Cities 168 (2026) 106348

Contents lists available at ScienceDirect

Cities

journal homepage: www.elsevier.com/locate/cities

Encampments as neighbors: Encampment location and proximity to amenities among Seattle, WA's unhoused population

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ARTICLE INFO

Keywords:
Homelessness
Amenities
Housing
Encampment
Shelter

ABSTRACT

In the United States, no jurisdiction guarantees the basic conditions necessary for health, such as stable housing, even as homelessness continues to intensify. King County, Washington, the twelfth largest U.S. county, hosts the fourth largest population of people experiencing homelessness, many of whom reside in Seattle. Discouraging encampments and providing shelter beds has proven ineffective. We investigate how encampments' proximity to basic amenities compares to those in emergency shelters and rental units. We analyze rich spatial, administrative, and outreach worker data from Seattle's Evergreen Treatment Services (ETS) REACH on individuals living in tents and on the street from 2016 to 2022. We discuss the implications of providing effective support for people living unhoused and provide, to our knowledge, the most comprehensive and recent study of neighborhood amenities proximity among the unsheltered population in Seattle, WA. We find that, in most neighborhoods, encampment locations were similarly located in proximity to a range of amenities as were rental units. Additionally, encampments were located closer than shelters to certain amenities, especially food-related ones, excluding food banks, suggesting that they may offer opportunities for meeting basic needs, and accessing WiFi. We conclude that housing options that feel like homes rather than institutions are crucial in supporting the unhoused population. Our findings suggest that emergency shelters should be more integrated into neighborhoods and better reflect the proximity to amenities of tent encampments and rentals.

1. Introduction

The United Nations' 1948 Universal Declaration of Human Rights (Article 25) names housing as a necessary requirement for human life (United Nations, 1948); still, no jurisdiction in the United States (U.S.) ensures the fundamental conditions producing health, including housing, even though the phenomenon of homelessness is intensifying (Barr, 2019). This is no more apparent than in the U.S., particularly in King County, Washington, which encompasses the Seattle metro area. It is the twelfth-largest U.S. county, with approximately two million people, but hosts the fourth-largest population of people experiencing homelessness (de Sousa & Henry, 2024), with 16,868 people living unsheltered. The number of people living unhoused in King County has grown by 23% between 2022 and 2024 (King County Regional Homelessness Authority, 2024b). As is the case across the country, people experiencing homelessness – especially *unsheltered* homelessness (e.g., those sleeping outside in parks, benches, tents, etc.) – in the Seattle, King County, WA area experience disproportionately greater morbidity (Bensken et al., 2021; Funk et al., 2022) and mortality (Auerswald et al., 2016; Fowle & Routhier, 2024; Meyer et al., 2023; Scott et al., 2023) compared to the housed population. Almquist et al. (2025) shows that in King County the average age of death in the unhoused population is 50, compared to the average age of death for the housed population, which is 80.

We follow the standard practice of following the federal definition of homelessness (Almquist et al., 2025).[1] The U.S. Department of Housing and Urban Development (HUD) define a person as experiencing

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[1] Other definitions have been considered, but in practice, most U.S. cities and counties follow federal guidelines due to funding limitations (Almquist et al., 2025).

https://doi.org/10.1016/j.cities.2025.106348
Received 8 November 2024; Received in revised form 24 July 2025; Accepted 1 August 2025
Available online 27 August 2025

"homelessness" as a person lacking a fixed, regular, and adequate nighttime residence — for example, someone sleeping in a car or staying in an emergency shelter because they have no safe place to live (Culhane, 2021). We also follow federal guidelines, distinguishing between those who are currently sleeping in an emergency shelter and those who are sleeping in the "rough". The unhoused population who sleep in public or private places unintended for human habitation (e.g., on the street, in a tent, etc.) are referred to as living unsheltered (Richards & Kuhn, 2023). For example, in King County, 58% of the population of people experiencing homelessness are living unsheltered on any given night, compared to 42% who have access to an emergency shelter bed.

Unsheltered homelessness is a visual and spatial process (Chien et al., 2024) in cities like Seattle, where efforts to address the homelessness crisis have included discouraging encampments and providing beds in shelter systems. This approach is a temporary and unsatisfactory stopgap (Katz et al., 2017). The majority of unsheltered people in Seattle (and elsewhere) live in informal roadside encampments and survive in precarious, dynamic conditions often characterized and shaped by frequent displacement carried out by city employees ("sweeps"); "the forced disbanding of homeless encampments on public property and the removal of both homeless individuals and their property from that area" (ACLU Washington, 2017). Sweeps directly harm the health and well-being of unsheltered people by increasing overdose risk, hospitalizations, and mortality – particularly among those who use injection drugs – while also reducing access to treatment for opioid use disorder (Barocas et al., 2023). These actions are traumatic disruptions that compound the stigma and discrimination already faced by the unhoused population (Canham et al., 2024). Sweeps also hinder the delivery of essential services like health care and shelter, and complicate efforts to collect data on their urgent needs, though geographic approaches to this are expanding (Chien et al., 2024; Hudson & Vissing, 2010; Semborski et al., 2022).

Resources for housing individuals experiencing homelessness are, of course, limited — reflecting the broader societal and institutional marginalization of this population by those in positions of power. For this paper, we seek to investigate how the encampments of people living unsheltered are located in (spatial) proximity to amenities, especially compared to the housing available for rent. Living close to certain amenities like bus stops, grocery stores, and parks may be considered comparable to having reasonable access to these, though this may not always be the case for every amenity (e.g., high-end retail, lack of ability to enter a store or pay for goods). Even so, in the absence of individual-level access data, studying proximity is a first-step effort towards a better understanding of access to amenities among the unhoused population in Seattle. In this paper, we ask the question, "*are there differences in proximity to place-based amenities*[2] *between rentals,*[3] *encampments, and emergency shelters in the city of Seattle?*" We follow up the analysis of this question by discussing the implications of providing effective support for people living unhoused.

To our knowledge, this study is the most comprehensive and recent examination of neighborhood proximity to amenities among the unsheltered population in Seattle, WA, the largest metropolitan area in the U.S. and Washington state (see Fig. 1). To do this analysis, we obtained outreach worker encounter data from Evergreen Treatment Services (ETS) REACH – Seattle's largest homelessness outreach and stabilization provider (Evergreen Treatment Services (ETS) REACH, 2022) – on people living unsheltered in Seattle, and combined this with local administrative records on shelter locations (King County Regional Homelessness Authority, 2024a) and the City of Seattle's contemporaneous Rental Property Registration data (City of Seattle, 2024b). We focus on REACH's database records from 2016 to 2022 and limit the administrative data to this period, where possible. For practical and privacy reasons, we focus on a neighborhood-level analysis (see Fig. 1 for a visualization of Seattle neighborhoods). This enables us to examine the proximity of encampments, shelters, and rental unit locations to amenities throughout Seattle. We further enrich and support the necessity of neighborhood-level analysis by also including a city-wide analysis of these proximity data. We include rental units as a counterfactual scenario to experiencing homelessness. We hypothesize: (H1) Encampment locations more closely reflect the proximity to amenities available to the housed, renting population than shelter locations; and (H2) amenities that provide for basic needs (e.g., groceries, transit) are more proximate to encampments than shelters.

2. Background on homelessness in the U.S.

A well-developed literature in the U.S. focuses on the origins and consequences of homelessness (Teixeira & Cartwright, 2020). Research regarding the effects of encampment location and displacement has focused on the rise in the prevalence of encampments in Washington and California (Herring, 2014; Herring & Lutz, 2015). These include a focus on socio-spatial seclusion (Herring, 2019), the variable and shifting spatial distribution of encampment sites in places such as Oakland, California (Finnigan, 2022), and difficulties surrounding vaccine hesitancy and COVID-19 among those experiencing homelessness in Sacramento, California (Finnigan, 2023). We briefly consider attitudes towards encampments, displacements, and visible homelessness in the U.S. We outline the material needs of people experiencing homelessness, including the amenities and resources they require. We then discuss the differences in the experiences of living in encampments versus emergency shelters.

Fully understanding and appreciating the homelessness crisis in the U.S. requires a brief examination of the current political and social climate shaping life in cities across the country. People experiencing homelessness often face both social stigma (Reilly et al., 2022) and targeted policy actions, including forced removal or prohibitions against sleeping in public spaces (Foscarinis et al., 1999). In response to the significant increase in homelessness (which remains an issue; in 2024 there was an increase of 18% of people experiencing homelessness (de Sousa & Henry, 2024)) and in the wake of the dissolution of Jim Crow and vagrancy laws in the 1980s (Funk et al., 2022), U.S. cities began rolling out municipal codes and policies criminalizing unsheltered survival strategies like camping and sleeping in parks, sitting on public sidewalks, and panhandling (Barr, 2019; Ortiz et al., 2015). In particular, suburban sentiments around safety and aesthetics (Speer, 2019) in gentrifying urban environments may contribute to hostility towards visible poverty and homelessness (Kasinitz, 2012; Speer, 2017). Gentrification is linked to increased health precarity in this vulnerable population (McIntosh et al., 2023), and to an increase in interpersonal conflict between housed and unhoused people that complicates increasingly liberal attitudes towards unhoused people living and using public park spaces (Mullenbach et al., 2024; Pitas et al., 2023, 2024, 2025). In rapidly gentrifying Seattle, significant visible homelessness impacts many local neighborhoods. Although there is evidence that public attitudes from the 1990s onward have become more empathetic and compassionate toward people experiencing homelessness (Tsai et al., 2017, 2019), this has not yet been reflected in policy trends. Policies around criminalizing homelessness have been on the rise over the recent decades. The prevalence of these laws has increased particularly rapidly since 2016 (Barr, 2019). In a 2019 survey of 187 cities, a large proportion were found to have at least one law restricting public camping (72%), sleeping (51%), begging (83%), sleeping in vehicles (50%), scavenging/"dumpster diving" (76%), loitering/vagrancy (35% citywide 60% for specific public

[2] We define place-based amenities as desirable facilities and similar amenities, such as grocery stores, that are geographically located in a specific place with the goal of serving the population residing in that place.

[3] We compare against rentals as the most reasonable counterfactual to either encampments or shelters.

spaces), property storage (55%), and urination/defecation (83%) (Barr, 2019). The 2024 Supreme Court decision permitting cities unfettered authority to sweep tent encampments worsens the precarity of people living outdoors (National Homelessness Law Center, 2024).

3. Proximity to resources and amenities in the U.S.

Little is known about the experience of unhoused people regarding proximity to amenities (see, for example, Palta et al., 2016). We do know the basic material needs of people experiencing homelessness often go unmet (Fleury et al., 2021), including needs related to health care, like access to prescription medication (Baggett et al., 2010). Colburn and Aldern (2022) has illustrated how sociopolitical environmental circumstances driven by housing conditions, specifically housing stock availability and (un)affordability, have produced the conditions for the current homelessness crisis in the U.S.

The evidence-based "Housing First" model is grounded in the principle that adequate and stable housing is essential for recovery and survival. Initially developed to support individuals experiencing homelessness through mental health recovery (Tsemberis, 1999; Tsemberis & Eisenberg, 2000; Tsemberis et al., 2004), the model was first implemented in Seattle during the 1990s by the Downtown Emergency Service Center (DESC) (Downtown Emergency Service Center, 2025). Today, advocates in numerous U.S. cities have expanded the use of this approach to address the broader homelessness crisis (Malone et al., 2015).

In addition to housing, other fundamental material needs include proximity to safe food, clean water, hygiene facilities (such as bathrooms and showers), and health care services (Baggett et al., 2010). Public amenities, such as libraries and parks, along with commercial spaces like fast food restaurants, may offer limited support for food and hygiene. Equally important is proximity to transportation, which is essential for reaching these resources, and having private space, as it contributes to personal dignity and security (Baggett et al., 2010; Chan et al., 2014; Ding et al., 2022).

Furthermore, access and proximity to homelessness support resources and general amenities among people experiencing homelessness has been shown to be significantly curtailed by a lack of transportation options (Barile et al., 2020) and a general lack of geographic proximity (Rehn et al., 2024). Even in walkable cities like Seattle, older and aging people experiencing homelessness may struggle to access many services and amenities without access to automotive transport, buses, or at least places to sit and rest on their pedestrian journey. Proximity and access to critical amenities are thus clearly interlinked and worthy of closer examination, even if proximity is an imperfect proxy for access.

3.1. Encampments versus shelters

Lack of sheltered sleeping arrangements are known to impact sleep (Rice et al., 2025), health (Anderson et al., 2021), and the mortality (Almquist et al., 2025) of people experiencing homelessness. Living in encampments or more formal shelters is a survival strategy that comes with trade-offs, implications, and consequences, frequently shaped by the simple availability of shelter beds. Living in an encampment is a survival decision made due to a lack of alternatives (Herring, 2014). Stable housing is, of course, the ideal, but if that is not an option, those experiencing unsheltered homelessness frequently live in tents, automobiles, and RVs, or else sleep out in the open. While public officials are rightly concerned about hygiene in encampments, cities have also been shown to justify sweeps by pointing to unsanitary conditions and a lack of on-site hygiene resources (National Health Care for the Homeless Council, 2022). Despite this, many unhoused people live in an encampment rather than an emergency shelter. While stable indoor housing for some is preferred, if that is not an option, other options may be more to one's suiting, such as tents, automobiles, and RVs for their stability and security in lieu of overnight shelters for a variety of reasons (e.g., staying with pets, entering and leaving at will and the ability to smoke or drink as any housed adult is allowed to do in their home; see Almquist, Yang, et al. (2024), Kuhn et al. (2022) for details in Seattle, WA and Los Angeles, CA). Concerns about cleanliness have also contributed to displacement and sweeps in places like public parks (Rose, 2017). Relocating people from public spaces without offering them indoor shelter that respects their autonomy significantly disrupts their lives. It exposes them to greater health risks as they are forced to resettle in less safe environments. When encampments are swept, occupants may be disconnected from their personal networks, lose their personal property (e.g., clothes, work uniforms, bedding, photographs, identification, and prescription medications), and become disconnected from social workers and support systems (Goldshear et al., 2023). Overall, forced displacement undermines the health of people experiencing homelessness, and the American Public Health Association, among other organizations, has written policy to this effect (American Public Health Association, 2023; Qi et al., 2022).

Social workers from organizations such as REACH consistently visit specific encampment locations to provide outreach, care, and resources, but this is not a permanent solution to homelessness, nor is it simply placing people in limited shelter beds. Advocates for a Housing First approach to addressing homelessness emphasize that shelters are not housing; they are intended to be a short-term stopgap, not a long-term solution for those without formal housing. As the shelter systems in most cities, including in Seattle, are both short on beds and not designed to transition unhoused people into more stable housing situations, shelters are *de facto* not a solution to chronic homelessness (National Health Care for the Homeless Council, 2022). Shelters simply do not have all the functionality of a home, including personal space and a sense of safety, storage for personal items and food, cooking space, etc., though increasingly shelters in many cities are attempting to offer these types of amenities (Kuhn et al., 2022). We focus on the trade-offs between the shelter system (in Seattle, WA, this includes tiny homes, but not sanctioned tent encampments) and living outside. Encampments are complex spaces that can also be unsafe and violent, but bureaucracies do not manage them; they allow pets, provide somewhat private spaces, foster personal relationships, and offer all-hours access to one's space and possessions — considerations often, but not always consistently, afforded by shelters. Emergency shelters are sometimes associated with increased theft, violence, and substance use when they do not support single rooms or small group settings (Wusinich et al., 2019). For women, this can be further exacerbated by sexual harassment from both shelter staff and occupants (Garrow & Devanthéry, 2019), though this is by no means a universal experience. Even when shelter beds are available, many facilities restrict personal belongings to a single bag, leading to property loss — a problem that also arises during encampment sweeps. For individuals with cars, storing them near shelters can be difficult or prohibited due to limited in-and-out privileges, which can jeopardize a critical asset for maintaining stability. While many shelters offer strong programs and services, participation in these is often mandatory, even when the programs may not align with individual needs or are nearly impossible to benefit from without the foundation of stable housing, such as sobriety counseling (National Health Care for the Homeless Council, 2022). Rigid hours during which emergency shelter occupants may arrive and leave may not align well with working hours, making it more difficult to secure stable employment and exit homelessness (Poremski et al., 2014), and may damage their sleep schedules (Rice et al., 2025). Conversely, it is challenging to secure and maintain stable employment when one's sleeping arrangements are uncertain and precarious, as is often the case in encampments.

Additionally, shelters may have prohibitive rules that may leave their occupants feeling dehumanized, infantilized, blamed for their situation, and safer outside than in Daiski (2007), Donley and Wright

(2012), though again, this is not universal. Shelter staff provide critical care and support, and their kindness and empathy can be deeply meaningful to the people they support. Yet, shelters are complicated environments in which to work or survive. For example, there have been instances where shelter occupants' rights have been violated without recourse (Garrow & Devanthéry, 2019). There is also evidence that the shelter system is being used as a political tool to fuel the criminalization of visible, public homelessness and encourage the increase of sweeps (Herring, 2021). What is clear is that shelter resources are limited while the need for beds is great, and navigating the need for a safe place to sleep is difficult. People experiencing homelessness endure stressful living circumstances daily, which can be alleviated significantly by a stable, safe place to sleep. Shelters can provide temporary support in this regard, but are not a one-size-fits-all solution to homelessness.

4. Data

4.1. REACH encampment data

This analysis employs data provided in partnership with REACH, the largest independent homelessness services contractor to Public Health — Seattle-King County (Evergreen Treatment Services (ETS) REACH, 2022). We obtained University IRB approval to analyze REACH-provided aggregate case data from tent encampment sites. These represented 907 tent encampment site locations and street outreach locations (i.e., encounters not specifically related to an encampment location) within the Seattle city limits, recorded between 02/01/2016 and 09/06/2022. Site-specific data included the location of each encampment (recorded as address, street and block number, nearest cross-street, or relative description relative to local landmarks) and the date of the first and most recent social worker observations of the specific encampment location.

Analyses were undertaken at the neighborhood district level. We identified and mapped neighborhoods using the City of Seattle's unofficial neighborhood boundaries GIS file (City of Seattle, 2020). In this analysis, we used several publicly available datasets from the City of Seattle Open Data (City of Seattle, 2024a) and Geo Data (City of Seattle, 2024c) portals, including food safety data (to identify grocery stores, convenience stores, fast food restaurants), city-funded public toilets and hygiene (shower) stations (managed by the Seattle Parks Department, and also in community centers), food banks, public libraries, clinics with substance use treatment and mental health support options, places of religious worship (which often provide emotional and material support to those in need, such as with "soup kitchens", and connections to formal support services), and public parks. Data relating to King County Metro Transit Stops (we used only bus stops) were sourced from the King County GIS Open Data (King County GIS Open Data, 2018). The City of Seattle's Rental Property Registration data's 27,759 discrete geographic locations (representing a total of 193,192 rentable units) contemporaneous with the period of study[4] were used to identify a plausible comparison of proximity to amenities (City of Seattle, 2024b). These locations are the total record of registered rentals in Seattle, with very few exceptions[5] registration of rental units has been required by city council ordinance since 2014 City of Seattle Department of Construction & Inspections. These locations were filtered to 5536 rental locations (both single and multi-unit buildings) registered prior to 2023

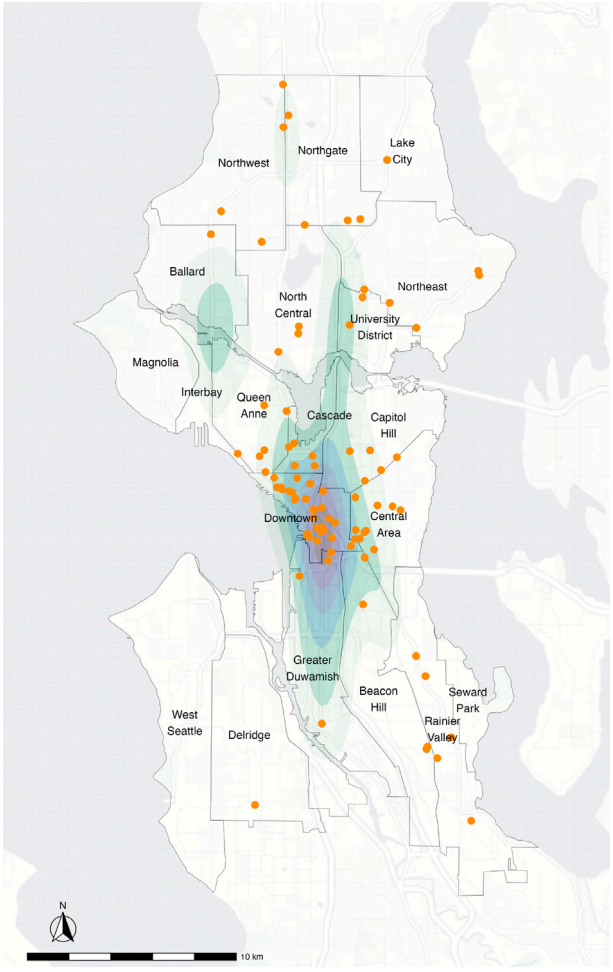

Fig. 1. Seattle is located in King County, WA, the twelfth largest county (2,271,380 people) in the United States by population (U.S. Census Bureau, 2023), and the fourth largest county with a population experiencing homelessness (16,868 people in 2024; a 26% increase from 2022). The core density of the encampment locations considered in this study is illustrated above in the blue and teal heat map. Density is concentrated around the Downtown area, extending north through the University District and south through the Greater Duwamish area, as well as a secondary area of density between the Ballard and Interbay neighborhoods. The city also hosts 127 shelters (representing approximately 6000 beds, with locations illustrated by orange points), many of which are concentrated in the Downtown area.

(the earliest rentals in these data were registered in 2018). As these represent the formal record of rental housing stock for Seattle for the period under consideration in this paper (i.e., before 2023), we consider this an adequate representation of rental locations in Seattle. Data also included over 127 known emergency shelter locations currently recorded in Seattle (King County Regional Homelessness Authority, 2024a). We illustrate the density of the encampments used in the study while protecting the exact locations of these as well as specific shelter locations across the city in Fig. 1.

5. Methods

5.1. Geocoding encampment locations

From the 907 original records provided by REACH, we validated and geocoded 742 encampment sites in R (R Core Team, 2022); the remaining 171 sites are considered geographically unidentifiable due to poor data quality. We obtained specific coordinates for each site using the NAD83 (National Spatial Reference System 2011), Washington North (EPSG: 6596) metric projection specification appropriate

[4] These data remain available from the City of Seattle.

[5] Seattle's Rental Registration and Inspection Ordinance, "...includes multi-family apartment buildings, single family homes for rent, boarding houses, fraternity/sorority houses, micro-housing facilities, floating on-water residences for rent and vacation home rentals that are not owner-occupied," with exceptions such as "...hotels, nursing homes, religious housing, government housing, or emergency housing."

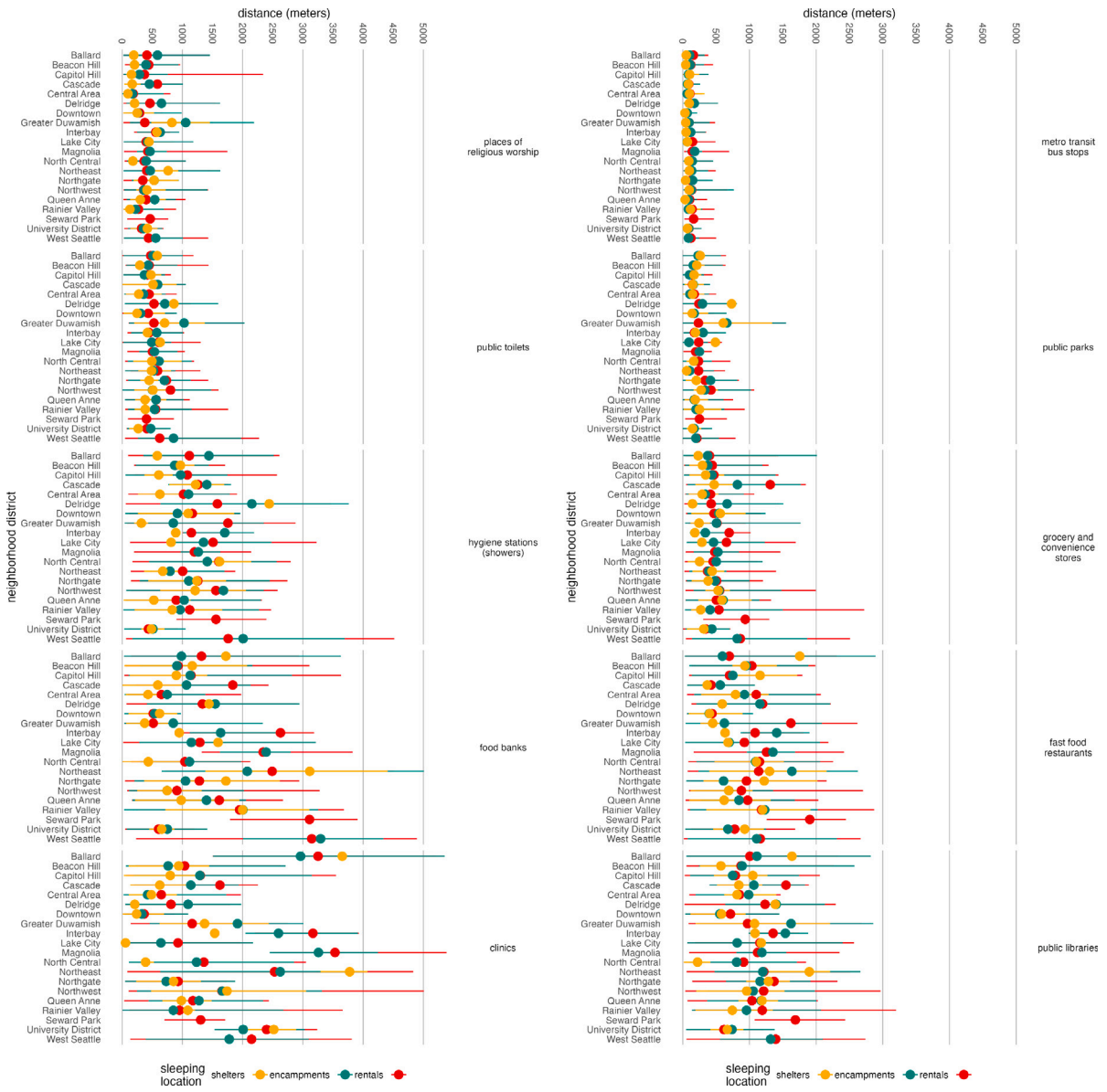

Fig. 2. Descriptive statistics of the mean distance to the nearest amenity by neighborhood and sleeping location, including the minimum and maximum interval.

for analysis within the King County, Washington area (U.S. National Geodetic Survey, 2011). Several sites were difficult to geocode due to imprecise or vague records. If the general site area was identified relative to the nearest cross-street/street intersection, we used a point at the intersection to estimate the site location. For the small number of sites described as being located on a specific street and city block without more specific location information, we identified the two closest intersections bounding the described location, geocoded these two points, and randomly drew one to represent the location of the site. We consider this adequate for capturing the relative location of these sites because the distance between the bounding points was small (usually < 100 m). In a few cases, we consulted with REACH to identify the relative location of encampments when social workers used non-standard geographic descriptions of locations in the records (e.g., local or colloquial names for locations, such as "The Blade", a location in Downtown's Pioneer Square area). In these cases, we manually identified an approximate geolocation. We analyzed encampment locations atemporally due to issues with temporal identifiability, sparseness, and to protect the privacy of those living outside.

We measured the Euclidean distance from each encampment, shelter, and rental unit location (the three "sleeping locations", the collective locations of which we call "sites") to the nearest location of each type of amenity, irrespective of neighborhood boundaries (i.e., "globally" across the city) to account for mobility between spaces. Descriptive statistics of these distances by neighborhood, sleeping location, and amenity are illustrated in Fig. 2, and provided in Table A.1 in the Appendix. We note that the descriptive distances were all increased by one meter to accommodate the log-transformation in the regression model; this was done to uniformly handle several instances where the distance to the closest amenity was zero. For this analysis, there is no functional difference between one and zero meters. We built a log-normal linear regression model of the distance to amenities with interactions between amenity type, neighborhoods, and sleeping location (i.e., encampments, shelters, and rental units). We then predicted and visualized the balanced marginal means of each amenity type and site type within each neighborhood, including the 95% confidence intervals. Additionally, we provide city-wide proximity data for comparison by sleeping location and amenity types.

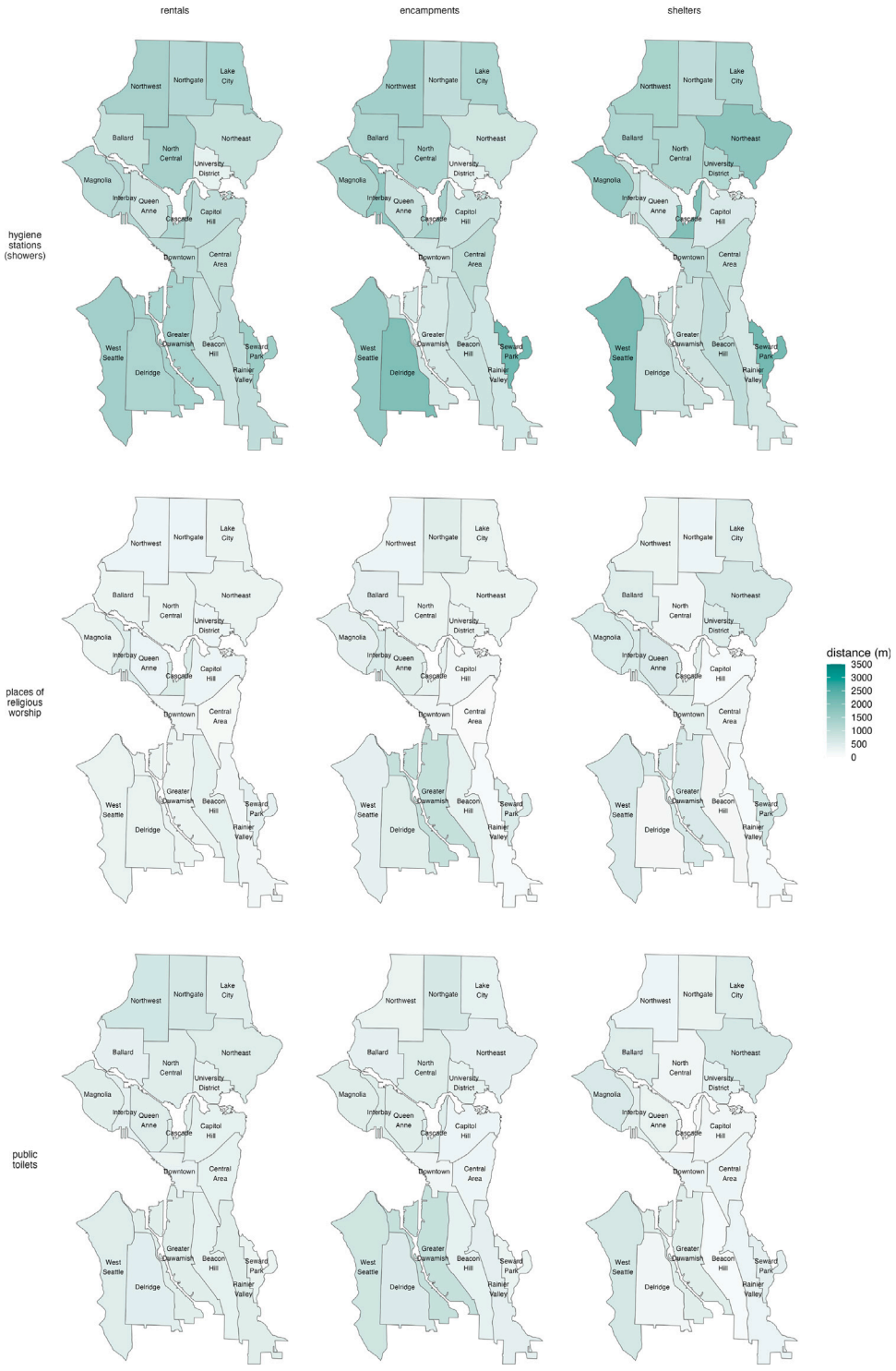

Fig. 3. Comparative maps of the predicted marginal mean distance (in meters) to the nearest hygiene station (shower), place of religious worship, and public toilets by sleeping location and Seattle neighborhood (complete results are illustrated in Fig. 7). Proximity to amenities was similar among encampments, rentals, and emergency shelters for hygiene stations, places of religious worship, and public toilets. Both encampments and shelters were farther away from hygiene stations in neighborhoods in south Seattle (including West Seattle, Delridge, and Seward Park).

6. Results

Predicted marginal means from the regression analysis of the distance to amenities by Seattle neighborhood for encampments, shelter, and rental units are illustrated in Fig. 7 (full regression results, Table A.2, and full statistics for predicted marginal means, Table A.3, are available in the Appendix). Comparative maps of the mean distances of these predicted estimates are available in Figs. 3–6.

In most neighborhoods, metro transit bus stops, public parks, places of religious worship, public toilets, and grocery and convenience stores were located within 1 km (1000 m) of each sleeping location. For these, there was a greater level of heterogeneity among shelters, as indicated by the large confidence intervals present in the predicted marginal

Fig. 4. Comparative maps of the predicted marginal mean distance (in meters) to the nearest substance use/mental health support clinic, food bank, and grocery or convenience store by sleeping location and Seattle neighborhood (complete results are illustrated in Fig. 7). Shelters were more proximate to clinics and food banks, and slightly less proximate to grocery and convenience stores. Encampments and rentals had similar proximity to clinics and food banks.

means (up to 2 km in several central and north Seattle neighborhoods) (Fig. 7). All three types of sleeping locations were at least 1 km from a hygiene station (showers), which were available either at formal stations or through community centers. All sleeping locations were within 2 km of fast food restaurants, clinics, public libraries, food banks, and hygiene stations (showers). Rentals and encampments in several neighborhoods were frequently farther away from fast food restaurants (West Seattle and Magnolia), clinics (Magnolia, Interbay, and Ballard), and food banks (West Seattle and Magnolia) than shelters. Among encampments, those in Magnolia, Interbay, Lake City, and West Seattle neighborhoods had some of the greatest heterogeneity in proximity to public parks, places of religious worship, public toilets, grocery options, fast food restaurants, public libraries, clinics with substance use treatment and mental health support options, and food banks. In summary, though all sleeping location types were generally reasonably close to amenities across the city, shelters exhibited the

Fig. 5. Comparative maps of the predicted marginal mean distance (in meters) to the nearest metro transit bus stop and public library by sleeping location and Seattle neighborhood (complete results are illustrated in Fig. 7). All three sleeping locations were extremely close to bus stops, and had similar proximities to public libraries. Shelters were slightly farther away from libraries in the Northeast neighborhood, and much closer in the North Central neighborhood. Encampments were somewhat farther away from libraries in the south end of the city, with the exceptions of Beacon Hill and Rainier Valley.

greatest heterogeneity in proximity to almost all amenities studied except metro transit bus stops (as indicated by the substantial confidence intervals illustrated in Fig. 7). Taken with the density of encampments and locations of shelters during the period of study (Fig. 1), we find the northwestern neighborhoods of Magnolia, Ballard, and Interbay to be areas underserved by shelters, and where amenities were not located in close proximity to encampments.

6.1. Neighborhood case study: Ballard

Neighborhood trends are informative, but to speak more directly to the individual experience of living in an encampment versus shelter or rental and the accompanying proximity to amenities, we briefly consider a few study locations in Ballard. Ballard is a neighborhood we have identified as having highly geographically centralized amenities and few shelter options, but with a substantial density of encampments, in northwest Seattle (see Figs. 8 and 9).

During the study period, Ballard was host to a large number of encampments. It also hosted a single shelter that was located at the north end of the neighborhood. As a comparative example, we have selected two unique locations to represent a "typical" encampment or rental location in an area with the average density of each sleeping location. The shelter was close to and thus well-served by metro transit bus stops, was fairly close to two grocery options, was close to a few parks with public toilets, and was located near several places of religious worship. Conversely, it was much farther away from fast food restaurants (which can offer free Wi-Fi, inexpensive food, and toilets, and serve as a warm place to spend time), food banks, and the public library. While the shelter was located in the north end, most amenities in this neighborhood were concentrated in the south end, primarily in the primary commercial area, which had a central density along the southernmost east–west bus stop series, representing the neighborhood's main street. The encampment and rental locations were much closer to this area. Both the rental and encampment locations were in closer proximity to the public library, a hygiene station (including a shower) at the local community center, a food bank, several other options for public toilets, as well as grocery stores, fast food restaurants, and public parks. There was only one clinic offering substance use treatment or mental health services; all three example locations were within a distance of one to two kilometers (i.e., between one and two thousand meters). More significantly, the shelter was over 2.5 km from the food bank (compared to 1 km for the encampment and about 0.6 km for the rental), 1.75 km from the nearest fast food restaurant (compared to 0.5 km and about 0.45 km, respectively), and about 2.1 km from the public library's resources (0.5 km, and 100 m). There was a large difference in general proximity to amenities between the three sleeping locations in Ballard. Rental units and encampment locations tended to be located closer to the main commercial street and its numerous amenities. In contrast, the shelter was more isolated from areas of high foot traffic.

Fig. 6. Comparative maps of the predicted marginal mean distance (in meters) to the nearest fast food restaurant and public park by sleeping location and Seattle neighborhood (complete results are illustrated in Fig. 7). All three sleeping locations were similarly close to fast food restaurants, and public parks. Encampments were farther away from parks in the Greater Duwamish neighborhood, while shelters were farther away in the Northeast and Queen Anne neighborhoods.

6.2. City-level proximity to amenities

Finally, to situate these results in the broader context of the city of Seattle, we present city-level data reflecting the proximity to amenities by shelter type. These distances were calculated simultaneously with the results of the neighborhood-level analyses. Instead of aggregating these trends to the neighborhood level, we present the non-aggregated, city-wide trends (Fig. 10) and are also available in Table A.4 in the Appendix. At the city level, shelters were closer than encampments across all amenities. Furthermore, these distances suggest rentals were farthest away from amenities than shelters and encampments, and also had the greatest variation in proximity. Though perhaps initially counterintuitive, these data support our initial smaller geography/neighborhood approach to the analysis of proximity to amenities in cities. The wide distribution of distances to amenities suggests there was large heterogeneity across the city of Seattle. Aggregating these data at the city-level therefore runs the risk of ecological fallacy (Openshaw, 1984; Openshaw & Taylor, 1979), and more specifically the modifiable areal unit problem "scale effect" (Wong, 2004).

7. Discussion

Recent research in King County, WA, has shown that many individuals who become homeless tend to remain near their last formally housed location and typically exhibit a tenure similar to that of the housed population in the county (Almquist, Kahveci, et al., 2024). Further, previous work on space and access to care among people who were previously unsheltered demonstrated the importance of proximity in terms of facilitating access to clinical support options, leisure spaces, and integration into community (Chan et al., 2014). Studying proximity to amenities is, therefore, a highly localized question appropriate for smaller-scale geographic consideration. Understanding proximity is important because it speaks to whether a particular place has the potential to facilitate access to amenities, but it is also crucial to emphasize that it cannot identify whether someone is indeed able to use amenities or receive services through them. In the absence of data on amenity use, we interpret proximity as a proxy for access among people experiencing homelessness. This assumption informs our use of the data. This paper is a first step toward understanding access to amenities among the unhoused population in Seattle by first parsing their lived proximity to these.

Seattle is not a geographically large place, but the density of encampments and shelters in this study was extremely concentrated in the Downtown area, stretching north–south along the I-5 freeway corridor, and with emergent density in northeastern neighborhoods, particularly Ballard, Interbay, and Magnolia. During the study period, the average distance to amenities was similar across sleeping locations at the neighborhood level. The large uncertainty and heterogeneity in shelter proximity estimates, relative to the high level of certainty for encampment and rental estimates, suggest that (H1) encampment locations more closely reflected rentals' than shelters' proximity to many amenities in the majority of neighborhoods, although these differences were small and not universal.

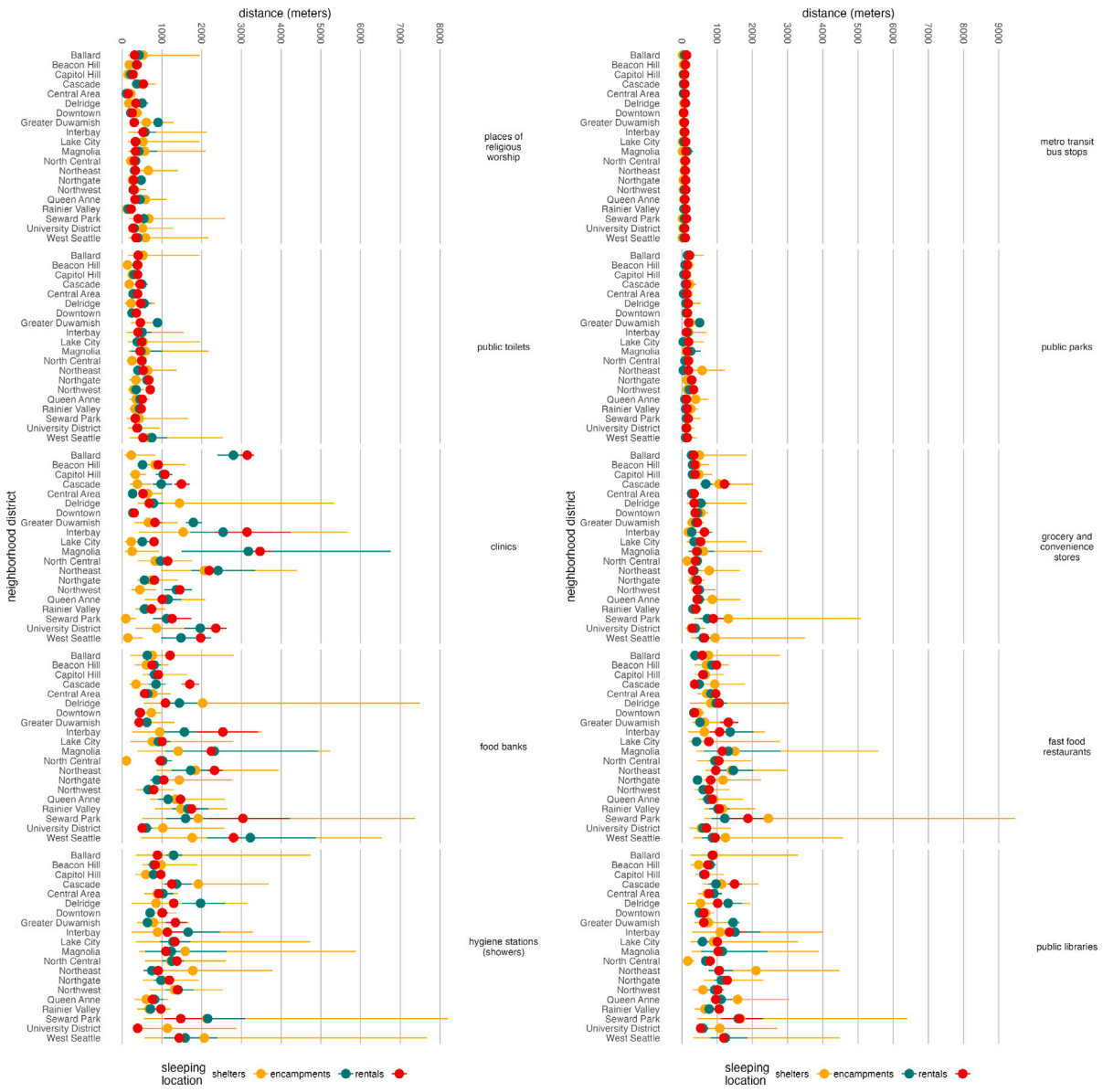

Fig. 7. Predicted marginal means from the log-normal mixed effects regression analysis of distance to amenities, with the closest amenities at the top, and the farthest at the bottom.

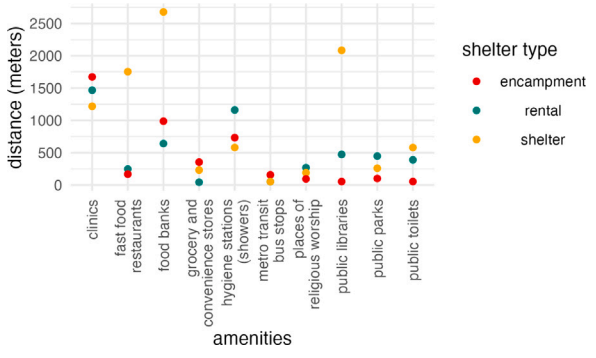

Fig. 8. When we compare three example locations of sleeping locations in the Ballard neighborhood, we see the shelter, encampment, and rental locations were fairly close to several amenities, including metro transit bus stops, public toilets, and places of religious worship (note these measurements represent raw Euclidean distance in meters). Conversely, the shelter was significantly farther away from the food bank, the nearest fast food restaurant option, and the public library than rentals and encampments.

All three sleeping locations were frequently located close to many amenities, but shelters were more likely to have much more variable proximity than encampments or rentals. Some (H2) amenities that cater to basic needs, particularly food-related amenities (except food banks), were located closer to encampments than shelters. This may reflect differences in overall resource access through shelters versus encampments. For example, some shelters have associated food banks, or provide meals (or else transportation to places that provide them), and have showers and toilet amenities, fulfilling basic needs and de-emphasizing the importance of being near to amenities related to food (grocery, fast food restaurant) and hygiene (public toilet, library, hygiene station). Similarly, many shelters have integrated substance use and mental health support clinics. Still, while this is not universal, our discussion of proximity to amenities by sleeping location in the Ballard neighborhood illustrates how both housed and unhoused residents of many neighborhoods across Seattle prioritize proximity to the main street and its numerous amenities; there is more variability with respect to shelter locations. We recommend that shelter locations continue to be strategically placed in neighborhoods with high encampment density and close to basic amenities.

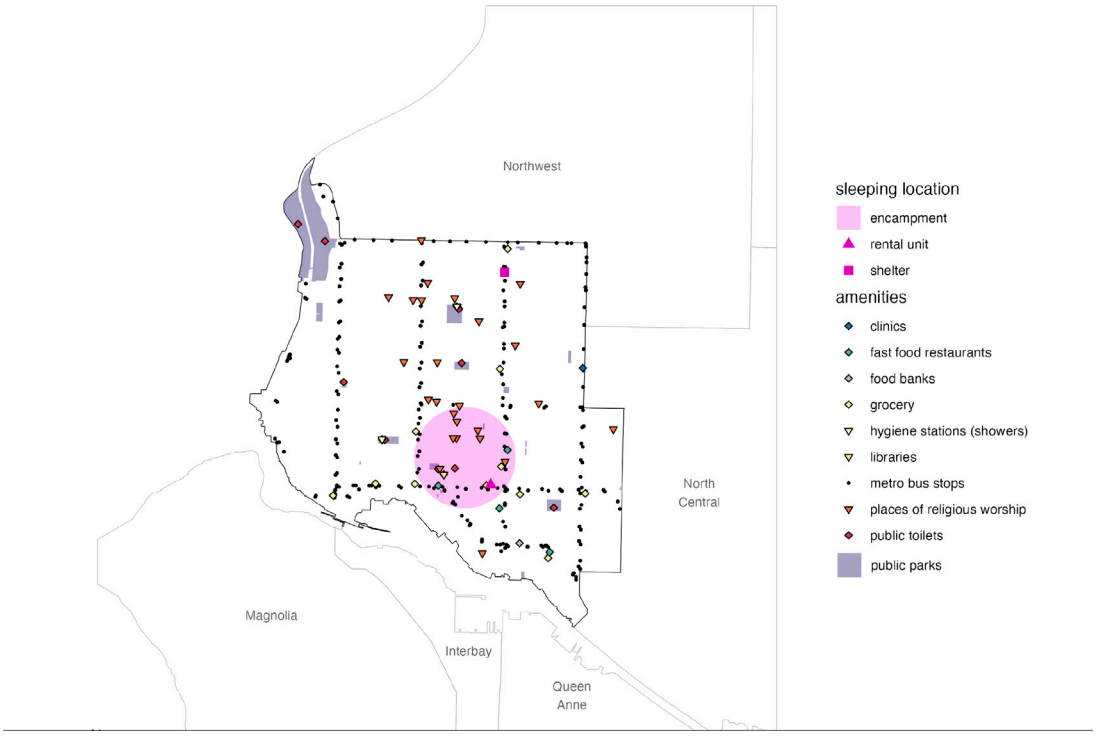

Fig. 9. In the Ballard neighborhood, the shelter was located in the north end, while the majority of amenities were in the south end in the primary commercial area (the central density of which is along the southernmost east–west bus stop series, representing the neighborhood's main street). The encampment and rental locations were much closer to this area and were thus in closer proximity to the public library, food bank, several more options for hygiene and grocery, fast food restaurants, and public parks. There was only one clinic in Ballard that offered substance use treatment or mental health support; all three example locations were at least 1 km from it. Rental units and encampment locations were close to the main street and its many amenities.

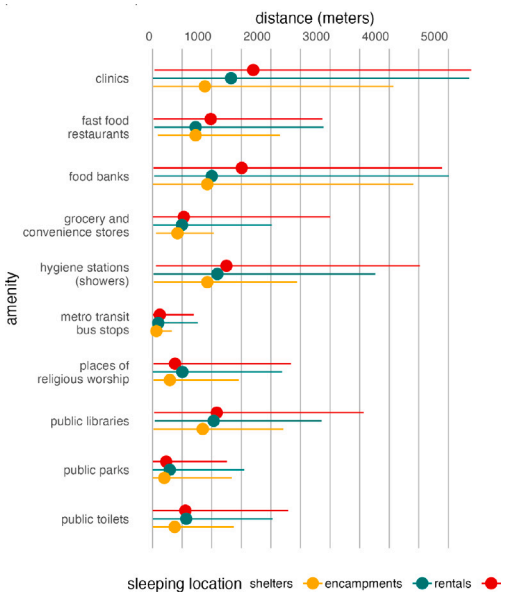

Fig. 10. Descriptive statistics of the mean distance to the nearest amenity by shelter type, including the minimum and maximum interval, across the city of Seattle.

7.1. Shelters are helpful, but housing is critical

Additionally, it is important to emphasize that shelters do not provide permanent housing for people experiencing homelessness, and are not designed to do so. For all the support and care they provide, in other West Coast American cities, there is evidence of systematic seclusion and "neutralization" of the homelessness crisis through shelters (Herring, 2014, 2019). Certainly, while an important stopgap, shelters are not a long-term solution to the homelessness crisis, though they are, of course, preferable to unsheltered habitation. Despite this tension between supporting and controlling people experiencing homelessness, our findings emphasize that people experiencing both sheltered and unsheltered homelessness must have their basic needs met; when they are left without the option to seek formal shelter, they appear to locate tents in places that maximize their potential ability to meet these needs. Through this analysis, we were unable to determine whether the people living in these encampments were able to do so consistently; based on our knowledge of the experiences of unsheltered individuals generally, it is unlikely that all were able to do so. Further research should be conducted to understand the location of shelters that fulfill specific needs across the city, the relationship between this distribution and encampment density, and how care providers can better meet the basic needs of people who are surviving unsheltered. We expect on-the-ground care organizations, such as REACH, our data partner for this study, to become increasingly important as the homelessness crisis intensifies in Seattle and elsewhere, and as sweeps increase in frequency, disrupting traditionally geographically static care and support approaches. A continued focus on developing transitional housing among policymakers, therefore, seems prudent.

7.2. Limitations

A key *limitation* of our analysis is that a city-level analysis could not be undertaken reliably due to the large distribution of amenities at the city level and the risk of the *modifiable areal unit problem* (MAUP). In these data, there exist rentals that were far away from amenities. Similarly, emergency shelter locations across the city were too variable to make reliable conclusions at the city level. Instead, we make our analysis at a smaller geography – neighborhoods – to reflect meaningful

trends: proximity characteristics of tent locations correlated with those of rental locations at this finer scale. Further, there is a large literature on the importance of neighborhoods for health and well-being that situates such analysis (see for example, Chaskin, 1997; Lewicka, 2010).

A second limitation is that we are unable to speak to undocumented rental units in our analysis. A third limitation is that we cannot directly address the availability of publicly accessible toilets due to a lack of information in the data. Access to hygiene options, such as toilets, is another amenity recognized as a basic human right (United Nations, 1948). A fair amount has been written on the necessity of access to toilets and other hygiene amenities among unsheltered people, including links to well-being and health (Frye et al., 2019; Marcus et al., 2020; Maroko et al., 2021; Portillo et al., 2023), menstrual hygiene (Maroko et al., 2021; Sommer et al., 2020; Teizazu et al., 2021), and connections to rural homelessness as well as substance use (Ballard et al., 2022). The COVID-19 pandemic resulted in closures to many public services, including toilets (Marcus et al., 2020), and had big effects on general public health issues (Amato et al., 2022). While the nuances of availability are unclear here, we expect many fast food restaurants, gas stations, grocery stores, and convenience stores to have toilets accessible to the public (or customers) during business hours (typically between 9 a.m. and 10 or 11 p.m.). We also expect that this was likely complicated by the fact that amenities were closed to the public (or had reduced hours) during the COVID-19 pandemic. We hypothesize that the availability of toilets in amenities not primarily focused on hygiene (i.e., those listed above) likely affected where encampments were located. Similarly, as these secondary toilet locations were generally inside amenities and farther away from shelters, we expect that individuals in shelters had more limited secondary toilet options than those in encampments. A lack of nearby toilet options may limit an individual's willingness to travel from a shelter. Furthermore, proximity to toilet options can be compromised by negative interactions between amenities' staff and unsheltered people; e.g., an unsheltered person might be accused of trespassing or experience interpersonal friction with amenities' staff members, thus limiting both their access, as well as other unsheltered individuals', due to staff attitudes and formal or informal bans on their entry. Additional mixed-methods research is required to clarify the role of proximity to toilet and shower options, as well as shelter options among those living unsheltered on Seattle streets.

8. Conclusions

During the study period, encampments were located near essential amenities, particularly transit, public spaces such as parks, places of worship, grocery stores, and public toilets. We cannot speak to individual-level intentionality or circumstances around encampments and their locations, of course, because our analysis is correlational rather than causal, but our findings align with similar research findings (Almquist, Yang, et al., 2024; Kuhn et al., 2022). Encampments' proximity to amenities was, on average, the same as that of rental units and similar to shelters. However, when we consider the total distribution of each sleeping location's proximity, encampment proximity data reveal an underlying trend: just like housed people, unhoused people need and want safe shelter in the form of adequate housing that is integrated into neighborhoods, and reasonably close to basic amenities. Though again we cannot speak to individual-level experiences, we suggest the distribution of encampments reflects a prioritization of places close to basic amenities. This follows from the observation that people living unsheltered in King County typically prefer to travel less than 3 miles (4.83 km), mostly by bus, walking, or biking, to access amenities and resources (Hernandez et al., 2024). Of course, encampment locations reflect the survival strategies of those living outside; they are locations shaped by material needs, but also by the realities people living outside face, including encounters with law enforcement, sweeps, other social stigmas, private property, violence, theft, and so on. Compared to encampments and rentals, shelter locations exhibited the greatest variation in distance to various amenities across neighborhoods, although this variation was relatively small. We interpret these differences as a compromise; shelters were fixed locations generally close to many amenities.

We suggest that shelter locations be periodically reassessed and permitted as necessary. Shelters should be strategically located near critical amenities and integrated into neighborhoods to provide localized support for individuals experiencing homelessness. Yet, we again emphasize that shelters are a temporary solution for those without stable housing. To echo our Seattle-based colleagues Colburn and Aldern (2022), as is the case elsewhere in the U.S., homelessness in Seattle is primarily a housing issue. To improve homelessness outreach, it is critical to have stable, low-cost, or transitional housing options in places where people can not only meet basic needs, but also feel integrated with their local communities where they are most likely to have been previously housed (though newcomers to neighborhoods, of course, deserve similar support). This is a big demand. Even so, housing instability among the unhoused population is a direct threat to their well-being and even their lives; as elsewhere, in Seattle, people die without shelter (Scott et al., 2023). It thus behooves policymakers and practitioners to legislate and/or provide effective support that centers on autonomy, dignity, and harm reduction. Neither encampments nor shelters are particularly safe or healthy places for individuals to reside. Formal shelters are also not equipped to deal with the volume of unsheltered homelessness in Seattle. We thus agree with the expert Housing First advocates' position that there are advantages to allowing encampments to exist and be managed in place, and that Seattle's existing permanent supportive housing programs are a wise investment in reducing homelessness. We find that this work supports the policy recommendation made by the National Health Care for the Homeless Council (National Health Care for the Homeless Council, 2022) that progress can best be achieved through (H)ousing those who live outside, while taking adequate steps toward (E)arning their trust, including (L)imiting police, (P)reventing sweeps, and ensuring service providers can deliver care through (S)upport service interventions (the HELPS framework). To address the homelessness crisis in the twenty-first century, we must prioritize the dignity and respect of our unhoused neighbors, acknowledge their autonomy, and meet them where they are.

CRediT authorship contribution statement

Aja Sutton: Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Whitney Walker:** Writing – review & editing, Data curation. **Amy Hagopian:** Writing – review & editing, Supervision, Resources, Project administration, Funding acquisition, Conceptualization. **Zack W. Almquist:** Writing – review & editing, Supervision, Resources, Project administration, Funding acquisition, Conceptualization, Methodology, Investigation and Formal analysis.

Funding

Partial support for this research came from a Eunice Kennedy Shriver National Institute of Child Health and Human Development research infrastructure grant, P2C HD042828, and training grant, T32 HD101442 to the Center for Studies in Demography & Ecology at the University of Washington; National Science Foundation CAREER Grant #SES-2142964; UW Population Health Initiative Tier 2 and 3 Grant. The content is solely the authors' responsibility and does not necessarily represent the official NIH or NSF views.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

As an Evergreen Treatment Services (ETS) REACH employee, Whitney Walker acknowledges the importance of transparency and accountability in scientific research and peer review. ETS REACH employed Walker during the period of time represented by the retrospective dataset used in this study. As a contractor to Public Health—Seattle & King County, ETS REACH collected data for the study period as part of its regular outreach program.

Appendix A. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.cities.2025.106348.

Data availability

Encampment data from ETS REACH are confidential. All other data are publicly available and cited in the manuscript; they are generally available from Seattle and King County open data portals online.

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