



The Hidden Impacts of Vehicle Parking and Parking Policy

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I. INTRODUCTION

Parking lots, towers, and garages are ubiquitous in American cities. This is the result, in part, of mandatory minimum parking requirements present in many zoning codes. These requirements stem from the expectation that a person be able to drive to and from anywhere and park their car for relatively cheap if not completely free.

Minneapolis is no exception: local ordinances mandate a minimum number of parking spaces for many real estate development projects. These required parking spaces occupy land, cost money to construct, encourage people to drive, increase greenhouse gas emissions, and increase economic and racial disparities.

The Minneapolis 2040 Plan, approved in 2018, established a policy to “eliminate the requirement for off-street parking minimums throughout the city.”¹ Similarly, the City of Saint Paul established a policy to “Reduce or eliminate citywide minimum parking requirements” in its Climate Action & Resilience Plan.² Both cities are now in the process of implementing these policies in city code. This paper illustrates the effect of parking requirements (and lack of parking maximums) in Minneapolis to inform both Minneapolis and Saint Paul’s decision-making processes around parking reform.

This report looks the impact of a single year’s worth of parking space approvals in Minneapolis. The report finds that one year’s worth of Minneapolis parking approvals—about 6200 spaces—equals:

- > **Space** — 940,000 square feet of surface area—enough to completely cover 16 football fields every year!
- > **Cost** — \$105 million in construction costs—enough to fund two new Bus Rapid Transit lines every year!
- > **Climate Pollution** — Over 21,000 metric tons of CO₂ emitted every year due to trips incentivized by parking availability!
- > **Inequity** — harm to lower income communities and communities of color.

This report is intended to provide context and perspective for decision makers and residents in the Twin Cities as they consider parking code and policy reforms.

1 Minneapolis 2040 Plan, Policy 6 (2018), <https://minneapolis2040.com/policies/pedestrian-oriented-building-and-site-design/>.

2 Saint Paul Climate Action & Resilience Plan (Dec. 2019), page 56, <https://www.stpaul.gov/sites/default/files/Media%20Root/Mayor%27s%20Office/Saint%20Paul%20Climate%20Action%20%26%20Resilience%20Plan.pdf>.

II. BACKGROUND: PARKING DATA

For the purposes of this study, Move Minnesota assumes approximately 6200 parking spaces are approved in the City of Minneapolis each year. Move Minnesota arrived at this figure by reviewing all Minneapolis City Planning Commission development applications over a six-month period in quarters two and three of 2020 and doubling that count.

Over six months, the Minneapolis Planning Commission approved forty-eight development applications. These applications included 3118 parking spaces. Of these approved parking spaces, 864 spaces were surface-lot spaces and 2254 spaces were enclosed.³ Of the 3118 parking spaces approved, 2753 were residential spaces and 365 were part of commercial projects.⁴

³ Enclosed spaces include both above-grade and below-grade parking spaces.

⁴ We define commercial broadly to include office buildings, schools, retail locations, and all other non-residential uses.

III. PARKING: THE SPACE IT TAKES

Parking takes up a lot of space. And there is a lot of it. Although there has not been a comprehensive inventory of the number of parking spaces in Minneapolis or Saint Paul, a study of peer cities found between five and nineteen parking stalls per household in those cities.⁵

Yet we keep adding parking and it keeps taking up space. Based on Move Minnesota's parking counts, **Minneapolis approves just shy of one million square feet of space dedicated to parking cars every year!**⁶ More than 250,000 square feet of this total is surface parking.

To put this in perspective, the ~950,000 square feet of parking approved in Minneapolis each year is equivalent to more than:

- Sixteen football fields, or
- Forty-three First Avenue venues (or 950 Main Room dance floors!).

Or, to put it another way, if you lined up all the annually-approved parking stalls end to end, they would extend 21 miles—that's farther than the distance between the Minnesota State Capital and Hudson, Wisconsin... a whole other state!

And while we are perhaps not sacrificing music or sports venues when we build this much parking, we do likely sacrifice housing and work space. This is because buildings can only be so big under a zoning code. Thus, if significant space is dedicated to parking within that limited building envelope, that parking area cannot be used for the primary purpose of the building, whether providing housing, office, or other uses.

To put this in context, the average apartment size in Minneapolis is 786 square feet.⁷ At 786 square feet, if developers in Minneapolis replaced parking spaces with apartments—potentially literally feasible given the inclusion of parking in residential building envelopes—the city could see just shy of 1200 additional apartments constructed each year.⁸

5 Eric Scharnhorst, *Quantified Parking: Comprehensive Parking Inventories in Five Cities*, Research Institute for Housing America (May 2018). Seattle, WA, has 5.2 parking stalls per household; De Moines, IA, has 19.4 parking spaces per household. Other cities in the study (New York, Philadelphia, and Jackson, WY) were less comparable to Minneapolis.

6 Minneapolis parking area design specifications require standard parking stalls be 8 feet 6 inches wide and 18 feet deep, which equals 153 square feet per parking space. 153 ft² X 6200 spaces = 949,600 total square feet. (This number does not include drive aisles in lots and garages, which can often take up around a third of the lot area depending on the angle of the stalls, whether the aisles are one way or two, etc.—the 950,000 ft² used in the examples is a deliberately conservative number.)

7 RentCafe (last viewed Nov. 2020), <https://www.rentcafe.com/average-rent-market-trends/us/mn/minneapolis/>.

8 As an aside, not all parking spaces can be converted to residential units post-construction: the ceilings in garages are often lower than those in apartments, and some parking is constructed on an incline while residential units are not. Further, the average apartment square footage does not include hallway and lobby spaces. However, given how conservative our estimate for the total parking square footage built in Minneapolis (see footnote 6), 1200 units is a reasonable approximation.

IV. PARKING: THE MONEY IT TAKES

Parking spaces are not cheap to build: the average surface space costs between \$5,000-\$10,000 to construct,⁹ while structured parking can cost \$20,000 to more than \$50,000 to build.¹⁰ In Minneapolis, this means the development community spends upward of **\$100 million on parking every single year.**¹¹

Money spent on building parking is money unable to be spent on other potential infrastructure or benefits. For example, to complement the analysis in Part III of this report, \$100 million could pay for the construction of 636 residential units, assuming the average unit size of 786 square feet and \$200 per square foot construction costs for mid-rise buildings.¹²

Or, at least as relevantly, \$100 million could support alternative transportation options for tenants in individual developments or for the community at large. For example, \$100 million could pay for one year's worth of unlimited Metro Transit fares for more than 69,000 people—that's the equivalent of free transit for everyone in the city of St. Cloud, Minnesota!¹³ Or, if the money were spent on infrastructure, those parking costs could support construction of two Bus Rapid Transit lines every single year!¹⁴

In short, there is an opportunity cost to building parking in Minneapolis that directly implicates people's ability to live and travel in the city.

9 *Transportation Cost and Benefit Analysis II*, Victoria Transit Policy Research Institute (March 20, 2020), <https://www.vtpi.org/tca/tca0504.pdf>.

10 Above-grade parking (parking above the ground) is typically less to construct than below-grade parking: \$24,000 vs \$34,000 per space respectively nationwide. But these numbers may under-estimate the cost of parking: The GAO found that parking adds \$56,000 to the cost of a housing unit (*Low Income Housing Tax Credit*, Government Accountability Office (Sept. 2018), page 30-31, <https://www.gao.gov/assets/gao-18-637.pdf>). For purposes of staying conservative in our data analysis, we use \$21,500 per enclosed parking space for our calculations (see *Parking Structure Cost Outlook for 2019*, WGI <https://wginc.com/parking-outlook/>).

11 In Q2 and Q3 of 2020, the Minneapolis Planning Commission approved the construction of 864 surface spaces. Using \$5,000 as the cost of a surface space, this totals to \$4.32 million dollars worth of spaces. Add to that the 2254 stalls of structured parking at \$21,500 per space (for a total of \$48.5 million in construction costs) and the six-month-worth-of-spaces total comes to \$52.8M, or over \$100 million annually in parking construction costs. Operations and maintenance costs for parking are not included in these numbers.

12 See Hannah Hoyt, *More for Less? An Inquiry into Design and Construction Strategies for Addressing Multifamily Housing Costs*, Harvard Joint Center for Housing Studies (March 2020) page 23 for housing cost estimates (https://www.jchs.harvard.edu/sites/default/files/media/imp/harvard_jchs_gramlich_design_and_construction_strategies_multifamily_hoyt_2020_3.pdf). At \$200 per square foot, the average housing unit on Minneapolis costs \$157,200 to build.

13 An unlimited monthly Metro Transit pass in 2021 is \$120, making the annual cost \$1440.

14 The C-Line BRT cost \$37M; the B-Line cost 54M.

V. PARKING: THE EMISSIONS IT MAKES

In addition to direct costs, constructing parking imposes costs on society by encouraging driving. Parking encourages driving through a phenomenon called “induced demand,” in which the easier it is to drive a car—whether because of increased road capacity or increased parking capacity—the more likely people are to drive, either instead of using alternate transportation modes or through an increase in trips.¹⁵

Increased driving creates a host of negative impacts, including increasing greenhouse gas emissions.¹⁶ The transportation sector is the State of Minnesota’s highest source of climate pollution, and cars and other personal vehicles are responsible for the majority of these emissions.¹⁷

Move Minnesota found that the car travel induced by the 6200 parking spaces approved in one year was substantial, and that the corresponding emissions increase was also substantial. Importantly, all parking spaces considered for the study are in Minneapolis, a city (like St. Paul) reasonably well served by transit, walking, rolling, and bicycling alternatives, which means that alternative ways of getting around exist if driving is not encouraged.

First, Move Minnesota’s analysis assumed that a reduction in parking spaces at commercial locations would primarily impact people’s choice of commutes, rather than people’s decisions to own an automobile.¹⁸ Move Minnesota’s analysis revealed an estimated annual increase of 840 metric tons of greenhouse gases generated from one year’s worth of parking approvals.¹⁹

15 For a fuller explanation of induced demand, see *Driving Down Emissions*, Transportation for America (2020), page 12 (<https://smartgrowthamerica.org/wp-content/uploads/2020/10/Driving-Down-Emissions-FINAL.pdf>). For an overview of induced demand generated by parking, see Eric Jaffe, *The Strongest Case Yet that Excessive Parking Causes More Driving*, Bloomberg CityLab (Dec. 12, 2016) <https://www.bloomberg.com/news/articles/2016-01-12/study-the-strongest-evidence-yet-that-abundant-parking-causes-more-driving>.

16 Increased driving rates also negatively impact health outcomes, increase traffic fatalities, and reduce social cohesion, among other impacts.

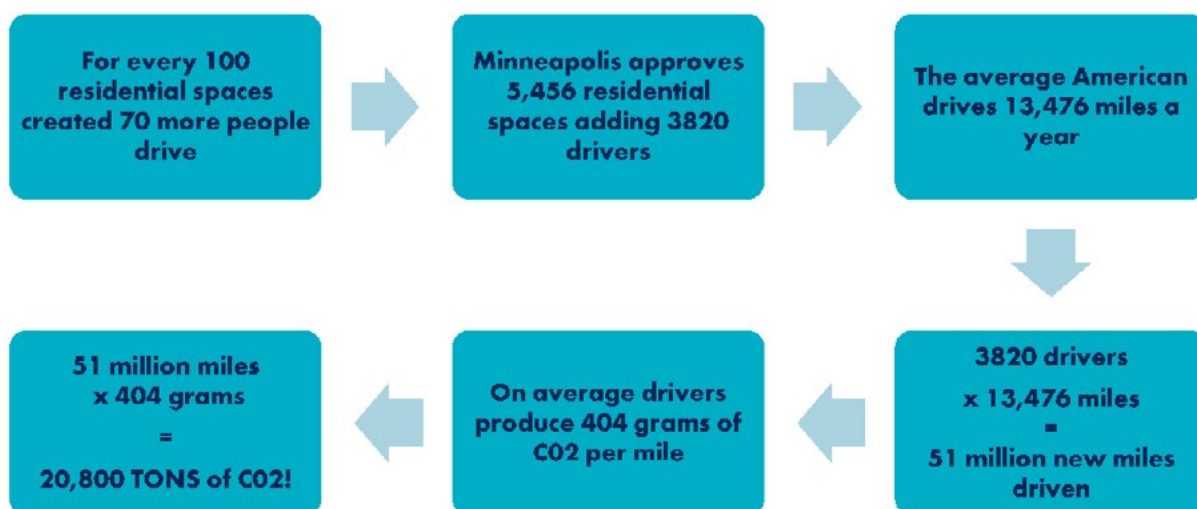
17 *Greenhouse Gas Emissions Inventory 2005-2018*, Minnesota Pollution Control Board, January 2021 (<https://www.pca.state.mn.us/sites/default/files/lraq-1sy21.pdf>).

18 Although commercial spaces are used for customer parking in retail, for the purposes of the study each commercial space was assumed to primarily service commuters driving to work.

19 The average commuter in the Twin Cities drives 9.5 miles to work each day (Elizabeth Kneebone and Natalie Holmes, *The Growing Distance Between People and Jobs in Metropolitan America*, Brookings (March 2015), https://www.brookings.edu/wp-content/uploads/2016/07/srvy_jobsproximity.pdf). Assuming a round trip commute five days per week, fifty weeks per year, this totals 4750 commute miles driven annually. The EPA estimates that the average car emits 404 grams of CO₂ per mile (*Greenhouse Gas Emissions from a Typical Passenger Vehicle*, EPA (last viewed November 2020) <https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical-passenger-vehicle>). At that rate, the average drive alone commuter produces 1919 kilograms of CO₂ every year. Move Minnesota estimated that every 100 commercial spaces approved would induce sixty people to commute by car. (Studies show that after charging for parking in lieu of having it free produce a 50-60% reduction in driving rates (see e.g. David Gutman, *The Not-So-Secret Trick to Cutting Solo Car Commutes: Charge for Parking By the Day*, Seattle Times (Aug. 11, 2017) <https://www.seattletimes.com/seattle-news/transportation/the-not-so-secret-trick-to-cutting-solo-car-commutes-charge-for-parking-by-the-day/>); removing spaces would have a similar if not more extreme effect.) 1919 kgs X 730 commercial spaces X 60% = 840,552 kgs, or 840 tons.

Second, Move Minnesota’s analysis assumed that a reduction in residential parking spaces would primarily impact people’s decision to own a car at all, thereby impacting all driving trips. Move Minnesota’s analysis revealed an estimated annual increase of 20,800 metric tons of greenhouse gas emissions attributable to residential parking construction each year.²⁰

In total, the estimated ongoing annual contribution of greenhouse gas emissions attributable to one year’s parking approvals in the City of Minneapolis is over 21,500 tons of carbon emissions. This represents a full 2% increase in induced transportation emissions across the City of Minneapolis every year, which runs contrary to the city’s goal to reduce emissions by 30% by 2025 and thus must be counterbalanced by other emissions reduction measures.²¹



20 The average American drives 13,476 miles annually (*Annual Miles Driven Per Driver By Age Group*, Federal Highway Administration, <https://www.fhwa.dot.gov/ohim/onh00/bar8.htm>). Move Minnesota examined trends in new housing in other cities and estimated that for every 100 residential spaces approved, 70 people who would’ve decided to go car free drive instead (housing data from DC and San Francisco shows that over 80% of new households are car free: Payton Chung, *88% of New DC Households are Car Free*, Greater Greater Washington (Sept. 12, 2014) <https://ggwash.org/view/35905/88-of-new-dc-households-are-car-free>). Thus the 5456 residential spaces approved in Minneapolis induced 70% of the holders of those parking spaces, or 3,822 people, to own and drive a car annually. 3822 cars X 13,476 miles per year X 404 grams of CO2 emissions per mile = 20.8B grams of CO2 annually, or 20,800 metric tons of CO2.

21 City of Minneapolis Office of Sustainability estimates that in 2018 the city released 4.3 million metric tons of CO2, approximately one million tons of which was generated by the transportation sector (*2018 GHG Update*, City of Minneapolis, <https://www2.minneapolismn.gov/media/content-assets/documents/2018-GHG-Inventory.pdf>).

VI. IMPLICATIONS: RACIAL DISPARITIES AND CLASS DISPARITIES

Parking requirements and construction carry particular costs for communities of color and lower income community members. This is primarily because parking reinforces a series of land use, operational, practical, and cultural systems in which car ownership is necessary to fully access opportunities. This system is unsustainable.

Car ownership is inequitably distributed. In Minneapolis 31% of households of color do not own a car, while only 12% of white households are carless.²² This disparity stems in part from discriminatory pricing in auto loans and car insurance as well as the fact that non-citizen residents cannot get a driver's license in Minnesota.²³ But even those who do not own cars ultimately pay a monetary cost for parking, whether that cost is bundled into the cost of food (because grocery stores build and maintain parking), rent (renters who don't own cars pay an estimated \$440 million for parking they will never use²⁴), or other commodity prices.²⁵

Changing our infrastructure priorities from parking to transit, biking, walking, and rolling infrastructure would begin to reduce these inequities.

22 Car Access, National Equity Atlas (last viewed April, 2021) https://nationalequityatlas.org/indicators/Car_access#/?-geo=07000000002743000.

23 Fact Sheet: Driver's Licenses for All, Immigrant Law Center (Feb 17, 2021) <https://www.ilcm.org/latest-news/fact-sheet-drivers-licenses-for-all/>.

24 C.J. Gabbe and David Pierce, *Hidden Costs and Deadweight Losses: Bundled Parking and Residential Rents in the Metropolitan United States*, Housing Policy Debate (Vol. 27, 2017) <https://www.tandfonline.com/doi/abs/10.1080/10511482.2016.1205647>.

25 Donald Shoup, *How Parking Requirements Hurt the Poor*, Washington Post (March 3, 2016) <https://www.washingtonpost.com/news/in-theory/wp/2016/03/03/how-parking-requirements-hurt-the-poor/>.

VII. CONCLUSION

This report has shown how parking takes space from housing and other uses; how parking drains money that could be used to support sustainable and healthy transportation options and housing; how parking generates greenhouse gas emissions at a time our communities seek and need to cut emissions; and how parking harms lower income and communities of color.

Parking in Minneapolis is abundant and ubiquitous. Similar patterns of parking and parking development exist in Saint Paul. Minimum parking requirements in cities' zoning codes have contributed to the prevalence of parking and the associated reliance on automobiles in our communities.

The results of this study show that if Minneapolis, and other cities around the state of Minnesota and the country, were to eliminate or reduce parking requirements—while ensuring mobility for all—the cities would have more tools to support community, create space for housing, and fund transportation alternatives.

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Move Minnesota is a leader in the movement for an equitable and sustainable transportation system that puts people first. We are passionate about connecting communities, ending the climate crisis, expanding access to jobs and resources, and improving daily life for Minnesotans of all ages, races, incomes, and abilities.

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