Susquehanna Township Sustainable Parking Ordinance:

A Paradigm Shift in Parking

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I. Introduction

In many instances, efforts to accommodate parking have overextended actual need. The approach used by many cities and municipalities to establish minimum parking requirements is typically a generic formula based on satisfying maximum demand for free parking. Although this practice may allow city planners to err on the side of caution, it has some serious drawbacks. In practical terms, this practice increases the cost of development and creates disincentives with respect to smart growth development and redevelopment. In addition, strict minimum parking requirements create excess parking spaces that consume land and resources, encourage automobile use and associated pollution, and degrade water quality. The oversupply of parking is of particular concern for smart growth development in areas where the existing parking infrastructure can be better utilized and parking alternatives, such as shared parking, encouraging the use of non-motorized vehicles, and increased use of transit and pedestrian modes, can be more readily implemented.[1]

The significant environmental costs associated with parking are not typically factored into development decisions, and only recently have begun to be considered in setting parking requirements. Construction of unnecessary impervious surfaces[2] increases the impacts of

[1] Christopher V. Forinash, Adam Millard-Ball, Charlotte Dougherty & Jeffrey Tumlin, *Smart Growth Alternatives to Minimum Parking Requirements*, U.S. ENVIRONMENTAL PROTECTION AGENCY, at 2, (2003), https://pdfs.semanticscholar.org/9aca/93497f2f31589bc1ef46f2faddbfbf601b9f.pdf.

[2] An impervious surface refers to any surface that water cannot soak into asphalt (streets), concrete (sidewalks), highly compacted crushed stone and gravel, and rooftops. When water cannot soak into the ground, it either sits in one place or moves along to a place where it can soak into the ground or be collected. As it moves along these hard

stormwater runoff, either on the storm sewer system or the surrounding land. Paved surfaces can also result in water pollution and flooding, resulting in a decline in adjacent property values. Heat islands, or areas of artificially raised temperatures, also are exacerbated by unnecessary pavement.[3]

Consuming land for parking also reduces the land available for greenspace or other, more productive development. Land preserved as part of the green infrastructure allows stormwater to percolate into the soil, provides wildlife habitat, provides air quality and noise reduction benefits, and is aesthetically desirable. Land developed for living, working, and shopping rather than just parking provides more intensive use. This lowers the demand to develop other land nearby or elsewhere in the region. Shared parking and intensifying use also creates a more supportive environment for transit, walking, and bicycling as well.

In contrast to generic minimum parking requirements, the revised ordinance for Susquehanna Township will feature maximum limits that account for need, use, and space to restrict the total number of spaces that can be constructed, rather than establish a minimum number that must be provided. Planners set maximum limits much like they set minimum requirements. Typically, a maximum number of spaces is based on the square footage of a specific land use. When a landowner determines that the maximum limits do not provide an

surfaces it gathers pollutants like trash, oil, brake dust, fertilizer, salt and pet waste. Approximately 25% of Susquehanna Township is covered by impervious.

[3] See generally, Mikhail Chester, Arpad Horvath & Samer Madanat, *Parking Infrastructure: Energy, Emissions, and Automobile Life-cycle Environmental Accounting*, IOP SCIENCE, (July 29, 2010), https://iopscience.iop.org/article/10.1088/1748-9326/5/3/034001/pdf. When discussing the environmental effects associated with parking, the externalities come at a premium. We often disassociate the cumulative effects and almost never consider the environmental sacrifices made during construction and maintenance of surface lots. This study tries to reel in just how much these other factors make their pollution contribution by accounting for energy and emissions from constructing and maintaining the parking infrastructure when assessing the total human health and environmental impacts of vehicle travel. They developed five parking space inventory scenarios and from these estimate the range of infrastructure provided in the US to be between 105 million and 2 billion parking spaces. Using these estimates, a life-cycle environmental inventory is performed to capture the energy consumption and emissions of greenhouse gases, CO, SO2, NOX , VOC (volatile organic compounds), and PM10 (particulate matter) from raw material extraction, transport, asphalt and concrete production, and placement (including direct, indirect, and supply chain processes) of parking space construction and maintenance.

adequate amount of parking for the intended use, the proposed ordinance is flexible by design to allow for increases in the maximum allowed. When considering an increase from the maximums, we propose that Susquehanna Township should encourage the use of environmental best management practices in order to offset some of the negative environmental externalities associated with the now larger parking lot.

The overall purpose of the proposed ordinance is to minimize the amount of parking spaces that landowners are required to provide. By reducing the amount of parking spaces required, landowners will be able to use that space to increase the density of their developments. By increasing the density of commercial and multi-family residential developments, Susquehanna Township can reverse the side effects of urban sprawl and welcome new and repurposed developments into the area. These new development opportunities will hopefully enhance the overall social, economic, and environmental wellbeing in the Township.

Part II of this narrative discusses some of the major problems associated with surface parking lots including their effects on climate change, stormwater management, and the overall livability of a community. Part III discusses how an overabundance of parking was discovered in Susquehanna Township and how the current ordinance has required landowners to dedicate land to parking instead of other more beneficial and profitable uses. Part IV discusses the approaches other municipalities have taken to changing their off-street parking ordinances, and the means to measure the effectiveness of these ordinances. Part V discusses the proposed amendment to the Susquehanna Township off-street parking requirements, and the policy choices and benefits of the proposed amendment.

II. Current Problems Associated with Parking Lots and Their Regulatory Framework

The major issue with most off-street parking zoning regulations, including the current ordinance that Susquehanna Township has in place, is that they create a surplus of unused and quite frankly, unneeded supplies of surface parking lots. By setting minimum requirements for the amount of off-street parking spaces a landowner must provide to the public, the zoning code is actually encouraging, whether by design or by fault, the overproduction of impervious surface. Recognizing that before every parking lot was paved over, it was grass, water, dirt, or some other natural entity, is vital in order to fully understand the broad scope of the externalities associated with this practice.

As Joni Mitchel so eloquently put it, “they paved paradise, and put up a parking lot.” Hypothetically, part of that paradise used to be home to a patch of native grass. The native grass was the exclusive habitat to a rare species of beetle. The beetle was the preferred food source for migratory birds. This ripple effect that our actions have on the ecosystem are profoundly vast, to the likes of which these pages cannot possibly encapsulate. However, if you are adverse to subscribing to the ecosystem butterfly effect, even the narrow externalities can be devastating. They can be as simple as your neighbor deciding to pave his driveway and now every time it rains your basement floods. The end game of this more sustainable ordinance is not to rip up every paved surface and restore it to a natural habitat, but rather consider the externalities associated with putting down paved surface and only building what you really need. Afterall, the true focus of environmental sustainability is not to make drastic changes to everything, its to make small, gradual, targeted, impactful changes to things that have been identified as being wasteful.

In painting a small enough picture just to get the point across that impervious parking surfaces create problems in our everyday life, this section starts by taking a look at how

excessive parking surpluses are negatively contributing to climate change. Anyone who has walked through a large mall or superstore parking lot in the summer can sympathize, but we may be forgetting to consider that the large parking lot might have made you drive your car to the store in the first place. Next, this section will discuss some of the livability issues that excessive parking might have including the effect on property values, and dangers they pose to pedestrians. Lastly, this section discusses some of the problems that off-street parking requirements create by causing massive amounts of stormwater, and the fortunes it costs small towns and cities to process it.

A. Climate Change Issues

The temperatures in parking lots can be 20-40 degrees higher than the surrounding areas.[4]Heat island effect (HIE) occurs in urban areas where materials that have heat-absorbing properties, such as asphalt, are prevalent. The combined effect of such surfaces can cause a change in the energy (temperature) balance, leading to hotter air and surface temperatures. Recent research indicates that urban areas are 2 to 8ºF hotter in summer due to this increased absorbed heat.[5] Parking lots contribute significantly to HIE. Asphalt, one of the most common paving materials used in parking lots, is a dark, heat absorbing material.[6] When asphalt cools at night, all the heat it has absorbed during the day is released into the air, slowing the rate of nighttime cooling.[7]

[4] Montgomery County Planning Commission, *Sustainable Green Parking Lots*, MONTGOMERY COUNTY, PA., at 8, (2016), https://montcopa.org/DocumentCenter/View/9735/Green-Sustainable-Parking-Guide-2_10_2016-Web?bidId=.

[5] *Green Parking Lot Resource Guide*, US ENVIRONMENTAL PROTECTION AGENCY, at 3, (Feb. 2008), https://nepis.epa.gov/Exe/ZyPDF.cgi/P100D97A.PDF?Dockey=P100D97A.PDF

[6] Jim Gibbons, *Pavements and Surface Materials*, UNIVERSITY OF CONNECTICUT NONPOINT EDUCATION FOR MUNICIPAL OFFICIALS, at 2, (1999), https://nemo.uconn.edu/publications/tech_papers/tech_paper_8.pdf.

[7] *Reducing Urban Heat Islands: Compendium of Strategies, Cool Pavements*, US ENVIRONMENTAL PROTECTION AGENCY, at 1, (June 2008), https://www.epa.gov/sites/production/files/2014-08/documents/coolpavescompendium_ch5.pdf.

The environmental impacts of the HIE are varied. Hotter temperatures can lead to more CO2 emissions due to increased energy demand to cool neighboring buildings.[8] HIE can also increase smog, and subsequently exacerbate pulmonary and cardiovascular health problems. During rain events, paved surfaces can transfer heat to runoff, increasing the temperature of receiving waters. This warmer water can be detrimental to the natural habitats of fish and other aquatic life.

In less than an hour, a closed car in an unshaded parking lot can achieve temperatures in excess of 140 degrees. Not only does this produce an extremely dangerous condition, but it forces drivers to use excess air-conditioning to cool down their vehicles. Excessive heat in parking lots makes them unpleasant places for pedestrians.[9]

B. Livability Issues

To be sure, excess parking facilities cause a host of other problems not normally associated with climate change. This section discusses some of those issues including the crippling effects that zoning regulations can have on livability and land use development. Zoning regulations are generally understood to be a common benefit to all. They help by creating the general guidelines that promote stability and consistency, but if left unchecked, they can be the breeding grounds for environmentally unfriendly building habits. The quick onset of urban sprawl has left devastating effects on the long-term land uses in suburban areas, such as Susquehanna Township. Fleeing the city to build homes on large plots of land to avoid congestion and getting to know your neighbor have solidified a dependence on automobiles as the primary means of transportation. Next, we contemplate whether zoning regulations are actually making landowners leave money on the table. By requiring landowners to dedicate their

[8] *Id.*
[9] Montgomery County Planning Commission, *supra* note 4, at 8.

land to parking facilities, municipal authorities are essentially reducing the value of the property in their jurisdiction, and disincentivizing high density development. Lastly, large open parking lots might actually be a serious hazard to the lives of those brave enough to traverse them on foot. Limiting the size of parking lots might actually make them safer for pedestrians.

1. Urban Sprawl

Urban sprawl is the uncontrolled spreading of urban developments on undeveloped land near a city.[10] Urban sprawl is considered by most environmental scientists and urban planners to be a serious environmental problem.[11] Urban sprawl and prevailing low-density development patterns characterized by free, plentiful parking reinforce dependence on automobiles for commuting to work, shopping, and social activities.[12] Thus, conventionally designed parking is an enabler of urban sprawl.[13]

The problem can readily be seen in the local area with the vast majority of shopping and entertainment establishments encouraging residents to rely on automobiles for their primary means of transportation. From large lots that require you to get in your car to travel between stores, to residential developments being placed just out of a reasonable walking distance, the effects of urban sprawl are copious. Conventional parking creates barriers to alternative transportation, including walking and bicycling, and encourages automobile travel, disconnecting communities and decreasing the habitability of cities and towns. The resulting increase in vehicle miles traveled and the associated high levels of mobile source air emissions exacerbate air quality issues and contribute to global climate change as well.

2. Property Values

[10] *Urban Sprawl*, MERRIAM-WEBSTER, https://www.merriam-webster.com/dictionary/urban%20sprawl (last visited Oct. 30, 2019).
[11] Amelie Davis, Bryan Pijanowski, Kimberly Robinson & Bernard Engel. *The Environmental and Economic Cost of Sprawling Parking Lots in the United States*. 27 LAND USE POLICY 255, 255-61 (2010).
[12] *Green Parking Lot Resource Guide*, *supra* note 5, at 5.
[13] *Id.*

Simply put, minimum required parking regulations cost land owners and municipalities money. An overhaul of a local parking ordinance that is able to reduce the overall amount of parking spaces that developers are required to provide will in turn free up land that the developers are then able to put to better, and more dense uses. This concept of increasing density, in theory, should be a win-win for all parties involved. Land that was once a parking lot can be converted into retail, commercial, or residential developments. The consolidation of these uses will in turn lower the number of trips people need to take while relying on automobiles, and at the same time it will increase the value of the land for the landowner. The increased development directly benefits the tax revenue that will be drawn from the increased property values and will encourage new developers to invest in the surrounding areas.[14]

3. Dangers to Pedestrians

Parking lots can be dangerous places for pedestrians, and even though pedestrians have the right-of-way in parking lots, many drivers do not always see or yield to pedestrians.[15] In some communities, more than 20% of pedestrian injuries occur in parking lots.[16] Often, parking lots can be more hazardous than streets, on streets, the direction of traffic is predictable, but in parking lots, vehicles may be moving in all directions and drivers are often distracted searching for parking spaces or maneuvering through the lot.[17]

In 2016, the National Safety Council polled nearly 2,500 drivers about their attitudes toward distracted driving. Of those, 67% of adult drivers said they felt at risk from other drivers who are distracted by technology, and 25% said they put themselves or others at risk because of their own use of technology while driving. But for every variety of distraction – phone calls,

[14] See generally, DONALD SHOUP, THE HIGH COST OF FREE PARKING (Routledge eds., 2011).
[15] Montgomery County Planning Commission, *supra* note 4, at 9.
[16] *Id.*
[17] *Id.*

texting, grooming, use of social media, etc. – both groups showed a much higher likelihood of technology use in parking lots than on the highway or surface streets.[18] One viable way to address this problem is to reduce the size of parking lots, as well as breaking up the vast expanses in parking lots by incorporating rain gardens, bioswales, buffer strips, or any other type of vegetation habitat.

C. Stormwater Issues

Water runoff from parking lots is a major contributor to non-point source pollution of our waterways. Conventional parking lots quickly move stormwater into receiving water bodies. As it flows across pavement, the water picks up pollutants from the surface. This results in large volumes of polluted runoff entering surface water and groundwater resources, negatively affecting water quality.[19] Contaminants in parking lot runoff can originate from a variety of sources, including the paving materials used to build them. Recently, the U.S. Geological Survey pinpointed parking lot sealants as a significant source of non-point source pollution, specifically polycyclic aromatic hydrocarbons, a known carcinogen that can be toxic to fish and wildlife.[20]

While meeting with local government officials for the City of Lancaster, we discussed some of the major drivers of expense for the City. By far, one of the largest expenses municipalities generate is the costs associated with stormwater management. This is such a large expense that many local governments, including Susquehanna Township have created an additional fee charged to residents in order to offset some of this cost. Strict federal regulations are requiring the Township to reduce stormwater entering polluted streams and an aging

[18] Joe Bush, *Avoiding Parking Lot Perils*, SAFETY & HEALTH, (Dec. 19, 2017), https://www.safetyandhealthmagazine.com/articles/16449-parking-lot-safety.
[19] Van Metre, P. et al, *Parking Lot Sealcoat: A Major Source of Polycyclic Aromatic Hydrocarbons (PAHs) in Urban and Suburban Environments*, U.S. DEPT. OF INTERIOR, (Jan. 2006), https://pubs.usgs.gov/fs/2005/3147/pdf/fs2005-3147.pdf.
[20] *Coal-Tar-Based Pavement Sealcoat, PAHs, and Environmental Health*, U.S. GEOLOGICAL SURVEY, https://www.usgs.gov/mission-areas/water-resources/science/coal-tar-based-pavement-sealcoat-pahs-and-environmental-health?qt-science_center_objects=0#qt-science_center_objects (last visited Oct. 30,2019).

stormwater infrastructure system are creating enormous financial burdens on the Township.[21] Recently the Township announced that their stormwater infrastructure requires capital improvement projects that will cost the township over thirteen million dollars.[22]

The problem here is simple to identify, the more storm water the municipality puts into the stormwater system, the more they have to spend to treat the water. Paved impervious parking surfaces are a major contributor to local stormwater volumes. By reducing the size of surface parking lots, and introducing developers to eco-friendly or green infrastructure practices, best case scenarios can allow massive reductions in the volume of water needing treatment. A combination of green parking infrastructure upgrades can allow some parking lots to fully infiltrate or process almost all of the water that lands on their parking surfaces.

For example, a site in Chicago, IL that had an infiltration area of 2,000 square feet and a drainage area of 4,000 square feet is able to retain 80% of its stormwater runoff. Calculations were done in order to see how much water this site was able to infiltrate naturally, and the results were notable. The results showed that by capturing 80% of the annual precipitation the site was able to naturally retain and infiltrate 113,760 gallons of runoff annually.[23] Another study showed a slightly larger lot, with a surface area of 5,000 square feet, that used permeable pavement, was able to reduce its annual runoff by 94,800 gallons annually.[24]

D. Light Pollution

Parking lots generally contain lighting to provide safety and security for users and adjoining facilities. In many parking lots, inappropriate lighting structures do not effectively

[21] *Stormwater Program Fee Frequently Asked Questions*, SUSQUEHANNA TOWNSHIP, at 1, https://www.susquehannatwp.com/sites/susquehannapa/files/uploads/swpf_faq__0.pdf (last visited Oct. 30, 2019).
[22] *Id.*
[23] *The Value of Green Infrastructure: A Guide to Recognizing Its Environmental and Social Benefits*, CENTER FOR NEIGHBORHOOD TECHNOLOGY, at 19, (2010), https://www.cnt.org/sites/default/files/publications/CNT_Value-of-Green-Infrastructure.pdf.
[24] *Id*. at 20.

direct the light onto paved surfaces and shield it from adjoining uses resulting in light trespass. Light escaping from parking areas can negatively impact the well-being of surrounding neighborhoods. In some cases, this can create unsafe conditions for motorists on adjoining roads. Excess lighting can waste energy and diminish dark sky vistas.[25]

Light pollution can also have dire consequences for wildlife. For example, birds that migrate or hunt at night navigate by moonlight and starlight. Artificial light can cause them to wander off course and toward the dangerous nighttime landscapes of cities. Migratory birds depend on cues from properly timed seasonal schedules. Artificial lights can cause them to migrate too early or too late and miss ideal climate conditions for nesting, foraging and other behaviors.[26] By making some very minor changes to Susquehanna Township's parking ordinance section that governs lighting in parking lots, we are able to reduce the overall light pollution generated by requiring shields on light fixtures that allow the light to shine down instead of up.

III. Susquehanna Township's Current Parking Ordinance Creates an Overabundance of Unused Parking Space

One of the major issues that was identified in Susquehanna Township was that there appears to be a massive surplus of unused parking space. Specifically, Susquehanna Township has almost one square mile of paved impervious parking surface. Susquehanna Township, in total, is only fifteen square miles.[27] A drone survey was conducted by Shippensburg University's Center for Land Use & Sustainability (CLUS) so that the Township could assess just how bad

[25] Montgomery County Planning Commission, *supra* note 4, at 9.
[26] *Light Pollution Effects on Wildlife and Ecosystems*, INT'L DARK-SKY ASS'N, https://www.darksky.org/light-pollution/wildlife/ (last visited Oct. 30, 2019).
[27] Center for Land Use & Sustainability, *Parking Inventory in Susquehanna Township, Dauphin County, PA.*, SHIPPENSBURG UNIVERSITY, https://ship.maps.arcgis.com/apps/MapSeries/index.html?appid=c7b2c17a49f94f328d9ad536ed9ca46c (last visited Oct. 30, 2019).

the problem was.[28] CLUS flew drones over commercial sites including office buildings, fast food restaurants, shopping centers during peak hours and on major shopping events such as "Black Friday."[29] The drone study revealed that some of the shopping centers used only about 80% of the spaces on "Black Friday"--the biggest retail shopping event of the year--and only 44% on the Saturday before school started for "back to school" shopping.[30] This shows that even during the highest traffic events, there is still an abundance of parking that is not currently being used, and tailoring a zoning ordinance to fleeting events that take place once or twice per year is inadvisable.[31]

The effect of the current off-street parking ordinance is to mandate strip malls.[32] In conjunction with setback and frontage requirements off-street parking minimums create the "strip mall effect."[33] Because so much parking is required and there are mandatory setbacks developers have no choice but to put parking in front of buildings and closest to the road; this creates a sea of asphalt and strip malls. This design hurts pedestrian traffic because of the increased distance between the road and the store front which can also be visually unappealing.[34] Furthermore, crossing vast parking lots on foot is unsafe and isolating.[35]

The strip mall effect also subsidizes driving while impacting consumers. Although off-street parking is often regarded as "free" it is far from it.[36] Developers have to pay to construct and maintain parking lots. The Developer will then pass theses added expenses off to the

[28] *Id.*
[29] *Id.*
[30] *Id.*
[31] *Id.*
[32] Michael Lewyn, *New Urbanist Zoning for Dummies*, 58 ALA. L. REV. 257, 280 (2006).
[33] *Id.*
[34] *Id.*
[35] *Id.*
[36] *Id.* at 280-81.

businesses who lease the structures, and then those costs are passed off onto consumers.[37] In a 2002 study the costs of a parking space were estimated to be $127 per month.[38] The true nature of "free" parking is a massive tax on consumers, including nondrivers.[39] Susquehanna Township should amend its off-street parking ordinance to fight the strip mall effect.

A. Freeing up Parking Space to Foster New Development and Increasing Density

The major factor contributing to this oversupply of parking is the current off-street parking ordinance. The current off-street parking ordinance in Susquehanna Township takes the form of creating a mandatory minimum requirement. While parking minimums have been standard practice in the planning world for decades, little research has been used to calculate the number of spaces actually needed per land use. The drone research by CLUS revealed that even at peak demand, patrons are not using approximately 20% to 60% of the surface parking lots available to them.[40] This means that Susquehanna Township is severely underutilizing one of its greatest assets, land.

Hypothetically, if you were able to minimize the amount of land that an owner is required to dedicate to parking, the landowner would then be able to develop that new "freed up" land. The revised ordinance discussed here intends to do just that. By reducing the amount of parking required of local landowners, Susquehanna Township will be allowing and encouraging landowners to more fully develop their land. As discussed in Section II, urban sprawl has created an environment that has led to the underutilization of land and has encouraged the reliance on practices and habits that create pollution. By revising their parking ordinance, Susquehanna

[37] *Id.* at 281.
[38] *Id.* (citing DONALD SHOUP, THE HIGH COST OF FREE PARKING, 185-91 (Routledge eds., 2011)).
[39] *Id.*
[40] Center for Land Use & Sustainability, *supra* note 27.

Township will be able to free up anywhere from 20% to 50%[41] of privately-owned land that is shackled by the current ordinance.

Codifying reductions in parking requirements provides the greatest certainty for developers and enables them to plan for less parking from the outset. It also reduces the risk of developments being held up in the permitting process or being challenged by local residents who may be reluctant to see the project built at all. Where the exact offset formula is not codified, reductions in parking requirements can be granted on a case-by-case basis, often on the condition that mitigation measures are provided. Cities such as Eugene, Oregon, specify in their zoning codes that such reductions will be granted subject to a parking study showing that the proposed variance will be adequate to meet demand.[42]

IV. Different Jurisdictional Approaches to Parking Maximums

Unfortunately for this project, most municipalities that have amended their off-street parking ordinances are medium size cities.[43] The most similar municipality to Susquehanna Township, which has dramatically changed its off-street parking ordinance, is Lower Macungie Township, Lehigh County, Pennsylvania. Both are first class townships and suburbs of small size cities, Harrisburg for Susquehanna Township and Allentown for Lower Macungie Township.[44] Lower Macungie's approach to off-street parking requirements is different from all other municipalities surveyed. Rather than reducing minimums or imposing maximums, Lower Macungie Township requires spaces by calculated need.[45] While this approach may get the best

[41] Estimates are based on the average change in required space that will happen by adopting the proposed ordinance.
[42] Forinash, *supra* note 1, at 5.
[43] Michael Lewyn & Judd Schechtman, *No Parking Anytime: The Legality and Wisdom of Maximum Parking and Minimum Density Requirements*, 54 WASHBURN L. J. 285, 289 (2015).
[44] *Lower Macungie Township Pennsylvania*, WIKIPEDIA, https://en.wikipedia.org/wiki/Lower_Macungie_Township,_Pennsylvania (last visited Oct. 30, 2019).
[45] LOWER MACUNGIE TOWNSHIP, PA., MUNICIPAL CODE, ch. 27, pt. 23, § 27-2301 ("The 85% peak threshold shall be utilized to determine required parking spaces for any use in the Township. . . . The Township shall review, confirm and approve of the proposed calculations and number of proposed parking spaces.").

results, because it is a case-by-case determination based on needs, the township may have a hard time administering its ordinance since the township will need to review and approve every new or modified parking facility. Additionally, the ordinance was amended on August 1, 2019, so there is no information yet to judge the impacts or effectiveness of Lower Macungie's needs-based approach.[46]

Almost universally, municipalities that have established parking maximums retain a minimum requirement as well. The differences between minimums and maximums varies depending on jurisdiction, but the minimum and maximums do not stray too much from each other. The maximum parking standards tend to vary between 125% and 200% of minimums.[47] However, San Francisco amended its parking ordinance to eliminate minimums throughout the city this year.[48] Other cities like Hartford, Connecticut, and Buffalo, New York have already eliminated minimums.[49] While there is a growing trend in the elimination of minimums, the majority of local governments maintain minimum requirements alongside maximums creating a range of off-street parking.

A. Three Strategies for Enacting Parking Maximums

The municipalities that have altered their parking ordinances to incorporate maximums have done so using three strategies.[50] The first is by establishing maximum parking standards for all uses within the municipality.[51] The second strategy municipalities have employed is to

[46] Lower Macungie Township, Pa., Ordinance 2019-10, (Aug. 1, 2019).
[47] FORT WORTH, TEX., CODE, § 6.201(B)(2) ("maximum number of parking spaces shall not exceed 125 percent of the minimum parking requirement."); LOUISVILLE, KY., LAND DEV. CODE, ch. 9, pt. 1, tbl. 9.1.2A (showing most maximums are twice the minimum requirements).
[48] *San Franciso Removes Minimum Parking Requirements Citywide*, LIVABLE CITY, (Jan. 4, 2019), https://www.livablecity.org/time-san-francisco-say-goodbye-minimum-parking-requirements/.
[49] Angie Schmit, Hartford Eliminates Parking Minimums Citywide, STREETSBLOG USA, (Dec. 13, 2017), https://usa.streetsblog.org/2017/12/13/hartford-eliminates-parking-minimums-citywide/.
[50] Lewyn, *supra* note 32, at 289.
[51] *Id.*

establish maximum parking standards for specific uses within the municipality.[52] The final strategy used establishes maximum parking standards for all uses within a specific area of the municipality.[53] Generally, the decision to choose one approach over the other has to do with the characteristics of the municipality, such as availability of public transit, geographic area, and political concerns.[54] Again, most of the data on these changes comes from medium size cities.

Few cities have adopted the first strategy to impose maximums for all uses through the entire municipality. San Francisco, California; Louisville, Kentucky; and Forth Worth, Texas have all adopted maximums for all uses within their jurisdictions.[55] This approach seems to make the most sense for cities that want to effect change the quickest. Louisville, Kentucky, and Forth Worth, Texas are both very sprawling cities, while San Francisco is very compact.[56] All three cities recognized the demand for space was impacted by an overabundance of parking. A key consideration for Forth Worth is its projected growth, which with business as usual would over tax its roadways.[57] Louisville is currently considering lessening parking minimums to entice development since required parking is an additional cost on small businesses.[58] San Francisco

[52] *Id.*
[53] *Id.*
[54] *Id.*
[55] *Id.*
[56] *Id.*
[57] Kerry Curry, *Dallas/Fort Worth Region Considering Options for a Flexible Future of Parking*, URBAN LAND MAGAZINE, (Aug. 9, 2017), https://urbanland.uli.org/development-business/dallasfort-worth-region-considering-options-flexible-future-parking/ ("Parking is a big issue in the Dallas/Fort Worth region, an area that 3.4 million more people are expected to call home between now and 2040, raising the total population to 10.6 million—and also adding 2.3 million more cars to clogged roadways.")
[58] Chad Mills, *Louisville Could Study Whether Less Parking Would be Better for Business*, WDRB NEWS, (Jul. 24, 2019), https://www.wdrb.com/news/louisville-could-study-whether-less-parking-would-be-better-for/article_a5831bfc-ae7f-11e9-9086-dbb1e07116b4.html.

has been incrementally adjusting its ordinance over the years,[59] and has a well-developed public transit system.[60]

The majority of cities employ the second strategy of focusing on specific uses, and target commercial uses rather than residential.[61] While minimums are maintained for all uses, the maximums are typically only applied to commercial uses.[62] This strategy makes sense to prevent the strip mall effect, while not penalizing residents; however, this strategy misses many other uses such as industrial, recreational, or institutional uses.[63] Cities employing this strategy also wildly differ from each other in what uses have maximums and the leniency between minimums and maximums.[64] For example, El Paso's difference between minimum and maximum parking requirements for office uses is only 2.1 (min), and 2.4 (max) spaces per 1,000 ft,[65] while Portland's difference between office uses is 2 (min), and 3.4 (max) spaces per 1,000ft.[66] Still this strategy is beneficial as a starting point for many municipalities who face concerns over an abrupt change to its parking.

The last strategy is employed by a mix of municipalities looking to revitalize downtown areas, promote transit-oriented development, or create traditional neighborhood developments (TNDs). Instead of amending the whole parking code, such municipalities carve out exceptions for different districts. For a local example, Harrisburg's off-street parking ordinance states, "[t]he

[59] *A Brief History of Parking in San Francisco*, LIVABLE CITY, (Jun. 15, 2015), https://www.livablecity.org/parking-history-sf/.
[60] *San Francisco Commuter Statistics by Sex*, UNITED STATES CENSUS BUREAU, https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF (search "San Francisco;" then select "Business and Industry" tab; then follow "Commuting Characteristics by Sex" hyperlink) (showing 34.0% of commuters used public transit).
[61] Lewyn, *supra* note 32, at 290.
[62] *Id.*
[63] See COLUMBUS, OHIO, CODE OF ORDINANCES, tit. 33, ch. 3312, § 3312.49 (establishing maximums for only its commercial uses). But see MILWAUKEE, WIS., BUILDING & ZONING CODE, vol. 2, ch. 295, subch. 4, tbl. 295-403-2-a (establishing maximums only for single-family and two-family dwelling, and "general retail establishments").
[64] Lewyn, *supra* note 32, at 290-91.
[65] EL PASO, TEX. CODE, tit. 20, app. C, tbl.4.09.
[66] PORTLAND, OR., ZONING CODE tit. 33, ch. 266, tbl. 266-2. See also, Lewyn, *supra* note 23, at 290.

off-street parking requirements in this chapter do not apply to uses within the Downtown Center or Commercial Neighborhood Zoning Districts."[67] As such, Harrisburg has eliminated parking minimums in these districts. This strategy is useful for municipalities that wish to focus on a particular area and is often used in conjunction with other changes in the zoning code. Sticking with the Harrisburg example, the Commercial Neighborhood District seeks in part "to encourage pedestrian-oriented uses, while avoiding auto-related uses."[68] The other zoning regulations for the Commercial Neighborhood District work in conjunction with the exemption from the off-street parking ordinance to fulfill its goal of decreasing automotive uses.

Calculating parking spaces per use is generally guided by the *Parking Generation Manual*,[69] published by the Institute of Transportation Engineers.[70] The method of calculation depends on the type of use. Commercial and industrial uses tend to be calculated by square feet, while recreational uses like stadiums or auditoriums are calculated by seats or maximum capacity.[71] Many local governments still base calculations in part on the number of employees on the largest shift; however, this measurement is imprecise because it varies overtime.[72] The need for precise calculations of parking needed is imperative for municipalities to manage its parking requirements, so to not require more parking than is needed or restrict parking below what is needed. Therefore, the calculations based on size or another fixed and measurable attribute are the best for setting minimum and maximum parking requirements.[73]

B. The Best Measurement of Effectiveness

[67] HARRISBURG, PA., PLANNING AND ZONING CODE tit. 7, pt. 3, ch. 7-327, § 7-327.2.
[68] *Id.* § 7-305.4(D).
[69] Institute of Transportation Engineers, *Parking Generation Manual*, (Kevin G. Hooper ed. 5th ed. 2019).
[70] Zoning and Land Use Controls, Ch. 42., Traditional Zoning, § 42.06 (LexisNexis Matthew Bender)
[71] *Id.*
[72] *Id.*
[73] *Id.*

Most of the changes to off-street parking to include maximum requirements and reduce or eliminate minimum requirements have only been adopted recently. As such, there is little data to measure the effectiveness of these ordinances. Additionally, because all ordinances have a prospective effect there is no immediate change to previously built parking facilities. However, success can be measured in a few ways. First, the number of variances from the off-street parking requirements granted. Second, the number of unused spaces in a parking facility. Third, the change in behavior of developers and consumers.

The number of variances requested for parking facilities is probably the best measure of success. If a developer is able to build its project with the parking it needs within the ordinance, then the ordinance is best accounting for the actual needs of parking. The fewer the variances the more effective the ordinance is. For example, Jacksonville's revised parking ordinance went into effect in 2007.[74] Although some developers had to request variances to get more than the allowed parking, most developers did not seek variances to provide fewer spaces than were required by the pre-2007 minimums.[75] Assuming all the variances were in good faith and based on actual parking needed, the number of parking spaces provided might not have changed much, but the administrative hassle of seeking variances was reduced. An ordinance is most successful when it can be applied fairly without a constant need for variances.

If the ordinance appropriately balances the need for parking, then there should be few unused spaces. Data measuring the change in unused spaces due to revised off-street parking ordinances is sparse. However, a study showed that after London eliminated its parking minimums and switched to parking maximums most developers provided less spaces than the

[74] Lewyn, *supra* note 32, at 294.
[75] Jacksonville, Fla., Ordinance 2007-588-E (Jun. 12, 2007).

maximum requirements.[76] Presumably, this reduction in spaces provided is evidence that the actual number of spaces needed was less than the maximums, so by reducing spaces developers prevented unused spaces. While the situation in London is substantially different from Susquehanna Township, the reduction in unused spaces is still a valid measurement of success of the amended ordinance.

Another measurement of success is the behavioral change of developers and consumers. As discussed, minimum parking requirements create automotive dependency and the "strip mall effect." An amended off-street parking ordinance will enable developers to move beyond the design of strip malls and focus on design strategies like joint parking facilities, increased bike and pedestrian facilities, commuter transit lots, and a more community style commercial area.[77] New developments or infill of old locations embracing these changes would be a way to measure the success of the ordinance on the developer side.[78] Consumers would then take advantage of these new facilities and change their behavior.[79] These behavior changes can be measured in driving and commuting data.[80] Increased use of alternate forms of transportation, such as walking, bicycling, or carpooling, would show that consumers are changing their behavior in response to the developers' behavioral changes from the ordinance. All of these measurements will take time to show their effect, especially the change in behavior.

V. Recommendations for Susquehanna Township

[76] Lewyn, *supra* note 32, at 292 n.51.
[77] Brian P. Shea, *Protecting Pastures from Parking Lots: Detrimental Density Restrictions and the Need for Integrated Infill Development*, 66 DRAKE L. REV. 473, 501-05 (2018).
[78] *Id.* at 505.
[79] *Id.* (relating to induced demand created by parking facilities).
[80] *See Susquehanna Township Commuter Statistics by Sex*, UNITED STATES CENSUS BUREAU, https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF (search "Susquehanna Township;" then select "Business and Industry" tab; then follow "Commuting Characteristics by Sex" hyperlink) (showing 91.1% of Susquehanna Township residents drove to work, and 82.3% drove alone).

The proposed amendment to Susquehanna Township's off-street parking requirements will address the issues discussed in part II by reversing the parking paradigm. Less parking spaces means less problems associated with large surface parking lots, such as stormwater runoff. As discussed, parking minimums incentivize and, in many cases, mandate more parking than is required, while parking maximums incentivize less parking and more parking alternatives. The proposed amendment flips from minimums to maximums. For example, in the current ordinance retail spaces require—at a minimum—four parking spaces per 1,000 square feet;[81] the proposed ordinance changes that figure to a *maximum* of two spaces for the same amount of square footage.[82]

While this may seem like a radical change it should be noted that the shopping center with the Giant on Linglestown Road is 123,353 square feet of retail space.[83] Under the current minimum parking standards, the developer must provide *at least* 493 parking spaces and is not prevented from providing more. Under the proposed amendment, the developer is only allowed to provide 247 parking spaces. This reduction in spaces is not the only story. There is sharing of spaces through joint parking facilities, the ability to increase the parking maximum through increased bicycle or alternative vehicle parking, and the ability to increase parking through the use of green infrastructure.

There is no need for so many spaces if they are being utilized at different times of the day, this is the general concept behind joint parking facilities. While Giant may need many of those spaces it does not need the same amount throughout the day. In fact, the surrounding stores likely use those spaces at different times of the day as well, for example, the donut shop is busy

81 SUSQUEHANNA TOWNSHIP, PA., MUNICIPAL CODE ch. 27, pt. 23, § 27-2302.
82 Email from Betsy Logan, Director of Community & Economic Development, Susquehanna Township, Dauphin County, to authors (Sept. 17, 2019, 4:35 p.m. EST) (on file with authors).
83 *Blue Mountain Commons*, LOOPNET, https://www.loopnet.com/Listing/19478592/2300-Linglestown-Rd-Harrisburg-PA/ (last updated Dec. 30, 2016).

in the morning, and the pizza shop is likely busy at dinnertime. This is a perfect example of joint parking facilities, established by the ordinance, when different shops use the same parking spaces at different times.

Developers can also increase the number of parking spaces through the addition of bicycle facilities and parking facilities for nontraditional vehicles such as compact cars, electric vehicles (EVs), and autonomous vehicles (AVs). For example, section 109 of the amended ordinance allows for an increase of maximum parking for additional bicycle spaces at a ratio of 1 vehicle space per 4 bicycle spaces. Additionally, in section 116 the approval criteria for an increase of the maximum includes provisions for compact cars, EVs, and AVs. Similarly, green infrastructure improvements made by developers will allow the Zoning Hearing Board to grant additional spaces.

A. Technical and Policy Considerations

The other municipalities surveyed are mostly medium size cities. While they face different technical issues from a municipality like Susquehanna Township, medium sized cities generally face the same policy issues. There are competing issues of land development and the need for parking.[84] Most cities have opted for a gradual approach, keeping minimums in place and creating maximums, and sometimes only in specific zones or areas within the city.[85] Generally, these conservative measures make sense in cities because development and redevelopment happens at a much quicker pace. Focusing on a pilot program in one part of the city allows a city to latter expand that program to other parts of the city.

In Susquehanna Township the constraints of size and geography is not as much of a concern. Susquehanna Township is mostly "built out" and current developments are TNDs

[84] Brian P. Shea, *Protecting Pastures from Parking Lots: Detrimental Density Restrictions and the Need for Integrated Infill Development*, 66 DRAKE L. REV. 473 (2018).
[85] *See infra* part IV.

which are not affected by this ordinance. Redevelopment is a much more gradual process in Susquehanna Township, as such it makes sense for the ordinance to apply to the whole township rather than specific areas. If a residential zone is redeveloped next, then it will have to apply the amended ordinance. There is no focus on a particular area because it would prevent the ordinance from applying to other areas.

The policy choices for maximum parking standards are the same no matter the size of the municipality. Policy choices come down to the conflict between the demand for parking and the negative effects of large surface lots. Minimum parking requirements tend to be based on peaks, like the amount of parking required at the mall on "Black Friday".[86] Instead, maximum parking seeks to curb the diet of automotive dependence.[87] It should be noted that while many cities that adopted maximums had initial pushback from residents and developers, the actual implementation of the standards was well accepted.[88] The policy choice to switch the parking paradigm in Susquehanna Township really comes down to the same choice as the cities that have adopted parking maximums: changing the status quo for long term benefits.

B. Providing for Flexibility in Parking Maximums

Taking into consideration the fact that developers and city planners prefer to have consistency within their local zoning codes, as well as the notion that each use creates its own unique set of demands, the revised Susquehanna Township ordinance features a way to have the best of both worlds. One feature of the revised ordinance allows a property owner to ask for increases and a review of their individual parking situation. By allowing landowners the

[86] Lewyn, *supra* note 32, at 288.
[87] *Id.*
[88] *Id.* at 294.

opportunity to increase from the capped maximums set in the parking schedule, Susquehanna Township would be able to be flexible with the capped numbers.

If landowners want an increase in their parking allotment, they are able to apply for the increase by submitting traffic or impact studies as well as other relevant information that they have used to help determine their need for an increase. The Zoning Hearing Board will then make a case by case determination based on the information submitted that will allow the landowner to increase the number of parking spaces to commensurate with their anticipated need. We were not able to determine an exact offset or variance formula that could be used in all situations, such as one that allows for a 25% additional allotment for any off-street parking facility that incorporates permeable asphalt. Instead, we have left those determinations to be made on a case by case basis and suggested the use of industry best management practices be the starting point in asking for an increase from the maximum parking allotment.

Knowing that a larger surface lot creates more environmental externalities, using best management practices suggested by the Environmental Protection Agency should minimize the external effects created by the increased lot. The majority of these practices are focused on treating the stormwater runoff onsite by using natural processes such as bioswales, buffer strips, and plenty of thirsty plants, trees and shrubs to soak up the excess rainwater. By offsetting the increase in the lot size with some eco-friendly practices, we allow developers the flexibility they need to increase their lot size and are able to mitigate some of the negative environmental effects at the same time.

C. Benefits and Costs Associated with the Amended Ordinance

The benefits that Susquehanna Township will reap if they adopt the revised ordinance are vast and far reaching. Meanwhile the costs are very limited and will likely require no separate increase in funding.

1. Social Benefits

The social benefits that can be fostered through the enactment of the proposed ordinance are directly tied to the new development that can be achieved through its passage. By "freeing up" land that was dedicated to parking, landowners will now be able to increase development on those sites. For example, the Giant Plaza on Linglestown Road would benefit by adding more stores, or residential housing thus increasing the density of the site. By adding these new amenities to the area, patrons will have different opportunities to engage with other members of the community. By creating an environment of high density commercial and residential facilities within close proximity to each other, people might be more inclined to walk or bike to work, or the stores instead of driving which can also increase social interaction within a community. If everyone gets in their car to drive to work or to the store they are missing out on opportunities to engage with others in the community, whereas walking with someone or riding next to someone on the bus allows people to talk to each other and enhance the overall social fabric of the community.

2. Economic Benefits

The economic benefits that will be gained by the adoption of the revised ordinance are promising. One of the major benefits will be the increased development of land that was formerly a paved parking lot. Again, freeing up this land allows new development. This new

development will create jobs, housing, and transportation alternatives. New jobs, housing, and transportation alternatives will draw new developers into the area. These new opportunities will also have a positive effect on property values in the area. The increase in property values in the area adds to the assessed value of the land, which in turn will increase property tax revenue. These additional revenue sources would not have been able to flourish but for "freeing up" land dedicated to parking.

3. Environmental Benefits

The environmental benefits created through the adoption of the revised ordinance are also reasonably attainable. By reducing the amount of impervious surface lots, there will be an immediate reduction to the amount of water that contributes to stormwater runoff. Landowners can also choose to eliminate some of their unneeded parking space-that requires upkeep and maintenance- and replace it with green features or green infrastructure upgrades such as trees and plants that will help with water infiltration and carbon sequestration. Appendix II of the proposed ordinance points developers to resources that they can use to fully maximize the green infrastructure on their land. If we are able to convince just a handful of developers that these practices are cost effective, a trend could be created locally where people expect a new development to incorporate these green infrastructure upgrades and become the norm in the area. Furthermore, the increased density of current development will encourage people to keep their cars in the driveway and engage in more environmentally friendly practices such as walking, biking, or taking advantage of mass transit.

4. Cost Associated with Adoption

Currently there are no added expenses associated with the adoption of the proposed ordinance. The ordinance itself is sustainable in that it addresses a major issue in the area that is

able to be solved by the passage of the new ordinance. The only area of expense that could be generated would be the added burden put on the Zoning Hearing Board after the adoption of the ordinance. The ordinance does have the potential to create an increase in development or repurposing of commercial parking facilities. To make changes to existing parking facilities, landowners will need to have their plans approved by the Zoning Hearing Board before they can begin construction. These costs are de minimis in comparison to the impact that the reduction of surface lots could have on Susquehanna Township's stormwater management system, as well as all of the increased development and economic activity that will be generated after its adoption. After the first few years the status quo should be restored as local developers become more familiar with the new regulations.

VI. Conclusion

In conclusion, the parking paradigm shift from minimum to maximum requirements will have numerous benefits for Susquehanna Township. This amendment will establish flexible parking maximums, which will allow for growth and redevelopment beyond the stagnant strip mall landscape and encourage more community-oriented development. The amendment will cost very little to the township, and in the long run bring in more tax revenue from higher property values while simultaneously mitigating the effects of stormwater. Although there is expected push back from deviating from the status quo, none of the research has shown any decrease in development, or any other problems. Instead this amendment will help bring Susquehanna Township into the 21st century in terms of planning for transportation needs.

SUSQUEHANNA TOWNSHIP
DAUPHIN COUNTY, PENNSYLVANIA
ORDINANCE NO. 19-XX

AN AMENDMENT TO THE ZONING ORDIANNCE OF THE TOWNSHIP OF SUSQUEHANNA, DAUPHIN COUNTY, PENNSYLVANIA TO ESTALBISHED REGULATIONS RELATED TO OFF-STREET PARKING CHANGING RIGID MINIMUM PARKING REQUIREMENTS TO FLEXIBLE MAXIMUM PARKING STANDARDS, AND ADDING AND REVISING RULES RELATED TO OFF-STREET PARKING FACILITIES.

NOW, THEREFORE, be it enacted and ordained by the Board of Commissioners of Susquehanna Township, Dauphin County, Pennsylvania, and the same is hereby ordained and enacted as follows, to wit:

ENACTED this _____ day of _____, 2019 in public session duly assembled.

ATTEST:

BOARD OF COMMISSIONERS
OF SUSQUEHANNA TOWNSHIP

_____
[ ]
Secretary

_____
Frank Lynch
President, Board of Commissioners

Section 101. Title.

This chapter shall be known as and may be cited as the Susquehanna Township Off-Street Parking Ordinance.

Section 102. Purpose.

The purpose of this Part is to:

(a) Provide for off-street parking facilities designed for the parking of motorized and nonmotorized vehicles, such as bicycles, to satisfy the needs of occupants, employees, and patrons of all uses in this Township.[89]

(b) Protect air and water quality pursuant to PA. CONST. art. I, §27, including the capacity of drainage and stormwater management systems.[90]

(c) Limit the amount of impervious surface that may be permitted on a parcel of land or accessory to a use or building.[91]

(d) Promote efficient use of land, encourage use of alternative modes of transportation, and provide for better pedestrian movement.[92]

(e) Establish flexible maximum standards for off-street parking and loading.

(f) Promote the use and development of joint parking facilities and cross-access between sites.

Section 103. Legal Authority.

This Part is enacted and ordained:

(a) Under the grant of powers by the General Assembly of the Commonwealth of Pennsylvania under the act of July 31, 1968 (P.L. 805, No. 247) known as the Pennsylvania Municipalities Planning Code.[93]

[89] ROCHESTER HILLS, MICH., ZONING ORDINANCE art. 11, ch. 1, § 138-11.100 (2018).
[90] PA. CONST. art. I, § 27.
[91] ROCHESTER HILLS, MICH., ZONING ORDINANCE art. 11, ch. 1, § 138-11.100 (2018).
[92] PORTLAND, OR., ZONING CODE tit. 33, ch. 266, § 33.266.115(A) (2018).

(b) Under the act of June 24, 1931 (P.L. 1206, No. 331) known as the First Class Township Code.[94]

(c) As authorized by Section 15-102 Manner of Adopting Permanent Traffic and Parking Regulations of this Code.[95]

(d) In recognition of Susquehanna Township's constitutional duties under Article I, section 27 of the Pennsylvania Constitution.[96]

Section 104. Construction.

This Part shall not be interpreted to excuse a landowner from compliance with any portion of the Susquehanna Township Municipal Code. Whenever possible, this Part and all other laws shall be construed as being consistent with each other.

Section 105. Definitions.

The words in this section have the given meanings unless the context clearly indicates otherwise.

"Board" – the Susquehanna Township Board of Commissioners.

"Off-street bicycle facility" – the entire area used for the storage of bicycles tied to a specific building or use, and which is not located on a dedicated street right-of-way. The term includes bicycle racks, lockers, and access area.

"Gross floor area" - the sum of the horizontal areas of all the floors of a building or structure as measured from the exterior face of exterior walls, or from the centerline of a wall separating two buildings, but excluding any space where the floor-to-ceiling height is less than six feet. The area of parking garages contained within a building shall not be included in the gross floor area

93 53 PA. STAT. § 10101 et seq.
94 *Id.* § 55101 et seq.
95 SUSQUEHANNA TOWNSHIP, PA., MUNICIPAL CODE ch. 15, pt. 1, § 15-102 (1997) ("All traffic and parking regulations of a permanent nature shall be enacted as ordinances, as parts of ordinances, as amendments to ordinances, or as amendments to this chapter, except where the law specifically authorizes less formal action.")
96 PA. CONST. art. I, § 27.

calculation, nor shall sub-basement areas with a finished floor level six feet or more below the adjacent grade.[97]

"Joint parking facility" – an off-street parking facility that is shared by multiple buildings or uses.

"Off-street loading facility" - the entire area used for the loading and unloading of supplies from vehicles, and which is not located on a dedicated street right-of-way. The term includes loading berths, loading lanes, and accompanying driveways.

"Off-street parking facility" - the entire area used for the storage of motor vehicles tied to a specific building or use, and which is not located on a dedicated street right-of-way. The term includes parking spaces, parking lots, parking structures, as well as accompanying driveways, footpaths, and interior landscaping.

"Off-street parking space" -any temporary storage area for a motor vehicle which is not located on a dedicated street right-of-way.

"Parking structure" -a building or structure consisting of more than one level and used to store motor vehicles.

Section 106. Enforcement and Appeals.

(a) It shall be unlawful to construct off-street parking or off-street loading facilities without prior approval of the Board.

(b) The Board shall approve or deny any applications for modification of the standards set forth by this Part.

(c) Enforcement and Appeals of this Part shall be handled by the procedures set forth in Part 26 of this Chapter.[98]

[97] AURORA, COLO., BUILDING AND ZONING CODE art. 15, ch. 146, div 3, § 146-1504(C)(2) (2006).
[98] SUSQUEHANNA TOWNSHIP, PA., MUNICIPAL CODE ch. 27, pt. 26 (relating to administration and enforcement).

Section 107. General Parking Regulations.

The off-street parking facilities required under Section 108 shall be available to patrons throughout the hours of operation of the use for which the facilities are provided.

(a) Off-street parking facilities shall be maintained and not encroached upon so long as the principal use remains, unless an equivalent number of spaces are provided elsewhere in conformance with this Part.

(b) An outdoor parking space shall not be deemed to be part of the open space of the lot on which it is located.

Section 108. Off-Street Parking Schedule.

The off-street parking requirements shall be the maximum standard for each use according to the table in Appendix 1, "Off-Street Parking Schedule."

(a) Where more than one use is present in a building or at a site, the maximum space requirement shall be the maximum of the primary use plus 50% of any supplemental use. The primary use shall be the use which yields the most parking.

(b) In the case of multiple supplemental uses, additional parking shall be determined on a case-by-case basis by the Board of Commissioners, but no more than 50% additional parking shall be allowed. The Board may consider:

    (1) The extent to which the uses overlap, such as shared employees or services incidental to each use.

    (2) The extent to which the uses utilize the off-street parking facility at different periods of the day or different days of the week.

    (3) Any other relevant factors relating to the uses and parking needs.[99]

[99] ROCHESTER HILLS, MICH., ZONING ORDINANCE art. 11, ch. 2, § 138-11.200(D) (2018).

(c) Any request to provide off-street parking that is less than 50% of the parking maximum values established in Appendix 1 shall be accompanied by proof of actual average and peak parking rates from a facility deemed to be comparable and acceptable to Susquehanna Township and be submitted by a certified traffic engineer.

Section 109. Residential Off-Street Parking Facilities.[100]

A residential off-street parking space shall consist of a parking lot, driveway, garage or combination thereof and shall be located on the lot it is intended to serve.

(a) No part of a required front yard shall be used for off-street parking requirements in residential districts, except for that part of the front yard that is occupied by a driveway.

(b) A driveway shall be limited in width to 20 feet. Parking on a driveway shall be limited to vehicles registered as a passenger car or a truck having a gross weight rating under 7,500 pounds.

(c) In the case of multifamily residential uses, off-street parking spaces shall be located within 200 feet of the primary entrance of the use served.

Section 110. Non-residential Off-Street Parking Facilities.[101]

Except as provided under Section 114, Joint Parking Facilities, off-street parking spaces for non-residential uses shall be on the same lot and in the same zoning district as the principal building or open area.

(a) Parking spaces shall be located within 350 feet of the primary entrance of the use served. Adequate, safe and convenient pedestrian access shall be provided from the parking area to the use.

[100] The following three sections were derived from § 27-2301, "General Parking Regulations," and § 27-2303, "Location of the Parking Space." The requirements in those sections had to do with the location and type of spaces allowed depending on use. We rearranged the components of those sections into "residential," "non-residential," and "garage" sections. See SUSQUEHANNA TOWNSHIP, PA., MUNICIPAL CODE ch. 27, pt. 23, §§ 27-2301, 27-2303.

[101] *Id.*

(b) Parking spaces shall be in the same ownership as the principal use to which they are accessory.

Section 111. Garages and Parking Structures.[102]

Garages and parking structures shall not be counted as off-street parking spaces for the purposes of determining maximum spaces under this Part.

(a) A garage or carport may be located wholly or partly inside the walls of the principal building or attached to the outside walls.

    (1) In the case of single-family residential uses, the garage may be separated from the principal building. The garage shall conform to all accessory or building requirements within this Code.

    (2) In the case of multifamily and nonresidential uses, a parking structure, whether above or below ground, must conform to the bulk area requirements for the district in which the parking structure is located.

(b) A garage or parking structure may be constructed under a yard or court provided that the level of the yard or court conforms to the general level of the other yards or courts on the lot. The space above an underground garage or parking structure shall be deemed to be part of the open space of the lot on which it is located.

Section 112. Bicycle Parking Required.[103]

(a) A non-residential use shall be required to provide off-street bicycle facilities in addition to the off-street parking required under Appendix 1, "Off-street parking schedule."

(b) Off-street bicycle facilities shall be provided for at a minimum rate of 3% of the maximum parking spaces for the respective use.

[102] *Id.*
[103] AURORA, COLO., BUILDING AND ZONING CODE art. 15, ch. 146, div 3, § 146-1508 (2005).

(c) The maximum motor vehicle parking spaces may be increased at the ratio of one motor vehicle parking space for each four bicycle parking spaces, up to a maximum increase of 5% of the required motor vehicle parking space.

(d) Design. Bicycle parking facilities, both lockers and racks, as applicable, shall comply with the following:

(1) Be located in convenient, highly visible, active, well-lit areas but shall not interfere with pedestrian movements. At least 10% of bicycle parking spaces, or 10 bicycle parking spaces, whichever is less, shall be located within 100 feet of the primary building entrance.

(2) Provide for storage and locking of bicycles, either in lockers, medium security racks, or equivalent installations in which both the bicycle frame and wheels may be locked by the user.

(3) Consist of racks or lockers anchored so that they cannot be easily removed, and of solid construction, resistant to rust, corrosion, hammers, and saws.

(4) Be consistent with their environment in color and design, and be incorporated whenever possible into building or street furniture design.

(e) Bicycle racks shall be approved by the Board and shall conform to the following:

(1) Be simple, functional and durable.

(2) Be capable of supporting a bicycle in an upright position.

(3) Allow the user to lock a bicycle frame and wheel with either a standard U-shaped lock or a chain and cable and lock.

(4) Have no edges, seams, or hardware to pose a hazard or become unsightly.

(5) Be freestanding units to allow flexibility in the number provided and their placement.

Section 113. Off-street Loading Facilities.[104]

In addition to the off-street parking facilities required by this Part, commercial, industrial, hospital, and other similar uses shall provide adequate off-street area for loading and unloading of supplies to and from vehicles.

(a) A maximum of one loading berth shall be provided where the combined gross floor area of the main building and accessory buildings exceeds 25,000 square feet.

(b) Notwithstanding the provisions of subsection (a):

    (1) In the case of industrial or commercial uses an additional loading berth shall be allowed for each additional 25,000 square feet of gross floor area.

    (2) In the case of all other uses an additional loading berth shall be allowed for each additional 50,000 square feet of gross floor area.

(c) An off-street loading berth shall be not less than 10 feet wide, 35 feet in length, and 14 feet in height, when covered.

(d) No exterior portion of an off-street loading facility, including access drives, shall be located within 50 feet of any land within a residential zone or use. Off-street loading facilities shall be located on the face of the building not facing any adjoining land in a residential zone.

(e) When an off-street loading facility abuts a residential use or zone, a five feet buffer area shall be provided contiguous to the property line of the residential use or zone in addition to the required setback and shall be planted in accordance with Section 27-2106(5), "Requirements for buffer yards and screening."[105]

[104] This section is substantially similar to § 27-2309 of the current off-street parking ordinance. We merely changed the calculations from minimum to maximum loading berths. See SUSQUEHANNA TOWNSHIP, PA., MUNICIPAL CODE, ch. 27, pt. 23, § 27-2309.

[105] SUSQUEHANNA TOWNSHIP, PA., MUNICIPAL CODE ch. 27, pt. 21, § 2106(5) (relating to buffer yards and screening).

(f) An off-street loading facility shall be designed so that there will be no need for service vehicles to back over streets or sidewalks. Off-street loading facilities shall not interfere with off-street parking facilities.

Section 114. Joint Parking Facilities.[106]

(a) Joint parking facilities shall be allowed in the BOR, CN, CH, IG, MU1, MU2, and COL districts.

(b) Joint parking facilities shall not provide more parking than the parking maximums established for each use separately.

(c) The Board shall approve applications for joint parking facilities if the following requirements are met:

(1) The nearest point of the parking lot shall be no further than the following distance to the nearest point of the property served:

(i) For a residential use: 100 feet.

(ii) For a commercial use: 200 feet.

(iii) For an industrial use: 300 feet.

(2) The uses jointly utilizing the joint parking facility must do so at different periods of the day or different days of the week.

(3) The joint parking facility must remain under the control of the owner or operator of the use to which the joint parking facility is appurtenant.

(4) The joint parking facility shall be recorded as a deed restriction, irrevocable license, easement or other recordable document in a form satisfactory to the Township solicitor filed in the Dauphin County Courthouse in the chain of title of the land to be

[106] This section is substantially similar to § 27-2304 of the current off-street parking ordinance. We merely changed the emphasis from reduction in spaces from the minimum requirement to encouraging even greater reductions through space sharing. See SUSQUEHANNA TOWNSHIP, PA., MUNICIPAL CODE, ch. 27, pt. 23, § 27-2304.

burdened for a period to extend throughout the life of the use requiring the maintenance of the required number of spaces.

Section 115. Application for Increased Maximum Parking.

The Board shall have the authority to approve or deny applications for increased maximum parking.

(a) The applicant must submit a written plan by a certified traffic engineer demonstrating:

(1) Proof of actual average and peak parking rates from a facility deemed to be comparable and acceptable to Susquehanna Township.

(2) The anticipated stormwater runoff volume and other adverse environmental effects of the proposed additional off-street parking facilities.

(3) A mitigation plan for the additional stormwater and other adverse environmental effects of the proposed additional off-street parking facilities.

(b) Stormwater runoff mitigation may be provided for off-site, but in the same watershed if such stormwater facilities are consistent with Susquehanna Township Pollution Reduction Plans[107] or other applicable stormwater plans and accepted for dedication by Susquehanna Township.[108]

Section 116. Approval and Denial Criteria for Increased Parking Applications.

The approval process for increased maximum parking shall be governed by Chapter 24, Part 4, "Subdivision and Land Development Ordinance."[109]

(a) Approval. The Board shall approve the application if the written plan:

[107] See Susquehanna Township, Pa., Ordinance 17-14 (Sept. 14, 2017) (relating to adoption of intergovernmental cooperation agreement for the preparation and implementation of the Joint Pollution Reduction Plan).
[108] Email from Betsy Logan, Director of Community & Economic Development, Susquehanna Township, Dauphin County, to authors (Sept. 17, 2019, 4:35 p.m. EST) (on file with authors)
[109] SUSQUEHANNA TOWNSHIP, PA., MUNICIPAL CODE ch. 24, pt. 4 (relating to plan specifications and process procedures). See also Email from Betsy Logan, Director of Community & Economic Development, Susquehanna Township, Dauphin County, to authors (Nov. 25, 2019, 5:45 p.m. EST) (on file with authors).

(1) Demonstrates actual or anticipated demand for additional parking, cannot be satisfied by the amount of parking allowed by this Part.[110]

(2) Addresses the mitigation of increased stormwater from the additional off-street parking facilities.

(3) Shows the minimization of other detrimental effects resulting from the additional off-street parking facilities, including, but not limited to, traffic congestion, environmental impacts, or conflict with existing or planned streetscape improvements.[111]

(b) In calculating the additional parking spaces, the Board shall consider:

(1) Parking spaces that are part of a park and ride facility integrated into the transit system shall not be included in the parking maximum calculations.

(2) When a parking structure is utilized for the additional off-street parking facilities rather than a surface lot, such parking spaces shall not be included in the parking maximum calculations.

(3) Parking spaces for smaller vehicles, such as compact cars, motorcycles, or scooters shall be counted as 0.5 spaces in the parking maximum calculations.

(4) Parking and charging spaces for electric or autonomous vehicles shall be counted as 0.5 spaces in the parking maximum calculations.

(5) Green infrastructure improvements, such as porous pavement, or retention basins shall be counted as 0.5 spaces for the spaces utilizing the green infrastructure in the parking maximum calculations.

[110] SAN FRANCISCO, CAL., PLANNING CODE art. 3, § 303(u) (2019).
[111] *Id.*

(6) Ridesharing lanes or spaces shall be counted as 0.5 spaces in the parking maximum calculations.

(c) Denial. The Board shall deny the application if the written plan is incomplete, not certified by a traffic engineer, or fails to meet the criteria in subsection (a).

Section 117. Conditions on Approved Parking Increases.

(a) All approved additional off-street parking facilities shall be located behind the front face of the building.[112]

(b) The interior lot landscaping requirements of section 27-2306 may be met by employing any of the Best Management Practices provided for in the EPA's Green Parking Lot Resource Guide, such as bioswales, rain gardens, riparian buffers, retention basins, or infiltration systems.[113]

(c) The Board may proscribe additional best management practices on approved additional off-street parking facilities.[114]

(1) Best management practices shall address stormwater runoff so that they are ideally managed to approximate or surpass the pre-development stormwater filtration conditions of the site.

(2) Best management practices shall consider the peak discharge, runoff volume, infiltration capacity, base flow levels, ground water recharge, and maintenance of water quality.

Section 118. Lighting.[115]

[112] Email from Betsy Logan, Director of Community & Economic Development, Susquehanna Township, Dauphin County, to authors (Sept. 17, 2019, 4:35 p.m. EST) (on file with authors).
[113] *Green Parking Lot Resource Guide*, U.S. ENVIRONMENTAL PROTECTION AGENCY, (Feb. 2008), https://nepis.epa.gov/Exe/ZyPDF.cgi/P100D97A.PDF?Dockey=P100D97A.PDF.
[114] *Id.*
[115] This section amends § 27-2308, adding "and shall not shine skyward" to subsection (b), and adding subsection (c) as an extinguishing time. See SUSQUEHANNA TOWNSHIP, PA., MUNICIPAL CODE ch. 27, pt. 3, § 27-2308.

Off-street parking facilities shall be lit in accordance with the, Section 22-506 of Susquehanna Township Subdivision and Land Development Ordinance during evening operating hours.[116]

(a) Lighting fixtures shall be located on raised parking islands and not on the parking surface.

(b) Lighting shall be arranged and shielded so the direct rays from the luminaries shall not fall off-site on adjacent properties and shall not shine skyward.

(c) Off-street parking facility and vehicular and pedestrian way lighting for commercial, industrial and institutional uses shall be automatically extinguished no later than one hour after the close of business or facility operation.

Section 119. Drainage, Surfacing, and Maintenance Standards.

(a) The area of the parking lots, including driveways, shall be graded, surfaced with asphalt or concrete and drained to the satisfaction of the Township Engineer to the extent necessary to prevent dust, erosion or excessive water flow across streets or adjoining property.

(b) Off-street parking and loading facilities shall be maintained in accordance with the provisions of this Part, an approved site plan, and the following:

    (1) Alterations to an approved off-street parking or loading facility that are not in accordance with an approved site plan shall be considered a violation of this ordinance.

    (2) Off-street parking facilities, perimeter landscaped areas, and required screening shall be kept free from grass and weed overgrowth. Surfacing, curbing, lighting fixtures, signage, and related improvements shall be kept in good repair.

    (3) Off-street parking and loading facilities shall be diligently kept clear of snow. Up to 10% of the parking area may be used for snow deposit.

[116] SUSQUEHANNA TOWNSHIP, PA., MUNICIPAL CODE, ch. 22, pt. 5, § 22-506 (relating to lighting).

(4) Off-street parking and loading facilities shall be maintained in a clean and debris-free manner.

Section 120. Severability.

Susquehanna Township declares that the chapters, sections, subsections, paragraphs, subparagraphs, clauses, or subclauses of this ordinance are severable. If any chapters, sections, subsections, paragraphs, subparagraphs, clauses, or subclauses of this Ordinance are declared unconstitutional, illegal, or otherwise invalid by the judgement or decree of a court of competent jurisdiction, that invalidity shall not affect any of the remaining chapters, sections, subsections, paragraphs, subparagraphs, clauses, or subclauses.[117]

Section 121. Repeals.

Chapter 27 Part 23 of the Susquehanna Township Municipal Code is hereby repealed, excepting sections 27-2305 “Design Standards,” and 27-2306 “Interior Parking Lot Landscaping.”

Section 122. Effective Date.

This ordinance shall take effect sixty (60) days after enactment.

[117] Susquehanna Township, Pa., Ordinance 89-16 (Nov. 21, 1989).

Appendix 1

Maximum Off-Street Parking Schedule[118]

Type of Use	Maximum Spaces
A. Residential use:	
1. Single and multifamily dwelling	2 spaces per 1 dwelling unit
2. Group home or halfway house; personal care and nursing care center; and rooming and boarding house	1 space per 4 beds
3. Communities for residents 55-years-and-over	1.1 spaces per 1 dwelling unit
B. Commercial use:	
1. Automotive repair and maintenance; gasoline station; and car wash	2 spaces per 1 service bay area
2. Automotive sales	2 spaces per 1000 square feet of gross floor area
3. Banks, business/office buildings, retail, and grocery stores	2 spaces per 1000 square feet of gross floor area
4. Hotels, motels, and bed and breakfasts	1 space per 1 room
5. Kennels	1 space per every 15 animals of capacity
6. Medical, dental, and veterinarian offices, including outpatient clinics	3 spaces per the maximum shift of doctor, dentist, or veterinarian
7. Restaurants, bars, brewpub, distillery, and winery	1 space per 4 seats; or 3 spaces if no customer seating is provided
C. Recreational use:	
1. Indoor recreation, membership club, or exercise club	1 space per 4 persons of maximum capacity
2. Outdoor recreational facility, sports arena, auditorium, theatre, and assembly hall	1 space per 4 seats
3. Golf course	4 spaces per 9 holes
4. Golf driving range and miniature golf	1 space per 1 tee or hole
D. Industrial use:	
1. Manufacturing plants and research or testing	1 space per 3,000 square feet gross

[118] The following calculations were derived by the Tri-County Regional Planning Commission and were provided by the client. Email from Betsy Logan, Director of Community & Economic Development, Susquehanna Township, Dauphin County, to authors (Sept. 17, 2019, 4:35 p.m. EST) (on file with authors).

laboratories	floor area
2. Mini or self-storage	1 space per 20 units
3. Wholesale establishments or warehouses	1 space per 3,000 square feet gross floor area
E. Institutional use:	
1. Churches and religious institutions	1 space per 4 seats
2. Colleges; universities; or business, technical, or fine art schools	1 space per 3 student design capacity
3. Day care centers	1 space per 5 student design capacity
4. Elementary and middle schools	1 space per 7 student design capacity
5. High schools	1 space per 3 student design capacity
6. Hospitals	1 space per 3 beds
F. Public use:	
1. Community buildings and social halls	1 space per 4 persons maximum occupancy