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Off-Street Versus On-Street Parking Trade-Offs

By displacing public on-street parking, off-street parking requirements often reduce total available parking supply. This study evaluates these impacts.

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Since most driveways displace one on-street public parking space and public parking can serve multiple users and destinations, off-street parking requirements often reduce motorists' convenience and increase costs.

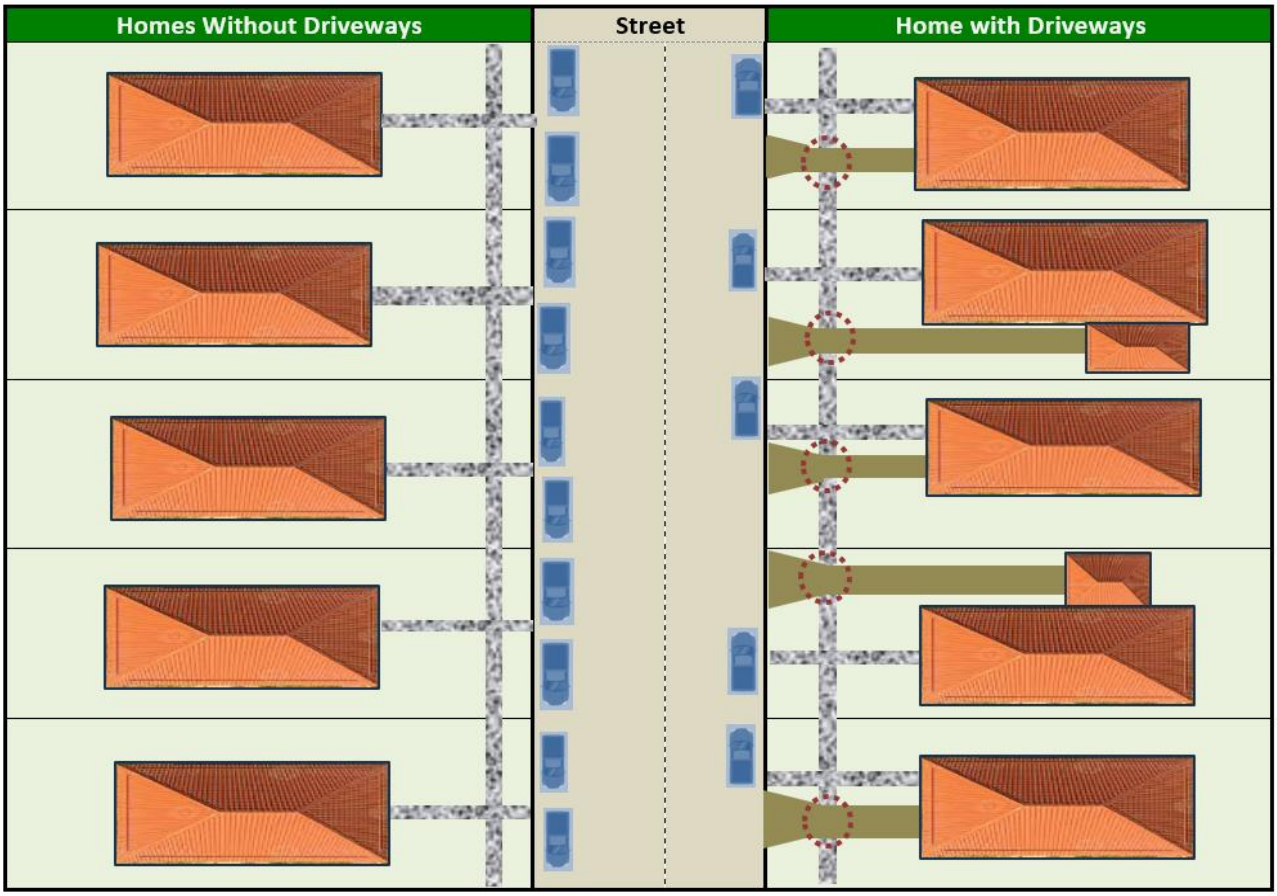
Summary

Most municipalities require property owners to provide off-street parking to ensure adequate supply. However, since most driveways displace a public on-street parking space, there are trade-offs between on- and off-street supply, and since public parking spaces can serve more users and destinations than private parking, off-street parking mandates often *reduce* rather than increase available supply. Off-street parking mandates also significantly increase housing costs, impervious surface area (and therefore stormwater management costs, heat island effects and greenspace loss), and create risks to pedestrians where they cross sidewalks. This study analyzes these impacts. It finds that in neighborhoods where households own fewer than two vehicles on average, off-street parking for single-family homes usually reduces total parking availability and driver convenience, particularly for delivery and visitors' vehicles. Off-street parking also increases housing costs 10-20%, adds 350-800 square feet of impervious surface area, and reduces walkability. It also encourages vehicle ownership and driving, increasing traffic problems. Reforming mandates is often justified for efficiency and fairness sake.

Introduction

Most municipalities require property owners to provide off-street parking, typically one or two spaces for single-family homes, to ensure that motorists can easily find a parking space at each destination. However, this overlooks important impacts. Since most driveways displace a public on-street parking space, and since public parking is more efficient – each space can serve more users and destinations than private parking – adding off-street parking often *reduces* the number of parking spaces available to motorists. For example, typical 40-foot urban lots can either have two on-street spaces, or one on-street space and a driveway, as illustrated below.

Figure 1 **Neighborhood Parking Supply With and Without Driveways**



Public parking spaces (blue) are available to any motorist, but private spaces may only be used by residents and their designated guests. A 40-foot-wide lot can have two on-street spaces, but only one if it has a driveway, reducing public supply by half. Although most driveways are designed to accommodate multiple vehicles, many don't. As a result, driveways that serve less than two vehicles tend to reduce total parking availability. They also increase housing costs, impervious surface area, and pedestrian risk where driveways cross sidewalks (red circles).

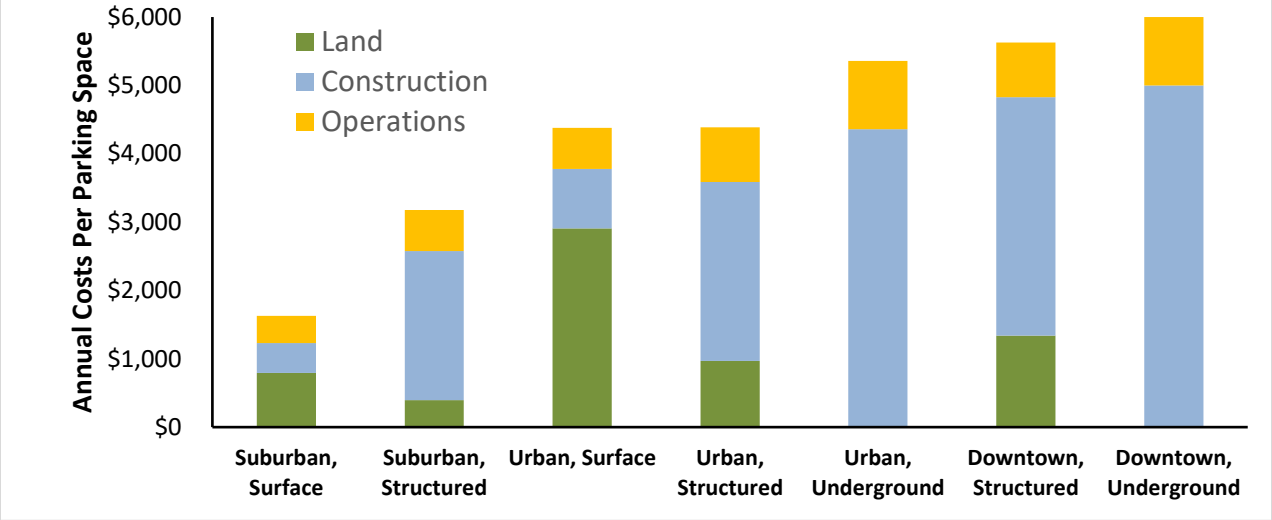
To understand this, it is important to recognize the distinction between *total* and *functionally available* parking supply. Public spaces are available to any motorist, but private spaces may only be used by occupants and their designated guests. Driveway's net effects on parking availability can be evaluated by comparing the supply and utilization of the spaces they serve with the on-street spaces they displace. Although most driveways are designed to accommodate multiple vehicles, many don't; garages are often used for storage, motorists often use curb even when off-street parking is available for

convenience's sake, and private spaces are often unoccupied. Vehicle ownership and parking demands vary over time; a home may need zero spaces one day but two, three or four the next. Public spaces accommodate these variations much better than the same private parking supply. For example, if vehicles are away from home eight hours per day, two on-street spaces provide 5,840 annual hours of public parking compared with only 2,920 for one on-street space and a driveway.

Parking mandates often oversupply parking comparted with what motorists demand, particularly for low- and moderate-income households located with compact, multimodal neighborhoods (Litman 2024; Shoup 2020; Volker and Thigpen 2024). Oversupply is particularly severe in areas with transportation and parking management policies (Galdes and Schor 2022). This suggests that in neighborhoods where households own fewer than two vehicles on average, off-street parking usually reduces rather than increases total parking availability, particularly for delivery and visitor vehicles.

Off-street parking is costly. Building a driveway and basic garage typically costs $25,000 to $50,000. Considering land, construction and operating expenses for driveways and garages, an off-street parking space typically costs from $1,500 annually for surface lots to more than $5,000 annually for structured or underground parking, as illustrated below. This typically increases housing costs 10-20%, and more for lower-cost homes in high land value areas (Lehe 2018; Litman 2024).

Figure 2 **Typical Annualized Parking Facility Costs (Parking Calculator)**

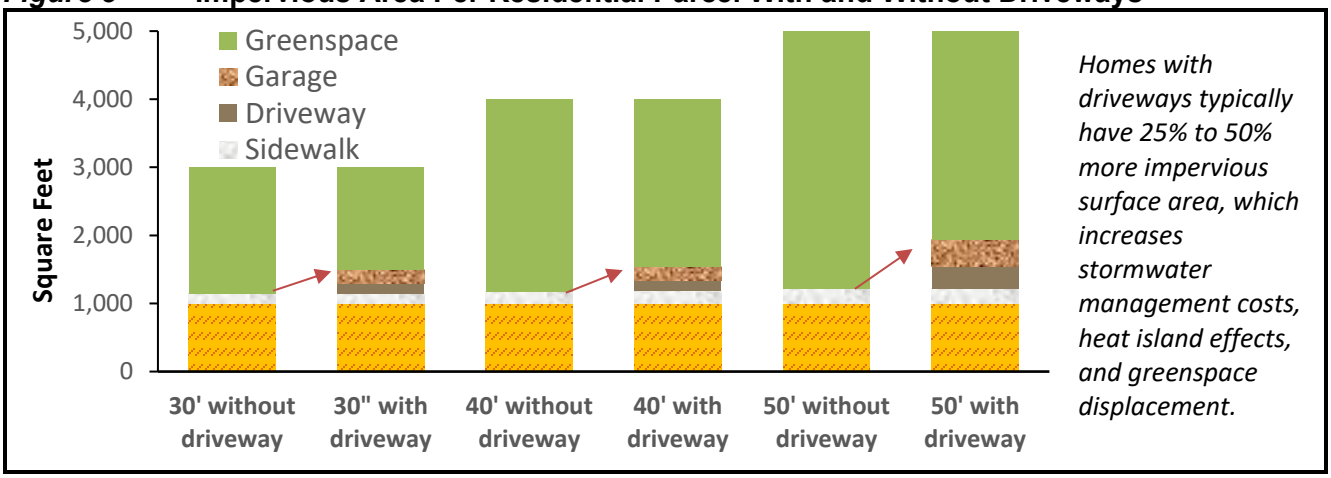


This figure illustrates typical annualized costs for various types of parking facilities.

Several studies analyze how off-street parking mandates increase housing costs (Litman 2024). For example, "The Hidden Cost of Bundled Parking" (Gabbe and Pierce 2016) found that in 2012 an off-street parking space increased Seattle housing costs approximately $1,700 per year or 17%. Other studies find similar results. Jia and Wachs (2019) which found that off-street parking typically increases San Francisco area single-family housing prices 12% compared with similar units without parking. A 2013 study by Manville (2013) found that off-street parking increased Los Angeles housing costs about $43,000 per unit or about $200 per month. This is unfair to households that own fewer vehicles than mandated parking spaces, for example, owning one vehicle where two spaces are required, or being car-free where one space is mandated.

Off-street parking also increases impervious surface area which exacerbates stormwater management costs and heat island problems, and displaces greenspace (lawns, gardens and trees). For a typically single-family home, off-street parking adds 360 to 720 square feet of pavement, increasing impervious surface area by a quarter to half. The figure below illustrates these impacts. The study, "Death of the Front Yards," (Davies, et al. 2026) found in a sample of 370 homes in Sydney, Australia, between 2017 and 2023 the average front garden area declined by 46% and tree canopy declined 62%, while driveways and other impervious surfaces increased 57%.

Figure 3 **Impervious Area Per Residential Parcel With and Without Driveways**



In addition, where driveways cross sidewalks they increase pedestrian delay and risk, while on-street parking provides a safety buffer to vehicle traffic (NACTO 2013). Since most public transit trips include walking links, this discourages both walking and transit travel. By encouraging automobile ownership and use, and discouraging non-auto travel, off-street parking mandates increase vehicle travel and traffic problems. Compared with cost-recovery parking pricing, free parking typically increases affected vehicle ownership by 5-15% and vehicle trips by 10-30% (Lehner and Peer 2019; Spears, Boarnet and Handy 2014). This suggests that a significant portion of traffic problems, including congestion, crashes and pollution, result from off-street parking mandates that degrade walking conditions and encourage driving beyond what travellers would choose with less parking supply and more efficient parking pricing.

Off-street parking mandates are so ubiquitous that their costs and benefits are seldom evaluated. Transportation engineers say that buildings "generate" parking demands, but that is not completely true. Motorists generate parking demands which vary widely depending on demographics, conditions and management practices. It is inefficient and unfair to force non-drivers to pay for costly off-street parking facilities they do not demand through higher prices for housing and other goods. Recent experience shows that parking reforms can significantly reduce off-street parking supply without harming motorists and communities.

This analysis indicates that off-street parking mandates are often inefficient and unfair. Given a choice, property owners build fewer driveways which increases public on-street parking supply, housing affordability, greenspace and walkability. All these factors should be considered when evaluating the full costs of off-street parking requirements and the full benefits of parking policy reforms.

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