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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 2023¹. **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 levels⁴. 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 CO₂ emissions related to urban transport⁵; 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 emissions⁶; in Europe they generate 40-50% of NOx and 8-10% of CO₂ emissions in urban areas⁷.

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.

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- **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

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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.

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

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.**

