



Work Smarter, Not Harder

Great ways to leverage big data to enhance parking programs.

By Nicole Ybarra

IF YOU ARE LOOKING FOR EVIDENCE that we are in the midst of a parking renaissance, look no farther than the street right outside your door. In bustling city centers to sleepy suburbs once lined with coin-only mechanical meters, new smart meters have begun to dominate the parking landscape. Pull up to a meter today and you'll likely be able to pay for parking with your mobile phone or even from the comfort of your own vehicle. Motorists may not enjoy the act of paying for parking any more than before the introduction of smart meters, but they have more flexibility than ever before.

While the parking industry was undergoing a significant transformation, the role of parking administrator was also evolving. Municipal parking management garners attention at the highest levels of local government and, consequently, parking administrators are faced with growing pressure to make the most of limited resources and to maximize return on investment (ROI) on their city's new smart meters. Parking administrators are turning to smart meters for real-time data they

can analyze and interpret to make meaningful adjustments to their parking program.

The Value of Parking

Transportation and parking industry experts suggest that parking problems are not simply a result of a lack of parking space(s). Rather, they can signify a need for more efficient parking management. Parking management involves control of the quantity, location, cost,

Smart parking meters have revolutionized the parking experience by offering convenient payment options for motorists and real-time data for cities to analyze, interpret, and implement meaningful adjustments to their parking program.



of hundreds of thousands of inter-related data points, including payment transactions, occupancy data, sensor data, enforcement data, length of stay data, meter status data, and more. With the appropriate technological blend, these data can be analyzed and organized into meaningful information parking administrators can use to understand and predict customer behavior patterns.

Another way to look at this is for every prime parking space occupied by a business owner, office worker, or other employee in the downtown core area, one or two jobs are potentially being lost, businesses are losing out on retail revenue, and local governments are not realizing their share of sales tax on those retail transactions.

and availability of parking. It seeks a balance between the competing needs of motorists, transient users, and pedestrians to satisfy various public objectives. These can include mitigation of traffic congestion, economic growth, and preservation of public investment and community values.

While the amount varies from city to city, a common rule of thumb for the value of a prime on-street parking space is approximately \$150 to \$300 in retail sales per day, according to research firm HyettPalma, Inc. Based on this calculation, the cost per year to downtown retailers is a loss of \$45,000–\$90,000 when business owners and downtown employees park in prime downtown spaces. Another way to look at this is for every prime parking space occupied by a business owner, office worker, or other employee in the downtown core area, one or two jobs are potentially being lost, businesses are losing out on retail revenue, and local governments are not realizing their share of sales tax on those retail transactions. In short, if downtown employees are not walking, then customers are.

Enhancing Policies

How can smart parking technologies enhance parking management policies? The answer is smart data. Data are the most important asset of your smart city's parking program, but they only have value if you use the data. Smart parking programs are data rich, comprised

A data management system is intended to address this very issue by aggregating all the data collected from smart meters, sensors, mobile applications, and other connected devices and presenting it in a sophisticated and useful format. Equipped with this information, parking administrators can use the data to proactively manage their program and enhance efficiency, revenue, and public perception.

Municipal parking management garners attention at the highest levels of local government, and parking administrators are faced with growing pressure to make the most of limited resources. Cities are leveraging real-time data collected from smart meters to make data-driven decisions.





Big data collected from smart parking meters and aggregated in a data management system can help cities forecast occupancy patterns, adjust enforcement staff to meet expected demand, and streamline collections processes, leading to greater program efficiency.

Efficiency Management

The main goal of many cities is to improve the efficiency of their program to minimize the stress sometimes associated with parking. Efficiency is typically evaluated by a city's ability to manage parking capacity, generate turnover, and

predict fluctuations. Big data and analytics can help cities forecast occupancy patterns based on past data and planned events (sporting events/parades/street fairs, etc.). Capacity data can help the city adjust enforcement staff accordingly to meet expected demand. Data analysis of payment type (coin versus credit card) helps streamline collections processes and dictate collection frequency. Capacity patterns also allow the city to adjust rate structures and the maximum parking time, benefitting both motorists and businesses.

Revenue Management

Tracking revenue trends and variations in revenue cycles can help a city make adjustments to maximum parking time, rates, and enforcement hours. Analysis of occupancy trends versus paid parking spaces can also help the city increase revenue. Armed with data, cities can employ price and economic incentives to drive occupancy in desired areas (on-street versus off-street, core versus non-core) to generate turnover, increase availability, and maximize revenue.

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Equipment Management

Efficient meter management is key to the overall efficiency and success of a city's parking program. Data on real-time meter status and faults combined with data on historical trends can help maintenance personnel mitigate device failure risks, reducing effects on occupancy, revenue, and customer convenience.

Perception Management

Data are not only useful to implement changes to your program. They are also powerful tools to garner public support for parking initiatives. *SFpark* was a federally funded, innovative approach to managing parking. The program used smart meters and real-time data to generate turnover via demand-based pricing. During the course of the pilot, the San Francisco Municipal Transportation Agency lowered the average hourly rate at meters by 11 cents from \$2.69 to \$2.58 and average hourly rates at *SFpark* garages by 42 cents from \$3.45 to \$3.03. Parking turnover also increased during the pilot project. A proactive outreach program to communicate a

rate decrease following the introduction of smart meters—and having the hard data to back up such claims—can help garner critical public support for your parking program.

The Future of Smart Parking

Smart parking meters have evolved significantly during the past two decades. The technology will continue to advance, but the biggest evolution will be seen in the use of smart data. The role of parking administrator has also changed, and parking now faces increased prominence and scrutiny. When cities leverage data to responsibly manage resources, enhance the user experience, and garner public support, the result can be a win-win for city and customer. 



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