Solving difficult parking problems with a self-paying meter

By Bern Grush

A self-locating, self-paying parking meter can dramatically improve workflow, enforcement and the political relationship between municipal parking management and its stakeholders. This technology meshes with existing pay-by-phone and pay-and-display systems.

Few parkers are likely to appreciate that municipal parking management is a considerably more complex matter than may appear when they are frustrated by no parking signs, parking citations, poles with multiple confusing instructions, loading zones, handicapped parking, no stopping, variable time limits, too little parking just where they want it, and so on. Municipal parking has many different requirements and there are many stakeholders with conflicting priorities involved in the task of fitting what is sometimes too many automobiles into the scarce spots along our urban streets. In any large urban area and many medium-sized ones, municipal parking management is certainly far more difficult than managing the lots or garages for suburban shopping malls.

Municipalities always want their parking spaces utilized correctly for traffic flow and safety reasons. They generally like to see a sensible occupancy level to ensure a balanced, vibrant commercial downtown—i.e., not so much that access is denied to some or that congestion is inadvertently encouraged. Nor so little that the commercial district might suffer and businesses relocate. Many cities need to generate sufficient revenue to fund the collection and enforcement process, and a significant number even seek to generate a surplus for their treasury.

Business associations want business traffic, including people that arrive in automobiles. This generally results in demand for plentiful free or cheap parking which cities can increasingly ill-afford from a financial or traffic management perspective.

Environmentalists consider the automobile and by association, parking, to be a problem—and they have a point. They may want parking to cost more, or to have less of it available. The logic of parking scarcity to discourage use can have the opposite affect on the environment by creating congestion. (Caution: the matter of regulating parking "minimums" or "maximums" is unrelated here, rather, I am referring to the willingness of drivers to circle excessively for street parking no matter how much supply is constrained.)

Drivers want immediate, available, convenient, cheap parking. Unfortunately, most want it free. Even those who understand that "free" is not always feasible, often find the activity of paying, worrying and rushing back to avoid citations to be a transaction cost more painful than the payment itself. Pay by phone can make payment a little easier since parking can paid from the driver's seat while it is raining or topped-up from the cafe table instead of running out to the street, but distraction and error remain.

This self-pay parking meter, *PayBySky*, is a small telematics device inserted into the vehicle's on-board diagnostics port (OBD). This system is the next step beyond the use of the smart phone for paying for parking. It relieves drivers from the nuisance they increasingly face to make many small parking payments throughout the day or week. Such payments are especially troublesome for commercial fleet drivers that endure multiple, daily parking citations in larger metropolitan areas.

This self-pay service automatically detects parking in a paid spot, calculates the correct fee, and charges a pre-arranged account. Three things set this apart from pay-by-phone. *PayBySky* requires no human attention, thereby providing far more convenience. After detecting and calculating a parking session, it automatically triggers the correct charge over a cloud-based service, hence guaranteeing exact compliance. Thirdly, it charges a fixed monthly fee rather than a fee per use, making it especially appropriate for a vehicle that parks more than two or three times each day.

4-WAY PARKING

These are just four of the many stakeholder viewpoints that must be considered when working through municipal parking management issues at the macro level. Keeping these in mind, there are several matters that can be addressed to the benefit of all parties, using an automated, self-paying meter, as described in the sidebar.

The ultra-short stay parker. In certain cases, the trouble of paying at a meter, or even paying by phone, is greater than the trouble of accepting the occasional citation. This is especially true when a driver expects to park for only a few minutes, and does so many times each business day.

This is one reason many cities have a subset of drivers with a chronic payment compliance problem. I am not referring, here, to the scofflaw. Rather I refer to the driver, employee or shopper whose work schedule, use of parking or habits of care make it less likely to stay citation free. Over the past several years I have questioned many drivers of commercial vehicles and have been told consistently that they average about three citations per workday. While that is far worse than the average careless parker who might get a citation every couple of months, there are a large number of working vehicles whose parking behaviours incur many citations and whose missed-payment behaviours are unlikely to be corrected by issuing citations.

A self-paying meter detects commencement of paid parking, issues payment from a pre-arranged account, and registers a digital enforcement credential—all without driver intervention. This especially addresses payment compliance for the urban commercial fleet of delivery and service vehicles that incur the majority of parking citations in many cities. This means that a substantial enforcement burden can be replaced with 100% payment compliance among users who adopt self-pay technology. An attractive service offering to incentivize these users is automated payment by the minute. This is especially suitable for frequent parkers that stay only some minutes at each session.

This would relieve commercial drivers—and the municipal enforcement team—of the endless and wasteful cycle of offense-citation-court services-repeat.

Free parking. There are several reasons cities time-ration free parking spots. They may be used as backup for local merchants as nearby main streets fill up with shoppers. Maybe spots need to be cleared for local residents after peak work hours, or they experience insufficient occupancy to justify the expense of on-street metering. Perhaps they were abused by local employees or transit users avoiding payment at a nearby garage. When these are time limited—such as "One Hour Free"—enforcement can become an expensive activity, since each vehicle must be checked twice before issuing a citation. Depending on enforcement and compliance rates, revenue from this activity is likely to cover less of the enforcement expense compared to that of metered spots.

A self-paying meter can be used to charge for parking in these spots once a nominal (grandfathered) free period is used. This allows parkers to stay-and-pay in underused spots that may be just off an arterial, while replacing the citation revenue that might otherwise accrue. Enforcement would continue for others, but fines could be raised slightly in recognition that there is now an easy way to pay in order to avoid a violation. This new payment method needs no change in signage or enforcement procedure, except that license plates can be checked digitally for payment. This has the additional advantage of permitting transit users to park-and-pay two or three blocks from a station helping relieve intermodal pressures. Variable fees can be used to clear these spots for local residents in the evening.

Asset-free parking—i.e., lots and block-faces that rely entirely on wireless payment technologies such as pay-by-phone—are already in sight for cities like Calgary, Pittsburgh and Washington DC, since these cities deploy payment and enforcement systems in a 100% digital "license-plate enabled ecosystem". Since a self-paying meter such as *PayBySky* uses no curb-side equipment and the wireless data flow is the same, albeit without user intervention, this technology forms an additional payment platform making citation-free compliance in an asset-free parking zone that much easier. Every technology that removes payment friction makes the transaction cost of parking payments lower for the parker and the municipality.

Parking analytics rely on location- and time-sensitive parking demand data to adjust prices for optimal turnover performance. These allow a municipality to balance demand, reduce circling, and maximize revenue within occupancy performance and access goals. Until recently, these have been collected manually, which made this prohibitive and essentially constrained to the occasional academic study. Now with technologies such as multi-space meters and pay-by-phone, we can collect more

demand data, more cheaply. In a further development, analytics data gathered from spot sensors were used with considerable success in the 2013 Los Angeles ExpressPark project.[1]

The self-pay meter adds a new and far-more powerful analytics method. *PayBySky* can provide unique circling metrics for a parking-congestion map without any physical in-ground or at-curb infrastructure. A "circling heat-map" can then be used to determine demand, but over a much wider area. In fact, this technology can measure parking demand in free-parking areas even without enforcement. *PayBySky* also enables a city to meter road congestion and parking congestion at the same time, allowing a better understanding of their interrelationship.

GRADUAL CONVERSION

Conversion from on-street payment to in-car payment, however inevitable, may take some parkers longer than others to adopt. As well, the four ideas described are each of value to a subset of stakeholders. The ultra short-stay parker represents only three to five percent of parkers (but upwards of 25-30% of business-day parking sessions). Only a fraction of parkers would wish to pay to over-stay in One Hour Free parking zones. At first, only restricted areas of a city would deploy asset free parking. Data collection for parking analytics requires only a small percentage of the vehicle fleet parking in an urban area to be effective.

For this reason, it makes sense to introduce the self-pay meter on a targeted and volunteer basis for programs that would have specific impacts that the municipality and its parking customers seek. One way to make this enticing is a single management change regarding turnover management: offer progressive pricing in lieu of citations. With the self-pay meter both approaches can be used concurrently. It can be business-as-usual for non-participants.

Citations are a costly and unfriendly method of turnover management. 80 years ago, citations for a payment violation were natural companions to the single-space parking meter. The metronome of commercial turnover, timed by a small fee for a short ration, required a way to ensure the parker would depart. Given that 1935 technology, citations make sense. Michael Klein of the Albany (New York) Parking Authority (APA) puts it well: "Until recently, the on-street parking market was generally regulated by price ceilings and rationing. This yields inefficiency that results in shortage of supply, queues, and unnecessary cruising, as well as favoritism and corruption." [2]

Contrary to the perceptions of many drivers, citations are a poor and self-limiting form of municipal revenue. If they are set low or enforcement rounds are too few, they are ineffective. If set high, parkers are more likely to pay the intended parking fee or to leave within the posted time limits.

Progressive parking fees—charging each increment of time at a slightly higher rate than the previous—are a better way to encourage turnover. The APA was able to reduce enforcement costs and increase revenues, with a modest rate change as they switched from time limits to progressive rates. In their case, each hour is now charged at 25 cents more that the previous hour with the first two hours unchanged from before. Average stays remained just under the two-hour mark. Klein also noted: "…increased payments for services rendered replace ticket revenue, and higher compliance at meters allows enforcement staff to focus on other needs such as safety infractions."

How does the self-pay meter figure into progressive rates? Depending on the machines a municipality has deployed, reprogramming, as the APA carried out, may be expensive or infeasible. But Klein makes two other critical observations: "technological improvements allow multiple [concurrent] payment platforms" and "22% of our patrons are long stay customers who generate 59% of the revenue with suitable lengths of stay, turnover, and occupancy metrics." This implies that a minority of parkers pay for the new value. It is this minority that will start the conversion toward solving a number of parking's more difficult problems on the way to a fully digital parking ecosystem.

WHERE CAN THE SELF-PAY METER TAKE OUR STAKEHOLDERS?

As you can imagine, I am optimistic that all-digital parking technology—location, pricing, collection, credentials, and enforcement—will not only soon clear our sidewalks of twentieth-century parking payment equipment, it will be able to address many of the more difficult parking problems we have today.

Municipalities have access to better space utilization and a path to reduced enforcement costs as well as access to demand analytics, and increased revenue retention.

Business associations will see a more welcoming environment for their customers and a more sensible workflow for their commercial vehicles.

Environmentalists will see reductions in circling and a set of analytic methods for pricing that manages demand and can help reduce the externalities of current parking policies.

Drivers will have access to more parking without circling, but paid at fair rates. Remember a simple, documented fact: parkers want freedom to park even more than they want free parking.[3] ■

1. Daniel Mitchell, Peer Ghent, ExpressPark: An Intelligent Parking Management System for Downtown Los Angeles, 2013
2. Michael Klein, To Market, To Market, The Parking Professional, International Parking Institute, May 2013, p.26
3. Glendale Downtown Mobility Study, 2007, pg 5-13,14

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