

SUSTAINABILITY INITIATIVE: 01-01



STORMWATER MANAGEMENT

PARKING MAXIMUMS: MANAGING STORMWATER
THROUGH SUSTAINABLE PARKING LOTS



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Oversized parking lots create numerous problems for municipalities, businesses, citizens, and the environment. Large lots can render vast areas impervious, forcing stormwater into a city's sewer system and eventually into waterways, leading to flooding, pollution, and increased water treatment costs. Oversized parking lots also exacerbate sprawl, making driving – rather than walking, biking and even public transit - virtually mandatory. They also contribute to traffic congestion, air pollution and poorer public health.¹ Traffic congestion in turn may result in calls for wider streets, bigger intersections, and even higher parking requirements, increasing local costs and further damaging local ecosystems.² Finally, the cost of building parking lots - from \$4,800 per spot for suburban surface lots to more than \$43,400 per spot for central business district surface lots -³ inevitably get passed onto consumers. When those spots are under-utilized, consumers, developers, and cities are paying unnecessary charges.⁴

WHY PARKING LOTS?

City codes often require developers to provide a minimum amount of off-street parking, but there are rarely accompanying maximum lot sizes.⁵ This means developers can or must build larger-than-needed parking lots,



¹ Michael Lewyn, *Sprawl in Canada and the United States*, *The Urban Lawyer*, Vol. 44, No. 1 (Winter 2012).

² Donald C. Shoup, *The Trouble with Minimum Parking Requirements*, *Transportation Research Part A*, Vol. 33 (1999).

³ Todd Litman, *Parking Cost, Pricing and Revenue Calculator*, Victoria Transport Policy Institute, available at www.vtpi.org/parking.xls.

⁴ Shoup, *supra* note 2, at 1.

⁵ See, e.g. Des Moines, Iowa Code § 134-1377

https://library.municode.com/HTML/13242/level3/MUCO_CH134ZO_ARTVOREPALO.html#MUCO_CH134ZO_ARTVOREPALO_S134-1377OREPAARRE.

often to meet a perceived parking need or to attract a certain business. Land that is used for parking is then unavailable for other uses, such other development that may boost the local economy and bring in more tax revenue, or green space that makes the city more livable.

A maximum parking standard more accurately accounts for the true costs of parking lots and helps reflect their real impact.

WHAT IS THE PROPOSAL?

To address the stormwater, traffic congestion, and livability issues related to oversized parking lots, we have drafted and attached a model parking maximums ordinance. The ordinance places a cap on parking lot sizes, thereby curbing the practice of building large parking lots with unneeded spaces. Understanding that some businesses may need or want more parking than the ordinance allows, the proposal incorporates a flexible system to accommodate larger lots. The system allows developers to choose from a menu of sustainable parking solutions to counteract the environmental, economic, and aesthetic detriments of large parking lots. As set forth in the ordinance, such options include: permeable pavement, shared parking agreements, landscaping requirements, bike parking, and the inclusion of carpool spaces. The ordinance, attached to this abstract, is designed to work on a sliding scale: the larger the variation from the maximum, the more menu options the developer must incorporate. In addition, we have attached a summary of the costs and benefits associated with maximum parking lots.



MODEL ORDINANCE NO. _____ (Parking Maximums)

AN ORDINANCE to amend the Municipal Code of the City of _____, Section XXX-XXX [applicable parking code section], relating to certain shared parking spaces subject to a shared parking agreement.

Be It Ordained by the City Council of the City of _____:

Section 1. That the Municipal Code of the City of _____, Section XXX-XXX, is hereby amended by repealing and replacing Section YYY-YYY [applicable local code section pertaining to the schedule of parking spaces] [the following is typical existing code language that varies by jurisdiction]:

Schedule of spaces. In all zoning districts, except [districts that have special or more stringent parking requirements], in connection with every industrial, commercial, business, trade, institutional, recreational, or dwelling use and similar uses, space for parking and storage of vehicles shall be provided in accordance with the schedule in this subsection. Required off-street parking facilities shall be primarily for the parking of private passenger automobiles of occupants, patrons, or employees of the principal use served. No parking space provided for the purpose of complying with the provisions of this chapter shall be included as a parking space required under this chapter for another building, structure or use. *The maximum schedule of spaces for parking and storage of vehicles shall be as follows:*

[insert revised schedule which reduces the schedule of parking spaces by fifty percent]

Section 2. That the Municipal Code of the City of _____, Section XXX-XXX, is hereby amended by repealing Section ZZZ-ZZZ and enacting a new Section ZZZ-ZZZ with language set forth as follows:

Section XXX-XXX.

a. A developer may exceed the maximum schedule of spaces for parking and storage vehicles by up to 50 percent, provided the lot includes one or more of the following features:

- (1) Permeable pavement, as defined in Section AAA-AAA, on at least 20 percent of the surface. Regular maintenance of those permeable areas is required as set forth in Section AAA-AAA.*
- (2) A Shared Parking Agreement as provided in Section BBB-BBB.*

- (3) *Climate-appropriate Vegetation on at least 10 percent of the surface.*
 - (4) *A Climate-appropriate Tree per 10 or fewer parking spaces of a size set forth in the tree replacement ordinance, Section CCC-CCC.*
 - (5) *Parking spaces designated for compact or electric cars comprising at least 20 percent of the parking spaces.*
 - (6) *Any other sustainable feature approved by the [appropriate city official].*
- b. *A developer may exceed the maximum schedule of spaces for parking and storage vehicles by up to 75 percent, provided the lot includes two or more of the features in subsections (a)(1) through (a)(6) of this Section.*
 - c. *A developer may exceed the maximum schedule of spaces for parking and storage vehicles by up to 100 percent, provided the lot includes three or more of the features in subsections (a)(1) through (a)(6) of this Section.*
 - d. *No parking lot may exceed the parking maximum by more than 100 percent.*

Section 4. This Ordinance shall be in full force and effect from and after the later of its passage and publication as provided by law.

Section 5. That the City Clerk is hereby authorized and directed to cause certified copies of this ordinance and proof of publication of this ordinance to be properly filed in the office of the [County Recorder]:

FORM APPROVED:

Analysis of Off-street Parking Requirements

Summary

Cities began to require new developments to provide off-street parking in the 1930's, when on-street parking started disappearing due to the rapid growth of car ownership, and problems such as "cruising" for parking and "spillover" parking into residential neighborhoods emerged.⁶ Now most cities require developers to provide enough off-street parking to meet peak demand for that use, resulting in off-street parking lots that are nearly empty much of the time.⁷ These minimum parking requirements are rarely accompanied by a cap on parking lot sizes,⁸ meaning developers can build far more parking than even peak demand would warrant. These oversized parking lots exacerbate numerous problems faced by businesses, citizens, and municipalities, including flooding, pollution, traffic congestion, urban heat, increased infrastructure needs, decreased walkability, and higher costs for developers, building tenants, and consumers.⁹

Analysis

While minimum parking requirements have produced no single disaster, "...evidence of their harm confronts us everywhere—traffic congestion, air pollution, energy imports, the orientation of the built environment around the automobile, perhaps even global climate change. Although not their sole cause, minimum parking requirements magnify all these

⁶ Donald C. Shoup, *The High Cost of Free Parking*, Updated edition (June 21, 2011).

⁷ *Id.*

⁸ See, e.g. Des Moines, Iowa, Code § 134-1377, available at https://library.municode.com/HTML/13242/level3/MUCO_CH134ZO_ARTVOREPALO.html#MUCO_CH134ZO_ARTVOREPALO_S134-1377OREPAARRE.

⁹ Todd Litman, *Parking Management: Strategies, Evaluation and Planning*, November 2013, available at http://www.vtpi.org/park_man.pdf.

problems.”¹⁰ For example, minimum parking requirements - and a lack of maximum parking regulations - exacerbate stormwater management issues. Parking lots are impermeable surfaces that prevent stormwater from seeping into the ground, forcing it into the city’s storm sewers and eventually into streams, rivers and lakes. An inch of rain on a one-acre parking lot creates 3,450 cubic feet of runoff, compared to 218 cubic feet of runoff on a one-acre meadow.¹¹ This leads to flooding, pollution, urban heat, and increased water treatment costs for cities.¹²

Minimum parking requirements are not without benefit; they ensure every individual land use can accommodate peak parking demand. But that local benefit hurts the city as a whole. Along with exacerbating stormwater management issues, oversized parking lots also cause sprawl, which makes driving – rather than walking, biking, or even taking public transit - virtually mandatory. Shops that are surrounded by a sea of parking are not only difficult to get to by foot or bike due to sheer distances, but are also uninviting and dangerous for pedestrians.¹³ The increased driving this engenders then leads to traffic congestion, air pollution, and poorer public health,¹⁴ and traffic congestion in turn results in calls for wider streets, bigger intersections, and, ironically, even higher parking requirements.¹⁵ Importantly, land that is used for parking lots then cannot be used for housing, commerce, or recreation.

¹⁰ Shoup, *supra* note 6.

¹¹ Lewyn Coase, *Towards a Sustainable Urbanism: Lessons from Federal Regulation of Urban Stormwater Runoff*, 48 Wash. J. Urban & Contemp. L. 1, 12 (1995).

¹² Amy Rowe, *Green Infrastructure Practices: An Introduction to Permeable Pavement*, Rutgers, The State University of New Jersey (February 2012), available at <http://njaes.rutgers.edu/pubs/publication.asp?pid=FS1177>.

¹³ Michael Lewyn, *What Would Coase Do? (About Parking Regulation)*, 22 Fordham Env’tl L. Rev. 89 (2010), available at <http://works.bepress.com/lewyn/70>.

¹⁴ Michael Lewyn, *Sprawl in Canada and the United States*, The Urban Lawyer, Vol. 44, No. 1 (Winter 2012).

¹⁵ Shoup, *supra* note 6.

It's no secret that there are many more parking spaces than cars or drivers in the United States. A study from professors at Arizona State University and the University of California, Berkeley estimated the number of off-street parking spaces in the United States at anywhere from 630 million to 910 million – far greater than the estimated 240 million passenger vehicles in the country or 210 million licensed drivers.^{16 17} When on-street parking is included, estimates range from 722 million parking spaces to more than 2 billion parking spaces – nearly 1 percent of the entire land mass of the United States.¹⁸ Another study focusing on the upper Midwest estimated Illinois, Indiana, Michigan, and Wisconsin allocate 5 percent of their urban land use to over 43 million off-street parking spaces, or nearly three off-street parking spaces per vehicle.¹⁹ That study does not include on-street parking, which would raise those figures significantly.²⁰

These parking spaces carry not only immense societal and environmental costs, but also huge fiscal costs for developers, tenants, and consumers. According to the Victoria Transport Policy Institute, an independent research organization dedicated to developing innovative and practical solutions to transportation problems, each parking space in a suburban surface lot carries a price tag of \$4,818 in land and construction costs in 2002 dollars (along with \$300 annually in operation and maintenance costs)(See Table 1).²¹ An urban surface lot is nearly three times as much, at \$13,333 per space and \$500 in annual operation and maintenance

¹⁶ Mikhail Chester, Arpad Horvath & Samer Madanat, *Parking Infrastructure and the Environment*, ACCESS #39 (Fall 2011).

¹⁷ Federal Highway Administration, *Our Nation's Highways: 2011*, available at <https://www.fhwa.dot.gov/policyinformation/pubs/hf/pl11028/chapter4.cfm>.

¹⁸ *Id.*

¹⁹ Amélie Y. Davis, Bryan C. Pijanowski, Kimberly D. Robinson, & Paul B. Kidwell, *Estimating parking lot footprints in the Upper Great Lakes Region of the USA*, *Landscape and Urban Planning*, May 30, 2010.

²⁰ *Id.*

²¹ Litman, *supra* note 3.

costs.²² And central business district (CBD) surface lots are an astounding \$43,462 per space, with \$600 in annual operation and maintenance costs.²³ The immense cost of building and maintaining off-street parking lots inevitably gets passed onto building tenants and consumers, who effectively subsidize cheap and ample parking through higher rents and retail costs.²⁴

Table 1

Type of Facility	Land Costs, Per Acre	Land Costs, Per Space	Construction Costs Per Space	Total Costs	Annual O & M Costs
Suburban, On-Street	\$200,000	\$800	\$3,000	\$3,800	\$200
Suburban, Surface	\$200,000	\$1,818	\$3,000	\$4,818	\$300
Suburban, 2-Level Structure	\$200,000	\$909	\$15,000	\$15,909	\$500
Urban, On-Street	\$1,000,000	\$4,000	\$5,000	\$9,000	\$300
Urban, Surface	\$1,000,000	\$8,333	\$5,000	\$13,333	\$500
Urban, 3-Level Structure	\$1,000,000	\$2,778	\$18,000	\$20,778	\$600
Urban, Underground	\$1,000,000	\$0	\$25,000	\$25,000	\$700
CBD, On-Street	\$5,000,000	\$20,000	\$5,000	\$25,000	\$400
CBD, Surface	\$5,000,000	\$38,462	\$5,000	\$43,462	\$600
CBD, 4-Level Structure	\$5,000,000	\$9,615	\$20,000	\$29,615	\$700
CBD, Underground	\$5,000,000	\$0	\$35,000	\$35,000	\$800

²² *Id.*

²³ *Id.*

²⁴ Shoup, *supra* note 6, at 1.

Minimum off-street parking requirements - and the lack of a maximum parking regulation - put in place by cities are a major source of the excessive supply of parking and the problems that come with it. For example, the Clive City Code requires restaurants to provide 15 parking spaces per 1,000 square feet of gross floor area.²⁵ That would mean a 4,000 square foot McDonald's, for instance, would have to provide a minimum of 60 off-street parking spaces.²⁶ A lot that size could easily take up 16,000 square feet – four times the size of the restaurant. That means a developer must allocate 80 percent of the land area for parking, amounting to nearly \$300,000 in land and lot construction costs (based on Table 1). Again, these costs are passed on to building tenants and consumers. Image 1, below, is an example of the immense amount of parking required by these regulations. This McDonald's and KFC are located near 114th Street NW and University Avenue in Clive.

Image 1²⁷



²⁵ Clive City Code, Ch. 13 Sect. 11-3-8, *available at* http://sterlingcodifiers.com/codebook/index.php?book_id=595§ion_id=350231.

²⁶ *Id.*

²⁷ Google maps.

Unreasonable minimum parking requirements are just part of the problem. Developers will often build parking lots well over the minimum, to respond to a perceived need or to attract certain tenants. One example of this can be found at The Shoppes at Three Fountains, located in the 4500 block of University Avenue in West Des Moines. While the West Des Moines city code required a minimum of 448 parking spaces for the development, 691 parking spaces were built - over 50 percent more than required (See Image 2, below).



Image 2²⁸

So where do these minimum off-street parking requirements come from? The two most common ways to determine appropriate minimum parking requirements - surveying nearby cities and consulting Institution of Transportation Engineers handbooks - are both seen as problematic by scholars.²⁹ Surveying nearby cities “may simply result in a repetition of someone

²⁸ Google Maps.

²⁹ Donald C. Shoup, *The Trouble with Minimum Parking Requirements*, Transportation Research Part A, Vol. 33 (1999).

else’s mistakes,”³⁰ while generic parking rates “cannot take into account the mix of context-sensitive, community-specific variables—density, demographics, availability of transportation choices, or the surrounding land-use mix—all of which influence demand for parking and *should* be reflected in parking requirements.”³¹

Instead, requirements are based on maximum demand for parking, when parking is provided at no charge to users, and walking, biking, and transit are not available choices. This formula yields a surplus of parking area that is costly for developers to provide, and it subsidizes personal automobile use and encourages auto use even in areas where convenient transportation choices exist. Because of the way in which they are typically established, parking requirements are remarkably consistent across different cities, despite varying levels of economic vitality, population size, and development density.³²

An examination of local city codes suggests many minimum parking requirements need an update. The Des Moines city code contains incredibly specific minimum parking requirements for uses as varied as bowling alleys (five parking spaces for each lane); churches (one parking space for every eighty square feet of principal auditorium, including balcony, if any); funeral homes and mortuaries (one parking space for each five seats in the principal auditorium); fraternity or sorority houses (one parking space for each two persons residing on the premises); and theatres and assembly halls with fixed seats (one space for each six seats).³³ The minimum parking requirements for all these uses are the same as when they were set nearly 50 years ago.³⁴

³⁰ *Id.* (citing Planning Advisory Service, 1971. An Approach to Determining Parking Demand, Planning Service Report Number 270. American Planning Association, Chicago).

³¹ Christopher V. Forinash, Adam Millard-Ball, Charlotte Dougherty & Jeffrey Tumlin, *Smart Growth Alternatives to Minimum Parking Requirements*, 2nd Urban Street Symposium, July 28-30, 2003.

³² *Id.*

³³ See e.g. Des Moines City Code, *supra* note 8.

³⁴ See e.g. City of Des Moines Ordinance 7226, adopted July 12, 1965.

Conclusion

Minimum parking requirements imposed by cities – and the lack of maximum parking regulations – create huge costs for all sectors of society, from cities and developers to consumers and the environment. Many of these requirements are outdated or lack a strong factual basis. Reducing minimum parking requirements significantly and then capping the maximum size of parking lots would address many of these issues, while allowing developers to exceed the maximum by incorporating sustainable features into lot design provides for flexibility.

This document is the product of a collaboration between the Greater Des Moines Partnership and Drake University Law School. The document was drafted by the Partnership's Senior Vice President Meg Fitz, Professor Jonathan Rosenbloom and Drake Law students Andrew Duffelmeyer, Kelsey Knight ('14) and Derek Moran ('12). If you have any questions, please contact us at: jonathan.rosenbloom@drake.edu or mfitz@desmoinesmetro.com