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Convenient, affordable parking when and where you need it

The benefits of accurate pricing and smart technologies

By Stuart Donovan

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Executive summary

The famous American entertainer Will Rodgers once quipped "[P]olitics ain't worrying this country one-tenth as much as where to find a parking space." If you are frustrated by parking problems, then rest assured you are not alone. All of us have experienced the stress that comes from arriving at your destination only to have to circle the block searching for a parking spot. With Canada's cities and towns set to grow by 12 million people in the next 40 years our current parking problems seem destined to deteriorate.

So why don't municipalities provide more parking? In their defense, municipalities must try to balance the need for parking against the costs of providing it, especially the land it takes up. In larger cities, providing more parking can also indirectly contribute to increased congestion and take up space that may be better used for other things, such as sidewalks. However, should rapid urban growth, worsening congestion and limited space mean we ignore parking problems altogether, especially when a lack of convenient and affordable parking could see drivers spend their money elsewhere? The answer to these questions is a resounding "no."

Instead, this paper suggests a combination of accurate pricing and smart technologies can resolve many of the parking problems that currently plague Canadian cities. Accurate pricing sets high prices at times of high demand, and vice versa, in much the same way as the price of airfares depends on the demand for specific flights.

Accurate pricing will mean that the price of parking varies between different parts of the city and at different times of the day. This encourages the demand for parking to spread out—in much the same way that cheap airfares encourage price sensitive passengers to fly at off peak times. Accurate pricing sets the price of parking as low as possible, while ensuring that some spots are always available for those drivers that really need it.

In this way, accurate pricing delivers convenient and affordable parking for drivers, while removing the need for inflexible parking restrictions, such as time limits. Accurate pricing benefits municipalities because it increases the efficiency with which existing parking is used and alleviates the need to provide more parking (as in the case of roads, simply increasing the supply of parking does not ensure an optimal level of availability in the absence of accurate pricing). Finally, accurate pricing allows cars to park quicker thereby alleviating congestion. San Francisco is already trialing such a system, where the price of parking is allowed to vary from $0.25 to $6 per hour, depending on demand. Drivers can use a free smart phone app or the internet to find where parking is available.

These types of initiatives have potential to solve many of our parking problems and reduce the "worry" involved in finding a parking space. It is time for municipalities to implement effective, durable parking policies that deliver convenient, affordable parking when and where you need it.

Frustrated with parking problems? You are not alone

Most of us have experienced the frustration of arriving at a destination only to have to drive frantically around searching for a parking spot. In response to this frustration, many people wonder aloud why municipalities do not provide more parking spaces.

However, municipalities must balance the demand for parking against the costs of providing it—and parking is in fact extremely expensive. The National Parking Association, for example, has estimated that off-street and surface parking costs $20,000 and $5,000 per bay respectively (Victoria Transport Policy Institute, 2011). These costs can cause considerable frustration even in smaller towns. In Whistler, Councillor Ralph Forsyth lamented recently,"… forget it, just put it back, put it all free again and fire it onto my taxes. Every Whistler resident can pay their 200 bucks a year and have it go to parking." (French, 2011).

The problem with this approach is that when drivers do not pay for parking directly, people are encouraged to drive more—which only worsens traffic congestion, especially in larger cities (Shoup, 2005). Traffic congestion is perhaps the only thing that is more infuriating than struggling to find a parking spot. In a recent survey of international cities, Toronto and Montreal were found to have worse commute times than London or New York, while Vancouver was not much better (*The Globe and Mail,* 2011). Despite what some drivers think, the reality is that most of Canada's larger cities cannot afford the direct or indirect costs of providing "free" parking.

We need better parking solutions.

Projections suggest that by 2050 Canada's urban areas will be home to an additional 12 million people, which is 40 percent more than the current population (United Nations, 2009). Based on current trends, this would see approximately 100 square miles of land reserved to provide parking—equivalent to half the area of Montreal City.[1] Not only would this be grossly expensive, but it will also undermine municipal efforts to provide quality urban spaces. Danish architect and urban designer Jan Gehl has written at length about the benefits to cities from providing urban spaces that encourage "life between buildings" (Gehl, 2001). In response to this evidence, many cities around the world are actively trying to create public streets that cater not just the movement and storage of cars, but also a range of other important urban activities (CABE, 2007). The desire to create quality urban paces will only increase pressure on the parking supply.

> ***…many cities around the world are actively trying to create public streets that cater not just the movement and storage of cars, but also a range of other important urban activities.***

Figure 1: Each parking spot takes up approximately 100-200 square feet of prime inner-city space. In the images below, people have paid the cost of on-street parking so they can create private gardens to use during their lunch break.

Photo credits: Left by Teeter (2010), and at right by Treehugger (2007).

However, should rapid urban growth, worsening congestion and the desire to create quality urban spaces mean we ignore parking issues altogether, especially when a lack of convenient parking could see drivers shop elsewhere and cause inner-city businesses to shut down or shift to the suburbs? The answer to these questions is a resounding "no." In the sections that follow, this Backgrounder will argue that Canadian cities and towns can have it both ways. We can ensure that convenient, affordable parking is available for drivers, while also supporting progress towards wider community outcomes.

Both drivers and municipal staff need to face reality. First, drivers need to accept that it simply is not viable to provide free or subsidised parking. Second, municipalities need to accept that price signals, rather than arbitrary and ad-hoc regulations, are the best way to manage the demand for parking. Nevertheless, before we examine accurate pricing and smart technologies in detail, let us examine why current parking policies are not working.

Why are current parking policies not working?

Current parking policies are not working. In many places, parking policies are knee jerk political reactions to localised problems that arise when the demand for parking exceeds the available supply. Rather than developing a strategic approach to parking management, many municipalities persist with archaic parking policies without considering whether they are an effective or durable solution.

One such example is time limits, which allow drivers to park for no cost up to a certain maximum time limit, after which infringing vehicles receive parking fines. While time limits are simple to apply and easy to understand, they have a number of frequently overlooked drawbacks. The most obvious issue is their lack of flexibility. Consider a situation where you are visiting the dentist for a 30-minute check-up and decide to park in a spot with a one-hour time limit. During the

check-up, your dentist discovers that you actually need four fillings. You emerge one and a half hours later with a numb jaw, a hefty dentist bill and parking fines plastered on your car. Compounding your frustration is the knowledge that you would have been prepared to pay for parking (just to be safe) but did not have that choice. Everyday life is full of this type of uncertainty, which time limits are unable to accommodate.

In an attempt to increase the flexibility of time limits, some municipalities apply different time limits at different times, but this can result in collections of signs that are not only extremely confusing for drivers but also clutter the sidewalk. Some parking signs seem deliberately designed to entrap unsuspecting drivers, as illustrated at right.

One couple apparently stared at the above signs for several minutes before shrugging their shoulders and giving up. The man complained,

> 'I can't read that. We even looked at each other and thought, "Is it going to get towed? No. It's 20 bucks (to park at a garage). What's the fine? $30?" You might as well just park on the street where you want.'
>
> And besides, who really knows the difference between a tow away zone, snow route, or a no stopping sign?
>
> 'It just means you're in trouble, either way,' one local commented, trying to make some sense of it all. (City News, 2007a).

Aside from their practical drawbacks, time limits also suffer from a number of strategic problems. The first issue is one of fairness: Time limits create high-stakes, win-lose situations where drivers pay nothing (if they park for less than the time limit) or a relatively hefty parking fine (if they park for longer than the time limit).

Figure 2: Parking restrictions are often extremely confusing.

Photo credits: Top by Anon. (2009), and lower by City News (2007).

This highlights another problem—time limits are independent of people's need for parking.

Thus unimportant trips, such as buying a bottle of milk, are given the same priority as very important trips, such as visits to the doctor. The result is that the most convenient parking spots are often not available to those people who really need them. In fact, in many places, employees tend to occupy the best parking spaces. Time limits also do not generate revenue for the municipality, aside from that earned from parking tickets, which means

Figure 3: Parking lots in Whistler and Edmonton are sometimes empty since pay parking was introduced in 2010.

that municipalities cannot easily finance more parking even when it is justified by demand—unless they raise taxes from elsewhere. Finally, in situations where people need to run several errands time limits can actually encourage them to drive their cars for short distances (rather than walk) between destinations. In this way, time limits succeed at getting parked cars to turnover, but in a way that is wholly inefficient.

When confronted with the problems caused by time limits, many municipalities elect to adopt pay parking. However, pay parking (at least how it is usually implemented) suffers from other problems. For example, most cities specify relatively flat hourly rates that are independent of demand. This tends to create situations where parking lots are often completely empty, as illustrated below in Whistler (Miller, 2011) and Edmonton (Tupper, 2011). In these situations, many residents and businesses quite reasonably protest that pay parking has resulted in poorly utilised parking areas.

It is easy to see why charging flat hourly rates for parking is not particularly clever. This would be akin to a situation where airlines charged the same price for all plane tickets no matter how busy the flight, so that some planes flew nearly empty while other planes flew completely full. If airlines were to use such a pricing strategy, customer dissatisfaction (and probably bankruptcy) would be sure to follow! Because flat hourly rates do not respond to demand, they provide no incentives for people to manage their demand for parking and contribute to inefficient use of the available parking resources. Occasionally pay parking is applied on top of time limits, for no apparent reason.

By combining the drawbacks of both policies, municipalities run the risk of parking becoming such a hassle that drivers simply give up and go to the mall. Subsequent sections of this Backgrounder will argue that that where pay parking exists, there is no need to also apply time limits.

In what seems to be a tacit acknowledgement of the inconvenience created by current parking policies, many municipalities provide residents with exclusive access to parking permits that exempt them from the parking policies that apply in the area (or zone) around where they live. Parking permits are very generous but not very logical—they are equivalent to reserving seats on the bus for local residents at the expensive of everyone else. Parking permits are also only convenient insofar as they allow you to park within one residential zone; as soon as

you need to travel to another area you are again subject to the inconvenience associated with time limits and/or pay parking. So while parking permits appear to be a good deal for drivers, they only make it convenient and affordable to park outside your front door—and not wherever else you may need to drive.

Parking permits suffer from other serious drawbacks. First, because they are so generous they are very attractive and subject to widespread abuse. In Toronto, a recent audit found 4,000 permits were issued to supposed centenarians, when only 24 registered drivers in the entire province of Ontario were older than 100 years (City News, 2007b). Parking permit schemes are not only abused by residents: In New York, city agencies issued over 140,000 permits to their own employees in 2008 alone, which was almost twice as many as expected (The New York Sun, 2008). Parking permits are also not a particularly durable parking policy, because demand often tends to exceed supply. In these situations cities resort to a range of unsatisfactory rationing mechanisms. For example, in the City of Amsterdam (The Netherlands), the demand for parking permits has so outstripped supply that applicants are required to wait approximately four years for a parking permit (Cition, 2011). In Canada, many municipalities arbitrarily limit the number of parking permits allowed per household, which is a form of rationing that is obviously inconvenient for those households that may need several permits.

The final issue with current parking policies relates to enforcement, which seems to be a difficult situation for all concerned. Time limits and parking permits are only effective when backed up by stringent enforcement. On the other hand, such enforcement raises the ire of drivers, residents, and businesses, which in turn creates additional pressure on the municipality to "go easy." For example, in 2010 the Calgary Parking Authority (CPA) raised approximately $15-million in revenue from 300,000 parking tickets. In response, one councillor encouraged the CPA to be "a bit more flexible or compassionate" (Dormer, 2011). However, if the CPA were to act on this advice then more people would be likely to flout the parking regulations and exacerbate existing parking problems. When it comes to enforcement of parking policies, Canadian municipalities have placed themselves in a punitive position—the only way to ensure adequate turnover of parked vehicles is to punish drivers when they break the rules.

"Parking permits are also not a particularly durable parking policy, because demand often tends to exceed supply. In these situations cities resort to a range of unsatisfactory rationing mechanisms."

Even so, strict enforcement is increasingly failing to deter many drivers from breaking the rules. For example, in just a few years Vancouver real estate agent Bob "Condo King" Rennie has received over $6,000 in parking tickets. When interviewed about these tickets, Rennie commented (Skelton, 2010):

> 'I think it's just a cost of being busy... . I don't get upset when I get a ticket… . [I]f you just broke it down in business terms, if I kept a parking spot in a Triple A location... [the cost] would far exceed—or be equal to—the sporadic tickets... and [you have] the convenience of parking exactly where you want... [M]aybe I should negotiate with the city and see if I can buy that meter.'

Rennie's comments highlight a critical point: To discourage someone who thinks "in business terms" the cost of parking tickets (and the likelihood of being caught) must be sufficiently high so that it approaches the cost of renting a parking spot. Otherwise, you may as well just endure the occasional parking ticket, knowing that it is still costing less than you would have to pay to park elsewhere. Anecdotal evidence suggests this is indeed the attitude many people take to parking fines; the end result is that municipalities will have to increase penalties and step up enforcement levels to the point where drivers do not getting cheap parking—they just pay market rates for parking indirectly by way of parking tickets, rather than the parking they actually use.

Based on this evidence we suggest that current parking policies are inflexible, inconvenient, and ultimately ineffective. Rather than trying to patch over these issues with ad-hoc modifications to existing policies, we suggest that municipalities should step back and consider more effective and durable parking policies that deliver convenient, affordable parking. This is the topic of the following section.

Delivering convenient, affordable parking

Previous sections of this Backgrounder have pointed out the limitations of current parking policies. This section outlines what type of outcomes we want to achieve and then identifies the types of policies that can help us get there. We suggest that the task faced by municipalities is actually rather simple: We want convenient, affordable parking to be available when and where drivers need it—and provided in a way that supports, rather than detracts, from the urban environment.

First, let us define "convenient, affordable parking" more precisely. "Convenient" parking is reasonably straightforward, even if it varies from person to person. When we say parking needs to be "convenient" we are imagining a situation where at least one parking spot is always available within a five-minute walk of your destination. Recent research suggests that ideally about 10 per cent of parking spots should be available at any particular time (Litman, 2006; Shoup, 2005). Convenience has another dimension, however. That is, parking should not inconvenience other people. This means, for example, that the provision of parking should not detract from the quality of the pedestrian environment. A definition of "affordable" parking is slightly more complex because we need to consider costs from two perspectives, namely drivers and the municipality. From the drivers' perspective, an "affordable" price is one that results in well-used parking facilities. From the municipality's perspective, an "affordable" price is one where the revenue earned from parking completely covers the costs of providing parking. However, what do we mean by "costs"?

We define "costs" quite broadly. Costs should include not only ongoing maintenance and operational costs (such as the costs of parking meters, enforcement, and security) but also the cost of capital tied up in providing parking, most notably the value of the underlying land. Parking costs could also incorporate external economic costs directly linked to the use of parking—most notably the costs of congestion.

This might see higher parking costs during weekdays, as a (second best) mechanism for internalizing the costs of congestion and discouraging vehicle travel.[2] Once municipalities have determined what costs need to be covered, we can work out the minimum "floor price" that the municipality should charge for parking. The aim is to deliver parking at this price—that is the lowest possible price, while also recognising the need to maintain the desired vacancy level, of say 10 per cent.[3] Thus, we would expect the price of parking to be set at the "floor price" unless there is a need to manage excess demand, at which point prices rise to the level that maintains the desired occupancy level.

This all sounds relatively simple—and it is. Some readers may at this point be wondering why municipalities do not already follow these general principles. The main reason is that setting prices to achieve the desired occupancy level has only recently become viable due to technological improvements, especially in information technology. The reality is that continuing improvements in technology, and reductions in costs, have enabled the development of more refined parking management systems that were not possible a few years ago. A second reason is the reluctance of municipalities to rely on price signals to manage demand (mainly due to perceived equity issues), preferring instead rationing mechanisms that are based on regulations. What municipalities should recognise is that the regulatory policies that they favour will almost inevitably lead to a form of market pricing—just one based on punitive parking tickets, rather than direct price signals. The third and perhaps most important reason why municipalities have persevered with current parking policies is that, until recently, we simply did not realise how damaging they were. Only recently has research (see for example Shoup (2005),

"The reality is that continuing improvements in technological, and reductions in costs, have enabled the development of more refined parking management systems that were not possible a few years ago."

and Litman (2006)) shown the important role that parking policies play in a wide range of areas. In this case, our ignorance has not been blissful—as most frustrated drivers and municipal staff will attest.

The following sections introduce some key policies that can help municipalities deliver convenient, affordable parking when and where it is needed. We note from the outset that a detailed review of new parking solutions lies outside the scope of this paper. For this reason, we focus on three parking policies that have the most potential for changing the way that we approach parking problems. We avoid detailed questions on the design of parking facilities, instead focussing on how to manage parking once it is in place.

Replace time limits with pay parking

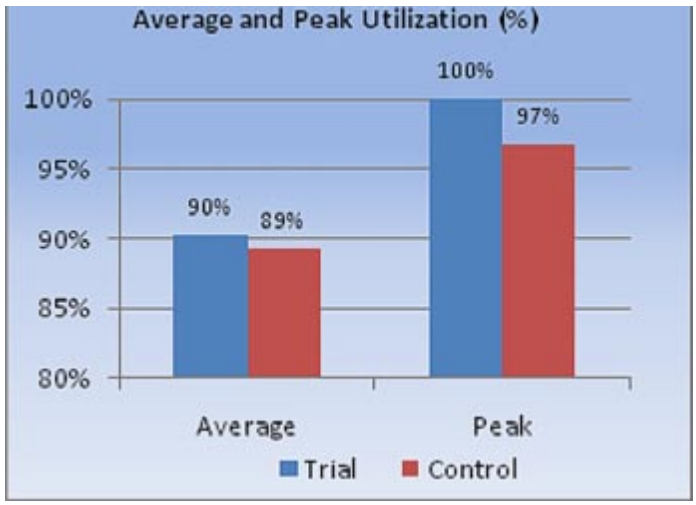
Our first recommendation is rather simple: We suggest that municipalities replace time limits with pay parking, when and where practicable. Pay parking is superior to time limits in almost every way: Rather than arbitrarily deciding how long people need to park, pay parking allows them to park as short or as long as they want, provided that they are willing to pay for the privilege. In this way, pay parking encourages vehicle turnover without discriminating against those drivers who might need to park longer.

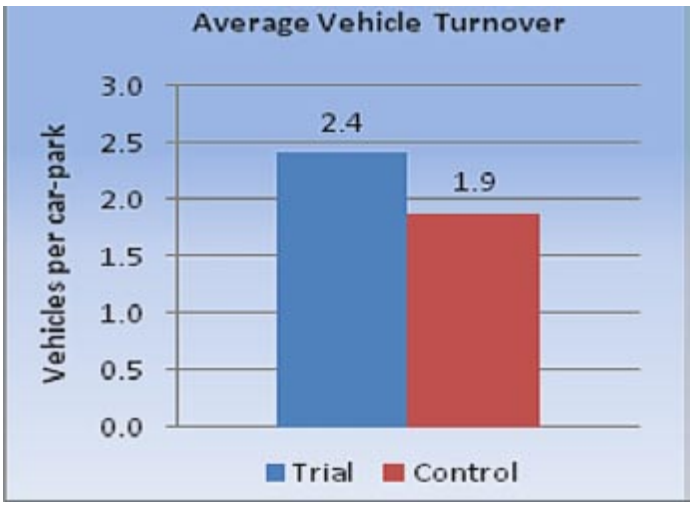
Some cities have experimented with replacing time limits with pay parking, with extremely positive results. Auckland (New Zealand) recently removed and replaced two-hour time limits with pay parking in a busy downtown area. The aim of the trial was to increase the turnover of parked vehicles and, in particular, reduce instances where staff parked in the most convenient parking spots. Surveys compared the effects of the trial with an adjacent control area, where the original (two-hour) time limits remained in force. Parking utilization and turnover statistics for the trial and control areas are illustrated in the figures below.

Results suggest that the trial area (where prices replaced time limits) experienced similar levels of utilization as the control area. More importantly, the turnover of parked vehicles in the trial area was 26 per cent higher than in the control area. Survey results also revealed that only eight per cent of cars in the trial area were parked for longer than three hours versus 24 per cent in the control area. This is somewhat ironic given that the control area had two-hour time limits whereas the trial area had none. So it seems that pay parking is effective not only at increasing turnover but also at reducing the extent to which people park for long periods of time.

Based on this success, support for the trial has increased amongst the affected businesses and the trial measures have been retained indefinitely. Meanwhile, other businesses in the city centre heard of the trial's success and requested that the initiatives be extended to their neighbourhoods. These results provide compelling evidence that prices are more effective than time limits in managing the demand for parking.

Figure 4: Comparison of average utilization (average and peak) and average vehicle turnover for the trial area (no time limits, just prices) and the control area (no prices, just time limits)





Set parking prices dynamically

While pay parking is certainly more effective than time limits, the former does have its drawbacks. Previous sections have discussed how flat parking rates can cause "empty lot" syndrome, where parking spots sit empty for much of the day. Most of us intuitively know that the demand for parking varies considerably depending upon when and where you park. This in turn suggests that the price of parking should be directly linked to demand, in much the same way that airfares increase during busier times. Stated differently, the price of parking should go up when demand is high and go down when demand is low, similar to the way airfares goes up during busy periods.

Dynamic parking prices will not see drivers stripped of every penny, in fact quite the opposite. We suggest that prices are set as low as possible, while ensuring that the revenue covers the costs of providing parking. Prices should only increase when necessary to achieve the targeted vacancy rate. Moreover, because prices are allowed to vary, dynamic prices actually allow drivers to make trade-offs between parking somewhere close and convenient (which is more expensive) versus parking somewhere slightly further away and less convenient (which is cheaper). In this way, dynamic parking prices allow drivers to choose where they park and how much they pay when they do.

Do dynamic parking prices have any major drawbacks? Obviously they do need more advanced parking meters and sensors (that detect when a parking spot is occupied), which are linked to a central facility from where demand is monitored and prices are set. It is possible to smooth these upfront capital costs by rolling out dynamic prices in a staged fashion, focussing on those areas where old parking meters are already due for replacement. In addition, the new meters and sensors often deliver considerable ongoing operational savings. For example, sensors can automatically detect when a parked vehicle has exceeded the time that was paid for and notify the nearest available parking enforcement officer. We expect these savings to be substantial.

> ***"Most of us intuitively know that the demand for parking varies considerably depending upon when and where you park. This in turn suggests that the price of parking should be directly linked to demand..."***

As of this year, dynamic parking prices have moved from theory and into practice. In San Francisco, the regional transport authority responsible for parking management (SFPark) is currently testing a fully dynamic parking pricing system. This is the first large-scale trial of dynamic parking in a major metropolitan area and it will run for 18 months and involves approximately 20,000 on- and off-street parking spots in seven downtown areas. During this time SFPark will adjust rates from $0.25 to $6.00 per hour, with the stated goals of maintaining an average occupancy of 80 per cent and ensuring that at least one parking spot is available on every block (SFPark, 2011). SFPark anticipates that dynamic parking pricing will have a number of benefits. Time limits have been relaxed or eliminated, which will increase convenience for drivers.

Because people can now park for as long as they want (provided they pay) SFPark expect the numbers of parking fines issued to drivers will reduce. Drivers will also be able to top up their meter via mobile phone, making life easier for those who underestimate how much time they need. To their credit SFpark has developed a free smart-phone app that helps drivers identify and navigate to cheap parking spaces close to their destination. By allowing drivers to park more quickly, fewer vehicles will need to cruise through city streets causing congestion for other drivers. Finally, the trial is also expected to benefit other road users. For example, by reducing instances of double-parking buses can travel faster while reducing risks to pedestrians and cyclists.

SFPark do not expect the trial to increase revenues, because the reduced number of parking fines will offset any increase in meter revenues. The total cost of the trial is $25-million, which includes the capital costs for new meters and sensors, as well as detailed monitoring of the results. While this cost sounds significant, it equates to only about $1,500 per parking bay, which is considerably less than the average annual revenue earned per parking space—and much less than the cost of constructing new parking spaces. SFPark have made detailed results from the trial publicly available at http://sfpark.org/.

Online auctions for parking permits

Previous sections highlighted a number of issues associated with residential parking permits. Does this mean we should get rid of parking permits altogether?

There are in fact good arguments for retaining parking permits, albeit in a modified form. First, permits are convenient for the driver who regularly needs to park in the same part of town. Allowing drivers to purchase a permit to park in a specific area is not only convenient (because they avoid having to feed the meter) but it also reduces administration costs for the municipality, which receives one single payment up-front rather than many small payments. Parking permits are similar in many respects to monthly public transit passes, which allow holders to pay once and travel as much as they like for a specified length of time.

However, major modifications are required to make parking permits—for the reasons previously discussed. We suggest opening up the opportunity to buy parking permits. There is no reason to restrict the purchase of a permit to residents of a particular area (although of course residents of the area are more likely to want a permit), nor should residents be restricted to a specific number of permits per household. Indeed, the primary purpose of permits is to make parking more convenient, which should not be a privilege that is limited to a few drivers based on where they live, but one that is extended to any person who may regularly need a parking spot in a particular area.

Anyone should be able to purchase parking permits for wherever he or she needs to park regularly, just as anyone can purchase a monthly public transit pass.

Objectors to this suggestion might note that opening up access to parking permits is likely to see even more demand for parking permits—especially in popular areas. Accurate price signals and smart technologies are again the best way to manage this demand. In particular, we suggest that municipalities use online auctions to sell parking permits, because they allow drivers to decide what price they are prepared to pay to park in particular areas. In these auctions, the municipality's role is limited to determining the number of parking permits that are available in a particular area as well as the minimum reserve price for each permit. Of course, if the demand for permits exceeds supply then the price for the permits will be "bid up" to the point where demand is reduced. A Dutch auction is particularly well suited to this type of allocation because it finds the lowest possible price that sells all the available parking permits (the Dutch auction process is explained in detail below).

The practical benefits of this approach are immediately obvious. People who live in areas where the price of parking permits is very high may instead elect to park in a neighbouring area where the price is lower. This may be particularly attractive for people who use their vehicles only rarely (on weekends, for example) and do not need it parked nearby all the time (of course, if drivers wish to have their car located nearby then all they need to do is purchase a permit in their zone). Those residents that choose to buy a permit in less busy areas will not only save money for themselves but also free up a valuable parking spot in their area for someone else. Because auctions send clear signals about the scarcity of permits in different areas, they create incentives for people to make trade-offs about where they park their car, trade-offs that are completely absent from current parking permit systems.

What is a Dutch auction?

A Dutch auction starts at the municipality's ceiling price, which is the maximum amount it would expect to receive for the parking permits. This price is reduced over time and stops when potential buyers have placed enough bids to purchase all the available parking permits. The final bid received determines the clearing price, which is the price where the demand is equal to the number of parking permits available. All successful bidders pay the clearing price, irrespective of their initial bid. In this way, every successful bidder pays the same price, which is the lowest price possible. The municipality can also specify a reserve price below which it would be unwilling to sell parking spots. A Dutch auction is distinct from the better-known English auction, which sees prices rise over time based on bids from buyers. Dutch auctions are not only more suited to selling large numbers of items, they are also fairer in that all successful bidders pay the same clearing price.

Chapman University, a private university located in Orange County, California Online has tested the use of auctions to sell parking permits. Despite the university constructing multiple parking lots and structures, university surveys found persistently negative perceptions about the difficulties involved in securing a parking permit. In response, Chapman University proposed to allocate parking permits by way of an online Dutch auction (REAP Consultants, 2010). The auction ran over three days from 10 a.m. to 10 p.m. during which time prices progressively reduced (at 15 minute intervals) until all available parking permits were sold. All students, faculty and staff were able to participate in the auction. Prices for the more desirable parking lots increased, while prices for less desirable lots remained the same as previous years.

The reserve price was reached before all permits were sold. Surplus parking permits was subsequently re-auctioned to allow people a second chance to secure a parking spot, albeit possibly not in their preferred lot. By the end of the second auction, all available parking permits had been successfully auctioned off, ending the auction. A review undertaken by Chapman University suggested that while the selling process was successful, not all participants fully understood the Dutch auction process. We expect this problem will reduce over time as staff and students become more familiar with the process (we note that Dutch auctions are now available on e-Bay, which is likely to contribute to greater awareness of the process). Based on its initial experience, Chapman University decided to continue with the auction system.

While the experience at Chapman shows that online auctions can be used to sell parking permits, we recognize that a number of important questions still need to be answered before such a process could be used to allocate public parking permits. Most importantly, municipalities must decide how many permits to sell and what the reserve price should be. One option is to set the price based on the revenue earned from parking meters in that area, possibly with some discount to reflect efficiencies associated with the bulk one-off payment. This reflects the cost of foregone revenue to the municipality from "giving away" a parking spot.

What is clear from this example, however, is that online auctions could provide an effective and durable way to allocate parking permits. By creating differential prices for parking permits in different zones, such a system could encourage efficient behavioural responses that ultimately increase the efficiency with which we use our existing parking resources. This lies in stark contrast to current policies, which tend to rely on arbitrary rationing mechanisms that do not provide any form of incentive for people to manage their demand for parking. Prices, rather than arbitrary rules set by municipal staff, are the best way to manage the demand for parking permits.

Conclusions

Where to from here?

Given the rapid growth of Canada's cities, it is clear that current parking policies need to change. A paradigm shift is required in the way we approach parking problems. This paper recommends that municipalities reject current parking policies and instead recognise the potential for accurate pricing and smart technologies to solve our parking problems.

The first step is relatively easy: Pay parking should replace time limits. The price of parking, however, should be determined dynamically based on demand. If demand is low, then prices should also be low—and vice versa. Prices should only increase in situations where it is necessary to achieve a desired occupancy level. Our final recommendation is that municipalities open up access to parking permits, but allocate them by way of online auctions. Taken together, these policies will encourage drivers to manage their demand for parking in an efficient way; they provide incentives for drivers to make good choices rather than simply punishing them for their mistakes. Parking policies based on accurate pricing and smart technologies will ensure that convenient, affordable parking is available when and where drivers need it, while also supporting broader community objectives, such as managing congestion.

Looking forward, we suggest that the efficient allocation of space between competing activities will increasingly define whether Canada's cities prosper or fail. As parking is very important, space intensive, and costly to provide, it seems sensible to think carefully about how we can use the parking we have more efficiently. Other places around the world are already pushing forward with policies designed to deliver convenient, affordable parking. Our final question is how long it will take for Canadian cities to catch-up? The answer, we hope, is not very long.

Endnotes

1. This assumes vehicle ownership rates of 563 vehicles per 1,000 residents and that each additional car requires four additional parking spots at 200 square feet each (this includes an allowance for access and maneuvering). We also assume that 50 per cent of the parking is provided in above and below ground structures. The calculation thus becomes: 0.563 cars per capita x 12,000,000 people x 200 square feet per parking spot x 4 parking spots per vehicle x 50% = 95 square miles. By way of comparison, the City of Montreal occupies an area of approximately 190 square miles.
2. Although we note the ability for municipalities to internalize external costs into parking costs depends on the degree to which they are the dominant parking provider. Where private parking providers are operating in competition with the municipality, increasing the costs of public parking may simply encourage drivers to park elsewhere. If this were to happen then the municipality is essentially foregoing parking revenue to the benefit of private parking providers.
3. If revenue from parking does not cover the costs incurred by the municipality, then this indicates that the "costs" involved in providing parking exceeds what drivers are willing to pay. In this situation, the municipality should consider reducing costs, for example by redeveloping land currently used to provide parking.

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Further Reading

June 2009

How Free Is Your Parking?

By Stuart Donovan

http://www.fcpp.org/publication.php/2839

March 2011

Dispelling the Myths of the C-Train

By Steve Lafleur

http://www.fcpp.org/publication.php/3704

May 2011

Transportation in Toronto and Beyond

By Wendell Cox

http://www.fcpp.org/publication.php/3728

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The End of Taxi Regulation

By David Seymour

http://www.fcpp.org/publication.php/3764