CLARITY
HUMAN SERVICES

GIS Technology and Homelessness

Using GIS to Solve 3 Common Problems in Helping the Homeless

White Paper

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EXECUTIVE SUMMARY

Geography is a critical but often overlooked factor to consider when designing and evaluating homeless services and programs. With the advanced technology we have today, methods such as geographic mapping and spatial analysis have become more accessible to the human services industry.

One such example is the use of geographic or geospatial information systems (GIS). It's an important tool that can help communities better define and target geographic problems commonly faced when helping the homeless.

GIS can solve three common problems:

1. Lack of access to housing and services

✓ ***GIS answers questions such as:***

- Where are the homeless located in relation to where housing and service providers are located?
- How accessible is public transportation in these areas?
- Does shelter quality affect the rate of unsheltered homelessness in an area?

2. Understanding complex social and environmental factors affecting homelessness

✓ ***GIS answers questions such as:***

- What neighborhoods host the most Section 8 Vouchers?
- Which criminalization measures are in place within certain areas?
- Do certain areas have prevalent health hazards that perpetuate or exacerbate homelessness conditions?

3. Barriers to finding and effectively helping homeless and at-risk youth

✓ ***GIS answers questions such as:***

- Where are the street "hangouts" that homeless youth frequent?
- Based on this information, where are the best locations to establish drop-in centers?
- Which neighborhoods should be targeted for youth reentry services?

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GIS technology enables us to better understand (and thus respond) to these three common problems. We can identify patterns in accessibility issues, clarify the relationship between various social and environmental factors, and locate and serve seemingly invisible homeless youth populations.

Although GIS can transform the way we understand the homeless in our communities, many communities are unaware of this tool, or are unsure of how to use it.

Purpose

The purpose of this white paper is to present a clear picture of how GIS relates to homelessness, and how to use this technology to solve three specific problems in homeless services: 1) accessibility, 2) social and environmental factors, and 3) hard-to-reach youth populations.

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WHAT IS GIS?

Basics of GIS

Put simply, GIS (geographic or geospatial information systems) link data to its geographical location.

Definition

A **geographic or geospatial information system (GIS)** is a system designed to capture, store, manipulate, analyze, manage, and present all types of spatial or geographical data.[2]

GIS incorporates **spatial data** (data that in some way references locations on the earth) with **attribute data** (additional information about each of the spatial features) in order to map, analyze, and assess real-world problems.[1]

For example, the actual location (e.g. zip code) of a client is the spatial data. Additional data such as the client's name, age, and income would make up the attribute data.

By combining these two data types, homeless-services providers can address challenges in their communities in ways they never even knew existed.

History of GIS

Believe it or not, the idea behind GIS has been around for awhile – the use of geographic mapping in social work practice dates back to the late 19th century. Settlement house workers developed a series of community maps in order to assess social and economic injustices in Chicago neighborhoods.

However, advancements in technology have made these methods more accessible to the human services industry, especially in recent years.

GIS is rapidly gaining popularity as an important data visualization tool, enabling professionals to glean new insights on homelessness in their specific communities.

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ACCESSING GIS DATA

There are several different ways to access GIS data.

1. HMIS Integration

Certain HMIS software integrates with data analysis tools, combining map data visualization with powerful analytics. This means that data entry, reporting, and GIS techniques can all be conducted in a single interface without having to switch between softwares and applications. All the data you need is there at your fingertips.

2. HUD eGIS StoreFront

The U.S. Department of Housing and Urban Development (HUD) provides a free eGIS library of existing geospatial datasets, web-based mapping tools, and more.

3. GIS Software, Tools, and Services

There is a broad range of stand-alone (i.e. not integrated with HMIS) GIS applications and services available. Some have been used for recent online studies include Esri, GIS Cloud, and CartoDB. You can view an extensive list of options here.

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HOW GIS HELPS THE HOMELESS

Now that we understand GIS, let's talk about how we can apply it to our efforts to help the homeless in our communities.

We'll discuss each of the following three problems in the context of GIS, including common challenges and different questions to consider for each.

Solutions to these problems differ among communities. However, hopefully the information provided will communicate the value of GIS in understanding these problems.

Problem #1. Lack of access to housing and services

For many communities, multiple homeless services are already established. Shelter is in place, affordable housing is increasing, and service providers are ready to accommodate. However, there are still barriers that inhibit the homeless from accessing the shelter, housing, and services they need.

A report from HUD's Office of Policy Development and Research (PD&R) provides an in-depth look at some of these barriers and strategies for improving access to mainstream benefits. Several of the barriers mentioned in this report can be better understood using GIS. These include structural barriers, or obstacles that prevent an eligible person from getting available benefits, such as where programs are located and the atmosphere or environments of these offices and shelters.[3]

Below are a few examples of questions to ask, and how GIS can help solve them.

Where are the homeless located in relation to where housing and service providers are located?

For this question, you can identify the correlation between where the homeless are concentrated and where shelters, affordable housing, and services are located. By combining a layer of zip code data with a layer of addresses for service providers and housing, you could generate a map that easily visualizes this data.

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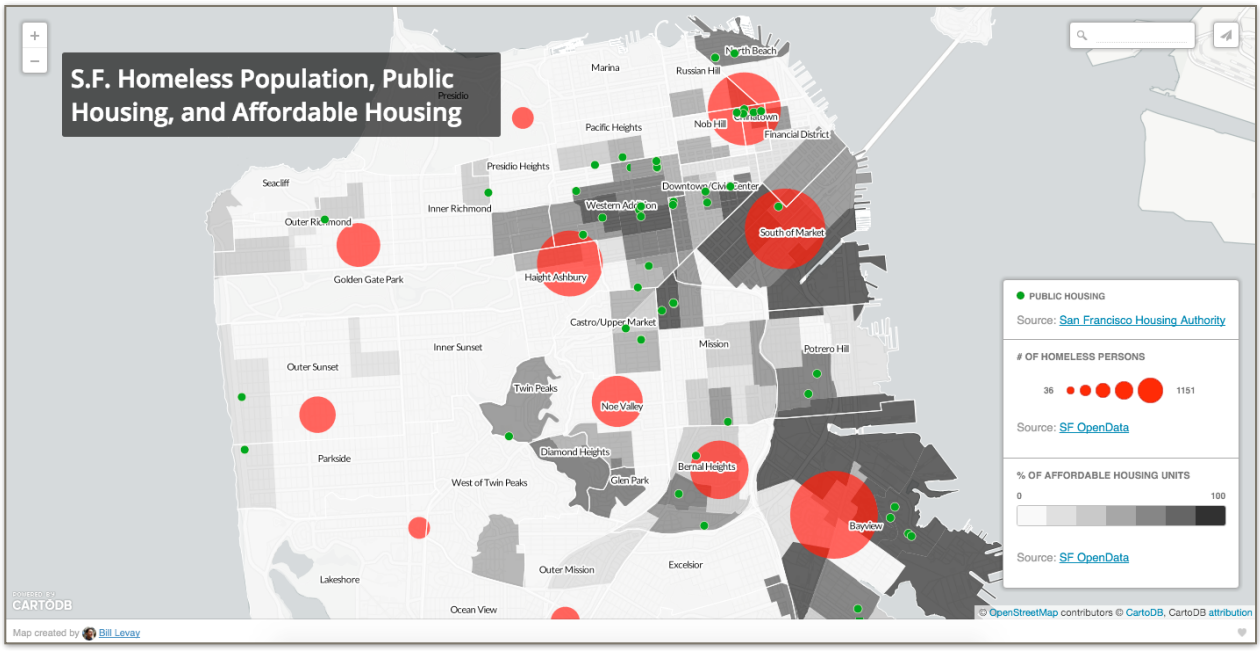
For example, the map below combines two sets of data—locations of homeless populations, and locations of public and affordable housing—to study whether resources are located near those in need.



View the full interactive map (created by CartoDB user Bill Levay).[4]

This data visualization shows larger concentrations of the homeless population located near downtown and the South of Market area where there are only a few scattered public housing sites. However, there is much more public housing grouped together in Chinatown. This information is important, and should be used to inform future decisions about where to locate resources.[5]

Larger concentrations of the homeless population are located near downtown and the South of Market area where there are only a few scattered public housing sites. However, there is much more public housing grouped together in Chinatown.

Another example comes from one of the communities using Clarity Human Services HMIS software. The Southern Nevada CoC created a 'jurisdiction' custom field within the HMIS so that whenever a homeless client enters a community program, this jurisdiction data will be captured. This custom data shows whether a client originated from any of Southern Nevada's main jurisdictions or known homeless encampments, or if they're coming from areas of town that aren't currently a primary focus of outreach efforts.

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The goal of Southern Nevada will be to produce a map outlining this data to inform decisions for more targeted outreach and funding needs. For example, this map could potentially secure more funding for homeless outreach if it indicates there is a higher service demand in areas of the city that Southern Nevada doesn't currently have the capacity to reach due to funding restrictions.

How accessible is public transportation in these areas?

Lack of transportation to and from housing, shelters, and service providers is a barrier to service acquisition. Communities can map the locations of public transportation, zip codes of homeless individuals and families, and addresses of housing and services. There are multiple other layers of data you could include, such as the span of public transportation routes, gas prices, and transportation schedules compared to open hours for various benefits offices.

Every data layer added allows you to enrich the context of your program evaluation and develop a data-driven community.[6] With these maps, you may find that homeless services are located outside the span of public transportation routes. You may find that public transportation has moved away from certain areas due to hikes in gas prices. You may find limited access to transportation is the key reason homeless populations in rural areas are difficult to reach and serve. Insights like these are valuable to community decisions.

Does shelter quality affect the rate of unsheltered homelessness in an area?

Your community can map the locations of unsheltered individuals and compare these to the locations of shelters, including additional information about the quality and conditions at each shelter.

Examples of such additional data could be the percentage of men to women, levels of security and cleanliness, and volume of domestic violence complaints at each shelter. Example conclusions include results showing that low levels of security and/or filthy conditions discourage individuals from staying at particular shelters. Other shelters have seen a rise in domestic violence complaints, which, understandably, could lead to a decline in the number of women choosing to stay at these shelters.

Understanding the issues that affect accessibility is key to such decisions as shelter policies and program design.

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Problem #2. Understanding complex social and environmental factors affecting homelessness

While research shows that lack of affordable housing is the reason homelessness exists, there are many different factors that exasperate these circumstances. Health problems, substance abuse, lack of quality public education, and criminalization measures are just a few of the numerous issues that cause and/or perpetuate homelessness.

Because these social and environmental factors vary for each community, it's important to study the specific neighborhoods in which homeless populations live. There are hundreds of variations of questions associated with this common problem.

Below are just a few examples of such questions, and how to apply GIS solutions to them.

What neighborhoods host the most Section 8 Vouchers?

Communities can map where clients with vouchers are being housed in real-time. This requires a data visualization tool that is integrated directly with an HMIS to ensure homeless clients are not collectively housed in the same area, preventing the artificial creation of isolated, low-income neighborhoods.

Another great example explores the correlation between where Section 8 vouchers are used and where other factors are prominent, such as race, income, education, unemployment, and teen pregnancy.[7] This data is shown in the image on the following page.

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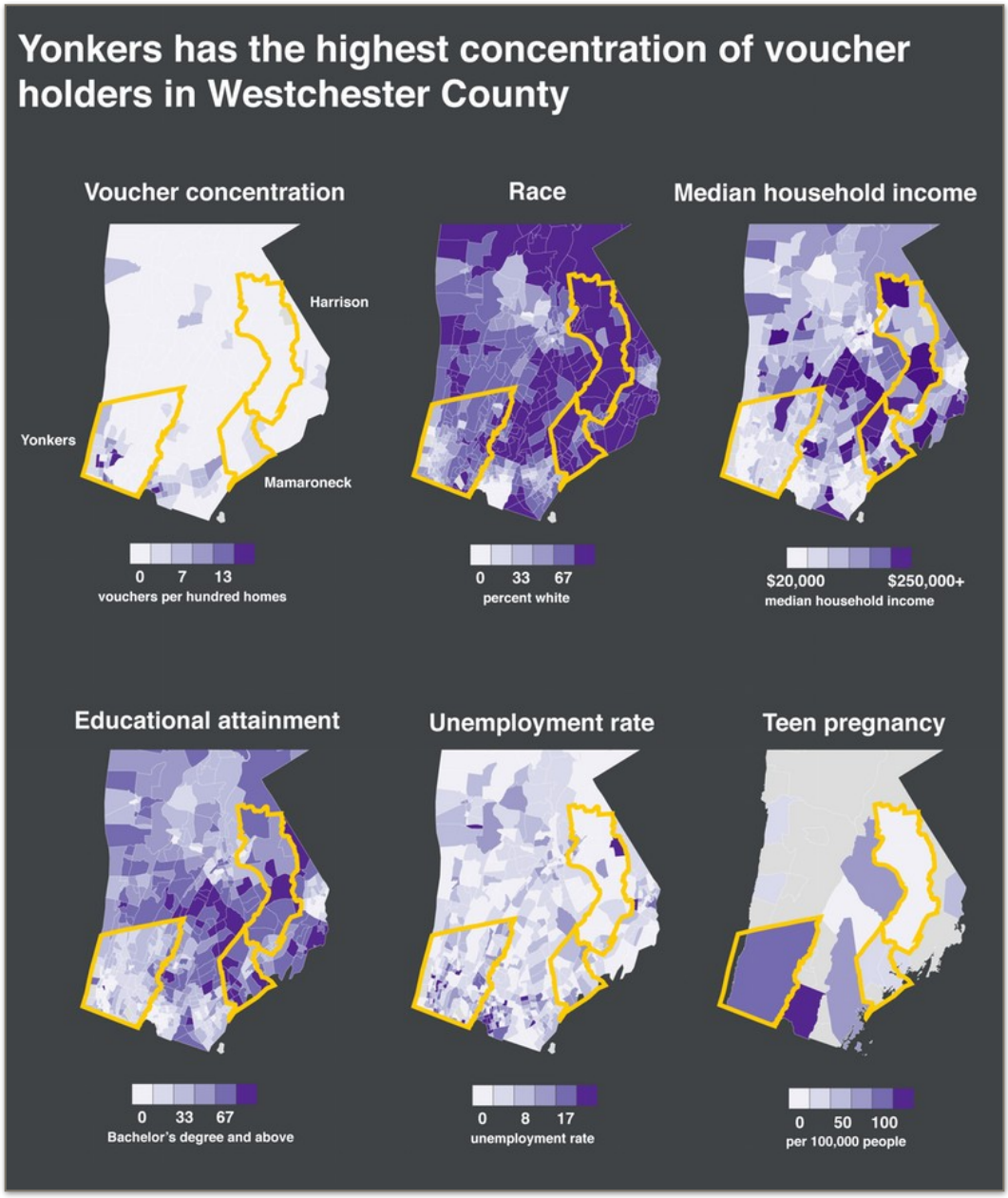

Image source: New Republic[7]

The maps in the image above illustrate clear contrasts among three cities within Westchester County, NY. Compared to Harrison and Mamaroneck, Yonkers shows the highest concentration of voucher holders, as well as the highest concentration of non-white individuals, low-income households, low educational attainment, unemployment rate, and teen pregnancy.

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HUD affirms this data, noting that when voucher holders are placed in already-existing bad neighborhoods with minimal job opportunities, low high school graduation rates, and high crime rates, the chances of escaping homelessness are greatly reduced.[8]

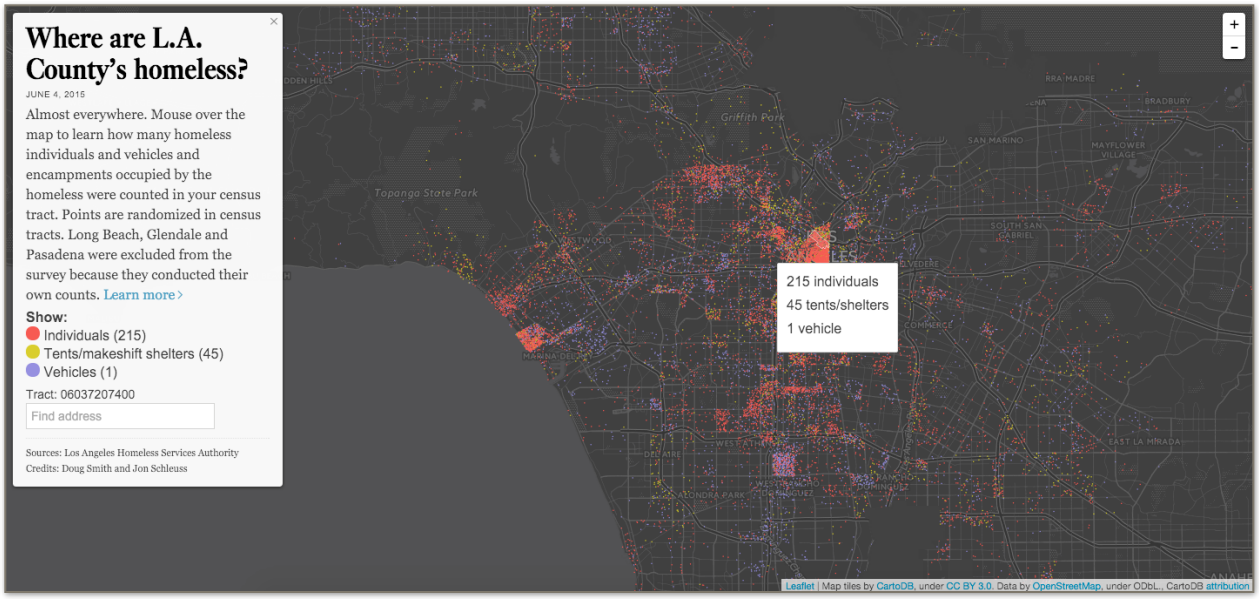
Understanding these environments and their effects on homeless clients can influence placement decisions. Visualized information like this can also drive community efforts to improve particular neighborhoods—or reduce existing stigma among landlords in better neighborhoods toward housing vouchers.

Which criminalization measures are in place within certain areas?

Communities can map the nighttime locations of homeless populations, differentiating between those sleeping on the streets, in tents, or in vehicles. This data can be compared to the rate at which corresponding homeless criminalization measures are enforced, mapping the volume and locations of tickets issued and arrests made against the homeless.

A map created by the *Los Angeles Times* displays where homeless populations end up at night, breaking it down by total individuals, tents/makeshift shelters, and vehicle camping.

Knowing which criminalization laws are in place (such as bans against sleeping in public or camping in vehicles), Los Angeles could use this map to target specific locations, advocating for revisions of criminalization laws and discouraging police raids on homeless encampments.[5]



View the full interactive map.[9]

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Do certain areas have prevalent health hazards that perpetuate or exacerbate homelessness conditions?

Communities can map the locations of all homeless clients compared to the locations of homeless clients reporting infectious diseases such as HIV, Hepatitis C, and tuberculosis.[10] Additional dataset layers could include locations of health providers, rates of chronic homelessness, and number of pregnant homeless clients.

Having a clear visualization of this data can help service providers decide where to focus community interventions such as health screenings, vaccines, and rapid re-housing programs.

3. Barriers to finding and effectively helping homeless and at-risk youth

We know that homeless youths are a difficult population to locate and help. Many youths are unaware they qualify as homeless. And if they are aware, they often refuse the label and the services associated due to embarrassment around peers.

In addition, depression, anxiety, and associated histories of abuse and betrayal can intensify their distrust of adults, shelters, and support services. As a result, this marginalized population is largely under-counted, and therefore under-served.

There are several ways to approach the challenges in finding and helping this population. Below are a few examples of questions to consider, and how to use GIS to understand them.

Where are the street "hangouts" that homeless youth frequent?

Communities can map the known locations of adolescent homeless clients and use those as reference points to find others. They could study the similarities between these locations (e.g. coffee shops, access to Wifi, drug hot-spots, volume of sex trafficking tips) to predict other locations where homeless youth may hang out.

It is also wise to partner with organizations who work specifically with youth at-risk of or experiencing homelessness. Formerly or currently homeless youth volunteers will have special insight into where other homeless youth congregate.[11] Producing a map that visualizes this data helps communities determine where to send outreach teams.

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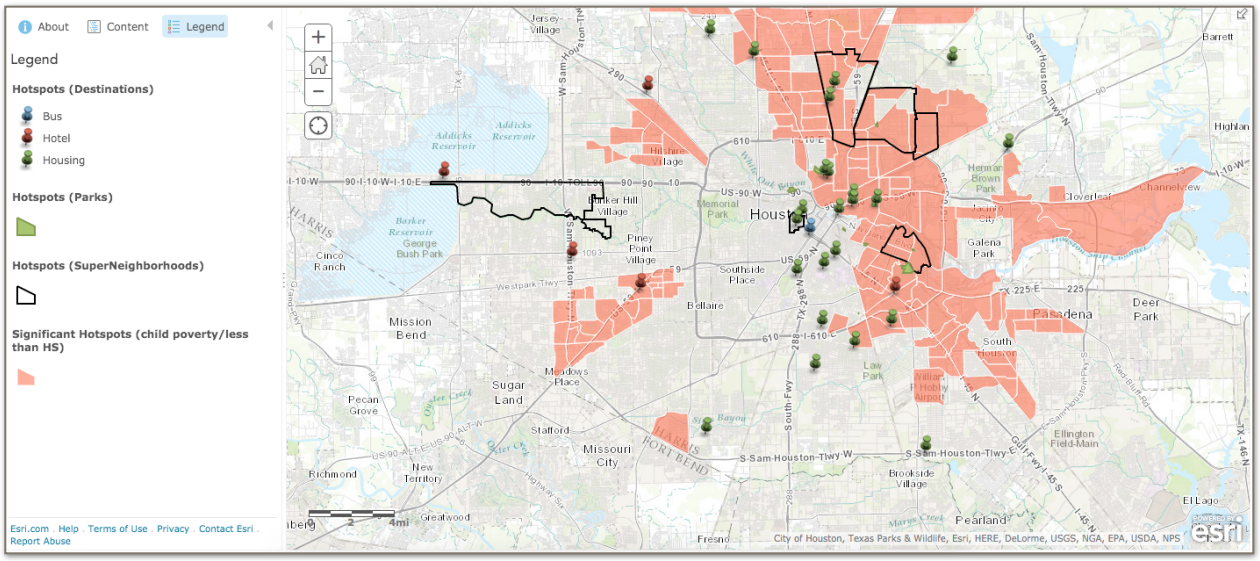
The City of Houston produced the map below to visualize where homeless youth can be found, including bus stations, hotels, parks, and housing.



View the full interactive map.[12]

Additionally, leading up to the annual PIT count, communities can preselect homeless youth "hot spots" to target, increasing the number of homeless youth counted who would have otherwise gone unnoticed.

Where are the best locations to establish drop-in centers?

The same model for providing shelter and services for homeless adults and families can't be applied to homeless youth.

"Many kinds won't go to shelters because they're hiding on the street," says Natasha Slesnick, the lead researcher for a study published in the January issue of the journal *Prevention Science*. "They're avoiding the service system because they've been abused and betrayed by everyone who is supposed to love them … They're fearful of being preyed upon by older people at shelters, and the paperwork can be overwhelming."

Slesnick recommends every city have a drop-in center—an informal place for homeless youth to hang out with friends, do laundry, take a shower, get something to eat, and ask for help.[13]

Using GIS, you could map the locations of homeless youth and assess the varying levels of need in the area. This data can inform where to best place a drop-in center, keeping other factors in mind such as transportation access and any potential "competing" resource

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providers that may reduce the impact of the center (e.g. libraries that already provide free wifi, or workforce centers that already provide free advice for seeking employment).

Which neighborhoods should be targeted for youth reentry services?

The Sentencing Project, National Alliance to End Homelessness, and the Youth Reentry Task Force published a brief on youth reentry. The brief notes that youth lack the necessary skills to cope with adult responsibilities when they are released, resulting in unemployment, school re-enrollment challenges, and homelessness. GIS could be used to address this problem.[14]

One GIS example that an article from Deloitte University Press highlights is from New York City's Justice Mapping Center. For many years, the center has tracked the residential addresses that inmates provided when they went into prison, finding that offenders are often concentrated in particular areas. Some cities are using this data to design reentry initiatives for specific neighborhoods.[15]

Likewise, communities can map the residential addresses of detained youth to see if there are particular areas that need to be targeted. You could then design and implement reentry services and aftercare programs to better support youth as they exit confinement and reintegrate back into their families, schools, and communities, preventing homelessness to begin with.

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CONCLUSION

GIS has become a fundamental tool to understanding and addressing homelessness in our communities. By combining geography with the critical information we already collect from clients and programs everyday (plus additional data we decide to capture or curate for specific purposes), we can transform the way we respond to the populations we serve.

Using GIS technology, communities are better equipped to solve common problems of accessibility, social and environmental factors, and hard-to-reach youth populations. GIS allows professionals to see these issues in a different light, empowering them to determine unique solutions for their specific communities.

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