Geospatial Analysis of Syringe Service Program Access and the Stay Out of Drug Areas (SODA) Laws in Seattle, Washington

Gina Sijia Liu

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Committee:

Clarence Spigner, DrPH

Megha Ramaswamy, Ph.D.

Jack Guirey, M.S.

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University of Washington

Abstract

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Gina Sijia Liu

Chair of the Supervisory Committee:

Clarence Spigner

Department of Health Systems and Population Health

In September 2024, the Seattle City Council reinstituted Stay Out of Drug Areas (SODA) exclusion zones across King County, Washington, which allows the court to prohibit individuals with existing drug-related criminal offenses from such areas. Syringe service programs (SSPs) provide a spectrum of resources to individuals who use drugs that reduce disease transmission and reduce overdose deaths. Proponents of the ordinance stated that the SODA zones were crafted to avoid obstructing access to substance use treatment and providers, but no study has been made public analyzing if the exclusion zones interfere with access to SSPs. This study utilizes exploratory geospatial analysis to determine the number of SSPs that exist within SODA zones, and if walking and driving access to SSPs were impacted by SODA zones. Using geographic information systems (GIS), the SODA zones were overlaid with the locations of King County-based syringe service programs, sourced from the Washington State Department of Health Syringe Service Program Directory. Each SSP location's 20-minute walking and 30-minute travel time radii, or isochrones, were calculated to assess access to each location. Results demonstrated that two out of five of the SSPs precise locations existed within a SODA

zone. Four of the SSPs' 20-minute walking isochrone and all five of the SSPs' 30-minute driving isochrone conflicted with a SODA zone. These findings conflict with the stated intent of the SODA zones to avoid substance use treatment, and support existing literature documenting the increasingly common pattern of using political and legal mechanisms to restrict SSP functionality and access. Similar policies rooted in criminalization have been demonstrated to dismantle the life-saving services that SSPs provide, and displace clientele. Further studies should assess how SODA zones and their implementation affect mobile SSP units, SSP utilization, and related health outcomes.

Introduction

The United States continues to face a devastating overdose crisis, primarily driven by an unstable drug supply.[1] In King County, Washington, overdose deaths have been declining since 2023, yet are still double the 429 overdose deaths in 2019 reported by the Washington State Department of Health.[2] In response to this national crisis, jurisdictions have adopted a range of strategies: some evidence-based and others rooted in enforcement-focused approaches.[3] In September 2024, the Seattle City Council adopted a "Stay Out of Drug Areas" (SODA) exclusion zones, along with the companion policy Stay Out of Areas of Prostitution (SOAP), after community hearings and an 8-1 vote among the Council.[4] The 2024 SODA ordinance created designated areas where the court can prohibit individuals who have been cited for drug-related criminal offenses from entering a SODA zone, and charge individuals with a gross misdemeanor penalty if they are found again in the exclusion zone.[5]

Syringe service programs (SSP) provide a spectrum of services and resources to substance users, such as drug checking, health care coordination, and access to safer syringe supplies.[6] SSPs, and their provision of these services have been shown to reduce transmission of infectious diseases, including hepatitis C virus (HCV) and human immunodeficiency virus (HIV), as well as overdose incidence rates and mortality.[7] Restrictive policies such as the SODA exclusion zones raise concerns on disruption of access to substance use treatment and other

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[1] "The Xylazine-Fentanyl Nexus: A Public Health Emergency - Kanwarpreet Singh Sandhu, Siddarth Kumar, Keshav Garg, Kanishk Aggarwal, Mayank Tiwwary, Griffin Perry, Vasu Bansal, Rohit Jain, 2025."
[2] Square, "King County Overdose Deaths Fall in 2025 but Remain Higher than Pre-Pandemic Levels"; "Data to Inform King County's Overdose Response - King County, Washington."
[3] McNeil et al., "Area Restrictions, Risk, Harm, and Health Care Access among People Who Use Drugs in Vancouver, Canada"; Tempalski et al., "NIMBY Localism and National Inequitable Exclusion Alliances."
[4] "Law Targeting Drug-Related Criminal Activity Passes City Council."
[5] KUOW, *Seattle City Council's SOAP and SODA Zones, Explained*.
[6] HIV.Gov, "Syringe Services Programs"; Abuse, "Syringe Services for People Who Inject Drugs Are Enormously Effective, but Remain Underused | National Institute on Drug Abuse (NIDA)."
[7] HIV.Gov, "Syringe Services Programs"; Mackey et al., "Executive Summary."

resources, and for their overall inability to alleviate the fundamental causes of drug use and perceived social disorder in these areas.[8]

When establishing the 2024 SODA ordinances, City Council stated their intent to avoid obstructing access to substance use treatment and providers within the SODA zones.[9] However, no mapping or study has been made public regarding if the exclusion zone policies actually interfere or do not obstruct access to SSPs. This study aims to fill that gap by geospatially analyzing the overlap between SODA zones and SSP locations in Seattle.

Literature Review

Syringe Service Programs: Model and Evidence Base

Syringe service programs (SSPs) provide life-saving and essential services for drug users, through distributing safer drug supplies, providing education for drug users, and providing care coordination to health care and other social services.[10] SSPs are shown to reduce disease transmission, prevent overdose-related deaths, and connect participants to other health care and social services.[11] Research has consistently demonstrated that SSP models and interventions are effective at reducing transmission of viral infections such as HIV and HCV among people who use drugs. SSPs are an example of harm reduction, which seeks to minimize the negative consequences of drug use through safer use strategies, rather than complete abstinence.[12] While SSPs and similar harm reduction models, such as supervised consumption sites, have been criticized for enabling drug use, there is overwhelming evidence that the presence of SSPs do not

[8] Cascade PBS, “Seattle Enacts Controversial Drug, Prostitution ‘Stay out’ Zones”; Humphrey et al., “A Geospatial Analysis of Access to Syringe Services Programs in the United States, 2023,” July 2026.
[9] Smith, “Proposal Would Ban People Who Commit Drug Crimes from Certain Parts of Seattle.”
[10] HIV.Gov, “Syringe Services Programs.”
[11] Dockery et al., “An Analysis of Syringe Service Programs across the Rural-Urban Continuum in the United States.”
[12] “Harm Reduction Principles.”

increase drug use in a given community.[13] In fact, individuals who use harm reduction services are more likely to engage in treatment and stop using drugs, while also providing community-wide benefits such as safe syringe disposal, reduced infectious disease transmission and overdose mortality.[14]

Despite the evidence underscoring the need and effectiveness of SSPs, many cities and local communities have taken steps to repeal and impose restrictions on harm reduction services in recent years, often responding to public backlash towards harm reduction efforts.[15] For example, the 2025 Legislative Assembly of Ontario passed a province-wide bill that banned Safe Consumption Sites (SCS) within 200 meters of schools, childcare centers and similar facilities, which resulted in the closure of 10 out of the 17 sites currently operating in Ontario.[16] Restrictive policies on where harm reduction centers and services can operate pose barriers for SSP access, and their ability to effectively reduce disease transmission for a given area.[17,18] For example, living farther from SSPs is associated with a higher likelihood of sharing injection supplies, and higher HCV seropositivity rates in populations.[19] The political tension between penalizing drug use and the provision of essential services of harm reduction models is not new; it is embedded in the U.S. Drug War's punitive policing and mass incarceration, which focused on racializing and criminalizing drug use, instead of connecting users to treatment or safer practices.[20]

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[13] "Messages Underpinning Backlash to U.S. Harm Reduction Policy."
[14] "Messages Underpinning Backlash to U.S. Harm Reduction Policy"; Mackey et al., "Executive Summary"; Tempalski et al., "NIMBY Localism and National Inequitable Exclusion Alliances."
[15] "Messages Underpinning Backlash to U.S. Harm Reduction Policy"; Lim, "Ontario to End Funding for 7 Supervised Drug Consumption Sites, Province Confirms."
[16] Bonn, "Ontario's Unconscionable Supervised Consumption Sites Shutdown."
[17] Humphrey et al., "A Geospatial Analysis of Access to Syringe Services Programs in the United States, 2023," July 2026.
[18] Whiteman et al., "Distance Matters"; Humphrey et al., "A Geospatial Analysis of Access to Syringe Services Programs in the United States, 2023," July 2026.
[19] Whiteman et al., "Distance Matters"; Canary et al., "Geographic Disparities in Access to Syringe Services Programs Among Young Persons With Hepatitis C Virus Infection in the United States."
[20] Greberman and Berryessa, "Drug Policy, Drug War, and Disparate Sentencing."

Stay Out of Drug Areas: Exclusion Zone Policies and Access to Services

Spatial exclusion policies, such as the "Stay Out of Drug Areas" (SODA) and similar civil exclusion orders, have been documented as an emerging pattern of social control policies, specifically in municipal government settings.[21] In Seattle, initial SODA zoning laws related to drug use-related offenses were implemented in 2005, as part of the City Attorney's efforts to "reduce the drug trade in our neighborhoods."[22] These series of initial SODA orders were similarly used to prohibit drug use offenders from entering restricted areas, typically as conditions of drug-related gross misdemeanor sentences.[23] The 2005 SODA zones designated roughly half of Seattle as an exclusionary zone (Figure 1).[24] These initial SODA laws were examined in Beckett and Herbert's *Dealing with Disorder: Social Control in the Post-Industrial City*, and cited as an example of "civility laws" that target perceived disorderly people and populations, through municipalities' civil, administrative, and the criminal/legal systems and processes.[25] Seattle City Council voted to repeal the initial iteration of SODA laws in 2020, citing the need to reduce disproportionate impacts of law enforcement and policing on Black, Indigenous, and other people of color.[26]

[21] Beckett and Herbert, "Dealing with Disorder."
[22] "The Seattle City Attorney's Liaison Links."
[23] "The Seattle City Attorney's Liaison Links."
[24] Beckett and Herbert, "Dealing with Disorder."
[25] Beckett and Herbert, "Dealing with Disorder."
[26] Denkmann et al., "Seattle City Council's SOAP and SODA Zones, Explained."

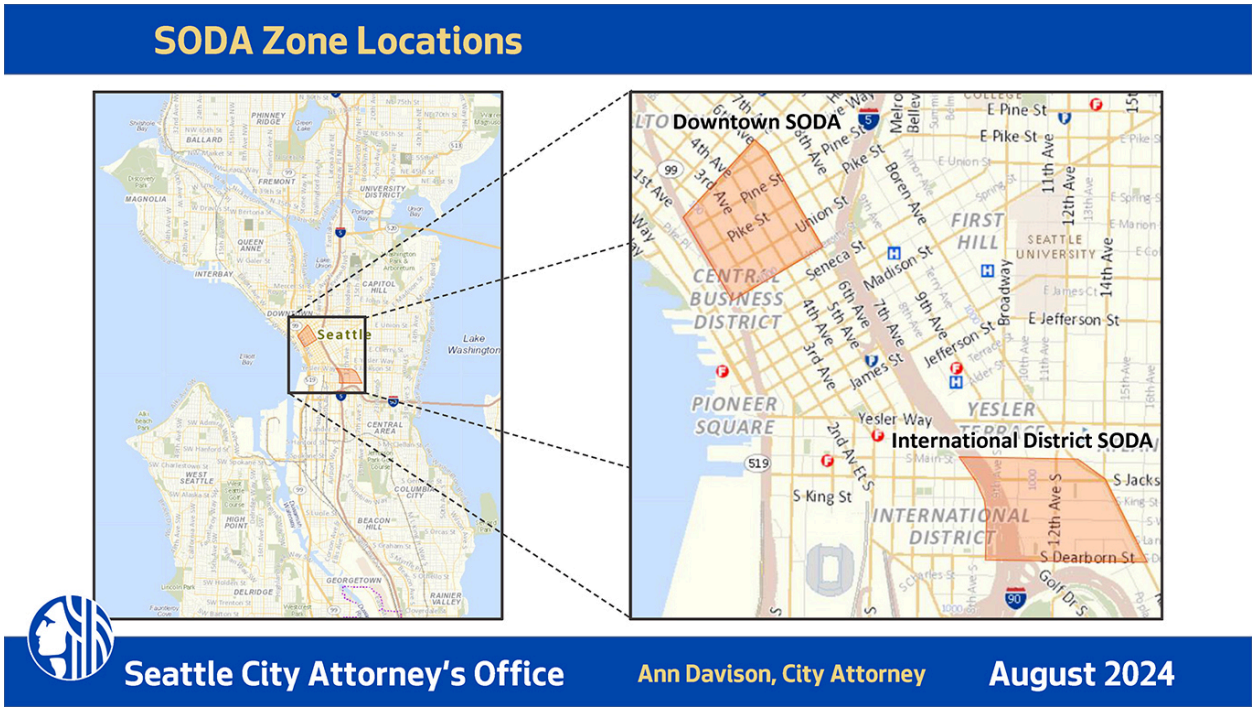
Figure 1: Seattle's SODA Zones, 2005. (Beckett & Herbert, 2010)

However, in September 2024, a Seattle SODA ordinance was re-adopted, and created designated zones where courts may prohibit individuals cited for drug-related offenses from entering, with violations constituting a gross misdemeanor (Figure 2).[27] The stated goals of the 2024 SODA

[27] "Law Targeting Drug-Related Criminal Activity Passes City Council."

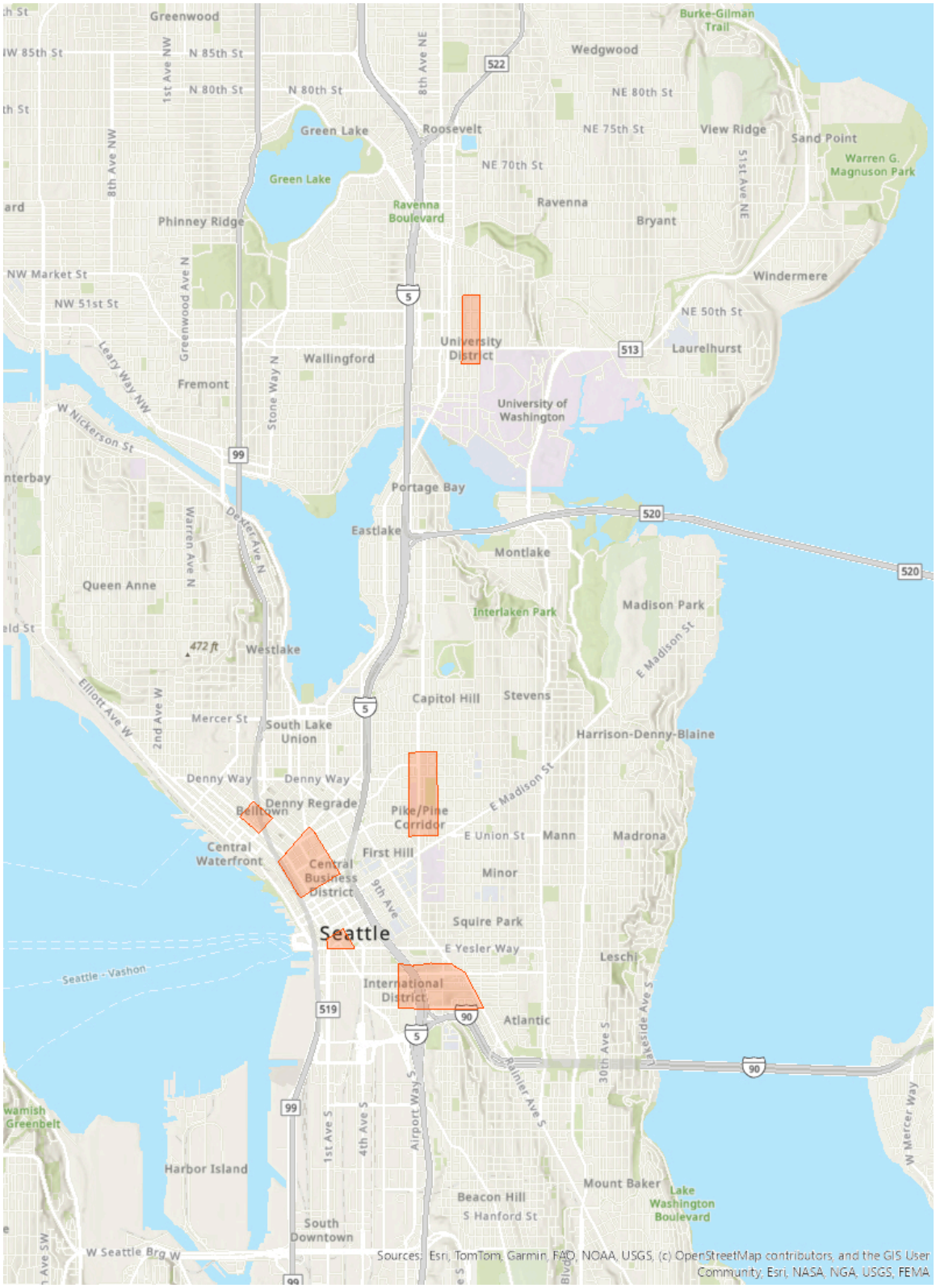
ordinances were to "address overdoses and reduce violent crime and property crime around "open-air drug trafficking markets," according to key implementor Seattle City Attorney Ann Davison.[28] During a Seattle City Council's September 10th Public Safety Committee meeting, the legislation was amended to expand upon the initial zones in Downtown and the International District to include additional areas in Belltown, Capitol Hill, the University District, and Pioneer Square neighborhoods, which were referenced as "areas of high drug use" in a City Council evidence report (Figure 3, 4, 5, and 6).

Figure 2: Seattle's Initial SODA Zones, August 2024.



[28] {Updating}

Figure 3: City of Seattle Amended SODA Zones, October 2024.



City Attorney Ann Davison, who introduced the legislation, stated that the proposed SODA zone boundaries "were crafted to avoid locations that provide substance abuse treatment and permanent supportive housing," and that commuting through SODA zones via public transit would not be specifically targeted.[29] However, this statement references substance use treatment and supportive housing, but does not specifically mention syringe service programs. This distinction is critical, as SSPs are harm reduction services that may not be classified as "treatment" in the traditional sense, leaving them potentially excluded from the City's stated protective intent. Overall, there is limited information on how these exclusion zone policies may affect access to harm reduction and treatment services.

Research Questions:

- RQ1: How many SSP sites in King County fall within the boundaries of Seattle's SODA exclusion zones?
- RQ2: What is the geospatial relationship between Seattle's SODA exclusion zones and the locations of Syringe Service Programs in King County?

Methods

Data Sources

The SODA zone ordinances and their respective boundaries were drawn from the public Seattle City Council documents, including the City of Seattle ArcGIS account.[30] The most updated exclusion zone boundaries were from October 23, 2024. The locations of the Seattle-based SSPs were extracted from the Washington State Department of Health Syringe

[29] Smith, "Proposal Would Ban People Who Commit Drug Crimes from Certain Parts of Seattle."
[30] "Stay Out of Drug Area (SODA) Zones - Overview."

Service Program Directory based on zip code.[31] The exact mobile delivery routes/sites were not publicly accessible on the directory, and were listed as servicing methods for several SSPs on the Washington State Department of Health Syringe Service Program Directory. For the purposes of this geographic analysis and available tools, only the static locations of SSPs were used.

Geospatial Analysis

To analyze the spatial relationship between the SODA zones and the corresponding syringe service programs, the ArcGIS geographic information system (GIS) was utilized. The latitude and longitudes of the SSPs were calculated using Google Maps, and uploaded as a dataset. The City of Seattle ArcGIS SODA zones and the exact coordinates of each SSP were overlayed to identify the number of SSP sites geographically contained within the legally defined boundaries of SODA zones. Sites were coded as “1” if located inside a SODA zone, and “0” if located outside. This measure provided a direct count of SSP sites physically situated within areas where individuals with drug-related offenses may be legally excluded, categorized as ‘Containment.’

In order to further understand the real-time access to SSPs under the SODA zone, both proximity and accessibility variables were constructed and analyzed using ArcGIS. ‘Proximity’ was defined as the distance in feet between an SSP site and the nearest SODA zone boundary, establishing a continuous measure of distance. Sites were categorized as 'Conflicted' (Inside SODA), 'Adjacent' (Within 500 feet), or 'Unaffected' (Beyond 500 feet)." ‘Accessibility’ was defined as the degree to which the area surrounding an SSP intersected with SODA zone boundaries, measured using the thresholds of 30-minute drive travel time radii and 20-minute walk travel time radii, also known as isochrones. The 20-minute walk and 30-minute drive

[31] EPI--5100, “Syringe Service Program Directory | Washington State Department of Health.”

isochrones are commonly accepted benchmarks to measure health care service access for health sites such as SSPs, and specifically sourced from a similar geospatial analysis of access to syringe services programs in the United States conducted on a national scale in 2023.[32] For each SSP site, service area polygons were generated representing the surface reachable within each time threshold along the street network. Accessibility was then coded as binary (yes/no) for each threshold based on whether the resulting service area intersected any portion of a SODA zone. This measure captured whether individuals traveling from an SSP (either by foot or by car) could potentially enter a SODA zone within a reasonable travel time, even if the SSP itself was located outside the zone's legal boundaries.

Results

A total of five static syringe service program (SSP) sites listed on the Washington State Syringe Program Directory were included in the analysis. Of these, 40% (n=2) were located entirely within SODA zone boundaries (Table 1). The remaining three sites (60%) were not directly contained within any SODA zone.

[32] Humphrey et al., “A Geospatial Analysis of Access to Syringe Services Programs in the United States, 2023,” July 2026.

Figure 4. SSP Locations and SODA Zone Intersections

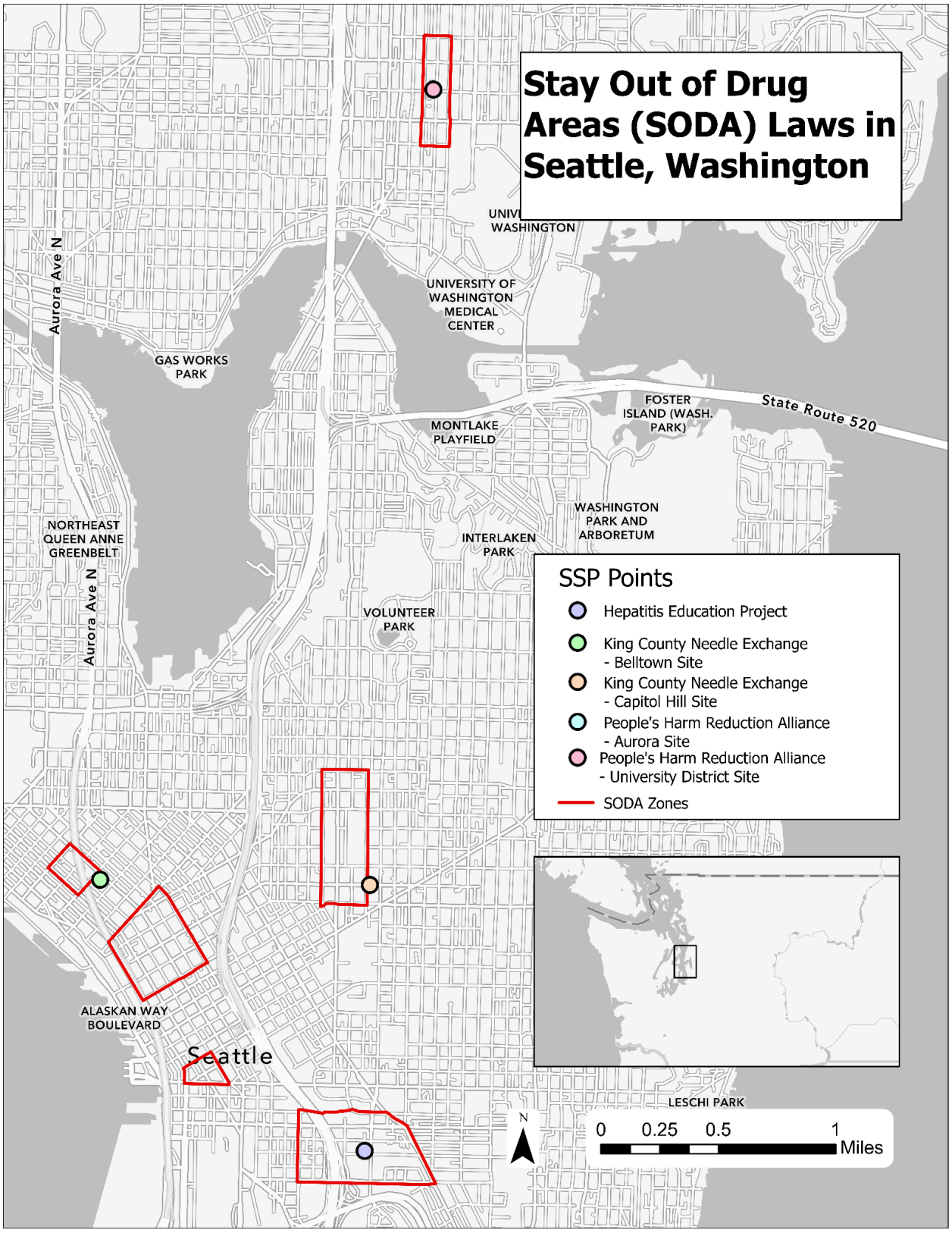


Table 1. Binary containment of static SSP sites within SODA zones (1=Yes, 0=No)

	Binary Containment (1=Yes, 0=No)
Hepatitis Education Project	1
King County Needle Exchange - Belltown Site	0
King County Needle Exchange - Capitol Hill Site	0
People's Harm Reduction Alliance - University District Site	1
People's Harm Reduction Alliance - Aurora Site	0
TOTAL	**2**

Proximity to the nearest SODA zone boundary varied substantially across sites (Table 2). Two sites were classified as adjacent (≤500 feet) to a SODA zone: the Belltown site (134.76 feet) and the Capitol Hill site (54.69 feet). The Hepatitis Education Project and the University District site were both classified as conflicted (inside SODA zones). The People's Harm Reduction Alliance - Aurora Site was unaffected (>500 feet), with a distance of 10,994.65 feet.

Table 2. Distance from each static SSP site to the nearest SODA zone boundary

	Distance to Nearest SODA Zone Boundary (ft)	Proximity Calculation (Unaffected, Adjacent, Conflicted)
Hepatitis Education Project	727.54	Conflicted (Inside SODA)
King County Needle Exchange - Belltown Site	134.76	Adjacent (<=500 ft)
King County Needle Exchange - Capitol Hill Site	54.69	Adjacent (<=500 ft)
People's Harm Reduction Alliance - University District Site	239.73	Conflicted (Inside SODA)
People's Harm Reduction Alliance - Aurora Site	10994.65	Unaffected (>500 ft)

The accessibility analysis revealed that 80% (n=4) of SSP sites had 20-minute walking service areas that overlapped with a SODA zone (Figure 5, Table 3). When extending the service area to a 30-minute drive, 100% (n=5) of SSP sites intersected with at least one SODA zone (Figure 6, Table 3).

Figure 5. SSP 20-Minute Walking Service Areas and SODA Zone Intersections

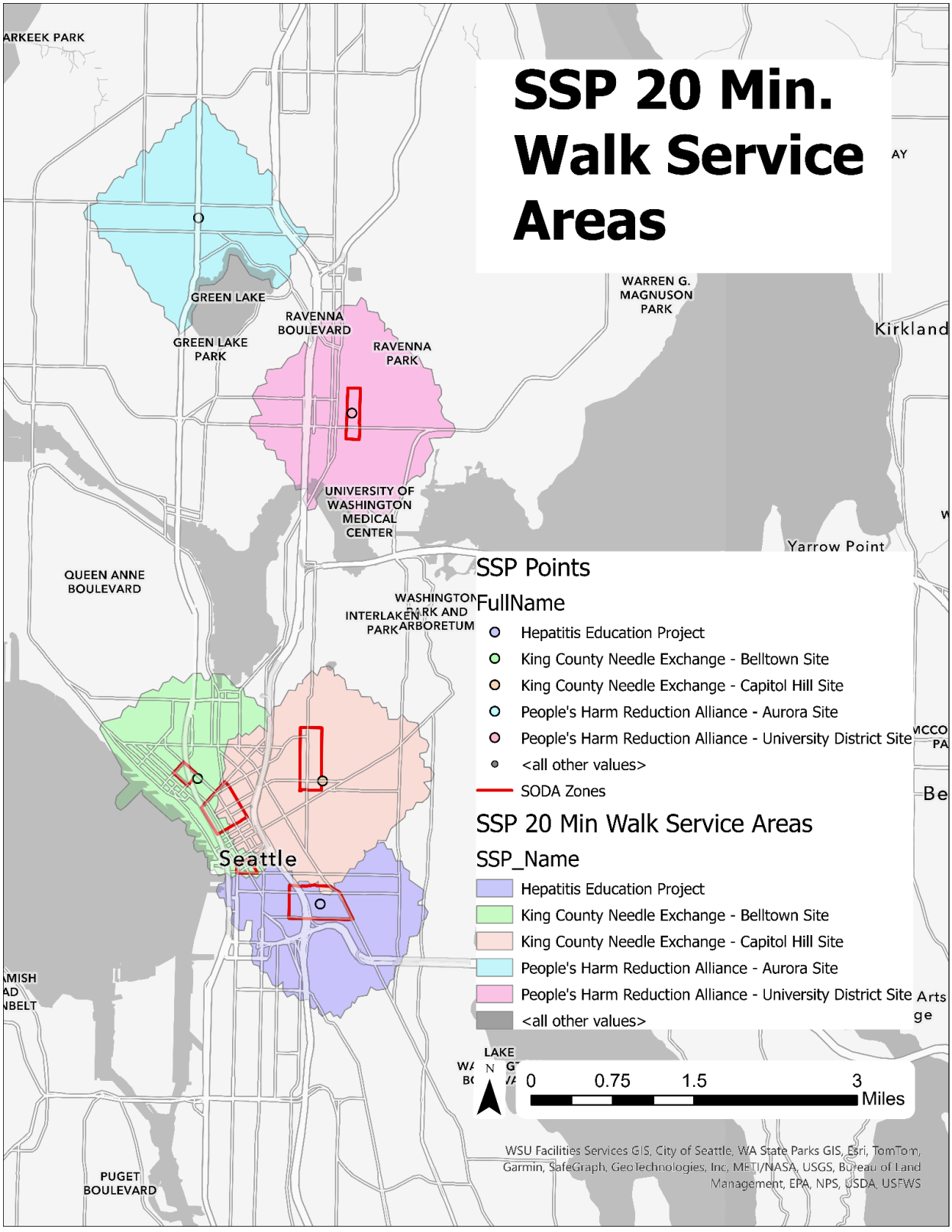


Figure 6. SSP 30-Minute Driving Service Areas and SODA Zone Intersections

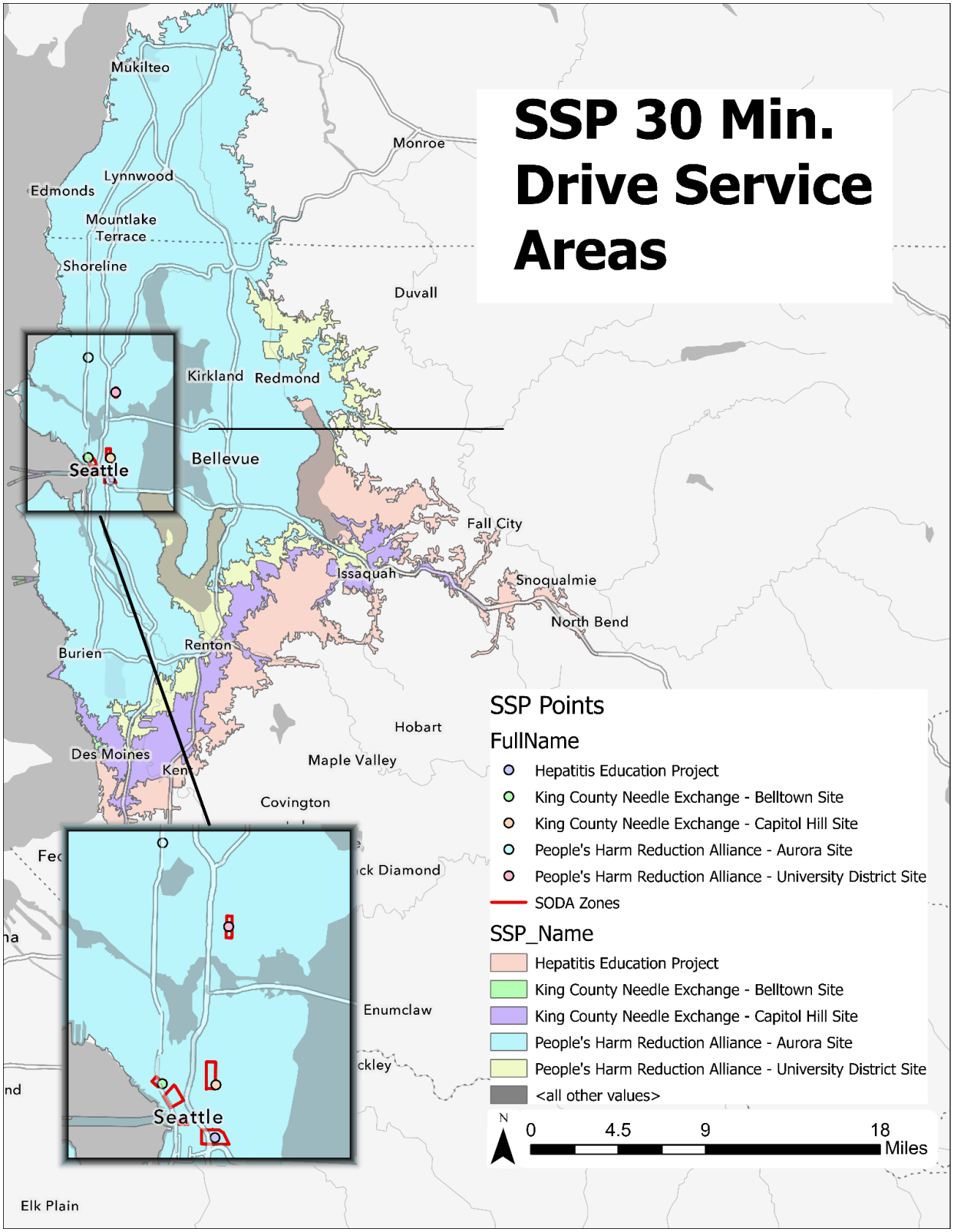


Table 3. Overlap between SSP service areas and SODA zones

	Overlap with SODA Zone in 20 min walk service area (1=Yes, 0=No)	Overlap with SODA Zone in 30 min drive (1=Yes, 0=No)
Hepatitis Education Project	1	1
King County Needle Exchange - Belltown Site	1	1
King County Needle Exchange - Capitol Hill Site	1	1
People's Harm Reduction Alliance - University District Site	1	1
People's Harm Reduction Alliance - Aurora Site	0	1
TOTAL	4	5

Discussion

This geospatial analysis revealed that 40% of static syringe service program (SSP) sites (n=2) listed on the Washington State Syringe Program Directory were located entirely within Stay Out of Drug Area (SODA) zones. These findings underscore the importance of critically examining how policies are implemented on the ground and the potential consequences for access to substance use treatment and related services. City Attorney Davison, the primary implementer of the policy, stated that “the [SOAP and SODA] zones were crafted to avoid locations that provide substance abuse treatment and permanent supportive housing.” While it remains unclear whether SSPs fell within Davison or the City Council’s definition of “substance abuse treatment,” the direct containment of two SSPs within exclusion zones raises concerns for individuals with drug-related offenses attempting to access harm reduction and treatment services. A robust body of evidence indicates that engagement with SSPs is associated with

higher rates of substance use treatment uptake and a greater likelihood of discontinued substance use.[33] Thus, the containment results directly contradict the stated intent of avoiding locations that provide substance use treatment, particularly given SSPs' well-documented ability to connect individuals to treatment and improve health outcomes among people who use drugs.

The accessibility measures developed for this study, designed to estimate how an individual's walking and driving patterns might be affected by SODA enforcement, showed that 80% (n=4) of static SSP sites had their 20-minute walking service areas overlapping with a SODA zone. Furthermore, when mapping 30-minute driving distances, every static SSP site (n=5) intersected with at least one SODA zone. Although the SODA policies include an exception for individuals using public transit, they do not explicitly exempt those walking or driving to an SSP.[34] This distinction is critical, as SSPs have been documented as a low-barrier, cost-effective health intervention that can effectively engage individuals experiencing homelessness, who often face significant physical and social obstacles to accessing facility-based or in-patient substance use treatment.[35] In contrast, areas without regular access to SSPs are shown to have worse health outcomes and higher rates of drug use among the population.[36] A 2026 national geospatial analysis of SSP access found that rural areas with limited 20-minute walking or 30-minute driving access to SSPs had among the highest rates of illicit opioid use, heroin injection, and reported HCV cases.[37]

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[33] Hagan et al., "Reduced Injection Frequency and Increased Entry and Retention in Drug Treatment Associated with Needle-Exchange Participation in Seattle Drug Injectors"; Bluthenthal et al., "Factors Associated with Readiness to Change Drug Use among Needle-Exchange Users."
[34] Barnett, "City Attorney Davison Proposes No-Go Zones for People Charged With Drug Crimes, Including Possession and Public Use."
[35] Hood et al., "Engaging an Unstably Housed Population with Low-Barrier Buprenorphine Treatment at a Syringe Services Program."
[36] Humphrey et al., "A Geospatial Analysis of Access to Syringe Services Programs in the United States, 2023," July 2026.
[37] Humphrey et al., "A Geospatial Analysis of Access to Syringe Services Programs in the United States, 2023," July 2026.

Policies that restrict or eliminate access to SSPs have been linked to a reversal of many community-level health benefits associated with these services. For example, the recent closure of multiple safe consumption sites (SCS) in Ontario County, Canada, has yielded preliminary evidence of rising overdose rates. The Toronto Drop-In Center reported a 179% increase in overdoses at its drop-in centers post-closure, as well as a 288% year-over-year increase in June 2025 alone.[38] Prior to the closures, participants based in Toronto expressed anxiety about their disrupted access to the myriad of life-saving services, including drug checking, access to harm reduction supplies, and connection to wraparound services.[39] Even without explicit exclusionary zoning, intensified criminalization deployed in specific areas can make likely participants feel unsafe and unable to access SSPs.[40] This dynamic, captured by the "Not In My Backyard" (NIMBY) framework and the concept of territorial stigma against SSPs, is further substantiated by qualitative interviews with SSP participants across the United States and Canada.[41] By establishing exclusion zones, SODA policies aim to physically and ideologically deter individuals from entering designated areas, similar to other urban social control policies.[42] It is therefore vital to recognize that the clear spatial overlap between SSP locations and SODA zones, including both direct containment and restricted accessibility, may prevent individuals from accessing life-saving treatment and the very resources that could mitigate perceived social disorder, such as safe syringe disposal.[43]

These local consequences in Seattle are emblematic of a broader national pattern of increasing political and legal mechanisms aimed at restricting SSP functionality and access,

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[38] Sood, " And the Dead Cannot Recover'."
[39] Ali et al., "'I Won't Make It without This Program.'"
[40] Tempalski et al., "NIMBY Localism and National Inequitable Exclusion Alliances."
[41] Tempalski et al., "NIMBY Localism and National Inequitable Exclusion Alliances"; McNeil et al., "Area Restrictions, Risk, Harm, and Health Care Access among People Who Use Drugs in Vancouver, Canada."
[42] Beckett and Herbert, "Dealing with Disorder."
[43] Humphrey et al., "A Geospatial Analysis of Access to Syringe Services Programs in the United States, 2023," July 2026.

predicated on persistent misinformation that SSPs exacerbate drug use in surrounding areas or enable individuals to continue using drugs without seeking treatment.[44] The very re-establishment of SODA zones in Seattle has been cited as a policy to mitigate concerns on public safety associated with homelessness and drug use.[45] Tempalski et al. coined the term "inequitable exclusion alliance" to describe such mechanisms, which include freezing SSP funding and creating exclusionary zones like Seattle's SODA areas.[46] While the SODA zones do not explicitly ban SSPs from operating in Seattle, their clear overlap with walking and driving radii around SSPs demonstrates a functional restriction on access.

Instead of addressing the root causes of homelessness and drug use associated with social disorder, SODA zones displace vulnerable individuals and dismantle the proven health benefits and life-saving services that SSPs provide.[47] Such policies perpetuate the same mechanisms of the U.S. War on Drugs, wherein the urge to criminalize continues to overshadow evaluated public health solutions.[48] If the goal of SODA zoning policies is truly to reduce social disorder and improve public safety, policymakers must align legal frameworks with public health evidence. This means investing in housing, services, and treatment rather than criminalization and exclusion, managing community-level misinformation about SSPs, and recognizing harm reduction as a legitimate and necessary component of the public health infrastructure.[49]

Limitations

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[44] Tempalski et al., “NIMBY Localism and National Inequitable Exclusion Alliances”; McNeil et al., “Area Restrictions, Risk, Harm, and Health Care Access among People Who Use Drugs in Vancouver, Canada.”
[45] Denkmann et al., “Seattle City Council’s SOAP and SODA Zones, Explained”; “Seattle City Council Passes SODA and SOAP Banishment Laws despite Public Outcry”; KUOW, *Seattle City Council’s SOAP and SODA Zones, Explained*.
[46] Tempalski et al., “NIMBY Localism and National Inequitable Exclusion Alliances.”
[47] McNeil et al., “Area Restrictions, Risk, Harm, and Health Care Access among People Who Use Drugs in Vancouver, Canada.”
[48] Marx et al., “Trends in Crime and the Introduction of a Needle Exchange Program.”
[49] Tempalski et al., “NIMBY Localism and National Inequitable Exclusion Alliances.”

The primary limitation is that this analysis relies solely on the static sites of SSP locations to determine the geographic relationship between SODA exclusion zones and SSP locations. Several SSPs in Seattle have mobile delivery units published via the Syringe Service Program Directory, though their routes are not publicly available or documented. In regards to mapping accessibility to sites, public transit isochrones were not calculated because the active ArcGIS travel modes available in this project were driving, trucking, rural driving, and walking only. Public transit is a significant measure given the urban landscape of Seattle and the greater Seattle area, and this study is limited in its public transit modality scope. This study also does not analyze preliminary criminal legal system data related to SODA citations, or overdose and disease transmission data, which limits the scoping evaluation of SODA zone implementation and its effects.

Recommendations

Future studies should combine geographic analysis with preliminary arrest and citation data under SODA to assess whether enforcement patterns burden individuals seeking harm reduction services. Qualitative interviews with key stakeholders, such as people who use drugs and SSP staff, can paint a wider picture of the barriers to access within or around SODA zones, as the geographic boundaries outside the purely static SSP sites may not reflect the full extent to which SSPs serve their clients and community. Multiple SSP sites had additional mobile delivery or outreach locations that were not included in this static analysis, and should be included in further analysis of SODA zoning impact on SSP accessibility. Additionally, since public transit was not accounted for in the analysis, a similar study mapping public transit isochrones should be created to get a more accurate scope of how individuals may be affected commuting through

the SODA zones. Finally, longitudinal research should examine whether SODA implementation, or lack thereof, correlates with changes in overdose rates, syringe disposal, disease transmission, or SSP utilization in and around exclusion zones.

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