Minimum Parking Review: Supplemental Documents

Spillover Parking

(This document has been peer-reviewed by Dr. Donald Shoup.)

The proposals contained in this report represent a significant departure from the existing parking regime in the inner-urban area and near transit stations. The current and proposed parking minima are underpinned by two different sets of assumptions, with the proposed rules representing a paradigm that better reflects current planning goals: one that has learned from fifty years of experience and is more appropriate in the context of current conditions and mobility targets.

Preventing spillover parking (that is, excessive or inappropriate parking on public or private neighbouring lands, superficially due to a lack of on-site parking at the actual destination) was originally the primary goal of mandatory on-site parking minimums. This concern continues to lie at the heart of the vast majority of controversies around parking and new development.

Unfortunately, parking minimums are, at best, based on an outdated and simplistic understanding of the relationship between on-site parking and spillover. This assumed relationship is almost never seriously questioned or examined. It must be, if Ottawa (and other cities) are to make progress. This document is provided in response to questions, comments and concerns expressed about spillover parking in the course of the Minimum Parking Review.

The logic of parking minimums

The logic of parking minimums as applied for the past several decades in most North American cities is as follows:

> *"Unless zoning requires a certain minimum supply of parking to be provided on-site, enough to accommodate peak or near-peak demand for free parking, the remainder of this peak demand will park on the street or on neighbouring properties."*

So, for instance, if one believes the peak demand for a certain development will be 1000 cars, a city must require that the developer provide 1000 parking spaces. If only 600 parking spaces are provided, then it is assumed that most of those remaining 400 cars will continue to arrive at that peak time, trespassing on neighbouring property owners' parking lots, monopolizing the street parking, and generally causing problems.

That, in a nutshell, is how minimum parking rates have been approached since the end of World War II. They are rooted in a desire to decisively prevent all spillover parking. In some circumstances, the near-peak hour will be used (for instance, the 85th percentile or 90th percentile occupancy, instead of the absolute maximum occupancy.) The assumptions about how many cars will come may be influenced by assumptions about mode share, e.g. that perhaps 10% of users will arrive by bus, so there will be that many fewer cars. There are various adaptations in various cities, often in tacit recognition of the impracticality of meeting

this standard everywhere, but these are exceptions are minor, circumstantial modifications to the underlying assumption described above.

This approach is deeply flawed, as detailed by Donald Shoup in his book *The High Cost of Free Parking.* First and foremost, he observes that there is little to no coherent theory behind long-standing parking minimums, beyond the approach described above. He notes that a plurality of cities appear to derive their parking minimums simply by copying another city's requirements, with little to no analysis of different urban contexts or circumstances. Where parking minima are derived from some kind of empirical data (most commonly the Institute of Transportation Engineers Parking Generation tables) this data suffers from problems such as:

- Data measure peak parking occupancy of existing parking facilities, inflating estimates of actual demand and leading to routine oversizing of parking facilities. (For instance, observing that a given parking lot has 100 cars parked in it at a given time tells us nothing about what would have happened if that parking lot had had only 50 parking spaces. Would the other 50 cars have come anyway, at the same time?)

- Data are almost exclusively for free parking facilities, where demand is not influenced by price.

- The two problems described above relate to a third problem, which is the routine conflation of observed peak occupancy of a free parking facility with parking demand (the latter of which is not a single number but a more complex relationship of usage to price, convenience, availability and other factors)

- Data for a particular land use are often derived from a small number of observations; in substantial number of cases, fewer than four observations, and many are based on a single observation.

- The relationship between peak parking occupancy and the single independent variable is often weak to nonexistent. In other words, the most readily-measurable bases for setting a parking ratio in the zoning (usually floor area) are not reliable indicators of how much parking will be used. (Meanwhile, more reliable indicators such as number of employees are not practical to use in zoning.)

- The equations describing the relationship between e.g. floor area and peak parking occupancy assume a linear relationship, and are themselves adjustments to curves with non-zero intercepts. In other words, the best-fitting straight line can suggest that, for instance, a shopping centre of zero square feet will have 138 cars parked in its parking lot.

To these criticisms of ITE figures, we would add that the individual data points do not (indeed, cannot) provide much in the way of meaningful context. (ITE says as much in the "Cautions" section of its fourth edition.[1]) A given observation is characterized as urban, suburban or rural. But it tells us nothing about whether, for instance, a site is located right next to an LRT station

[1] Parking Generation, 4th Edition., p.2. Institute of Transportation Engineers (ITE). 2010.

or on a frequent local bus line; whether it is on a mainstreet surrounded by a dense low-rise pre-war neighbourhood such as the Glebe; whether it is next to a cluster of high-rise condominiums or apartments like Lees Station; or other meaningful details that would help us understand and apply those figures. Using the average of many such figures introduces further distortion.[2]

It is only fair to note that, despite the flaws of their data, the Institute of Transport Engineers is not responsible for their misuse. ITE has long recognized to some extent the dangers of applying its numbers as a robust formula for setting parking requirements:

> *"It must be recognized that sizing a parking facility or setting parking requirements is a policy decision, not purely a technical one. It must be made in light of the objectives of the developer or the public agency; it does not simply drop out of a formula or equation."*[3] *"...most of the data currently available is from suburban sites with isolated single land uses with free parking... While obtaining statistically reliable data for each land use is a long-term goal, it will take substantial additional data to achieve that end. Parking Generation is only the beginning point of information to be used in estimating parking demand. Local conditions and area type can influence parking demand."*[4]

In short, parking minimums are unlikely to be based on any meaningful, rigorous, empirical data or coherent theory about the relationship between parking demand, land use and urban context. They are, at best, a brute-force solution that prevents parking spillover at the expense of literally almost all other considerations. This approach is not sustainable in any sense.

The present amendment recognizes the need to manage parking spillover, but to do so in a more sensitive, organic, and efficient manner. It recognizes the degree to which systems (people, cars, land uses, public transit) can adapt and respond to changing conditions if and only if the system provides room for such adaptation. The starting point is a more sophisticated understanding of what actually causes parking spillover.

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[2] ITE figures also include some questionable distinctions; for instance, in its figures for fast-food restaurants, it reports 50% higher peak parking demand for hamburger restaurants than for non-hamburger restaurants. (ITE 2010. Land Use 933, Fast-Food Restaurant Without Drive-Through Window, page 330-331.)This was done because it "produced better statistical results for the data submitted than did an aggregate;" but the implication, that parking demand is significantly influenced by whether the place serves burgers or tacos, is difficult to credit

3 "Using the ITE Parking Generation Report." ITE Technical Council Committee 6F-44. ITE Journal, July 1990.
4 Parking Generation, 4th Edition., p.2. Institute of Transportation Engineers (ITE). 2010.

What really causes parking spillover?

Parking spillover occurs due to not just one factor ("not enough parking on-site") but to a combination and interaction of factors. The more of these factors are at work, the more likely there is to be parking spillover, and the more intractable it will be. Parking spillover becomes more likely at destinations where:

Development attracts a large number of drivers relative to the amount of parking provided on-site. This is the obvious problem that parking minima are designed to solve.

Users expect parking to be available and cheap/free. People decide to make a certain trip by car if they think they can park when they get there (otherwise, what's the point?) If they expect to be able to park next to the door and there isn't a space available, or if they expect it to be free and it costs money to park, they may look around for a site that meets their expectations. Conversely, if they know when they leave home that it will cost them $5.00 to park for two hours, then when they arrive, they're willing to pay that amount. The key is the alignment (or lack thereof) between expectations and reality.

Users have no choice but to go to that destination, and to go during its busier times. Someone who knows the parking lot will be full at a certain time, or that parking will correspondingly be difficult or expensive, may be able to go to an alternate destination. Or they can time their trip differently, so that they arrive when it's less busy or when the meter rate is cheaper. But if the user has no such discretion, they may have to park somewhere inappropriate.

Alternatives to driving are impractical for that user. If parking is difficult, but good transit is available or the user can walk, it becomes easier to avoid driving altogether and many people will choose to do so. Conversely, origin-destination pairs that are far apart, unwalkable, unbikeable, and poorly served by transit rule out this option. In those situations, the user will drive. This is also true where users have a physical infirmity or a particular trip purpose that prevents them from walking, biking or using transit.

Users do not go there regularly, so they are unfamiliar with either the parking situation or the alternatives for getting there. When someone goes somewhere on a regular basis (for instance, to their place of work) they become very familiar with what the parking situation is like and what the transit is like. They know that parking is difficult at such-and-such a place because they've been there before; and they know which bus they can take because, since they make the trip often, it's been worth it to learn the route and schedule. But someone making a single, isolated trip doesn't benefit from this knowledge; it may appear easier to drive, even if they don't realize that parking will be difficult when they get there. Once they get there, it's too late to turn back.

Free parking, or parking that is cheaper or more convenient than the parking provided on-site, can be found (lawfully or not) on neighbouring properties or on the street. In urban areas in particular, where land is scarce and expensive, off-site parking lots and garages typically charge money. But if the garage charges $4.00 an hour and there is a nearby street space that only costs $2.00, then those cheaper street spaces will be taken up first. If there is unmetered parking nearby, this becomes even more likely; and still more, if...

Use of neighbouring or on-street parking is unregulated or poorly patrolled or enforced. If there is parking on the street or in a neighbouring lot, and there appear to be no consequences for misusing it (parking somewhere it is not permitted, or overstaying the time limit), many people will do so if it seems easier than parking in the appropriate location. This can be innocent enough; if parking does not obviously harm or inconvenience other users, many parkers will consider it a minor, victimless crime.

The user does not care about the social, legal and/or moral consequences of inappropriate parking. Some people are willing to risk the occasional parking ticket in order to avoid paying or searching for parking. Some people see free parking as a right and refuse on principle to pay for it. And some people are simply inconsiderate and don't care if they block someone else's driveway.

Several points can be made here.

Firstly, one or more of the situations described above can be seen at pretty much any point in the city, for some people, at any given time. One or two of these situations is generally not enough to create unmanageable spillover.

Secondly, parking spillover becomes more likely the more of these circumstances are at play, because each of these circumstances blocks off an opportunity for a traveler to adapt effectively. But, with one exception (see below) it only becomes truly inevitable and unmanageable when all or nearly all of these circumstances are at work, because they close off all viable adaptations to the situation.

Thirdly, in the inner urban area, this perfect storm is extremely rare. Downtown offers relatively few goods and services that cannot be found elsewhere, if someone really wants to drive. Transit service to and within the inner urban area is good, if someone is willing to use it. Opportunities to live and work downtown are also available, so people can and do walk on a regular basis. Most people do not expect to find free parking downtown whenever they want it, so most people accept that they will have to feed a parking meter.

Indeed, in an urban setting, even mandating ample parking supply will not reliably prevent spillover when nearby parking is cheaper than the designated parking space. Providing parking in a built-up area is inherently expensive; a space in a parking structure can cost $47,000 or more to construct, and the price per hour must be proportionately higher to cover that cost. But if there is cheaper and/or seemingly unregulated parking on the street nearby, it doesn't matter if that parking garage provides a hundred, two hundred or a thousand spaces: drivers will still use the cheaper street parking spaces first, contributing to the sense that the parking supply is overwhelmed.

It is for this reason that we argue for appropriate pricing and regulation of street parking as an essential component of any successful parking strategy.

A more urban model of parking minimums

The table below highlights the differences in the logic of traditional parking minimums and the updated, more balanced and sophisticated approach proposed in this report.

Existing minimums in the inner urban area/near rapid transit:	**Proposed parking minimums in the proposed Areas X,Y and Z:**
Treat parking supply as primarily a simple engineering issue: predict peak or near-peak demand for parking, and provide on-site parking to meet it.	Recognize that parking is a complex land use, economic and behavioural issue with some engineering implications. Supply of parking affects driving behaviour, and does not merely accommodate a deterministic amount of traffic.
Are inherited from the mid-20th century, driven by the sudden post-war introduction of mass automobility into urban environments that were not designed for them.	Recognize that it is now fifty years later; that cities have now built extensive car-supportive environments that amply serve those who must drive; and it is now the environments where car infrastructure does not dominate that are scarce.
Assume no negative side effects to excessive parking supply. “There is no such thing as too much parking.”	Recognize that the benefits of parking must be balanced against its costs, e.g. stormwater management, heat island effect, loss of trees and greenspace, increased car traffic, climate change, increased costs passed on to residents and consumers, undermining of public transit infrastructure and opportunity cost of land use.
Assume that most households want automobiles and will acquire one or more vehicles at the first opportunity.	Recognize that a large number of households that, whether for reasons of economics, physical or sensory disability, or simple lifestyle preference, cannot or prefer not to drive, creating an enormous latent demand for car-optional environments.

Existing minimums in the inner urban area/near rapid transit:	Proposed parking minimums in the proposed Areas X,Y and Z:
Assume that those households that do not or cannot own cars represent a minority of the population who can locate in walkable older neighbourhoods with good transit service.	Recognize that the fixed supply of walkable pre-war urban neighbourhoods are increasingly scarce relative to demand, and due to this scarcity and gentrification are increasingly priced out of the reach of lower-income people.
Do not prevent urban intensification along Mainstreets and in the general urban area, but tend to delay it until demand forces the sudden insertion of large-scale, high-cost forms that can absorb the additional cost of stacked parking (e.g. high-rise condo towers)	Enable gradual, small-scale intensification to occur one lot at a time, allowing traffic and transportation patterns to evolve with it.
Create an oversupply of parking, even if the oversupply is not readily apparent to users. Even if there are empty spaces in most parking lots most of the time, the preferred spaces (free parking right near the door right when you want it) are almost always full.	Recognize that requiring a large parking supply does nothing to increase the supply of preferred spaces, while vastly increasing overall costs.
Are based on a suburban/rural transportation logic, i.e. assume there is no significant transit service or pedestrian accessibility.	Apply an urban transportation logic: High level of public transit service, walkable densities and mix of land uses offer practical alternatives to driving for many users.
Assume little flexibility in people's travel behaviour. Because there are no alternatives to driving, almost all users will arrive by car.	Recognize that where there are alternatives, users can and will adapt their behaviour, timing and mode choices in response to less ample parking.

Existing minimums in the inner urban area/near rapid transit:	Proposed parking minimums in the proposed Areas X,Y and Z:
Greenfield logic: If parking is required, it is a simple matter to buy vacant land for this purpose.	Redevelopment logic: Surrounding land is already subdivided, developed and used; land assembly costs and barriers are much higher and make finding more land for parking problematic.
Assume that parking requirements affect large and small developments equally.	Recognize that the relative cost and land impact of parking is much higher for smaller developments than for large ones.
Assume developers will not build parking unless required to by the Zoning By-law.	Recognize that parking has long been part of standard development practice and financing criteria. Developers have a good understanding of actual parking demand and will provide it where demand justifies the cost.
Are designed to avoid spillover parking at all costs, and assume that if the parking lot is full, spillover parking cannot be managed.	Recognize that spillover parking is or can be efficiently and appropriately managed by a combination of regulation, pricing and enforcement of off-site parking supply, and adaptive behaviour by travellers.
Near rapid-transit stations: Provide substantial reductions in parking requirements for residential uses only, and small reductions for a handful of non-residential uses.	Provide substantial reductions in parking requirements for all uses near rapid-transit stations throughout the city, in order to pro-actively encourage development to cluster where residents, workers and customers are most likely to use the transit system.