



# What if Cities Used Data to Drive Inclusive Neighborhood Change?

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This essay is part of a five-part series that explores how city leaders can promote local economies that are inclusive of all their residents. The framing brief, “Open Cities: From Economic Exclusion to Urban Inclusion,” defines economic exclusion and discusses city-level trends across high-income countries (Greene et al. 2016). The four “What if?” essays suggest bold and innovative solutions, and they are intended to spark debate on how cities might harness new technologies, rising momentum, and new approaches to governance in order to overcome economic exclusion.

## What’s the Big Idea?

Economic segregation is on the rise in cities across high-income countries, preventing low-income families and vulnerable populations from accessing decent jobs, essential services, and safe and affordable housing. Multiple factors can contribute to segregation across neighborhoods and metropolitan areas, depending on local conditions and economic and demographic trends. In places with growing economies or rising demand for urban housing, affordability pressures and evictions can displace low-income families and small businesses, preventing them from benefitting from new opportunities in their neighborhoods. In weaker markets, disinvestment and crime can create downward spirals of distress, trapping low-income families in increasingly toxic and disconnected environments.

The seeds of these neighborhood changes are sown long before the changes are visible. By the time a neighborhood is “distressed” or “gentrified,” place-based interventions are costly and factors contributing to neighborhood-level exclusion may become entrenched. Local governments and

nonprofits may struggle after the fact to stem disinvestment or ensure that existing residents benefit from new investments. Whether economic opportunities in neighborhoods are declining or improving, sluggish responses by public and private actors may be unequal to the task of creating or preserving inclusion.

But what if city leaders and community groups could get ahead of these changes and act early to direct neighborhood changes toward more inclusive outcomes? Using big data and predictive analytics, they could develop early warning systems that track key indicators of neighborhood change and predict future trajectories. New tools and methods could make this intelligence accessible to people inside and outside of government. City leaders and community groups could then facilitate participation from residents in decisions that affect their families and neighborhoods. Based on new forward-looking knowledge, city leaders and community groups could co-design policies that secure benefits for low-income and vulnerable families in both rising and falling markets.

## How Would This Work?

The basic components already exist to accomplish this vision. Private businesses like Zillow use data on property transactions to track neighborhood changes in real time and apply sophisticated algorithms to forecast future trends.<sup>1</sup> Public agencies have become more adept at integrating data and using predictive analytics to anticipate and prevent individual-level challenges from recidivism to homelessness to prescription drug epidemics (Ritter 2013).<sup>2</sup> Some municipal governments are experimenting with using sensors and mobile apps to manage government resources and services more efficiently through “smart cities” initiatives, although they generally have not applied these new technologies to create more equitable outcomes at the neighborhood level.<sup>3</sup> A new “science of cities” has emerged that uses large datasets and advanced simulation and modeling techniques to understand urban patterns and how cities function (Batty 2013), but community groups and other actors working to improve neighborhoods rarely have the opportunity to review or apply the findings from these models.

Our concept would bring together the latest analytical tools with new and existing data sources to allow public and private actors to anticipate and act upon changes in vulnerable neighborhoods. Relevant data could be collected from multiple sources and integrated at the neighborhood level to develop and implement early warning and response systems. We recognize that data analysis alone—no matter how comprehensive, timely, or sophisticated—will be insufficient to secure inclusive neighborhood change. To achieve this vision, neighborhood early warning and response systems would need to be guided by three fundamental principles:

- **Equity:** These efforts would be explicitly designed to harness future changes to benefit vulnerable populations and places. Unlike current smart-cities efforts, these should do more than just improve efficiencies in basic governance functions. They should be designed to overcome barriers that prevent excluded groups from participating fully in the local economy. This principle requires implementers to pay attention to any biases in the data and disaggregate findings to shed light on how change differs for various demographic groups.

- **Participation:** These efforts would require broad participation from diverse stakeholders, including local governments, technology firms, researchers, real estate developers, local businesses, philanthropy, community organizations, and residents themselves. Whenever possible, anonymized or summary data and findings should be made publicly available and used to stimulate robust community dialogue. Residents and visitors to the neighborhood could contribute crowd-sourced data as inputs into the analysis.
- **Action:** These efforts would provide intelligence that policymakers, community groups, and partners could use to shape local policy and target investments. Key to this concept is that “early warning systems” need to be paired with “actionable responses.” It is not enough just to identify nascent challenges and opportunities; local stakeholders need to develop and deploy concrete strategies to address challenges and maximize opportunities. They also need to create accountability mechanisms and secure financial resources to sustain these efforts, over the long term.

Community leaders would need to think carefully about which home institution and governance structures are best suited to embed these principles into a neighborhood early warning and response system. Some audiences may distrust efforts initiated within local governments, and systems created within public agencies may not survive leadership transitions. Public agencies should participate as data providers and users and should contribute funding to these systems, but establishing these systems within nongovernmental organizations may improve their chances for longevity. For example, the local research institutions and nonprofit organizations that are members of the National Neighborhood Indicators Partnership (NNIP) collect and analyze data to help diverse stakeholders uncover problems, patterns, and solutions in their communities.<sup>4</sup> Across cities, NNIP members assist public agencies and community-based organizations to use data to inform local decisionmaking and empower residents as they strengthen their communities. The network has found that, the type of data organization is less important than its characteristics (Hendey et al. 2016). The organization that hosts a neighborhood warning and response system should have strong technical capacities, a commitment to and track record in strong community engagement, collaborative relationships with a wide range of local institutions, and a reputation for neutral information and data.

The home organization would be charged with ensuring that the principles described above are applied consistently across three essential stages of moving from raw data to effective community change: access, analysis, and application.

## **Access**

Communities would need access to relevant and reliable neighborhood-level data. Administrative data collected at all levels of government provide a good starting point. Local agencies collect data that can reveal neighborhood conditions and trends that affect economic inclusion. Building departments record applications for building improvements and track code violations that could be used to measure owners’ interest in investing in their properties; calls to 311 systems reveal changes in the level and nature of residents’ concerns about issues on their blocks; business-permit data could be used to identify trends

in the number and type of businesses that are opening and closing. Data collected by state and national government agencies could supplement local sources. Postal service data can be used to track moves in and out of zip codes as well as trends in property vacancies; income tax filings can be used to track changes in wealth and income over time; and sales tax records could track the activity in commercial districts.

To date, much of the needed administrative data have not been consistently integrated across agencies and levels of government. However, local governments are slowly improving how they organize and integrate their data internally. For example, Cleveland maintains a system that links data from several agencies to provide a comprehensive look at how well agencies are serving children to promote school readiness.<sup>5</sup> Local open-data portals are also increasingly common, providing public online access to an expanding range of indicators.<sup>6</sup> New federal initiatives, like the recently launched Opportunity Project (<http://opportunity.census.gov/>), provide public access to data from across agencies on key assets that determine access to opportunity at the neighborhood level. These trends toward better-integrated and more accessible public data provide momentum for this concept.

Private firms also hold a wealth of data that could enhance efforts to predict neighborhood change, including credit scores, advertised rents, and retail purchases. These datasets are updated frequently, allowing for real-time reporting—an essential component of an effective early warning system. Other firms, such as mobile phone providers and social media platforms, collect crowd-sourced user data that could also improve the timeliness of data and reveal how residents perceive and use neighborhood amenities.

Though privately held data on users and neighborhoods traditionally have been closely guarded, we are beginning to see new partnerships in which the data are shared with cities to help resolve local issues. Ride-sharing companies Uber and Lyft recently began sharing passenger trip information with several cities and researchers to help ease traffic congestion and study how ride sharing affects greenhouse gas emissions.<sup>7</sup> MasterCard recently launched a platform that combines its data on consumer transactions with local transportation data to help cities better understand how transit and economic activities are linked.<sup>8</sup> Private firms are also helping to promote standardization and dissemination of public data in innovative ways. For example Zillow, Accela, Esri, and several other private partners have developed a common standard all cities can use to publish data about building and construction permits.<sup>9</sup> Yelp has integrated municipal health inspection scores into its restaurant reviews,<sup>10</sup> and it recently began allowing users to review their experiences with government agencies to stimulate improvement in public services.<sup>11</sup>

## Analysis

Once the data are assembled, analysis will be required. This step is ripe for innovation, experimentation, and knowledge sharing. As a field, we know little about which indicators matter for forecasting neighborhood trajectories or whether these differ from place to place. We would need more researchers working in different types of cities to learn more about precursors and signals of neighborhood revitalization or decline. Some early efforts to better understand shifting neighborhood

dynamics across local markets are already under way. For example, in the Turning the Corner Project (a partnership between the Urban Institute's National Neighborhood Indicators Partnership, the Federal Reserve-Philanthropy Initiative, and the Kresge Foundation), local research organizations are developing new ways to monitor neighborhood change in post-industrial US cities.<sup>12</sup> The project team will develop protocols and methodology to monitor neighborhood revitalization that other cities can adapt. Efforts like this could be enhanced if groups in more cities undertake similar analyses, test relevant measures across a range of market conditions, develop and refine effective community engagement strategies, and share their findings along the way.

Both the data collection and analysis should be systematized to keep a stream of ongoing intelligence coming through. The analysts should also work in collaboration with neighborhood groups and practitioners who can help interpret and validate the results, providing qualitative information that may shed light on the quantitative results. When presented in a compelling and accessible matter, the data and analysis could stimulate community dialogue about setting priorities and mobilize support for interventions.

## Application

Applying the data and analysis to drive inclusive neighborhood change will be the most challenging step. To achieve our goals, government agencies, civic institutions, and neighborhood groups will need processes in place to integrate real-time data and forward-looking analysis into their decisionmaking and resource planning. Recent efforts, such as Bloomberg Philanthropies' What Works Cities (<http://whatworkscities.bloomberg.org/>) and Results for America's Local Government Fellowship (Results for America 2016), are helping to improve the capacity of local governments to use civic technologies, data, and evidence to improve performance management and delivery of municipal services. Although these efforts have not focused on overcoming economic exclusion, the capacities they are building for data-driven decisionmaking could be applied to develop and test neighborhood-level inclusion strategies.

Finally, and most importantly, all stakeholders will need to better understand which policies and interventions are effective at supporting inclusive neighborhoods change. Since most established strategies to address gentrification, neighborhood decline, or shifting demographics are based on reacting to these changes, new playbooks would have to be established that are designed to anticipate and harness neighborhood changes early on. Places across the country are already innovating in many ways to manage neighborhood change and improve opportunities for all residents. We suggest some emerging strategies in the next section, but building the evidence base for which combinations of strategies are most effective and the local market conditions that can support them will be an important contribution of these early warning and response systems.

## Who Would It Help, and What Aspects of Exclusion Would It Address?

Understanding neighborhood trajectories would help cities get ahead of the curve to develop and implement place-based investments and policies to protect and promote economic inclusion. These strategies would most directly address families' isolation from opportunity but could also improve economic security for vulnerable residents in changing neighborhoods. Residents would have greater security of tenure in neighborhoods facing upward market pressures and experience less distress and loss of wealth in neighborhoods at risk of decline.

In neighborhoods predicted to improve, nonprofits could prioritize acquiring or rehabilitating properties and maintaining them as affordable. City governments could review the disposition process of publicly owned properties and reserve units for nonprofit developers committed to preserving affordability. They could also consider capping increases in property taxes for long-time residents or providing tax credits for low-income and elderly households. Legal services providers and advocates could step up efforts to educate tenants about their rights. And since small locally owned businesses are often displaced by market pressures, protections for small businesses, such as commercial rent control or negotiated lease extensions, could be considered alongside "softer" supports, like Boston's Main Streets program, which helps existing businesses adjust to new market environments.<sup>13</sup>

In neighborhoods predicted to decline, communities could consider adopting vacant property registries or imposing surcharges on abandoned properties. Police departments could work with residents to strengthen crime prevention efforts. City agencies and nonprofits could provide training or financial assistance to landlords who buy distressed properties to fix up and rent out, with a focus on local owners. Federal and local funding streams could be blended to promote comprehensive community stabilization, and affirmative marketing strategies, like Minneapolis-Saint Paul's Live MSP program (<http://www.livemsp.org/index.php>), could help attract and retain residents.

Whether neighborhoods are predicted to improve or decline, all stakeholders would be able to better select appropriate interventions for neighborhood programs and investments. Community organizers could use neighborhood data to identify the points of leverage where residents should have a voice. City governments could also use neighborhood-level early warning and response systems to reduce costs through early interventions, freeing up resources down the road to deploy for other priorities.

## Where Has It Been Tried, and What Have We Learned?

Researchers from a variety of disciplines have studied neighborhood change. Most studies have investigated individual factors that drive neighborhood change, such as crime or housing conditions, and rarely capture how many factors affect a neighborhood simultaneously (Mallach 2016). These studies typically use federal Census data to track trends over time or invest in costly collection of local

data for a one-time analysis. Though these studies provide useful context, our vision requires more current and frequently updated data that cover a broad range of indicators. Further, inherent to our concept is a community action component that most other studies lack.

Governments and nonprofits have recognized the need to link analysis to action and experimented with tools to get ahead of these neighborhood changes. In the 1980s and 1990s, four US cities established neighborhood early warning systems, pulling together many data sources, largely focused on individual properties, with targeted user groups (Snow, Pettit, and Turner 2003). None of those examples are active today, demonstrating the challenges of sustaining funding over time and of building a broad enough base of active users to make the case for the investment. More recently, nonprofits and governments have used multifactor neighborhood typologies to guide investments and decisionmaking, but they lack the funding and infrastructure to keep the analyses updated as neighborhood conditions evolve (Goldstein 2016).<sup>14</sup>

We can also learn from other leading data development and analysis initiatives that have not focused on neighborhoods. More jurisdictions have developed advanced data systems on individuals or properties, linking records from multiple government and nonprofit agencies. These efforts can shed light on the data sharing and integration, and examples of payoffs of individual-level and property-level data for local policy already exist.<sup>15</sup> However, they are still labor intensive, and would benefit from a review to facilitate automation and reduce costs. Any efforts should also enlist the advice from private-sector firms that have embedded real-time predictive analytics into their decisionmaking and from the academic data science centers that are developing new models and a pipeline of new talent.

Lessons from these efforts teach us that systems need to be built incrementally, with the expectation of adding new data or improving models over time. Waiting for the perfect system or “enough” data to make a debut could result in waning support and delays field testing and community capacity building. Having community end users at the table with the analysts at the planning and design stage would build a broad constituency and help to keep the practical goals of the system at the forefront.

## What Else Do We Need to Know or Do to Make This Idea Work?

Many questions remain about how we could make neighborhood early warning and response systems idea a reality. At the outset, we should consider the risks inherent in building such a system. The major risk is that more easily available predictive information on neighborhood change could actually accelerate unwanted changes, such as property disinvestment in declining neighborhoods or real estate speculation in gentrifying ones. However, market segmentation systems, such as Nielsen's PRIZM system,<sup>16</sup> and predictive tools, such as Airbnb's pricing algorithm, Aerosolve,<sup>17</sup> already exist for those who seek to profit from better neighborhood intelligence, so this concept may actually help level the playing field. Establishing clear and effective local processes to *act upon* the intelligence gathered could also minimize this risk by preempting counterproductive actions and trends before they start.

Another significant risk is that cities and nonprofits will not have the interest or flexibility to adjust the timing and targeting of their resources. Both local governments and service providers would need to believe that it is cheaper and in their best interest to get ahead of neighborhood-level changes that undermine inclusion rather than react to the crisis of the day or respond to changes. Any communities launching these early warning and response systems would need to articulate the value in investing in a competitive environment—both in more equitable outcomes and in future monetary savings.

One way to mitigate this risk would be to develop tools that project public and private costs under a “do nothing” scenario—in other words, to quantify the future costs of failing to act on information made available through the new early warning systems. The Urban Institute is partnering with the Metropolitan Planning Council to develop just such a tool to examine the future costs of segregation to the city of Chicago and its surrounding region.<sup>18</sup> This model could be further developed and paired with early warning and response systems to make a strong case for forward-looking policy changes and targeted investments.

As mentioned, access to the data—particularly real-time data that private firms hold—will be important to this model, and we would have to better understand and articulate the business case for sharing the data. As smart-cities efforts expand within both larger and smaller cities, new data sources will emerge and much of these data will be managed and owned by private contractors. However, if cities establish the utility of neighborhood early warning systems, they could condition contracting on making the data available to advance inclusion goals.

Assuming these challenges can be overcome, we would also need to accelerate learning across places that are trying to plan and implement these systems. Because this concept is largely untested and relies on new data sources, evolving analytical tools, and novel policy frameworks, it will be important to promote peer-to-peer exchanges, sharing of best practices, and technical assistance across cities experimenting with this approach.

## Notes

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