) plays a supportive and mediating role, accompanying the development of actions for gardeners and the purposeful interaction with citizens, external groups engaged in the area, and nearby institutions.

Delegates from the EU countries, United States and Canada visiting the Garibaldi Cooperative on October 17th, 2025. Photos by Jacinthe Seguin.

Source: https://gardeniser.eu/en/toolbox-urban-gardens#

“In the community garden, for every square meter of land cultivated by an individual gardener, many other people get activated, who cultivate positive, social, educational , cultural and environmental externalities.”

Andrea Messori,
REPLAY Network

Conclusions

Local governments play a pivotal role in supporting t establishment and functioning of community gardens. By providing effective guidance and coordination, they help transform these gardens into vibrant hubs that embody the city's public policies and social objectives. As shown in Rome, this is achieved through fostering active citizen participation, ensuring that community members have a meaningful role in shaping the direction and activities of their local gardens.

An essential responsibility for local authorities is to act as guarantors for community organisations wishing to invest in the development of urban community gardens and facilitating access to land in the city to establish community gardens. This involves not only safeguarding the interests of these organisations but also enabling the growth and sustainability of the gardens themselves. By fulfilling this role, local governments help create a supportive environment in which community gardens can thrive and contribute to broader urban goals.

Lessons from food policy urban leaders

The contribution of delegates from 16 cities during the event revealed a wide range of local government practices and innovations related to food policies, urban agriculture, and organic waste management. Some are single-purpose initiatives, while others involve comprehensive strategies connecting social goals to environmental, land use, and economic plans and actions. While intersectoral and food chain approaches involve systems that can operate beyond the city-region, local governments are showing their ability and unique role in fostering connections and collaborations that support local agriculture and deliver positive social and environmental outcomes.

Food strategies & goals

- **Coimbra, Portugal**, developed a comprehensive Food Strategy for 2022-2030 that touches on sustainability, access to health foods, cultural heritage and education in schools.
- **Barcelona Metropolitan Area, Spain,** carried out several studies (2014-19) before creating their 1st Metropolitan Food Policy Action Plan from **2021-2023 (7 pillars, 32 actions) followed by their second plan 2025-2027 (5 pillars, 28 lines of action). The scope of their work, engagement of the food sector and their matrix with 50 indicators is among the most extensive by a metropolitan area.**
- **Austin Texas, the Travis County Food Plan** adopted in 2024 was co-created through community engagement and sets clear goals and strategies to move towards a more equitable, sustainable and resilient food system. Their focus is (1) access to food and affordability, and; (2) local food production and agriculture.
- **Rome, Italy adopted its Food Plan in 2022** including 10 lines of action and a Technical Office to support implementation.
- **Bergamo, Italy** adopted the **Bergamo Food Policy Manifesto (2023)** and a powerful new **Land Use Plan (2025)** created a green belt surrounding the city with 800 000 m2 of agricultural areas.
- **Toronto, Canada** was an early adopter of a **Food Policy in 1991** which led to a range of programs spread across many city departments, including those addressing food insecurity. Interest is growing to update **Toronto's Food Charter.**

Multistakeholder engagement & governance

- **Coimbra's** Food Strategy is managed by an I**ntermunicipal Executive Secretariat**, supervised by the Intermunicipal Council composed of 19 Mayors of the Region.
- **Atlanta, USA,** is building on a suite of programs dating back to 2007 and engaging stakeholders to define Atlanta's **Food Future.** The extensive collaboration involving Community Listening Sessions and consultation are defining the next steps for the establishment of the future food council.
- **Austin's Food Plan** relied on **extensive participatory process** and involves a well coordinated group of actors: consultants and city staff in designing, a community advisory community to guide and approve, the city & county executive leadership to review and course correct and the Austing Travis County Policy Board to support and advise.
- **Pittsburgh, USA** has a robust nonprofit community that monitors indicators (e.g., the Pittsburgh Food Policy Council, Grow PGH, and multiple foundations).
- **Rome, Italy** implements its Food Policy through a multistakeholder **Food Council** that is supported by a set of 6 issue table committees.

Strategic policies & community investments

- **San Francisco, USA**, is also a pioneer of food related policies and programs since the 2000s. Their **Edible Food Recovery Law (2024) and Climate Action Plan & Zero Waste Targets (2019)** have provided education and technical assistance helping fund partnerships between generators and food recovery organizations. The Local Directive 2009 "Healthy and Sustainable Food for San Francisco" has driven **hospitals and jails to adopt the Good Food Purchasing Standards and sets baseline targets.**
- **Nanaimo, Canada** adopted strategic directions for food security in 2022. **The policy** supports sustainable food systems, local food production, access to healthy food and integration of food systems into community planning.
- In **Albuquerque, USA,** political commitment led to the Albuquerque Food and Agriculture Action Plan (2019) and the creation of a **Local Agricultural Coordinator** who connects urban agriculture networks, activates vacant lots, and provides technical support to community gardens and composting initiatives.
- In **Toronto,** small investments in Community Engagement and Economic Development Gardens have transformed unused outdoor space into community-drive initiatives that build skills, generate income, reduce social isolation, improve food security and contribute to local sustainable food system.
- In **St. John's, Canada,** the Healthy City Strategy prioritizes equitable access to services and community wellbeing, creating opportunities for food security actions and cross-sector collaboration. It provided space and supported partnerships with local non-profits focused on food and poverty reduction (Food First NL, Stella's Circle), enabling hub-style service delivery and program coordination.
- **Granada, Spain** first created a **network of leisure gardens** to provide contact with nature and healthy food production for the elderly which grew in popularity and now is also targeting children learning and other social groups.

Food education and school programs

- **Umea, Sweden** implemented the **SchoolFood4Change** project to support local producers and create a long-term transition to healthy and sustainable eating habits among children and young people. **Their goal is 50% organic and 50% local food in public canteens** and their measures are supported by empirical data and monitored results.
- **The Good Canteen project in Bergamo,** as part of the European Food Trails Project is working to increase local food products in school canteens and raise awareness of the **ecological food foodprint.** The **Green Menu** logo promoted local products.
- In **Albuquerque**, pilot programs to reduce food waste and support composting in schools are being implemented.
- In **Braga, Portugal** the 22nd edition of the Map for Healthy and Sustainable Eating promotes local, seasonal and sustainable foods and features recipes from a local chef. The tool is integrated into schools, municipal events and family education.
- In **Sofia, Bulgaria,** in the central areas of the city, it established a commercial **food waste collection system** involving specialized containers that are serviced on a schedule. The collected food waste is then transported to the municipal biological treatment plant where it undergoes anaerobic digestion to produce biogas.
- **GZM, Poland** began talking about food policy with municipalities and a focus has been to reduce the amount of biodegradable waste. We cooperate by sharing best practices with other cities in Poland (f.e. Kraków, Wrocław) that have already introduced food policies, as well as with the GRUNT Food Strategy Institute from Warszawa.

Land-use actions and agriculture support

- **In Pittsburgh, USA,** the City is seeking input on the potential expansion of **city greenways** to reflect how the community envisions that these new green spaces should be utilized including orchard and community gardens.
- **In Nanaimo, the Island Roots Market Coop operates year-round at Beban Park** and includes a learning garden, supports over 38 vendors, and fosters community engagement. In 2023, it welcomed 22,900 visitors and generated $1.5M in economic impact. The seasonal Cedar Farmers Market added $3.6M in impact and 58,900 visits.
- **Austin, USA** is developing **Asset Maps in support of local agriculture initiatives** and engaging local farmers through focus groups as a first step in their Travis County Food Plan.
- In **St. John's, O'Brien Farm serves as an agricultural incubator** through its New Found Farmers program, giving new-entrant farmers access to land, mentorship, equipment and supports to help them grow local food and start up farming enterprises.
- **Granada** is leading a **regreening strategy** to connect green spaces with urban neighbourhoods, creating nature corridors, a green city perimeter, new innovative public spaces and neighbourhood planting education.

Reflections on these shared practices and lessons from Rome

1. **Food policies are not just about local agriculture but about equity, inclusion, health and dignity:** The right to food is as a much about quality of food and dignity as it is about quantity of food; the experience of Rome and others reinforced the fundamental role of food and food production in social equity, community building, climate mitigation/adaptation, environmental stewardship, economic development & equity.
2. **Strategies and food plans guide cities and bring stakeholders together:** Engagement is at the core of all strategies and a key ingredient for sustainable implementation. There were many different models of engagement, partnerships and co-creation between local governments and civil society that can serve as examples and inspiration.
3. **Cities play many roles: creating visions, recognizing the needs of underserved populations, fostering bonds and networks, providing access, supporting community groups, rallying businesses, protecting land, and monitoring change, among others.** Cities recognised their shared challenges. The exchange of information between cities inspired new ideas and provided tools that can be adapted to different circumstances.
4. **Cities must invest in land use policies to support regional production and urban agriculture.** Some cities are inspired by their zero land consumption as a concept/goal, and others by programs to repurpose vacant lots, support community gardens, local infrastructure, and markets.
5. **Education creates bonds in the community - from nutrition to food waste to local agriculture and cultural practices.** Community gardens can transform attitudes and approaches to food within a community, serving as a learning and networking hub. School education programs are important channels for learning about local food production, food culture, and nutrition.
6. **Importance of monitoring and collecting real data to support this long-term agenda.** Some monitoring and measurement are starting to emerge, but creative solutions to evaluating food and agriculture policy work need to be expanded and shared.

The Garibaldi Cooperative in Rome.

Delegates from EU countries, the US and Canada during the IURC NA Nature-Based Solutions event in Rome, October 2025.

Next steps

The presentations and exchanges during the event inspired participants to continue their efforts. City delegates reflected on actionable solutions and next steps:

+ Follow-up with IURC peer cities on specific initiatives to help advance one's own work;

- Participants will reach out to see how best to engage and integrate food and urban gardens in their urban forest masterplan;
- San Francisco will share its refuse collection program details with peers such as representatives from Austin and Albuquerque;

+ Push policy, ideas, or new goals forward; for example:

- Delegates will investigate opportunities for engagement such as the creation of a community advisory committee;
- Cities will do a deeper analysis of governance options, such as the creation of a Food Council to support the implementation of their own food strategy;

+ Sharing key takeaways, learnings, and new contacts with unit colleagues and other city departments. For example,

- Participants will plan a lunch and learn event for colleagues to share key learning and practices from IURC peers
- Delegates will reach out to colleagues working on the upcoming Food Summit to set ambitious goals, such as the local food & local agricultural support.

+ Explore a new project based on the exchanges, for example,

- Cities will evaluate implementing the Gardenizer model in their city;
- They will explore how the city can develop a rent-a-lot program for community gardens;
- And examine opportunities for food education and programs for children;

+ Reach out to local stakeholders to explore new ideas. For example,

- Italian peers will reach out to creative cities of gastronomy in the region to enquire about their food policies;
- And explore how to engage all citizens in community gardens,

Delegates from EU countries, the US and Canada during the IURC NA Nature-Based Solutions event in Rome, October 2025.

Best Practice

The Transformative Power of Urban Agriculture

From community gardens, urban food forests to rooftop and vertical farms, **urban agriculture** is evolving as a powerful tool to transform unused spaces into productive growing areas that offer a wide range of benefits to local communities. For many local governments, urban and peri-urban agriculture is not just a way to address local food insecurity but also about reconnecting people with the source of their food, helping to create community networks, supporting healthy living and biodiversity goals, making cities greener and more resilient to climate change.

Investments range from neighborhood initiatives to legislative and policy measures, research and advocacy, to comprehensive strategies that convene stakeholders to revitalize neighborhoods, catalyze innovation and build knowledge to develop local food systems to address food insecurity with the support of federal, state and local government funding.

Outstanding examples of vision and collaboration

Three initiatives showcase exceptional visions, the critical role of cities and collaborations in sustaining and growing urban and peri-urban agriculture to benefit community harmony, healthy living and the environment. These examples prove that challenges can be overcome for new models of agriculture to expand.

A network of cities working together in France to preserve peri-urban agriculture: *Terres en ville*

Elected officials and farming stakeholders from across France have been working together since 2000 through the **'Association Terres en ville'** to help sustain agricultural and forestry operations in peri-urban zones in the face of growing urbanization and amalgamation of rural communities. It is a unique forum that brings together elected officials and local players involved in the sustainability of agriculture in urban and peri-urban areas. Directed by their Charter, the network pursues 3 main objectives through dialogue and projects:

1. Know-how exchange between members
2. Joint experimentation
3. Contribute to the debate on cities and agriculture[1]

Monitoring and supporting the alignment of urban planning with food policies is an important function of the group that is well supported by in-depth cities' analyses[2] . The resulting plans detail actions to be taken to sustain local food systems, mitigate pressures, address priorities, and educate to also preserve the gastronomic heritage. Their work is extensive, evidence-based and reflects the value of local agriculture in France as well the importance of collective stewardship of the land. Their website offers a wealth of information (in French), including promoting training through the **AESOP4Food program**[3].

A city investing in its historical roots : Philadelphia's comprehensive plan to create a sustainable urban agriculture economy

Philadelphia has a history of agricultural practices nurtured by residents for generations. In 2014, the Farm Philly program was initiated by the department of Parks & Recreation to support some 60 agriculture projects on the lands it managed (e.g. youth education gardens, community gardens, vegetable farms, orchards, composting programs and a public greenhouse to grow seeds). In 2019, it raised its ambition by adopting a city-wide 10-year plan that serves as a road-map to develop a thriving local food system and urban agricultural economy [4]. The plan identifies resources, policies and programs to grow urban agriculture opportunities for all

residents and provides recommendations to the city and its partners for investing in agriculture and food justice.

Three public meetings provided the inspiration, feedback and recommendations regarding the systems, structures, resources, and policies necessary to sustain and grow urban agriculture in Philadelphia and nurture a more just local food system. The city implements several programs to support gardening, propagation, youth education and a critical Land Access Program **which contributes to expanding the 450 active urban agriculture spaces and 130 acres dedicated to urban agriculture in the city**. Farm Philly has also assembled a wealth of information and resources on its website to support stakeholders efforts and engagement[5].

10-year Urban Agriculture Plan Goals

- Land: Increase land security for growers, access to growing space in all neighborhoods, and stewardship of the land.
- Production: Build long-term support for urban agriculture initiatives into the City's infrastructure, policies, and programs.
- Preparation & Distribution: Invest in existing and new local systems necessary to support a sustainable, just, and equitable food system.
- Consumption: Build long-term support for locally sourced, nutritious meals and increased fresh food access into the City's infrastructure, policies, and programs.
- Food Waste Reduction: Be accountable to existing zero-waste commitments and create new ones.
- People: Recognize the role urban agriculture can play in the lives and livelihoods of people and communities.

https://farmphilly.org/urban-agricultural-plan

Urban Food Forests – creating edible ecosystems : *Boston Food Forest Coalition*

A food forest is a diverse arrangement of plants that attempts to mimic the ecosystems and patterns found in nature[6]. While providing healthy seasonal foods, these forests also provide useful tree canopy during hot weather, mitigate erosion, improve biodiversity and sequester carbon.

The Boston Food Forest Coalition is an innovative community land management model based on a community land trust (CTL). Their mission is to reclaim vacant urban spaces and design them as edible community sites prioritizing neighborhoods with less access to parkland. Each food forest has its own stewardship team that determines the vision for the site and ensures its maintenance while supporting the efforts of the broader coalition.

The city of Boston is the partner that transfers city-owned plots of land into the CTL which then become legally protected from development and available to the stewards for food forest gardening, educational classes and events. The food forest is a complement to Boston's urban forest plan which guides how the community can work together to improve the health, longevity and density of the tree canopy[7] .

1.https://terresenvilles.org/lassociation/
2.https://terresenvilles.org/wp-content/uploads/2022/01/Tev_Planif_Fiche_urbanisation_Nantes_VF.pdf
3. AESOP4Food seminar 2024 - WIKI Landscape Portal
4. Urban Agriculture Plan - Farm Philly- https://farmphilly.org/urban-agricultural-plan
5. https://farmphilly.org/resources/
6. https://www.bostonfoodforest.org
7. https://www.boston.gov/departments/parks-and-recreation/urban-forest-plan

Best Practice

Green Infrastructure to Mitigate Urban Heat Island

Since 2017, the **International Urban and Regional Cooperation** (IURC) program has been supporting Nature Based Solutions initiatives through knowledge exchange via study visits, networking events or online webinars, helping local governments integrate these ecosystem-based approaches into urban planning. The EU Green Deal and the EU Biodiversity Strategy for 2030 reinforce this approach through international collaboration to foster sustainable urban resilience, combat climate change and improve biodiversity in urban areas worldwide.

Context

The heat island phenomenon has been increasing steadily in cities around the world exacerbating the effects of **increased temperatures and heat waves.** Among known causes are the loss of vegetation and tree canopy, surfaces that capture solar energy and retain heat (e.g., pavement, dark roofs), densification of built space and increase in impermeable surfaces. It is not unusual to find significant variations in temperatures in the same city[1] . Urban heat islands (UHI) are of particular concern for public health, especially seniors, children and the most vulnerable neighbourhoods which often lack access to cooling spaces.

Green infrastructure to address UHI is often classified in one of three category of nature based solutions (NBS): conservation and restoration of ecosystems and biodiversity; sustainable management and climate-proofing of ecosystems, and; engineered ecosystem solutions (e.g. green roofs, facades, etc.)[2]. **There are a range of tools and modelling techniques at different scales that can help compare potential benefits of specific NBS measures** or combinations, to inform decision making [3] . There are many successful approaches from which to learn and improve the outcomes of green infrastructure investments.

Greening Hamburg's roofs: an early adopter is combining regulations, science, incentives and dialogue to maximize the benefits of green roofs in the city

Hamburg (pop. 1.8 million) was a green roof pioneer in the 1980's and later in 2015, the first city in Germany with a comprehensive green roof strategy. Housing requirements for a growing population, changes in rainfall patterns and increasing temperatures were exacerbating the impacts of extreme heat in the city.

Their comprehensive green roof plan[4] to promote green roofs and facades relies on a combination of policy, building requirements, financial incentives and public engagement to improve the city's rainwater retention capacity, reduce extreme temperature effects, provide additional green leisure areas and increase biodiversity. The implementation is not without its challenges as it competes with other city goals and must address reluctance to change by industry and public acceptance.

Since 2014, 30Ha of green roofs have been implemented (35% on housing, 35% on industrial and business premises and 25% on other buildings). There are some 10 000 planning and building permissions for housing units processed yearly and most of those with green roofs are underway.

The city took a systemic approach and used NBS quality indicators and regulations on the surface and thickness of the green roofs instead of the more conventional water retention capacity. The installations came in many forms, from moss-based roofs on existing buildings to full landscapes with small ponds and groves on new ones.

Regulations are reviewed regularly in collaboration with stakeholders. **The initial investment of EUR 3,5 million was renewed in 2023 until 2026** where property owners can receive grants **covering 40-60% of costs for their installations**. The green roof plan is complemented by a commitment to implement a city-wide network of green spaces by 2030 linking the city's outer ring with its dynamic centre through a series of walking and cycling-friendly regenerated habitats[5]

Montreal: Mobilizing community action and creating learning tools

Montreal has two decades of experience in working to mitigate heat island effects on its territory. The mobilization of community groups to delivered NBS is a stand-out element of their efforts. Financed by the Quebec Government's 2013-2020 Climate Change Adaptation Strategy, the CRE-Montréal, a non-profit organization, launched a 9-year program (ILEAU)[6] to improve the lives of residents of Montreal's eastern boroughs where there is a high proportion of low-income residents, a shorter-than-average life expectancy and a lack of green space. ILEAU partnered with public, private, and non-profit organizations to fund and implement practical UHI reduction projects using evidence-based criteria and maps developed by researchers at McGill University showing where to prioritize greening projects to create a network of green spaces that maximizes cooling benefits and biodiversity. ILEAU played a critical role in raising awareness in the community and developing tools to guide local efforts.

Montreal is also well supported by university researchers. The Heat Island Research Group of the Université du Québec developed a thermal picture of Montreal and maintains the data on an open portal. Recently, Montreal installed temperature and humidity measurement stations to collect data over 10 years and, in partnership with McGill University, assess the effectiveness of NBS and the distribution of UHI in the city.[7]

ILEAU's collaborations delivered :

- Planting of 31 840 trees, shrubs and perennials.
- Removal of 3058 m2 of pavement.
- 02 green installations.
- 400 meetings with local stakeholders.
- Hundreds of citizens mobilized through workshops, consultations and participative projects.

Tempe, Arizona: urban heat resilience in through urban forestry and networks of plans

Mid-size cities such as **Tempe, Arizona**, also recognise the importance of mitigating the impacts of UHI and extreme heat. Because of its location in the Sonoran Desert, **shade does not come naturally to many of the city's neighbourhoods**. With an average daily maximum temperature of 30.9 C and average of 111.4 days over 37.8C, the effectiveness of their actions is paramount to reducing the population's vulnerability to heat. The successive Climate Action Plans[8] and a comprehensive Urban Forestry Master Plan (UFMP) have guided the efforts to manage and expand the city's mostly man-made urban forest. Developing and maintaining a healthy urban forest provides many benefits including the reduction of energy use and utility costs, mitigation of the effects of the urban heat island, expansion of habitat for wildlife and reduction in stormwater runoff.

Specific goals and targets of UFMP:

- Empower residents, businesses, organizations and city staff to collaboratively create and care for an urban forest that provides a 25% tree canopy by 2040.
- Improve mobility through the equitable distribution of shade trees to create a walkable, 20-minute city that benefits public well-being and economic development.
- Increase park, open space and public space use and care for a healthy biodiverse urban forest canopy.
- Increase tree canopy, replace missing/diseased trees and update sparse landscape in rights-of-way, parks and city properties.

Since 2017, Tempe has relied on a range of incentives and programs to engage citizens and the business community. The Community Tree Stewards program is a newly launched collaboration from all levels of government aiming to promote community wealth-building and expand equitable urban cooling and resilience to extreme heat.

Conclusions and lessons

The scientific evidence that nature-based solutions (NBS) can mitigate the effects of UHI and address other societal challenges is expanding. While there remain gaps in measuring their effectiveness in various contexts, experiences show that successful approaches include plans supported by data, cross-sectoral collaboration, innovative designs, financial incentives and community engagement.

The use of NBS continues to evolve and we can draw useful lessons from these best practices and others from communities of all sizes such as Toronto (Green Roofs – City of Toronto), Boston, Massachusetts (Heat Resilience Solutions for Boston | Boston.gov). Madrid Barcelona (https://interlace-hub.com/green-infrastructure-and-biodiversity-plan-madrid) and many others.

here are active networks sharing experiences and results that can inform local decision-makers and useful searchable databases such as the US Environmental Protection Agency that can connect you to relevant local initiatives. All are useful resources that offer insights on the state of the science, available data sources, technology guidelines, and community education tools.

Resources:

European Environment Agency. Nature-based solutions in Europe: Policy, knowledge and practice for climate change adaptation and disaster risk reduction. EEA Report No1/2021

- Government of Canada: https://www.canada.ca/en/services/health/publications/healthy-living/reducing-urban-heat-islands-protect-health-canada.html
- Design guide for urban heat island mitigation measures https://publications.gc.ca/site/eng/9.857881/publication.html
- US Environmental Agency: https://www.epa.gov/heatislands/community-heat-island-effortshttps://www.epa.gov/heatislands/guide-reducing-heat-islands
- https://www.epa.gov/heatislands/guide-reducing-heat-islands

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5.http://www.hamburg.de/gruenes-netz/3939882/aufgruenen-wegen-artikel/

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7.Îlots de chaleur : des stations pour mesurer les températures estivales | Ville de Montréal

8.Meerow et al (2023) Plan Evaluation for Heat Resilience - City of Tempe.pdf

Best Practice

Mitigating Urban Flood Risks through Nature-based Solutions

Urban sustainability cannot be achieved without water resilience. Many cities are looking beyond traditional infrastructure to address the pressures from expanding urban areas and the increased risks associated with a changing climate. **Low-energy, low emissivity solutions such as nature-based solutions (NbS)** have gained in popularity in recent decades with applications in large and smaller cities aiming to adopt a more holistic approach to managing water. Various NbS, as stand-alone measures or in combination with traditional infrastructure, have proven to significantly **reduce flood damage while fostering community resilience**[1]. Studies have shown that several measures are effective at reducing surface runoff, alleviating urban flooding, enhancing ground water recharge and improving water quality[2].

The need to become more resilient to climate change has prompted cities to better understand the relationships between water systems -within their natural boundaries and catchment areas- and other urban systems as well as their related stakeholders. **From comprehensive planning to piloting innovations and engaging communities, resilience principles and NbS are influencing important transformations** in the urban landscape that aim to deliver multi-faceted benefits. We highlight two leading initiatives that use NbS to mitigate urban flooding caused by stormwater, surface run-off and severe rainfall which advance the expertise and understanding of how to integrate NbS in city plans.

The EU defines Nature-based Solutions (NbS) as *"solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such **solutions bring more, and more diverse, nature and natural features and processes into cities,** landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions".*

EU policies such as the European Green Deal, the Biodiversity Strategy 2030, and the Strategy on Adaptation to Climate Change promote the application of NbS, while EU funded programmes such as Horizon Europe bolster research, innovation and piloting NbS , with projects such as NetworkNature.

Several EU policies and initiatives as the New European Bauhaus also encourage the voluntary use of NbS: the EU Adaptation Strategy, the **EU Green Infrastructure Strategy** and the EU Urban Agenda.
https://research-and-innovation.ec.europa.eu/research-area/environment/nature-based-solutions

Resilient Houston: An engineering city embracing a holistic approach with a comprehensive plan

The extensive man-made drainage infrastructure, flood control measures and the expansion of freeways have enabled Houstonians to live in a coastal plain environment surrounded by bayous and bolstered Houston's growth from a small port town to a **667-square-mile city of 2.3 million people**[3]. The historic approach to flood control has been to push water downstream through channelized bayous and to build large single-purpose detention basins to store water. Flood events that were believed to have less than 2% chance of occurring have occurred annually in recent years and have drastically changed the city's outlook and priorities.

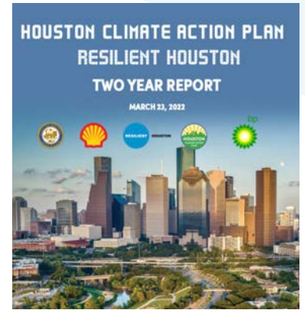
Houston's response to Hurricane Harvey in 2017 and six flood disasters in five years has been bold, ambitious and comprehensive to address flooding and other threats. With the appointment of a Chief Resilience Officer in 2019 and their **Resilient Houston Plan (with 62 actions across 18 goals)** that connects and integrates the role of all partners and citizens in building resilience, Houston joined the **100 Resilient Cities (100RC) Network.** A Resilience Executive Order further directed all city Department Directors to use the Plan as a tool in the strategic planning and priorization of programs. While the scope of the Plan developed with hundreds of diverse stakeholders exceeds what can be achieved by the city government alone, it is a blueprint for leveraging the necessary partnerships to address a wide range of stressors in order to improve Houstonian's quality of life and protect them from future disasters. **Their holistic approach integrates NbS to address various goals, but specifically as components of an integrated system to reduce flooding**. Here is a brief outline of key components addressing the management of water risks.

"We learned from recent flood events that retention, restoration, and nature-based solutions are of highest priority because not only is flood protection covered, but they also develop multi- benefits with respect to environmental goals, recreation, and biodiversity."

Resilient Houston report (Feb 2020)

- **Green stormwater infrastructure (GSI)** on private property plays an integral part in the City's complex stormwater system. In 2024, City Council adopted tax abatement guidelines for developers and lowered project threshold for eligible projects to developments worth at least USD735,000 with a minimum of USD35,000 associated green stormwater infrastructure.
- **Expand the detention capacity of bayou corridors.** Working with partner organizations, the city is looking at possibilities to incorporate large-scale GSI and NBS approaches, such as detention basins with permanent pools of water and wetland vegetation, natural stable channel design, riparian restoration, wetlands, and prairie restoration and preservation to improve the effectiveness of such basins. A combination of these features along expanded bayou corridors will slow down flow and store water to reduce peak flows and flood extents.
- **Hold water where it falls.** This strategy focuses on the use of innovative on-site water capture such as green roofs, permeable pavement, and rainwater harvesting to mimic the natural flow of water while improving rainwater infiltration and reducing runoff. These retention strategies will provide relief to the overburdened stormwater system and will reduce downstream watershed impacts and costly conveyance requirements.
- **Natural infiltration and treatment of stormwater**. The city will integrate natural stormwater infiltration and treatment through wetlands and prairies to improve water quality in the bayous and their diverse ecosystems. It will also continue to promote low-impact development and green stormwater infrastructure (GS)I techniques that mimic natural processes to enhance the water treatment across various watersheds.
- **BAYOU GREENWAYS** 2020 is transforming 150 miles of bayou adjacent trails and 3,000 acres of greenspace through a $220 million public-private partnership. These improvements create parks and greenways that weave throughout Houston's urban fabric to improve equitable access to natural resources.
- **Research and demonstration projects to improve water management,** including how to use new technology and research to monitor real-time operations, identify choke points, and integrate smart city concepts into water management practices across the city's bayous. The city will partner with local academic institutions and other stakeholders to advance research, piloting and evaluating NbS, specifically tailored to Houston.
- **Ecosystem toolkit and partnerships for bayou and floodplain restoration.** In collaboration with several local, state, and national partners, as well as environmental non-profits, the city will create a Toolkit of Nature-based approaches for restoring bayou corridors and improving holistic ecosystem health, including flood mitigation projects, such as riparian, urban forest, wetland, and prairie restoration and conservation, and hybrid projects that marry channel stabilization with green techniques to amplify ecological and aesthetic value. The Toolkit will also serve to guide restoration or preservation efforts for sites acquired or managed by various organizations.

So many aspects to this relatively recent strategy should be followed to understand how well NbS measures are being integrated with the existing infrastructure and new developments, their effectiveness and ancillary benefits. The **2022 Two Year Report** identified future reporting specifically on green stormwater infrastructure and urban prairie planting.



The City Blues: finding state-of-the-art solutions for Baltic Sea Region cities

The City Blues project as part of the Interreg Baltic Sea Region programme is a forerunner in developing best practices for planning, design, operation, monitoring and maintenance of green infrastructure in an urban catchment area. There is evidence that the implementation of NbS has increased since the 2000s, particularly in Sweden and Denmark, where

hybrid solutions like urban wetlands are widely used. Despite this progress, challenges remain in the more widespread adoption of NbS in urban areas, including limited resources, a shortage of expertise, complex institutional arrangements, and difficulties in collaborative governance. To address these challenges, the City Blues project is building on the NbS experience in five cities – Aarhus (Denmark), Malmo (Sweden), Stavanger (Norway), Tampere (Finland) and Tartu (Estonia) – to create a baseline, benchmark practices and develop tools to support a more widespread and systemic adoption of NbS, particularly in urban settings.

The project –running from 2023 to 2026–adopted the objective of developing a joint operational model for planning, design and implementing NbS in the Baltic Sea Region (BSR). Existing practices, regulatory conditions and capacities vary among cities, as the experiences in implementing basin-scale water management and NbS differs significantly. Accordingly, "the expected joint operational model developed in City Blues, will not be a standardized norm, but rather a set of validated best practices developed, tested and transferred across the consortium via mutual learning and experience exchange".

Baseline scenarios considering different possible solutions and outcomes have been developed for the cities' pilot sites and are then subject to discussion with stakeholders. A wealth of information has already been generated by the project and can be accessed at **https://interreg-baltic.eu/project/city-blues/.** Recent milestone reports were published in 2024, summarizing the modelling activities carried out for the pilots to estimate the understanding of the potential impact of the NbS options for managing stormwater and key performance indicators.

Aarhus, Denmark has implemented many significant projects showcasing NbS in the city. One of the landmark projects is Gellerup Park. It has been designed to provide multiple benefits to the community offering a variety of functions – from playgrounds, a football field, and outdoor fitness, to fruit groves and greenhouses. At the same time, the site operates as a stormwater retention basin and treatment system. The city has implemented river restoration projects that serve as examples for river basin management in urban and peri-urban settings, successful deculverting projects, as well as ecological restoration of the river by re-meandering and naturalizing riverbanks[4].

The project has already contributed to a deeper understanding of the potential and limitations of NbS, as well as considerations for their implementation. To break down the barriers between different stakeholders in the seven municipalities participating in the "City Blues" project, it will be necessary to develop more information on life-cycle costs, as well as an easy-to-follow operational model for integrated urban water management planning that considers water-related risks at all stages of urban development.

Other projects to watch and resources

Green Infrastructure Ontario (GIO)

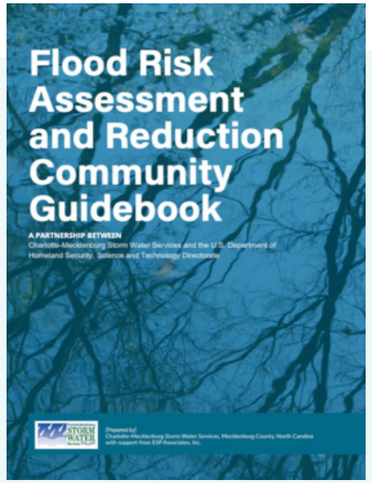
Asset Management Roadmap
The asset management approach to managing ecological systems still faces numerous challenges, especially where the services may not be fully understood, or the nature of the assets may generate unexpected outcomes compared to traditional infrastructure. GIO is currently developing a roadmap for achieving green infrastructure asset management in Ontario, Canada.

https://greeninfrastructureontario.org/asset-management/

From vision to action: A collaborative approach and commitment

Eight cities are taking part in **Commit 2 to Green**, a new EU-funded project that is changing the way cities design, implement and scale-up NbS through participatory greening and renaturing strategies at the community level.

Vejle, Denmark, is transforming a flood-prone former industrial area by integrating blue-green corridors and resilient urban regeneration. It combines climate adaptation with social inclusion, aiming to improve the resilience and quality of life of local communities.



Resources:

https://research-and-innovation.ec.europa.eu/research-area/environment/nature-based-solutions_

Connecting Nature Connecting Nature Resource Centre | Connecting Nature and Connecting Nature Enterprise Platform – **https://naturebasedenterprise.com**

Network Nature – is a resource for the Nature-based Solutions community
OPPLA - EU Repository of Nature-Based Solutions. **https://oppla.eu/ Green infrastructure - European Commission**

Sources:

1.Nature-Based Solutions for Flood Mitigation and Coastal Resilience - Analysis of EU-funded Projects. European Commission, Brussels, 2020

2.Anahita Azadgar et al., Optimizing nature-based solutions for urban flood risk mitigation: A multi-objective genetic algorithm approach in Gdańsk, Poland, in Science of The Total Environment, February 2025, Elsevier.

3.Resilient Houston

4.https://interreg-baltic.eu/wp-content/uploads/2024/05/D1.1-Benchmarking-report_final.pdf

Best Practice

Rehabilitating Urban Rivers and Restoring Waterways Ecosystems

Natural waterways and rivers are dynamic systems and unique assets that provide important social, environmental, and economic value to cities. Urbanization, industry, and climate change challenge waterway management, prompting cities to focus on flood zones and stream restoration for ecological health and risk reduction. As cities grow, rivers are often modified, affecting their quality, flow, and ecosystems. These changes, along with fluctuating rainfall and extreme weather, demand innovative strategies for resilient urban waterways. Restoration efforts by local governments and conservation groups are increasingly part of **integrated flood risk management and urban resilience plans.**

National governments recognise the importance of river and watershed management

In **Europe**, river and waterway restoration aids the European Green Deal by fostering climate neutrality and biodiversity. The EU Strategy on Adaptation to Climate Change (2021) promotes Nature-based Solutions for flood, drought, and heat risk management, while the **Do no Significant harm (DNSH) principle** under the EU Taxonomy Regulation ensures investments benefit water protection and climate resilience. Combined with the EU Water Resiliency Strategy, Water Framework, and **Floods**, and **Habitats Directives,** these policies integrate river restoration into urban resilience and sustainable development.

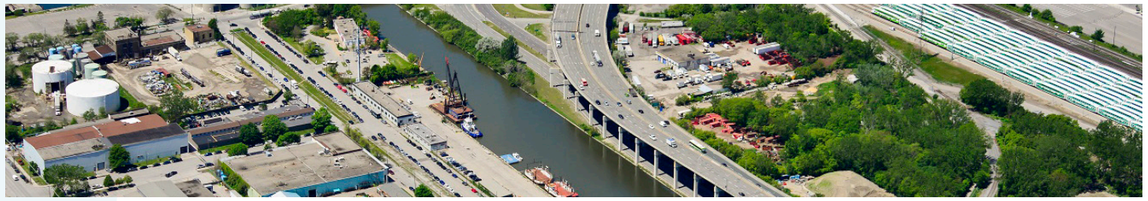
In the **United States**, urban river restoration is driven by the need to adapt to climate extremes, improve water quality, and create resilience for communities. Federal policies, such as the **Clean Water Act** and the National Climate Resilience Framework, provide guidance on watershed management. The Environmental Protection Agency (EPA), the National Oceanic and Atmospheric Administration (NOAA), and Army Corps of Engineers also guide or support green infrastructure and revitalization for flood control, habitat restoration, and equitable development.

In **Canada**, river rehabilitation and watershed protection are supported by diverse federal frameworks and programs, provincial watershed initiatives, and collaborations with Indigenous communities that integrate **Traditional Ecological Knowledge (TEK)** into planning and monitoring.

The new Canada Water Agency provides funding through Freshwater Ecosystem Initiatives according to Canada's Freshwater Action Plan—a key federal program for managing, restoring, and protecting Canada's freshwater resources. These efforts show Canada's commitment to ecosystem-based adaptation and reconciliation through water stewardship.

CANADA - Don River Restoration: multi-agency collaboration and long-term actions in the Toronto Region

The **Great Lakes-St. Lawrence River system**, containing 21% of global freshwater and supplying over 40 million people with drinking water, has a long history of conservation and restoration efforts and plays a key role in the regional economy.[1] Toronto's waterfront once featured diverse habitats such as bluffs, beaches, marshes, and estuaries. Industrialization along the Don River significantly altered the river's structure and watershed ecosystems. Toronto and Region was named an Area of Concern under the Canada-US Great Lakes Water Quality Agreement in 1987, prompting several interagency efforts to address local environmental issues affecting the wider Great Lakes system.



Source: *https://trca.ca/conservation/infrastructure-projects/don-mouth-naturalization-port-lands-flood-protection-project/*

For example, the Toronto Waterfront Aquatic Habitat Restoration Strategy was established in 2003 to guide restoration along the Toronto waterfront, provide practical aquatic habitat restoration guidance, and a strong framework for inter-agency cooperation. The Toronto and Region Remedial Action Plan (RAP) includes the **Don Mouth Naturalization and Port Lands Flood Protection and Enabling Infrastructure Initiative,** a CAN $1.25 billion (approximately € 767 million) effort to reconnect the **Don River** to Lake Ontario via over 1,000 metres of naturalized channel. This project coordinates strategies for terrestrial and aquatic restoration and supports the goals of partners and stakeholders as part of broader efforts to restore the **Don River watershed**.

Source: *https://tommythompsonpark.ca/about/#restoration*

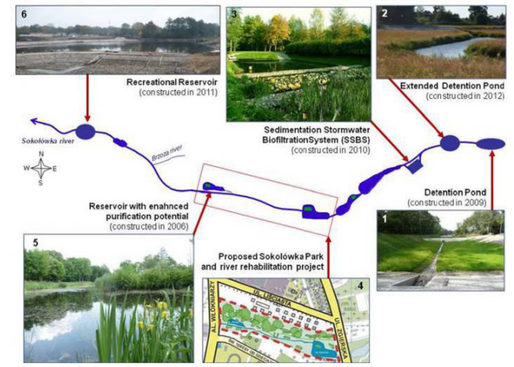
Port Lands Flood Protection (PLFP) project will naturalize the Don River's mouth, including the Keating Channel, and deliver flood protection for 240 hectares of Toronto's eastern waterfront.

Guided by robust environmental assessments and science-driven approaches, projects involve stakeholders via predictable and transparent consultation processes[2] , sharing a wealth of information. The Toronto and Region Conservation Authority (TRCA) Watershed and Ecosystems Reporting Hub provides interactive data on Toronto region watersheds and waterfronts. It shows current environmental conditions by theme, details key indicators of watershed health, tracks changes over time, and reports TRCA's progress towards its goals. The Toronto and Region Remedial Action Plan also reports that its TRCA was awarded the 2025 New Sustainable Cities and Human Settlements Award for Global Model Ecological Restoration and Protection, for its outstanding work at Tommy Thompson Park. The Park sits on land built from excavation debris, demolished structures, and harbour dredging. Thanks to TRCA's partnerships in restoration, science-based stewardship, and public engagement, it has become a leading urban ecological success in North America.

EUROPE - Blue-Green Network for river restoration set a successful example in Łódź, Poland Łódź, one of Poland's largest cities (population 645,000), lies in the central lowlands. With most streams canalized and extensive urbanization, the city faces major water management issues, including surface runoff and frequent flooding during storms. Combined sewer systems often overwhelm treatment capacity, leading to river pollution.

There are 18 small streams flowing through Łódź that collect stormwater from a 290 km2 area; the Sokolowka River flows across the northern territory receiving water from some 50 stormwater outlets.[3] The middle and lower sections of the river valley have maintained patches of meadows, wetlands, and forests. The Sokołówka river restoration project used a Blue-Green Network of hydrological rehabilitation measures implemented through a series of projects.[4 5]

To improve urban water management, the watershed increased aquifer-based retention reservoirs, restoring some sites and creating new ones. Detailed baseline data guided the design of three storm water reservoirs (built in 2006, 2009, and 2010) and a patented sedimentation bio-filtration system (completed in 2011). This first success led to broader plans for rehabilitating the Sokołówka river and developing its river park.



Source: Research Gate: Tools for strategic planning and management of urban water. I. Wagner and A. Januchta-Szostak. December 2014.

Despite new reservoirs, additional measures were needed to enhance stormwater retention in the system. Local developers also took interest in the Sokołówka valley; one company-built retention wells so all storm water stayed within their development. Other grassroots efforts to support rivers and green spaces appeared in parts of the city. Some NGOs became interested in the services that green and blue infrastructure can offer such as **alternative sustainable transportation routes** (cycle paths) and **green backyards**.

Since 2013, the **City of Łódź** has implemented a comprehensive water management system, comprising sectoral policies and monitoring results.[6] The **Sokołówka River Park plan** (approved in 2016) created new paths and recreational areas. In 2020, work began to link three Sokołówka Valley parks with trails and educational features. Ongoing efforts include river rehabilitation, pond cleaning, improved stormwater purification, and upgrades to facilities such as paths, playgrounds, toilets, and a restaurant.

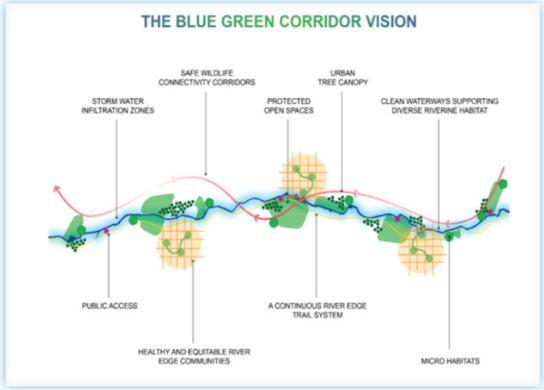
USA - Chicago-Calumet River: Conservation groups lead the way for Blue-Green solutions

The 156-mile Chicago-Calumet River system runs through downtown, parks, forests, and neighbourhoods, playing a key role in the region's history, industry, and environmental progress, serving as a vital resource for the region. Friends of the Chicago River are leading efforts to advocate and develop plans for implementing a blue-green approach, and Urban Rivers pilots' innovative approaches to support the restoration of the river system.

The Friends' recent Conservation and Recovery Plan outlines a strategic road map to realize a blue-green corridor, including a vision document and three action plans covering **wildlife, people, and water.** The blue-green corridor approach integrates waterway and land decisions, acknowledging that healthy ecosystems benefit people. A successful corridor connects neighbourhoods, green infrastructure, trails, open spaces, recreation areas, and wildlife habitats.

The planning process involved: reviewing progress; researching waterways management methods and case studies; consulting stakeholders and experts for input on future initiatives; identifying strategic investment opportunities and defining implementation steps to achieve the vision. In collaboration with several organisations, they recently developed a series of interactive tools and guidance for more strategic and collaborative watershed-wide investments in multi-beneficial Nature-based Solutions.

Bubbly Creek (South Fork of the South Branch of the Chicago River) was historically one of the most polluted sections of the Chicago River. In 2022, Urban Rivers partnered with Shedd Aquarium, and the Chicago Park District to introduce floating wetlands to improve the section's water quality and demonstrate the city's ability to revitalize something that was once written off. Hundreds of volunteers installed 3,000 square feet of gardens and planted over 3,000 native plants for the garden modules.[7]



Source: https://chicagoriver.org/issues/planning/blue-green-corridor

The new floating islands offer wetland habitats for wildlife, with native plants providing food and shelter for insects, birds, and aquatic species, which help filter pollutants, **improving local water quality**[8]. These gardens improve an industrialized waterway and support South Side Chicago communities facing environmental issues. Locals established these spaces for residents to learn, enjoy nature, and connect with the **Chicago River. In 2023,**

Free Kayak Days were launched, letting over 300 people explore the river by kayak with lessons from Urban Rivers staff.

Wild Mile Chicago is under development as a mile-long floating park on the North Branch Canal of the Chicago River. It is installed in modules and features floating gardens, walkways, and kayak docks, serving as a public park, open museum, botanical garden, kayaking spot, community classroom, and

Source: https://www.instagram.com/visioneerstv/reel/DQ7S_7njiDc/

Key takeaways

- River restoration and watershed rehabilitation reduce flood risks and provide health, social, and economic benefits, strengthening city resilience.
- As rehabilitation practices continue to develop, there is an ongoing need to formalize best practices, systematically gather data on costs and benefits, and determine requirements for long-term management.
- Successful projects use ecological and data-driven planning and monitoring, cross-sector collaboration, community involvement, including Indigenous peoples, visible reporting platforms and incorporate approaches for long-term maintenance.

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2. https://trca.ca/conservation/infrastructure-projects/don-mouth-naturalization-port-lands-flood-protection-project/don-mouth-environmental-assessment/
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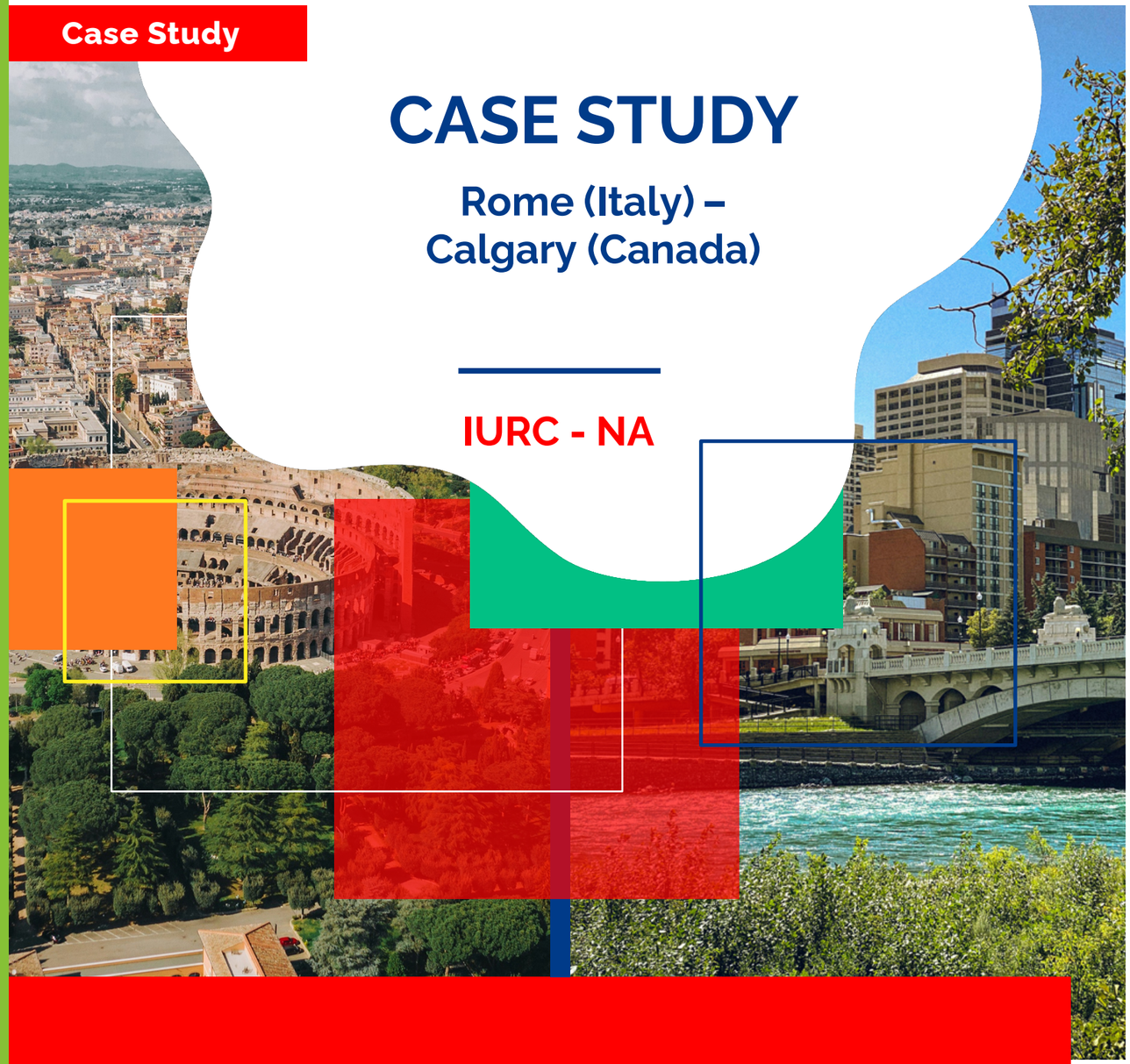
4. **EU SWITCH project (GOCE 018530), EHREK (LIFE08 ENV/PL/000517), Blue-Green Network (City of Łódź)**
5. **Accessed through Research Gate: Tools for strategic planning and management of urban water. I. Wagner and A. Januchta-Szostak. December 2014**
6. https://urbanrivers.org/bubbly-creek
7. Application of floating wetlands for the improvement of degraded urban waters: Findings from three multi-year pilot-scale installations - ScienceDirect; "The Effectiveness of an Artificial Floating Wetland to Remove Nutrient" by Eric W. Peterson, Phil Nicodemus et al.

Case Study

CASE STUDY

Rome (Italy) – Calgary (Canada)

IURC - NA



DECEMBER 30, 2025

Thematic Network(s): Nature-Based Solutions
Topic keywords: ***Energy communities; community gardens, local energy generation, net zero strategies.***

ROME (Italy) – CALGARY (Canada)

IURC – CASE STUDY

Cities lead the way in change and innovation, piloting new approaches and pursuing inclusion and sustainability goals. Energy communities allow citizens to collaboratively generate, share, and manage local energy, which increases security, lowers costs, and supports sustainability. Local governments play an essential role in diversifying energy systems and empowering local action for energy efficiency, cost savings, poverty reduction and access to local food. Two cities exchanged knowledge to further maximize these benefits and apply lessons to advance new initiatives.

EXECUTIVE SUMMARY

The cities of Rome and Calgary, like many modern cities, are confronted by the challenges of food and energy equity, fostering social inclusion, and adapting public infrastructures and programs to growing population needs and climate change. Despite their vastly different contexts, Rome and Calgary discovered common ground in their efforts to foster community through initiatives such as community gardens, food policies, energy communities, energy-efficient housing, and nature-based solutions. Through a series of technical calls and two exchange visits, their two-year cooperation under the International Urban and Regional Cooperation (IURC) North America programme highlighted innovative practices and inspired both cities to conceive new collaborative projects and incorporate learnings in the next iteration of their plans and programs.

Rome is undergoing major renewal through its Investment Plan Projects, funded by the city's €6B budget, EU post-COVID recovery funds, and extraordinary funding for the 2025 Jubilee. It's Climate Plan and The Food Policy Plan are two principal policy drivers of initiatives to create a resilient and inclusive city. Calgary is growing rapidly, aiming to balance urban expansion with biodiversity goals and actively involving Indigenous people in doing so. The Calgary Climate Strategy – Pathways to 2050 serves as the foundational framework for guiding city departments in their climate-focused efforts. This strategy is designed to steer improvements in several key areas: city building and development, buildings and homes, energy, mobility, waste and consumption, water, nature and ecology, and people.

This peer learning led to the exploration of Energy Communities, which provide affordable energy options for underserved groups to promote energy equity, diversify the energy grid, and support improved food access by powering community gardens with renewable energy, while also enhancing social engagement and inclusion. The exchanges also led to an innovative project proposal by Calgary inspired by projects observed in Rome and to a collaborative proposal by Rome under the Horizon Europe programme.

CHALLENGES AND SOLUTIONS

Cities account for more than 70% of global CO2 emissions[1]; their vision and actions will shape how we adapt to a changing climate. As part of the Horizon Europe programme, the EU has launched a Mission "100 Climate-Neutral and Smart Cities by 2030". Rome was selected in 2022 to contribute to the goals of this mission and act as an experimentation and innovation hub.

In 2025, the EU launched the **Affordable Energy Action Plan**, focusing on lowering energy costs, attracting investment, crisis preparedness, and completing the energy union. It emphasizes the role of energy communities—local groups that invest collectively in clean energy—to accelerate energy renovations. The pilot phase showed energy communities are effective but need better outreach and wider peer networks.

The Citizen Energy Advisory Hub, was created to help citizen collectives overcome barriers, especially for vulnerable groups, by offering information, expertise, and financial aid. Addressing these challenges is crucial for an inclusive and sustainable energy transition in Europe.

Calgary is a dynamic city that boasts robust and comprehensive policy frameworks guiding its work and engagement with communities, businesses, and Indigenous peoples. In 2022, the city adopted an ambitious Climate Strategy - Pathway to 2025, a comprehensive plan with two main goals: achieving net-zero GHG emissions by 2050 and enhancing the city's climate resilience. In addition, other initiatives have been launched to address strategic challenges in the city, such as the Food Resilience Strategy that supports Calgary's commitment to building a sustainable and resilient community by addressing food security and local supply chains.

Both cities have robust strategies to guide their work and stimulate innovation. For example, the Garbatella Neighborhood in Rome is an active Renewable Energy Community (REC), a citizen-led initiative coordinated by Borough 8, where the first pilot project was successfully implemented at a local public school with a direct investment from the City. The financial feasibility is based on incentives from the generation of renewable energy by the REC balanced against consumption from the grid. Under this scheme, any stakeholder can be part of a REC, ranging from individual citizens to businesses or public entities such as schools. Energy savings of €3,000 in the first year were reallocated to other needs. Garbatella's mayor highlighted that increased social awareness and community involvement were even more valuable than financial gains. This model will be replicated through a public-private collaboration agreement to expand its implementation.

[1] https://netzerocities.eu/

*Figure 1. Parc Ort 9 Delegates from **Europe, the US and Canada**, visiting Parco Ort9 during a IURC NA Thematic Networking Event in Rome on the 17th of October 2025.*

Parco Ort9 is an urban community garden managed by the citizen association "Vivere in". Ort9 Park is situated on municipal land that is maintained free of charge under an agreement. This public park (12,560 square meters) with 107 plots of urban vegetable garden, was created thanks to the European project "Sidig-Med", and boasts an automated irrigation system through drip lines, shared mechanical and manual tools, public toilet, barbecue, and outdoor or indoor socialization areas. The project actively involves the local community in setting and pursuing its own defined targets, such as fostering sustainable urbanisation and enhancing the resilience of the community. Additionally, the initiative places a strong emphasis on encouraging intergenerational and intercultural dialogue and collaboration, ensuring that perspectives and experiences from all age groups contribute to project development and outcomes. The network of urban community gardens of the city of Rome, ORTI IN COMUNE, through the European project RU:RBAN 2nd wave, has drawn up a proposal for a new regulation that Roma Capitale is now examining through various deliberative processes[2].

Calgary is working to address energy equity issues. To do so, they have developed an Energy Equity Strategy that aims to further engage communities and also co-create a program to address energy inequities. They have successfully engaged Indigenous communities in 5 themed summits over 3 years (Water, Land, and Climate) by respecting the value of traditional knowledge in their processes and offering compensation for their participation (e.g., childcare, transportation, traditional foods, compensation for time, etc.).

[2] https://gardeniser.eu/en/resources/romes-urban-community-gardens-regulation-proposal

RESULTS AND IMPACT

The Calgary delegation was particularly impressed by the potential benefits of the REC model and expressed interest in replicating the energy communities model in their city, through a pilot project "Empowering local energy solutions" in cooperation with Rome and Anci Lazio. They identified the Ramsey site and several local partner organisations to implement the Ramsey Solar Project and Greenhouse: Ramsey Community Association; Calgary School Board; Gardeners of Ramsey; Highfield Urban Garden; City of Calgary, and utility companies. The project could yield benefits such as: reduced operating cost for the community association; local food production; active outdoor participation; recreation opportunities; food quality production; indigenous participation; local job creation; greenhouse gas reduction; energy independence, and; reduced impact on the grid.

Types of energy communities

- Renewable energy cooperatives
- Community solar projects
- Microgrids
- Virtual power plants

Calgary will assess which approach will suit their context:

1. what type of additional energy generation (e.g. solar panels, wind turbines, etc.;
2. what type of storage (e.g. batteries or thermal storage);
3. What distribution model (local grid or peer-to-peer trading);
4. what management tools (smart meters or energy management systems).

Figure 2. Calgary's Ramsey Solar Project and Greenhouse, courtesy of the City of Calgary.

Calgary envisions the adoptionof the REC model to integrate a role for indigenous people and migrants and this will serve as an example for Rome in their work to develop programs to integrate immigrants and vulnerable people currently under the responsibility of Anci Lazio, in agreement with the City of Rome. Rome was also particularly inspired by the Indigenous outreach experience in Calgary and how traditional knowledge is used in creating plans for the future. They developed a new project proposal under the Horizon Europe programme with international partners incorporating some of these concepts.

KEY FIGURES

Rome
€3,000
(≅$ 4,800 CAD)

Garbatella school energy savings in the first year

Calgary
≅€402,000
($653,000)

Cost of the Ramsey Rink Solar Project

LESSONS LEARNED

Cities play a determinant role in shaping how we live, work and recreate. Every ambitious city wants a way forward that is inclusive, thriving, resilient and sustainable. How they embrace new ideas and learn from their peers can only strengthen their ability to innovate and adapt concepts to respond to challenges and new circumstances.

Here are some lessons that can be followed in designing an energy community project:

Lessons from Calgary on Indigenous involvement

- We are all learning what reconciliation means and what systems need to change
- Solutions, supports and resources must be culturally appropriate and attainable
- Ethical space – western vs indigenous views
- Do not be extractive (only take and not give anything back)
- Treaties are important

Take time to match the right energy community model to your context and circumstances

Measure all potential benefits, including financial ones, from community gardens and community energy initiatives.

Importance of learning from the past – learning from historical and cultural practices, incorporating traditional Indigenous knowledge, to create a future that builds inclusivity and engages various communitie.

Engage various partners to design and implement the project —programs have demonstrated that businesses, community organizations, Indigenous people, and residents can play roles in these efforts, co-create, and have valuable contributions.

Energy communities can strengthen citizens' involvement in the management of public affairs

THE INTERNATIONAL URBAN AND REGIONAL COOPERATION PROGRAMME IN NORTH AMERICA

The International Urban and Regional Cooperation program in North America (IURC NA), funded by the European Union, partners European cities with Canadian and USA cities to facilitate knowledge exchange through online tools, face-to-face interactions, study visits, participation in thematic and networking events, and capacity-building initiatives. Its activities support the achievement of policy objectives as well as major international agreements on urban development and climate change, such as the EU Urban Agenda, the UN Sustainable Development Goals, and the Paris Agreement. The program is part of a long-term strategy by the European Union to foster sustainable urban development in cooperation with the public and private sectors, researchers, innovators, community groups, and citizens. IURC NA is financed under the EU Foreign Policy Instruments and benefits from the strategic support of the Directorate-General for Regional and Urban Policy of the European Commission.

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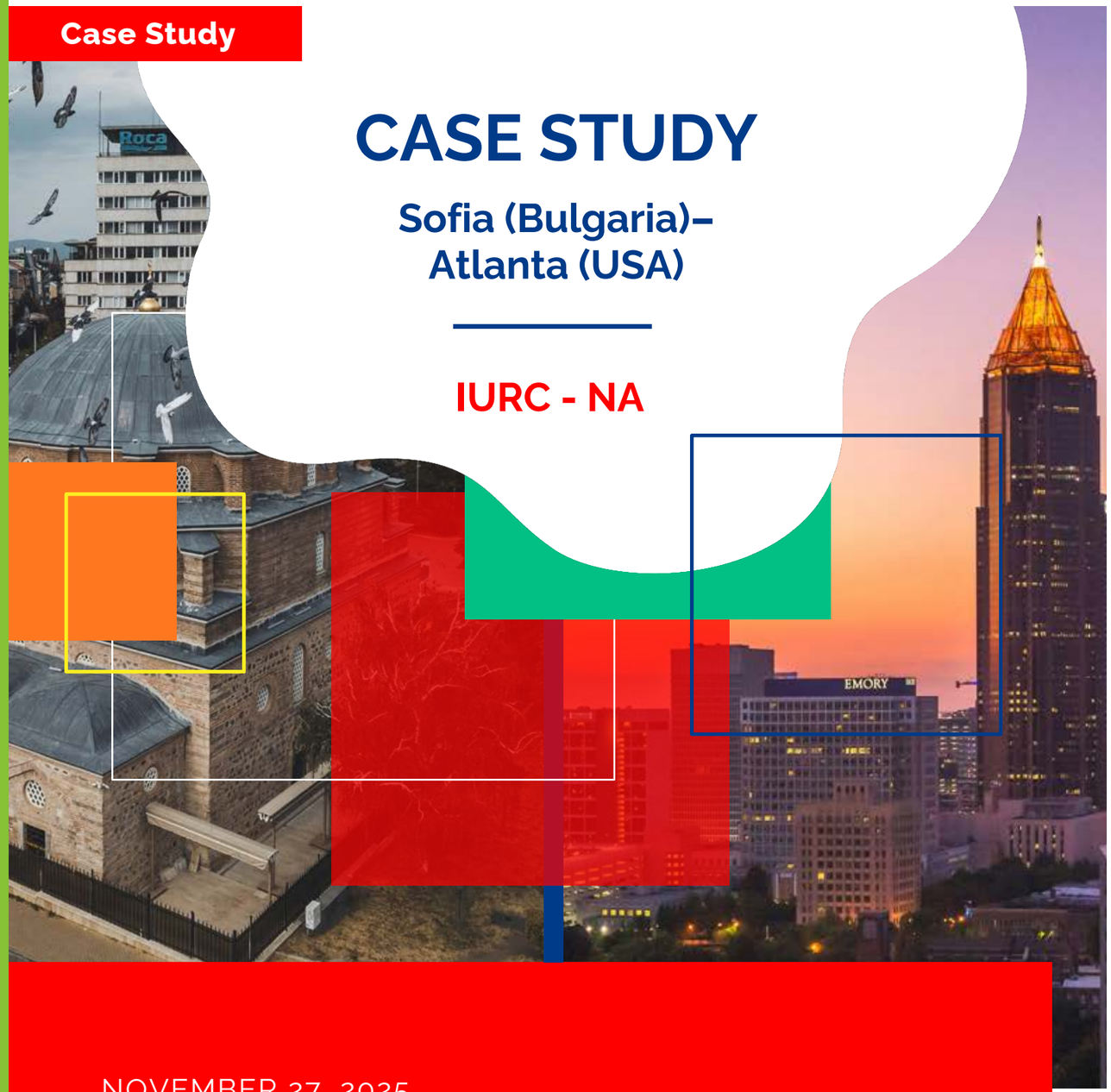
Case Study



CASE STUDY

Sofia (Bulgaria)– Atlanta (USA)

IURC - NA

NOVEMBER 27, 2025

Thematic Network: Nature-Based Solutions
Topic keywords: *Urban forestry, urban trees, canopy management, carbon credits*

Sofia (Bulgaria) – Atlanta (USA)

IURC – CASE STUDY

Strategic urban forest management can deliver a wide range of social, environmental, and economic benefits. Atlanta demonstrated an innovative path to their Urban Forest Management by embarking on Carbon Credits Program to further benefit from their preservation of urban forested properties. They showed that a multi-prong effort is accessible and replicable and aligns well with Sofia's values of community engagement and cooperation on corporate social responsibility. Through sharing knowledge and experiences both cities are contributing to advancing nature-based solutions.

EXECUTIVE SUMMARY

Many cities face the challenges of growing populations and inequitable distribution of tree cover, losing natural areas to development or natural disasters, aging tree canopy, and inadequate resources for conservation or tree care. Investments in urban forest management have shown to deliver wide ranges of benefits; the inclusion of residents, organisations, and businesses in programming is essential to fostering a shared vision for circular, inclusive, and climate-resilient urban futures. The cities of Sofia, Bulgaria, and Atlanta, USA, engaged in an 18-month cooperation under the International Urban and Regional Cooperation (IURC) North America programme to share their experiences in implementing nature-based solutions and innovative practices.

With a good foundation and interest in urban forest management, Sofia (population 1.3 million) explored the many facets of Atlanta's (population 520,070) approach to urban forest management, including city goals, a comprehensive urban forestry program, and advances in carbon credits as a revenue-generating model to help fund the preservation of urban forested properties. Atlanta boasts ambitious tree related goals as part of their urban forestry management continuum. Likewise, Sofia embarked on 'The New Sofia Forest' project in 2017, which aims to create a green belt around the Bulgarian capital that will improve air quality and create more places for recreation in the future.

This peer learning, based on site visits and shared presentations, also highlighted the assets in each city and the opportunities for Sofia to leverage its advanced waste management and urban forestry efforts and explore opportunities to generate carbon credits that are growing in Eastern Europe in order to finance future conservation projects. The multi-prong approach adopted by Atlanta can also serve as guidance for advancing new elements of urban forestry and inspire Sofia to build on work to date towards sustainable urban forests and conservation.

CHALLENGES AND SOLUTIONS

Like most large cities, Sofia also faces challenges related to the rapid development of the city and the need to ensure livability and sustainability. They have embraced the participation of local stakeholders in the development of the city as an essential component of their approach. Sofia took part in the CITIES4CSR project, which played an important role in improving dialogue and strengthening cooperation on corporate social responsibility. The project aims to strengthen the role and increase the added value of corporate social responsibility activities of companies at the local level, to improve the urban environment and innovation for social development in order to better respond to emerging challenges at the local level.

The largest reforestation initiative in the Sofia Municipality is the New Forest of Sofia. This initiative is a sustainable investment in the city's natural capital and has a long-term complex impact on improving the environment in Bulgaria's most populous municipality. It contributes to the implementation of measures related to:

- improving air quality;
- achieving a cooling effect in urban areas in the context of global warming and neutralizing the negative phenomenon of urban heat islands (the heating of asphalt and concrete surfaces during the summer months);
- participation in the global trend of mass afforestation with the aim of accumulating carbon in biomass and neutralizing part of the anthropogenic carbon emissions in the atmosphere;
- protection of biodiversity in the territory of Sofia Municipality through the creation of a new forest habitat for animals in the Sofia Field;
- provision of a regulating ecosystem service for flood prevention in the low-lying parts of the municipality – it has been proven that forest areas regulate surface runoff during heavy rainfall and reduce the risk of flooding;
- creating an area with potential for the development of suburban ecological and recreational tourism.

Atlanta is also known as A City in a Forest. The city's extensive urban canopy and urban forest were first documented in a baseline canopy analysis in 2008 by the City of Atlanta Department of City Planning. The baseline analysis revealed that Atlanta's overall tree canopy was number one in coverage for a major metropolitan city at nearly 50 percent. According to a Georgia Tech study released in 2018, 46.5 percent of the city is covered in trees. This legacy, and the canopy gain and loss cycle, requires active management in order to continue generating multiple benefits for the city. In 2023, following recommendations from Atlanta City Design:

US Forest Service
USD 5M Grant

- Comprehensive urban forest assessment (small tree inventory natural area assessment).
- Risk reduction maintenance of trees
- Restoration of forested areas
- Programs to connect people with urban forests & watersheds
- First comprehensive 10-year **Urban Forest Master Plan**

Nature, the city adopted an ambitious goal of maintaining 50% canopy and required that the Department of City Planning conduct a study every five years to measure the tree canopy cover within the city. A $5M federal grant awarded to the City of Atlanta in 2023 will be instrumental in enhancing their existing urban forest program continuum producing a leading example of sustainable urban forestry leading to a 10-year Urban Forest Master Plan (in development). With the lowest tree canopy in the entire city, the Downtown Atlanta Tree Planting Plan was launched in 2024. This initiative aims to double tree coverage in downtown by planting upwards of 8,000 trees

phased over ten years. This project will simultaneously cool streets, reduce the urban heat island effect, mitigate greenhouse gas emissions at the ground level, trap airborne particulate matter, and increase natural carbon sequestration.

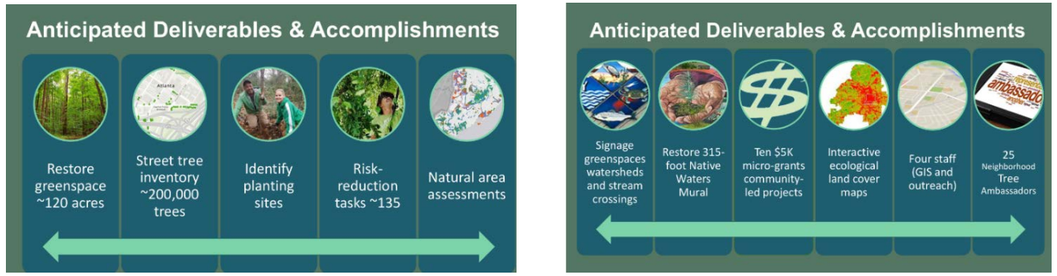


Figure 2. Images from the presentation "City in a Forest: Atlanta, Georgia" by Kathy Evans, Tree Conservation Commission, and Taryn Heidel, Arboricultural Mgr. for Natural Areas and Land Management, Dept of Parks and Recreation, City of Atlanta.

While planting trees is important, the maintenance and stewardship of trees require strategic planning and resources. Programs should consider measuring a range of benefits from urban natural areas, such as stormwater management, air quality, biodiversity, health, and recreational opportunities, to support financing efforts. One such source that Atlanta has begun tapping into is generating revenue from carbon credits (e.g., Atlanta's Carbon Credit Program 2024) from selected preservation initiatives that can be reinvested into urban forestry, climate resilience projects, and community green initiatives. Getting familiar with how carbon credits work and what preservation work could meet the rigorous requirements can expand financing opportunities and reinforce a city's leadership in sustainability.

City Forest Credits (CFC) is a registered national non-profit carbon registry helping to finance forests and communities in and around cities in the United States through verified carbon credits. It connects conservation and urban forest leaders to a new source of funding; empowers companies to invest in local climate action and develops national carbon protocols with leading urban forest and forest carbon scientists and professionals. Through their robust system to issue and track credits, it has opened the door to new projects and financing for urban forestry projects such as the Lake Charlotte Nature Preserve, which will preserve almost 200 acres of forested land in Atlanta and protect it from development. The property formerly owned by Waste Management was in danger of imminent destruction from development. The Conservation Fund purchased the land to protect it, and the City of Atlanta approved use of funds from its tree ordinance to purchase the property from the Conservation Fund in 2020. The process of registering the Nature Preserve required: (1) meeting a 40-year urban forest preservation protocol; (2) a contract for the Carbon Registry; (3) a deed restriction to establish additionality; (4) canopy confirmation and 3rd party verification, supported by CFC, and (5) ongoing reporting.

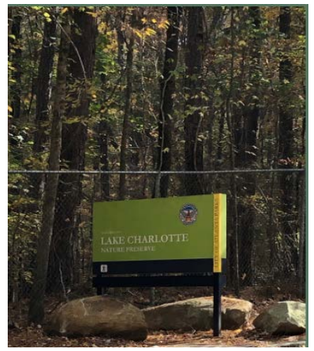


Figure 3. Images from the presentation "City in a Forest: Atlanta, Georgia" by Kathy Evans, Tree Conservation Commission, and Taryn Heidel, Arboricultural Mgr. for Natural Areas and Land Management, Dept of Parks and Recreation, City of Atlanta.

Building on the success of the Lake Charlotte Nature Preserve carbon credits pilot, Atlanta expanded its Carbon Credit Program in 2024 by adding four new sites (Southwest Nature Preserve, Utoy Creek Nature Preserve, Mount Zion Nature Preserve, and South River Nature Preserve), preserving over 200 acres of mature forest.

RESULTS AND IMPACT

The Lake Charlotte Nature Preserve Project created the basis for an expanded carbon credit program and systemic changes to support selling carbon credits from conservation projects. It also led to:

- Amending City procurement code to allow for the sale of environmental credits
- Additional environmental and community benefits (air quality, recreation, biodiversity)
- Establishing processes to develop market-based “Environmental Attributes” like Renewable Energy Credits and Carbon Credits.
- Institutionalized the City’s ability to sell these credits to further support sustainability programs, community programs, and forest stewardship and maintenance.

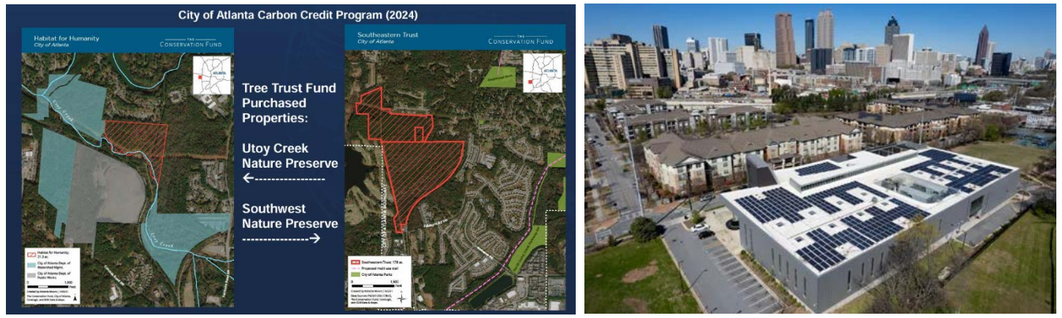


Figure 3. Presentation of the City of Atlanta Carbon Credit Program, John R Seydel, Deputy Chief Sustainability Officer

Creating Sofia’s “New Forest of Sofia” initiative – the city’s largest afforestation project aimed at improving air quality, reducing heat islands, and enhancing biodiversity – Sofia could explore participation in voluntary carbon credit schemes similar to Atlanta’s Carbon Credit Program (Lake Charlotte Nature Preserve). This could be possible through participation in the **EU Emissions Trading System (EU ETS)**, the mandatory cap-and-trade program targeting large industrial and power sectors, which typically applies to large entities rather than municipalities or voluntary renewable energy projects. Against this backdrop, the city could consider exploring how some of its initiatives could meet carbon registry requirements to generate financing opportunities. There are a few registries relevant for the region:

- **Balkan Carbon Credit Registry (BCCR):** The only carbon registry tailored to Bulgarian and Balkan projects, designed to fully comply with international standards. It enables registering, verifying, issuing, and tracking carbon credits with transparency.
- **Verra (Verified Carbon Standard – VCS):** A leading voluntary carbon credit standard globally, with over 2,300 projects and more than 1.3 billion credits issued. It covers sectors like energy, transport, forestry (including REDD+), waste, and industry.
- **CEB VER (Commodity Exchange Bratislava Voluntary Emissions Reductions):** A quality standard rooted in the Kyoto Protocol’s Clean Development Mechanism. It offers specific methodologies—like CEB VER Solar—and maintains its own registry via Carbonplace.

Figure 4. The New Forest of Sofia Initiative, image courtesy of the Sofia Municipality.

Figure 5. The New Forest of Sofia Initiative, image courtesy of the Sofia Municipality.

Figure 6. The New Forest of Sofia Initiative, image courtesy of the Sofia Municipality.

For more information visit https://www.sofia.bg/en/events-from-2022/-/asset_publisher/XgCeFG7oXOXg/content/zapocva-zalesavaneto-na-novata-gora-na-sofia-negovan

KEY FIGURES

Lake Charlotte Project in Atlanta

36,365 tCO_2e
in Carbon Credits

~$1 to $1.2 M
(~€860,000 to €1 M)
of revenue at an estimated sale price $30 - 35/ton

$4M
ecosystem services over 40 years as Co-Benefits

New Forests Sofia

>103,000
saplings of white acacia and oak were planted between 2017-2020 Sukhodol neighbourhood, Ovcha Kupel district, on an area of over 206 decares.

>76,000
oak saplings were planted between 2022-2024 in the village of Negovan, Novi Iskar district, on an area of over 120 decares.

>13,000
saplings of the common maple species have been planted in the Busmanci village, Iskar district, on an area of over 36 decares.

LESSONS LEARNED

It is important to value the city's natural assets and invest in maintaining them. Well-designed and planned conservation initiatives often yield multiple benefits, and long-term sustainability can be maintained with innovative funding sources such as carbon credits. Here are some lessons that can be followed to improve your natural assets.

Urban forest management is a continuum—starting with a baseline assessment, monitoring plan, community involvement, and maintenance program, the reforestation projects are necessary components to achieve and sustain urban forest targets.

Research standards for certification and carbon registry requirements—it is important to connect with organisations applicable to the region or project type.

Support new directions/aspirations with relevant city rules—consider how city codes and bylaws can support conservation efforts.

Start small or implement a pilot that will meet certification criteria—demonstrate what is possible with partners and engagement, measure benefits, and solidify your capacity to expand your work.

Engage various sectors and connect with communities—programs have demonstrated that businesses, community organisations, and residents can play roles in these efforts and have valuable contributions.

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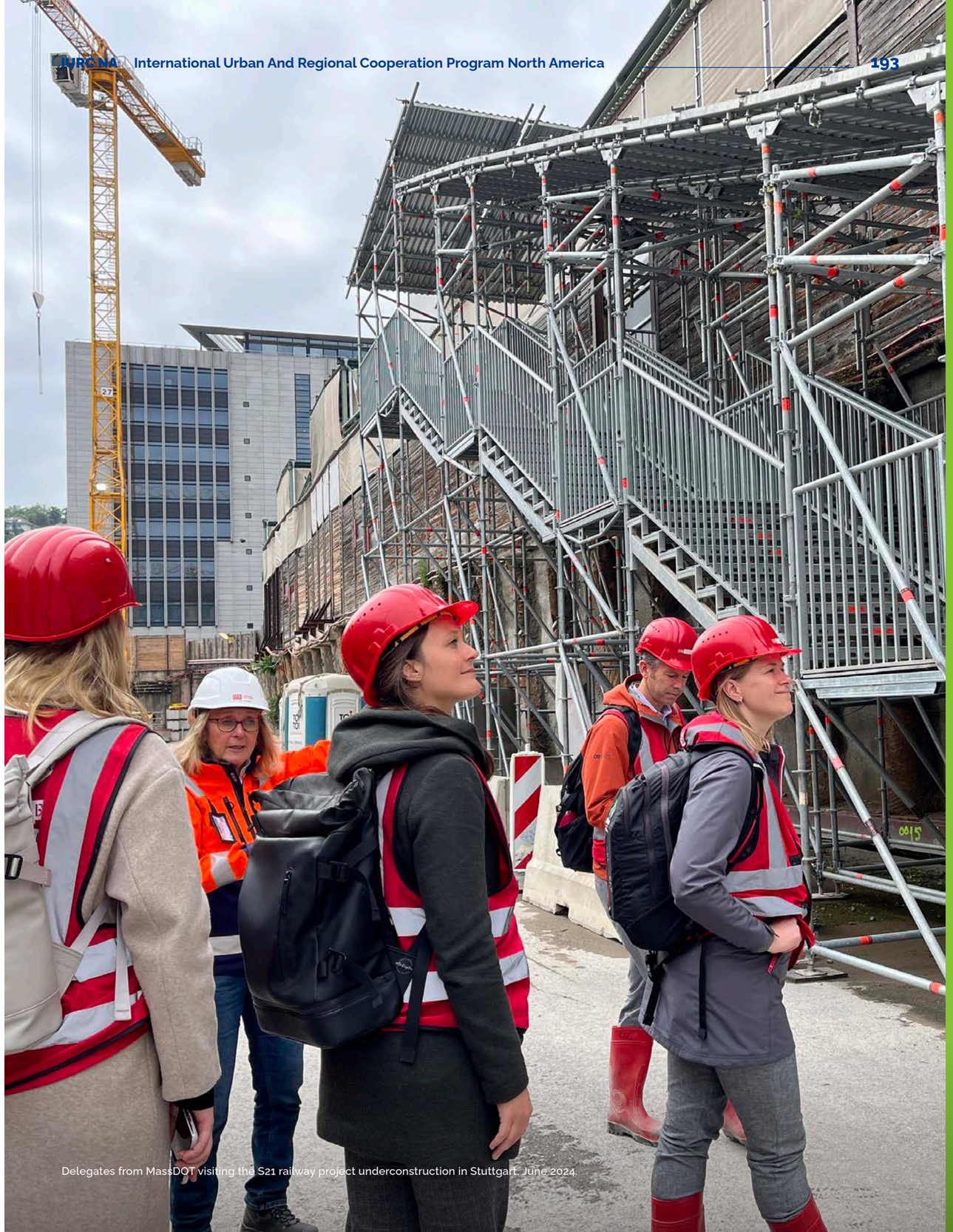
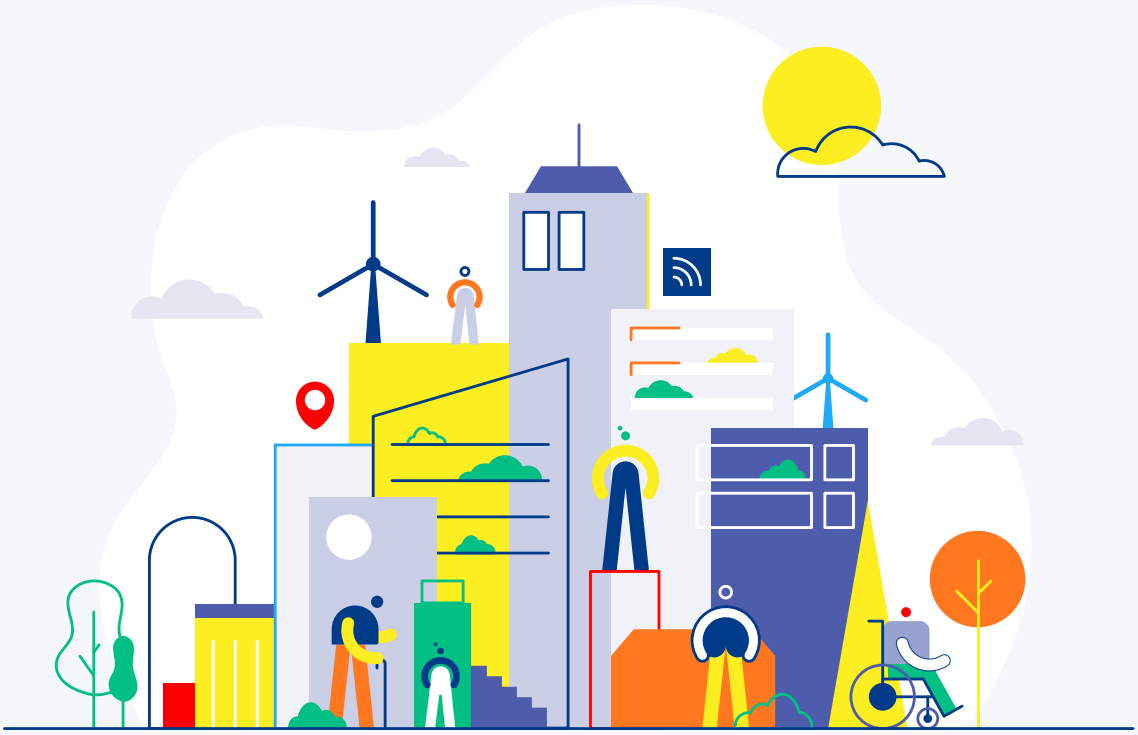
Links to related outputs:

i-tree Tools
CFC's Preservation Protocol - 40 years
Summary of the CFC Preservation Protocol
CFC's Reforestation Protocol
Legislation reference link for the City of Atlanta's Tree Trust Fund
Trees Atlanta - Urban Tree Canopy Study



Delegates from MassDOT visiting the S21 railway project underconstruction in Stuttgart, June 2024.

Thank you!



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INTERNATIONAL URBAN AND REGIONAL COOPERATION

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