

# ADAPTIVE PARKING: A FLEXIBLE FRAMEWORK FOR PARKING REFORM

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**Abstract.** Adaptive Parking is a framework for parking reform aimed at addressing both acute parking problems and the more chronic issue of car dependence in parking without necessarily imposing restrictions on parking supply. It is an extension and generalisation of parking policy proposals in Donald Shoup's "High Cost of Parking". Adaptive Parking contrasts with both of the main paradigms in parking policy. In other words, it requires different thinking about parking, not just different policies. Adaptive Parking is part of a third paradigm that emphasises market responsiveness rather than specific planned outcomes. It involves five reform thrusts that work together to gradually enable greater adaptability in parking systems. The Adaptive Parking policy agenda can be adapted to a wide range of circumstances.

## **INTRODUCTION**

This paper aims to challenge your assumptions. Even if you already support parking reform, don't assume that you already know what this paper will argue.

Most places currently plan parking like they plan toilets, placing faith in standards that require a certain number of parking spaces with every new building. This works well for toilets so that, at relatively low cost, most cities avoid public urination and defecation.

However, the same approach for parking (the 'conventional' approach) is much less successful than many people assume. Compelling parking construction with buildings (a practice that arose in the USA mid-20<sup>th</sup> century) generally fails on its stated aim of preventing parking problems in the streets. It succeeds only when complemented by strong on-street parking management or in ultra-low-density areas planned around car use, where parking requirements are taken to extremes.

You might say that such failures imply that parking minimums should often be higher. But ensuring 'enough' parking is vastly more costly and space-consuming than ensuring adequate bathroom facilities. This also ignores the fact that parking demand is much more malleable than the demand for toilet facilities.

Yet, there is much confusion over how else to do parking policy. Many assume that any reform away from conventional parking policy must involve the very opposite - aggressive restrictions on private vehicles. The focus of this paper, "Adaptive Parking", is indeed a significant departure from the conventional approach but it is not focused on restraining cars. It does not (necessarily) involve restricting parking supply or force mode shifts.

Nevertheless, by making parking more responsive to local conditions, Adaptive Parking offers an alternative to fear-based over-supply and over-planning of parking that locks an unchangeable over-supply of parking into the landscape, regardless of changing transport preferences and urban market trends.

## **WHY PARKING REFORM?**

As mentioned above, most parking policy worldwide is modelled on the USA's conventional suburban approach. It is the dominant approach in Oceania, Latin America, Southeast Asia, and South Asia and even across most of Europe, at least outside the inner cities (Barter, 2011; Rios Flores et al., 2013).

This conventional approach assumes that parking in the streets is inevitably difficult to manage. So it tries to ensure every site has "enough" parking. Parking space with buildings is mandated via standards (minimums) as part of the zoning or building codes. These try to avoid having parking spill beyond the site. It is feared that such 'spillover' will create unacceptable parking problems in nearby streets and neighbouring sites.

The conventional approach assumes that the private sector will not supply enough

parking unless forced to. But its parking requirements typically result in oversupply and hence off-street parking prices that are far below cost recovery (and often zero). The assumption thus becomes a self-fulfilling prophecy.

Parking minimums often fail on their central stated aim of easing on-street parking problems. Mandated off-street supply do not magically attract motorists away from the apparent convenience of free or underpriced, little-managed on-street parking. Parking studies all over the world repeatedly find busy areas with parking chaos in the streets, yet with nearby off-street parking that is under-used (for example, ITDP and Nelson\Nygaard, 2009).

Parking chaos in the street does indeed have severe impacts on pedestrians and buses with serious congestion side effects from the parking search traffic, double parking and vehicles waiting for parking (Shoup, 2005). But off-street parking supply does not magically solve such chaos if on-street parking remains poorly managed. Waiting for off-street supply to appear with new buildings is a distraction from the crucial task of improving the management of the on-street parking itself.

The conventional approach also means every customer and every tenant pays towards the cost of parking, even if they don't own a vehicle and don't drive. Excessive parking minimums force regressive and inefficient cross-subsidies into the system by shifting the real and significant cost of providing parking from its users to real-estate investment and hence to everyone (see for example, Shoup, 2005, among many others).

The 'infrastructure' thinking on parking demand in the Conventional perspective has a strong tendency to generate oversupply. When setting minimums, 'enough' parking is usually taken to mean that demand for FREE parking should be met within every site even at the busiest times in the week or year. Even in places where parking prices are not zero, the conventional mindset seems to ignore the prices when setting parking minimums. For example, Hong Kong parking prices are high, yet prices were hardly mentioned at all in two major reviews of parking demand to update the parking standards (Barter, 2011). Strangely, it seems to be tacitly assumed that such prices will remain unchanged, so ignoring the potential for market-based price rises to manage demand.

Donald Shoup has called parking minimums a 'fertility drug for cars'. By forcing extra parking supply and hiding and dispersing its costs, the conventional approach lowers the perceived cost of vehicle ownership and use, thereby generating traffic growth.

Parking minimums can have disastrous results if applied rigidly to older areas with a stock of old buildings on modest sized lots. Such locations would usually be expected to see cycles of redevelopment. Locations with good access by public transport would expect intensification. But minimum parking requirements can help block these processes. Requiring small lots to provide ample on-site parking renders uneconomic the re-use, redevelopment, infill of many sites. Conventional parking policy has played a key role (among other factors) in generating blight in the cores of American cities, many of which are now dominated not by buildings but by open-lot parking (Jakle and Sculle, 2004).

Parking supply mandates also harm housing affordability by inflating the cost of housing and by reducing the supply that can economically be built (Shoup, 2005). The impact of rigid parking minimums on housing costs is dramatic for small units and small sites.

Rigid minimum parking requirements are an obstacle to transit-oriented development and undermine the transit-orientation of whatever TOD is built. Dense development with excessive parking generates excessive traffic, fuelling traffic-related fear of increasing densities.

Conventional parking policy pushes newly motorizing cities towards automobile dependence. Examples abound in developing Asia. And it helps entrench the existing automobile dependence of metropolitan areas in Australia and North America.

Even many cities with more balanced transport systems have surprisingly conventional approaches to parking. This is an alarming anomaly for places such as Singapore, Hong Kong, Seoul and many European cities, since such parking policies promote private vehicle ownership and use, undermining these cities' efforts to build up alternatives.

## **A "MAP" OF REFORM OPTIONS**

It is often assumed that there is just a single alternative to the wasteful version of the conventional approach which was criticised above. In fact, there are several distinct directions that parking reform efforts can take (Barter, 2010). These involve contrasting ways of thinking about parking.

This section provides a framework for understanding these alternatives as illustrated in Figure 1. This is not the usual way to group parking policies. Other observers categorise parking policies based mainly on their attitude to supply. For example, Todd Litman (2006) talks of an 'old' parking paradigm (which is supply-focused and assumes demand cannot easily be modified) and a 'new' one (which is suspicious of adding supply and is more willing to manage demand).

However, the framework in Figure 1 involves two dimensions. The first is whether parking is seen as something to be provided site-by-site versus serving a whole area. The second dimension is whether parking is viewed as 'infrastructure' (requiring strict government planning and regulation) or as a kind of real estate (or real-estate based service). The resulting two-way matrix has three parking policy paradigms, with one empty box (which seems to be an impossibility).

The conventional approach, described above, has a mindset that assumes parking should be thought of as on-site infrastructure (like the toilets with a building). As *infrastructure*, it is seen as something which needs to be planned by government and which cannot be left to private initiative alone. As *on-site* infrastructure, it has to go with every building, with spillover minimized. The alternative approaches shown below involve mindsets that differ on one or both of these assumptions.

	<b>Every site should have its own parking</b>	<b>Parking facilities serve whole neighbourhoods</b>
<b>Parking is “infrastructure”</b>	<b>1. Conventional</b>	<b>2. Parking Management</b>
<b>Parking is a “real-estate based service”</b>	<i>no examples</i>	<b>3. Responsive</b> (including Adaptive Parking)

Figure 1 A simple framework for categorising parking policy alternatives

## **ALTERNATIVES: MODERATING THE CONVENTIONAL APPROACH**

The least radical kinds of reform merely reduce wastefulness in the ‘conventional’ box.

Some such reforms aim to avoid excessive supply rather than just avoiding shortage. This involves taking more care to adjust local parking minimums according to context, as in the push to ‘right size’ parking standards (see for example, Engel-Yan and Passmore, 2010).

Another way to moderate the conventional approach is to allow flexibility. Many cities allow exemptions where meeting the mandates would be excessively expensive, usually with some payment-in-lieu of parking provision. Allowing shared or off-site parking to count towards required parking is another example of flexibility.

These reforms retain the assumptions of the conventional approach but accept more risk that parking demand may not be contained on site. This requires a willingness to manage local parking beyond the site, if necessary, to deal with spillover.

In some places, this change in attitude to spillover opens the door to a more radical change in mindset – namely a shift to thinking of parking as a district-by-district not a site-by-site thing. Such a change in mindset opens up the two parking reform directions in the right-hand column of the matrix, as discussed below.

## **THE UNGLAMOROUS SECRET BEHIND ANY PARKING POLICY SUCCESS**

Both of the major alternatives to the conventional approach in Figure 1 involve a shift to seeing parking as serving whole areas, not just specific sites. They accept that some spillover is inevitable. They therefore require on-street management of parking.

So any city that wants to turn away from the conventional approach needs at least the basics of on-street parking management. This opens up parking policy options and frees cities from the trap of the conventional approach.

A city that can't or won't establish effective on-street parking control is stuck with the conventional approach.

Yet, as I argued above, this generally fails to prevent on-street chaos anyway. Even where it succeeds, the cure is worse than the disease, leaving you with a costly, sprawling and car-dependent city that is vulnerable to gasoline supply disruptions.

For parking policy success there is no avoiding the need for better management of on-street parking. This means at least the following: establishing clearer rules (and signs); building enforcement capacity to be 'good enough' for each location (better as an administrative not a law court matter, and better by local government or contractors not by the police); establishing trustworthy time-based fees; and building basic parking data collection capacities.

Many cities do have effective on-street parking management but still retain conventional parking policy, missing the chance to shift to the less wasteful alternatives below.

## **ALTERNATIVES: THE 'PARKING MANAGEMENT' MINDSET**

An interesting thing often happens in the inner areas of large cities, especially in places built up before the rise of cars. As mentioned above, the conventional approach is often unworkable in such places and inner urban authorities still need strong management of on-street parking, since most buildings still lack parking. And many introduce flexibility in their parking minimums because it would be lunacy to do otherwise.

These trends prompt a change of mindset. The assumptions and goals of parking policy change completely. Having gained experience at managing parking in the streets, many such places come to calmly see parking as something that serves the whole neighbourhood, not a specific site. Dropping the preoccupation with sufficiency of supply within each site opens new possibilities.

Without the obsessive focus on on-site parking adequacy, there is also often less emphasis on parking adequacy generally. It may be dropped as a goal completely or it can become just one of several goals.

Such places often then realize that parking can now be used to serve other goals, as they choose. Parking is usually still seen as infrastructure but as district infrastructure, not site infrastructure.

Because planning and managing parking feature strongly in this approach, I use the term '*Parking Management*' for this mindset, in which parking is seen as neighbourhood infrastructure able to serve various objectives. Many tools enable active management of

parking. These include: prices, eligibility, time-limits, design, sharing, parking taxes, and supply investments or limits.

One objective is managing conflict over parking (such as between retailing interests and residents or between employee and retail parking). Some places use subsidized parking supply in an attempt to compete economically with other areas. By contrast, some use limits on parking supply to constrain private vehicle use to certain destinations.

Despite such diversity, the common features that define these as Parking Management, are that parking is actively managed by government as infrastructure, and that there is little or no expectation that each site must handle its own parking. Parking is expected to be public and, regardless of where they park, motorists are welcome to then walk to any destination in the area (or to several). 'Park once districts' become the norm.

Few places with a Parking Management mindset actually abolish parking minimums (Australian city centres, the whole of Berlin and London, and large areas of San Francisco are examples) (Barter, 2013). Instead, the parking requirements usually now trigger payments to the local government *in lieu* of the required parking. For example, many German cities have minimums but in their inner cities they also impose maximums or even bans. The parking minimums determine the in-lieu payments that developers must pay for the required parking that they are not allowed to build (Topp, 1993).

The Parking Management approach works well. It is tried and tested in many cities around the world, especially inner cities all over Europe and in the inner cities of large North American and Australian metropolitan areas. It requires strong management capacities over on-street parking. But, as I argued above, that is the key to ANY parking policy success that escapes from the conventional approach.

However, as a challenge to the Conventional mindset, the Parking Management mindset has some limitations. In practice, it can be complex, resulting in a heavy reliance on specialist consultants. It can also involve a great deal of conflict. While the Conventional approach hides its losers and disperses its costs, the Parking Management mindset requires more explicit trade-offs to be debated. This can be contentious. Furthermore, since many places using this approach still retain parking minimums, at least on paper, there is a tendency for confusion over goals. Finally, the Parking Management approach seems unable to challenge the conventional approach beyond the inner cities.

## **ALTERNATIVES: "RESPONSIVE" APPROACHES**

This third mindset has come to prominence through the work of Donald Shoup (2005), who urges three main reforms for US cities:

1. Have on-street parking prices vary in time and space in order to target 85% occupancy (rising if occupancy is much higher and dropping if it is much lower);
2. Use parking revenue in ways desired by local stakeholders (especially via the

mechanism of 'parking benefit districts', to generate champions for reform);

3. Abolish minimum parking requirements (since the other two reforms should defuse spillover parking, which was the fear that led to the parking mandates).

These proposals point towards 'Responsive' parking approaches in which the supply of parking would reflect private choices that are informed by market-responsive prices and explicit opportunity costs rather than being shaped primarily by planning decisions.

Shoup's suggestions require a mindset shift. We cannot think of parking as building site infrastructure (like toilets and other 'common facilities'). Nor can we see parking as infrastructure serving the area (like streets or bus stops). Instead, this approach sees parking as a private economic good, the demand and supply of which should respond to market price signals. More specifically, this mindset sees parking as a real-estate based service, akin to meeting rooms for hire, or hotel rooms, or even food outlets.

Shoup was not the first to propose this kind of thing. A similar vision of urban parking arrangements has been suggested by various people since 1925 but until Shoup's advocacy these writings had no impact on policy in practice (Barter, 2010).

Nevertheless, we do find something akin to Responsive parking arrangements in the real world. Examples can be found where most parking is public but is provided by the private sector charging market prices, and where on-street parking is tightly regulated, so that the on-street parking doesn't undermine the market in off-street parking. These conditions apply in central business districts (CBDs) in many cities.

They also apply in Japanese cities as a result of several longstanding policies. Spillover is not feared, since there is almost no on-street parking in Japan and overnight parking in the streets is mostly banned. The 'proof-of-parking' law requires anyone wanting to register a car to prove to local police that they own or lease a long-term parking spot near home. This prompted commercial parking in most neighbourhoods. Japan did adopt parking minimums but faced no pressure to increase them as car ownership rose. The parking minimums remain exceptionally low and exempt small and medium buildings (Barter, 2011). Hence, much parking in Japanese cities is commercial with supply and prices that depend on market conditions more than planning.

In their explicit parking policies, neither western CBDs nor Japanese cities have fully embraced a mindset shift towards a Responsive approach. Nevertheless, parking actors in such places do seem to see parking as a real-estate based service.

## **ADAPTIVE PARKING**

Adaptive Parking is a new parking reform framework. It applies a Responsive parking mindset and aims to make parking supply and parking behaviour less rigid and more responsive to the local, ever-changing context.

It is partially inspired by the parking reform ideas of UCLA's Donald Shoup (2005) and involves a broadly 'Shoupista' line of thinking. However, it expands beyond Shoup's proposals and adapts them to a wider set of international contexts.

A jurisdiction that embraces Adaptive Parking would not immediately scrap its existing parking policies. Rather, it would adopt a simple set of five action principles (presented below) as pointers to guide a step-by-step reform process. These reform thrusts are designed to work together in synergy.

Adaptive Parking provides a 'compass' not a blueprint. Specific steps will vary from place to place according to local circumstances. Furthermore, it need not be all-or-nothing. Adaptive Parking reforms can involve small or large steps towards responsiveness.

Other prominent parking reform agendas emphasise planned change and neglect the fostering of market-responsiveness. However, such planning-oriented approaches (most of which fall into the category that I term 'Parking Management') are often compatible with Adaptive Parking and may also benefit from adding a dose of its responsiveness efforts. So hybrid Parking Management/Responsive approaches should be possible.

Here, in brief are the five action principles for working towards more Adaptive Parking.

*1: Share!*

Encourage more parking to be shared or, even better, made open to the public.

*2: Price!*

Use prices to eliminate parking queues, including slow motion queues (such as waiting lists) and invisible queues (such as parking search traffic or 'cruising for parking'). This is best done with 'performance pricing' - enabling prices to vary in time and space according to local demand pressure.

*3: Sweeten!*

Hear the interests and fears of key local stakeholders (such as residents and businesses) over parking reform and, if necessary, 'sweeten the deal'. But do so in ways that enhance responsiveness and that avoid undermining the wider reforms.

*4: Relax!*

Relax about supply (easing or abolishing minimum parking requirements) and allow parking supply decisions to be more responsive to market conditions. This becomes possible in conjunction with the other reform principles, which should allow governments and local stakeholders to no longer fear spillover parking.

*5. Choice!*

Market responsiveness sometimes needs further policy effort to expand options,

avoid monopoly problems and reduce rigidities in parking behaviour.

Next I will explain these reform thrusts and show how they work together.

### **Share! (make most parking shared or open to the public)**

The Share! reform principle calls on local governments to encourage parking to be shared or to be made completely open to the public. This is the first of three reform directions that aim to defuse the fear of spillover. The others are Price! and Sweeten!

The Conventional approach results in mostly private parking. Spillover parking is feared because private parking and poorly managed on-street parking mean that parking spillover has nowhere to go without causing problems. This also creates ridiculous expectations. Someone who drives to a shopping district for several errands, parking on-site at the first, would be expected to move the car to each subsequent site or risk angering the first shop's owners for free-riding on their parking.

In areas with a mix of land uses where many destinations have complementary times of peak parking demand, peak parking demand is much less than the sum of each building's peak demand. So public parking is much more efficient than multiple private parking facilities, just as shared seating in a food court is more efficient than having designated tables for each separate outlet.

Encouraging public parking also stimulates efficient pricing practices. This is because Adaptive Parking would discourage the Conventional response to on-site parking saturation or free riders, which is to step up efforts to exclude unwanted users. So owners of parking will need another response to prevent full parking lots. The response encouraged by Adaptive Parking thinking is to charge an appropriate price.

Even in areas that have some public, market-priced parking, encouraging private parking to become public should deepen local market processes, making them more resilient.

Action on this reform principle requires incentives for private parking to be opened to the public and disincentives against keeping it private. Some such policies are already found in some cities. We need not force all private parking to be made public, since some actors may place a high value on having private parking.

### **Price! (price to prevent queues and cruising for parking)**

This reform thrust urges a preference for pricing over other rationing methods to reduce the parking saturation that results in queuing. In particular, it urges that price setting practice be specifically aimed at this goal. This principle is a generalised version of Shoup's suggestion of performance pricing for on-street parking.

Parking 'queues' take several forms. There are obvious queues outside full parking lots but the invisible queues for on-street parking that take the form of parking search traffic (or 'cruising for parking') are much more common and just as disruptive. At places and

times with saturated on-street parking an alarming percentage of traffic can consist of motorists searching for a local parking spot. Waiting lists for regular or season parking, are slow motion invisible queues.

Using pricing to ease parking saturation (and hence parking queues) requires 'performance pricing' or market-responsive pricing. This means enabling prices to vary in time and place (at least to some extent) according to local demand pressure.

There are two key reasons to adopt responsive pricing from the Adaptive Parking perspective. Reducing the disruption caused by queuing (both visible and invisible) by preventing full parking is one reason, as mentioned above. Responsive pricing spreads out demand in both time and space. At the busiest times/places, which are now more expensive, parking durations drop and some motorists seek cheaper locations nearby or quieter times to visit. Some short trips switch to walking or cycling, some longer ones switch to other alternatives, including simply sharing a vehicle.

The other important reason is to support responsiveness in the wider parking system. Responsive pricing does this more strongly than flat prices and much more than other rationing strategies (such as time limits). Such pricing for on-street parking should improve the incentives in the off-street parking 'ecosystem' both to price efficiently and to supply parking at efficient levels. It may even prompt greater efficiency in commercial parking pricing. Commercial parking operations often already have occupancy targets as part of their pricing practices. But even private sector prices can be unresponsive – a parking industry adage says many set prices by 'looking across the street'. Responsiveness as a goal is also why Adaptive Parking urges responsive pricing to clear waiting lists, even though they don't cause obvious negative externalities in the streets.

Discussion of performance pricing often emphasises fears of price rises at busy times and places. But responsive pricing also helps avoid over-pricing at quiet times and places. This should allay fears that pricing will harm local businesses. Such fears are often based on prior experience with pricing that does not vary according to demand. Such flat prices are indeed inevitably too high during less busy times and on less busy streets.

San Francisco has been trialling an ambitious version of responsive pricing, SFPark, which applies to both on-street and public-sector off-street parking in several districts. SFPark prices vary from block to block and between morning, early afternoon and late afternoon. Price adjustments based on occupancy are made every six weeks. An evaluation suggests great promise as well as possible improvements (Pierce and Shoup, 2013). Los Angeles and Washington, DC has started smaller trials.

In fact, many cities have long applied (without much fanfare) a simpler and coarser version of this approach. Even imperfect versions of performance-pricing should be better than none. Examples are numerous and include Amsterdam, Budapest, several London boroughs, and recently Seattle. Relatively small price zones are common, with their prices set primarily using occupancy targeting. Much less common is varying prices between time periods as SFPark does.

Demand-responsive pricing is potentially controversial, especially where it replaces free parking, but there is no getting away from its importance. Easing the political obstacles to such reforms is an aim of the next reform principle, Sweeten!

### **Sweeten! (make stakeholders happy)**

This Adaptive Parking reform direction is a pragmatic but essential one. It aims to give local stakeholders reasons to like the reforms and less reason to fear them. People often feel territorial about parking in "their" streets and we will often need to placate those feelings. Certain groups also fear the loss of special parking privileges.

Resistance to parking reform is also often based on fears of spillover nuisance. Several Adaptive Parking reforms aim to alleviate this but may not be enough in many cases. Locals opposed to change tend to feel more strongly about it than anyone else. So this reform direction aims to defuse the 'collective action problems' around parking reform.

Introducing pricing tends to be more difficult than adjusting the prices or changing the price-setting approach. For example, San Francisco has faced stout opposition to parking meters for new areas but little opposition to SFPark's performance-pricing in areas that already had on-street parking pricing (Barter, 2012).

A promising formula is to be very generous in keeping parking revenues very local and in spending them in ways that please the local stakeholders. This could even involve local property tax rebates using parking revenues.

This reform thrust is another generalisation and expansion of one of Donald Shoup's proposals. His specific suggestion was to set up local Parking Benefit Districts (inspired by Business Improvement Districts) so that parking revenues are spent in ways favoured by local stakeholders.

It is very important that 'sweetening of the deal' does not undermine the spirit of the reform. Ideally, any 'sweetening' should actually enhance responsiveness of the local parking system. So compromises around performance pricing should not be about the price-setting approach itself but could focus on the use of the revenues for example. For example, it would be better for residents to be placated by a heavy discount on permits rather than making residents' permits exempt from responsive pricing altogether. Residents' usually desire that on-street parking near their homes be available to them at all times (especially evenings and weekends). For the sake of responsiveness, this desire would be better met via performance pricing, not by reserving spaces. Excluding buildings built after the reform from eligibility for permits may be a necessary compromise in some places which should not undermine responsiveness.

### **Relax! (about supply)**

A Responsive parking system would enable responsive parking supply, not just responsive prices. This becomes possible in synergy with the other Adaptive Parking

reform thrusts, which ease (and eventually abolish) the fear spillover parking. Governments can then worry more about parking design than about shortages. The level of supply becomes a matter for well-informed private decisions and market processes, in an adaptive, responsive parking ecosystem.

Relaxing about supply primarily involves easing or abolishing minimum parking requirements. But it can also mean moving away from other policies that artificially promote parking supply, such as subsidies and incentives for parking, including the common practice of exempting parking from counting towards the floor area limits under zoning or building codes. This reform principle is again a more general version of one of Shoup's three suggestions - to abolish minimum parking requirements. Remember also that it provides a compass direction, not an ideal end point. Even small steps towards relaxing about supply may be consistent with this Adaptive Parking reform thrust.

The arguments for this principle echo Shoup's arguments for abolishing parking minimums (Shoup, 2005). Once on-street parking is well managed and there is no possibility of free-riding, developers will be able to judge for themselves the parking their developments need, especially if their choices are informed by responsive price signals.

Please note that this reform principle does not actively discourage new parking supply! It is not as radical as it may sound to anyone steeped in the Conventional approach. Abolition of parking requirements does not mean no parking gets built. Numerous city centres across North America, Australasia and Europe have no parking minimums but see few new buildings with zero parking. The whole of Berlin has managed without parking minimums since the 1990s. London, and indeed most cities in England, abolished parking minimums in the mid-2000s (Barter, 2013).

Relax! reforms merely aim to allow parking supply choices to be responsive to local market conditions. Under Adaptive Parking, private real-estate decisions over parking supply are enabled to take account of the relative costs and returns of parking, and of alternative investment opportunities and alternative uses of the space.

There is a widespread belief that reform of minimum parking requirements requires excellent public transport. But this misunderstands the proposal. Eliminating parking minimums does not force parking closures and low-parking development. It merely allows them, if market conditions are favourable. In locations with poor alternatives to driving, developers will continue to see the market need to supply quite plentiful parking.

### **Choice! (improve options, encourage active choices and ensure competition)**

The previous two reform thrusts emphasised choice and responsiveness on the supply side of parking - over prices and over the quantity of supply. This reform principle emphasises responsive demand. Healthy and responsive market processes require that customers are able and willing to exercise choice. There are several elements to this.

One element is the need to preserve consumer choice by averting monopoly problems. Governments don't (usually) control private sector parking prices. So, unless the Adaptive

Parking includes steps against monopoly or market power, it may be vulnerable to cries of 'gouging!', 'exploitation!', 'abuse of monopoly!'. Parking is a local matter so monopoly problems are also local. Actively applying competition policy to parking should guard against localized monopoly (Barter, 2010). This goal is also assisted by the Share! and Price! agendas.

A second element of responsive demand is encouraging active choice making by motorists. This includes enhancing information on parking options (and other choices). Parking guidance including via parking apps is improving rapidly. It also means avoiding pricing practices that create rigidities in parking behaviour (such as habitual parking choices, driving without considering alternatives, and even vehicle ownership). For example, habitual parking behaviour is encouraged by long-term pricing schemes, such as monthly, which are common at workplaces. Pricing practice should aim to make it possible to save money by not driving, by not parking and/or by not owning a vehicle.

The third element of the Choice! push for responsive demand is to enhance and expand options and alternatives to parking. Enhanced taxi services, public transport, walkability and cycling facilities are all helpful. Enhanced options should also ease worries about local parking monopolies. Please note that a paucity of non-driving options does not make Adaptive Parking irrelevant. Enhancing options improves responsiveness but a lack of options does not totally undermine responsiveness. There are almost always some options, even if they are only alternative parking options. Nevertheless, improving options is certainly politically important to the success of parking reform.

## **CONCLUSION**

I have argued that local governments with the inefficient Conventional approach should recognize its failings and seek alternatives.

Such places first need to boost the capacity and willingness to manage on-street parking. This opens up wider parking policy choices, enabling a switch to one of the much more efficient alternative approaches to parking policy, either Parking Management or a Responsive approach.

Adaptive Parking was presented as a promising parking policy reform agenda with a 'Responsive' mindset. It urges local governments to adopt five reform thrusts which work together to make local parking arrangements more responsive to local context and to changing market conditions.

Adaptive Parking, together with improved on-street management, offers a possible pathway away from the Conventional approach.

But even places that already apply Parking Management thinking should consider complementing it with Adaptive Parking, since the goal of responsiveness is compatible with many goals pursued under Parking Management thinking.

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