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Dismantling place-based inequity

In the United States, race and place are inextricably linked. From American Indian[1] displacement and isolation on reservations to the Great Migration North and West by Blacks from the rural South to density zoning laws that perpetuate segregated housing , the United States isn't so much a melting pot as it is a dissonant mix, with clear spatial markers between racially homogenous groups. Communities of color in America have been systematically denied opportunities to change their physical location and environment, which has had a cascading effect on poverty, employment, and health.

This chapter explores the use of GIS tools to bring cross-sector leaders and the community together to address equity issues and influence policy in transportation, housing, health, and voter access. Since attention to equity must be part of all policies and a critical component of cross-sector collaboration to address wicked problems, the examples presented here illustrate various ways in which geospatial visualization can facilitate understanding and lead to action.

1 In this chapter, the term American Indian/Alaska Native is used in accordance with the Urban Indian Health Institute's practices. This term acknowledges the varying ways that North American Indigenous peoples are forced to identify within the American racial structure and English language.

Segregation and place

To understand potential solutions, it's important to establish a brief history of geographic inequalities and oppressive place-based policies.

> "Racially restrictive covenants in deeds, steering by real estate agents, slum clearance and the construction of large public housing projects, the routing of interstate highways, discrimination in mortgage lending, the location of segregated schools, unequal labor market opportunities, threats of outright violence directed at black families, and lack of protection of property and civil rights have all profoundly affected where African Americans lived and the degree to which they could accumulate housing wealth."
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> —*Race, Risk, and the Emergence of Federal Redlining,* Fishback et al.

Researchers from the National Bureau of Economic Research (NBER) evaluated the infamous maps of the Home Owners Loan Corporation (HOLC), used to assess mortgage lending risk and to rank neighborhoods using grades A (green or "best") to D (red or "hazardous"). At the time the maps were produced (1935 to 1940), most households where Black Americans lived were in the red-shaded D locations. The NBER study looked at census records, federal lending patterns, HOLC maps, and other data to determine what effect these maps had on racial segregation.

The NBER researchers determined that while the HOLC maps deepened Black racial exclusion and helped entrench geographic disparities, these segregated conditions did not specifically result from discrimination in the HOLC maps but because Blacks "were forced to live in the lowest quality neighborhoods before the maps were created." Census data confirmed "that, as of 1930, the majority of Black households lived on city blocks that were destined to be shaded in red. Over 97 percent of Black individuals and 95 percent of Black-owned homes ended up in red-shaded HOLC zones."

Although race and place disparities existed before their creation, the HOLC maps legitimized practices that reinforced housing and school segregation, workforce discrimination, and neighborhood destruction through urban and highway planning.

Renting and lending discrimination further marginalized communities by gender, family and marriage status, and disability. Passage of the Fair Housing Act in 1968 prevented racial discrimination, and its provisions over the years grew to include gender (1974), families with children, and individuals needing additional accommodation because of physical or mental disabilities (1988).

As NBER's research illustrates, no single action caused the spatial inequities we continue to see today in US neighborhoods. Rather, existing discrimination was institutionalized and built into policies like zoning codes and lending laws, deepening the divides that have plagued this nation since its inception.

Geographic-based solutions

Given the way that discrimination is rooted in America's landscape, policies and interventions aimed at closing wealth, health, and education gaps have a strong geographic component. This chapter reviews cross-sector, place-based solutions that use GIS data and mapping to uncover, reduce, and eliminate these disparities in major US cities.

Urban planning and transportation in Oakland, California

Oakland's Department of Race and Equity works with other city departments to maintain diversity and eliminate racial disparities. Oakland has long resisted gentrification and fought for racial equity, although it hasn't been immune to housing shortages and an influx of wealth from nearby San Francisco and Silicon Valley. To effectively address gentrification, the Race and Equity team needed a baseline understanding of the issues faced by Black, Indigenous, and people of color (BIPOC).

Supported by a research grant from the City University of New York's Institute for State and Local Governance, Oakland analyzed more than 70 indicators of well-being such as housing security, education levels, and health care by race. It used GIS to compare results across geographies. Geographic visualization of this data helped the city understand the relationship between the indicators, and race and income levels.

The Race and Equity team addressed transportation and mobility early in its work because its research showed glaring disparities between neighborhoods of color and white neighborhoods. Long commute times, unprotected bike lanes, and poor road conditions were more common in neighborhoods of color. To address the discrepancies, the team collaborated with other governmental departments and with the community directly.

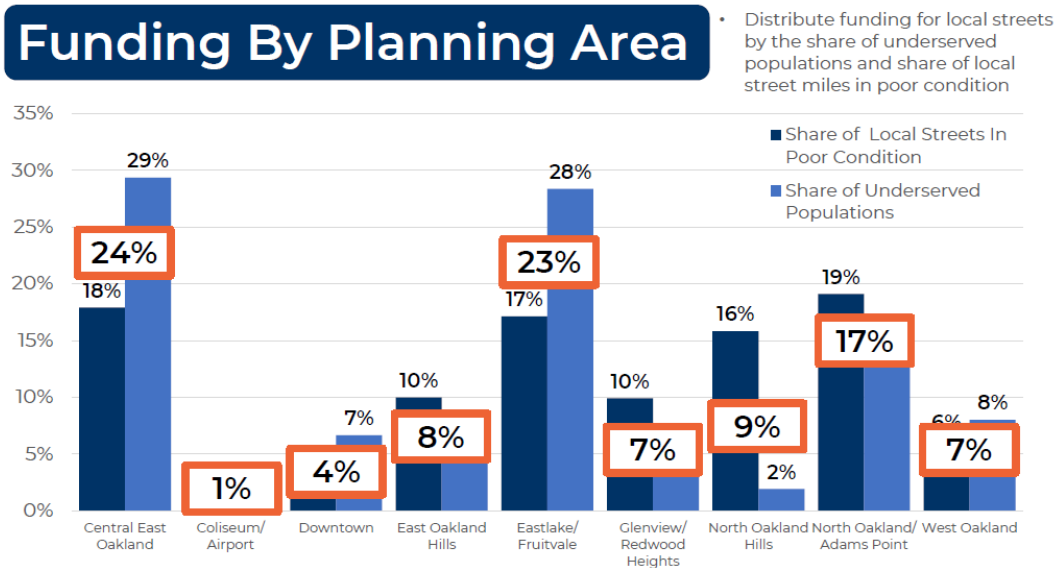
Equipped with the GIS data, the Race and Equity team partnered with the Oakland Department of Transportation (OakDOT), which had been examining these same discrepancies. The Race and Equity team had already worked with OakDOT employees on race, diversity, and equity training and had helped them develop a shared set of definitions and language to discuss these issues. For the bike lane work, the collaboration facilitated community engagement sessions with local residents around street conditions, partnering with five BIPOC-led community-based organizations (CBOs) on the community engagement.

OakDOT, the Department of Race and Equity, and the five CBOs hosted listening sessions and design workshops and used digital engagement tools to engage historically excluded populations in the planning process. Community members reviewed the GIS data and helped map new bicycle infrastructure. More than 3,600 people participated in person and more than 2,300 comments were received online.

Cross-sector engagement was also evident in the city's equity-focused paving plan, The Great Pave. According to Sarah Fine, the Complete Streets Paving and Sidewalks program manager at OakDOT, paving projects had traditionally focused on major streets, with a few local streets chosen by city council members based on resident complaints. However, a voter-approved infrastructure bond resulted in a $100 million, 3-year citywide paving program, and OakDOT and the Department of Race and Equity wanted to ensure equitable spending, especially since the bond was three times the city's average annual spending on street paving.

OakDOT and the Department of Race and Equity used community outreach, data collection, and maps to assess street conditions and develop an equity-focused approach to paving and street repairs. Officials viewed every street in the city and determined how well-traveled each was, who lived along these streets, and what kind of facilities (e.g., schools and doctor's offices) were close by.

The maps helped the city focus on streets in the worst shape, which often run through segregated, high-poverty neighborhoods. By mapping streets in poor condition in relation to underserved populations, Oakland more equitably distributed local street funding.



By mapping neighborhood density in relation to street conditions and share of underserved populations, Oakland distributed local street funding more equitably than before.

Once OakDOT developed a plan for equitable paving, city officials shared their analyses with residents, highlighting road conditions and where most people were affected. This information allowed residents to see the data upon which decisions had been made and how the plan lined up with the city's equity focus. The maps also helped justify the cost of repaving, because the Race and Equity Department and OakDOT showed how they made paving decisions.

According to Fine, the process helped build trust between the city departments and traditionally underserved communities. The city fulfilled its equity commitments by planning street work in a more equitable way, engaging with the communities and completing the work. The promise to promote and uphold equity was a core component of Oakland's plan. The proof however, was in the paving.

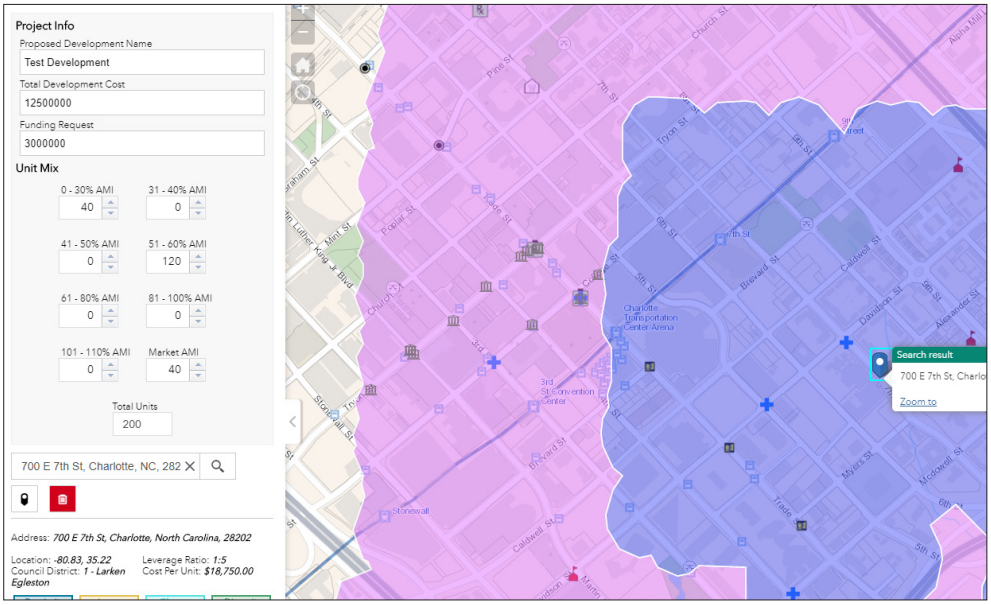
Health and housing in Charlotte, North Carolina

Charlotte has experienced significant population growth in the past two decades, surpassing San Francisco as the 15th most populous city in the United States in 2020. With the influx of new residents, gentrification has increased—a concern among homeowners who have lived in historically Black neighborhoods for generations.

The Charlotte Housing Trust Fund (CHTF) helps finance affordable housing and shelter development within the city. The Fund, supported by voter-approved housing bonds, is managed by the Housing and Neighborhood Services' (HNS) Housing Services Division. In the past, the city council reviewed developers' site requests and cast simple yes or no votes on potential affordable housing locations. But, according to Warren Wooten, the Housing Services Operations manager at HNS, increasing gentrification and attention to data-driven solutions led the Housing Services division to introduce map-based decision-making to increase collaboration and transparency for the community and developers.

Wooten's team built a data map to analyze and score proposed locations, adapted from the same metrics originally used by the city council when doing traditional site selection, but

with standardized data and categorization of each site. Each potential location receives a score between 1 and 10, along a tenth of a point increment. The total score is an amalgam of four different sub-scores, measured as *Proximity* to amenities, car and public transit, *Access* to jobs, neighborhood *Change* score, and neighborhood *Diversity*. Charlotte's publicly available open data underlies the map and was built with input from the city council members, local developers, and the community.



Tool mock-up with fictional proposed project, including score and project information.

Like schools and grocery stores, the *Proximity* measure includes parks and green spaces as amenities. Recognizing the well-documented impact of green spaces on health and economic success, the city engaged community groups and shared data on green space disparities among neighborhoods so extreme that they are visible from far above Earth.

Charlotte's application of map-based decision-making to site selection has increased transparency and slowed gentrification. Knowing how their bids and proposals will be graded allows developers to prepare better proposals. Less time is wasted, and the process is more efficient. Before the maps existed, developers often submitted proposals that did not meet standards, and city officials spent time reviewing proposals that clearly needed to be rejected.

Wooten says that Charlotte residents are also interested in understanding the tool because it influences the makeup of their neighborhoods. By using maps to understand and layer features like diversity, green spaces, and walkability, local government leaders in Charlotte provide a foundation for collaboration between the city, community groups, and developers.

Public health and pipes in Denver, Colorado

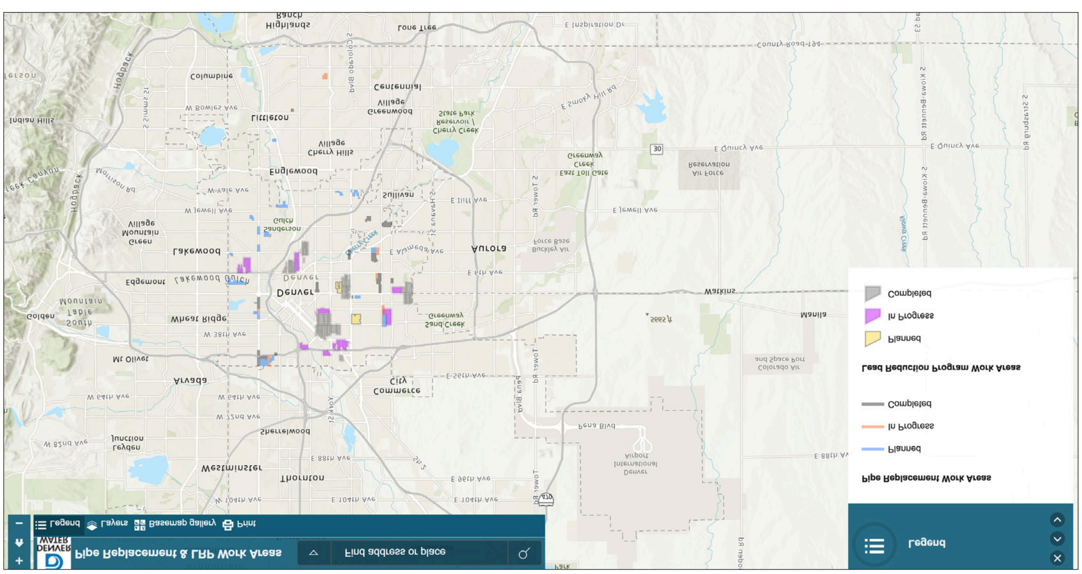
High levels of toxins in the water, soil, and air of certain cities and neighborhoods have led to extreme health disparities, perhaps most infamously in Flint, Michigan. Contaminated water, which was eventually found to have extremely high levels of lead and other chemicals, was first observed by Flint residents but was initially denied by state and local officials. In 2016 the American Journal of Public Health published a study showing that the blood lead levels of children

under five years old had at least doubled in Flint. The implications of the journal's findings were significant. Lead is a "potent neurotoxin," and "childhood lead poisoning has an impact on multiple developmental and biological processes, most notably intelligence, behavior, and overall life achievement."

The case of Flint, Michigan and the 2020 updates to the Lead and Copper Rule spurred many cities to examine their water sources and pipe systems for toxins. Lead in pipes, paint, and soil presents a serious health issue that disproportionately harms people (especially children) of color. In 2019 Denver launched the Lead Reduction Program, an ambitious plan to identify and replace all city lead water lines within 15 years. Even though the water lines are not owned by the city, Denver plans on replacing all lead pipes at no cost to property owners.

The publicly available Denver Water Lead Service Line Replacement map guides city engineers by showing the location of confirmed and suspected lead lines. The city's complementary Pipe Replacement and LRP Work Areas map shows where the city has already completed replacements and where work is planned in the future. Each year, the city prioritizes work areas for the upcoming 12 months, based on factors like the concentration of infants and children, the concentration of lead service lines, and the extent to which a neighborhood has traditionally been underserved. Since replacing domestic pipes requires the cooperation of the neighborhoods and homeowners, Denver Water uses these maps in partnership with two local CBOs. Members of the CBOs act as ambassadors in each neighborhood to make sure that everyone receives the same project information and city resources.

The ambassadors use the lead service line replacement information to show residents the pipe replacement and work areas map which also shows the timing of the repairs.The suite of maps Denver makes available helps residents make informed decisions about whether to independently test their water for lead and whether to remove the pipes themselves, for which they receive a partial reimbursement. Denver is purposefully applying an equity lens to its pipe replacement strategy and identifying neighborhoods that need extra support, trusted community messengers, and multilingual messaging.



Denver Water's Pipe Replacement and LRP Work Areas map.

Voter suppression and disenfranchisement in the US

Increasing equity through data-driven mapping is one of the most important missions of the Anchor Collaborative, a diverse group of national organizations including the NAACP and UnidosUS. The collaborative fights disenfranchisement by revealing and repairing discriminatory power structures that have systematically oppressed Americans of color. Maps are a key tool for the group, which works with an extensive network of government, community, and local stakeholders.

Leading up to the 2020 Census, the Anchor Collaborative's goal was to ensure that every person in the United States was counted. Undercounts have significant adverse effects on political representation and federal funding. Too often, young children, people of color, and immigrants are undercounted. In 2018, the NAACP and the Anchor Collaborative built a cloud-based data hub for the upcoming census.

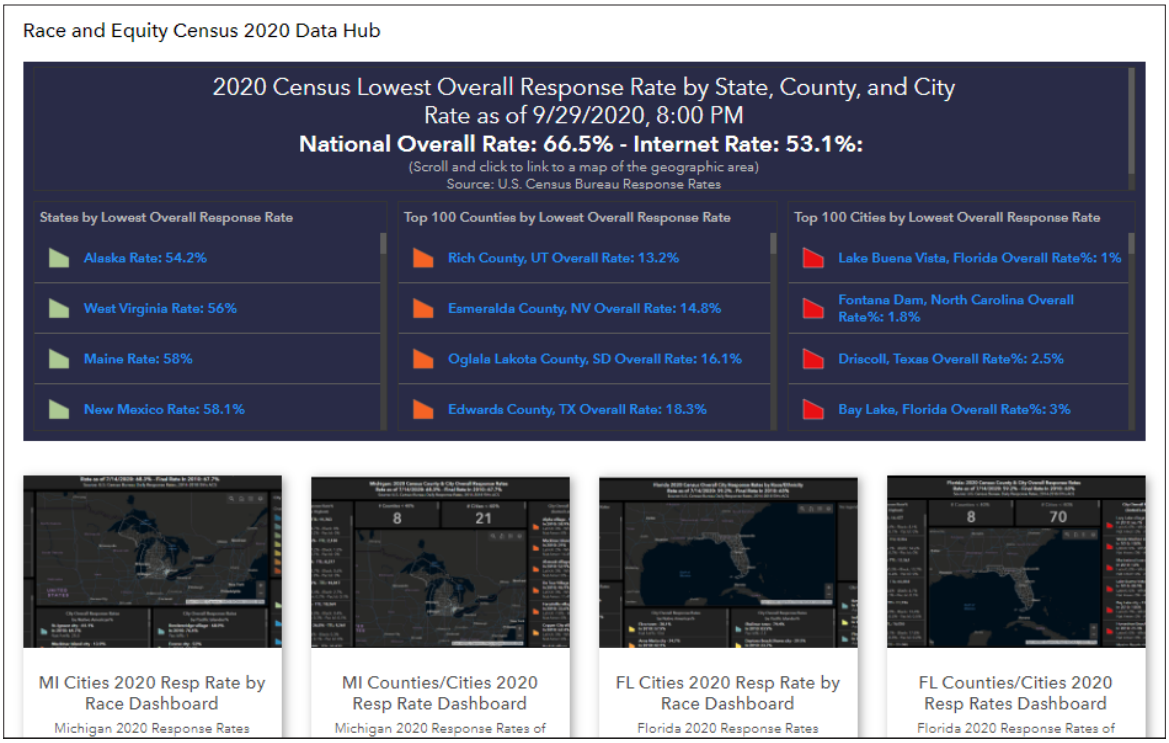
Since the map covered the entire country, the collaborative enlisted local CBOs to assist with their 2020 census response drives. Anchor Collaborative members made their back-end databases and GIS training available, allowing local organizations to monitor and update progress and direct attention to areas that were behind on response rates. Local representatives used the maps during direct outreach meetings, campaigns, and online events.

These data-informed efforts were particularly effective during the COVID-19 pandemic, which made informal community encounters and typical in-person outreach difficult.

The targeted and specific information was also helpful as legal challenges and court orders ended the Census count on October 15, 2020, two weeks earlier than the original, extended October 31st end date, making it that much more important for volunteers and community organizations to reach harder-to-count communities efficiently. According to Jamal Watkins, Vice President of Civic Engagement at the NAACP, the shortened counting period and the disproportionate strain of COVID-19 on communities of color "means more people left out and the game of the haves and the have nots continues. A true disaster for the American people." Thankfully, the Anchor Collaborative and their community-based partners were able to use their data tools to home in on areas of focus.

Immediately after the 2020 Census, the Collaborative turned its attention to the November presidential election, again producing maps on voter registration and providing support for local hubs hosting registration events. The United States includes more than 10,000 voting jurisdictions, so visualizing locations and their various procedures proved particularly important to the community organizations and local NAACP branches participating in the initiative. According to Watkins, geospatial mapping helped simplify all of the different jurisdictions and rules into an easy-to-understand visual that meant volunteers and CBO employees could keep track of hyper-local regulations and statistics. Local CBOs also used the Anchor Collaborative maps to identify and track voter suppression, based on input from residents.

NAACP staff work, spatial visualization, and technical support helped network partners address issues of equity. Network partners in turn used the maps to support the formation and operation of their own collaborations. For example, Faith in Action trains and educates community and faith-based organizations through its local offices. Genesis Garcia, the director of operations at the Florida based CBO, uses the Anchor Collaborative Census Map to train social justice ministries, clergy, organizers, and lay volunteers across Florida.



The Anchor Collaborative's Race and Equity Census 2020 Data Hub for Florida.

During the 2018 midterm elections, the Anchor Collaborative collected stories of voter suppression and disenfranchisement and brought them to the federal government through hearings at the Subcommittee on Elections of the Committee on House Administration. The collaborative adds value to its partners and its cause in multiple ways. Its visualizations drive the narrative while providing a foundation for collaboration. The technical work and the ability to easily adapt the maps to different locations facilitates the formation of ad hoc and formal collaborations. The Anchor Collaboration is one such cooperative undertaking; local NAACP affiliates also collaborate with their national office in applying these techniques in their communities. The adaptability of the spatially expressed data powers all of this action and allows the cross-sector partners to achieve what should be an obvious goal: fair and equal representation for all.

Conclusion

Transparent data, well visualized and localized, powers community engagement, which produces shared understanding and trust. In Charlotte, the Neighborhood Services Department conducted community meetings to develop and introduce an affordable housing tool to residents. In Oakland, officials used GIS as part of an 18-month community engagement process around climate action, transportation, and environmental justice.

Dismantling the pernicious effects of place-based inequality is an uphill battle. However, the dedicated collective action of community groups, nonprofits, and city officials facilitated by geospatial data and analytics can power remedies to decades of neglect and discrimination and provide a way to loosen their grip.