An Assessment of Parking Policy in Minnetonka, Minnesota: Recommendations for Future Parking Policies to Create a Resilient Community

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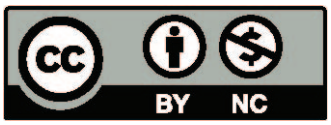

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Introduction

The city of Minnetonka has partnered with the University of Minnesota through the Resilient Communities Project to improve the sustainability of the city. The city approached the "Networks and Places-Transportation Land Use and Design" graduate course, asking for recommendations on how the city should change current parking regulations and policies to meet their sustainability goals. While this is just one element of the broader sustainability goals that the city hopes to meet, it is an essential piece of the puzzle. In short, an overabundance of parking causes far reaching environmental and economic impacts that are not seen at first glance. It is essential that these problems be addressed through innovative ideas. If a package of successful parking strategies is implemented, Minnetonka will be at the forefront of suburban communities for progressive parking regulations. This group has established a portfolio of strategies to solve these issues based on Minnetonka's desired outcomes:

(1) establish parking requirements based on average parking demand, not peak parking demand;
(2) provide more flexibility through use of shared parking; and
(3) establish a maximum parking requirement.

Our recommendations provide an alternative to the historical design of parking regulations based on peak demand through improved parking efficiency and flexibility as well as managed externalities. A quick look at the city provides significant evidence that Minnetonka is no exception to the consequences of traditional parking ordinances. We begin with a brief history of parking regulations and the problems they have created. We then establish recommendations in light of Minnetonka's desired outcomes. These recommendations culminate in a revamped parking ordinance, which has been provided within the appendices.

Figure 1: Underutilized parking at the Opus campus (Source: Author photo)

The Parking Dilemma

A Brief History

The parking dilemma in America, and Minnetonka, is the product of roughly six decades of almost universal minimum parking requirements. The first off-street parking ordinances were produced in the 1930s. It was around this time that car ownership in America began proliferating rapidly. Before this cars were parked next to carriages and tethered horses. Rapidly expanding car ownership led to a shortage of public parking, which was predominantly provided on-street at no cost to the driver. Municipalities responded to the shortage with the first off-street parking requirements. These ordinances required businesses to provide the parking their patrons required. Despite the environmental and societal problems that can be attributed to parking, these ordinances addressed some important issues. First, they tied the provision of parking to those creating the need. This insured that parking supply grew as the businesses that generated the demand multiplied. Even more critically, the ordinances minimized spill-over parking thereby preventing free riders (Shoup 2011, pg. 1).

Source: www.greatstreets.org

Adoption of these parking ordinances was slow in the beginning. A survey in 1946 found that only 17% of the cities sampled had or were preparing parking ordinances. By 1951, however, that percentage had expanded to 71%. Over the next several decades the style of these parking requirements began to steadily converge as municipalities began largely adopting the parking standards of their neighbors (flaws and all). Many of the parking regulations we have today are a product of that era and most set minimum parking requirements based on peak demand. The requirement of 4 parking spaces per 1,000 square feet of building space was (and in some places still is) so ubiquitous it became known as the “Golden Ratio.” It wasn’t until relatively recently that planners like Donald Shoup began seriously questioning the merit and costs of conventional parking regulations (Shoup 2011, pg. 22-31).

Minimum Parking Requirements

In general, the formation and adoption of minimum parking requirements (MPRs) is a highly flawed process that has led to extensive negative consequences within our built and natural environments. These negative results, which will be discussed in detail, are not easy to observe or quantify for the average American. Nevertheless, they continue to shape our daily lives. In this section, we will reference some of the best knowledge on the subject of parking requirements to make our case for the elimination of MPRs. On the other hand, we will temper the recommendations of this academic perspective in light of the political realities and economic climate within Minnetonka. As users of transportation infrastructure and consumers of retail goods and services, we benefit from the convenience of ample free parking at nearly any suburban location. However, a one-size-fits-all approach is rarely the best method, and we will draw from several philosophies in the development of our recommendations.

The biggest error in setting Minimum Parking Requirements lies in the method of identifying the mini-

mums for each land use. Historically, the two predominant ways that planners set minimum requirements are to adapt them from other municipalities or to adhere to the guidelines set forth by the Institute of Transportation Engineers' (ITE) Parking Generation guide (Shoup, 1999). This practice is easily rationalized by the fact that there are very few resources that compute parking demand and cities may have limited resources to conduct the requisite surveys. Cities that adopt (or at least reference) the parking ordinances of other cities are prone to repeating any errors that will be expounded upon in more detail below. With limited budget, this "copying" method can be an inexpensive way to estimate relevant parking policies. However, every city faces its own unique challenge in providing transportation infrastructure. Without studying the distinctive factors of a city that contribute to travel behavior and parking demand, copying even a successful plan from a different location may lead to undesirable results. Of course, the main problem is that the referenced ordinances likely obtained their policy in a similar manner. Or, even worse, the referenced ordinances were developed from ITE's Parking Generation.

Parking Generation is perhaps the prime source of original data on parking generation rates, but the data is severely limited in applicability to minimum parking requirements. The traditional view of parking, which has formed the basis for employing parking minimums, rests on the assumption that parking scarcity is the main problem. This assumption completely ignores the dangers of oversupplying parking. In an effort to provide adequate parking, traditional planning practice has over allocated land for that use by referencing Parking Generation. As Shoup (2011) indicates in his comprehensive book *The High Cost of Free Parking*, "the objective of the ITE survey is to count the number of vehicles parked at the time of peak parking demand" (p. 32). ITE's report is designed to determine peak parking demand, not a baseline or even average expectations for parking demand. To use a source of peak demand as a guide for minimal parking space procurement is an invitation for waste. Also important to note in this discussion is that ITE has relied upon existing parking lots in suburban locations without transit access to conduct its surveys (Shoup, 2011). Thus, planners that rely on ITE's research for parking generation are susceptible to any confounding variables in play at the survey sites. There is a circularity in the planning process with no true theoretical starting point. The minimum parking requirement policy depends on parking generation data, which depends on existing parking infrastructure, which in turn depends on municipal parking policy.

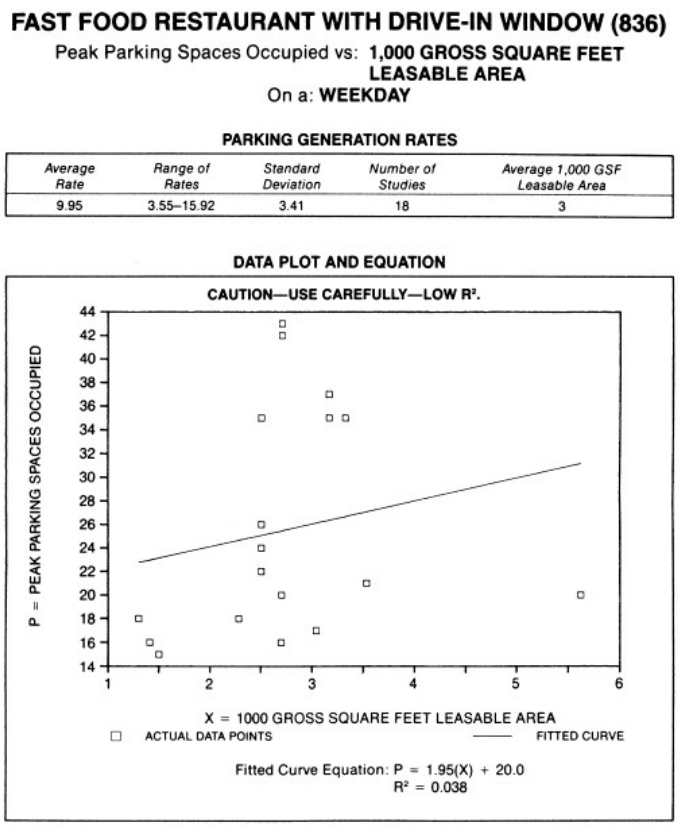

Figure 2 (Source: Shoup, 2011)

The data contained in Parking Generation suffers from the misrepresentation of development conditions, the violation of fundamental economic theory, and the lack of statistical strength. ITE's report presents parking generation data for various land uses based on surveys of parking occupancy. According to Shoup (2011), the sites selected for analysis over-represent suburban cities and un-

der-represent urban areas. The focus on suburban sites means that more people are likely to drive to the studied locations. The influences of walking, biking, and public transit options are minimized since few sites offer significant transportations alternatives to driving. While this analysis may have some relevance for certain suburban areas, the reported calculations of parking demand are an overestimate for urban and suburban locations with transportation goals that include walkability, bicycle access or increased transit use. Rather than consulting Parking Generation for a guide to parking demand, it would make sense to consider the data as an approximation of the highest demand for the most car-dependent locations.

Nearly all of the sites selected for analysis by ITE have abundant free parking designated exclusively for use by vehicles for a specific site (Shoup, 2011). This is a very specific parking arrangement, and it neglects the fundamental underpinnings of economic supply and demand. Supply and demand curves depend on a price value for a good or service, but free parking means a true determination of demand is impossible. Free parking at ITE's survey sites inflates the trip generation rates beyond what economic theory would predict because demand is higher when the price of parking is lower (Shoup, 1999). Economic theory describes the optimal parking supply as "the amount consumers would purchase in a competitive market, if they have various travel and parking options, and prices reflect the full cost of providing the facilities" (Litman, 2006, p. 7). The conditions of the ITE surveys simply do not represent market conditions. Since the survey sites have an oversupply of free parking, the parking occupancy is essentially a measure of how many parking spaces the given land uses can give away. A minimum requirement should not rely on that kind of measure. The reported results of parking generation should therefore not be considered as accurate standards of expected parking demand.

Aside from its economic and setting biases, the Parking Generation guide lacks important details and statistical reliability (see Figure 2). Among the omitted information are the dates and times of conducted surveys, the length of the surveys, the length of the peak parking demand period, and the range of departure from non-peak demand (Shoup, 1999; 2011). The reported parking generation calculations would provide much more value if the complete conditions of the surveys were communicated to the readers. Planners would be more capable of applying the results to their own parking ordinances if they were made aware of the limitations to their own land use and economic realities. Not only are the rates biased with respect to site characteristics, but they also suffer from small sample sizes in many cases. Of the 101 parking generation rates reported by ITE, roughly half have been calculated from less than five surveyed sites with over 20 based on one individual survey (Shoup, 1999, p. 551). Furthermore, the sites can be highly variable in terms of their observed parking occupancy and are largely unpredictable from site to site.

Unfortunately, despite its inherent flaws Parking Generation is still used as a prime source in establishing MPRs. Since ITE's trip generation rates represent a small number of variable automobile trips at sites with copious amounts of free parking, their use in establishing minimum parking requirements generally leads to an oversupply of parking. Peak parking occupancy at areas with abundant free parking essentially becomes the minimum amount of parking that developers are required to provide (Shoup, 1999). In his study of parking demand and supply in Los Angeles, Richard Wilson (1995) found that the supply of Office Parking was nearly double the amount of actual parking utilization. On average, almost half of suburban parking spaces were empty during peak periods. His study is one of many studies that identify the prevalence of wasted parking spaces on an average day.

Consequences

According to Shoup (1999), minimum parking requirements might reduce or eliminate the price of parking but do nothing to reduce the collective cost of parking. The effect is multiplied as each land use must provide for its own peak demand period. When developers are forced to provide more parking than they otherwise would be willing to construct, their increased costs are passed on to their tenants and consumers in a multitude of ways. Parking spaces cost money to construct and maintain, and they carry an opportunity cost of consuming land that could be used for other purposes. This cost is picked up by consumers and residents of locations that offer free parking. The cost of parking spaces is thus "bundled" into the price of retail goods and services, commercial and office property values, and residential rental rates (Cutter & Franco, 2012; Barter, 2010, Shoup, 1999). Several researchers have found that developers usually tend to build the minimum number of spaces required by policy, confirming that MPRs significantly constrain most developers by increasing the number of parking spaces that would otherwise be built (Cutter and Franco, 2012; McDonnell et al, 2010). This has the effect of lowering site densities, increasing land consumption, and reducing the profits for a given parcel of land. Land consumed by parking reduces land available for parks and green space or more intense productive activity, which also has revenue implications for cities (Forinash et al, 2003).

Additionally, the convenience of readily available free parking distorts travel choices by accelerating the demand for driving and discouraging other modes of transportation (Barter, 2010; Shoup, 1999, 2011). Excessive free parking is effectively a subsidy for driving. As parking supply is ahead of demand, driving is encouraged. When driving is encouraged, there is little incentive for drivers to carpool or seek other modes of transportation. Weinberger (2012) has found a clear relationship between the presence of MPRs at residential locations and an increase in the amount of driving, even in the presence of transit options. As a result of increased driving, congestion increases along with energy consumption and air pollution from automobile emissions (Wilson, 1995). As the lack of price on parking directly reinforces automobile use, the land use consequences of excessive parking exacerbate the car-oriented state of our infrastructure. Large expanses of pavement serve as a physical barrier to walking and bicycling. The expanses of low-density land use make it inconvenient (and uninteresting) to walk and undermine the density required to make public transit an economically viable option (Forinash et al, 2003).

In addition to the air pollution of burning fuel, the physical environment bears the signature of an automobile-oriented transportation system. Excess parking consumes land and space, which destroys natural habitats. Parking lots often replace green space, which allows water to infiltrate, provides habitat, noise reduction, air quality, and aesthetic benefits. Those benefits are erased by paved areas, which contribute to flooding, water pollution, and heat island effects (Forinash et al, 2003). Large parking lots are vast stretches of impervious surfaces, which threaten the integrity of ecosystems and water quality. The amount of runoff increases with an increase in the percent imperviousness within a watershed, and the runoff carries pollutants into water bodies. Impervious surfaces require innovative and potentially expensive stormwater management solutions in order to preserve water quality and minimize flooding. Thus, free parking imposes costs on society because funds must be dedicated to mitigating water quality and environmental damage from an automobile-oriented infrastructure (Cutter & Franco, 2012; Barter, 2010, Shoup, 1999).

Parking in Minnetonka

The city of Minnetonka is no exception to the problems that parking can cause. Figure 3 shows the Target and Cub Foods stores located on County Road 101 on Saturday June 20th, 2009 at 1:15 pm, an expected peak hour for the store. A quick glance at the aerial image shows that well over 50% of parking spaces are empty. This land use arrangement is a prime example of the excessive parking supply conventional MPRs can lead to.

Another prime example of the negative consequence of MPRs can be found in Figure 4, which is the commercial area at the intersection County Road 101 and Minnetonka Boulevard. Of the 19 acres analyzed in this commercial area, 11 of them were in use as parking lot. Those 11 acres are outlined in red. The use of 57% of the buildable area in parking is a clear waste of precious resources, and a perfect example of the many issues that MPRs have caused.

Figure 3: Aerial image of Commercial area in Minnetonka at County Road 101.

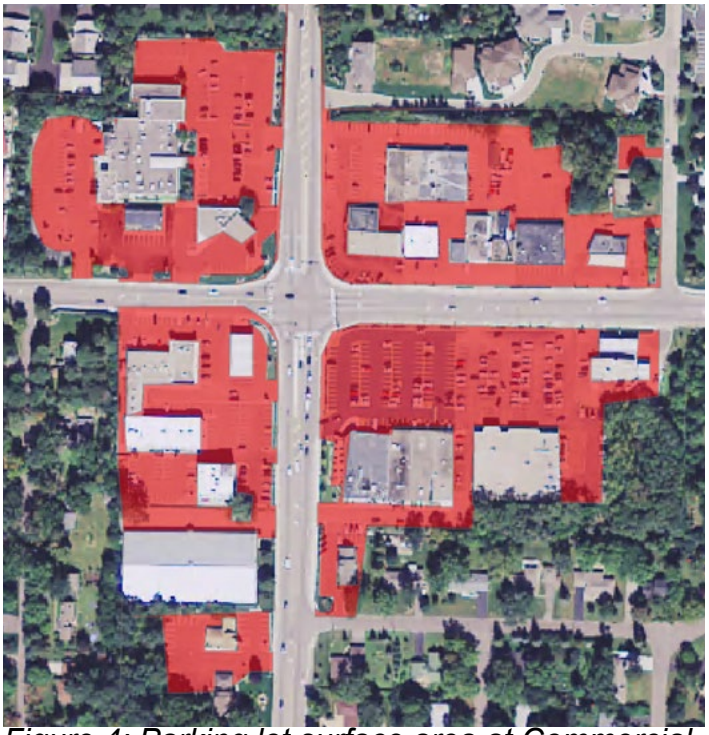

Figure 4: Parking lot surface area at Commercial area in Minnetonka at the intersection of County Road 101 and Minnetonka Boulevard.

Many other commercial areas in Minnetonka show similar trends. For a sample of Author photographs documenting underutilized parking spaces in Minnetonka, please refer to the Appendices. With this knowledge, we have identified recommendations for Minnetonka's parking ordinance, which will help alleviate the parking dilemma the city currently faces.

Code Recommendations

Eliminate Minimum Parking Requirements

From an academic perspective, there is significant justification to simply eliminate Minimum Parking Requirements (MPRs) altogether. Researchers have been quite consistent in identifying the flaws and negative impacts of minimum parking requirements, which leads us to recommend their elimination from parking ordinances. The City of Minnetonka desires to have less wasted parking space, and MPRs are the prime culprit in preventing that goal from being achieved. If Minnetonka chooses to eliminate minimum parking requirements altogether, we recommend the following:

> The transition to a more compact and market-driven approach to providing parking in Minnetonka would have to be coupled with an increase in development on land currently occupied by off-street parking. If a new parking ordinance devoid of MPRs were to be implemented, the amount of parking provided at a site would be determined by the site developer. Since the regional transportation infrastructure and land use patterns are heavily oriented to the automobile, it is likely most residents and visitors traveling to businesses would still have few alternatives to driving and therefore need a place to park. The success of the new parking policy would hinge on effective pricing for on-street parking. By underpricing or overpricing the "overflow" spaces, the market-based supply of off-street parking would fail to serve its purpose, and potentially lead to congestion (Barter, 2010; Shoup, 2011). The political and social disapproval of removing guaranteed free off-street parking would not dissipate in the event of an inefficient transition.

Sacramento, California has eliminated minimum parking regulations within their city. The city found its off street parking spaces to be highly underutilized through an in depth analysis of their parking. To ensure that the elimination of the minimums is not affecting congestion, or hurting business, the city completes a survey of the city every three years (Canepa, 2013). This ensures that the elimination of parking minimums remains effective. The fact of the matter is, businesses have the incentive to provide enough parking spaces for paying customers, and Sacramento understands that it is in a business' best interest to place only the number of spaces that they need, no more and no less.

Minnetonka's parking policy goals would be best met in theory by eliminating MPRs, but the existing infrastructure and social context presents challenges for complete elimination. For that reason, we suggest finding a new minimum that is much lower than peak use predicted by Parking Generation and fits the unique characteristics of Minnetonka. Parking demand will vary by location and land use (Wilson, 1995). It is not a universal or permanent number but rather a fluid amalgam of density, demographics, land use, transportation infrastructure, economic vitality, and long-term goals (Forinash et al, 2003). In the following section, we lay out a strategy that will help the City of Minnetonka identify a new basis for establishing minimum parking requirements.

Survey-Based Minimum Parking Requirements

MPRs can be valuable when properly implemented. They limit congestion that might arise from drivers' unpredictable search for scarce parking, they prevent spillover parking in residential areas, and they ensure that businesses can be reached easily by driving customers (Shoup, 1999b). The elimination of MPRs may not be as applicable for Minnetonka's almost exclusively suburban land use as it is in more urban environs. According to Barter (2010) changing the status quo of convenient, reliable, and free parking is likely to be met with skepticism by the public in a suburban context. The mainstream approach to driving and parking can be deeply embedded, and is likely to be influenced by current residents preferring to live in a setting that gives them perceived driving freedom. Under this context, another more politically attainable option for Minnetonka is to establish a new minimum.

The city of Minnetonka has indicated that they would prefer a minimum parking regulation based on average parking demand in lieu of the current parking regulations based on peak demand. Average parking demand is a relatively new concept that is not heavily explored in academic literature. We chose to define average parking demand as the average of the peak parking period, the hour before the peak period, and the hour after the peak period. We believe that this would lower the minimum parking requirement to a level that would not discourage regular business, but simply spread out the demand over a slightly longer period of time. This can potentially alleviate traffic during these peak periods and reduce congestion and the harms it can cause.

In order to gain an average that will be effective for the city, parking data directly from Minnetonka is needed. Unfortunately, this group did not have the resources to study the many land uses Minnetonka contains in order to find average parking values for each use. An effective study would need extensive survey data covering a variety of uses at many times throughout the week and weekend to ensure that parking demand was being properly accounted for. As the calculations were outside the scope of this project, we have compiled a list of recommendations that the city can effectively employ to determine and implement a new minimum parking regulation based on average. Municipalities including Sacramento, California, and Monroe County, New York have performed their own parking counts. The following recommendations rely heavily on the strategy used by Monroe County. Monroe County determined a new minimum parking regulation based on peak demand, so some alterations from their methods were necessary.

1) Identify land uses, and businesses that fall within each land use.
This determines categories that will be included within the updated ordinance. This data can easily be obtained through records already held by the city.

2) Send out a questionnaire to businesses within each land use category.
This questionnaire will allow for an identification of hours of operations, general site characteristics, square footage, days and times of peak use, usual length of a customers stay, and other data depending on use. Furthermore the questionnaire should include a letter asking for permission for the city to obtain parking counts on the property. An example questionnaire, along with a sample letter can be found in the Appendix (Page A13). The hours of operation, days of peak use, and length of stay indicates the times that counts should be taken, while the square footage or other applicable data allows for the average to be assigned to appropriately sized facilities.

3) Obtain Parking Counts.

Using the data from the questionnaire, the time periods that counts are performed can be determined. Minnetonka would likely need to train several employees to do this over the course of a year, or use trained volunteers to determine the counts. The duration between each parking count is dependent on the length of customer stay that each business indicated on the questionnaire. Counts would occur during peak hours and the hour before and after peak parking demand to determine an average. Another option would be to use camera technology to count a different land use each week. This would permit a less labor intensive process and possibly a smaller investment for the city. However, using camera technology would pose other issues and require technology and IT support.

4) Interpret data to create new average parking counts.

The first step is to find an average parking for each business. These averages can then be plotted on a graph with other similar uses. The dependent variable represents average parking spaces occupied during the counting period (y-axis), while the independent variable (x-axis) is the size of the building (or other applicable characteristic such as number of seats). Only similar uses should be graphed against one another, as different uses should see very different parking demands. After graphing the average parking demand, a linear regression line can be found to determine the correct number of spaces for a specific use. With this regressions line will be an R^2 value and an equation for the line. A linear regression line assumes that the number of spaces needed will increase by a constant number of spaces with an increase in business size. An R^2 value closer to one indicates a better relationship between variables, which means the data is useful in determining an average. A low R^2 likely indicates that the city requires more data, that a non-linear regression will be needed, or that another independent variable other than square footage may be needed. If a high R^2 value is found, the city can use the equation to determine average parking for the use. Once an equation is found for the line, it is easy to determine the expected parking needed. For example, figure 5 shows the results of plotting the used parking spaces for fitness and community centers in Monroe county, New York. The green line is the linear regression line that represents the expected demand based on the data collected. The equation of that line is also provided, which shows that 3.524 spaces plus 3.295 spaces are needed per 1,000 square feet of floor area for fitness centers. This is the equivalent to approximately 1 space per 150 square feet. Remember, Monroe used data for peak demand, so the average demand would likely yield lower results than the example shown.

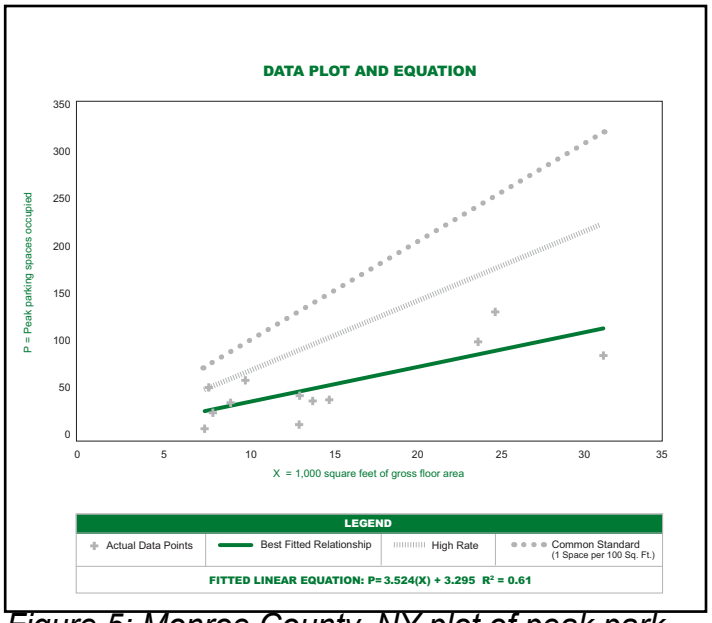

Figure 5: Monroe County, NY plot of peak parking vs square feet of floor area (Source: Monroe County, 2007)

Reduce Minimum Parking Requirements by 35%

Since Minnetonka cannot immediately implement average parking minimums, other steps can be taken now to improve parking regulations. It is clear to the city that parking is in overabundance, and development will not halt until a proper study on parking demand can be completed. Other studies can be used to approximate how much parking should be reduced, although this is not recommended as a permanent solution. The city of Pensacola, FL, found that two of their lots in their business district had only a 46% occupancy rate even during peak hours of demand (Urban Place Consulting, 2007). In Oregon City, Oregon, during peak demand in one study, the usage was found to be 56.5% for off-street spaces in the downtown area, and 38.2% occupied in the non-downtown zone (Rick Williams Consulting, 2009). In a study of a mixed-use suburban area in King County Washington, it was found that the ITE reccomendation was 50% greater than was needed for the situation (Gebhart, 2012). A study in Hattiesburg, Mississippi found that most retail locations were under 50% utlilized during peak hours all year round (Albanese and Matlack, 1999). Countless other sources have shown underutilization of parking space as well. While none of these communities are perfect models for Minnetonka, a clear message is evident in all of them. Even during peak demand hours, free off-street parking demand can be met with roughly half the current supply. Investigation of aerial imagery in Minnetonka, along with an investigation of office space in Minnetonka during peak demand, shows similar results with some parking lots not being used at all.

We recognize that 50% is a significant reduction in parking requirements, and that it may be difficult to reduce the current figures by this much without pushback from the public. That is why we recommend a more moderate 35% reduction in the minimum parking requirement until a more thorough survey can be completed. This also addresses the variation in local conditions that may have impacted the results of the surveys referenced above. Without on-street parking, demand for off-street parking in Minnetonka may be slightly higher than other studies. We believe that a 35% reduction in MPRs will provide an adequate parking supply for Minnetonka while diminishing the parking externalities.

This revised policy will provide businesses and developers with the flexibility necessary to reconsider the most efficient use of their property. Specifically, this will create opportunities for store expansions, additional green space, and more economic development surrounding underutilized lots. More concentrated development will increase opportunities for shared parking arrangements.

Shared Parking

Outside of minimum parking requirements, shared parking provisions are among the most popular components of a parking ordinance. To some extent they commodify parking by allowing business to trade rights to their parking according to their various needs. The basic premise is that businesses don't use all of their parking all of the time. Parking use tends to peak at specific times in a predictable manner, which leaves parking underutilized for the remainder of the day. Furthermore, peak parking occurs at different times for different uses. Permitting the shared use of parking between uses with staggered peak parking times is a benefit to businesses and the city. Businesses need to construct and maintain fewer parking spaces while cities enjoy a more efficient use of land and thus higher property tax revenues.

Implementation of this concept can be achieved in at least two ways. First, businesses can prove their hours of operation don't overlap. Another approach is to establish guidelines for which uses can share

parking according to their anticipated peak demand. A book published by the Urban Land Institute titled *Shared Parking* provides a detailed description of how to establish such guidelines (ULI, 1983). An ordinance prepared by the City of Minneapolis has been provided in the Appendix as an example.

Maximum Parking Ratios

One possible complement to minimum parking requirements is the adoption of maximum parking requirements. The City of Minnetonka has shown interest in updating their parking ordinance to establish maximum parking requirements. The traditional approach of controlling parking within a municipality has been to set minimum parking requirements, but this has led to obvious negative externalities that are discussed in more detail in the minimum requirements section above. Maximum parking requirements would allow a municipality to shift from requiring parking to limiting parking with maximum requirements and having more control over the parking supply in the city (Barter, 2010). Maximum parking requirements shift the view of regulating parking and change the question that a municipality addresses when viewing parking. Instead of regulating how much parking to supply, maximum parking requirements address how much parking to allow.

Maximum parking requirements could solve many of the negative externalities that have arisen from the adoption and regulation of minimum parking requirements. There are many advantages to using maximum parking requirements including reducing the amount of impervious surfaces, preserving more open or natural space in the city, increasing the efficiency of land use and encouraging more walkable urban activity centers (Forinash et al, 2003). The introduction of maximum parking requirements would benefit the city and create a more sustainable community, as there is clearly a demographic and cultural shift occurring in this country resulting in an increased demand for more concentrated, walkable communities. Maximum parking requirements could be just one tool used to bring the urban design of the city of Minnetonka towards this future and attract a greater diversity of residents.

By adopting maximum requirements, the city of Minnetonka will be able to provide as much parking as they believe is necessary for each land use, but nothing more than what is necessary at each land use. The city would be able to manage its parking supply more efficiently with maximum requirements and decrease the over-abundance of parking spaces that come along with minimum parking requirements. This problem is especially evident in the large commercial activity centers throughout Minnetonka. Parking requirements could be tailored to meet parking demand, which could be based on a variety of factors such as density, household size, area population, levels of transportation service or transit accessibility.

Certain developers and businesses may support the adoption of maximum parking requirements. Land uses that do not generate the parking demand that is currently required under the minimum parking approach would be able to provide less parking, therefore lowering construction and development costs (Forinash et al, 2003). However, this will not apply to all business owners or developers. There is a balance in setting maximum parking requirements, and the policy makers in Minnetonka must have a thorough understanding of the parking demand in different areas of the city. This parking demand could be adjusted according the results of the survey discussed above.

Maximum parking requirements could be easily adopted by the city of Minnetonka within the existing regulatory framework by replacing the existing minimum requirements with maximum requirements.

Maximum requirements would be relatively simple to draft into the existing City Code and would follow the same rationale as the minimum parking requirements for each type of land use, such as a ratio of parking spaces based on the square feet of development. Pittsburgh, Pennsylvania and Redmond, Washington are just a couple examples of communities that have established maximum parking requirements based on such a ratio (Davidson and Dolnick, 2002). Like minimum requirements, maximum requirements could be provided and set for many different types of land use.

Davidson and Dolnick have described other methods of adopting maximum requirements, such as limiting the number of parking spaces only in certain areas or combining maximums with minimums to create an allowable parking range (2002). Adopting maximum requirements in certain areas that are applied equally to all businesses in that area would be much more acceptable than targeting certain uses, such as high activity commercial centers (Litman, 2006). The city of Minnetonka could use one of these forms described above to adopt maximum parking requirements in their community.

While there are benefits to adopting maximum parking requirements, limitations of this type of regulation exist. One basic limitation is that maximum requirements are not ideal for every situation or land use. Another limitation is that businesses may not be supportive of the shift from minimum to maximum requirements. Developers may be concerned with the long-term marketability of property for businesses as land uses and the associated parking needs change (Forinash et al. 2003). Also, maximum requirements do not allow businesses to provide the ample parking and the possibility exists that parking supply may not meet demand, which could affect businesses that rely on the ability of their customers to easily find parking (Davidson and Dolnick, 2002). Another limitation of maximum parking requirements is the possibility of spillover parking into adjacent lots or neighborhoods. Addressing this potential overflow parking will be important in working with businesses and residents throughout the community. Clearly there are some obstacles that would need to be addressed if maximum parking requirements were going to be effective in Minnetonka.

The transition to maximum parking requirements would have to be accompanied by other policies to ensure efficient parking management. One potential policy would be a system of parking entitlements that could be transferred between users. This type of system was adopted in Portland, Oregon, and was structured around a system in which allowable parking spaces could be sold as an entitlement to other developers interested in exceeding the maximum parking requirement (Forinash et al, 2003). Exceptions to the parking maximums could be adopted if developers or businesses provide structured parking or extra stormwater management techniques (Davidson and Dolnick, 2002). St. Paul, Minnesota allows a developer or businesses to exceed the maximum number of parking spaces if structured parking is used to accommodate the excess parking spaces. One other potential policy would be to impose a parking tax for excess parking spaces, but this policy would most likely meet more resistance than the other policies suggested (Litman, 2006). As for the spillover effect, the city could allow residential or commercial parking permits that discourage the use of adjacent parking facilities or residential on-street parking spaces. By combining maximum requirements with one or more of the policies described above (and below) , the city of Minnetonka would have a better chance of selling the new regulations to businesses and residents.

Reduction for Transit Proximity

Unique parking requirements in areas proximate to transit are valuable for a variety of reasons. First, where transit exists, fewer automobiles will be used to make trips. While there are certain environmental factors which play a role as well, research conducted by Paul Schimek (Schimek 1996) noted a strong correlation between the level of transit service and transit use. This research provides justification for lowering minimum parking requirements in areas proximate to transit.

There are also important reasons to limit the maximum surface parking ratio. Centrally, the success of transit is largely dependant upon characteristics of the area surrounding transit stops. Overabundant surface parking can diminish these characteristics in several ways. One of these variables is density. Research by the US Department of Transportation has shown that lower density areas are negatively correlated with transit use (Frank & Pivo 1996). Surface parking requirements inherently limit the density potential of a development and thus the potential for transit use. Another factor is distance. Research has shown that people are willing to walk only so far to use certain transit modes. New Urbanist designers recommend 1/4 mile for buses and 1/2 mile for BRT and Light Rail. Research has shown that people are willing to walk even further than this, particularly to access rail (Burke & Brown 2007). Surface parking, once again, limits the number of people that can live, work, and shop within proximity transit stop. A third factor is aesthetics. Reid Ewing, an expert on urban form, has published a variety of research detailing the environmental elements that have been shown to facilitate walking and transit use. Surface parking lots contradict several of the important urban design elements recommended by Dr. Ewing (Ewing & Bartholomew 2013). While these factors listed above do not constitute an exhaustive list, they are sufficient to justify a reduced maximum parking ratio in areas proximate to bus and light rail stops.

Minnetonka has a few opportunities to implement this policy. Metro Transit currently provides a variety of bus stops within the city. Within the next couple years it is likely that Minnetonka will also be served by a light rail stop in the southeast corner of the city. Each of these transit stops provide the opportunity for modified parking requirements. Reduced or eliminated minimum parking could be one of multiple measures to promote transit ridership at those locations. The City of Portand, Oregon has eliminated MPRs for sites located within 500 feet of transit with at least 20 minute service (Mukhija & Shoup, 2006), and this model could be a reference for Minnetonka. With reliable service to and from the LRT stations, developers could have more discretion to choose how much parking to provide. An example of how to implement these policies has been provided in the sample parking ordinance in the Appendices. Other than simply eliminating or reducing parking near transit stations, there are spatial options to reduce the impact of parking in these areas. Walking can still be encouraged if the zoning requirements for the near-station developments included specifications on the positioning of parking. For example, parking can be consolidated into one or two locations that might also allow for park-and-ride users. Furthermore, walking would be easier and more pleasant if parking was located below, behind, or beside buildings rather than in front of their entrances (Mukhija & Shoup, 2006). The proposed light rail stations in Minnetonka present an opportunity to be proactive with parking policy. Parking quantity and quality can be modified from the traditional practice that discourages pedestrian movement.

Compact Car Parking

Preserving a share of parking spaces for compact cars is a viable option that would allow Minnetonka to waste less space and still avoid spillover parking effects. Some cities choose to provide a share of

required parking as compact spaces for this purpose, while most are discouraged due to the simplicity of a broad one-size-fits-all approach (Shoup, 2011). However, providing compact spaces serves additional purposes. A guarantee of compact spaces would provide incentive for residents to purchase smaller cars (Shoup, 2011). The standard large spaces do nothing to stifle the increasing size of automobiles, which is a missed opportunity to have a greater percentage of fuel-efficient vehicles on the roads. Also, providing choices in parking space size would cater to a range tastes and purchasing abilities, just as variety in apartment sizes suits different demands for housing (Shoup). By specifying that a certain proportion of parking spaces take up less space, Minnetonka could decrease the overall cost of parking and pioneer a new parking movement that has environmental and social benefits.

Bicycle Parking

Source: www.cwespta.net

Bicycles, like transit, provide an alternative to the automobile. Where they are used, they reduce vehicle trips and thus the need for parking. Of course, they won't be used if the appropriate infrastructure doesn't exist for bicyclists to travel and store their bikes securely. Minnetonka already has a bike system with plans for expansion. A complete system of bike racks and bike lockers are the missing element. Our recommendation is that businesses with bike racks and/or bike lockers be permitted to reduce their minimum parking requirements. As an example, the city of Omaha permits developers to replace up to 5% of their automobile parking requirements with bike parking facilities. In their ordinance, 1 bike locker is equivalent to 1 vehicular space and 5 bike rack spaces are equivalent to 1 vehicular space. Their parking ordinance has been provided within the appendices for reference.

In-Lieu Parking

A supplement to minimum parking requirements are in-lieu programs. These programs provide an alternative for developers that, for various reasons, would choose not meet the minimum parking requirements if given the opportunity. This program permits developers to pay a per-space fee in lieu of meeting the parking requirement. These funds can in turn be used to construct and maintain public parking structures or on-street spaces. In-lieu programs have been used to great effect in number of cities. A thorough description of methods available for pricing the in-lieu fee and public parking can be found in Donald Shoup's book "The High Cost of Free Parking." The benefits of this program include increased flexibility for developers, consolidation of parking, shared parking and a reduction in the need for variances (Shoup, 2011, Ch. 9).

Minnetonka could implement this program by first establishing districts where consolidated public parking would improve the efficiency of land uses. Within these areas developers would be permitted to pay a fee in-lieu of meeting the minimum parking requirements. The fee would be dependant upon the cost of constructing and maintaining the public parking spaces. A sample of how the City of Pasadena financed their on-street and parking structure projects has been provided in the appendices. While there are a variety of opportunities to apply this program within city, one promising opportunity will be the light-rail stop currently proposed by Metro Transit.

Policy Recommendations

Beyond improvements to the parking ordinance, there are several opportunities for Minnetonka to establish complementary policy priorities. Recommendations for parking policy have been provided below. As with the zoning ordinance amendments, these policies will work most effectively as components within a broader policy package.

On-Street Parking

On-street parking can be an important complement to the overall parking system. It is used most in urban environments, but there are many successful applications in suburban locations as well. Benefits to business include additional parking during peak periods. Cities benefit because they can manage the supply and price of the parking.

In light of Minnetonka's vision for the Ridgedale Mall area (see Figure 5), this would be an appropriate location to construct on-street parking space. On-street parking also provides opportunity to establish an in-lieu parking program. The fees collected through the program could be used to retrofit existing streets with on-street stalls.

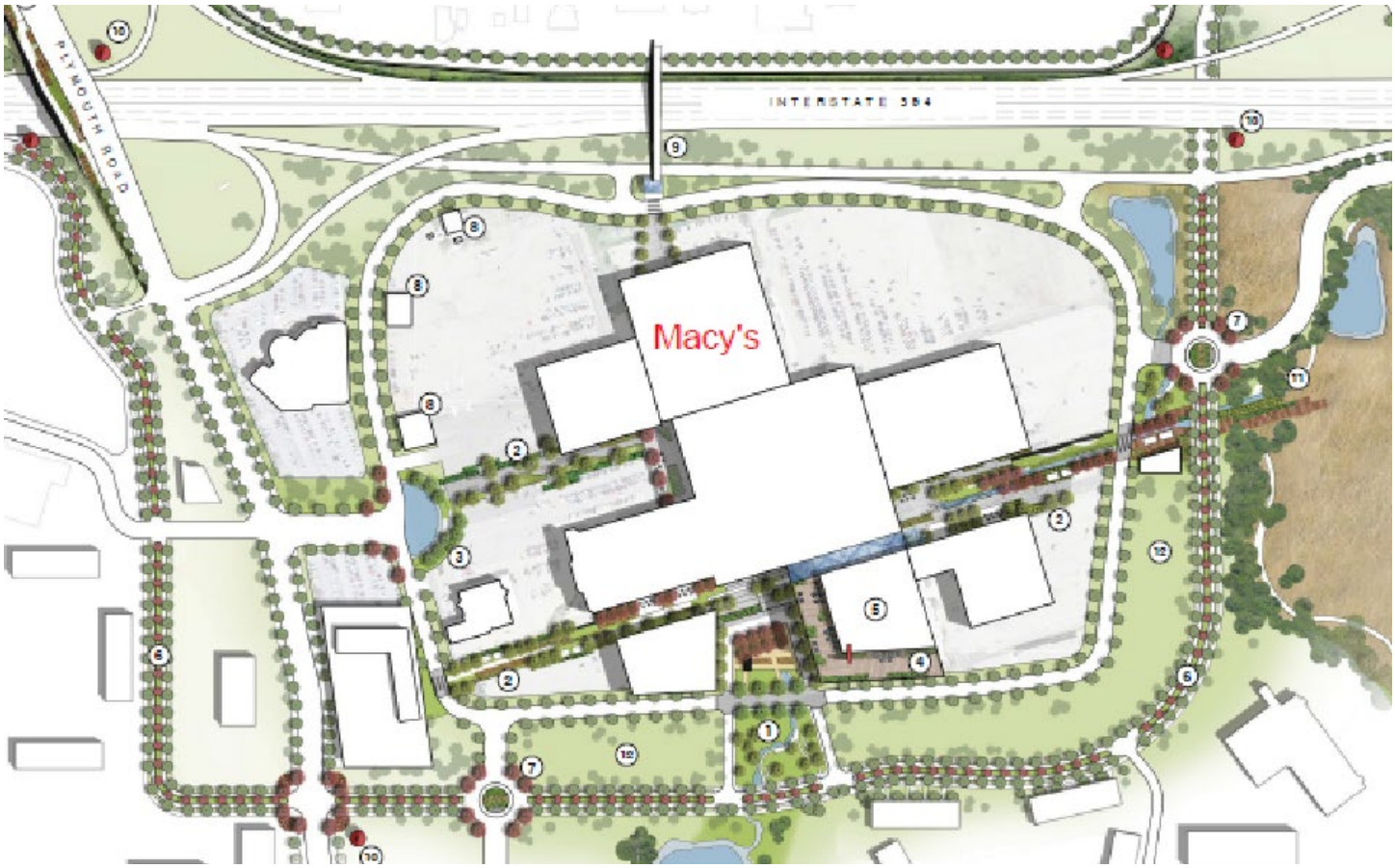

Figure 5: Minnetonka's Vision for the Ridgedale Mall

Market Rate Parking

The work of Donald Shoup has been used extensively in the preparation of our parking recommendations. He is the foremost authority on parking theory and his central recommendation is that parking should not be free. Simply, free parking conceals the true cost of parking within the goods that we purchase. The consequence is that consumer habits are distorted. Individuals ultimately consume more than we would otherwise because the price is bundled with the goods and services we purchase. The comparable example that Shoup provides is that of a meal where dessert is included, or bundled, with the cost of the meal. Economic theory suggests we are more likely to eat the dessert when it is bundled with the meal than we would if we had to pay for it separately. In terms of parking, there are a variety of equity and environmental costs that stem from these distorted actions.

The most appropriate solution is to unbundle parking and charge the market rate for its use. According to Shoup, the market rate should leave roughly 15% of the parking spaces open (specifically in the context of curb parking). This may mean parking is free during some parts of the day and $5 dollars during others. Modern parking technology makes all of this relatively easy to implement. The benefits of this system are extensive. First, it encourages parking turnover, which means businesses will see more traffic. Users can always find a space when they need one. Cities have a new source of revenue for street improvements, landscaping improvements, security/enforcement, etc. Studies indicate that appropriately priced parking can also reduce vehicle miles traveled, which has pollution and congestion benefits.

There are currently limited opportunities to establish market rate parking within Minnetonka. It is clearly infeasible to require businesses to charge for parking. However, there is no reason it can't be permitted and even encouraged. In terms of public parking, the on-street stalls or parking structures constructed through an in-lieu program provide an ideal opportunity to implement market rate prices (Shoup 2011, Ch. 12).

Parking Benefits Districts

Historically, the fees collected from parking have been allocated to municipal general funds with no direct benefit to local residents or businesses. This naturally makes parking fees (and the parking attendants who enforce them) unpopular. An alternative recommended by Shoup is to return some or all of that revenue to the location from which it was collected. These are called parking benefits districts. For business that don't make the connection between market-rate parking and increase business, these districts have proven an effective way to win support for new parking policy. Cities that employ this policy, like Pasadena, use the revenue for security, street cleaning and public works projects in the area around the source of revenue. Thus, in addition to the boon of market-rate parking, businesses and residents benefit from an more aesthetic and safer environment (Shoup 2011, Ch. 16).

The risk of lowering parking requirements is the potential for spillover parking. Parking benefits districts provide a way to manage that risk while providing benefits to the businesses and residents within that district.

Sample Parking Ordinance

The sample parking ordinance, found at the beginning of the Appendix, provides a base that Minnetonka can use to begin the implemention of the strategies outlined in this report. As Minnetonka chooses to implement further strategies, such as minimums based on average parking and further allowances for on-street parking, the ordinance will need to be adjusted accordingly. The ordinance covers 6 key issues that will begin to mitigate for the many externalities that an overabundance of parking can cause:

1) Provide more opportunity for off-site parking
2) Further guidelines for shared parking spaces.
3) Decreased parking requirements in exchange for bicycle parking.
4) 25% of spaces be set aside for compact car use.
5) Maximum parking regulation based on peak hour demand, which is the current minimum.
6) Minimum parking regulation based on a 35% reduction in parking demand, until average values can be studied.

With these recommendations in hand, we feel that Minnetonka can be a leader in the Twin Cities suburban community for parking policy. These changes are essential in creating a more sustainable community that will need to become less dependent on automobiles as time progresses. With a change in parking regulations, along with the many other recommendations obtained through the Resilient Communities program, we feel that Minnetonka will be valued by residents into the future.

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Appendix

Appendix: Revised Parking Ordinance- City of Minnetonka

The sample ordinance reflects many of the recommendations made previously in this report. The following recommendations were made based on the thorough analysis of Minnetonka:

1) **Provide more opportunity for off-site parking.**
2) **Provide further guidelines for shared parking spaces.**
3) **Decrease parking requirements in exchange for bicycle parking.**
4) **Require 25% of spaces be set aside for compact car use.**
5) **Provide a maximum parking regulation based on peak hour demand, which is the current minimum.**
6) **Provide a reduced minimum parking regulation based on average. Until this data is obtained reduce current minimum by 35.**

Each change is color coded within the ordinance according to the topic above.

12. Parking and Loading Requirements.

a) Parking and loading shall be provided and maintained in accordance with the following.

1) No change of use, tenancy or occupancy of a parcel of land or building, including construction of a new building or an addition to a building, which requires additional parking or loading spaces shall be allowed until such additional parking or loading is approved and furnished. Review may be required under the site and building plan review procedures of section 300.27 of this ordinance.

2) Required parking and loading areas and the driveways providing access to them shall not be used for storage, display, sales, rental or repair or motor vehicles or other goods or for the storage of inoperable vehicles or snow.

3) Parking spaces shall be provided using the following methods:

a. On the same development as the use served

b. Off site from the use served provided there is reasonable access shall be provided from the off-site parking facilities to the use being served; the parking shall be within 1000 feet of a building entrance of the use being served; the parking area shall be under the same ownership as the site served, under public ownership, or the use of the parking facilities shall be protected by a recorded instrument, acceptable to the city; failure to provide on-site parking shall not encourage parking on the public streets where on-street parking is prohibited, or on other private property or in private driveways or other areas not expressly set

aside for such purposes; and the off-site parking shall be maintained until such time as on-site parking is provided or an alternate off-site parking facility is approved by the city as meeting the requirements of this ordinance.

4) Shared Parking- Notwithstanding any other provision of this subdivision to the contrary, a land use may provide the required off-street parking area for additional land uses on the same development site if the following conditions are met:

a. because of the hours of operation of the respective uses, their sizes and their modes of operation there will be available to each use during its primary hours of operation an amount of parking sufficient to meet the minimum parking requirement of each use. A reduction in the total number of required parking spaces for two or more uses jointly providing off-street parking when their respective hours of peak operation do not overlap. Shared parking shall be subject to the location requirements of section 3-c-1 and the following conditions:

b. Computation. The number of shared spaces for two or more distinguishable land uses shall be determined with the following procedure:

b-1 Multiply the minimum parking required for each individual use, as set forth in Table b-1-a, Specific Off-Street Parking Provisions, by the appropriate percentage indicated in figure 26, Shared Parking Calculations, for each of the six (6) designated time periods.

b-2. Add the resulting sums for each of the six (6) columns.

b-3. The minimum parking requirement shall be the highest sum among the six (6) columns resulting from the above calculations.

B-4. Select the time period with the highest total parking requirement and use that total as the shared parking requirement.

Figure 26:

General Land Use Classification	Weekdays			Weekends		
	2:00 a.m. – 7:00 a.m.	7:00 a.m. – 6:00 p.m.	6:00 p.m. – 2:00 a.m.	2:00 a.m. – 7:00 a.m.	7:00 a.m. – 6:00 p.m.	6:00 p.m. – 2:00 a.m.
Office	5%	100%	5%	0%	10%	0%
Retail sales and services	0%	90%	80%	0%	100%	60%
Restaurant (not 24 hour)	10%	70%	100%	20%	70%	100%
Residential	100%	60%	100%	100%	75%	90%
Theater	0%	40%	90%	0%	80%	100%
Hotel						
Guest rooms	100%	55%	100%	100%	55%	100%
Restaurant/lounge	40%	60%	100%	50%	45%	100%
Conference rooms	0%	100%	100%	0%	100%	100%
Religious institution	0%	25%	50%	0%	100%	50%
Reception or meeting hall	0%	70%	90%	0%	70%	100%
Museum	0%	100%	80%	0%	100%	80%
School, grades K—12	0%	100%	25%	0%	30%	10%

c. the property owner can provide evidence that even with similar hours of operation, there are an adequate number of spaces to meet the minimum parking requirement of each use. The zoning administrator may make the final decision on the proposed use.

d. the joint use of the parking facilities shall be protected by a recorded instrument, acceptable to the city. The recorded instrument may or may not include the following:

d-1. Twenty four hour exceptions to the shared parking spaces (ie Black Friday), assuming that the lack of shared spaces for proposed 24 hour exceptions shall not encourage parking on the public streets, other private property or in private driveways or other areas not expressly set aside for such purposes.

5) Bicycle parking facilities shall be provided in an amount and design adequate to the demand generated by each use. Bicycle parking may be provided in lieu of parking spaces in the amount of:

a. One enclosed bike space, or 5 rack spaces is the equivalent to 1 car space and;

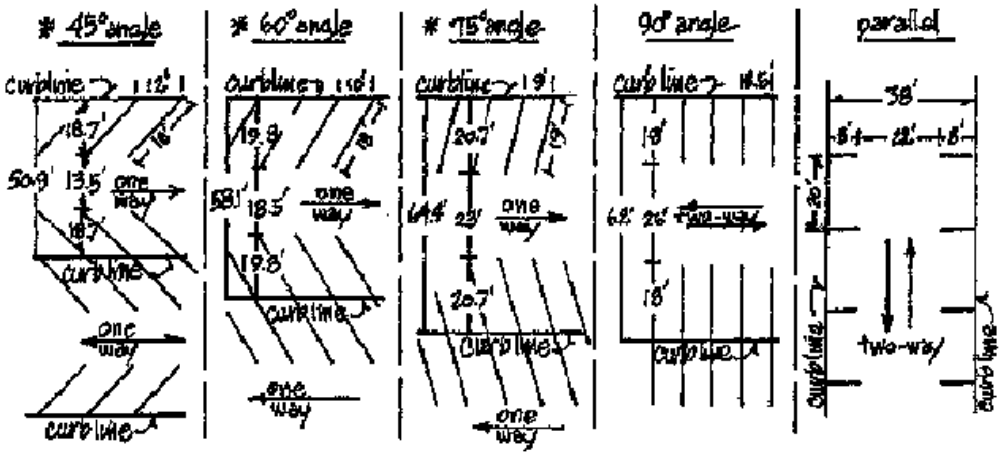
b. A maximum of 10% of spaces shall be replaced by the equivalent bike spaces.

6) Parking areas shall not be used to meet stormwater holding requirements as specified in the water resources management plan.

7) Parking areas and structures shall be designed and maintained to avoid vehicles queued within the public right-of-way. Gates or other access limiting devices may be installed only after a finding by the city that no adverse impacts on public right-of-way will result.

b) Parking areas shall be designed in conformance with the following: (Figure 27)

Figure 27:



1) **Parking stalls shall have a minimum paved dimension of 8.5 feet by 18 feet. Stall and aisle dimensions shall be as noted below for the given angle:**

Angle	Curb Length	Stall Length Parking Structure	Aisle Width***	Low-Turnover
45◦	12.0'	18.0'	13.5'*	12'
60◦	10.0'	18.0'	18.5'*	16'
75◦	9.0'	19.0'	23'	18'
90◦	8.5'	18.0'	26'**	24'
Parallel	20.0'	8.0'	22'	22'

* one way aisles only.
** aisles serving one row of 90◦ angle parking spaces may be 22 feet wide.
*** aisle widths within parking structures for low-turnover uses, such as offices, industrial facilities, residential complexes and hospitals. Retail uses and other uses with similar traffic characteristics are considered high-turnover uses.

2) **25 percent of the total number of required spaces in all parking areas will be for compact cars and have minimum paved dimensions as follows:**

angle	curb length	stall length
45◦	10.0'	16.0'
60◦	8.5'	17.5'
75◦	8.0'	16.5'
90◦	7.5'	16.0'
Parallel	16.0'	8.0'

a. compact car stalls shall be identified by appropriate directional signs consistent with sections 300.30 et seq. of the code of city ordinances;

c. compact car stalls shall be distributed throughout the parking area so as to have reasonable proximity to the structure served.

d. the design of compact car areas shall to the maximum feasible extent be such as to discourage their use by non-compact cars.

3) **All parking areas except those serving one and two family dwellings on local streets shall be designed so that cars shall not be required to back into the street. If deemed necessary for traffic safety, turn-around areas may be required.**

4) **Buffers and setbacks shall be provided as follows.**

a. Access drives, driveways and aisles shall not be allowed to intrude into a required parking setback except at the access point or where a joint drive serving more than one property will provide better or safer traffic circulation; and

b. Parking lots, driving aisles, loading spaces and maneuvering areas shall have setbacks as indicated in the following table:

Required Parking Setbacks								
land use designation of adjacent property	**zoning classification of subject property**							
	R-1/R-2	**R-3**	R-4	R-5	B-1	B-2	B-3	I-1
R-1 with CUP for public buildings	20'	20'	20'	20'	20'	20'	20'	20'
low density	20'	20'	20'	20'	20'	20'	30'	30'
mid density	20'	10'	20'	20'	20'	20'	30'	30'
high density	20'	10'	20'	20'	20'	20'	30'	30'
commercial	20'	10'	10'	10'	10'	10'	10'	20'
industrial	20'	10'	10'	10'	10'	10'	10'	10'
office	20'	10'	10'	10'	10'	20'	20'	20'
institutional	20'	10'	20'	20'	20'	20'	20'	20'
public open space	20'	20'	20'	20'	20'	20'	20'	20'
right-of-way	20'	20'	20'	20'	20'	20'	20'	20'

Land use of adjacent property is as designated in the comprehensive plan. Where a mix of land uses is indicated on the comprehensive plan for adjacent property, the most restrictive applicable buffering requirement shall be observed. The requirements of this table may be waived at points where shared access is utilized.

5) All parking and loading areas, aisles and driveways shall be bordered with raised concrete curbs, or other equivalent approved by the city. Single family and two family dwelling developments shall be exempted from this requirement.

6) All parking, loading and driveway areas shall be surfaced with asphalt, concrete or equivalent material approved by the city except single family homes which are subject to the driveway provisions of section 1105 of the code of city ordinances.

7) Except in the R-1 and R-2 districts, all parking stalls shall be marked with painted lines not less than four inches wide in accordance with the approved site and building plan.

8) All parking lots shall provide islands for traffic control as needed.

c) The number of required parking spaces shall comply with the following.

1) Calculating the number of spaces shall be in accordance with the following:

a. if the number of off-street parking spaces results in a fraction, each fraction of one-half or more shall constitute another space;

b. in churches and other places of public assembly in which patrons or spectators occupy benches, pews or other similar seating facilities, each 24 inches of such seating shall be counted as one seat for the purpose of this subdivision;

c. except in shopping centers or where joint parking arrangements have been approved, if a structure contains two or more uses, each use shall be calculated separately in determining the total off-street parking spaces required;

d. for mixed-use buildings, parking requirements shall be determined by the city based on the existing and potential uses of the building. In cases where future potential uses of a building will generate additional parking demand, the city may require a proof of parking plan for the difference between minimum parking requirements and the anticipated future demand; and

e. if warranted by unique characteristics, or documented parking demand for similar developments, or both, the city may allow reductions in the number of parking spaces actually constructed as long as the applicant provides a proof of future parking plan. The plan must show the location for all minimum required parking spaces in conformance with applicable setback requirements. The city may require installation of the additional parking spaces whenever the need arises.

2) Maximum and minimum parking requirements are provided below. Current businesses may follow the guidelines to expand operations, or use extra parking spaces for alternative uses. The minimum parking requirements can be used as a ratio, based on the unit of measurement, to determine the minimum amount of parking that is required. The maximum number of off-street parking spaces of each use shall be as follows:

a. single-family dwelling and two-family dwellings: maximum two parking spaces for each dwelling unit.
Minimum: 1.3 parking spaces per dwelling unit.

For single-family dwellings, a suitable location for a garage measuring at least 20 feet by 24 feet which does not require a variance shall be provided for each dwelling unit. For two-family dwellings, a suitable location for a garage measuring at least 13 feet by 24 feet, which does not require a variance, shall be provided for each dwelling unit. Such spaces must be shown on a survey or site plan to be submitted when applying for a building permit to construct a new dwelling or alter an existing space;

b. multiple family dwelling: two parking spaces for each dwelling unit, of which one space per dwelling unit shall be completely enclosed. The maximum parking spaces may include the space in front of garage doors.
Minimum: 1.3 parking spaces per dwelling unit.

Additional spaces for visitor parking shall be provided based on the specific characteristics of a development and the anticipated demand for visitor spaces as determined by the city. These characteristics may include, but shall not be limited to, the project size, the number of enclosed parking spaces, the accessibility of open parking spaces, access to on-street parking, topographical characteristics, the preservation of significant trees, the impact to surrounding property, and the site and building design. Developments of 12 or fewer dwelling units, where each unit has two enclosed parking stalls, must have a maximum visitor parking of 9 parking spaces total. Visitor parking may include spaces in front of garage doors for individual units;

c. senior citizen housing developments: one parking space for each unit is the maximum. The city may require proof of parking of two spaces per unit if conversion to general housing appears possible. At least 50 percent of the required parking spaces shall be within an enclosed weather controlled structure connected to the principal structure. The visitor parking requirements for multiple dwellings shall apply;

Minimum: 0.65 parking spaces per unit.

d. boarding or lodging house: maximum one parking space for each two persons for whom sleeping accommodations are provided;

Minimum: 0.65 parking spaces for each 2 person accommodating unit.

e. convalescent or nursing home: maximum one parking space for each four beds for which accommodations are offered, plus three spaces for each four employees on the major shift.

Minimum: 0.65 parking spaces for each four resident beds.

Minimum: 0.5 parking spaces for each four employees on the major shift.

If the city determines that the building is convertible to market rate housing, two stalls may be required for each potential dwelling unit under a proof-of-parking plan. Each facility must provide a parking plan or agreement for special event parking, if there is not adequate on-site parking for these events;

f. hospital: maximum one parking space for each two hospital beds plus one space for each employee on the major shift;

Minimum: 0.65 parking spaces for each two hospital beds

Minimum: 0.65 parking spaces for each employee on the major shift

g. religious institutions and facilities, other buildings that include public assembly space, such as community centers and buildings of fraternal organizations, but excluding hotels, and related uses: maximum one parking space for each 2.5 seats based on the design capacity of the main sanctuary or assembly space.

Minimum: 0.25 parking spaces for each 2.5 seats of the main sanctuary or assembly space.

h. senior high school: maximum one parking space for each classroom plus one space for each 10 students based upon design capacity;
Minimum: 0.65 parking spaces for each classroom.
Minimum: 0.65 spaces for each 10 students.

i. elementary, junior high school or similar school: maximum two parking spaces for each classroom;
Minimum: 1.3 parking spaces for each classroom.

j. conditionally permitted schools which are not covered by paragraphs h. and i.: maximum one parking space for every three students, plus one space for each instructor;
Minimum: 0.2 parking spaces for every three students.
Minimum: 0.65 parking spaces for each instructor.

k. municipal administration building, public library, museum, art gallery, post office or other municipal service building: maximum 10 parking spaces plus one space for each 500 square feet of floor area plus one space for each vehicle customarily kept on the premises;
Minimum: 6.5 parking spaces plus 0.65 parking spaces for each 500 square feet.

l. golf course, golf clubhouse, country club, swimming club, tennis club, racquetball club or handball club: maximum 20 spaces plus one space for each 500 square feet of floor area in the principal structure;
Minimum: 13 parking spaces plus 0.65 parking spaces for each 500 square feet of the principal structure.

m. general office building, bank and savings and loan association: maximum one parking space for each 250 square feet of floor area.
Minimum: 0.65 parking spaces for each 250 square feet of floor area.
For class A office buildings exceeding 100,000 square feet of floor area, parking requirements may be reduced based on parking studies of the anticipated parking demand of the specific building. Parking studies are to be prepared by a registered traffic engineer or certified planner;

n. medical and dental office: maximum one parking space for each 175 square feet of floor area;
Minimum: 0.65 parking spaces for each 175 square feet of floor area.

o. shopping center:

1. regional – maximum 5.5 spaces per 1,000 square feet of gross area;
Minimum: 3.5 spaces per 1,000 square feet of gross area.

2. neighborhood or community – maximum 4.5 spaces per 1,000 square feet of gross area.
Minimum: 2.9 spaces per 1,000 square feet of gross area.

If a center contains substantial interior common space, required parking spaces may be reduced based on an analysis of parking demand or proof of parking to be installed if needed at the request of city. Parking demand for restaurants and theaters located within the center will be added to the above figures based upon the requirements of this subdivision;

p. automobile service or gas station: maximum four parking spaces plus three parking spaces for each service stall, one parking space for each 250 square feet of building area used for the sale of goods or services and adequate parking for gas pump areas;
Minimum: 2.5 parking spaces plus 2 parking spaces for each service stall.
Minimum: 0.65 parking spaces for each 250 square feet of building area used for the sale of goods or services.

q. bowling alley: maximum five parking spaces for each bowling lane;
Minimum: 3.25 parking spaces for each bowling lane.

r. hotel or motel: parking subject to the following:
1. with no other facilities than guest rooms – maximum one space per room plus one space per employee on the major shift;
Minimum: 0.65 parking spaces per room plus 0.65 parking spaces per employee on the major shift.

2. with other facilities, including restaurants, conference facilities or meeting rooms – maximum one space per room plus one space per each 4.5 persons of capacity in other facilities.
Minimum: 0.65 spaces per room plus 0.65 spaces per each 4.5 persons of capacity in other facilities.

s. health or fitness center: maximum one parking space for each 225 square feet of floor area;
Minimum: 0.65 spaces for each 225 square feet of floor area.

t. miniature golf course: Maximum 1.5 parking spaces per golf hole;
Minimum: 1 parking space per golf hole.

u. archery or golf driving range: maximum one parking space for each target or driving tee;
Minimum: 0.65 parking spaces for each target or driving tee.

v. assembly or exhibition hall, auditorium, sports arena, banquet facility, conference facility: maximum one parking space for each three seats based upon design capacity;

Minimum: 0.65 parking spaces for each three seats based upon design capacity.

w. theater: maximum one parking space for each three seats for a theater with 15 screens or less that does not share parking with a shopping center and one parking space for each four seats for all other theaters;
Minimum: 0.65 parking spaces for each three seats for first type of theater.
Minimum: 0.65 parking spaces for each four seats for all other theaters.

x. restaurant, tavern or lounge:
1. sit down full service:
a) without on-sale intoxicating liquor or dance hall license – maximum one space per 60 square feet of gross floor area or one space per 2.5 seats, whichever is greater;
Minimum: 0.65 parking spaces per 60 square feet of gross floor area or 0.65 spaces per 2.5 seats.

b) with on-sale intoxicating liquor or dance hall license – maximum one space per 50 square feet of gross floor area or one space per two seats, whichever is greater, except that in cases in which there is a bar area separate from the food service area, a dance area larger than 100 square feet, or other public areas, additional parking will be required as necessary.
Minimum: 0.65 spaces per 50 square feet of gross floor area or 0.65 spaces per two seats.

2. fast food or self service: maximum one space per 60 square feet of gross floor area.
Minimum: 0.65 parking spaces per 60 square feet of gross floor area.

y. skating rink: maximum one parking space for each 200 square feet of floor area;
Minimum: 0.65 parking spaces for each 200 square feet of floor area.

z. retail store or service establishment: maximum one space for each 250 square feet of gross floor area within the building;
Minimum: 0.65 parking spaces for each 250 square feet of gross floor area within the building.

aa. wholesale business, storage or warehouse establishment: maximum one space for each 1,000 square feet of gross floor area for any building used solely in a storage capacity.
Minimum: 0.65 parking spaces for each 1,000 square feet of gross floor area.

For a mixed use building where storage and warehousing is an incidental use to other activity, required parking spaces shall be based upon the specific requirements for each use appearing in this subdivision. Parking requirements

for a mixed use building or a building designed to contain mixed uses shall be calculated by allocating a minimum of 50 percent of gross floor area to the most intense use;

bb. manufacturing, processing or assembly plant: maximum one parking space for each employee on the major shift or one parking space for each 350 square feet of gross floor area devoted to manufacturing plus one space per 250 square feet of gross floor area devoted to office use, whichever is greater, plus one space for each motor vehicle customarily kept on the premises;
Minimum: 0.65 parking spaces for each employee on the major shift or 0.65 parking spaces for each 350 square feet of gross floor area devoted to manufacturing, plus 0.65 parking spaces per 250 square feet of gross floor area devoted to office use.

cc. licensed day care facility: maximum one parking space for each six children based on the licensed capacity of the facility;
Minimum: 0.65 parking spaces for each six children.

2) One handicapped parking stall shall be provided for each 50 stalls. Handicapped parking spaces shall be in compliance with the uniform building code and state law.

3) The parking requirement for uses not listed in this subdivision may be established by the city based on the characteristics of the use and available information on parking demand for such use.

4) Anyone wishing to exceed the maximum regulation may create underground or structured parking, and only with a special exceptions permit issued by the city.

d) Loading and unloading requirements shall be in compliance with the following.

1) Any use which the city believes requires the provision of designated spaces for the loading, unloading or parking of trucks or semi-trailers shall provide such spaces and maneuvering area in the number and configuration which shall be deemed necessary in order to prevent interference with the use of the public right-of-way and with vehicles entering onto or exiting from the public right-of-way.

2) Semi-trailer spaces shall be at least 55 feet in length, 10 feet in width and 14 feet in height plus necessary additional maneuvering space.

3) Spaces shall not be located on a street side of any building, or, if so located, shall be provided with screening deemed adequate by the city.

4) Spaces and the associated maneuvering area shall be at least 50 feet from the property line of any property which is zoned for or designated in the comprehensive plan as residential.

5) No trucks shall be parked in areas other than those designed for such purpose on an approved site plan.

6) Delivery and service areas shall be sized in accordance with Minnesota department of transportation WB-60 standards.

e) Business establishments containing drive-up facilities, including restaurants and financial institutions, shall provide a stacking area for vehicles on the site. A minimum of 6 vehicle spaces per lane shall be provided.
All such spaces shall be entirely on the site and shall be in addition to parking spaces required for the principal use. The vehicle stacking area shall not extend beyond the street right-of-way line and shall be delineated in such a manner that vehicles waiting in line will not interfere with nor obstruct the primary driving, parking and pedestrian facilities on the site.

f) All required parking spaces shall be accessed by adequate maneuvering space. All dead-end parking rows shall contain a turnaround area at least 13 feet deep.
(Amended by Ord. 2012-07, adopted June 25, 2012; Ord. #2004-37, adopted December 20, 2004)

Appendix A:

SAMPLE LETTER TO BUSINESSES
Planning Division- City of Minnetonka

14600 Minnetonka Boulevard,

Minnetonka, MN 55345

<<Insert Date>>
<<Insert Facility>>
<<Insert Address>>
<<Insert City, State Zip>>

Dear Facility Manager:

The Minnetonka Planning Division has established a Parking Survey Advisory Committee to obtain accurate parking counts for various land-uses for future development within Minnetonka. The advisory committee has developed a process to conduct parking counts for various land-uses and would like to obtain permission to conduct a parking survey at your facility.

This survey will aid interested municipalities within Minnetonka in the evaluation of their current parking standards for future development and provide current parking data for developers and consultants. Once all of the various parking counts are conducted and compiled, we will share this information with participating places of worship, municipalities within Minnetonka and all other interested parties.

The parking count on your site would require access for two Minnetonka employees at your site for approximately two to four hours for approximately three to five days. The employees would count the number of vehicles parked during specified time periods based on the typical weekly parking peaks. The data collected from participating businesses surveyed within Minnetonka will be analyzed to determine an accurate parking ratio for future development. We hope you will join us in this effort to provide information to assist in the evaluation of current parking standards used by local governments within Minnetonka. It would be greatly appreciated if you would fill out the attached parking occupancy survey form for your businnes, which contains specific questions about your facility. We are planning to begin conducting parking surveys in the next couple of months and would appreciate your response to the parking occupancy survey form by <<insert date>>.

We will be following up on this letter to determine if you are interested in participating in this survey. Thank you for your time and consideration of this project. If you have any questions, I can be contacted at <<insert number>>.

Sincerely,

<<Insert signature>>

Primary Source of example letter before changes: Monroe County, New York Municipal Government

Each land use has a separate facility questionnaire form. All land use questionnaires can be found on Monroe County's website: www.monroecounty.gov. Below is a sample of the Church/Synagogues Land Use.

FACILITY QUESTIONNAIRE FORM - CHURCH/SYNAGOGUES

Name: _____
Site address: _____
Site location (City/Town): _____

1. What is the square footage of the entire building? _____

2. Are there any other uses occupying your building? ❑ Yes ❑ No

3. Does the facility share parking with another use? ❑ Yes ❑ No

4. Do you have designated parking? ❑ Yes ❑ No
   If yes, how many parking spaces? _____

5. How many parking spaces are on site? Standard spaces: _____ Handicap spaces: _____

6. What are the days and hours that your facility is in operation? _____

7. Please indicate the busiest time ranges below?

Day of Week	AM	PM
Monday	-	-
Tuesday	-	-
Wednesday	-	-
Thursday	-	-
Friday	-	-
Saturday	-	-
Sunday	-	-

Each land use has a separate facility questionnaire form. All land use questionnaires can be found on Monroe County's website: www.monroecounty.gov. Below is a sample of the Church/Synagogues Land Use.

FACILITY QUESTIONNAIRE FORM - CHURCH/SYNAGOGUES

Name: _____

Site address: _____

Site location (City/Town): _____

1. What is the square footage of the entire building? _____

2. Are there any other uses occupying your building? ❑ Yes ❑ No

3. Does the facility share parking with another use? ❑ Yes ❑ No

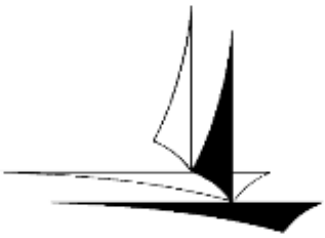
4. Do you have designated parking? ❑ Yes ❑ No
   If yes, how many parking spaces? _____

5. How many parking spaces are on site? Standard spaces: _____ Handicap spaces: _____

6. What are the days and hours that your facility is in operation? _____

7. Please indicate the busiest time ranges below?

Day of Week	AM	PM
Monday	-	-
Tuesday	-	-
Wednesday	-	-
Thursday	-	-
Friday	-	-
Saturday	-	-
Sunday	-	-



City of Minneapolis
Community Planning & Economic Development
Development Services Division
250 South 4th Street, Room 300
Minneapolis MN 55415-1316
612-673-3000

REDUCING OFF-STREET PARKING REQUIREMENTS APPLICATION

541.190. Shared parking. The zoning administrator may authorize a reduction in the total number of required parking spaces for two (2) or more uses jointly providing off-street parking when their respective hours of peak operation do not overlap. Shared parking shall be subject to the location requirements of section 541.250 and the following conditions:

(1) *Computation*. The number of shared spaces for two (2) or more distinguishable land uses shall be determined by the following procedure:

a. Multiply the minimum parking required for each individual use, as set forth in Table 541-1, Specific Off-Street Parking Provisions, by the appropriate percentage indicated in Table 541-4, Shared Parking Calculations, for each of the six (6) designated time periods.

b. Add the resulting sums for each of the six (6) columns.

c. The minimum parking requirement shall be the highest sum among the six (6) columns resulting from the above calculations.

d. Select the time period with the highest total parking requirement and use that total as the shared parking requirement.

(2) *Other uses*. If one (1) or all of the land uses proposing to make use of shared parking facilities do not conform to the general land use classifications in Table 541-4, Shared Parking Calculations, as determined by the zoning administrator, then the applicant shall submit sufficient data to indicate the principal operating hours of the uses. Based upon this information, the zoning administrator shall determine the appropriate shared parking requirement, if any, for such uses.

(3) *Alternative procedure*. An application may be submitted requesting that the zoning administrator authorize a greater reduction in the total number of required parking spaces for two (2) or more uses where an applicant believes that Table 541-4, Shared Parking Calculations, does not adequately account for circumstances unique to the particular property or properties in question. The application shall include, at a minimum, a parking study with a detailed description of the proposed uses, their hours of operation, their anticipated peak parking demand, and anticipated hours that such peak parking demand would occur. Based upon information demonstrating that the peak parking demand for the uses in question would not coincide, the zoning administrator may authorize a greater parking reduction than is authorized by Table 541-4, Shared Parking Calculations. The zoning administrator may impose reasonable conditions to mitigate potential negative effects.

(4) *Process*. An application for shared parking shall be submitted on a form approved by the zoning administrator, as specified in Chapter 525, Administration and Enforcement.

Table 541-4 Shared Parking Calculations

General Land Use Classification	Weekdays			Weekends		
	2:00 a.m. – 7:00 a.m.	7:00 a.m. – 6:00 p.m.	6:00 p.m. – 2:00 a.m.	2:00 a.m. – 7:00 a.m.	7:00 a.m. – 6:00 p.m.	6:00 p.m. – 2:00 a.m.
Office	5%	100%	5%	0%	10%	0%
Retail sales and services	0%	90%	80%	0%	100%	60%
Restaurant (not 24 hour)	10%	70%	100%	20%	70%	100%
Residential	100%	60%	100%	100%	75%	90%
Theater	0%	40%	90%	0%	80%	100%
Hotel						
Guest rooms	100%	55%	100%	100%	55%	100%
Restaurant/lounge	40%	60%	100%	50%	45%	100%
Conference rooms	0%	100%	100%	0%	100%	100%
Religious institution	0%	25%	50%	0%	100%	50%
Reception or meeting hall	0%	70%	90%	0%	70%	100%
Museum	0%	100%	80%	0%	100%	80%
School, grades K—12	0%	100%	25%	0%	30%	10%

541.195. Shared vehicles. Where one or more passenger automobiles are provided on-site for common use by residents, the minimum parking requirement for a multiple-family residential use may be reduced by ten (10) percent provided there are no more than one hundred (100) dwelling units per shared automobile.

Sec. 55-739. - Bonus provisions.

(a) *Bicycle parking bonus.*

(1) A use may substitute bicycle parking for a maximum of five percent of its minimum off-street parking requirement.

(2) For the purpose of calculating a permitted substitution, one completely enclosed and secure bicycle locker is the equivalent of one parking space; five spaces in a bicycle rack are the equivalent of one parking space.

(3) Bicycle parking facilities shall be anchored to prevent easy removal.

(4) The location of bicycle parking facilities shall be at least as convenient to the main entrance of the primary use as the most convenient automobile parking.

(b) *Public transportation access bonus.*

(1) The planning director may authorize reductions of the off-street parking requirement of a use requiring 100 or more parking stalls for providing access to public transportation.

(2) The off-street parking requirement for such a use may be reduced by five percent if the building having such use is within 300 feet of a transit stop designated by Metro Area Transit.

(3) The off-street parking requirement for such a use may be reduced by an additional five percent if the use includes one or more of the following improvements:

a. Provision of a bus shelter of a design approved by Metro Area Transit at the bus stop, together with a designated pedestrian route connecting the bus stop and the building.

b. Provision of a waiting area within the building with ready visual access to the bus stop, together with a designated pedestrian route connecting the bus stop and the building.

c. Provision of a waiting area within the building or a bus shelter within the site together with a designated routing through the site accepted by Metro Area Transit.

(Code 1980, § 55-739)

PARKING REVENUES			
Meter charges	$1,288,012	$1,867	per meter for 690 meters
Valet at meters	$68,915		Valet use of meter spaces
Investment earnings	$89,067		Interest on fund balance
Total parking revenues	$1,445,994	$2,096	per meter
PARKING EXPENSES			
Operating expenses			
Personnel	$51,162		
Cash handling	$44,112		
City abatements	$34,425		
Materials and supplies	$10,335		
Vandalism replacement	$11,862		
Rent	$7,896		
Internal service charges	$2,335		
Total operating expense	$162,127	$235	per meter (11% of revenue)
Capital expenses			
Parking meter lease payments	$66,338		
Parking meter replacement	$36,000		
Total capital expenses	$102,338	$148	per meter (7% of revenue)
Total parking expenses	$264,465	$383	per meter (18% of revenue)
NET PARKING REVENUE	$1,181,529	$1,712	per meter (82% of revenue)
EXPENDITURES IN OLD PASADENA			
Operating expenditures in Old Pasadena			
Security	$247,681	City of Pasadena	
Lighting services	$20,600	City of Pasadena	
Additional sidewalk and street maintenance	$410,796	Old Pasadena Management District	
Marketing	$15,000	Old Pasadena Management District	
Total operating expenditure	$694,077	59%	of net parking revenue
Capital expenditures in Old Pasadena			
Debt service for streetscapes and alleyways	$448,393	38%	of net parking revenue
Total expenditures in Old Pasadena	**$1,142,470**	**97%**	**of net parking revenue**
Net income after all expenditures	$39,059	3%	of net parking revenue

Source: Memorandum from Pasadena City Manager to City Council Finance Committee, May 21, 2001.

PARKING REVENUES		
Monthly and hourly parking fees	$3,251,538	66%
Tax increment	$787,371	16%
Lease revenue	$313,089	6%
Investment earnings	$256,024	5%
Parking credits	$228,537	5%
Marriott revenue	$83,612	2%
Miscellaneous	$7,425	0%
Total parking revenues	$4,927,596	100%
PARKING EXPENSES		
Operating expenses		
Contract services	$1,010,576	21%
Utilities	$203,211	4%
Marriott expenses	$175,180	4%
Personnel	$109,320	2%
City abatements	$62,705	1%
Insurance	$49,665	1%
Internal service charges	$47,236	1%
OP Management District	$30,000	1%
Rent expense	$10,860	0%
Materials and supplies	$9,422	0%
Total operating expenses	$1,708,175	35%
Capital expenses		
Debt service for garage construction	$2,219,694	46%
Payback to General Fund	$350,000	7%
Debt service for Marriott construction	$209,000	4%
Seismic upgrade debt service	$133,958	3%
Bond amortization	$119,521	2%
Amortization cost of land	$96,333	2%
Total capital expenses	$3,128,506	65%
Total parking expenses	$4,836,681	100%
NET PARKING REVENUE	$90,915	

Source: Memorandum from Pasadena City Manager to City Council Finance Committee, May 21, 2001.

Figure A1: Opus Office Park (Friday, April 26th, 2013: approximately 13:00)

Figure A2: Opus Office Park Friday, April 26th, 2013: approximately 13:00)

Figure A3: Ridgedale Mall (Friday, April 26th, 2013: approximately 14:00)

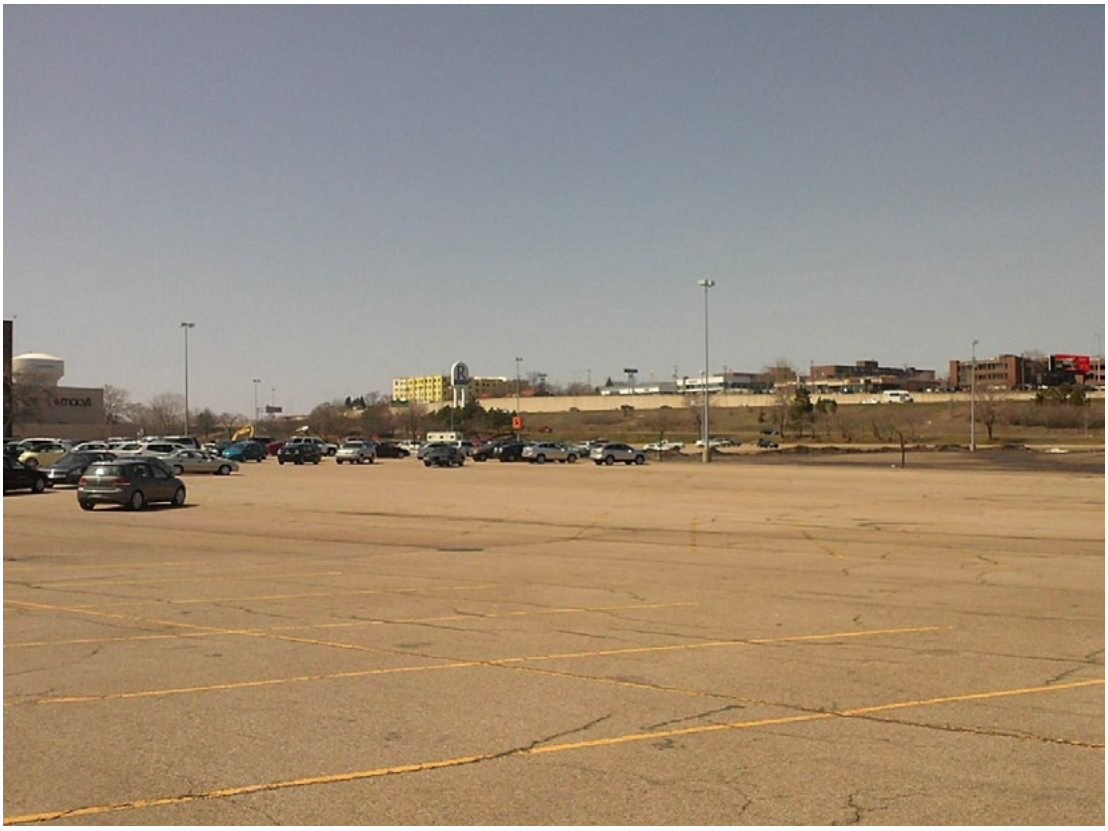


Figure A4: Ridgedale Mall (Friday, April 26th, 2013: approximately 14:00)

Figure A5: Target (Friday, April 26th, 2013: approximately 14:00)

Figure A6: Target (Friday, April 26th, 2013: approximately 14:00)