

Parking Transformation

Pathways Towards Sustainable and Integrated Urban Mobility



About UITP MENA CTE

The MENA Centre for Transport Excellence (CTE) was launched in 2011 as a joint effort between Dubai's Roads & Transport Authority (RTA) and the International Association of Public Transport (UITP) to unify regional efforts to build sustainable transport systems in MENA countries. MENA CTE aims to create cutting-edge knowledge and develop innovative tools necessary for the development of effective transport policies, strategies, and solutions to public and private institutions in the MENA region. It contributes to unifying regional efforts to foster sustainable mobility and enhance the quality of life in all Middle Eastern and North African countries.

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Executive Summary

Parking has traditionally been managed primarily as an operational service. However, the long-standing abundance and affordability of parking, have increasingly raised questions around how urban land is allocated across competing mobility services and public realm needs. In some urban contexts, the spatial footprint of parking warrants recalibration alongside other mobility and public realm uses. In addition, the extensive allocation of space to parking has often limited opportunities for more space-efficient, people-oriented, and multimodal urban functions.

As cities confront climate pressures, congestion, housing affordability crisis, inequitable access to mobility, shrinking public space (e.g., not enough dedicated space for active and collective mobility functions), and increasingly complex travel patterns, it becomes clear that parking should be deliberately planned as one of several uses of valuable urban land, aligned with wider mobility and urban development objectives. Given that, cities are now building on this foundation by elevating parking's strategic role within integrated mobility systems.

Importantly, parking is only one of many competing curb functions. The same space can serve bus priority, safe cycling, freight and logistics, micromobility, green infrastructure, or public life, each carrying distinct social, economic, and environmental value. Recognising this plurality reframes the debate: the core issue is not parking per se, but how its scale, price, and spatial footprint shape travel behaviour. Without integrated planning, parking can limit the ability of cities to accommodate other mobility and public space functions. In other words, how cities plan, price, manage, and integrate parking within broader mobility systems thus plays a decisive role in shaping travel behaviour and the overall quality of urban life.



This report has been developed under the UITP Global Parking Transformation Working Group, a global platform that brings together diverse stakeholders from across the mobility ecosystem. The Working Group includes public transport authorities and operators, parking and mobility operators, technology providers, and consultants, from several cities (the list of participating members is provided at the end of this report).

By convening these actors, UITP enables collaboration between the public and private sectors, enabling the exchange of international experiences and the co-creation of practical strategies for the evolution of parking systems. This multi-stakeholder dialogue ensures that the insights and recommendations presented in this report reflect a broad range of operational, policy, technological, and market perspectives. Drawing on this global expertise, the research reflects the collective vision of UITP and its members to reposition parking not merely as a space for vehicle storage, but as a strategic component of sustainable mobility, supporting multimodality, active travel, and inclusive accessibility within integrated transport systems.

The purpose of the report is given below:

- To explore how parking infrastructure and policies influence modal choice and shape the transition toward sustainable, inclusive urban mobility.
- To identify integrative strategies that align parking interventions with the goals of a multimodal ecosystem, including public transport, shared mobility, active modes, and the movement of goods. Although goods movement is not the primary focus of this report, delivery activities often compete for the same curb space as cyclists, pedestrians, and buses. Ensuring adequate space for efficient deliveries is therefore essential to avoid conflicts and support safe, seamless mobility for all users.
- To identify the governance, data, information sharing, and financing conditions needed for effective parking transformation, including coordination among agencies, coherent regulatory frameworks, and the use of digital tools for real-time parking management.
- To recommend practical pathways for cities to embed parking transformation into sustainable urban mobility planning and governance frameworks.

In scope, the report covers both on-street and off-street parking in urban contexts, emphasizing their role in enabling behavioural change and seamless connectivity, not only around public transport stations but across the entire urban fabric. Further, parking is considered here as both the origin and the endpoint of car trips.

The findings are intended to serve as a guide for decision-makers and practitioners to rethink the role of parking in building seamless, inclusive, and sustainable mobility ecosystems.



Key Deliverables of this report

- Recognise mobility as the objective, not parking revenue.
- Integrate enforcement into parking management to improve efficiency.
- Harmonise parking practices among stakeholders to reduce fragmentation and support a more integrated mobility ecosystem.
- Build knowledge from the data generated by faster adoption of technology and digital integration.





Foreword

Cities today are at a pivotal moment in shaping the future of mobility. Increasing congestion, urban land utilization, climate commitments, and evolving travel behaviours are challenging traditional approaches to transport planning. In this context, how mobility systems are designed, integrated, and experienced has become a defining factor in the success and liveability of cities.

A clear and irreversible shift is now underway across the globe. Cities are moving away from fragmented mobility systems toward more integrated ecosystems, where infrastructure, technology, and user experience are designed in concert. Within this transition, parking is emerging as a critical, yet often underutilised, component of the urban mobility landscape.

For decades, parking has been treated as a secondary function of urban infrastructure, planned in isolation from the broader mobility network. The consequences have been significant: inefficient use of scarce urban land, missed opportunities to influence travel behaviour, and a persistent barrier to the development of more sustainable mobility alternatives. As cities face increasing demands on space and infrastructure, this approach is no longer viable.

Reframing parking as a strategic mobility asset unlocks considerable opportunity. When planned and managed effectively, parking can actively shape travel behaviour, enable meaningful modal shift, and support seamless first- and last-mile connectivity. It can serve as a gateway to multimodal networks, a driver of improved customer experience, and a platform for broader sustainability and economic outcomes.

This report, developed through the collaborative efforts of the UITP Global Parking Transformation Working Group, reflects a shared commitment to advancing this transformation. Drawing on global expertise and real-world case studies from diverse urban contexts, it explores how parking can evolve from a static function into an integrated mobility enabler, supporting multimodal, inclusive, and resilient transport systems.

The findings highlight that successful parking transformation requires more than isolated interventions. It depends on the deliberate alignment of governance frameworks, the strategic deployment of enabling technologies, and deep collaboration across public and private stakeholders. Cities that integrate parking within their wider mobility ecosystems will be better positioned to manage demand, improve accessibility, and deliver more sustainable urban futures.

On behalf of the Working Group, I extend my sincere appreciation to all members and partners who contributed their expertise, time, and insights to this body of work, and to the UITP MENA Centre for Transport Excellence for its leadership and commitment in delivering this report.

Eng. Mohamed Abdulla AL ALI

Chair, UITP Global Parking Transformation Working Group
Chief Executive Officer, Parkin Company PJSC



1. Introduction

Parking is no longer just about managing car storage; it is a decisive factor in shaping how people move through cities. Well-designed parking policies and infrastructure can encourage shifts toward public transport, shared mobility, and active modes. On the other hand, when parking is not fully integrated with wider mobility strategies, it may unintentionally reinforce car dependency.

This chapter establishes why parking transformation is essential in modern cities, positioning parking as a strategic lever rather than a passive service. In addition, it defines the scope, objectives, and research framework of the report.

1.1. Background: Why parking transformation matters now?

Cities today are at a critical juncture in shaping mobility futures. The urgency of climate commitments, rising costs of congestion, and competition for limited urban land have placed unprecedented pressure on urban transport systems. Within this context, parking is being increasingly positioned as a supporting service within transport systems. Urban land once devoted to static car storage is increasingly needed for housing, green and public spaces, as well as accommodating mobility alternatives like on-street bikeshare station, car share parking, and active mobility corridors ⁽¹⁾.



In certain contexts, abundant or underpriced parking can contribute to higher private car use, underscoring the importance of context-specific pricing strategies. Cities that oversupply parking tend to encourage longer car trips and reduce demand for public transport, walking, and cycling. This creates a cycle in which car ownership grows, congestion intensifies, and more land allocated to parking, which can contribute to higher housing costs and affect negatively the opportunity to have more efficient and sustainable transport use. Hence, having a diversified combination of different mobility services is key to reduce streets congestion. By that we mean,

reducing private cars by walking, biking, public transport, carsharing, with each mode answering to a different trip purpose, from short distance trips to long distance one; from travelling light, to travelling with cumbersome objects, from daily trips to occasional trips, etc.

Parking is also directly linked to economic and social equity. The design of parking pricing and subsidy models plays an important role in shaping equity outcomes across user groups ⁽²⁾.

In rapidly urbanising cities facing housing pressures, the extensive allocation of land to parking can further constrain residential development and contribute to rising housing costs. This dynamic can push people toward the urban periphery, where public transport connectivity is often weaker, increasing dependence on private vehicles and lengthening commuting times. Reducing excessive parking supply, particularly in well-served urban centres, can encourage the use of public transport and shared mobility, and contribute to broader goals of greening cities and decarbonising the transport sector by discouraging unnecessary private car travel where sustainable alternatives are available.

Fragmentation in mobility networks further complicates the picture. Without integrated approaches, parking is managed in isolation from broader mobility objectives, resulting in inefficiencies, inequities, and missed opportunities ⁽³⁾. This disjointed management is increasingly incompatible with the push toward integrated, multimodal transport systems. A transformation in how cities plan and manage parking is therefore essential, not simply as a matter of traffic management, but as a strategic pathway toward sustainable, inclusive, and resilient urban mobility ⁽⁴⁾. This requires recognising that parking is not just a mobility function but a major use of public space, and that this space can be reallocated differently and transformed to support broader urban and mobility goals and make our cities more sustainable and liveable.

1.2. The role of parking in enabling integrated mobility ecosystem

Parking is a critical, yet often overlooked, component of urban mobility ecosystems. Its availability, cost, and location exert strong influence over how people choose to travel. When managed strategically, parking can become a lever for behavioural change. The abundance and affordability of parking at destinations are one of the most influential factors in the motorists' modal choice ⁽⁵⁾. Parking available can influence destination choice, trip timing, car occupancy, and car ownership ⁽⁶⁾. Therefore, when parking supply and pricing are aligned with mobility objectives, users are better supported in considering multimodal travel options.

Park and ride (P+R) facilities, for example, enable commuters to switch from private cars to public transport for the longest part of their journey ⁽⁷⁾. Similarly, curbside management is fundamentally about balancing public space so that all mobilities including people, goods, and other services can operate safely and efficiently. It is driven by a need for greater equity, ensuring that people and businesses have fair access to the limited street space. Because the curb is often dominated by parking, understanding how it functions is essential to reallocate space more effectively. Strategies such as dedicated areas for micromobility docking enable a more flexible and multimodal use of urban space, supported by better knowledge of actual curb demand and activity.

Integration between on-street and off-street parking

On-street parking refers to spaces provided along the curbs of public roads, which are highly visible and compete with other valuable street uses such as bus lanes, bike lanes, delivery zones, or pedestrian walkways.

Off-street parking is located away from the roadway in facilities such as multistorey garages or underground structures. These spaces are typically linked to private developments or public buildings and are regulated mainly through zoning codes.

Why off-street parking transformation matters as much as on street: integrating management for holistic urban mobility



Parking is a demand shaper. When the total supply of parking is large and/or priced below its social cost or market value, which could be through the availability of subsidies, it could contribute to lowering the generalised cost of car trips and induces higher vehicle ownership and use. Empirically, residential parking availability is a significant determinant of car ownership ⁽⁸⁾.

The dynamics of on-street parking and off-street parking are closely interlinked: shortcomings in one directly influence the other ⁽⁹⁾. On-street parking is for quick access, short-term parking, while off-street parking is for long-term parking.

Where curbside parking is not well-coordinated with off-street policy, demand patterns can become imbalanced. Off-street parking only becomes attractive when on-street supply is limited in volume or stay duration, or when pricing is structured so that on-street charges rise quickly enough to make off-street daily rates more appealing. For example, dynamic pricing schemes in which hourly curbside rates escalate toward or above the off-street daily maximum can effectively shift longer-term parkers into off-street facilities, reducing circulation and competition for curb space.

Different approaches for transforming parking:

- On-street first and then moving to off-street parking.
- Off-street first: prioritising off-street parking transformation.

In both paths, a joint operating model is needed. Responsibility for parking is typically divided between institutions: transport or public works departments usually oversee on-street parking, whereas off-street facilities are more commonly under the authority of urban planning agencies or private operators.



As a result, achieving integrated management of both types of parking generally necessitates coordination across multiple departments and between neighbouring cities.

As per the working group opinion, both must be tackled simultaneously. They are considered as “communicating vessels”, in which when removing on-street parking for bus or cycling space, cities must provide off-street alternatives and align tariffs to pull demand into garages. In addition, to move the demand to off-street alternatives, motorists and car drivers must be aware of the alternative off-street spaces. In the case of Geneva, for instance, the strategy was to work on the tariffs, where on-street tariffs were increased, whereas the off-street tariffs were reduced to make off-street parking (e.g., parking garages) more attractive ⁽¹⁰⁾.

The Impact of Parking in Geneva ⁽¹⁰⁾

Key figures: A cross-border and rapidly growing metropolitan region

Geneva forms the heart of Greater Geneva, a binational metropolitan area spanning Switzerland and France, covering 209 municipalities and hosting over 1.05 million inhabitants.

Between 2005 and 2021, the region recorded remarkable growth:

- Population: from 836,700 to 1,054,950
- Daily trips: from 3.3 million to 4.2 million
- Cross-border trips: from 500,000 to 650,000 daily
- Public Transport modal share: Increased from 11% to 15%
- Car ownership (City of Geneva): Declined from 480 to 428 cars per 1,000 inhabitants

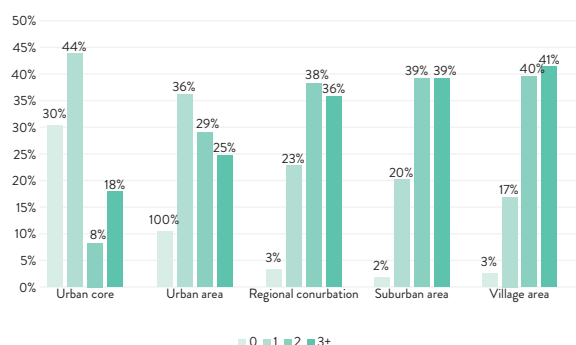
Highlight: This evolution has intensified mobility demand and cross-border commuting pressures, reinforcing parking as a strategic lever to manage growth, congestion, and emissions.

Impact of parking in mobility behaviour

→ Parking at home versus car ownership

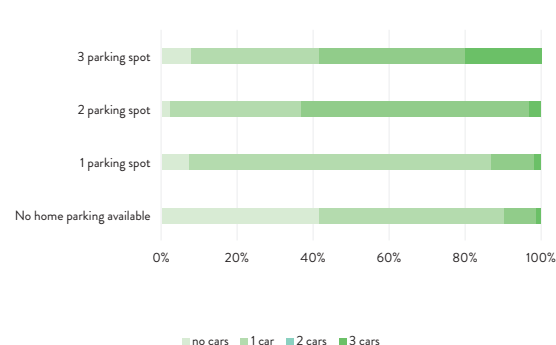
Modus Fondation, an NGO supporting decarbonisation actions in Geneva, conducted a survey in 2024 to identify the relationship between parking availability and territorial typology, which showed a very strong correlation. While more than 30% of residents in the urban core have no parking space at home, this share drops to less than 3% in more peripheral areas.

Home parking: available parking spaces



→ Source: (10)

Home parking vs number of cars



→ Source: (10)

In addition to that, the survey has looked into the relationship between other factors such as the residential parking availability and household car ownership. The data from Geneva shows a strong correlation between these two factors. While 42% of households without parking at home are not motorised, the share of non-motorised households falls below 5% when at least one parking space is available. This implies that residents without guaranteed parking spaces are significantly less likely to own or use private cars. In central districts, limited on-site parking has supported the steady decline in car ownership, while suburban areas with abundant private parking continue to exhibit higher car dependency.

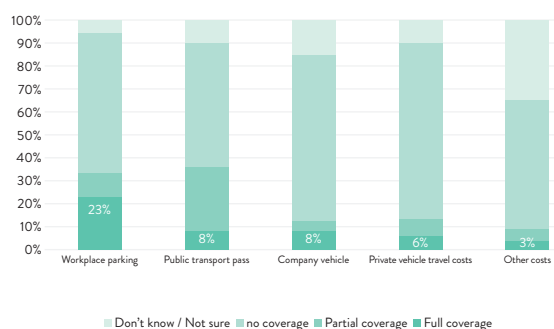
→ The impact of workplace parking on commuter mode choice

Another survey conducted by Modus Fondation focused on the impact of workplace parking availability on modal choice. It was found that nearly half of all employees have access to a parking space at their workplace.

The survey also reveals that about one-third of companies still cover parking costs for their employees, with 23% offering full coverage. In comparison, only 8% of employers fully cover the cost of public transport subscriptions⁽¹⁰⁾.

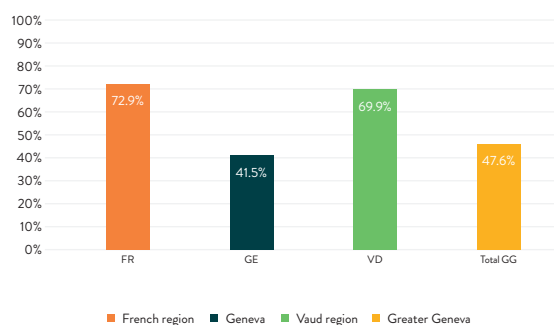
Key takeaway: Geneva demonstrates that parking reform can directly shape travel behaviour and enable modal shift when tied to pricing, accessibility, and service integration.

Employer coverage of commuting expenses



→ Source: (10)

Workplace parking availability in %



→ Source: (10)

1.3. Methodology and study scope

This report examines parking transformation through the lens of sustainable curb management and mobility. It covers both on-street curbside management and off-street facilities, highlighting how these spaces jointly influence modal choice and urban liveability. More importantly, the study moves beyond parking near public transport stations to consider citywide dynamics, acknowledging that the availability and affordability of parking throughout the urban fabric fundamentally shape mobility behaviour.

This report, developed under the UITP Global Parking Transformation Working Group, explores how cities can rethink parking as a lever for sustainable mobility. By assessing global practices and emerging innovations, the study highlights pathways where parking becomes a gateway to multimodality, integrated with public transport, mobility services, and active travel, while also contributing to climate goals, urban liveability, and social equity.

In sum, the study focuses on how parking infrastructure, policy, and design can support modal shift, system integration, and quality of life improvements, moving toward seamless and inclusive mobility ecosystems.

1.3.1. Main objectives

- RO1: Understand the role of parking systems in enabling multimodal integration and advancing sustainable urban mobility objectives.
- RO2: Explore the infrastructure, technological, governance, and financial dimensions of parking transformation that contribute to multimodal integration and sustainable urban mobility.
- RO3: Identify integrative strategies that align parking transformation strategies with multimodal ecosystem goals (public transport, shared mobility services, and active mobility).
- RO4: Provide recommendations for cities to implement integrated parking transformation that aligns parking systems with sustainable urban mobility goals.

1.3.2. Guiding questions

- RQ1: How can public parking infrastructure be transformed to support multimodal integration and advance sustainable urban mobility objectives?
- RQ2: What technologies are currently being deployed to improve the multimodal integration and users' experience?
- RQ3: What governance strategies enable successful parking transformation?
- RQ4: How can parking revenues be leveraged to fund sustainable mobility and public transport improvements?
- RQ5: How can cities implement integrated parking transformation systems aligned with sustainable urban mobility objectives?

1.3.3. What is our approach?

This report has been developed as a collaborative knowledge product of the UITP Global Parking Transformation Working Group. The information and findings presented throughout the study are informed by multiple sources of input:

- Working group discussions: Regular exchanges among the members provided insights about challenges, practices, and emerging solutions.
- Case studies: Selected international examples highlight innovative approaches to parking transformation, covering both on-street and off-street contexts, with emphasis on integration into wider mobility systems.
- Desktop research: Secondary sources, including urban mobility plans, policy documents, and academic research, were reviewed to contextualise findings and provide evidence-based recommendations.

By combining practitioner insights with comparative global evidence, the report reflects both the collective expertise of UITP's global network and the practical realities of cities implementing parking transformation.

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2. Parking Transformation Enablers

The chapter explores how parking can be transformed from a fragmented, car-oriented function into a coordinated system that actively supports sustainable mobility. The discussion then highlights the structural barriers to this transformation, including fragmented institutional responsibilities, misalignment between revenue and mobility objectives, competition for curb space, and the lack of reliable data and digital integration.

Building on this, the chapter identifies three critical enablers:

- Governance, to align stakeholders, integrate policies, and ensure effective enforcement.
- Digital technologies, to enable data-driven management, improve user experience, and support multimodal integration.
- Financing, to guide behaviour through pricing and reinvest revenues into sustainable mobility systems.

Drawing on international examples, the chapter demonstrates that when these elements are aligned, parking can shift from a passive asset into a strategic instrument for enabling multimodal, accessible, and liveable urban environments.

2.1. Importance of parking transformation

Parking is treated as an essential interface in the mobility chain: the end-point of private car trips and a seamless entry/exit point to public transport and shared mobility services. At first glance, parking seems static: an idle car in a designated bay. Yet beneath this apparent stillness lies an important lever for urban mobility. Parking policies quietly shape our daily choices whether to drive, to board a bus, to cycle, or to walk. They determine how close we can bring our car to the office door, whether a residential street is congested with stored vehicles or open for children to play, and whether a train station is approached through a hostile parking lot or a welcoming plaza of bikes, buses, and cafes.

In many cities, the oversupply of under-priced and unregulated parking has enabled ease of access to parking spaces and convenience, reinforcing congestion. On the other hand, this has created opportunities today to better align pricing with mobility and space-management goals.



The cost of “free” parking is paid not at the meter, but in longer commutes, reduced air quality, and the loss of public space that could have been dedicated to housing, parks, or safe walking and cycling spaces. In contrast, cities that transform their parking spaces send a different message: they make driving less inevitable and other choices more attractive. Well-calibrated pricing reduces unnecessary trips, right-sizing supply prevents induced demand, and reallocating curb space invites public transport and shared and active mobility modes into the conversation. In 2022, Vienna introduced a city-wide parking management system, meaning all street parking is subject to payment, and limited to two hours for non-residents. Expanding paid parking zones has started bringing in around 180 million euros annually, that the city is putting into cycling lanes ⁽¹⁾, which shows the need for efficient parking enforcement.

Parking transformation policies are about managing modal choices and travel demand. When cities offer abundant and affordable parking everywhere, low public transport modal share becomes an expected outcome. By treating parking as a core transport demand management tool, cities can influence how, when, and why people travel, and support a shift toward more sustainable modes. In other words, it is about managing parking in a way that affirms the curb as an accessibility zone for all users.

2.2. Barriers to integrating diverse mobility functions

Transforming parking from a static supply for private vehicles into a dynamic access system that supports public transport, shared mobility, and active travel is one of the most difficult tasks cities faces. The barriers are not only physical but also institutional, financial, and cultural.

This section highlights the most common barriers, institutional, contractual, spatial/operational, digital, and social.

Fragmented institutional governance of parking systems

Parking management is rarely under the control of a single authority. One of the biggest challenges is the fragmentation between agencies and the mix of public and private owners managing on-street and off-street parking. This is reinforced by decentralised technologies, where each operator uses its own payment platform, whether proprietary or third party, resulting in dispersed information and limited system-wide visibility.

Different stakeholders manage different layers: public transport, shared mobility, parking, each with their own platforms, data, and rules⁽²⁾. In other words, responsibilities are often dispersed across municipal transport departments, parking agencies, traffic police, and private operators. This fragmentation results in:

- Creating conflicting priorities, between mobility objectives and revenue generation.
- Underused parking spaces.
- User confusion due to inconsistent rules, rates, and enforcement, mainly between jurisdictions and private operations.

Misalignment between parking revenue governance and mobility policy objectives

Parking has been regarded as a significant revenue stream for cities due to the substantial income it generates. For instance, the Toronto Parking Authority (TPA) generates approximately CAD 160.9 million (€103.0 million) in revenue annually. Likewise, the Agence de mobilité durable de Montréal reported CAD 83.4 million (€52.8 million) in 2024. In Geneva, parking operations managed by the Fondation des Parkings generated around CHF 130–150 million (€135–156 million) in recent years. These figures illustrate the scale of financial flows associated with urban parking systems.

Despite this financial significance, the governance of parking revenues and operations is often fragmented. In many cases, enforcement responsibilities are managed by entities separate from those responsible for pricing policies or strategic planning, each operating under different performance indicators.

This institutional separation can complicate coordination between pricing, enforcement, and broader mobility objectives. At the same time, cities are increasingly recognising that the curb generates economic and social value that extends beyond direct parking revenues.

Spatial competition and design limitations of parking spaces

Urban curb space is limited and increasingly contested by a wide range of users including bus priority lanes, protected cycleways, freight and service vehicles, micromobility docks, pick-up and drop-off (PUDO) zones, and parking for residents and businesses. When curb use is not managed dynamically or allocated by time of day, these functions overlap and compete, creating inefficiencies and safety risks ⁽³⁾. Off-street facilities face similar challenges: many garages still lack secure bicycle parking, clear wayfinding, or connections to other modes, limiting their ability to support a genuine shift toward multimodal travel ⁽⁴⁾.

Insufficient data and digital infrastructure for parking management

While public transport systems often collect detailed ridership and performance data, parking data is sparse, inconsistent, and rarely standardised ⁽⁵⁾. Parking is considered as an under-measured infrastructure. Despite its scale and effect on mode choice, cities lack robust on-/off-street data (occupancy, turnover, effective supply by time of day). Few cities have reliable information on occupancy, turnover, or dwell time, especially in private off-street facilities. This absence of evidence makes it difficult to implement demand-responsive pricing, evaluate multimodal hubs, or monitor the impacts of curb reallocation.

Furthermore, trip planners often underestimate total travel time by excluding the time required to locate an available parking space. The unavailability of cruising time data can distort modal comparisons in favour of private vehicle use. This highlights the need to systematically collect and standardise parking-related indicators such as occupancy rates, search time, and turnover so that real-world parking conditions and reliability can be accurately reflected in journey planning and travel time assessments.



Moreover, proprietary parking systems and lack of open Application Programming Interfaces (APIs) hinder integration with public transport and shared mobility apps. For instance, ticketing and payment systems remain siloed: parking apps, public transport smartcards, and micromobility wallets rarely interoperate, making seamless multimodal journeys challenging ⁽⁶⁾.

Comprehensive and accurate data collection is therefore essential for informed parking management. Understanding where both on- and off-street spaces are located, how they are priced, and how they are utilised allows cities to develop evidence-based policies and set context-sensitive tariffs.

Most public transport systems collect rich, ridership and performance data, while on the other hand, many cities have sparse, non-standard parking occupancy, turnover, dwell, and curb-use datasets especially off-street. This hinders demand-responsive pricing, time-of-day allocation, and evaluation of hub performance.

Conclusion

Taken together, these barriers illustrate that parking transformation is not solely a technical or operational challenge, but a systemic one that spans governance, policy, infrastructure, data, and user behaviour. Addressing these challenges requires cities to move toward a more integrated approach in which curb management, digital systems, and mobility services are planned and managed in a coordinated manner. When parking is integrated across these dimensions, it can evolve from a passive asset function into an active component of the mobility system supporting efficient curb allocation, enabling seamless multimodal journeys, improving data-driven decision-making, and reinforcing broader transport demand management objectives.

Based on the identified barriers, the following sections highlight the three important elements for parking transformation, namely, governance, digital transformation, and financing.

2.3. Role of governance in parking transformation

2.3.1. Why parking governance matters

Parking transformation is increasingly recognised as a governance challenge rather than a technical one. While cities deploy smart parking systems, dynamic pricing, and digital platforms, these tools deliver limited impact when institutional responsibilities, enforcement, and parking management are fragmented, and/or objectives are misaligned. In addition, when revenue objectives are not clearly aligned with mobility goals, parking systems may underperform their full potential as mobility enablers.



Across cities worldwide, parking is rarely governed as a coherent system. Responsibilities are often split between municipalities, public transport authorities, police departments, and parking operators. This institutional situation may result in inconsistent pricing and enforcement, limited coordination with public transport and mobility services, weak integration of

parking into broader urban strategies, and missed opportunities to repurpose parking for mobility hubs and public space. Hence, governance arrangements fundamentally shape how parking performs as part of mobility ecosystem.



2.3.2. Key governance aspects for parking transformation

Parking as a core mobility infrastructure

A fundamental governance principle emerging across cities is the need to plan and manage parking as core mobility infrastructure, rather than as residual real estate or a standalone municipal revenue stream. This reframing allows parking supply, pricing, and enforcement to actively support public transport performance, accessibility, and sustainable travel behaviour.

The City of Amsterdam uses part of the income from on-street parking, permits and fines to pay for parking enforcement, permit administration, and the maintenance of parking meters. However, the greater part goes to the Municipal Sustainable Mobility Fund (SMF). This fund is used to finance traffic and public space projects in the city. So, the income from parking fees ultimately contributes to greater traffic safety and a more liveable city for its residents ⁽⁷⁾.

Montreal – Parking Governed As a Mobility Infrastructure ⁽⁸⁾

Agence de mobilité durable de Montréal (Sustainable Mobility Agency of Montreal) is the result of a systemic governance reform that explicitly repositions parking as a component of the urban mobility system. In other words, mobility is the main objective of the Agency's mandate, while revenues from parking management and enforcement are consequences of its activity. The principles of Montreal revised governance include:

- Parking must be planned and managed as a core mobility infrastructure. More specifically, the primary function of parking is to support public policy objectives and transportation system performance and not maximise revenue. In addition, public space must be recognised as a finite collective asset, requiring allocation and pricing strategies that prioritise uses delivering the greatest mobility, economic, and social benefit.
- Enforcement must be recognised as a core function of parking management.
- Parking planning, management and operational practices must be harmonised across the urban area to facilitate alignment with the objectives of the transportation system.

Institutional leadership and integration

Parking systems perform best when there is clear institutional leadership, either through a unified authority or a formalised governance framework that defines roles, responsibilities, and decision-making powers. Fragmentation without coordination leads to conflicting objectives and operational inefficiencies.

Geneva Parking Strategy – Unified Public Parking Authority ⁽⁹⁾

Geneva's parking system operates under a dual-tier model that balances regulation and execution. The State of Geneva acts as the strategic brain, setting policy, tariffs, and coordination frameworks, while the Fondation des Parkings functions as the operational arm delivering infrastructure, managing enforcement, and driving digital innovation.

- **State of Geneva (policy and regulation):** Sets the overall parking policy and regulatory framework, including limits, zoning, and pricing; defines strategic priorities related to multimodal mobility, climate objectives, and sustainable urban development; coordinates with municipalities and transport agencies; and approves major parking projects and funding.
- **Fondation des Parkings (operator):** Develops and promotes parking infrastructure; delivers parking services such as subscriptions, permits, customer service, and digital payments; monitors and enforces parking regulations and develops innovative solutions to respond to evolving mobility needs.

Parking policy interventions implemented in Geneva to strengthen multimodality

- Cornavin multimodal hub (Mobility Carshare + Fondation des Parkings): Integration of shared electric vehicles (EV) parking with the central station.
- Progressive reallocation of on-street parking: The city has been progressively developing or using existing underground garages to absorb demand for on-street parking and create space for greenery, cycle lanes, walking infrastructure, and improve the public realm and liveability without completely removing car access.
- Expansion of P+R facilities: By 2030, over 2,500 new spaces will be added; 20 new bike and motorcycle stations and carsharing and bike sharing options; and special discounts for car poolers, delivery vehicles, carsharing
- Dynamic pricing and zoning system: Differentiated tariffs for residents, visitors, and commuters to discourage long-term car use in central areas.
- Incentives through corporate mobility plans: Incentives to set up and strengthen company mobility plans with parking transformation (through pricing, car sharing provision, schemes to incentive carpooling, etc.).

Fondation des Parkings responsibilities ⁽¹⁰⁾

Parking planning, management, and enforcement are consolidated under the Fondation des Parkings, a public foundation established by cantonal law.

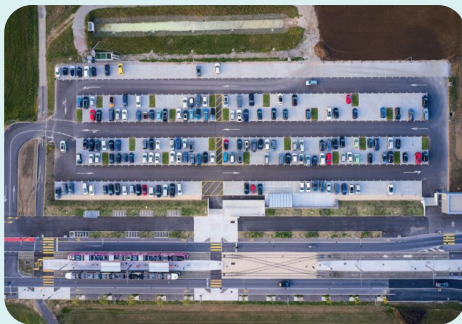
Key governance characteristics include:

- A single institution responsible for on street and off-street parking management and enforcement (parking enforcement coordinated centrally).
- A legal mandate explicitly linking parking to mobility management, environmental protection, and quality of life.
- Governance oversight through a board composed of public representatives from the canton, municipalities, and the City of Geneva.

Parking is explicitly used to reduce car penetration into the city, support multimodal travel, and protect environment and enhance liveability. This is operationalised through: strong P+R policy (CHF 720–1,600/year including public transport), discouragement of long-stay city-centre parking, and extensive support for bicycles, motorcycles, carsharing, and the use of EVs.

Key figures (Fondation-owned parking facilities)

- ~90,000 parking spaces managed (on-street and off-street)
- 20 P+R locations in Geneva with 3,500 subscribers
- 2,700 motorcycle spaces in 60 car parks
- Management of 3,000 secure, monitored bicycle parking spaces in 25 bicycle stations in Geneva
- 120 Mobility locations (car sharing) in 26 car parks (40% of fleet is electric)
- 450 charging points in 39 car parks



Key takeaways:

Unified institutional leadership allows parking policy, pricing, and enforcement to operate coherently in support of modal shift and regional mobility objectives.

Geneva's approach shows that parking policy can be a central tool in supporting multimodal mobility, but integration requires strong governance coordination and clear distribution of responsibilities.

Effective enforcement

Effective enforcement is essential for parking to function as a policy tool. Weak or misaligned enforcement undermines safety, accessibility, and the credibility of pricing and access rules. Across cities, a key principle is that enforcement should be institutionally aligned with parking policy, not treated as a detached or revenue-driven activity. For instance, Montreal and San Francisco both emphasise enforcement as a core management function, with clear separation between enforcement objectives and revenue generation, reinforcing compliance, safety, and system performance.

San Francisco – Parking Embedded In a Transport Authority ⁽¹¹⁾

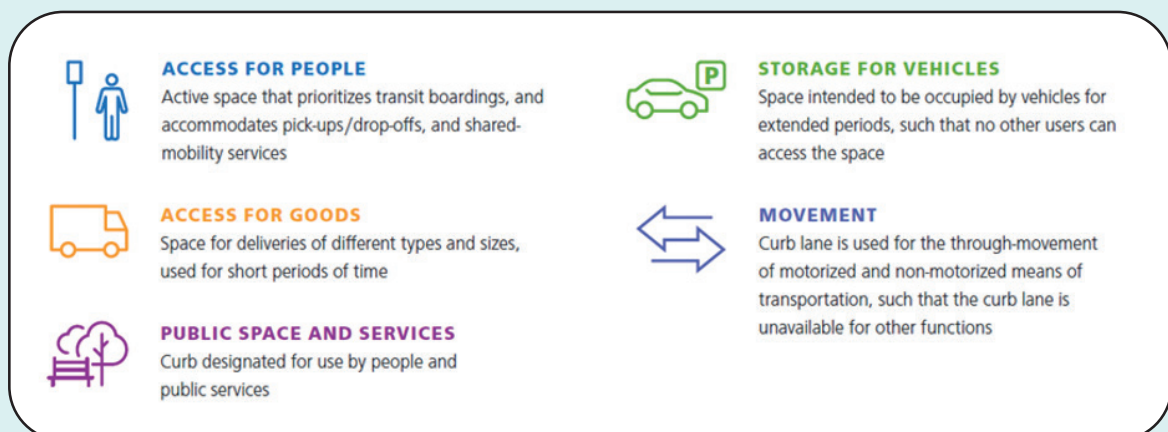
San Francisco integrates parking and curb management within the San Francisco Municipal Transportation Agency (SFMTA), which also governs public transport, traffic management, and street design. In 1993, California converted most parking violations from criminal infractions to civil penalties. Fines, payments, and late fees could be handled administratively, outside the police and court system. In 1999, the SFMTA was created combining San Francisco Municipal Railway and the Department of Parking and Traffic.

The city explicitly recognises that 90% of curb space was used for vehicle storage. This allocation does not reflect how people travel, as the curb can be more productive. For instance, 80 feet of curb can serve 4 private vehicles, 22 motorcycles, 32 shared bikes, and 40 feet Coach Bus. Hence, the SFMTA has developed Curb Management Strategy that its goals are Safety (Vision Zero), transit priority, climate action, equity and accessibility, and transparency in decision-making.

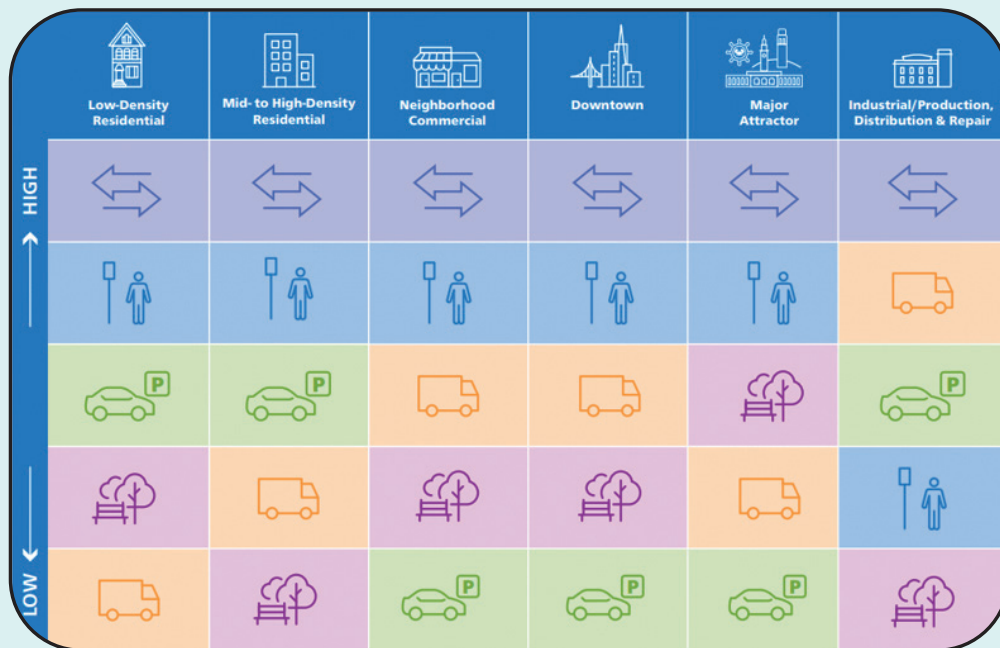
Curb management strategy

This strategy defines five key curb functions and how those functions and users are prioritised in different land use contexts to reflect how curb needs vary across the city.

Curb hierarchy - functions



Curb hierarchy – priorities by land use:



This governance structure allows to:

- Shift enforcement focus from low-impact violations toward behaviours that directly affect network performance and safety.
- Support curb reallocation for transit, loading, and active mobility.
- Ensure enforcement credibility without framing citations as a revenue-generating tool.



Enforcement of parking regulations for People with Reduced Mobility (PRM) is also a critical component of equitable parking management. Accessible parking spaces are designed to ensure that individuals with reduced mobility can access essential services, public spaces, and transport networks. However, the effectiveness of these provisions depends heavily on robust enforcement mechanisms that prevent misuse and ensure that these spaces remain available to those who require them.

Cities typically rely on a combination of regulatory, technological, and operational measures to enforce accessible parking provisions:

Permit systems: Access to disability parking spaces is usually controlled through a permit or badge system issued by public authorities. These permits are linked to individuals with certified mobility impairments and must be displayed when using designated spaces. To avoid misuse, monitoring and enforcing compliance are important to ensure equitable access.

On-street enforcement officers: Parking enforcement officers conduct regular inspections to verify permits and ensure that vehicles occupying accessible spaces are authorised to do so. Violations often result in fines or vehicle towing.

Digital enforcement technologies: Many cities are increasingly adopting digital tools such as plate recognition technologies systems, enforcement cameras, and digital permit databases. These technologies allow enforcement officers to verify whether a vehicle is associated with a valid disability permit. This approach is seen in cities like Dubai, Budapest, and Montreal.

Key takeaways:

When enforcement is institutionally aligned with transport policy objectives, such as reducing double parking, protecting transit lanes, and ensuring accessibility to different mobility users including disabled people, parking becomes an effective instrument for safety, accessibility, and sustainable mobility and can allow curb and parking decisions to directly reinforce sustainable mobility and street reallocation.

Harmonisation across the different stakeholders

Parking fragmentation is often not only institutional but also spatial, with different rules, prices, and standards across municipalities, districts, or operators. Governance changes should aim for harmonised planning and operational frameworks at the city or metropolitan scale.

Toronto – A “One-City” Parking Strategy - Parking Agency with Strong City Coordination ⁽¹²⁾

Facing a fragmented parking system managed by multiple departments, Toronto developed a unified policy framework that consolidated responsibilities, standardised objectives, and embedded parking within its wider urban mobility strategy. The key changes include:

- Redefining TPA as a mobility agency rather than a parking operator.
- Aligning mandates, key performance indicators (KPIs), and governance structures to support sustainable mobility, shared modes, and digital integration.
- Incorporating curb management, micromobility access, and EV infrastructure into a single portfolio ⁽¹³⁾.



TPA is a municipally owned agency operating parking on a commercial basis, while remaining closely aligned with city policy. In specific, it operates within a governance context where responsibilities are shared. It also manages on-street and off-street parking, bike sharing, and EV charging. The on-street parking enforcement is carried out by Toronto Police Services, while transport, public realm, and land-use decisions sit with multiple city departments. Furthermore, there is a collaboration across different stakeholders such as parks, forestry and recreation, transportation services, corporate real estate, business improvement areas, and Toronto police services. This inter-departmental coordination enables:

- Alignment of parking assets with cycling infrastructure, EV charging, and last-mile services.
- Repurposing of surface parking lots for community uses, shared mobility, and mobility hubs.

- Reinvestment of parking revenues into broader city services, reinforcing political support for parking transformation.

Key figures related to parking and owned by TPA

- 24.9 million transactions for the year 2025; 15.5 million on-street transactions at 21,800 parking spaces, 9.4 million off-street transactions at 40,000 parking spaces, and 2.7 million transactions using green parking app customers.
- 533 EV charging stations; 434 are off-street and the remaining (99) are on-street locations.
- 8.1 million bike sharing rides in 2025 (Toronto has the 3rd largest bike share in North America). Also, 2,300 e-bikes, 1,060 stations, and 1,360 e-docks were deployed in 2025.

Key takeaways:

Even without full institutional consolidation, formalised and strong coordination mechanisms can align parking governance with mobility and public space objectives can reposition parking as a mobility enabler.

Montreal is converting publicly owned parking lots into multimodal mobility hubs as part of a long-term strategy to deliver 150 hubs by 2050. Led by a structured governance model involving the city council, dedicated committees, and a program office, the initiative ensures coordinated planning and scalable implementation⁽⁸⁾. The approach demonstrates that governance-led parking transformation can support sustainable mobility and enhance public acceptance by embedding environmental and social value.

Metropolitan-scale coordination efforts observed in Toronto and Montreal demonstrate how harmonised planning frameworks can improve alignment between parking supply, public transport access, and broader urban mobility objectives, even where ownership remains mixed.



2.3.3. Concluding remarks

Parking transformation is fundamentally a governance challenge, where institutional alignment, clear roles, and effective enforcement determine whether parking can support broader mobility objectives.

Across cities, the shift is clear: parking must move from a fragmented, revenue-driven function to a coordinated policy instrument that supports accessibility, multimodality, and urban liveability. This requires governance frameworks that align stakeholders and treat enforcement as a core component of mobility management.

While governance defines the direction of transformation, its implementation increasingly depends on digital technologies and data systems. The following section therefore explores how technology enables cities to operationalise these objectives in practice.

2.4. Digital transformation of parking for user-centric, data driven, and integrated mobility systems

The evolution of parking technology reflects a broader shift in urban mobility from static vehicle storage toward active and digitally enabled mobility infrastructure. Enabling technologies play a dual role: they enhance the operational performance of parking as a service, while simultaneously providing the data and digital inventories required for multimodal integration. Real-time monitoring, integrated access and payment, and data-driven curbside management together allow cities to manage parking more efficiently, improve user experience, and align parking policies with wider sustainability objectives.

2.4.1. Why technology and information sharing in parking transformation matter?

As urban mobility systems diversify, user journeys are becoming increasingly multimodal, personalised, and complex. Enabling technologies are critical to reposition parking into an active user-centric mobility service.

Enhancing user experience: Modern parking technologies directly address key friction points in urban travel:

- Real-time information reduces uncertainty, search time, and unnecessary circulation.
- Digital and account-based access simplifies authentication, validation, and payment.
- Multiple payment channels increase convenience and user choice.
- Personalisation allows users to make informed decisions based on time, cost, and environmental impact.

Enabling inclusivity and accessibility: Technology plays a central role in ensuring that parking systems serve all users:

- Centralised user accounts and digital permits reduce administrative barriers and reliance on physical documents.
- Enforcement through automated plate recognition protects priority users and ensure consistent access rights.
- Reduced dependence on physical interfaces benefits users with diverse accessibility needs.

Supporting multimodal integration: Parking technologies form a critical integration layer within the wider mobility ecosystem:

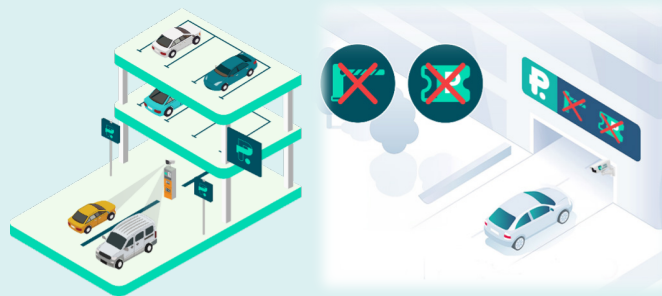
- Real-time data enables parking to be embedded in journey planning and MaaS platforms.
- Account-based systems provide technical compatibility with broader mobility services.
- Digitally managed facilities can function as mobility hubs, hosting EV charging, micromobility, and last-mile services.
- Shared standards and APIs support collaboration between public transport authorities, operators, and mobility providers.

As mobility systems become more complex, enabling technologies are essential to keep user journeys simple, inclusive, and seamlessly multimodal. Parking technology is no longer optional; it is foundational to modern urban mobility.

Seamless Multi-storey Car Parking (MSCP) Transforming the Customer Journey in Dubai ⁽¹⁴⁾

As urban mobility systems evolve, customer expectations are increasingly shaped by digital-first, frictionless experiences. Traditional multi-storey car parks (MSCPs), often reliant on physical tickets, barriers, and payment kiosks, can create bottlenecks at entry and exit points. During peak periods, these friction points contribute to congestion, unnecessary queuing, and suboptimal traffic circulation within surrounding areas.

Recognising that parking is a critical touchpoint within the broader mobility journey, Dubai initiated a transition toward fully seamless MSCP operations. In 2025, Parkin, Dubai's exclusive public parking operator, introduced a contactless parking solution across some of its MSCPs powered by Automatic Number Plate Recognition (ANPR) technology.



The seamless MSCP model delivers impact across multiple dimensions:

Customer experience: Eliminates queues at entry and exit points; Removes ticket handling and kiosk interactions; Reduces uncertainty and waiting time; Integrates parking into a smooth, uninterrupted journey.

Traffic and congestion management: Improves throughput at access points; Reduces peak-period bottlenecks; Minimises internal circulation delays within car parks.

Operational efficiency: Removes reliance on paper ticketing systems; Reduces infrastructure maintenance requirements; Enhances accuracy in time calculation and billing.

By eliminating physical barriers, MSCPs transition from controlled access facilities to digitally managed mobility nodes.

Beyond customer convenience, seamless MSCPs generate structured entry and exit data, strengthening demand analysis and enabling better utilisation management across assets.

This transformation positions structured parking not merely as a storage function but as a digitally integrated component of the urban mobility ecosystem. By embedding automation, real-time data, and frictionless payment into the parking journey, Dubai demonstrates how multi-storey car parks can evolve to support smarter traffic management, improved user satisfaction, and more efficient urban movement.

2.4.2. Smart and real-time technologies for parking management and enforcement

Smart and real-time parking management systems rely on digital payment platforms, smart meters, plate recognition, smart scan cars fixed cameras, and cloud-based analytics to monitor occupancy, compliance, and usage patterns across on-street and off-street facilities.

Smart parking meters are digitally connected parking meters that support electronic payments and communicate continuously with central management systems. They deliver accurate, real-time payment status, enable zone- and time-based rules, and allow rapid tariff or regulation updates without physical intervention. They also offer a consistent rule across streets and zones, improving trust and usability.

In Dubai, smart parking accepts both cash and Nol card, which is a rechargeable smart card for seamless travel and payments across all public transport (Metro, Bus, Tram, Water Transport) along with parking services ⁽¹⁵⁾.

Another smart meter is the Pay by Plate meters, which is a smart parking meter system in which drivers pay for parking by entering their vehicle's license plate number instead of parking in a specific numbered space or displaying a physical ticket. In Toronto, the service is deployed and it accepts four payment options (Debit, digital wallet (apple or google pay), scan QR code, text-to-pay) ⁽¹³⁾.

Automatic Number Plate Recognition (ANPR)-enabled enforcement vehicles and cameras, including smart scan cars, curbside smart cameras, and pole smart scan cameras. Smart scan cars automate large-scale compliance checks by continuously scanning license plates while patrolling. It is used to identify vehicles and validate parking activity against payment, permit, or exemption databases. For enforcement, this technology enables ticketless parking, faster inspections, and more consistent rule application, reducing manual checks and human error. This technology eliminates the need to display tickets or permits, supports seamless entry and exit in off-street facilities, and simplifies the overall parking process. ANPR can also be referred to as Automated License Plate Recognition, (ALPR), which is often used in North America while ANPR term is mostly used in Asia and Europe.

Several cities like Dubai, Abu Dhabi (launched pilot program in 2025), Toronto, Paris, Geneva, and Amsterdam are utilising this technology to monitor parking and enforcement. For instance, the City of Paris manages more than 43,000 parking spaces and has 17 electric cars equipped with number plate readers to carry out the checks. They also organise controls for light vehicles, motorised two-wheelers and people with reduced mobility. The City of Geneva, operated by Fondation des Parkings uses 3 scan cars to optimise monitoring and increase operational efficiency ⁽¹⁶⁾.



Furthermore, ANPR curbside smart cameras which can capture vehicle license plate and use the associated data for automated parking management, entry/exit time, payment, and enforcement. The automated enforcement improves fairness and predictability, discourages misuse that reduces availability, and protects priority users without intrusive manual inspections. In Dubai, Parkin's smart inspection vehicles form a core component of the city's parking enforcement and compliance framework, operating daily to support fair, consistent, and efficient parking management ⁽¹⁵⁾.



Smart Scan Vehicles Enabling Data-Led Operations in Dubai ⁽¹⁴⁾

As cities scale their paid parking networks, enforcement becomes increasingly complex. Traditional patrol-based models rely heavily on manual inspections, fixed routes, and reactive deployment. This often results in uneven coverage, inefficient resource utilisation, and inconsistent compliance levels. In high-demand urban environments such as Dubai, ensuring fairness, accuracy, and operational efficiency requires a fundamentally different approach.

To address this challenge, Dubai has progressively transitioned toward a data-led enforcement ecosystem powered by smart scan vehicles.



At the core of this transformation is a fleet of smart scan vehicles equipped with:

- AI-powered ANPR capable of scanning multiple vehicles simultaneously
- Real-Time Kinematic (RTK) positioning for centimetre-level spatial accuracy
- Integrated backend systems that process scans in real time within a proprietary enforcement platform

Rather than functioning solely as enforcement tools, these vehicles act as mobile data collection units, generating high-resolution spatial and behavioural insights across the entire parking network. This shift redefines enforcement from a manual inspection activity to a continuous, intelligence-driven monitoring system.

The insights generated by the smart scan fleet extend well beyond identifying violations. The data is systematically leveraged to enable:

- Intelligent route planning, dynamically prioritising high-turnover or high-demand areas
- Optimised inspector deployment, reducing redundancies and improving coverage balance
- Targeted compliance strategies in zones with recurring behavioural patterns
- Performance analytics to refine enforcement models and policy calibration

By embedding analytics into daily operations, enforcement resources are deployed where they generate the greatest operational and behavioural impact.

By the end of 2025, Dubai's fleet of 26 smart scan vehicles had significantly scaled its operational capacity:

- Annual scanned license plates increased from over 37 million in 2024 to more than 93 million in 2025, representing a ~150% year-on-year growth
- Manual inspection share was substantially reduced from ~13% of total scans in 2024 to 1% in 2025
- Enforcement errors were minimised through automated verification and spatial precision

Dubai's smart scan vehicles illustrate how enforcement technology can evolve into a strategic data asset. By combining Artificial Intelligence, high-precision geolocation, and integrated analytics, parking management shifts from reactive control to proactive system optimisation.

This transformation demonstrates that modern enforcement is not merely about issuing violations but building a real-time understanding of urban parking behaviour, enabling cities to manage space more intelligently, equitably, and efficiently.

Digital payment platforms enable users to start, manage, and pay for parking sessions electronically through mobile applications or account-based systems linked to vehicle license plates. From a customer experience perspective, they remove the need for cash or physical tickets, allow remote session management, and significantly reduce friction and uncertainty, particularly for visitors and occasional users ⁽¹⁷⁾.

Digital permits and account-based access replace physical permits with centrally managed digital authorisations linked to vehicles or user accounts. They enable instant verification, reduce fraud and misuse, and simplify differentiated rules for residents, businesses, and priority users. Account-based access in parking is a digital system that uses a customer's online account, rather than a physical ticket or cash payment, to grant vehicle entry/exit and manage payment for parking facilities. It enables frictionless repeat use across facilities and ensures consistent recognition of access rights across locations. In Toronto, camera-based payment integration is adopted, and permits are linked to ANPR.

IoT-based sensor systems detect real-time parking occupancy and turnover at the space, zone, or facility level using in-ground, overhead, or camera-based technologies. They provide objective evidence of occupancy and overstay, support targeted inspections, and enable dynamic regulation. Furthermore, they underpin reliable availability information, reduce cruising for parking, and improve journey reliability while lowering congestion and emissions.

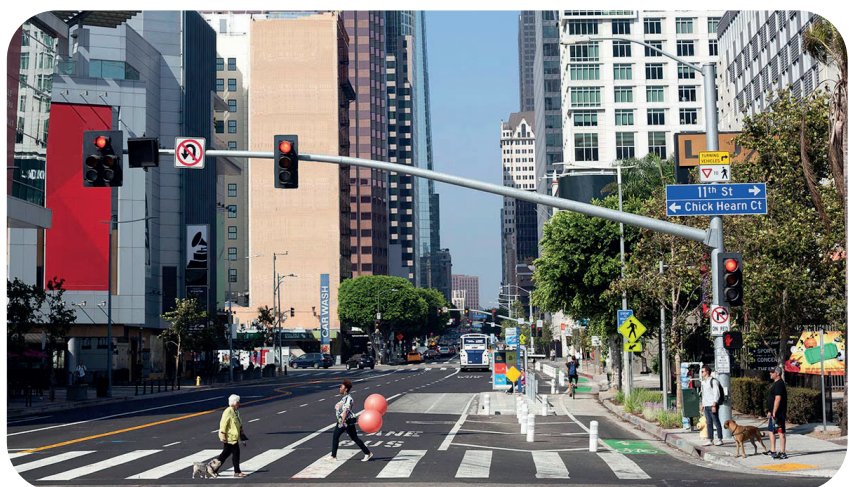
Cities such as Amsterdam and Barcelona have effectively deployed such systems, achieving congestion reductions of up to 30% ⁽¹⁸⁾.

Real-time parking guidance and wayfinding systems use digital signage and in-app navigation to direct drivers to available spaces based on real-time data. This can cut search time, reduce stress, and improve accessibility, particularly for first-time users.

B:SM (Barcelona de Serveis Municipals) integrates camera-based detection with the SMOU app to provide real-time parking availability and guidance to its municipal garages in Barcelona. This system aims to improve urban mobility by reducing the time spent searching for parking. Similarly, Toronto utilises real-time occupancy analytics in off-street parking ⁽¹⁹⁾.

Dynamic pricing and demand-responsive management adjust parking tariffs and rules based on real-time demand, location, and time of day. This strategy can improve compliance and turnover by aligning price signals with actual demand, reducing overstay and misuse.

Los Angeles Department of Transport (LA DOT)'s sensor-enabled programme delivered real-time data and demand-responsive pricing that is called LA Express Park, reducing congestion and improving turnover in the downtown area. In specific, the strategy has led to a 37% reduction in parking duration for LA Downtown, as well as a 16% increase in parking revenue ⁽²⁰⁾.



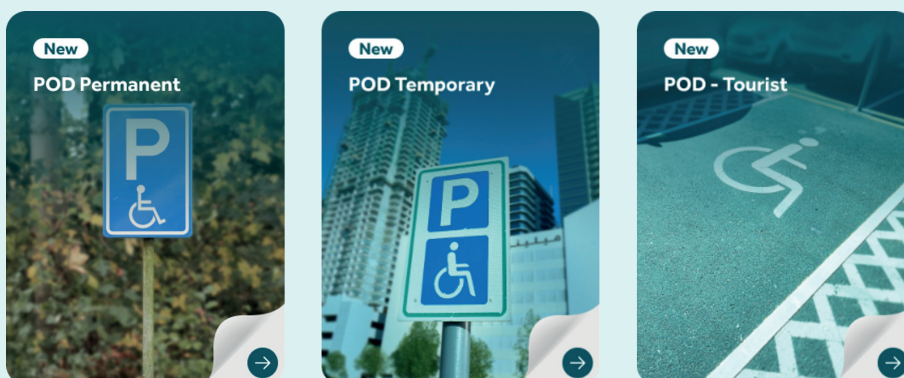
Inclusivity Through Digitalisation - People of Determination Journey in Dubai ⁽¹⁴⁾

For People of Determination (PoD), a term used in the UAE to refer to individuals who are commonly referred to as People with Reduced Mobility (PRM), the parking experience is inseparable from the broader urban journey. Any uncertainty, such as the risk of not finding an accessible space, unclear signage, or weak enforcement, can undermine users' ability to plan and complete their journeys with certainty and ease.

In Dubai, PoD parking is embedded within the citywide system, allowing consistent treatment of priority users across all parking environments. Around 2,000 designated PoD spaces, managed by Parkin, are distributed across on-street corridors, multi-storey car parks, hospitals, malls, transport hubs, and residential areas, ensuring continuity throughout daily journeys. Technology plays a central role in protecting this experience:

- AI-enabled cameras and ANPR monitor PoD spaces continuously.
- Automated detection and enforcement reduce reliance on manual checks and prevent repeated misuse.
- Digitised PoD permits eliminate physical documents and enable citywide recognition of access rights, with over 21,800 active PoD permits integrated into the city's parking management system.

This system transforms accessibility from a reactive accommodation into a predictable, user-centred service. It demonstrates how parking technology can operationalise inclusivity at scale. Rather than treating accessibility as a static designation on the ground, Dubai integrates it into the real-time logic of parking management, ensuring that customer experience, enforcement, and policy objectives are fully aligned. In doing so, parking becomes an active mechanism for delivering equitable and reliable access and a foundational element of a customer-centric urban mobility system, rather than a source of uncertainty for PoD.



Key takeaways:

Dubai integrates PoD parking within the core parking management and enforcement system, ensuring that accessibility is consistently protected across locations and contexts.

AI-enabled cameras and ANPR allow continuous monitoring of PoD spaces, reducing misuse and eliminating dependence on sporadic manual inspections.

Inclusive mobility begins at the curb and in parking facilities, where parking systems play a decisive role in enabling or constraining access for priority users.

A Digital Parking Ecosystem Enabling Performance, User Experience, And Multimodal Integration in Dubai ⁽¹⁴⁾

Dubai has implemented a comprehensive digital parking ecosystem that demonstrates how enabling technologies can enhance parking performance, improve user experience, and strengthen integration with wider urban mobility systems. Rather than relying on a single interface or payment method, the city has adopted a multi-channel, platform-based approach that supports diverse user needs while ensuring operational resilience and scalability.

In Dubai, digitalisation has been used to optimise parking operations across a large and heterogeneous on-street and off-street network. The parking system supports multiple parallel payment channels, including mobile applications, SMS, smart cards, parking machines, and integrations with wider city service platforms. This redundancy reduces system vulnerability to outages and ensures business continuity while minimising payment failures and enforcement disputes.



The transition toward electronic ticketing and account-based parking has enabled a gradual reduction in physical infrastructure, such as ticket display requirements and excessive parking machines, while maintaining access for users who prefer non-digital options (Adoption Rate as of 2026 for cash payments is 6.66%). From an operational standpoint, features such as auto-renewal, subscriptions, and fleet accounts support more predictable demand management and enforcement efficiency.

Improving user experience through inclusivity and choice: User experience has been positioned as a central design objective of Dubai's parking system. The availability of multiple payment channels addresses the needs of different user groups, including residents, tourists, rental car users, commercial fleets, and individuals without smartphones, mobile data, or bank cards. By allowing users to select their preferred payment method, the system reduces friction, unintentional non-compliance, and parking session abandonment.

Advanced digital features, such as location-based zone detection, real-time notifications, wallet-based payments, and app-less payment options, simplify the parking journey and reduce cognitive burden on users. The ability to manage multiple vehicles under a single account further supports household and fleet use cases, contributing to a more seamless and predictable parking experience.

Supporting multimodal integration and first- and last-mile connectivity: Dubai's digital parking ecosystem also plays a role in enabling multimodal travel. The use of the Nol card, a payment instrument shared with public transport, creates a functional link between parking and mass transit, reinforcing park-and-ride and first- and last-mile journeys.

Key takeaways:

Multi-channel digital payment systems enhance inclusivity and system resilience, while supporting high user adoption.

User-centric digital design reduces friction and improves compliance, strengthening the effectiveness of parking policies.

Integration with public transport payment and city platforms supports multimodal journeys and first- and last-mile connectivity.

Digital parking systems can evolve into mobility platforms, enabling data-driven management and future service integration.

2.4.3. Parking within MaaS and multimodal systems

What is MaaS and importance of integration

As urban mobility systems diversify, user journeys are becoming increasingly multimodal, personalised, and complex.

Mobility as a Service (MaaS) features two fundamental components: information (users planning how to move) and access to services (users making the move). In public transport, access to the service is possible through ticketing, while in shared mobility services, access can be based on booking and unlocking a vehicle. The generic term “access” is here the connecting term for use of mobility services. This gives a crucial role to the ticketing, and the related payment, when setting up every MaaS initiative ⁽²¹⁾.

Despite the growing interest in MaaS, fragmentation remains the principal barrier to effective integration. Different stakeholders manage different layers including transport, parking, shared mobility each with their own platforms, data, and rules. That's why modern MaaS ecosystems are shifting toward open, modular frameworks built on account-based access and APIs, so each mode from parking to public transport can plug into the same digital layer and offer users one smooth experience. Integration fails when systems remain siloed; it succeeds when services share a unified account structure and exchange data securely and transparently.

Despite that, motorists often remain disengaged from MaaS platforms because they primarily rely on private cars and therefore have limited interaction with public transport or other alternative mobility options. However, MaaS trip planners and navigation tools can serve as important exposure channels by introducing motorists to transport alternatives that they might not otherwise consider. One practical approach is to integrate multimodal travel information into applications already used by drivers, such as parking payment apps. These platforms provide a direct interface with motorists and can present information about public transport, shared mobility, or active travel options during trip planning or parking decisions. By providing such information at the moment when travel choices are being made, agencies may encourage motorists to reassess their options and recognise when alternative modes offer a more efficient way to reach their destination.

The role of digital integration between parking and public transport and shared mobility

The main goal of the digital integration is to provide motorists with a more realistic representation of the total time associated with using their cars. Currently, most trip planners estimate travel time based only on the door-to-door driving duration, without accounting for the additional time required to search for and access parking. As a result, the actual time cost of car travel is often underestimated. This can generate incomplete and inaccurate information about the travel time estimate that already include walking, waiting, and transfer times. By incorporating parking search and access time into trip planning tools, digital integration can help present a more balanced comparison between transport modes and support more informed travel decisions by sharing the right information.

In addition, by enabling drivers to park at peripheral locations and complete their journeys using public transport or shared mobility, in this way, parking integration does not encourage additional car use; rather, it channels existing car trips into more sustainable multimodal patterns, supporting demand management strategies and cleaner urban cores.

Challenges in integrating parking into MaaS

Despite its potential, integrating parking into MaaS requires strong coordination across multiple stakeholders, including parking operators, public transport authorities, and MaaS platform providers. Fragmented governance structures and variant mandates could hinder effective collaboration. A central challenge lies in data interoperability. The adoption of common data standards is the most critical prerequisite for integration, as it ensures that different systems can structure and interpret information consistently. Once such standards are in place, APIs can then be used to enable real-time data exchange between platforms. This process also requires a willingness among stakeholders to share information and establish clear agreements regarding data ownership, access rights, and responsibilities.

Examples of parking integration within MaaS ecosystems

In **Helsinki**, the Whim application, developed by MaaS Global, demonstrated the technical feasibility of integrating parking alongside public transport, taxis, and shared mobility within a single user account. The integration of parking into the MaaS ecosystem was established through open data mandates. All mobility operators provide open APIs for their services, enabling third-party apps like Whim to sell tickets and access data. While MaaS Global ceased operations in 2024, the Whim platform remains an important proof of concept, showing how parking can support end-to-end journey planning and multimodal access ⁽²²⁾.

In the **United Kingdom**, regions such as West Midlands and Manchester have pursued “smart travel” initiatives that integrate public transport and P+R parking information within shared digital platforms, supporting modal shift into urban centres ⁽²³⁾.

With a user base exceeding 985,000 across **Barcelona and its metropolitan region**, SMOU, which is Barcelona’s official integrated mobility application, integrates approximately 20 mobility-related services within a single platform. It functions as a single digital platform that brings together multiple urban mobility services, allowing users to access, plan, book, and pay for different modes in one place. These services include pay-per-minute options for on-street parking, electric charging network, and the Bicing bike-sharing system. In addition, the platform enables users to locate shared mobility services such as bicycles, cars, and motorbikes, while also providing real-time public transport information and a multimodal journey planner that suggests the most efficient travel options across the city. More recently, SMOU has expanded to include taxi services, allowing users to book and pay for taxi trips throughout the city ⁽²⁴⁾.



2.4.4. Data-driven curbside management and digital representation

As curb space becomes increasingly congested, cities must start to move toward digital representations of the curb to manage access, regulation, and performance more effectively. The curb is no longer treated solely



as a physical edge of the roadway, but as a digitally governable asset where rules, user rights, and pricing mechanisms can be defined, communicated, and monitored through data-driven systems. Traditional curbside management approaches rely on fixed regulations that are costly to update and difficult to enforce consistently.

A digital inventory of the curb is a structured, geospatial database that digitally records and maps the location, characteristics, regulations, and uses of curb space along city streets. It provides a comprehensive representation of curbside assets such as parking zones, loading areas, bus stops, bike parking, and PUDO areas. Effective curb management first requires a clear understanding of what activities are permitted at each curb location and at what times, that is the regulatory framework. Beyond regulatory information, cities must also understand how curb space is actually used. This requires operational data collected through various sources, such as scan cars that monitor parking occupancy, in-road sensors, CCTV cameras, and data provided by mobility and logistics operators. Combining regulatory data with real-time and observational data allows cities to better understand curb demand, monitor compliance, and implement more dynamic and efficient curb management strategies and regulations. This allows cities to adapt curb allocation in response to demand patterns, time of day, special events, or policy priorities such as freight efficiency, public transport reliability, or accessibility. Through standardised digital interfaces, curb rules can be communicated directly to curb users and service providers, reducing ambiguity and improving compliance. At the same time, authorities gain visibility into how curb space is used, moving beyond periodic surveys toward continuous monitoring of curb activity.

To enable data-driven management of the public right-of-way, several cities are adopting open, standardised data specifications that support digital communication between authorities, mobility services, and curb users. Two widely used specifications in this context are the Mobility Data Specification (MDS) and the Curb Data Specification (CDS). The MDS is an open data standard designed to enable two-way digital communication between public authorities and mobility service providers operating in the public right-of-way. It allows authorities to receive standardised data on mobility activities while issuing digital policies, rules, and geofencing requirements to support regulation, monitoring, and compliance⁽²⁵⁾. The CDS extends the digital governance of the right-of-way by enabling cities to digitally represent curb space itself. CDS allows curb locations, permitted uses, time-based regulations, pricing rules, and priority user classes to be encoded in machine-readable formats and shared via APIs⁽²⁶⁾.

2.4.5. Concluding remarks

The digital transformation of parking represents a systemic shift rather than a technological upgrade. By integrating sensing, transaction, analytics, and user interface layers, parking systems evolve into intelligent platforms capable of influencing behaviour, enforcing policy, and supporting multimodal integration. Digital parking enables cities to move from reactive management toward proactive optimisation, aligning parking operations with broader mobility, accessibility, and sustainability objectives.

2.5. Role of financing in parking transformation

Financing plays a critical role in driving parking transformation by funding the high initial investments required for smart technology, enabling innovative business models, and generating revenue that supports broader urban planning and sustainable mobility goals

2.5.1. Supporting sustainable and multimodal mobility

Parking pricing is first and foremost a transport demand management strategy. The level of parking charges plays a decisive role in influencing travel behaviour: when parking is free or significantly underpriced, motorists have little incentive to reconsider their travel choices and will naturally rely on private cars. Conversely, when parking reflects the real cost of occupying valuable urban space, travellers are more likely to evaluate alternative modes such as public transport, shared mobility, and active mobility.

In this sense, parking revenues should be understood primarily as a consequence of pricing policies designed to manage travel demand, rather than as the main objective of parking management. In other words, parking revenues are most effective when treated as both an outcome and an enabler of sustainable mobility investment. Charging for parking can support regulating the use of scarce curb space while discouraging unnecessary and short car trips, particularly in dense urban areas where street space is limited and competing uses are numerous.

2.5.2. Enabling asset management and technology adoption

Financing mechanisms are essential to support both the capital expenditure and operational expenditure. While digital parking technologies are increasingly promoted as a key component of modern curb management, it is important to recognise that they represent an additional layer of cost. The more fundamental priority



is ensuring proper asset management and maintenance of existing parking infrastructure. Only after these basic functions are secured, cities can invest in advanced technologies such as smart meters, ANPR, digital payment platform, real-time occupancy monitoring, etc. These technologies can improve operational efficiency and user experience, but they require sustained investment and predictable funding sources (e.g., dedicated revenue streams, which are mostly derived from parking fees and citations).

For instance, San Francisco (SFpark) demonstrates how reinvesting parking revenue into technology can improve occupancy management and enhance customer experience without increasing overall revenue dependency. In specific, the revenue generated through the SFpark program's variable pricing model is used to cover operational costs and ensure that the program's technological infrastructure including the network of embedded sensors, smart meters, and data analysis systems remains cutting-edge.

2.5.3. Reducing reliance on public budgets through self-financing parking ecosystems

A central role of financing in parking management is to reduce long-term dependence on general municipal budgets, which are often constrained and subject to competing priorities. Well-structured parking systems can evolve into largely self-financing ecosystems, covering both operating costs and a share of capital investments.

However, achieving this financial sustainability requires strong political backing. Parking fees and citation levels are typically determined by city councils and are therefore subject to political pressure. Without a clear political commitment to the role of parking management in urban mobility policy, revenue streams may remain too low or unpredictable to support long-term investments. When supported by consistent political direction, a stable financing strategy can provide operators with greater certainty to invest in infrastructure, asset management, and technological upgrades.



In Melbourne, curbside management is structured to be financially sustainable, with the value of kerbside space and the full costs of providing, operating, and maintaining parking services clearly defined and reflected in pricing. Parking fees are applied transparently to manage demand and optimise the use of high value curbside space, while revenues generated from parking recover the costs of service delivery and asset management. This approach reduces reliance on public budgets by limiting the need for parking subsidies and ensuring that users contribute proportionately to the cost of the service, particularly in high-demand locations, thereby supporting long-term financial resilience and efficient curbside management ⁽²⁷⁾.

Examples of parking financing and supporting sustainable mobility

Given the mentioned above, financing is a critical mechanism. International best practice shows that when parking revenues are reinvested, they can fund and contribute to improving the mobility ecosystem.

In **Amsterdam**, high parking charges are used as a demand-management tool, while revenues are reinvested into cycling and public transport systems. In 2012, the gross revenue generated from paid parking was allocated as follows: 39% of the gross income goes to general city budget, 38% covers the management and maintenance of the parking system itself, and 23% goes into a central mobility fund for the inner-city district to finance sustainable mobility solutions. This forms the Amsterdam Mobility Fund ⁽²⁸⁾.

Several **Polish cities**, including **Kraków**, have begun to implement this approach of using parking revenue to promote sustainable mobility in practice. Since 2019, national legislation has required cities with populations exceeding 100,000 to allocate at least 65% of parking fee revenues and all revenues from parking fines towards sustainable transport initiatives and the protection of green spaces in central urban areas. While the COVID-19 pandemic temporarily reduced parking-related income due to the suspension of charging, Kraków has reaffirmed its commitment to this policy. In its 2022 municipal budget, the city earmarked approximately €15.5 million from parking revenues to support sustainable transport investments ⁽²⁹⁾.



Park4SUMP (Park for Sustainable Urban Mobility Plan) Strategy

Park4SUMP initiative builds on the Push&Pull Strategy to show how parking revenue can be used strategically to support sustainable mobility goals. By introducing paid parking, adjusting fees, or improving the management of parking spaces, cities can increase parking income while encouraging drivers to shift toward more sustainable transport options. A portion of the revenue generated is earmarked to support alternatives to car use such as walking, cycling, public transport, and interchange facilities like Bike-and-Ride and Park-and-Ride ⁽³⁰⁾.

Another example is from **Bogotá**, in which private cars account for an estimated 12–15% of daily trips and have traditionally benefited from unrestricted free on-street parking. In 2021, the city introduced paid curbside parking in selected high-income districts as part of a broader effort to better manage curb space. The revenues collected from these charges are earmarked for reinvestment in the TransMilenio public transport system, including the electrification of the bus fleet, upkeep of infrastructure, and service quality improvements such as increased service frequency ⁽³¹⁾.

In **London's boroughs**, parking income refers to any net revenue remaining after covering the costs associated with parking operations, including charges, permits, penalties, and pay-and-display services. Legislation requires that this surplus be reinvested in local transport and related initiatives. In practice, these funds are largely directed toward the upkeep and enhancement of transport infrastructure, such as roadway maintenance, street lighting, and facilities for pedestrians and cyclists. Surplus parking revenues may also be allocated to support sustainable travel measures, including electric vehicle charging infrastructure, cycling networks, and improvements to public transport services. Through the reinvestment of parking surpluses, London boroughs are able to manage traffic conditions, encourage cleaner travel choices, and contribute to safer and more inclusive streets ⁽³²⁾.



From a policy perspective, this demonstrates that parking finance can act as a redistributive mechanism, transferring resources from car use toward more sustainable and inclusive transport options.

2.6. Conclusion

In conclusion, parking transformation emerges as a systemic and strategic lever for shaping urban mobility rather than a standalone operational function.

The chapter demonstrates that achieving this transformation requires aligned governance, robust digital infrastructure, and sustainable financing mechanisms, all working in coordination. When these elements are integrated, parking evolves from a fragmented, revenue-driven activity into a data-driven, user-centric, and policy-oriented mobility tool that supports modal shift, enhances accessibility, and optimises the use of urban space.

In sum, the effectiveness of parking transformation lies in its ability to connect policy intent with operational execution, enabling cities to manage demand, improve multimodal integration, and contribute to broader sustainability and liveability objectives.

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3. Parking Transformation Strategies for an Integrated Multimodal and Intermodal Mobility Ecosystem: Case Studies

As cities transition toward more sustainable, multimodal, and integrated transport networks, parking plays a critical role in influencing travel behaviour, managing demand, and facilitating seamless connections between modes.

This section examines a set of parking transformation strategies that reposition parking as an active enabler of multimodal and intermodal mobility. Drawing on international case studies, it explores how tools such as park-and-ride systems, dynamic pricing, shared parking, curbside reallocation, and the development of mobility hubs can support modal shift, optimise the use of urban space, and enhance accessibility across the transport network.

By analysing these approaches, the section highlights how parking policies and infrastructure can be aligned with broader mobility objectives, enabling cities to move from car-dependent systems toward more integrated, efficient, and user-centric mobility ecosystems.

3.1. Park-and-ride facilities and pricing incentives

A Park-and-Ride (P+R) is a transport facility that allows travellers to park their private vehicles at a designated location and continue their journey using public transport, typically rail, metro, tram, or bus. At its core, P+R operates as an intermodal transfer point, linking private car use with high-capacity, more sustainable transport modes. They aim to reduce car traffic in central areas, support public transport ridership, and improve overall network efficiency.

Park-and-Ride Facilities in Dubai ⁽¹⁾

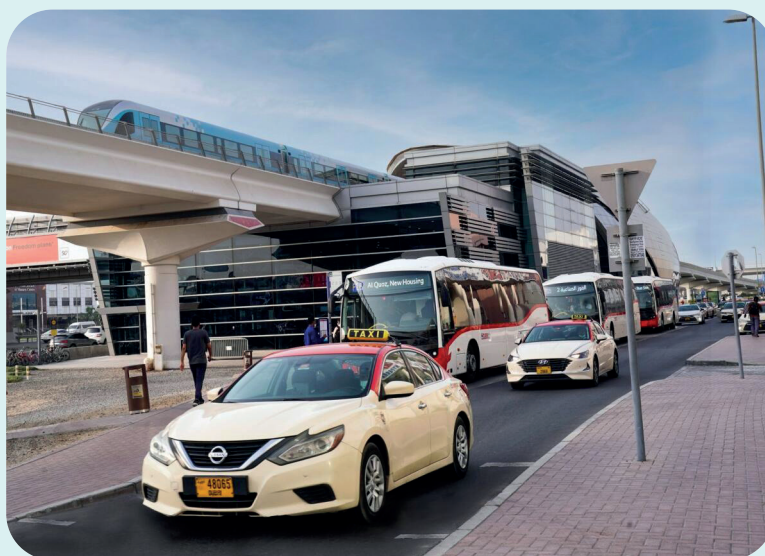
Dubai has institutionalised a P+R scheme at selected stations across the Dubai Metro, enabling private-car users to park their vehicles at no cost and complete their journeys using public transport. Access to the metro is facilitated through the Nol smart card system administered by the Dubai Roads and Transport Authority (RTA).

From a mobility management perspective, the scheme is designed to reduce inner-city congestion, lower parking pressure in high-demand districts, and promote modal shift from private cars to high-capacity public transport.

Operational conditions for P+R users

- Vehicles entering and exiting the designated metro car parks within 10 minutes are not subject to any parking fee, allowing short stops without penalty.
- To retain free parking entitlement, users must exit the car park within 60 minutes of their final metro trip validated via the Nol card.
- Exceeding this time window results in standard parking charges being applied, which may accumulate to up to AED 50 per day.

In sum, Dubai's P+R system illustrates how parking policy can be aligned with public transport objectives, positioning parking as an enabling interface within a broader and integrated urban mobility ecosystem.



Amsterdam Park-and-Ride Strategy ⁽²⁾

Amsterdam operates a strategically designed P+R systems, using pricing incentives, spatial planning, and multimodal integration to reduce private-car penetration into the inner city. The P+R programme is linked to the city's compact mobility vision, which prioritises public transport, cycling, and walking.

Rather than functioning as standalone parking facilities, Amsterdam's P+R hubs act as modal-transfer nodes positioned at the edge of the metropolitan area, directly connected to high-frequency metro, tram, and commuter-rail corridors.

Amsterdam's P+R system tariffs are directly tied to verified public transport use. Drivers pay a significantly discounted parking rate (either €6 or €13 per 24 hours) only if they use Amsterdam's public transport to travel into the centre. To obtain the discounted rate, travellers must tap-in and tap-out using their OV-chipkaart or P+R GVB ticket. If no public transport trip is made, the driver pays the full standard parking rate, which is substantially higher (can reach up to €5/hour or more). This creates a clear financial incentive to shift to public transport and discourages car entry into the central districts.



Île-de-France Mobilités – Park-and-Ride in Paris ⁽³⁾

Île-de-France Mobilités (IDFM), the transport authority for the Paris region, is currently executing an advanced and rapid expansion of its park & ride (parcs relais) infrastructure, aiming to significantly enhance intermodality between private cars and public transport. As of early 2026, the strategy has resulted in approximately 23,305 labelled, secure spaces across 79 facilities, with a concrete target to reach 30,000 labelled spaces by the end of 2028.

Since 2016, IDFM has financed over 11,000 new spaces, with a further 10,000 planned under the 2022-2028 investment program. To facilitate and promote train travel for Île-de-France residents in the outer suburbs, the “Parking Relais” label has been created. The “Parking Relais” label ensures consistent quality, including the guarantee of finding a place for subscribers, a security requirement, reserved spaces and accessible equipment for people with reduced mobility, spaces for two-wheelers and car-poolers, and charging points for electric vehicles. The system is increasingly using ANPR technology for seamless, ticketless entry, which also allows for booking spaces in advance. For holders of an annual Navigo pass, many of these secured Park & Ride facilities offer a low-cost or even “zero-euro” monthly subscription, provided they use the facility at least 9 times a month. Finally, the focus is primarily on outer suburbs to aid daily commuters in accessing train lines, particularly in areas with limited bus access.



3.2. Dynamic pricing

Dynamic pricing is a demand-responsive approach and transport demand management strategy, in which parking rates are adjusted periodically or in real time based on measured occupancy levels. Adjusting parking pricing can be based on occupancy rate, time of the day, and/or day of the week. Further, prices can be tiered spatially: areas closest to major destinations or high-demand corridors are priced higher, while nearby secondary streets or less busy areas are priced lower. For example, cities may apply premium pricing on main commercial streets while offering more affordable options on adjacent side streets ⁽⁴⁾. In Dubai, the variable parking tariff system was introduced in the second quarter of 2025, as part of a broader efforts to manage parking demand, reduce congestion, and improve the efficiency of urban land use. The system, implemented by Parkin in coordination with the Dubai RTA, applies differentiated parking tariffs based on location and time of day. At the same time, free parking periods continue to apply during overnight hours, Sundays, and public holidays.

By charging parking at its real value, cities can reduce excess car use, discourage long-term occupancy, and better reflect the actual cost of consuming scarce urban space. Establishing a citywide minimum price, adjusted according to factors such as demand, location, and time of day, ensures a consistent and fair baseline while still enabling variation where appropriate.

Los Angeles Demand Pricing Strategy: LA Express Park ⁽⁵⁾

LA Express Park is a demand-based, intelligent parking management program in Downtown Los Angeles and in Westwood that adjusts hourly meter rates based on real-time occupancy. The system integrates a citywide digital architecture comprising thousands of in-ground occupancy sensors, approximately 6,000 smart parking meters with variable pricing capability, mobile applications, and the regional 511 traveller information service. Together, these components provide continuous feedback on parking availability, enabling prices to be calibrated block-by-block and time-of-day to reflect actual demand conditions.

The system aims to increase parking availability, reduce congestion, and improve air quality by directing drivers to open spots. In specific, the objective is not to maximise revenue but to maintain an optimal occupancy target of 10 to 30% availability on every block.

The programme was supported by United States Department of Transportation, which provided approximately USD 15 million in funding for system deployment and evaluation. Parking tariffs are reviewed and adjusted periodically; the most recent adjustment took effect on 1 December 2025. In Downtown Los Angeles, average weekday rates increased by approximately USD 0.34–0.44, depending on time of day, while weekend rates rose by around USD 0.49.

While LA Express Park is not a public transport service itself, one of its secondary goals is to encourage the use of alternative transportation. By making street parking more expensive or scarce during peak times, it incentivizes drivers to consider taking the bus or train instead of driving all the way to their destination.

3.3. Parking sharing

Parking sharing represents a viable approach to better utilise off-street parking capacity. It involves allocating the same parking spaces to different user groups at varying times throughout the day, thereby reducing periods when these spaces would otherwise remain idle. This strategy can help improve the efficiency of off-street parking spaces by enabling parking owners to “rent out” spaces (either directly or using a mobile app or platform) during off-peak times. For example, parking may be shared between businesses with different hours. In recent years, mobile applications have enabled parking owners to list and rent out available spaces to drivers for short- or long-term stays in real time.



The Good Move Mobility Plan in Brussels-Capital Region 2020 – 2030 aims to eliminate too many of on-street parking spaces and harmonise the parking policy with the regional mobility vision by prioritising off-street parking, reducing the number of places in public spaces, encouraging the use of hybrid vehicles, active modes and new mobility solutions. In this way, off-street parking would be important and cutting the amount of time that the parking is unused is essential ⁽⁶⁾.

3.4. Dedicated parking for shared vehicles and active mobility vehicles

Dedicated parking for shared and active mobility vehicles refers to spaces that are specifically allocated for vehicles operating within shared mobility systems, as well as for privately owned bicycles and micromobility devices. These spaces are designated through public policy and planning measures to organise curb space efficiently, support service reliability, and promote a shift toward more sustainable and space-efficient modes of transport.

For shared mobility services, dedicated parking is essential to enable operational efficiency and reduce negative externalities such as random vehicle distribution, sidewalk obstruction, and conflicts with pedestrians. These spaces are typically reserved for car-sharing vehicles, ride-hailing PUDO activities, and shared micromobility fleets. Cities implement these provisions through various regulatory and spatial mechanisms. For example, reserved curb zones for car-sharing fleets have been introduced in cities such as Paris and Montreal. Designated ride-hailing PUDO areas are commonly implemented in high-demand locations, including airports and major activity hubs, as seen in Dubai and Los Angeles. In addition, micromobility parking corrals integrated into curb management strategies have been deployed in cities such as Washington and Madrid, helping to organise shared fleets and improve the use of public space.



→ Montreal - Parking reserved at all times for monthly permit holders

Beyond shared systems, the provision of dedicated parking for privately owned bicycles is increasingly recognised as a critical component of urban mobility systems. Evidence from Montreal shows that cyclists and motorists exhibit comparable parking behaviours, reinforcing the need to manage both within a unified institutional and operational framework. In response, the city mandated the Agence de mobilité durable de Montréal to develop a structured and secure bicycle parking network, recognising cycling as a form of vehicular transport requiring the same level of planning and management as car parking. This approach becomes even more relevant with the rapid growth of e-bikes, which increases demand for secure, reliable, and conveniently located parking infrastructure ⁽⁷⁾.

Similarly, parking.brussels, the parking agency for the Brussels-Capital Region, has developed the Cycloparking programme, which provides a comprehensive network of secure bicycle parking solutions across the Brussels-Capital Region. These include on-street bicycle racks, secured bicycle boxes in residential areas, and access-controlled facilities in dense urban zones and near public transport hubs. A key component of this system is the integration of Bike&Ride lockers within P+R facilities, located near public transport. In the Brussels Region, 11 Bike&Ride locker sites provide approximately 110 secure bicycle parking spaces, strengthening the connection between cycling and mass transit ⁽⁸⁾.

The spatial dimension of bicycle parking is particularly critical. The provision of secure facilities within close proximity to destinations, typically within a 150-metre catchment area, is one of the key factors in reducing short car trips and encouraging modal shift toward cycling. Locating bicycle parking in city centres, residential neighbourhoods, and near high-demand activity nodes strengthens accessibility and supports first- and last-mile connectivity with public transport systems.

Bicibox (Secure bicycle parking system) in Barcelona ⁽⁹⁾

Bicibox is a metropolitan-scale secure bicycle parking system developed in the Barcelona region and managed by the Àrea Metropolitana de Barcelona (AMB). It offers over 250 covered, locked stations for private bicycles and scooters throughout the metropolitan area.

→ **Usage rules:** Users can park for a maximum of 48 hours on weekdays and 72 hours over weekends to ensure high turnover.

→ **Intermodality:** Strategically located at transport hubs to encourage combining bikes with public transport.

Why is it important?

Instead of expanding car parking supply, Bicibox repurposes curbside and station-adjacent space to serve bicycles, multiplying person-throughput per square metre. This aligns with the shift from vehicle storage efficiency to access efficiency. By co-locating bicycle parking with high-capacity public transport, Bicibox reduces first- and last-mile friction, expanding the effective catchment area of metro and rail stations without adding feeder car traffic.



3.5. Reallocation of on-street curbside parking

A city's curbside is among its most critical urban assets. When it is managed thoughtfully, it supports better access and enables the space to function more efficiently for residents, visitors, and businesses. The result is a range of economic gains and noticeable improvements in overall quality of life. This strategy often involves removing or repurposing these spaces for other uses such as bus lanes, cycle tracks, wider sidewalks, loading bays, or public seating. Because curb space is a limited and a valuable public asset, cities prioritise uses that provide greater social and mobility benefits. Reallocation often goes hand in hand with street redesigns and pedestrianisation projects. The strategy of curb space reallocation creates safer, more attractive environments for walking and cycling, and can give public transport systems (e.g., buses and trams) priority over cars.

Chicago: The city has effectively repurposed portions of its on-street parking supply into dedicated cycling infrastructure. To ensure equitable access, the city offers a highly subsidised membership for its Divvy bike-share program, allowing low-income residents to use the service for an annual fee of just \$5 ⁽¹⁰⁾.

Paris: Since 2014, Paris has transformed more than 70,000 on-street parking spaces, converting them into cycling lanes, green spaces, and pedestrian-friendly areas. This reallocation was a key factor in enabling the city's rapid cycling boom and improving bus priority ⁽¹¹⁾.



→ Chicago, United States



→ Paris, France

Traffic Reduction Measures – Street Repurposing in Venloer Straße, Cologne ⁽¹²⁾

The Venloer Straße is a central thoroughfare in Ehrenfeld, accommodating motorists, cyclists, and pedestrians within a limited space, leading to frequent conflicts and accidents. It was identified as one of the most hazardous streets in the state of North Rhine-Westphalia.

In October 2022, the first stage of the traffic trial introduced a traffic-calmed business area with a 20 km/h speed limit. However, this did not achieve the desired reduction in through traffic, and compliance with the new “right-before-left” rule was inconsistent.

In October 2023, the street was then converted into a one-way street as part of a two-stage traffic trial aimed at enhancing traffic safety and improving the area’s quality of life. Approximately 60 short-term parking spaces were repurposed to create areas for outdoor dining, seating, bicycle parking, and spaces for sharing systems and cargo bikes, thereby improving the street’s amenity value.



3.6. Mobility hubs within parking spaces

According to UITP, a mobility hub provides a focal point in the transport network that seamlessly integrates different modes, especially mass public transport, shared, and active mobility. It combines supportive multimodal infrastructure such as charging points and placemaking strategies. It is worth mentioning that a placemaking refers to the collaborative process of turning urban spaces into places. A hub maximises access to various mobility services and other resources, while ensuring a transfer between modes for first- and last-mile connectivity ⁽¹³⁾.

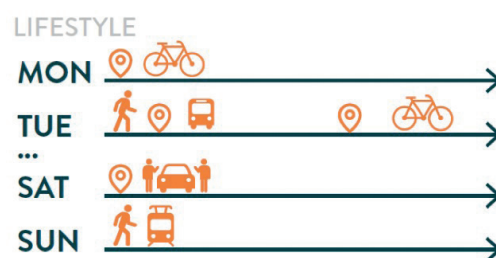
Dual functionality of mobility hubs (intermodality and multimodality)

Transfer (intermodality): At the trip level, mobility hubs act as interchange points that facilitate smooth transitions between different modes within a single door-to-door journey. In this perspective, mass public transport provides the main corridor of travel, while other modes as the first- and last-mile(s). The hub therefore functions as a point of interchange between modes in an intermodal trip from point A to point B.



Intermodality refers to a door-to-door trip – such as home to work – where different means of transport are combined. Smooth transitions between these means are ensured by both physical and digital integrations that support users' needs ⁽¹³⁾.

Access (multimodality): At the lifestyle level, mobility hubs operate as access points to a variety of mobility services that people and households may rely on across weeks, months, or years. Rather than focusing solely on a single trip, this view considers how shared cars, cargo bikes, e-bikes, public transport, and other services collectively support the shift away from private car ownership to more flexible, sustainable, and multimodal mobility patterns.



Multimodality refers more widely to the lifestyle of people over time, where different means and combinations of transport can be chosen to fulfil their requirements. These include the trip's purpose, the time of the day and the year, weather conditions, their physical health state and the price ⁽¹⁴⁾.

Characteristics of mobility hubs

Although mobility hubs can take many forms, they generally share several core characteristics. They bring together different modes of transport and the supporting infrastructure or services these modes require. They can also have a clear and recognisable identity, supported by their own branding and strong visibility, and can rely on both physical and digital integration to make transfers easy and to strengthen multimodality. Finally, effective hubs incorporate placemaking principles to ensure that the surrounding space is safe, attractive, and welcoming for users ⁽¹³⁾. Mobility hubs could also include rainwater absorption, greening, light coloured pavers.

As stated in the UITP Policy Brief on mobility hubs ⁽¹³⁾, parking operators can be identified as “allies to the promotion of sustainable mobility”, alongside housing and energy sectors. This positions parking operators as key implementation partners for cities, and authorities and public operators leading mobility hubs developments.

P+R facilities can also function as public transport interchanges and are increasingly being recognised as emerging forms of mobility hubs. These hubs are typically smaller in scale and focus on integrating shared mobility services. In this context, the concept of mobility hubs is also being applied to rethink traditional facilities such as P+R sites and car and bicycle parking areas. By integrating additional mobility services and improving the surrounding public space, these locations can evolve into multimodal nodes that offer a more seamless and attractive travel experience for users ⁽¹³⁾.

The City of Bremen, Germany – Car-Sharing-Based Mobility Hubs (“mobil.punkte”)

The City of Bremen is widely regarded as one of Europe’s pioneers in developing a networked system of carsharing-based mobility hubs, locally branded as mobil.punkte and mobil.punktchen. In specific, 10 large hubs (mobil.punkte) were developed at central locations near public transport stops, each hosting 4-12 car-sharing vehicles. On the other hand, 38 smaller neighbourhood hubs (mobil.punktchen), with 2-3 car-sharing vehicles and bicycle parking, have been distributed across decentralised locations. The municipality plans to expand by 8-10 new hubs per year to close spatial gaps and ensure accessibility within a 300-m walking distance ⁽¹³⁾.



According to the study “Analysis of the Impacts of Carsharing in Bremen” ⁽¹⁵⁾, each car-sharing vehicle in Bremen replaces or prevents the purchase of around 16 privately owned cars, resulting in the removal of more than 7,500 cars from streets by 2023, freeing approximately 40 km of on-street space.

Key takeaways:

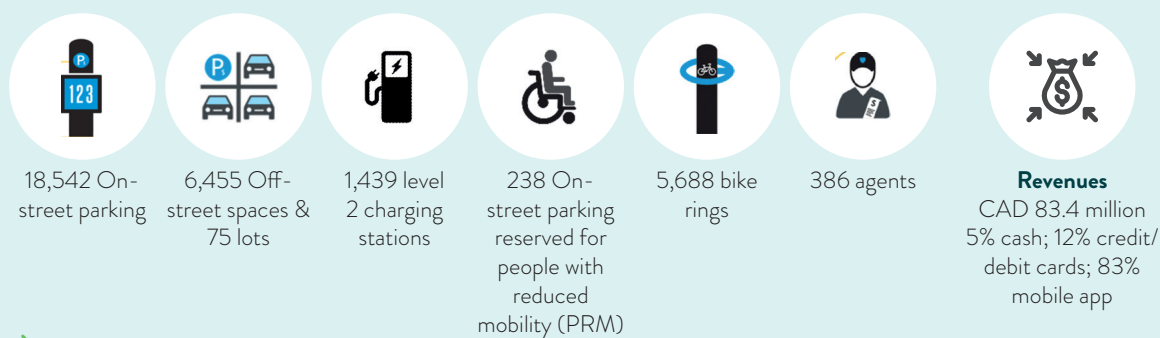
Bremen's approach exemplifies how parking transformation can underpin sustainable mobility transitions:

- On-street spaces were repurposed for shared mobility.
- The policy reframed parking as public infrastructure for access, not ownership.
- Design standards emphasised compactness, safety, and visibility, ensuring seamless interchange with walking, cycling, and public transport.

Transforming Parking Lots into Multimodal Mobility Hubs in Montreal ⁽⁷⁾

Agence de mobilité durable de Montréal is a non-profit municipal corporation created by the City of Montreal to manage and enforce parking, the public EV-charging network and taxi operations. All parking and enforcement revenues are returned to the city, while the Agency's operating and capital budgets are approved annually by the municipal council.

The below figure shows the Agency's efforts and coverage in numbers.



→ Source: (7)

The Agency manages city-owned parking and is leading a long-term program to convert **150 off-street lots into multimodal mobility hubs by 2050**. This goal is part of the city's Urban Planning and Mobility Master Plan.

By converting these lots, the city could reduce curbside congestion and on-street parking demand, enable multimodal access to transit, active, and shared modes, and reinforce placemaking and local economic vitality.

A mobility hub is defined as “an attractive, comfortable, and safe place, that brings together a range of sustainable mobility services, in a space integrated into the neighbourhood and the daily life of its population.” A hub integrates paid parking and dynamic pricing zones, carsharing and taxi stands, fast EV-charging, public bike-sharing and secure bicycle lockers, bike-repair stations and micro-mobility docking, parcel lockers / PUDO zones, waiting areas and social seating for comfort and safety, and connection to public transport stops or metro stations when close by.

These features reframe the act of parking into a mobility transition moment, encouraging travellers to switch modes conveniently. Between 2023 and 2026, the first three hubs: Masson Street, Boyer Street, and Fleury Street, were delivered.

- **Masson Street Hub:** Introduced EV fast-charging stations, covered bike parking, and landscaped public seating.
- **Boyer Street Hub:** Comprehensive transformation including green walls, pedestrian alleys, waiting areas, and secure bike facilities.
- **Fleury Street Hub:** Demonstrates replication potential using a cluster-based rollout model.



→ EV Fast Charging Stations and Covered Bike Parking



→ Greening of the Parking and Stormwater Management

How Barcelona is Transforming its Parking Spaces ⁽¹⁶⁾

Barcelona de Serveis Municipals (BSM), the municipal parking operator of the city of Barcelona, illustrates how public parking agencies can actively drive urban mobility transformation by repurposing parking assets into integrated mobility spaces.

Rather than functioning as static car storage facilities, BSM's network of 45 off-street parking structures has evolved into multiservice platforms that serve the needs of electric mobility, last-mile logistics, and shared mobility, aligning with the city's broader decarbonisation and space-reclamation goals.



Implementation and services

BSM facilities have been reimagined as a local service hub within a 300 to 600-metre radius of residential and commercial users. Key services offered include:

- Over 700 charging points, with continuous expansion supported by smart energy management systems.
- Micromobility hubs: designated areas for bicycles, e-bikes, and scooters (approximately 700 spaces in 2023).
- Battery-swapping pilots: two operational facilities that test circular battery-exchange models for micromobility operators.
- Carsharing and scooter-sharing services available in 95% of the network.
- Traditional parking: over 14,000 spaces, many repurposed or flexibly managed to support new functions.

Key takeaways:

Municipal parking agencies can act as mobility enablers, not just operators.

Parking operators and public transport authorities can leverage existing parking stock to accelerate shared mobility without requiring large new infrastructure.

San Francisco Bay Area - Southeastern San Francisco Mobility Hub Plan ⁽¹⁷⁾

The San Francisco Municipal Transportation Agency (SFMTA) has initiated the Mobility Hub Plan – Southeastern San Francisco to improve transport access, community spaces, and the public realm.

Each mobility hub is envisioned as a complete-mobility environment, combining transport connectivity with placemaking elements such as safe crossings, lighting, wayfinding, and community services. The plan emphasises design that composes of wide, well-lit sidewalks and improved crossings; secure bicycle parking, micromobility docks, and EV charging; clear way-finding and multimodal information signage; safe, sheltered waiting and pickup areas; and integration of community amenities such as retail kiosks and public art.

It aims to shift travel behaviour through design and service integration:

- Encouragement of multimodal travel: “Ride a bike to a hub, then take a train downtown.”
- Reallocation of curb and parking space for active and shared mobility.
- Enhanced safety and visibility encouraging walking and cycling.
- Equity-based access, ensuring that households without cars have accessibility.
- Climate co-benefits: fewer solo car trips and lower emissions.



Budapest – Converting Parking into Micromobility Hubs (Mobi-points)

Budapest has adopted a citywide strategy to reorganise its streets by converting existing car-parking spaces into micromobility hubs, known locally as Mobi-points. Led by the BKK Centre for Budapest Transport, the initiative aims to improve the orderliness of shared micromobility and reduce clutter on sidewalks ⁽¹⁸⁾.



The first pilot Mobi-points, introduced in 2021 along the Danube embankment, replaced curbside parking bays with clearly marked zones for shared bicycles, e-scooters, and e-bikes. Each Mobi-point is marked with bright green pavement markings and signage, with pictograms indicating allowed vehicles (bike, scooter, etc.) to ensure clarity and visibility ⁽¹⁹⁾. By reallocating parking rather than adding new infrastructure, Budapest strengthened multimodality while preserving pedestrian space.

The programme has since scaled rapidly: by 2022 more than 600 micromobility hubs had been deployed across the city, many of them created by repurposing on-street parking ⁽¹⁹⁾. The long-term target is to reach around 1,000 hubs, forming a dense grid of mobility hubs ⁽¹³⁾. In addition, the city differentiated between three types of mobility points:

1. Micromobility points in densely populated areas, at 150 meters from each other and dedicated to micromobility vehicles only (bicycle, scooter, cargo bikes, etc.)
2. Mobility points in densely populated areas, dedicated to car-sharing and shared scooter parking, and spaced 250-300m apart; and
3. Mobility stations, located at larger intermodal transport hubs, featuring additional services like delivery pick-up points, luggage lockers, etc.

In addition, with the integration with BKK's trip-planning app, these hubs link micromobility directly to the public transport network. Budapest's approach demonstrates how conversions of on-street parking can create a coherent network of mobility hubs that support multimodal travel, and reduce uncontrolled micromobility parking.

Parking Spaces into Integrated Mobility Hubs ⁽²⁰⁾

In Dubai, parking is increasingly perceived as a continuous customer journey. As travel patterns become more multimodal, users expect parking to be convenient and seamlessly connected to the rest of their trip. The quality of this experience directly influences travel choices and perceptions of the wider mobility system. Recognising this shift, Dubai is progressively repositioning its multi-storey car parks (MSCPs) as future integrated mobility hubs.

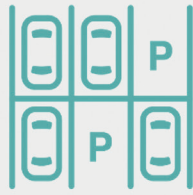
Parking across Dubai's paid public network is centrally managed by Parkin, providing a unique governance structure that enables coordinated transformation at scale. This centralised model creates the foundation for a structured evolution of parking assets from standalone facilities into multi-functional urban mobility nodes.



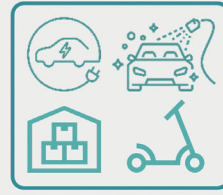
The transformation of parking assets into integrated mobility hubs in Dubai is structured around a clear categorisation of parking services, each responding to distinct user needs while collectively contributing to a coherent, end-to-end customer experience. Rather than treating parking as a single function, services are layered to support vehicle users, logistics flows, and multimodal travellers within the same spatial footprint.

- **Car-related services:** These services remain foundational and continue to anchor customer expectations of reliability and convenience. They include EV charging infrastructure to support the electrification of private and shared fleets, maintenance pods and washing bays for on-demand vehicle care and fuelling or recharging areas where applicable.
- **Last-mile logistics services:** Parking facilities increasingly support urban logistics functions, reflecting the growth of on-demand delivery. Dedicated delivery micro-hubs, smart lockers for 24/7 parcel collection and returns, and temporary staging zones for event logistics or pop-up services are integrated into selected parking assets.
- **Multimodal integration services:** The most transformative category relates to multimodal integration, positioning parking as an active connector within Dubai's broader mobility ecosystem. Facilities increasingly accommodate shared micromobility docks, ride-hailing PUDO bays with digital integration, and connections to public transport and shared mobility platforms.

Traditional Parking Lot



Integrated Mobility Services Node



These services enable smoother first- and last-mile transitions, reduce waiting time, and support more informed travel choices. Dubai's approach demonstrates that clearly defined parking service categories are essential for delivering integrated mobility hubs, enabling parking assets to simultaneously support electrification, logistics efficiency, and multimodal connectivity, while delivering consistent and high-quality customer experience.

The Promotion of Shared Mobility - hvv Switch Mobility Hubs in Hamburg

The city's public transport operator, Hamburger Hochbahn AG, has been developing hvv switch stations since 2013, under mandate from the City of Hamburg, to connect public transport with shared mobility services ⁽¹³⁾. The hvv switch app in Hamburg is a MaaS application combining public transport, carsharing, MOIA ridesharing, and e-scooters into one platform. It allows users to book, pay, and travel using multiple modes.

There are 217 hvv switch points throughout Hamburg, with expansion into the wider metropolitan region under consideration ⁽²¹⁾. In 2022, hvv announced that it would increase its switch points by 150%, focusing on the outer city, where public transport is not as dense as in the inner city ⁽²²⁾.

Parking bays were reorganised and repurposed to create clearly marked multimodal zones that enable seamless transfers between U-Bahn, buses, shared cars, and micromobility. By reallocating on-street parking rather than creating new space, Hamburg expanded shared-mobility availability while reducing the dominance of idle private cars in public space.



From Off-Street Parking Facilities to Mobility Hubs in Madrid ⁽²³⁾

In Madrid, parking infrastructure was identified as an opportunity to support intermodality, electrification, shared mobility, and urban logistics. Rather than functioning solely as vehicle storage facilities, parking sites were reimagined as integrated mobility hubs that facilitate seamless connections between different transport modes and services.

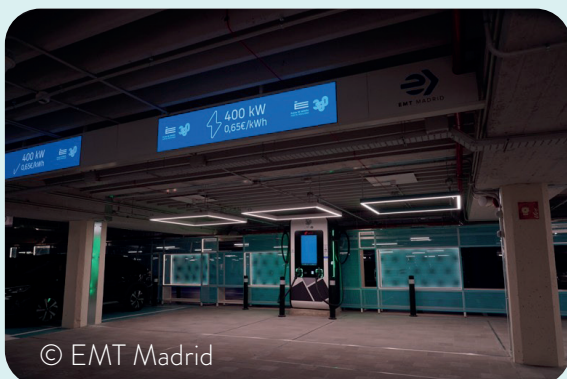
EMT Madrid developed a network of Mobility Hubs as part of the city's "Madrid 360" sustainability strategy. These hubs are designed as multifunctional spaces where a range of mobility services coexist, including:

- Intermodality
- Active and shared mobility
- Electrification of the vehicle park
- Optimizing logistics activity
- Living lab for sustainable mobility

The objective is to transform parking facilities into key nodes within the urban mobility ecosystem, supporting intermodality, sustainable travel choices, and efficient use of urban space. In addition, the transformation program includes four mobility hubs currently under operation, and five new mobility hubs under development. The hubs are also digitally integrated through Madrid Mobility 360, enabling users to access mobility information and services through a unified platform.

Furthermore, Madrid integrates parking with public transport through P+R facilities located near major transport corridors. The P+R sites incorporate EV charging infrastructure, lockers, sharing parking areas, and secure bicycle parking (BiciPARK). Users are incentivized to continue their journey by public transport through schemes such as free parking when combined with transit use.

As a key takeaway, it can be implied that Madrid demonstrates how parking facilities can evolve into multifunctional mobility hubs. By leveraging existing parking infrastructure, cities can create high-value mobility nodes that facilitate modal shift while maximizing the efficiency and functionality of urban space.



Orchestrating Corporate Mobility through Smart Parking and Mobility Wallets in Geneva ⁽²⁴⁾

Organisations are increasingly seeking new ways to manage employee parking in response to evolving mobility needs and more flexible working patterns. Traditional parking systems are typically based on fixed annual subscriptions and first-come, first-served allocation mechanisms, offering limited flexibility for employees who increasingly combine different transport modes and hybrid working arrangements.

To address this challenge, Transports Publics Genevois (tpg) developed an integrated solution combining a digital mobility wallet with smart parking management. The initiative was implemented through tpg evomoov, a programme designed to support businesses, institutions, and municipalities in addressing their mobility challenges through mobility strategies, mobility wallets, and multimodal integration.

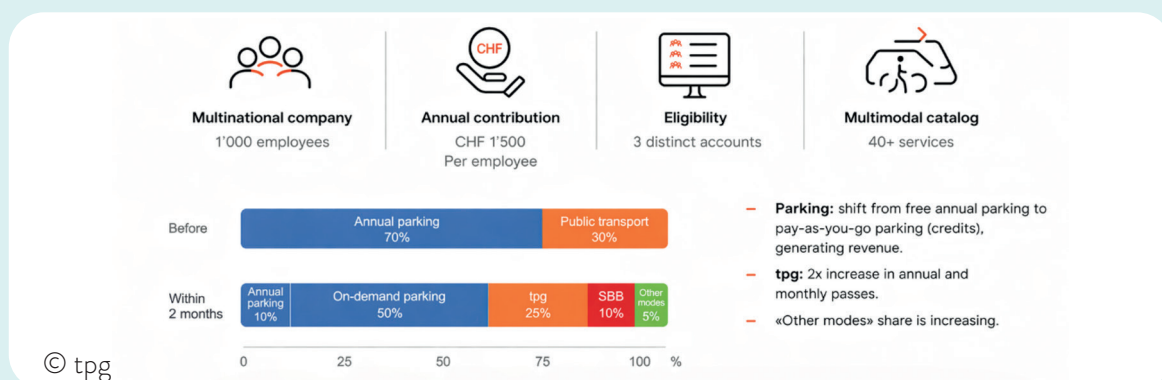
The approach combines:

- A mobility wallet that allows employees to choose between different mobility services.
- A smart parking management platform.
- A pay-as-you-go credit system that links mobility choices with parking access.

Instead of free-access parking based on first-come, first-served principles, parking spaces are allocated dynamically according to demand. Employees are given greater autonomy to select their preferred mobility option daily, while organisations can manage parking resources more efficiently.

Key takeaway: The case demonstrates how digital parking management can be combined with mobility wallets to move from fixed parking entitlements towards a more flexible allocation system that supports multimodal travel choices while optimising the use of existing parking capacity.

Employer launch of system — December 2024



3.7. Conclusion

The case studies presented demonstrate that parking transformation is a powerful lever for enabling multimodal and intermodal mobility, particularly when it is strategically aligned with broader transport and urban development objectives.

Across cities, several common principles emerge. First, parking can be used to actively manage demand through pricing, spatial planning, and access conditions, influencing travel behaviour and encouraging modal shift. Second, the integration of parking with public transport, shared mobility, and active modes through strategies such as P+R, dedicated micromobility parking, and mobility hubs, strengthens first- and last-mile connectivity and expands the effective reach of transport networks. Third, the reallocation and optimisation of parking space, both on-street and off-street, allows cities to prioritise higher-value uses of urban space, improving liveability and supporting more sustainable mobility patterns. Ultimately, the effectiveness of these strategies depends on their integration within a coherent policy and governance framework, as well as their ability to respond to local conditions.

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4. Recommendations and Way Forward

4.1. Recommendations for Successful Implementation of Parking Transformation

Parking is one of the most influential yet often under-managed components of urban mobility. When abundant, underpriced, or poorly coordinated, it reinforces car dependency, congestion, and inefficient use of public space. Parking transformation is a structural shift in how parking is governed, designed, financed, and integrated into the urban sustainable mobility ecosystem, to prioritise active, mass and shared mobility above private and individual means of transport. In sum, it enables better demand management, supports modal shift, and improves urban quality of life.

This chapter identifies a set of recommendations which are categorised into three fundamental pillars of successful parking transformation:

Pillar 1. Revision of governance and public policies

Pillar 2. Adoption of technologies and digital integration

Pillar 3. Knowledge building and sharing

The three pillars proposed for successful parking transformation are mutually reinforcing. Governance provides strategic direction and establishes clear accountability for parking services. Technology and digital integration support wider adoption of modern parking practices, while knowledge building and sharing enables the effective implementation of policies through improved management.

A summary of the three pillars and their interactions with each other is depicted in the below figure as virtuous cycle. The strength of this framework lies not in any single pillar, but in the synergy between governance, technology, and knowledge, together creating a virtuous cycle that continuously improves mobility, optimises urban space, and strengthens institutional capacity. Better mobility enables better parking management. Better parking management enables better mobility. Data and governance keep the system continuously improving.

01 Revision of Governance & Public Policy

- 1 Harmonising governance and institutional alignment
- 2 Embedding parking in sustainable urban mobility and land-use policies
- 3 Repositioning parking within the mobility ecosystem
- 4 Aligning financing and revenue with public value
- 5 Identifying parking pricing and enforcement as policy instruments

Helps implementing parking policies

03 Knowledge Building & Sharing

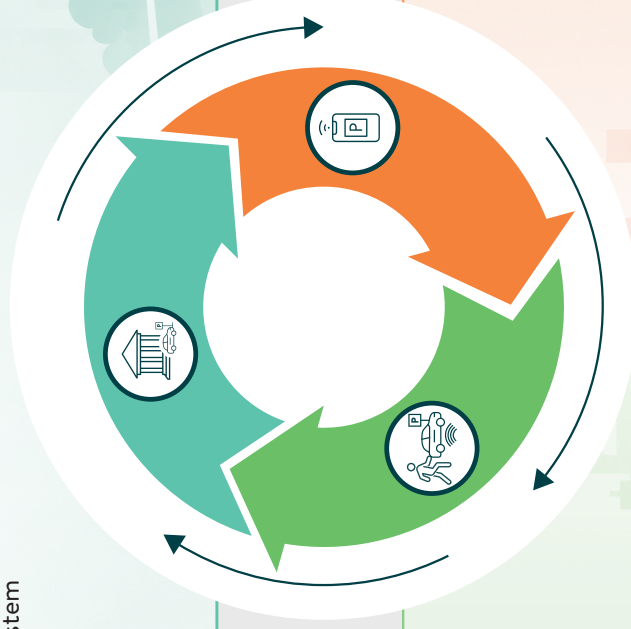
- 1 Understanding travel behaviour and user preferences
- 2 Monitoring curb utilisation and off-street parking patterns
- 3 Communicating and educating through factual data

Supports continuous learning and adaptive management
Feeds back to strengthen policy

02 Adoption of Technologies & Digital Integration

- 1 Integrating parking into multimodal platforms
- 2 Implementing digital enforcement and regulatory compliance
- 3 Facilitating digital payment and dynamic pricing

Establishes direction and accountability for parking management



Pillar 1. Revision of Governance and Public Policies

A holistic parking management requires a re-thinking of institutions, mandates, revenue frameworks, and coordination of parking on the municipal level so that parking infrastructure and services support a sustainable mobility behaviour rather than providing an isolated, revenue-driven service for car-drivers only. In addition, it ensures that parking supports the overall transport system performance, spatial planning objectives, and quality of life.

Parking management is not an operational need; it is a planning instrument and a component of sustainable mobility governance.



Element 1.1.

Harmonising governance and institutional alignment

Parking management is often characterised by institutional fragmentation, with responsibilities divided among municipalities, public transport authorities, public and private operators, and enforcement bodies. Such fragmentation reduces policy coherence and undermines system-wide effectiveness. Recognising that mobility patterns transcend administrative boundaries, parking governance should move toward coordinated metropolitan frameworks that align planning, operations, and enforcement across jurisdictions.

Key directions:

- Identify clear institutional mandates and encourage cross-sector coordination to align parking authorities, public transport agencies, planning departments, and finance units.
- Transitioning organisational mandates from “parking operators” to “mobility asset managers.”
- “Parking policy is city policy” situates parking at the heart of urban governance, mobility management, and land-use planning.
- Local municipalities must have sufficient flexibility to set and adjust parking tariffs according to local demand conditions, public space scarcity, and mobility objectives. Where national legislation imposes rigid fee caps, it may constrain the effectiveness of parking as a demand-management instrument and limit the ability of cities to respond to urban congestion and climate goals. In addition, coordinated parking policies across municipalities are essential to prevent the displacement of parking pressures from one area to another and to ensure consistent behavioural change across the urban region.
- Align parking operators, public transport authorities, shared mobility operators, and logistics operators through a parking platform like a “task force” or “transition team”. Coordination challenges exist between transport authorities, city planning, and parking management entities. Parking management is typically divided among multiple stakeholders: municipalities control curbside parking, private owners, and various institutional owners have their own parking assets. This fragmentation leads to inconsistent policies, lack of integrated data, and difficulties in implementing coordinated strategies.
- Unified budgeting and coordinated investment planning further ensure that parking policies contribute to overall system performance rather than operating in isolation.

Element 1.2.

Embedding parking in sustainable urban mobility and land-use policy

Strategic parking policies should be embedded within Sustainable Urban Mobility Plans (SUMP), climate strategies, and land-use management frameworks.

Key directions:

- Parking objectives must be directly linked to mode share targets, public space transformation strategies, and urban density policies. In doing so, parking becomes a structural determinant of urban form and travel behaviour rather than an isolated operational concern.
- Regulatory coherence between public and private parking supply is essential. Municipalities should ensure that private parking provision is subject to policy logic consistent with public parking management, including parking caps, taxes, and repurposing mechanisms for mobility hubs and housing.
- Integrating privately owned corporate parking into the urban parking management framework is essential, including the promotion of workplace mobility plans, demand-based pricing mechanisms, and sustainable travel alternatives such as carpooling, shared bikes, and public transport.
- The flexible use of P+R spaces and private parking lots should be considered from the outset, considering expected changes in mobility behaviour and future demand. In other words, these spaces should be designed to allow adaptive reuse, enabling them to serve alternative functions if the need for parking declines over time.
- Ensure the sequencing and timing of parking measures are carefully aligned with the broader implementation of SUMP. Parking adjustments should be introduced in coordination with improvements to public transport services, network expansion, and active mobility infrastructure to ensure that viable alternatives are available before demand-management measures are strengthened.
- Prioritise measures that strengthen public transport and multimodal integration by reallocating parking space to support active and shared mobility. This may include developing mobility hubs at key transit nodes and converting selected car parking spaces near stations or stops into bike parking, bike-sharing docks, or geofenced micromobility zones. Such interventions enhance first- and last-mile connectivity while optimising the use of limited urban space.

- Reduce short-distance car trips in inner cities by aligning parking policy with active mobility objectives. Evidence from several European studies shows that short trips represent a significant share of urban car movements, many of which could be replaced by walking or cycling. Parking management should therefore support the reduction of unnecessary short car journeys through differentiated pricing, limited short-stay curb allocation, and the reallocation of selected parking spaces to pedestrian and cycling infrastructure.
- Early and structured engagement with real-estate developers, planners, and economic experts is critical to ensure that parking policies respond appropriately to local market conditions and development dynamics. Such collaboration strengthens the analytical robustness of parking decisions and reduces unintended spatial or behavioural consequences. In addition, recognising the role of local market conditions ensures that parking policies support broader mobility integration without unintended spatial or behavioural outcomes.

Element 1.3.

Repositioning parking within the mobility ecosystem

Parking policy plays a major role in achieving mobility objectives, as it is a powerful lever for modal shift.

Given that, parking should be formally repositioned from a passive vehicle storage function to an integrated mobility component. It represents the starting point of many journeys and serves as a decisive transition node between private vehicle use and public transport, shared mobility, walking, and cycling. As such, parking must be recognised as access infrastructure comparable to transit interchanges or curb management systems.

Key directions:

- City's policy should explicitly define parking as a mobility gateway rather than a terminal land use. Planned parking facilities should accommodate multiple functions, including shared mobility services, electric vehicle charging infrastructure, logistics operations, and first- and last-mile connections.
- Curb space should prioritise short-duration, high-turnover curb use (access, deliveries, passenger drop-off) and reallocate on-street parking to bike sharing, when possible, while relocating long-term parking to garages and off-street parking spaces.

- Integrate parking with mobility planning creates the foundation for efficient curb management and modal shift.
- Facilitate car-sharing spaces in public garages and on-street locations to encourage shared mobility.
- Parking transformation strategies such as P+R facilities, mobility hubs, integrated payment systems and coordinated pricing/fare strategies enable parking to function as part of a multimodal journey. This approach reframes parking management as a means of managing demand and influencing mode choice, rather than simply accommodating vehicles.
- Mobility hubs should be explicitly recognised as a strategic instrument of parking transformation. Rather than treating parking facilities as isolated assets, municipalities should prioritise the conversion of selected parking locations, particularly those near public transport corridors into multimodal mobility hubs that integrate public transport access, micromobility parking, shared mobility services, logistics functions, and EV charging. Positioning parking sites as mobility hubs creates a tangible incentive for transformation by demonstrating added public value. When parking areas evolve into multimodal access points, they shift from being perceived as space-consuming storage areas to active contributors to urban accessibility and quality of life.
- Electric mobility should also be integrated into parking strategy, recognising the link between transport and energy systems. Parking facilities and mobility hubs can support EV charging, smart grids, and battery-powered vehicles positioning parking as an enabler of both mobility and energy transition. Preferential parking conditions, such as priority access, differentiated tariffs, or dedicated charging bays, can incentivise zero- and low-emission vehicles within regulated areas. Integrating Low-Emission Zones (LEZ) rules with digital parking systems enables automated verification and enforcement, while ensuring that charging infrastructure and mobility hubs support the transition to cleaner vehicles.

Element 1.4.

Aligning financing and revenue with public value

Parking revenue should be understood as an outcome of effective management rather than its defining objective. The primary function of parking is to support mobility performance and ensure equitable access to urban space. Financial returns should therefore follow from appropriate valuation of public space and demand-responsive management. In this way, revenue becomes a by-product of rational public space governance rather than an independent objective.

Key directions:

- Municipalities should strengthen the legitimacy of parking revenue through transparent reinvestment in mobility improvements, public space upgrades, and accessibility initiatives.
- Revise the pricing structure to encourage short-term parking in support of local businesses and discourage long-term parking, while ensuring that it does not incentivise car use over more sustainable modes such as public transport and active mobility.
- The functional scope of parking spaces should be expanded by offering value-added services such as EV charging, last-mile delivery lockers, vehicle maintenance, and car washing, improving user convenience while diversifying revenue streams.
- Reconcile the financial interests of departments that view parking as a revenue source with mobility departments focused on sustainability and demand management.
- Assess the economic and social value of curb space, including comparative studies that demonstrate higher commercial returns when reallocating parking areas for active frontages (e.g., Paris).

Element 1.5.

Identifying parking pricing and enforcement as policy instruments

Parking pricing constitutes a regulatory instrument that typically falls within municipal authority and can function as a transport demand management tool comparable in purpose to congestion pricing. When designed strategically, demand-responsive parking tariffs can discourage excessive vehicle circulation, improve turnover, and encourage more efficient travel choices.

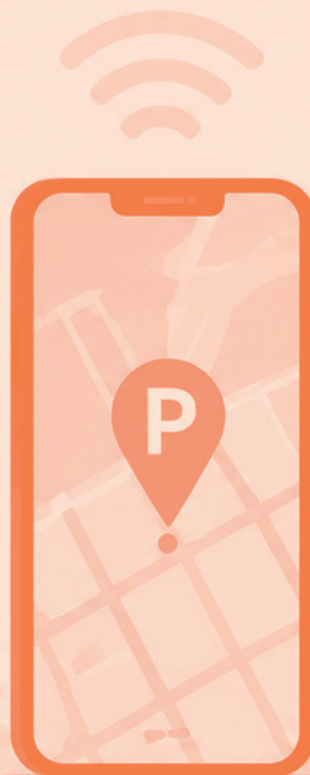
Key directions:

- Effective enforcement is a prerequisite for parking to function as a policy tool. Consistent and policy-aligned enforcement safeguards safety and accessibility, ensures compliance with pricing and access rules, and preserves the credibility of parking management as a demand-management instrument.
- The parking management must retain direct oversight of enforcement activities for both on-street and off-street facilities, as timely intervention is essential to ensure safety, operational efficiency, and network performance.
- Enforcement mechanisms are intended to support effective management to ensure effective user compliance rates.
- Parking rates are an excellent transport demand management tool by reducing drivers circling looking for a spot, and encouraging better travel choices, therefore reducing traffic and congestion.
- Adopt dynamic pricing as part of a broader urban toolset (not only a revenue tool, but a planning instrument). In this sense, pricing and enforcement operate together as complementary regulatory instruments.

Pillar 2. Adoption of Technologies and Digital Integration

The emergence of digital technologies for parking services represents a structural shift in parking management. Technology should be viewed as an instrument for enabling policy implementation, adaptive pricing, user transparency, and multimodal integration.

Establishing real-time information and smart parking management to enable evidence-based management and seamless multimodal journeys.



Element 2.1.

Integrating parking into multimodal platforms

Parking management should be driven by user experience, recognising that journeys are increasingly multimodal, personalised, and time sensitive. Therefore, parking should be integrated into MaaS ecosystems as a foundational access layer rather than treated as a competing mode.

Key directions:

- Align physical and digital multimodal integration is essential. Parking strategies are more complementary and supportive to sustainable modes, when physically and digitally linked to other modes, such as parking with public transport tickets, bike & ride facilities, and shared mobility zones, all visible through one digital interface. This holistic approach allows users to compare, combine, and pay for modes within a single journey, reinforcing the idea that the car is just one stage in a broader multimodal trip. By weaving parking into the same digital ecosystem as buses, trains, bikes, and shared fleets, cities turn static infrastructure into an active enabler of integrated and sustainable mobility.
- User experience must drive system design. Parking transformation should begin by defining the ideal end-to-end user journey; how a person discovers, accesses, pays for, and transitions from parking to other modes, rather than by focusing solely on infrastructure or policy changes. In other words, parking should be integrated within the overall mobility journey, allowing users to plan, book, and pay for parking and connecting modes seamlessly through unified interfaces.
- A unified account system that links identification, access control, and payment across parking, public transport, and shared mobility services is fundamental to encouraging mode shift. When users can plan, pay, and travel seamlessly, they are more likely to combine modes instead of relying on private cars for entire trips.
- Real-time information integrated into trip-planning tools or MaaS platforms enables informed travel choices and reduces unnecessary vehicle circulation.
- Integrate parking within unified digital mobility platforms to actively support multimodal travel. This integration can be reinforced through preferential measures that reward modal transfer. For example, allocating dedicated P+R spaces or offering pricing advantages to users who continue their trip by public transport, verified through digital applications. By linking access conditions and benefits directly to public transport usage, parking becomes a structured incentive for multimodal travel rather than a standalone service.

Element 2.2.

Implementing digital enforcement and regulatory compliance

The enforcement of parking regulations has undergone significant transformation through the adoption of digital technologies. While governance defines the purpose and legitimacy of enforcement, technology determines its efficiency, consistency, and transparency. Automated systems allow municipalities to modernise enforcement practices in a manner that strengthens compliance while reducing administrative burdens.

Key directions:

- ANPR technologies, deployed through mobile enforcement vehicles or fixed roadside units, allow high-frequency verification of payment status, permit validity, and duration compliance. Yet it is important to keep in mind that increased violations could arise from unclear signage, limited communicated information, or parking rules. For example, compliance requirements in off-street parking facilities should be communicated clearly, consistently, and through user-friendly channels to ensure that regulations are easily understood and followed.
- The main purpose of parking enforcement should shift from increasing citation volumes to ensuring the proper valuation and management of public space. All enforcement mechanisms including the digital ones should support the fair pricing and allocation of curb access based on its scarcity and competing uses.
- Entry–exit camera systems in off-street facilities enable automated tracking of parking duration without physical barriers, ensuring seamless vehicle flow while maintaining regulatory oversight. Complementary technologies such as curbside occupancy sensors, geofencing tools, and digital curb management platforms allow municipalities to monitor overstays, misuse of priority spaces, unauthorised loading activities, or violations in time-restricted zones.
- In addition to plate-based technologies, smart sensors embedded in curb spaces or parking structures provide real-time occupancy monitoring. When integrated with enforcement platforms, these sensors allow municipalities to detect overstays, misuse of priority spaces, or non-compliance with pricing rules.
- Leverage digital parking technologies to launch parking credit systems, meaning digitally managed, account-based entitlements that allocate time-based or usage-based parking allowances to eligible users with reduced mobility, thereby improving the administration of access rights, preventing misuse, and ensuring equitable allocation of accessible parking spaces.
- Incentivise P+R use via dynamic pricing (e.g., time-based incentive, price differentiation, demand redistribution, real-time information), digital booking, and integration with public transport apps. Dynamic pricing can make P+R facilities financially attractive compared to central-area parking, encouraging drivers to shift from full car trips to multimodal journeys. Digital booking systems reduce uncertainty by allowing users to reserve spaces in advance, increasing reliability and time predictability for commuters. Integration with public transport and MaaS applications enables users to plan, book, and pay for both parking and transit within a single platform, creating a seamless door-to-door experience.

Element 2.3.

Facilitating digital payment and dynamic pricing

The facilitation of seamless and interoperable digital payment systems constitutes a central component of parking transformation.

Key directions:

- Modern digital payment ecosystems extend beyond traditional pay-and-display meters to include mobile applications, contactless bank cards, QR-code systems, near-field communication (NFC), in-vehicle payment integrations, subscription-based digital permits, and account-based mobility wallets.
- Payment infrastructure is not limited to transaction processing. Instead, it is the mechanism through which public space is valued, regulated, and governed. By attaching a transparent and context-sensitive monetary signal to curb use, authorities can manage demand, improve turnover, and align parking allocation with broader mobility objectives.
- ANPR systems linked to digital payment databases allow barrier-free access and frictionless validation. The availability of multiple payment channels enhances inclusivity, reduces transaction friction, and improves compliance by accommodating diverse user preferences and technological capabilities.
- Digital payment platforms provide the foundation for dynamic pricing mechanisms. Dynamic pricing adjusts tariffs in response to real-time or forecasted demand conditions, spatial occupancy levels, or time-of-day variations. By leveraging live transaction data and occupancy metrics, municipalities can calibrate prices to maintain optimal turnover and availability targets. This approach reduces excessive cruising for parking, discourages prolonged occupation of high-demand spaces, and distributes demand more evenly across locations and time periods.
- Adjust the pricing structure to encourage the use of off-street parking over curbside parking, helping to reduce street congestion, improve traffic flow, and support the use of sustainable mobility options such as public transport, cycling, and walking and deliveries.

Pillar 3. Knowledge Building and Sharing

Knowledge building represents the analytical pillar of parking transformation. It transforms parking from assumption-driven management into evidence-based governance. Historically fragmented data and unreliable assessments must be replaced by systematic data collection, analysis, and cross-sector collaboration.

Despite parking being one of the most extensive components of urban transport infrastructure, reliable data on parking occupancy, turnover, and usage remain scarce. Without accurate data, policy decisions on pricing, space allocation, and enforcement remain reactive.

The widespread deployment of digital parking technologies, including payment platforms, occupancy sensors, automated enforcement systems, digital inventories, and dynamic pricing tools, now generates continuous data streams. When systematically collected, integrated, and analysed, these datasets transform operational information into structured knowledge. Parking management can thus shift from assumption-driven decisions to measurable, performance-oriented governance.

Understanding parking patterns is not a passive by-product of digitalisation, but an active management element that strengthens analytical capacity, supports adaptive management, and enhances institutional learning.



Element 3.1.

Understanding travel behaviour and user preferences

Parking availability and pricing strongly influence travel behaviour. Limiting parking supply and introducing demand-based pricing can discourage long-term car use, increase turnover, and promote sustainable modes such as public transport, cycling, and walking. Carefully designed parking policies therefore serve as a powerful lever to achieve urban mobility and environmental goals.

Comprehensive parking data enables a more precise understanding of occupancy patterns, turnover, duration, and spatial demand fluctuations. Such insights support the calibration of pricing, time regulations, and curb allocation strategies while informing broader transport planning decisions.

Parking data thus functions as a behavioural mirror, revealing how car users interact with urban space and how parking influences modal interactions.

Key directions:

- Data and transparency are essential behavioural tools. They shape trust and compliance while enabling adaptive management and enable better data sharing policies between transport authorities & parking operators, shared mobility providers, transport operators.
- Establish robust monitoring and evaluation frameworks following implementation to reinforce existing measures and inform the adoption of more ambitious policies over time. Through systematic data collection and analysis, municipalities should assess the impacts of parking transformation on road safety, travel behaviour (including gender-disaggregated data), congestion levels, bus travel times, noise exposure, and local economic activity. Evidence-based evaluation strengthens policy legitimacy, supports adaptive management, and enables the progressive tightening of measures where outcomes demonstrate positive impact.
- Real-time data enhances decision-making, which provide live information on availability, pricing, and travel options helps users choose the most efficient and sustainable mode. Integrating this information into trip-planning apps or MaaS platforms allows for informed, real-time choices.
- Technical interoperability is a prerequisite, in which data-sharing protocols are needed so that different mobility providers, payment platforms, and parking operators can communicate effectively and deliver a consistent experience across systems and cities.

- The interaction between enforcement data and pricing analytics also enables continuous calibration. For example, recurring overstays in high-demand zones may signal that tariffs are too low to achieve desired turnover rates, while low occupancy in other areas may indicate overpricing. By linking compliance data with occupancy metrics, municipalities can refine pricing structures in a demand-responsive manner. In this context, enforcement becomes a feedback mechanism within an adaptive pricing system.
- Dynamic pricing operates not only as a regulatory tool but also as a behavioural feedback mechanism within the parking ecosystem. In specific, it generates valuable insights into how users respond to economic signals. By linking transaction data with occupancy metrics, municipalities can observe how tariff adjustments influence duration of stay, arrival timing, and location preferences. High-demand zones may experience reduced overstays following tariff increases, while lower-demand areas may benefit from demand redistribution. Continuous monitoring of these responses allows authorities to calibrate tariffs in an adaptive manner, ensuring that pricing supports turnover, availability, and broader mobility objectives.
- Beyond short-term behavioural shifts, parking data also reveals how pricing structures influence longer-term user preferences, including seasonal permits and subscription-based parking products. Adjustments in demand-responsive tariffs may alter the relative attractiveness of monthly or annual permits compared to pay-per-use models. Monitoring changes in subscription uptake, renewal rates, and spatial concentration of permit holders enables municipalities to evaluate whether long-term allocations align with turnover and accessibility objectives.
- Data collected from mobility hub environments, including usage of micromobility docks, shared vehicle bays, EV charging stations, and P+R facilities, provides valuable insights into modal transfer behaviour and infrastructure performance. Analysing these interactions enables municipalities to refine hub design, optimise space allocation, and scale successful models across the urban network.

Element 3.2.

Monitoring curb utilisation and off-street parking patterns

Detailed utilisation data enhances the management of multifunctional curb space. As cities increasingly treat the curb as a shared asset accommodating deliveries, micromobility, passenger drop-offs, and public realm functions, empirical data allows authorities to optimise allocations and reduce conflicts between competing uses.

Key directions:

- Detailed utilisation data enhances the management of multifunctional curb space. Modern cities increasingly treat the curb as a shared resource accommodating delivery, micromobility, passenger drop-offs, public realm uses, and traditional vehicle parking.
- Empirical utilisation patterns allow authorities to optimise allocations, reduce conflicts between competing uses, and test flexible or time-based zoning strategies. By grounding curb allocation decisions in measured demand rather than anecdotal claims, municipalities can maximise social, economic, and mobility benefits.
- Off-street parking patterns are equally important. Data on structured garages and private facilities enables a clearer understanding of spillover effects, peak demand mismatches, and underutilised assets.
- Integrating on-street and off-street data streams provides a system-wide perspective, allowing more coherent pricing coordination and spatial redistribution strategies. Consolidated datasets allow municipalities to identify underutilised structured parking, peak demand mismatches, and redistribution opportunities between curbside and garage facilities. Coordinated pricing and allocation strategies across both domains improve overall network efficiency and reduce unnecessary circulation.
- Performance monitoring of mobility hubs can serve as a measurable indicator of parking transformation success, linking parking management directly to broader mobility and climate objectives.

Element 3.3.

Communicating and educating through factual data

Education, communication, and capacity-building are essential to ensure that municipal staff, local businesses, and residents understand the rationale, objectives, and expected benefits of parking measures.

Key directions:

- Establish clear communications and engagement with local commercial owners in the transformation of parking. Transparent dialogue and early consultation reduce resistance, mitigate misinformation, and build local ownership of reform measures.
- Invest in targeted training and capacity-building for municipal planners, parking managers, enforcement teams, and decision-makers to strengthen understanding of pricing, data analytics, and multimodal integration. Building institutional expertise ensures consistent implementation, rigorous evaluation, and continuous adaptation of parking measures over time.
- Develop public awareness campaigns that clearly communicate how parking management supports broader mobility, safety, and climate objectives. Educational initiatives should explain pricing logic, dynamic tariffs, accessibility rules, and multimodal alternatives, helping users understand the rationale behind changes.

4.2. Conclusion

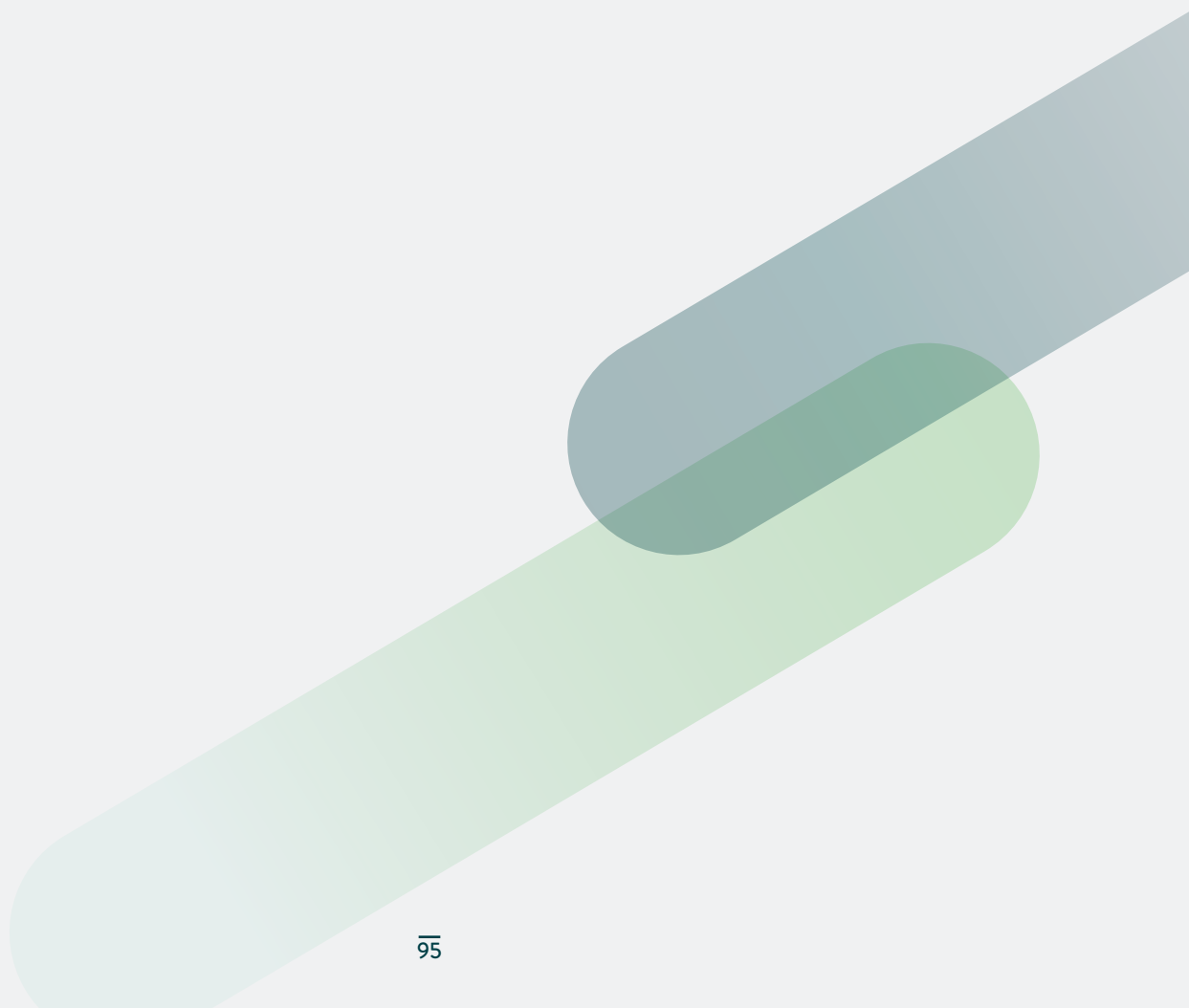
Parking is not merely an operational necessity within urban transport systems, it is a structural determinant of mobility behaviour, land allocation, and modal choice. The long-standing model of abundant and low-cost parking has generated a reinforcing cycle: expanding supply encourages car use, increased car use intensifies demand for parking, and perceived shortages prompt further expansion. This dynamic does not resolve congestion or accessibility challenges, instead it entrenches car dependency. Evidence shows that access to a parking space can significantly increase the likelihood of car ownership, while free parking operates as a substantial, often invisible subsidy to private vehicle use.

The implications extend beyond mobility. Urban land, particularly in dense city centres, is among the most valuable public assets. Dedicating large shares of this space to vehicle storage carries considerable opportunity costs, limiting its potential for housing, public space, active mobility corridors, economic activity, and environmental improvement. Reconsidering how parking space is allocated is therefore a strategic question of urban value and long-term spatial efficiency.

Adjusting parking pricing and reducing oversupply can influence travel behaviour, but such measures are effective only when credible alternatives exist. Shifting users away from private cars requires reliable public transport, safe walking and cycling infrastructure, shared mobility services, and seamless first- and last-mile connections. Parking policy must therefore operate within a broader multimodal framework. In this context, parking evolves into a multimodal interface, supporting smooth transitions between private vehicles, public transport, and shared mobility, rather than functioning solely as static car storage. In addition, optimising the allocation of street space, while maintaining necessary accessibility, allows parking to become part of a balanced urban mobility system.

This report has contributed by reframing parking as a strategic policy instrument. It has examined governance structures, regulatory frameworks, pricing mechanisms, and technological integration, and has positioned parking within a multimodal accessibility perspective. By introducing the concept of a virtuous cycle, where governance and policy define direction, technology enables implementation, and data-driven knowledge strengthens decision-making, the report provides a structured foundation for aligning parking management with broader sustainable mobility objectives.

Ultimately, the transformation of parking is not about eliminating it, but about correcting distortions created by its abundance and underpricing. By aligning governance, pricing, land-use strategy, and multimodal integration, cities can redirect valuable space toward higher returns and position parking as an enabling component of sustainable urban mobility.



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Working Group Members and Acknowledgments

The UITP Global Parking Transformation Working Group brings together public transport authorities, operators, cities and industry partners to exchange knowledge and develop practical approaches to parking transformation. Recognising the significant role that parking plays in shaping travel behaviour and modal choice, the Working Group studies how parking assets can be planned, priced and managed to support public transport and integrated mobility systems. In addition, the Working Group focuses on transforming parking into an enabler of multimodal mobility, strengthening governance frameworks for sustainable transport, and advancing data-driven parking management practices. Through collaboration, knowledge sharing and the development of practical tools, the group seeks to align parking policies and practices with wider sustainable mobility objectives.

The Working Group is chaired by Eng. Mohamed Abdulla Al Ali, Chief Executive Officer at Parkin Company PJSC, and vice-chaired by Charles de la Chevrotière, Executive Director, Business and Mobility Strategies at Agence de mobilité durable de Montréal (Sustainable Mobility Agency of Montreal).



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