Minnesota GreenStep Cities

New Approaches to Parking Management

A guide for Minnesota communities

April 2021

Developed for the GreenStep Cities Program

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This GreenStep guide was written by Barb Thoman, RETAP transportation consultant, with significant contributions from Lance Bernard, Hoisington Koegler Group Inc. and Lucy Galbraith, AICP, Metro Transit. The Minnesota Pollution Control Agency funded this work. Photos were taken by Barb Thoman.

Overview

The GreenStep Cities program developed this guide to help municipalities in Minnesota improve the way they regulate and manage on- and off-street parking. The guide will help cities better align their requirements with actual use and changes in how people work, live, shop, and get around. It will help cities identify opportunities for infill development or conversion of underutilized parking to other uses such as public space, farmers markets, community gardens, or art space. It encourages new thinking about the value of on-street parking at the curb. A companion document, to be developed in 2021, will provide a summary of actions taken by cities in Minnesota and elsewhere to right-size and right-price parking.

A tremendous amount of a city's developed land is devoted to parking for vehicles – both on the street and off. Cities regulate and manage parking through the city code and city policies. For decades, city codes required ample parking and cities subsidized curb and ramp parking so it would appear to be 'free' to drivers.

Today many more cities are changing their approach to parking. Cities see underutilized parking lots – contributing to high costs for property owners and high impacts to the environment. Cities feel pressure to better manage curb space which is in higher demand for pick-up and delivery, outdoor dining, and bike lanes and bike parking.

LAND USED FOR PARKING

It's estimated that there are 3.4 parking spaces for every vehicle. There were nearly 4.8 million cars, SUVs, and pick-up trucks registered in Minnesota in 2019. This would equate to 16 million parking spaces or roughly 153 sq miles of land in the state devoted to parking – an area even larger than Rochester, Minneapolis, and St. Cloud combined.

With strained budgets for public works departments, many cities are looking to offset some costs by charging for curb space and municipally owned off-street parking.

This guide discusses the reasons cities of all sizes are reexamining their approach to parking. It outlines the benefits of improving the way that parking is regulated and priced. It talks about the importance of surveying parking utilization and provides a checklist to evaluate a city's parking code. Finally, it outlines a step-by-step process for making improvements, provides estimated costs for consulting help, and lists resources. Updated parking policies, regulation, and management contribute to economically vibrant, sustainable, and equitable cities.

A short history of parking requirements

Richard Willson, in his book, *Parking Reform Made Easy*, provides a little history on the origin of parking requirements. Columbus, Ohio was the first city to adopt parking requirements. The year was 1923. After WWII, parking requirements became widespread due to increasing suburbanization and auto ownership. By 1972, nearly all cities surveyed by the Eno Foundation had adopted parking requirements.[1]

Cities establish requirements for off-street parking in their zoning code. Codes specify how many parking spaces are required for different land uses. For example, one parking stall per hotel room, for each table at a restaurant, or per square foot of floor area. Typically, codes also specify where parking must be located on a site and how parking areas should be designed.

Many cities developed their requirements from guidance in a manual published by the Institute for Transportation Engineers. Some cities adapted their requirements from other municipalities. Both ways of setting parking requirements – using national ratios and copying from other cities - have been subject to significant criticism. Sample sizes were small and local data, expertise, and context was often lacking. National parking expert Donald Shoup states that, "The belief that minimum parking requirements are based on rational city planning resembles the belief that the world is flat and balanced on the back of a giant turtle."[2]

Most cities can plainly see from the high number of partially used surface parking lots that their code requires too much parking. A lack of explicit charges for parking contributes to excessive or possibly unnecessary driving and traffic congestion. Too little parking or poorly managed parking can result in vehicles cruising for a parking space, illegally parking on adjacent properties, or lost business.

Actively managing on-street parking is good for business

Demand for curb space has increased dramatically due to the proliferation of door-to-door pick-up and delivery services, ride hailing, growing demand from restaurants for outdoor dining, and space needs for bicycle and scooter parking. In downtowns and commercial corridors, new uses compete with drivers who typically prefer curb parking to parking in a ramp or garage. Employers still need to provide incentives for employees to leave high use curb space for customers.

Overall, management of parking at the curb has become more complex and demanding. When actively managed, on-street parking can be a boon for business – ensuring access and turnover and keeping roads free of vehicles cruising for parking. Customer cars parked at the curb provide a buffer for pedestrians, making the sidewalk safer for walkers and other uses. Well-managed curb parking can reduce the need to build off-street parking.

In high demand commercial areas, metered parking is becoming more common. Today's parking technology can automatically modify parking rates by day of the week, time of day, or real-time demand. While technology allows for remote payment, a cash option for people without credit cards or smart phones will still be needed. A rule of thumb suggests setting meter rates such that 15 percent of spaces, or one in every eight spaces, will be open at any one time.[3] Evidence indicates that shoppers will pay a little more at the meter for assurance of finding an open space.

INCREASED DEMAND FOR CURB PARKING

New parking management technology helps cities manage high demand for curb space.

Parking is expensive and people who don't use it still pay

In the United States, most parking for vehicles is provided at no cost to the user, but that doesn't mean that the costs are insignificant. The book *Shared Parking* estimates that constructing off-street parking ranges from $3,500 per stall in a surface lot to $50,000 per stall for an underground garage. Annual operating costs range from $45 per month to $550 per month per stall. [4] By contrast, someone arriving on bicycle needs only one-tenth the space to park a bike.

'Free' parking is subsidized parking and there is a growing recognition that providing, maintaining, and operating parking increases the cost of everything from hardware to health care. 'Free' parking is often not equitable. The cost of providing 'free' parking is paid indirectly by everyone. Customers who arrive at a restaurant, the doctor, or the pharmacy on foot, bicycle, or public transit are still paying for parking even though they don't use it or need less of it.

Since transit riders and people who walk for transportation often have lower incomes, providing 'free' parking for drivers can be a cost to people who can least afford it. For low-income people for whom driving is a necessity, there will continue to be a need for subsidized and affordable parking. Cities shifting to more paid parking may want to consider low-cost parking options for low-income users or low wage workers.

The impacts of parking lots and the benefits of 'right-sizing'

This section discusses reasons to re-thinking parking policies and requirements and the benefits that can result.

City revenues

How much parking a city requires or allows can greatly affect its finances. In some cities, revenue from on-street parking fees, in lieu fees, or parking facility charges, are an important revenue stream. When a city's code requires ample parking, buildings will be smaller and parking lots will be bigger, resulting in less property tax revenue per site. Non-profit organizations, including churches, do not pay property taxes.

LOST TAX REVENUE

Three houses on Holly Avenue in Saint Paul pay property taxes that contributes to city and county services including schools, parks, and road repair. Across the street on a similar sized parcel of land, sits a church-owned parking lot that is used infrequently.

Three houses on Portland Avenue in Saint Paul generate approximately $28,000 annually in property tax revenue.

Church parking lot across the street from the three houses in photo above. While appreciated by parishioners, the parking lot generates runoff, heat, and no revenue for the city.

Business creation; retention of historic structures

Getting parking right is essential to a healthy business climate and to access within a city. Too little parking can

be a barrier to business creation and retention; but too much required parking can be a barrier to the creation, expansion, and operation of small businesses.[5] This is especially true in older areas that lack the land or affordable sites for parking. In many cities, usable and historic buildings have been demolished to make way for parking lots which can reduce the appeal and economic vitality of commercial areas.

The cost of housing

Building and maintaining parking whether in a lot, a ramp, or underground is expensive. The more parking a housing developer is required to build, the higher will be the purchase price of a unit or the monthly rent. Studies have shown that the cost of structured parking can add $140 per month or $1,700 annually to a renter's household costs; comprising 17% of monthly rent.[6] More broadly, the amount of parking required can directly or indirectly prevent the construction of affordable housing.[7] Cities are beginning to reduce or eliminate parking requirements for multi-family housing. Seattle is now requiring that tenant parking be rented separately from a housing unit in buildings of ten units or more [8]. This is referred to as unbundling. These practices save money for tenants without a car while tenants with a vehicle will pay an amount closer to the true cost.

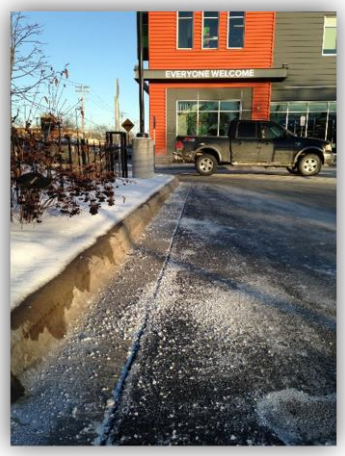
Stormwater runoff

A surprising amount of water runs off a parking lot after a rain or when snow melts. In an average year in Minnesota, precipitation on one surface parking stall can generate as much as 5,600 gallons of water.[9] Climate change is increasing precipitation across much of Minnesota and heavy rain events that result in flooding are happening more often.

In the winter and early spring, parking lot run-off is typically laden with chloride used for deicing. Chloride permanently pollutes rivers, lakes, and groundwater. Permeable pavement can direct stormwater to groundwater rather than surface water, but won't reduce chloride impacts.

In the summer, parking lot pavement can be super-heated. On a hot day when it rains the warm run-off elevates temperatures in receiving lakes, streams, and rivers. Aquatic life can be injured or killed by water that is too warm. Warmer water can also change the type and abundance of plants and animals in Minnesota's lakes and rivers.[10]

WARM, SALTY STORMWATER



Grocery store parking lot in Minneapolis.

Deicing salts on parking lots pollute water, soils, and damage property. Often more parking means more pollution.

Urban heat island effect

On hot sunny days, the surface temperature of parking lots (and roads) can be 50°F to 90°F warmer than the air. Impervious surfaces, including parking lots, increase the air temperature in the daytime and the nighttime at both a neighborhood and municipal level.[11] A research study from the University of Minnesota found that "some parts of the Twin Cities can spike temperatures up to 9°F higher than surrounding communities as a result of the 'urban heat island' effect."[12] Higher summer temperatures increase air pollution, health risks, and energy use. Five to 10 percent of community-wide demand for energy is used to compensate for the heat island effect.[13] Replacing underutilized parking spaces with

development topped by solar panels or by vegetation can reduce temperatures by using or deflecting the sun's radiation and releasing moisture into the air.

Degradation of the pedestrian environment

Parking lots sandwiched between buildings or located in front of buildings detract from the vibrancy of a city street. Lots can be impediments to pedestrians – providing no shelter from wind or sun and increasing the time and distance to get to destinations. Parking facilities can be perceived as unsafe by pedestrians as they provide few 'eyes on the street.' Cities are being more prescriptive about the design of parking – limiting where it can be placed in relationship to a building or building entrance, requiring dedicated walkways through parking lots, installation and maintenance of vegetation and fencing, and on-site stormwater management.

Parking requirements and 'free' parking contribute to driving

When parking is readily available and provided at no cost to the driver, it makes driving and parking more likely. 'Free' parking disadvantages other modes of transportation – often the modes that lower-income people or people with a mobility-impairment need the most. Incentivizing driving through abundant or subsidized parking, contributes to air pollution, traffic, and noise – which negatively effects walking and community livability. Many big city downtowns don't have parking requirements and workers and shoppers typically pay closer to market prices. In these places, people are more likely to choose public transit, carpooling, walking, bicycling, or scooters.

Steps to evaluate and update a city's parking practices and policies

This section outlines steps a city can take to update and modernize the way it regulates and manages vehicle parking. The 'right' amount of parking to require and the 'right' price for that parking will be unique to each city. Requirements will be unique to each land use type and may differ within zoning areas/districts. City topography, transportation networks, land use patterns, and development goals will contribute to determining the right amount of parking to require and how curb parking should be regulated.

Cities can revise parking requirements to incentivize opportunities for infill development (new businesses or housing) or conversion of underutilized parking to public space, farmers markets, art markets, community gardens, art space, and other desired uses. Many small cities with low parking demand will likely continue 'free' curb and municipal parking but they may want to better regulate use of the curb in downtown and other commercial areas.

Updating parking requirements may not be without controversy but the benefits will be significant. Most drivers are accustomed to ample and seemingly 'free' parking nearly everywhere they go – so a city will need to approach parking reform like any other potentially controversial effort the city would undertake. The support of key staff, city council members,

MANAGING DEMAND

Cities are more actively managing curb parking because of high demand.

Lake City manages curb parking along Highway 61 to ensure parking is available for users when they need it.

the business community, and residents will be key. A robust and equitable public engagement effort should be a part of your plan. Briefly, here are the steps the experts recommend.

Step 1. Undertake a utilization survey and 'count the cars'

Most cities start the process of updating municipal parking requirements and practices by accessing how much parking is provided and how much is being used. Locally derived data is essential. While the local perception might be that parking is hard to find, usage surveys often reveal that parking is available for most land use types even during high demand periods.

A parking survey must consider utilization during different times of the day, week, and year. Determine how usage rates vary for different land use types in general and as specified by category in your code. Note locations where on-street parking or ramp parking, if it's available, is used to handle regular or overflow parking. A city should note usage during special events or usage for winter snow storage.

A review of parking use in a small area or district can be accomplished by city staff or with interns using sound methodology. A more in-depth analysis will be needed for a larger area, or an area with more complex and varied on-street requirements. Keep in mind that societal changes, such as the pandemic, may impact parking demand and use for specific land use types for some time to come.

Step 2. Review the parking sections of your city code with this sample checklist

Parking requirements are typically found in a city's zoning code; often in more than one section. A city should not rely solely on ratios developed by national publications or other cities. Take time to thoroughly review the code and consider these questions:

a) Has the parking code been updated in the past five years and what feedback have your heard from developers or local property owners about the current requirements?

b) How many categories of land uses are identified in the code? More is typically better than fewer.

c) Are there areas of the city without minimum parking requirements such as the downtown or small-scale neighborhood retail where there is on-street parking? Some cities have eliminated parking requirements for older buildings, within specific districts, or for the first few thousand square feet of floor area. This is most common in older commercial areas where parking may contribute to the loss of older or historic structures.

d) Does the zoning code consider the availability of off-street parking in its on-street parking requirements? In small towns, older suburbs, and urban neighborhoods, on-street parking can substitute for much and sometimes all, of the parking needed to support business and reduce vehicle cruising. With meters and signage, curb parking can be managed to ensure that there are always one or two open parking spaces.

e) Are there maximums, or a cap, on the number of off-street spaces or is a variance required for proposed parking over the minimum? Maximums help to reduce the oversupply of parking and have the benefits described previously.

f) Are there incentives (density bonuses) for affordable housing or reduced parking requirements for actions that might incentivize travel without the need for motor vehicle parking?

g) Is bicycle parking required for tenants, visitors, and customers? The code should require indoor bicycle storage for tenants and exterior parking for customers or visitors in a secure enclosure or rack (not a rack that only secures a front wheel). Placement should be in a visible and accessible location to reduce theft and increase user safety.

h) Does the code identify placement of parking relative to the building to maintain a strong and appealing street frontage and to ensure safe pedestrian access? Are multiple curb cuts discouraged to improve traffic safety especially for bicyclists and pedestrian?

i) Does the city allow and encourage shared parking? Is a developer or tenant allowed to reduce the amount of parking it provides if it can document shared parking with a nearby property or within a district? Consultants can help businesses and cities develop shared parking agreements.

j) Is remote parking and shuttle service feasible for major events, festivals, etc.? Shuttle service can reduce the need to require large amounts of off-street parking for occasional uses. Ideally, cities should require event spaces to be located on transit lines/routes or in locations where walking can accommodate a portion of trips. (Location is also important for major facilities such as medical centers, schools, etc. so that a portion of trips can be accommodated without driving and parking).

k) Does the city require a Travel Demand Management Plan (TDM) for developments over a certain size? TDM plans outline strategies developers or property managers will use to reduce the need for vehicle access and to reduce parking demand. The code can make these plans enforceable.

l) Does the city regulate each specific land use separately or does it have form-based codes that regulate the public space? See Step 6 for more information.

m) Is the minimum requirement tailored to the ease of walking and bicycling and the amount and kind of transit available (if it is)?

n) Does the code make provisions for or provide incentives for electric vehicle charging?

REQUIRING BICYCLE PARKING

More cities are requiring development to include secure parking for bicycles.

Step 3. Decide to act and then develop a plan with a budget and a timeline

When it's time to change how your city regulates and manages parking, put together a plan for this effort. The plan should outline your key goals, action steps including robust public engagement, and a budget and timeline. The more extensive the revisions, the longer the project will take, and the more staff time will be required.

You will need the support of key city staff (planning, public works, economic development) and elected leaders. The involvement and support of the business community will be essential. Consider whether you have the resources to hire assistance from a firm with expertise in parking planning and management. See page 12 of this guide for information on consulting help.

Step 4. Evaluate your code and practices in light of survey data

This is the most time-consuming step in the process. There is not a formula to determine the right amount of parking for each land use type, and requirements for one land use type may vary by area of the city. Cities will want to review each type of land use in the code. Cities typically create a spreadsheet to make these comparisons identifying:

- Your city's current code requirements
- Suggested baseline data from national publications
- Code requirements from a few peer cities that have updated requirements in recent years
- Information from your parking utilization survey
- Note differences by zone (such as downtown, mixed-use walkable, suburban low-density no sidewalk)

PROACTIVE STAKEHOLDER INVOLVEMENT

People have strong opinions about parking so planning for public involvement should be a high priority.

Publications that are used by cities and consultants to develop initial baseline estimates of parking requirements are *Parking Reform Made Easy* by Richard Willson (2013) and *Shared Parking* from the Urban Land Institute (2020). Each document provides a step-by-step process for developing/revising parking requirements. Both publications call for comparing current requirements with national estimates, comparing this to local survey data, and then adjusting for estimated trips by bike/walk/transit and goals in local planning documents.

Step 5. Adjust parking requirements/practices in light of city plans

A city's parking requirements and parking practice should be aspirational and forward thinking. If more parking is required than will be needed, the impacts will be felt for decades to come. When updating city parking requirements or management practices, consider your city's long-range plans for development and transportation. Reduce required ratios if your plans call for, or expect, increased walking, bicycling, carpooling, ridesharing, autonomous shared vehicles, transit ridership, or remote event parking or shuttle service. Goals in city planning documents are as important as how much parking is being used in the community today.

Don't forget to examine city public works, economic development, and police department budgets to determine how much your community may be subsidizing parking. This information will help to make the case for change. Could curb parking or parking meters in high-use areas help to offset some of these costs and level the playing field for all modes of travel?

Step 6. Consider district-wide parking approaches rather than regulating each land use separately

A district-wide parking approach uses a combination of strategies to take full advantage of the existing parking supply, while reducing the demand to build additional spaces. This approach is commonly applied in downtown settings, redevelopment areas, and commercial corridors to encourage walkability, foster economic growth, and strengthen the urban environment. Examples are described in the table on the following page.

District wide parking approaches

Downtown Development Authority (DDA)	A typical downtown development authority oversees infrastructure projects, including parking facilities, roadway projects and physical buildings. An authority's primary goals are to increase the quality of life for residents and businesses through economic and physical revitalization of a downtown.
Enterprise Funds	A city can set up an enterprise fund to manage the physical assets and finances for parking facilities, meters, and payments in lieu of parking. Keeping parking costs separate from general revenues helps increase transparency and helps a city better manage its parking resources. Collected revenues can be used to maintain and manage the city's parking supply or can be used for other city priorities.
Parking Benefit Districts (PBDs)	Some US cities have established PBD's to allow a portion of parking meter revenue to be used within the district where it is collected. City code or policy can identify eligible expenditures for PBD funds – examples include sidewalk repair, façade improvements, street trees, seating, lighting, installation of parking technology, and public art. PBDs are typically implemented in busy commercial areas or tourist areas. Often a local business association or neighborhood association helps to determine how the revenue is spent.
Improvement Districts	Improvement districts are formal/legal partnerships among municipal departments, local organizations, private developers, and businesses. They are established to ensure a high-quality customer experience within a specific geographic area. Parking management – including signage, parking rates, merchant ticket validation, and parking education/information - can be one function of an improvement district. Parking revenue can contribute to a district's budget.
Public-Private Partnerships	These partnerships are created to maximize the sharing of parking spaces within a specific geographic area. Revenues can be generated through developer payments, user fees, charges for common area maintenance, or payment in lieu of providing parking spaces required by a zoning ordinance.
Intermittent or seasonal events	Sometimes high parking demand is tied to a season or to occasional events such as summer concerts, art fairs, sports leagues, etc. Rather than building parking that will be empty much of the time, consider using available on-street parking, shared parking arrangements, or remote or shuttle parking.

IMPROVEMENT DISTRICTS

The City of Red Wing provides and manages public parking behind the buildings in its historic business district to prevent building demotion for parking lots on its main streets.

The commercial district along Highway 61 through downtown Red Wing retains its historic character.

The city provides parking behind the buildings along the main streets in downtown Red Wing.

Getting help

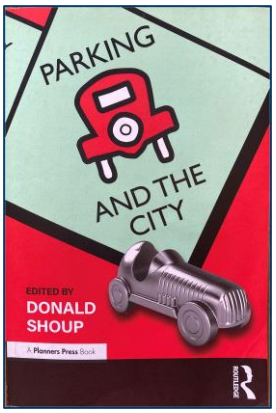
In most cities, staff expertise about parking is uncommon, which is one reason the GreenStep Cities program developed this guide. City planners are trained in only a general way about parking through their professional certifications. Consulting firms in Minnesota and nationally have expertise in parking analysis, planning, and management. Some consultants can help a city evaluate the cost-effectiveness of installing state-of-the-art parking meters.

The cost of a consulting contract for a district-wide parking evaluation will depend on the size of the study (e.g., neighborhood plan, downtown plan, or citywide) and the level of education/engagement that is needed to do the plan. Recent studies in the Minneapolis/St Paul metro area have range from $20,000 to $100,000. The level-of-effort will also vary depending on the amount of contracted public engagement and stakeholder outreach undertaken.

There are a good number of helpful publications about parking including:

- *Shared Parking*, Third Edition (2020). Book by the Urban Land Institute, 209 pages. Approx. cost $160.
- *Parking and the City*, (2018). Book edited by Donald Shoup, 513 pages. Approx. cost $60.
- *Parking Reform Made Easy,* (2013). Book by Richard W. Willson, 244 pages. Approx. cost $40.
- Publications from the American Planning Association can be accessed by members. https://www.planning.org/search/?keyword=parking
- Reports and web information from the Victoria Transport Policy Institute. https://www.vtpi.org/park_man.pdf
- Web resources for cities from the Oregon Department of Land Conservation and Development and the Oregon Department of Transportation. https://www.oregon.gov/lcd/tgm/pages/parking.aspx
- The GreenStep Cities program is developing a document summarizing best-practice examples from cities in Minnesota and elsewhere.
- University of Minnesota Design Center has resources on parking ramp design for flexible reuse.
- Parking Reform Network. https://parkingreform.org/resources/library/

RESOURCES



Shoup's books have been highly influential in changing how cities think about parking.

Conclusions

Most American cities have ample 'free' parking, so this is what drivers expect. Few people are aware of the damaging impacts of current practices. Like many planning efforts, changing parking requirements will be controversial and will require transparency, strong leadership, and clear compelling plans. A successful effort to modernize a city's approach to parking will produce benefits – for business, for housing affordability, for natural resources, and for climate adaptation. There are a great many resources available. It's time to get started!

Endnotes

[1] Richard W. Willson, *Parking Reform Made Easy* (Island Press, 2013), page 11.

[2] Donald Shoup, *Parking and the City (Routledge, 2018)*, page 71.

[3] Donald Shoup, *The High Cost of Free Parking* (Planners Press, American Planning Association, 2004), pages 297-307.

[4] *Shared Parking, Third Edition*, (Urban Land Institute, ICSC, National Parking Association, 2020), page 1.

[5] Willson, page 41.

[6] C.J. Gabbe and Greg Pierce, *The Hidden Cost of Bundled Parking*, Access magazine, University of California Los Angeles, Spring 2017, also reprinted in *Parking and the City*, page 155.

[7] Willson, pages 117-121.

[8] Streetsblog https://usa.streetsblog.org/2018/04/03/landlords-in-seattle-cant-force-renters-to-pay-for-parking-anymore/

[9] Mike Trojan, Minnesota Pollution Control Agency, Stormwater section. Calculations contained in an email to Barb Thoman received in October 2019. The calculations were made using the Minimal Impact Design Standards (MIDS) calculator.

[10] Barb Thoman conversation with Donna Perleberg, Minnesota DNR, on July 28, 2020.

[11] US Environmental Protection Agency, Urban Heat Island, https://www.epa.gov/heat-islands/heat-island-impacts

[12] University of Minnesota, on-line summary of an article in the Journal of Applied Meteorology and Climatology, September 2015, https://twin-cities.umn.edu/new-urban-heat-island-study-shows-surprising-variation-air-temperatures-across-twin-cities

[13] US EPA website on Heat Island Impacts, www.epa.gov/heat-islands/heat-island-impacts

Calculations

Page 3 photo text calculations. Mikail Chester, Arpad Horvath, Samer Madanat, *Parking Infrastructure and the Environment, Access*, University of California, Fall 2011 (for parking space per vehicle estimate). Minnesota Department of Public Safety, MnLARS Motor Vehicle Annual County Report for 2019 (for estimate of number of vehicles in Minnesota). Donald Shoup, *Parking and the City*, page 81, for size estimate of average parking space with access isles at 330 sq ft each.