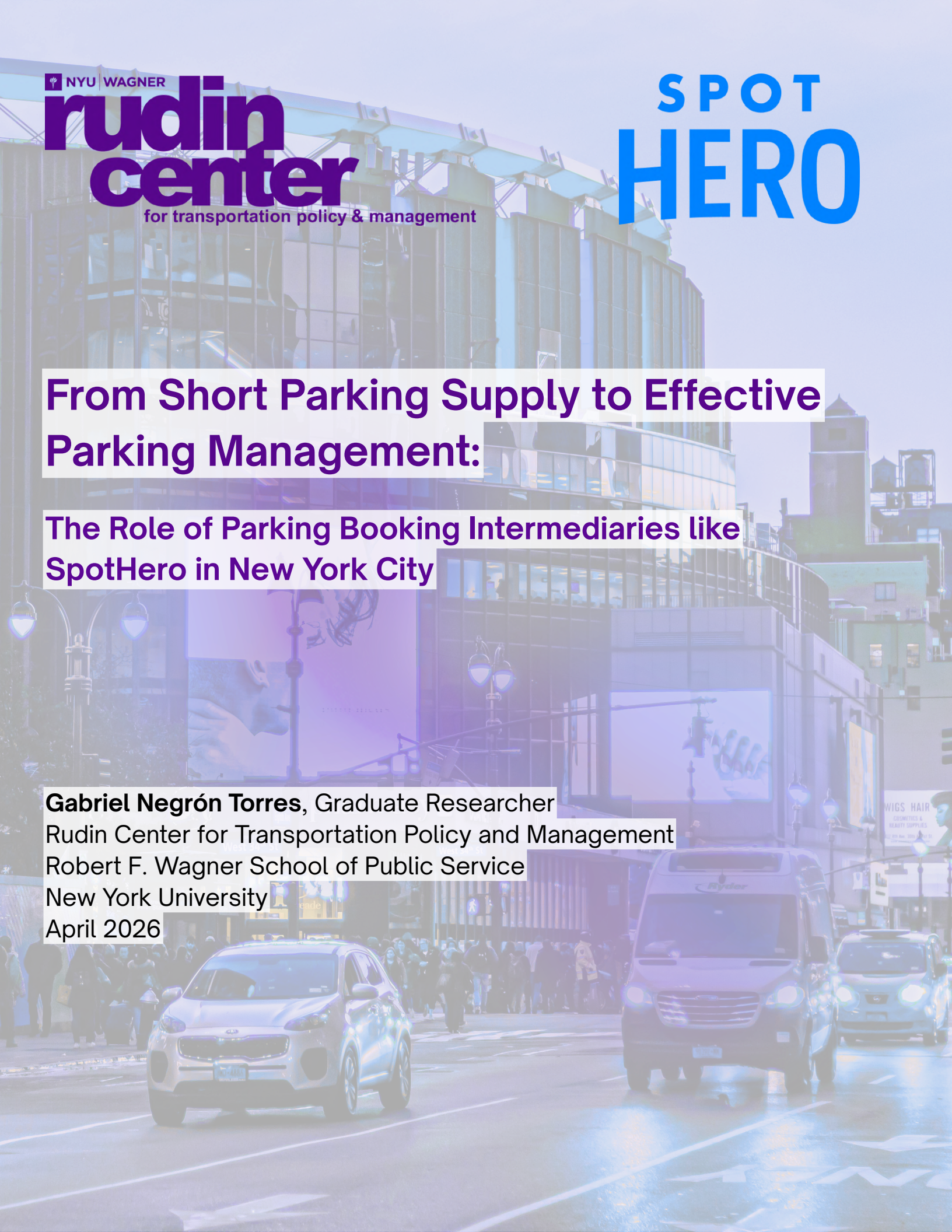

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SPOT HERO

From Short Parking Supply to Effective Parking Management:

The Role of Parking Booking Intermediaries like SpotHero in New York City

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From Short Parking Supply to Effective Parking Management: Executive Summary

New York City's transportation system is experiencing significant change driven by the lasting effects of the COVID-19 pandemic, shifts in work modalities and economic activity, and the implementation of congestion pricing in January 2025. These changes have altered travel behavior and elevated the importance of managing transportation infrastructure more efficiently.

Advanced parking reservation systems are a mobility management tool, not merely a consumer convenience.
Off-street parking, particularly when managed through advanced reservation platforms, can improve mobility outcomes without expanding parking supply. SpotHero, a digital platform that allows drivers to search, compare, and reserve off-street parking in advance, commissioned this analysis to examine how such platforms interact with changing travel behavior and transportation policy in New York City. This report examines trends in off-street parking using anonymized and aggregated data provided by SpotHero as a case study and evaluates how parking reservation platforms can support broader transportation and congestion management goals in New York City.

New York City's core challenge is parking efficiency, not parking scarcity.
Although New York City has the lowest car ownership rates among U.S. cities, with most households not owning a vehicle and most commuters relying on transit, vehicle ownership has increased modestly in recent years, particularly in the outer boroughs and surrounding counties. At the same time, off-street parking supply in the Manhattan Core has declined. Given space constraints and citywide mobility goals to reduce congestion and support transit-oriented development, increasing parking supply is neither feasible nor desirable. Improving the efficiency, utilization, and management of off-street parking is therefore essential.

Reservation patterns reveal how drivers respond to congestion pricing.
Analysis of SpotHero data shows that a significant share of advance parking reservations in New York City is driven by live events, while commuting accounts for a smaller share. Following the implementation of congestion pricing in January 2025, parking reservations continued to grow citywide, with significantly stronger growth outside the congestion zone than within it. This pattern suggests that drivers are adapting by parking outside the zone and completing trips by transit, rather than eliminating trips altogether. Advanced reservation platforms thus provide real-time insight into behavioral responses to pricing policy and can help policymakers understand spatial redistribution effects.

From Short Parking Supply to Effective Parking Management: Executive Summary

Reducing parking-related cruising generates measurable public benefits.
Across all use cases, advanced reservation systems reduce uncertainty and search time for drivers while improving revenue predictability for operators. From a public-policy perspective, the more consequential impact is the reduction in cruising for parking, an activity associated with excess vehicle miles traveled, localized congestion, emissions, and time loss. By enabling drivers to secure parking in advance and proceed directly to facilities, reservation platforms reduce unnecessary circulation and extract greater public value from existing infrastructure.

To better align off-street parking with New York City's mobility goals, we recommend that transportation management agencies, together with advanced parking reservation platforms, work together to take the following steps:

1. **View event-driven demand as a parking management opportunity:** The resurgence of live events has become an important driver of off-street parking reservations, concentrating demand near major venues. Policymakers can treat event-related parking as a predictable demand-management challenge rather than a justification for additional supply. Public agencies can encourage the use of advance reservations, support distributive incentivized pricing strategies, and coordinate with venue operators to distribute vehicles across underutilized facilities, reducing localized congestion and spillover into residential streets.
2. **Public agencies can develop data-sharing partnerships to enable performance-based parking policy.** Effective parking management requires visibility into how off-street facilities are used. Policymakers can establish structured data-sharing agreements with reservation platforms to access anonymized, aggregated information on occupancy, duration, turnover, and pricing patterns. Any such arrangements should be designed to protect consumer privacy and operator confidentiality, ensuring that shared data remains aggregated, anonymized, and subject to appropriate safeguards. The data would allow agencies to evaluate parking system performance, assess the impacts of congestion pricing, and design evidence-based interventions that prioritize turnover, reduce cruising, and enable more intentional, informed changes to parking supply.
3. **Off-street parking must be integrated into the city's broader mobility strategy.** The city can integrate parking with multimodal travel options by supporting park-and-ride collaborations with parking reservation companies and highlighting nearby transit and micromobility connections at these locations. As congestion pricing remains in effect and travel behavior continues to evolve, actively managing off-street parking will become an essential component to achieving long-term mobility and sustainability objectives.

Managing off-street parking as an integrated component of the transportation system, rather than as a residual land use, will be essential to advancing New York City's long-term mobility, climate, and equity objectives.

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Introduction

Over the past several years, New York City has experienced two significant events that reshaped residents' mobility patterns: the COVID-19 pandemic beginning in March 2020, its resulting expansion of remote work, and the implementation of congestion pricing in Manhattan south of 60th Street in January 2025. These monumental changes have compelled policymakers and stakeholders involved in transportation planning and management to reassess existing conditions, adapt to new realities, and implement necessary adjustments to address current challenges. Within this context, parking management has emerged as a key component that requires greater attention.

Historically, cities have paid little attention to parking as a unified policy area, often managing it in a fragmented, uncoordinated manner across agencies and stakeholders (McShane & Meyer, 1982). New York, the densest and most populous city in the United States, has done more than most American cities to address parking policy, largely by necessity due to space constraints. However, these efforts have largely focused on curbside parking and residential parking, with comparatively little attention paid to the role of off-street parking-parking facilities located outside the public right-of-way, including garages, surface lots, and parking structures operated by public, private, or institutional entities-within broader transportation policy discussions (New York City Department of Transportation, Curb Management Action Plan, 2023). In fact, the last large-scale study on off-street parking published by the New York City government was the Manhattan Core Parking Study in 2011, which focused primarily on areas south of 110th Street. Since the release of that study, the city has undergone substantial changes that extend beyond the pandemic: despite the absence of major expansions in public transit system capacity, the New York metropolitan region has added nearly one million residents (ACS 5-year estimates), while the city itself has seen an increase of approximately one million jobs (U.S. Bureau of Labor Statistics). At the same time, Census data indicate that automobile ownership in New York City increased during the early post-pandemic period, with the outer counties registering nearly six times the number of additional vehicles compared to previous years, reinforcing the growing relevance of off-street parking in a city where space remains highly constrained (Komanoff, 2023).

In response to the need for a more in-depth examination of current off-street parking conditions in New York City, SpotHero, a parking reservation intermediary that allows users to book parking in advance at more than one thousand garages across the city, commissioned this study from the Rudin Center for Transportation Policy and Management at New York University. SpotHero provided anonymized and aggregated proprietary platform data to support an analysis of current service conditions and to explore opportunities for improving efficiency in managing off-street parking.

This report begins with an overview of existing conditions related to off-street parking management and digital reservation platforms, and recent market trends in New York City, followed by a general overview of trends and growth in SpotHero's service use from 2019 through September 2025. It then presents an analysis centered on the implementation of congestion pricing in January 2025, comparing the period from January to September 2024 with the same months in 2025. This analysis leads to a discussion of event-related parking reservations, which appear to have experienced sustained growth since the pandemic. The report is further supported by a review of relevant literature on pricing structures and concludes with a set of recommendations for advanced parking booking platforms, off-street parking operators, urban planners, and public policymakers.

Existing Conditions

Existing ConditionsEffective management of parking spaces is essential for a city's sustainable development.

When parking management is impractical, comprehensive, or inefficient, it can create or exacerbate existing problems within the transportation network. For example, poor parking management can lead motorists to spend more time roaming for parking, wasting individual time, adding unnecessary vehicle miles traveled (VMT), burning fuel that results in higher greenhouse gas emissions, and contributing to traffic congestion, which in turn increases emissions and time losses for other motorists as well (Shoup, 2017). In fact, a 2017 INRIX report estimated that drivers in New York City spent an average of 13–15 minutes each time they searched for parking, resulting in an average annual cost of $2,243 per individual and a total citywide cost of parking search valued at $4.3 billion (INRIX, 2017). Nevertheless, through improved parking management policies and practices, driver behavior can be influenced, reducing these negative externalities.

To consider VMT impacts in the New York City context, conservative estimates using assumptions based on Shoup's work on cruising time and parking reservation data from 2024 and 2025, advance parking reservations may be associated with approximately 13,000 to 63,000 miles of avoided parking search-related circulation annually among reservation users. This equals 3,300 to 13,400 hours of search time, or up to a year and a half in aggregate for SpotHero users in the New York City area.[1]

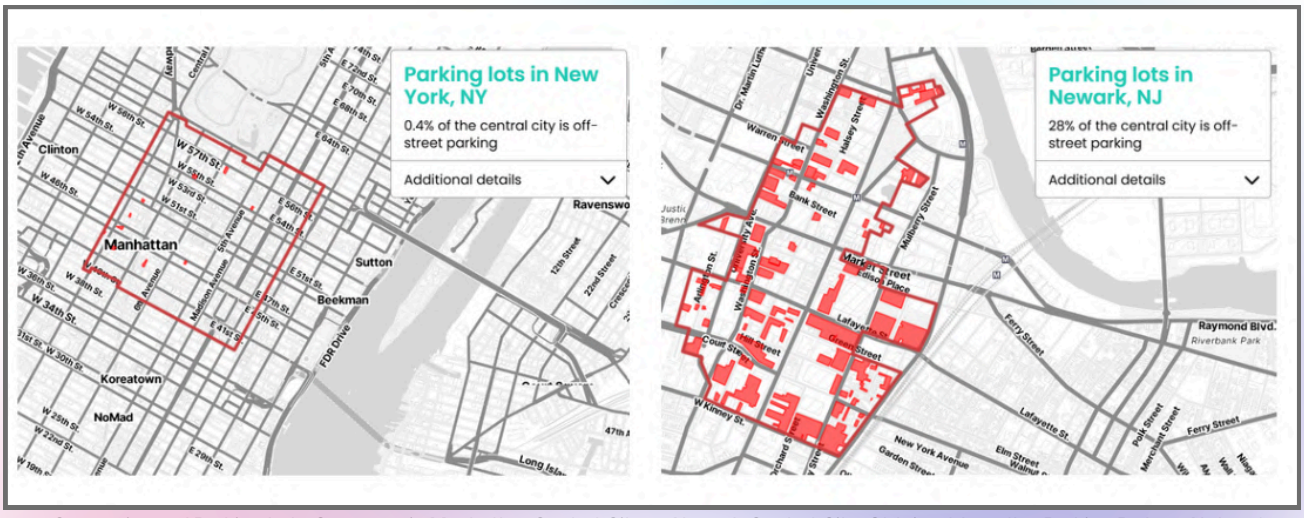
On-street parking spaces carry higher urban costs than commonly realized.

In addition to spatial constraints, each parking space carries high monetary and social costs (defined here as both the direct financial expenses associated with land acquisition, construction, and operations, as well as the broader social and economic tradeoffs such as foregone housing, commercial activity, and urban space) that are often invisible to the public. Considering land value, construction, and operating costs, the annual cost per parking space can range from approximately $500 to more than $3,000 (Litman, 2024), with the latter being more representative of conditions in New York City. It is also important to recognize that the more space dedicated to parking, the less space available for other uses such as housing and commercial activity. Taken together, these dynamics underscore how off-street parking addresses critical social and economic needs in New York City and why its role within the city's transportation and land-use system should no longer be undervalued.

Parking space allocations in New York City comply with the city's relatively low rates of car ownership.

New York City is an outlier in the United States when it comes to parking, as the largest share of residents commute daily by public transportation (ACS 2024). Still, parking management is important given the limited space the city can allocate to this use (Litman, 2024). New York City's primary employment center in Midtown Manhattan devotes only 0.4 percent of land area to off-street parking lots within the area defined as the "central city" by the Parking Reform Network. This stands in stark contrast to other regional central cities, such as Newark, Hartford, and Providence, where more than 25 percent of central-city land area is dedicated to off-street parking under the same definition (see images below). The fact that the average vehicle is parked for approximately 23 hours per day further complicates this situation (Litman, 2024). Increasing parking supply is not a viable solution in New York City, as it would be physically impossible and counterproductive to the city's mobility goals. Nonetheless, solutions do exist within the parking management paradigm, and the city and the private sector have the resources to implement them (Thoman, 2021). These solutions include a range of strategies such as pricing, shared use, improved utilization of existing off-street facilities, and coordination between public agencies and private parking operators.

[1] These estimates are intended to capture localized parking search behavior rather than a change in travel, meaning that it does not consider the potential time saved by passing drivers not looking for parking.



Comparison of Parking Lots Coverage in Manhattan Central City vs Newark Central City. Obtained from the *Parking Reform Network.*

Nevertheless, private vehicle ownership among households remains significant and has increased in recent years. Today, nearly 100,000 more households in the city own at least one vehicle compared to the 1,382,873 households with at least one car in 2010 (ACS, 2024), while growth in registered vehicles across the seven MTA non-city counties (counties outside the city to which the Metropolitan Transportation Authority provides commuter rail and bus services) was even higher, almost 6 times that of previous years (Komanoff, 2023).

Despite this growth in vehicle ownership, the number of off-street parking spaces within the Manhattan Core (below 96th St on the East Side and 110th St on the West Side) has not increased. On the contrary, as displayed in Figure 1, supply declined from approximately 127,000 spaces in 1978 to about 102,000 spaces in 2010 (Department of City Planning, 2011). Taken together, these patterns suggest that the decline in off-street parking supply in the Manhattan Core can be reasonably attributed to a combination of redevelopment pressures, zoning reforms that reduced or eliminated parking requirements, and a broader policy shift toward transit-oriented land use, all operating within a highly space-constrained urban context. This trend reinforces the need to implement measures that ensure each off-street parking location operates as efficiently as possible, both within the Manhattan Core and in surrounding areas.

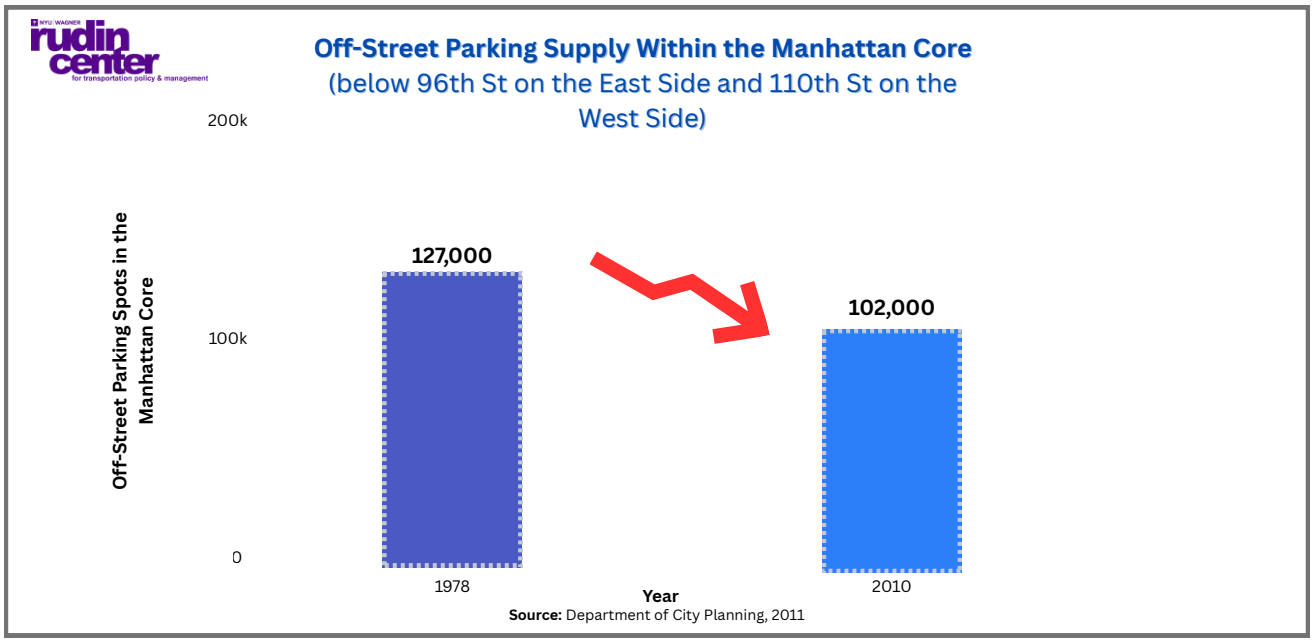


Figure 1: Off-Street Parking Supply within the Manhattan Core

NYC off-street parking is owned and operated by a patchwork of private companies.

The primary operators and managers of off-street parking in New York City are responsible for about one-quarter of garages. Based on self-reported New York City portfolios published on operator websites, Icon Parking operates the largest number of parking garages in the city (nearly 200), followed by iPark (approximately 100). Metropolis (72) and LAZ Parking (67) operate a smaller yet still significant number of locations in New York City. Based on New York City open data on garages with active operating licenses, these four companies together represent approximately 26 percent of all licensed parking garages, with locations concentrated in areas such as the Manhattan Core, airports, and major event venues. In addition, digital parking reservation intermediaries such as SpotHero operate in approximately 95 percent of parking locations across New York City. Other companies offering similar services in the city include BestParking, ParkWhiz, and SNAG, the latter operating exclusively at airports.

1

Growth of Technology Applications to Parking Management

Parking reservation systems, emerging from long-standing investments in technology, improve efficiency, time value, and service quality.

SpotHero emerged as a result of incremental technological improvements in parking garages over the past decade. Many parking garage owners and operators have adopted various Intelligent Transportation Systems (ITS) components, improving operational efficiency, security, occupancy ratios, and revenue management (Briones et al., 2021). These technologies include real-time occupancy sensors, access control systems, and electronic payment platforms, among others. Parking facilities that integrate these technologies are commonly referred to as Smart Parking Garages (SPGs), which serve as the technical foundation for advanced reservation platforms (Briones et al., 2021).

The resulting growth of digital advance reservation platforms represents a broader shift in how off-street parking is accessed, priced, and managed. Parking booking intermediaries allow drivers to view and compare parking options across multiple locations through a single platform, reducing information asymmetries that traditionally characterize the off-street parking market. By enabling comparison shopping and advance booking, these platforms reduce the need for drivers to toggle between individual garage websites or physically roam in search of more convenient or affordable options (Schwieterman et al., 2019).

From a system performance perspective, the use of reservation platforms has been shown to reduce drivers' search time, improve overall service quality, and impart tangible economic benefits to users, such as saved parking search time (Briones et al., 2021). These benefits accrue without requiring new parking supply, instead relying on more efficient utilization of existing spaces.

Parking booking intermediaries generate both private and public benefits.

For drivers, they offer guaranteed parking availability, reduced queuing, shorter waiting times, and improved convenience (Zhang et al., 2023). For parking operators, intermediaries facilitate dynamic pricing and more consistent and efficient utilization of facilities. At the system level, the use of intermediaries reduces drivers' incentives to cruise in search of off-street parking, thereby generating social benefits by lowering congestion and associated external costs (Briones et al., 2021). Estimates suggest that roaming motorists impose measurable social costs per trip, primarily driven by congestion, and that mitigating this behavior through reservation platforms yields significant collective benefits (Schwieterman et al., 2019).

As these platforms scale, their impact increases. Intermediaries function as de facto market coordinators, reducing search costs, encouraging more data-driven pricing practices, and aligning private operational decisions with broader public goals such as congestion reduction and emissions mitigation (Schwieterman et al., 2019). ITS have also brought advances in payment systems. Many platforms now support contactless payment, automated billing, and integration with other transportation services (such as charging for electric vehicles), increasing convenience and reducing transaction friction. These technical advantages allow reservation platforms to respond rapidly to fluctuations in supply and demand, fostering more consistent and efficient use of off-street parking infrastructure (Schwieterman et al., 2019).

Trends in Advance Parking Reservations: SpotHero Case Study

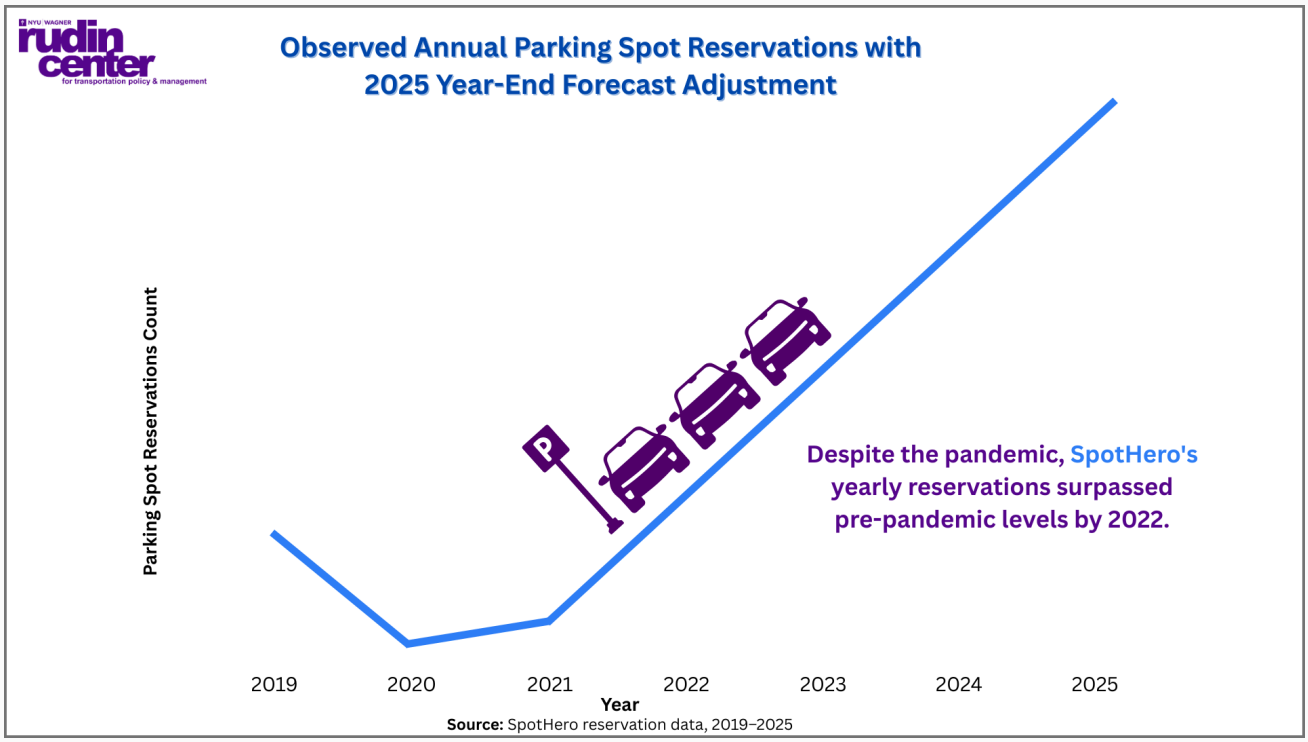


Figure 2: Observed Annual Parking Spot Reservations

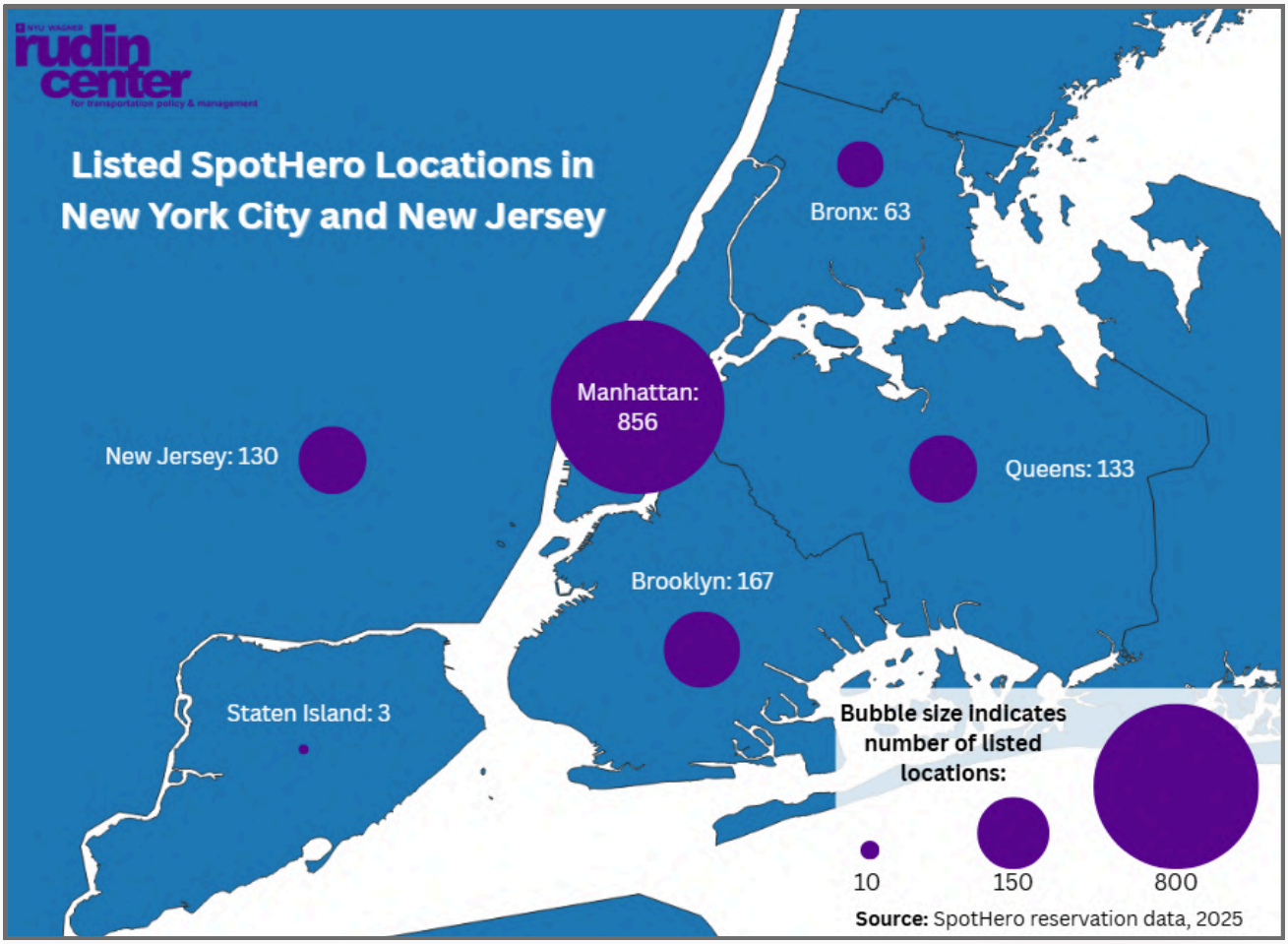
Using anonymized and aggregated data provided by SpotHero from 2019 onwards and considering the momentous impacts of the COVID-19 pandemic, we draw several observations.

As shown in Figure 2, after a sharp decline in reservations in 2020, the platform recovered and surpassed its pre-pandemic levels by 2022, despite remote work still being near its peak (U.S. Bureau of Labor Statistics)(Pabilonia et al., 2024).

This growth is also reflected in the number of locations listed on the SpotHero platform. Although still limited by garage inventory, by 2022 the platform was listing nearly 1,400 locations with available parking spots, representing the vast majority of all parking garages in the city and more than before the pandemic. This growth demonstrates SpotHero's far-reaching coverage of New York's off-street parking sector, as well as its capacity to implement parking-management practices that improve both the quality of services offered to customers and the overall functioning and flow of the city's streets.

This observation holds even when analyzing these trends across different parts of the city (see the map below showing the distribution of parking locations). Every borough today has more listed locations than before the pandemic, although the distribution is clearly shaped by Manhattan's dominance, with 60 percent of all listed locations, compared to 31 percent in the outer boroughs and the remaining 9 percent in New Jersey, which, for the purposes of this analysis, is considered part of SpotHero's New York market.

Trends in Advance Parking Reservations: SpotHero Case Study



Map 1: Listed SpotHero Locations by Borough (Plus New Jersey)

Congestion Pricing

The implementation of Congestion Pricing in New York City impacted parking trends.

Congestion pricing, a policy that had been part of public discussion in New York City for decades, was finally implemented in January 2025 with the goals of reducing vehicle congestion in the Manhattan Central Business District while simultaneously generating revenue for the Metropolitan Transportation Authority's (MTA) capital projects. The policy consists of tolling every entry point into the congestion zone, which includes all of Manhattan south of 60th Street, with dynamic pricing based on daytime hours, the driver's residency and income level, and vehicle type, ranging from $1.05 to $21.60. Most vehicles are charged $9 once per day.

Based on data from the program's first year, congestion pricing appears to be successful at reducing vehicle traffic. In its first year, congestion pricing resulted in 27 million fewer vehicle entries into the Congestion Relief Zone (CRZ) of Manhattan, an 11% reduction in traffic compared to prior baseline traffic levels. Drivers have experienced significantly faster crossing speeds into the zone and improved commute times, with some morning peak trips up to 51 % quicker than before implementation. Transit use also increased, with bus and subway ridership rising by about 7%, while the program generated over $550 million in net revenue to support critical transit improvements, including new rail cars and signal upgrades. Safety outcomes indicate continued benefits as crashes and traffic injuries declined, and pollution levels within the CRZ fell substantially, contributing to cleaner air (Office of the Governor of New York State, 2026).

Ultimately, congestion pricing is a policy designed to modify driver behavior, much like parking management practices. However, predicting behavioral changes, particularly in terms of how drivers redistribute themselves spatially, remains uncertain and is often underestimated (Bergeling, 2024). This uncertainty fueled concerns among some environmental advocacy groups that traffic destined for Manhattan would shift to outer boroughs already experiencing congestion. Early evidence suggests otherwise: traffic volumes in these areas have not increased faster in 2025, indicating that congestion pricing is reshaping travel behavior primarily through mode shifts rather than by physically displacing traffic into neighborhoods outside the congestion zone (Komanoff, 2025).

With the MTA projecting revenues surpassing the planned $500 million annually (Office of the Governor of New York State, 2025), congestion pricing appears likely to remain in place. This suggests that any effective off-street parking management policy in New York City must adapt to and capitalize on the opportunities created by congestion pricing. The following section considers how SpotHero performed following the implementation of congestion pricing.

Parking Booking Intermediaries in the Era of Congestion Pricing: Reservations increased significantly outside of the zone.

While SpotHero continued to grow its reservation numbers in 2025, the remaining question is whether this growth has been distributed evenly both within and outside the congestion zone, since continuous growth does not necessarily imply unchanged driver behavior. In this sense, SpotHero serves as a behavioral lens for understanding how demand for off-street parking reservations reacts in different parts of the city to the increased cost of driving into Manhattan under the congestion pricing policy.

When separating the parking garages within and outside the congestion zone, we observe that although both experienced growth, it was not distributed uniformly. In fact, during the months after congestion pricing was implemented, reservations grew almost three times as much outside the congestion zone as inside, compared to the same period the previous year. This difference suggests the influence of congestion pricing: commuters working within the congestion zone likely chose to park outside the zone and complete their trip by transit.

Advance reservation parking intermediaries can view congestion pricing as an opportunity to continue refining their parking management offerings. Some of these opportunities may be gleaned from publicly available data from the State

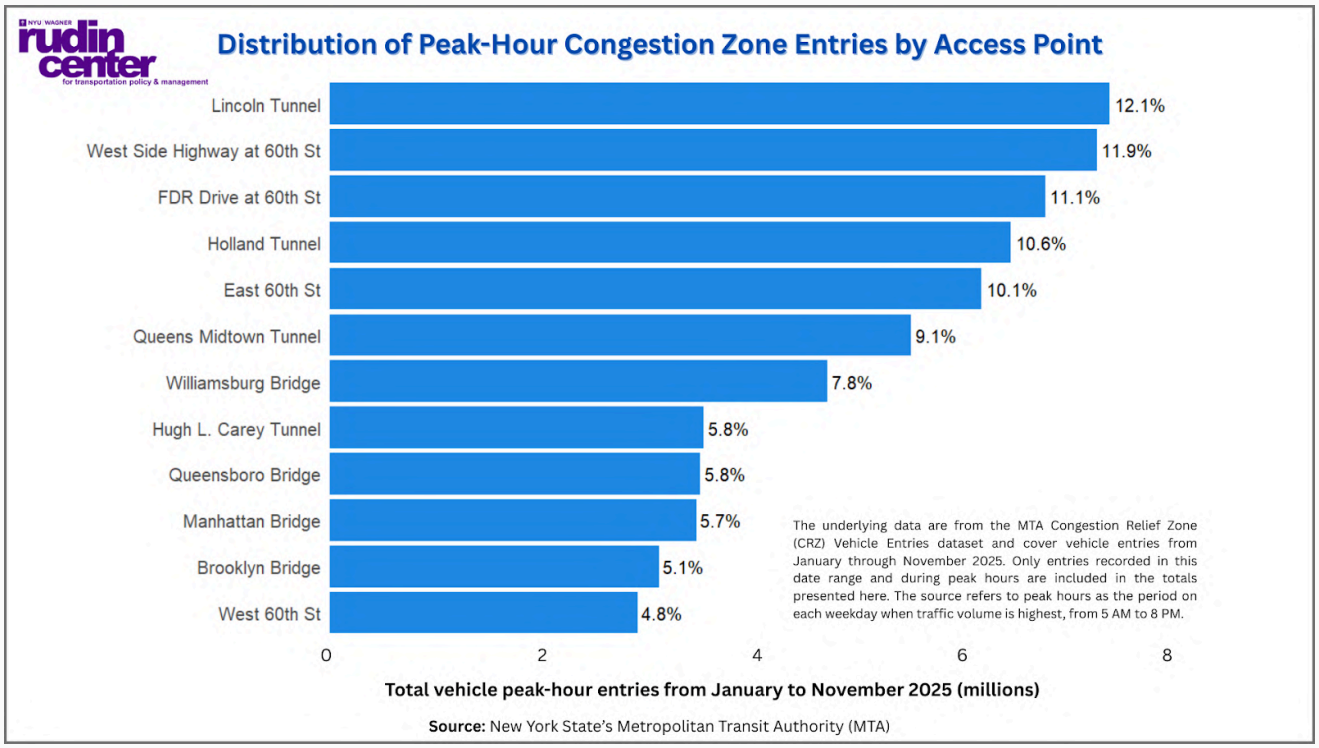


Figure 3: Distribution of Peak-Hour Congestion Zone Entries by Access Point

of New York on vehicle entries at each access point into the congestion zone, to assess whether the overall traffic reductions within the zone are evenly distributed across entry points. Figure 3 shows that one-third of the cars entering the congestion zone during peak hours do so through just three of the 12 entry points.

By continuously monitoring congestion zone entry data published by the MTA and New York State, parking reservation intermediaries can more accurately assess how to hone their offerings to improve the efficiency and appeal of off-street parking facilities. For example, the table below presents the distribution of Class 1 vehicles (typical personal cars and two-axle passenger vehicles under 7 feet 6 inches tall) entering the congestion zone during peak hours. Normalizing this data and examining percentage changes across entry points highlights areas where driver behavior appears to have shifted. In this case, we see that the West Side Highway tunnels and the Lincoln Tunnel have regained the highest share of drivers, on a percentage basis, since January 2025—an indication that these corridors may offer opportunities to strengthen SpotHero's presence near the routes drivers take when entering through these points.

Driver behavior will continue to adjust as congestion pricing remains in effect. This reinforces the need for ongoing evaluation of available data and using a dynamic approach that can respond to evolving behavioral patterns.

Parking for Events

With the lockdown and public health measures implemented during the 2020 pandemic, the live events sector (such as concerts, sports, and conferences) was severely impacted. Venues remained closed for long periods, and people concerned about contracting the virus avoided large gatherings even after the government permitted them. However, live events appear to have resurged, with attendance levels in many cases surpassing pre-pandemic numbers, from the major national sports leagues (Trine University, 2023) to concerts (Bloom, 2022)(NYT, 2025).

The growth of events presents strong implications for parking. Events held at large venues, such as Madison Square Garden and Yankee Stadium, bring together tens of thousands of people at once, creating parking management challenges and significant congestion in the surrounding areas. The best way to address these challenges is through parking-management strategies that do not involve adding new parking supply that would be used only on occasion and that do not fail to contribute to the functioning of the surrounding public space during non-event hours (Henao et al., 2013). This is precisely why intermediaries like SpotHero become highly relevant and necessary in addressing these challenges.

SpotHero shows that a significant share of reservations made through the platform in 2025 were for events (defined by the time the reservation was made), representing a majority of all reservations.. This remains true both within and outside the congestion zone, although the proportions differ from the citywide figures, an expected outcome given that most venues with more than 10,000 seats are located outside Manhattan. Within the congestion zone, event-

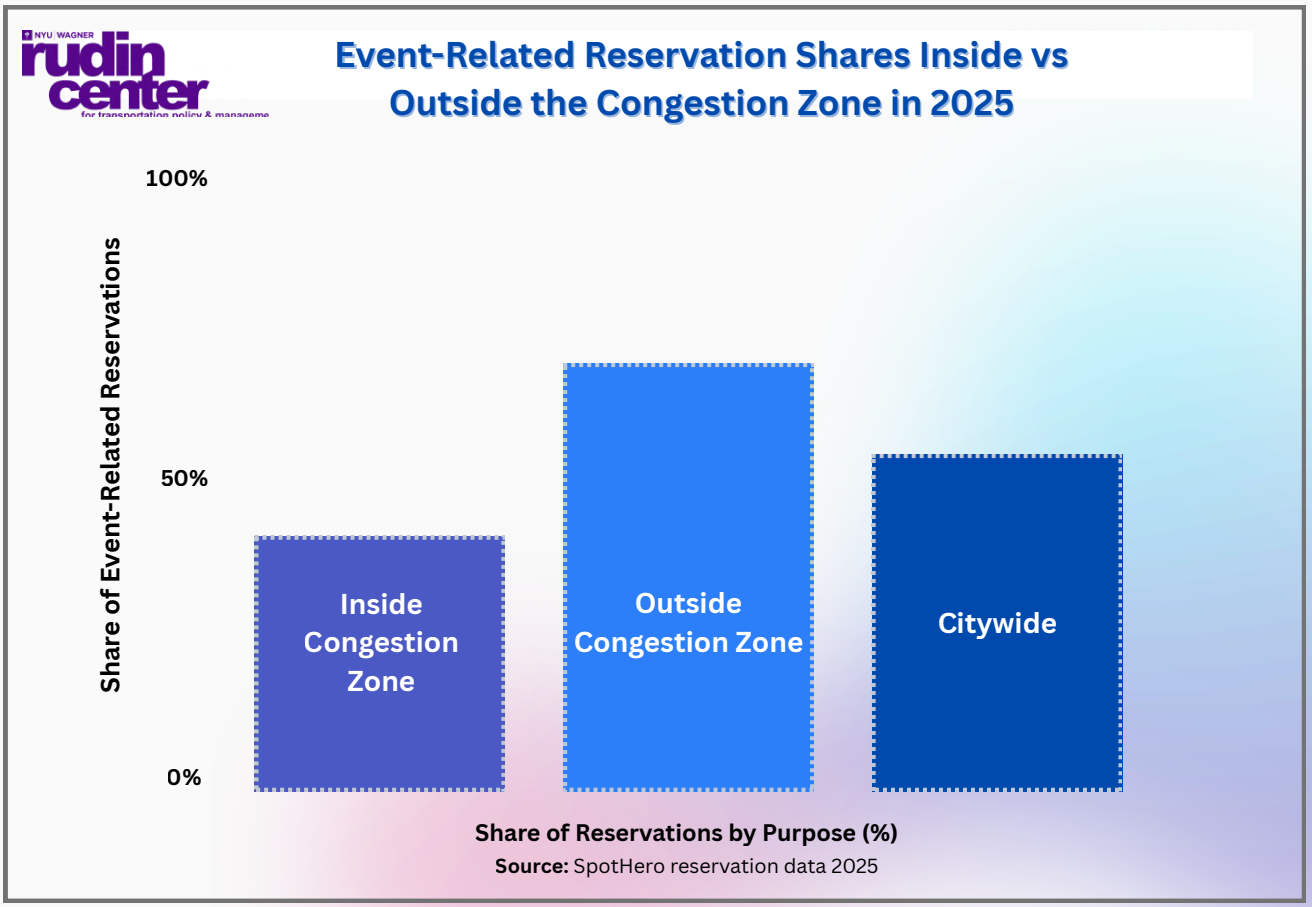


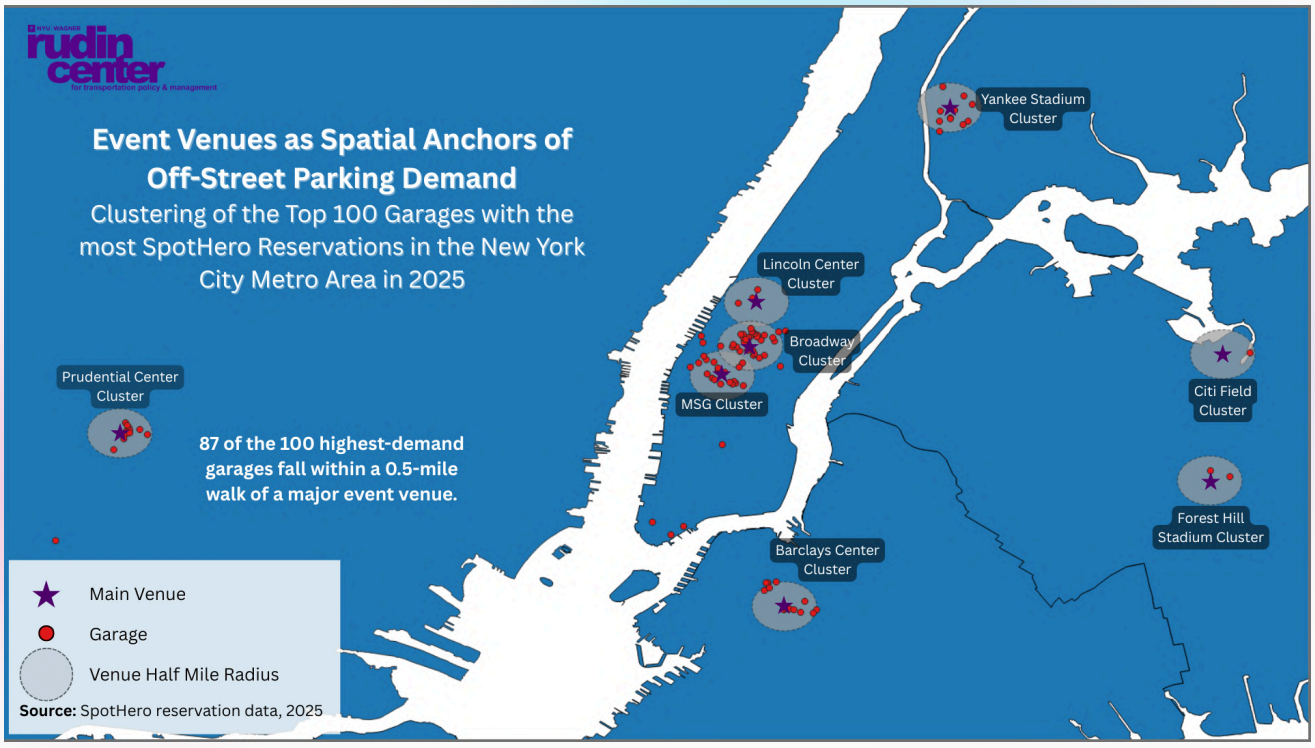
Figure 4: Reservation Purpose Shares Inside vs Outside the Congestion Zone in 2025

related reservations accounted for less than half of reservations, outside the zone, they accounted for about two-thirds of reservations (see Figure 4). The higher share of event-related reservations outside the congestion zone underscores the continued reliance on driving for access to large venues located beyond the zone, in contrast to Madison Square Garden, which sits directly above New York Penn Station, the busiest rail station in the country.

This distribution of reservation purposes remained nearly unchanged after the implementation of congestion pricing, when compared between 2024 and 2025. The most significant change was a minimal increase in commuter reservations, likely reflecting those who substituted a full car trip by parking and completing the final segment by transit. Interestingly, this growth occurred primarily within the congestion zone, while outside the zone, commuter reservations actually declined. It is possible that car owners living within the congestion zone substituted their entire trip to the final destination to avoid paying the congestion charge on their return from work. Event-related reservations increased outside the congestion zone and had an insignificant decrease within it. Taken together, these findings suggest that parking demand is still driven mainly by the location of jobs and event venues, while congestion pricing shapes behavior at the margins, influencing how some trips are completed rather than why they occur.

The correlation between the number of SpotHero reservations and the growth of live events is evident in a map showing reservations per garage. Clusters with high reservation counts surround major venues, including Madison Square Garden, Barclays Center, Yankee Stadium, Lincoln Center, Broadway theater district, Forest Hills Stadium, and Prudential Arena in New Jersey.

The spatial concentration of reservations around major venues suggests that a meaningful share of our estimated reduction in parking search-related circulation is likely to occur during event-related travel. Given that an important share of reservations in 2025 were associated with events, a substantial portion of avoided roaming and search time could be concentrated around peak-demand periods and venue-adjacent corridors, where last-minute parking search and local "block-level" circulation would be more pronounced (hence, this could mean that roaming times and/or distances could be longer

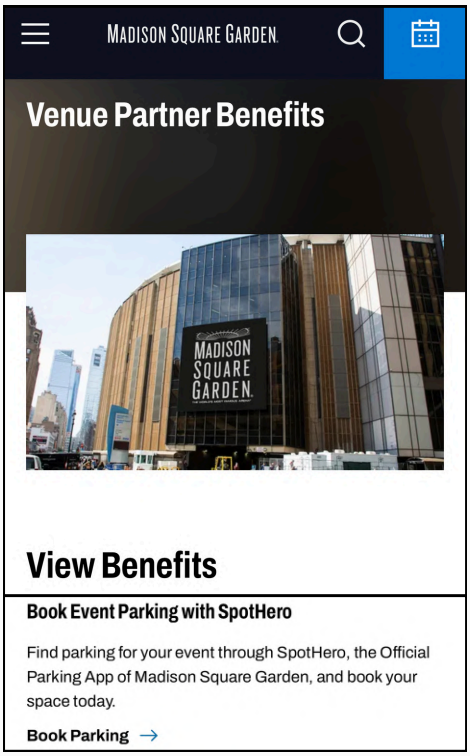


Map 2: Distribution of 100 garages with the most SpotHero reservations in 2025

than those assumed in our model). Under this context, even a modest reduction in cruising may have outsized localized impacts on traffic flow reliability and congestion near major event destinations. Assuming that share to be modest, that's about 34,020 hours in 2025, or 15,581 Knicks games.

Reductions in cruising also reduce environmental externalities. Cruising for parking is associated with frequent acceleration and deceleration, lane changes, and low speeds, which increase fuel consumption and emissions when compared to regular traffic circulation. Even small numbers of cruising vehicles can significantly increase emissions and fuel consumption, particularly in concentrated areas like parking entrances and intersections (Sui et al., 2022). Therefore, it is likely that near event venues and clustered garages in places like Manhattan, where parking search is concentrated within a small radius, a reduction in roaming behavior brings about localized environmental and air quality benefits during peak demand periods.

It is clear that the growth of event-related reservations represents an opportunity for advanced parking-reservation intermediaries, and a challenge for the city, which seeks to reduce traffic congestion and its negative externalities. This is where services like SpotHero can play a role in the solution through parking management, leveraging strategies such as direct partnerships with event organizers (something SpotHero is already doing), advertising at event venues, designing and providing shuttle services from additional parking garages during certain events, and using reward systems to incentivize customers to reserve parking in lower-demand locations. The latter represents another opportunity for SpotHero, especially given previous studies indicating that parking-price elasticity is lower for non-commuting trips (Lehner et al., 2019). These approaches highlight the potential role of parking intermediaries in managing event-driven travel demand without directly increasing vehicle volumes. Their effectiveness, however, will depend on coordination and partnership with city agencies, event organizers, and transit providers.



SpotHero listed as an official partner of Madison Square Garden (msg.com)

SpotHero promoting their services for events at MSG on their social media

Parking Reservation Pricing Structures

Striving for a parking structure occupancy rate of 85%

Parking pricing significantly influences driver behavior. Much of the parking supply in urban areas across the United States is priced inefficiently, whether through subsidies, bundling with housing, or free curbside parking, producing a distorted signal of the true social cost of parking and shaping motorists' decisions in ways that reinforce congestion and inefficient space use (Litman, 2024). Just as these pricing structures have historically encouraged behaviors that increase vehicle congestion and vehicle miles traveled, pricing can also be used to reallocate parking demand more efficiently, supporting better turnover, reduced cruising, and more appropriate use of limited curb and garage space (Lehner et al., 2019). In this context, pricing interventions are not intended to discourage vehicle travel altogether, but rather to improve how, where, and for how long vehicles are parked, such as prioritizing short-term curbside use, facilitating commercial loading, or shifting long-duration parking to off-street facilities.

The price of parking should not only change driver behavior but also improve the efficiency of how parking lots are used. Performance-based pricing seeks to maintain an optimal occupancy rate of around 85%, ensuring that space is not wasted while also leaving room to absorb sudden increases in demand without encouraging vehicle overuse (Litman, 2024).

Typical strategies for performance-based pricing include: demand-based adjustments, where prices vary by time of day or day of week (for example, charging higher rates during weekday peak commute hours and lower rates during off-peak periods to encourage turnover and reduce cruising), and expanded payment options, reduce transaction friction and uncertainty, allowing drivers to secure parking in advance and proceed directly to available spaces rather than circling for curbside parking.

With the emergence of ITS technologies and digital platforms such as SpotHero, many locations have already implemented this approach as a parking management tool (Briones et al., 2021).

A well-designed pricing structure can serve multiple objectives shared by the city and industry partners, including improving traffic efficiency, reducing vehicle congestion, and generating revenue (Litman, 2024). Additional models adjacent to performance-based approaches include spatial-temporal pricing, which adjusts price based on utilization and congestion in a given area, reducing cruising time and induced traffic (Zhang et al., 2023). Location-based pricing relates cost to proximity to the Central Business District (CBD), consistent with principles of urban economics (Liang et al., 2019), and reflects the spatial value of parking (Zhang et al., 2023). Taken together, these pricing strategies not only seem compatible with congestion pricing but also potentially mutually reinforcing, as coordinated parking and roadway pricing can amplify demand-management effects and improve overall transportation system efficiency in a localized area like the Manhattan Core.

Reservation platforms enable the implementation of several of these pricing structures simultaneously, tailored to the needs of individual locations, data availability, and city objectives (Litman, 2024). While SpotHero provides a block-pricing model (a pricing structure in which users pay a fixed, all-inclusive rate for a predefined time block) to its partnering garage owners and operators, reservation platforms more broadly have the capacity to incorporate these pricing and parking management frameworks and align private growth incentives with public-sector goals (Zhang et al., 2023). Guidance over the parking pricing structure remains one of the most powerful tools for addressing congestion challenges and improving the efficiency of off-street parking, and it must accompany any set of strategies or policy recommendations for the parking sector.

Opportunities for Advanced Parking Reservation Platforms

Advanced parking reservation platforms offer numerous benefits when implementing measures aligned with transportation agencies' objectives—namely, alleviating vehicular congestion and improving urban mobility experiences. These platforms also demonstrate a strong capacity to adapt to changes in travel behavior, as illustrated by the growth in live event attendance from 2020 to the present.

In collaboration with public agencies and other private-sector actors, these platforms are well-positioned to analyze data and implement a set of measures commonly referred to as Mobility Management: strategies aimed at improving the efficiency of transportation systems by modifying individuals' travel behavior (Litman, 2024).

Taken together, these dynamics suggest that advance parking reservation platforms should be understood not merely as private market actors, but as tools that can actively support public mobility objectives. The following recommendations outline specific ways in which platforms can align their operational strategies with broader transportation and parking management goals pursued by public agencies in New York City.

1. Connect parking reservations with complementary travel modes.

New York City is the U.S. city with the highest share of commuters who rely on public transportation. Over recent decades, the city has invested heavily in infrastructure to improve the experience of pedestrians and bicycle users, implemented micromobility sharing systems such as Citi Bike that have continued to grow, and seen transit ridership steadily recover since the pandemic. Within this context, there is a clear opportunity for parking reservation intermediaries to better integrate their services with other transportation modes, making multimodal travel more attractive to users (Litman, 2024). This integration could take several forms, including:

- Develop park-and-ride facilities for commuters at farther-flung garages, or off-site lots near event venues, in collaboration with public transportation agencies.
- Display information about multimodal transportation options near the parking location (including bus stops, subway and PATH stations, Citi Bike stations, and ferries.
- Explore partnerships with third parties, such as Citi Bike and NYC Ferry, allowing users to reserve parking and micromobility or ferry services simultaneously.

2. Explore offering peer-to-peer parking space rentals.

Peer-to-peer long-term parking rental platforms such as Neighbor and Spacer allow individual users to make private parking spaces available to others. While there are regulatory and contractual barriers, such as lease agreements established by landlords, this model presents a significant opportunity, particularly in NYC, where a significant share of housing includes bundled parking (where tenants pay for parking as part of their rent) that often remains underutilized (Gabbe, 2017; Litman, 2024; Liang et al., 2019).

Allowing advanced parking reservation platforms to operate within residential parking facilities where spaces are bundled with housing units could also help reduce housing costs by not imposing the cost of unused parking space to tenants, decrease demand for curbside parking, and expand the effective supply of off-street parking.

3. Use live traffic data to reduce congestion impacts.

In parking space allocation systems, it is necessary to account for vehicular congestion to improve overall efficiency (Zhang et al., 2023). Parking reservation platforms can incorporate real-time traffic and congestion information, such as

roadway speeds, bottlenecks, and delays near parking locations, to evaluate conditions around available garages and adjust recommendations or pricing accordingly. By directing drivers toward specific parking facilities that are easier to access or less likely to exacerbate congestion, these platforms can reduce unnecessary circulation, shorten access times, and minimize congestion impacts associated with vehicles searching for parking.

For example, when a customer has multiple parking options near their destination, the platform could encourage selection of the garage that minimizes congestion impacts, whether it is the closest or most efficient to navigate to (Zhang et al., 2023), using a points or credit system to reward the customer, rather than by increasing the price of other locations using dynamic pricing.

4. Maintain the implementation of continuous, secure data collection systems.

Although the conditions observed during the COVID-19 pandemic were exceptional, earlier analysis of SpotHero data illustrates how dramatically the parking reservation landscape has changed over the past five years. While future changes may not be as abrupt as those driven by the pandemic and recovery period, continued evolution in travel behavior is likely. Ongoing data collection enables platforms to adapt as efficiently as possible to these changes.

In addition, in a city where all public space—including streets—is highly contested, the data generated by these platforms represents a valuable opportunity for public mobility agencies to introduce a new analytical lens when evaluating urban planning challenges (Schwieterman et al., 2019)(Thoman, 2021).

Performance evaluation and customer reviews enable platforms to quantify the effects of parking reservation systems (Zhang et al., 2023). Beyond measuring customer satisfaction through ratings (e.g., one to five stars), platforms can gather information on how the entire driving experience improves, from the trip origin to the parking destination. This data can support operations planning, managing garage conditions, marketing strategies, and provide an additional source of insight for planners, policymakers, and garage owners (any use or sharing of that data, however, should be subject to clear guardrails to ensure that information remains aggregated and anonymized, that way protecting user privacy).

Data collection on vehicle types also offers a significant opportunity to evaluate performance across parking facilities (Zhang et al., 2023). This includes not only vehicle models, but also characteristics such as vehicle size and whether the vehicle is electric. Such information would allow individual facilities to adapt to evolving vehicle fleets and user needs.

5. Establish a data-sharing partnership between public and industry partners.

Public agencies can establish voluntary and mutually beneficial data-sharing partnerships with private parking and mobility platforms, including advanced parking reservation providers, to support consistent and outcome-oriented parking management. These partnerships could allow agencies to access anonymized, aggregated data on parking occupancy, duration, turnover, pricing, and temporal demand patterns—information necessary to understand how parking supply is actually used and to identify inefficiencies or conflicts. This could be integrated with other sources of data collected by the agencies that would allow them to have a better picture of the results from current parking management practices. In turn, private partners would learn from the aggregated data of their peers, helping them to better understand the local market in light of their participation, while establishing themselves as trusted partners of the public sector, which can result in more aligned changes and policies from public agencies.

Opportunities for Advanced Parking Reservation Platforms

Shared data would enable agencies to evaluate whether parking interventions are achieving core parking management objectives identified by Litman, such as prioritizing short-term and high-value uses, reducing cruising and spillover, and avoiding unnecessary expansion of parking supply. By embedding this data exchange within a common evaluation framework, public and private partners can ensure that new parking technologies support broader urban mobility goals rather than operating in isolation or reinforcing inefficient parking practices.

Conclusion

Off-street parking, when managed through advanced reservation platforms, can function as an effective mobility management tool in New York City rather than as a driver of additional vehicle use. Analysis of SpotHero data shows that parking demand is strongly influenced by live events and that, following the implementation of congestion pricing, growth in parking reservations has been significantly stronger outside the congestion zone, suggesting behavioral adaptation through park-and-ride and partial mode substitution rather than wholesale trip suppression. These patterns reinforce the role of parking reservation platforms as a lens for understanding how drivers respond to changes in pricing, land use, and transportation policy.

Critically, the benefits associated with advanced parking reservation, such as reduced cruising, lower search times, improved predictability for drivers, and more consistent utilization for operators, accrue without requiring new parking supply, instead relying on more efficient utilization of existing spaces. In a city with severe spatial constraints, low car ownership rates, and explicit policy goals to limit vehicle growth, this distinction is key. Rather than expanding parking infrastructure, reservation platforms leverage information, pricing, and coordination to extract greater public value from existing parking.

As congestion pricing remains in effect and travel behavior continues to evolve, integrating off-street parking more intentionally into New York City's broader transportation strategy will be increasingly important. Formal and protective data-sharing partnerships, demand-responsive pricing, and multimodal integration can ensure that parking reservation platforms support public objectives such as congestion reduction, efficient curb and public space use, and equitable access, positioning parking not as a liability to be managed defensively, but as an active component of a more efficient and sustainable urban mobility system.

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