



Turning the Corner

Final Local Analytical Report – Detroit

Third Edition

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Introduction

Turning the Corner (TTC) is a multi-city initiative led by the Urban Institute's National Neighborhood Indicators Partnership (NNIP), the Funders' Network's Federal Reserve-Philanthropy Initiative, and the Kresge Foundation to help communities identify closer-to-real-time patterns of neighborhood change through quantitative and qualitative research. Data Driven Detroit (D3) is the local partner on this project. Since April 2016, D3 conducted work to develop a quantitative model with the input of community members and partners, and conducted interviews and focus groups with residents to better understand how change impacts a community. Neighborhood change, in this context, is comprised of economic or physical changes that could substantially affect the composition and culture of a community. These changes, which we refer to in this report as 'transformational neighborhood change,' differ from the changes that take place every day in a community, as they are often triggered from a catalyzing investment or investments and can unfold rapidly.

One of the major problems that stem from these types of neighborhood change is displacement. When a neighborhood experiences upward economic swings, current residents can often be priced out of their owned or rented homes (Chapple and Zuk 2016). By identifying neighborhoods with a higher likelihood to undergo transformational change, TTC hopes to also identify neighborhoods at risk for displacement before the negative impacts of neighborhood change are too entrenched or too expensive to address efficiently and effectively. In the past, these types of analyses have been called early warning systems. However, these systems were found either to be unsustainable for a variety of reasons or did not provide closer to real time information for action.

The TTC project involved four different components: quantitative research, qualitative research, a community advisory group, and cross-site participation. The quantitative research focused on understanding indicators that are updated in closer-to-real-time, so that communities can monitor and react to activities that are taking place. The qualitative research involved a series of interviews and focus groups with business owners and residents in two focus neighborhoods to help understand what neighborhood change looks and feels like to those living through it. The community advisory group was a convening of stakeholders who helped shape the quantitative and qualitative research questions and implementation. For cross-site participation, D3 also participated in conference calls with Urban Institute and other TTC partners throughout the project to knowledge share best practices and updates about the qualitative and quantitative research processes.

Using our research, community organizations and affordable housing advocates can identify specific factors that may be affecting at-risk neighborhoods, allowing them to strategically target policy actions to address the possibility of displacement. This would allow for conversations within communities related to neighborhood change and displacement to occur earlier by identifying areas with the potential to be negatively impacted by transformational changes in the near future. The results of our analysis also can help communities that aren't at immediate risk for rapid change to further understand what areas of investment could have the greatest impact on the long-term sustainability of the community.

This report will first focus on the methodology of the qualitative research and the quantitative research. The next section will incorporate qualitative and quantitative findings organized by five categories: social advantage, housing stability, crime, business, and protective activities. The fourth section will explore these findings aggregated into a

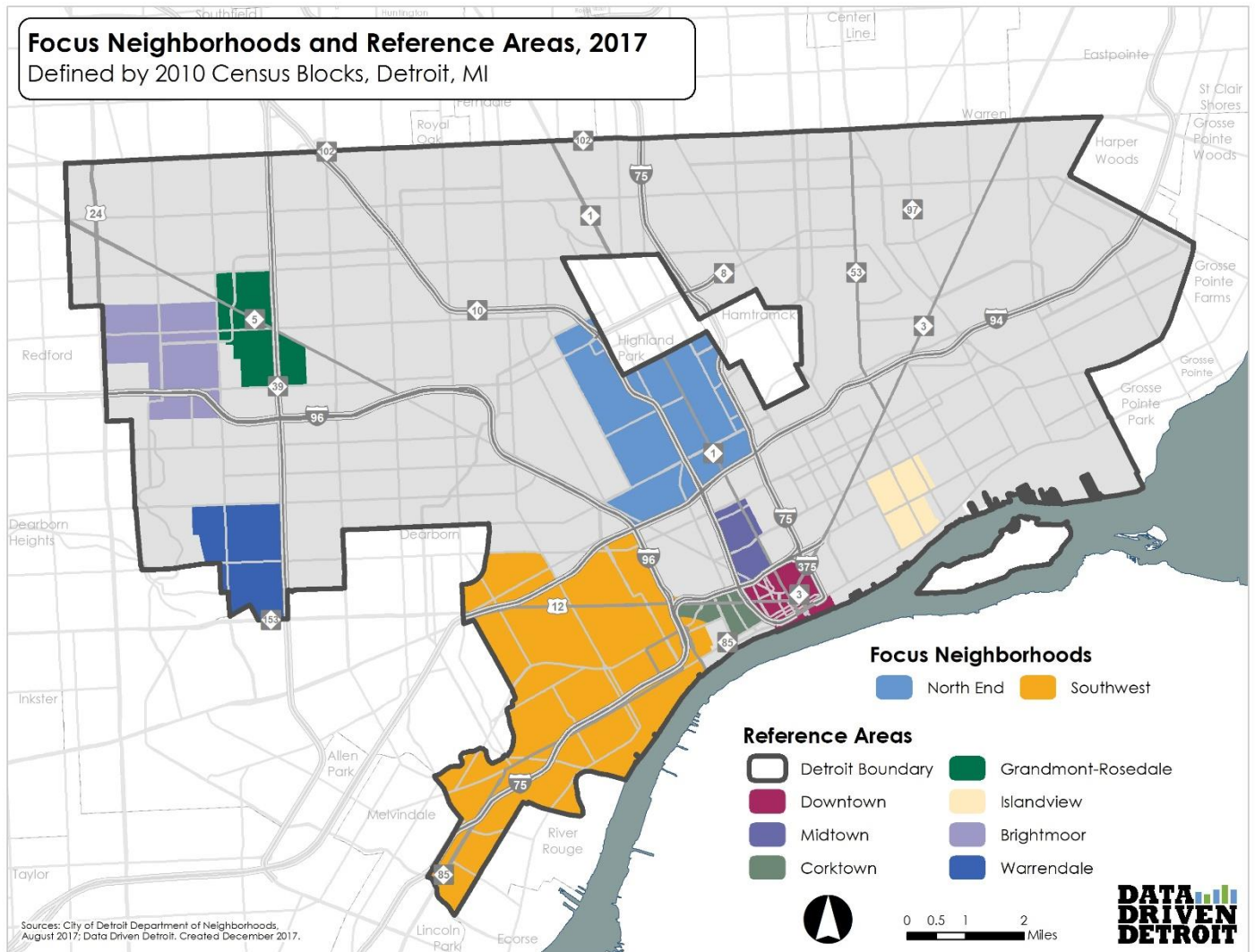
Neighborhood Change Index. The final section will conclude with a summary of the findings and discussion of limitations and further research questions that can build upon this work.

Qualitative Methodology

In partnership with the Urban Institute, D3 conducted an extensive qualitative data collection process, seeking to collect information like beliefs, values, and motivations. The goal of this process was to gather information under conditions where quantitative methods are too slow or narrowly-defined. Qualitative research also helps identify elements of displacement resulting from neighborhood change that may not be readily apparent from quantitative data as well as residents' perception of displacement. In gathering this information for TTC, D3 conducted conversations with over 60 people using neighborhood focus groups and one-on-one interviews with resident informants and long-time business owners. The topics of these conversations included changes in population, changes in businesses, and changes in the built environment over the past five years, with the goal of establishing which changes were taking place and in what order they occurred.

In order to focus the qualitative research, D3 selected two specific neighborhoods in Detroit – Southwest Detroit and the North End (Figure 1) to conduct interviews and focus groups in. Both communities were suggested to us in the early stages of research by community members and stakeholders as places that are experiencing neighborhood change. In addition, both are located close to neighborhoods in Greater Downtown Detroit that have experienced transformational neighborhood change in recent years. D3 conducted one focus group in the North End and two in Southwest Detroit, as well as multiple resident interviews in both communities and business owner interviews in Southwest.

Figure 1: Focus Neighborhoods for Qualitative Research



In both neighborhoods, the age of interviewees ranged from the early 20s to the early 70s, and we focused on residents who have lived in the focus neighborhoods for 8 to 70 years. The North End focus group was comprised solely of Black residents, while the Southwest Detroit focus groups were comprised primarily of Latino residents, with several Black and White community members. These demographics are fairly representative of the two neighborhoods, except for the small West Asian population in Southwest Detroit. D3 offered Spanish translation services at both Southwest Detroit focus groups, and a number of monolingual-Spanish speakers took advantage of this option. Focus groups took place at two non-profit organizations and a church, and outside organizations assisted in recruiting long-time residents to attend. Qualitative data were recorded digitally in audio files and typed transcripts, and names and personal information were removed in the final stages of reporting to de-identify individual sources.

Quantitative Methodology

Background of early warning systems and early research

Early warning systems are predictive systems that help identify areas where neighborhood change is occurring or about to occur before major impacts are seen on the ground. The first rounds of early warning systems started appearing in the 1980s and 90s (Chapple and Zuk 2016), most of which no longer exist. Chapple and Zuk's (2016) survey of early warning systems for neighborhood change found that they utilize everything from shifts in residential tenure; increase in residential down payments and decreases in FHA financing; increased educational attainment; housing value appreciation; out-migration; median owner-occupied home values; and many more indicators. The key is to find indicators that are measured regularly and available for public use.

Currently, the most commonly-used publicly-available indicators of neighborhood change are slow-to-update and often not available until displacement and other negative effects have already occurred. For example, using the American Community Survey (ACS) 5-year average for median rent means that as of December 2017, we know the average median rent for 2012-2016. This means that a sudden increase in 2016 is not captured for multiple years, and can be masked by the other years in the average estimate. One of TTC's main goals is to identify indicators that utilize unique data streams that are updated in closer-to-real-time than the ACS data. Local open data portals, like the one in Detroit, publish information that can provide closer to real time monitoring, resulting in better predictive strength.

In early stages of the analysis, D3 attempted to create a regression model that would add predictive power to locally-sourced indicators. For these purposes, Detroit is in a unique position, with two point-in-time city-wide parcel surveys: the Detroit Residential Parcel Survey (DRPS), and Motor City Mapping (MCM). In 2009, the DRPS surveyed blocks with 1-4-unit residential structures and rated the condition of the structures on a scale of 1 to 4 (1 indicating a high-quality structure and 4 indicating demolition necessary). In 2014, MCM surveyed every single parcel in Detroit for structure quality with a similar scale. D3 averaged the scores from both surveys for each block. Both surveys also included additional information, such identifying whether a structure was vacant, open, and dangerous. Additional data sources for this initial analysis included administrative records from the City of Detroit's open data portal and the Wayne County Treasurer's Office.

Unfortunately, upon further analysis, the DRPS survey's lack of larger multifamily unit structures excluded large swaths of Midtown and Downtown Detroit, which were the key areas that were widely expected to experience transformational neighborhood change from 2009-2014. D3 made attempts to identify other dependent variables, but ultimately none of these proved to be workable within the constraints of the project. In Appendix A, we offer a more in-depth look at this preliminary process to create a predictive regression model.

Dataset

Following the initial research phase, the D3 team shifted the focus of the quantitative research to developing an analytical framework that would identify neighborhoods where conditions that could be conducive to rapid transformational change are most prevalent. To begin this process, we constructed an expansive dataset incorporating local data from many sources. We collected most of the data at the parcel or address level and then aggregated up to census blocks. In isolated instances, we used ACS measures (such as median housing value); in these instances, we applied block group-level data down to individual blocks.

From our review of early warning systems, we found that indicators could be categorized into a variety of groups: change in property values and rents, investment in the neighborhood, disinvestment, change in tenure and demographic changes, investment potential, reasons people move in and out of the neighborhood, and coping strategies/displacement impacts (Chapple and Zuk 2016). Similarly, an analysis by Galster, Hayes, and Johnson (2005) identified five categories of robust neighborhood indicators: social disadvantage, housing type and tenure, crime, business, and prestige. D3 created a dataset that combines multiple data sources related to these categories at the block level including:

- Building permits
- Tax foreclosures
- Addresses and vacancies
- Blight violations
- Fires
- Residential structure and parcel
- Properties without an active DTE Energy customer agreement
- Water shutoffs
- Rental Properties
- Home sales data
- Speculator owned properties
- Crime

Appendix B contains the complete list of indicators, descriptive statistics of included indicators, and outlines additional potential indicators that could be included in future analyses.

Designing the Sample

Recognizing that not every block within the City of Detroit is vulnerable to transformational neighborhood change, the D3 team determined that it was necessary to limit the analysis to a specific sample of eligible census blocks to distinguish between change and transformational change. Transformational neighborhood change is the type of neighborhood change that results in displacement, either cultural or physical, by transforming the structure of the community, changing the lives and culture of the people who live there, and possibly increasing the costs of living. This is different than change, which happens every time a neighbor renovates their home or installs a fence. Transformational neighborhood change is the addition of many changes in a short span of time, and adverse effects related to this process can accumulate rapidly in a short period of time.

In a previous project with the Community Development Advocates of Detroit, D3 created criteria to identify neighborhood typologies related to neighborhood stability.¹ While the purpose of that project was different than TTC, we leveraged the work done on this project to further develop the theory that only certain neighborhoods are likely to undergo transformational neighborhood change. Ultimately, we identified two conditions under which blocks are less likely to be vulnerable to neighborhood change at a rate that causes significant displacement. Areas

¹ See <http://datadrivendetroit.org/cdad-residential-typology-analysis/> for more information

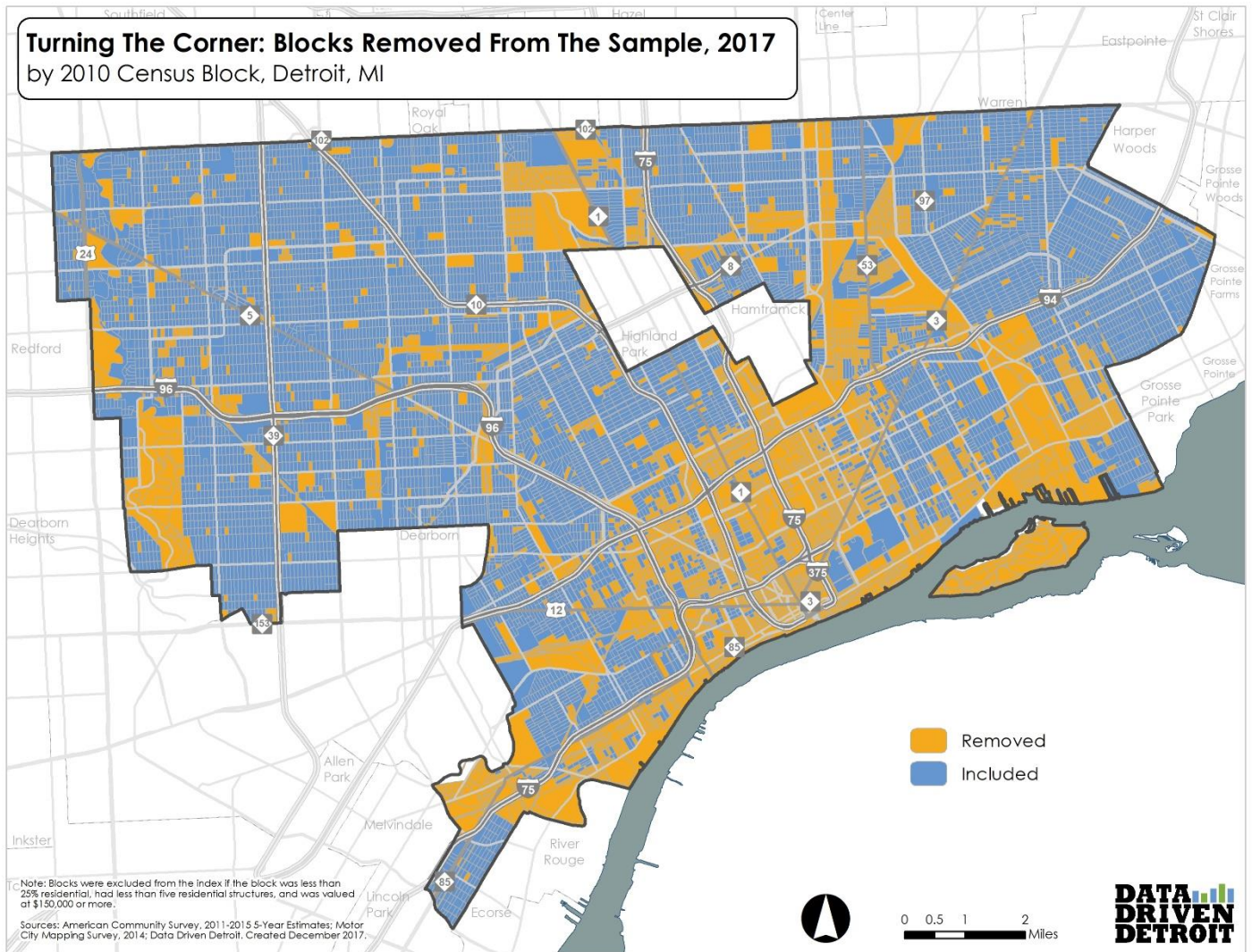
with little or no residential population have a low vulnerability of displaced residents through neighborhood change because residency in the neighborhood is already limited. On the other hand, neighborhoods which have already undergone transformational change or are historically stable high-income neighborhoods are also unlikely to further experience these trends.

Building upon this, D3 developed a preliminary analysis to identify areas that would fall into one of those categories so that they could be removed from the sample. We selected the sample at the block level as it provides a balance between granularity for identifying neighborhoods undergoing change as well as a level of aggregation to make the analysis more dependable. Had we conducted the analysis at the parcel level, the shifts might be too sporadic to allow us to identify communities undergoing change. On the other hand, limiting the analysis to larger geographies such as zip codes or city council districts would limit the model's ability to identify neighborhoods that are specifically vulnerable to rapid neighborhood change should a catalyzing event occur.

To ensure that all blocks in the dataset are blocks with the potential for transformational change, D3 created the following criteria to remove blocks from the sample:

- Blocks with fewer than 5 residential structures (Motor City Mapping, 2014)
- Blocks where fewer than 25% of parcels have a residential structure (Motor City Mapping, 2014)
- Blocks where the median home value exceeds \$150,000 (American Community Survey, 2011-2015).

Figure 2: Blocks Removed from the Sample



Appendix C contains maps of each individual criteria to narrow down the sample.

In total there are 15,935 blocks in Detroit. Applying these criteria removed 6,491 blocks, leaving 9,444 blocks for the analysis. Looking more closely at the maps of each criteria, the blocks that are removed from the sample align with our goals in undertaking this exclusion process. For example, the home value criterion removed wealthier single-family neighborhoods such as the Indian Village, Palmer Woods, and Sherwood Forest, which have traditionally maintained high rates of home ownership and relatively stable property values. It also removed portions of Midtown and Downtown Detroit, where apartment-to-condominium conversions indicate that transformational neighborhood change may have already occurred in these areas. The two criteria based on residential structures removed many areas that have high rates of commercial property (industrial, office space, and/or businesses) as well as neighborhoods that have gone through intense periods of disinvestment where few residents currently live.

Factor Analysis and Creating Indices

After applying the criteria and finalizing the sample, D3 conducted a factor analysis on the remaining blocks. Unlike a regression equation, a factor analysis doesn't require a dependent variable and is therefore not predictive in nature. It allows us to analyze a wide variety of variables that theoretically impact neighborhood change and produces groupings of the variables. Factor analysis is a statistical process that identifies which variables are most important in explaining events not captured by the data (for example, there is not a specific variable in our dataset that on its own merit estimates housing stability as a whole). The result is a series of components which group the variables with similar response patterns that could explain an unobserved situation (for example, rental properties and tax foreclosures tend to be associated in the same component). The components are comprised of "loadings" a numerical value that estimates how much the variable can explain about the unobserved data variations. Utilizing the factor analysis approach of Galster, Hayes, Johnson (2005), we ran an analysis of the 18 variables in the final dataset. The resulting indices that became apparent from the factor analysis (Social Advantage, Housing Stability, Crime, Business, and Protective Activities) aligned well with the buckets of indicators identified in previous research.

Based on this factor analysis, D3 created z-scores for each variable at the block level. Using the indicators that had heavy loadings on the factor ($>.45$), we averaged the z-scores of relevant indicators to create individual indices related to social advantage, housing stability, crime, business, and protective activities. In the Housing Stability component, rental properties had a loading of over .45 while commercial addresses fell below the threshold. The z-score for each indicator measures how many standard deviations from the mean the observation falls. For example, say the average block has 5 blight violations recorded. Block A, which has 15 blight violations would receive a high, positive z-score. Block B, which has 5 blight violations, would have a z-score equal to 0. Block C with 0 blight violations would have a negative z-score. The z-score always generates a measure that has a mean of 0 and a standard deviation of 1, allowing easy comparison of variables with different units of measure.

Conducting this analysis also required several assumptions. First, the overarching assumption is that these indicators do, in fact, correlate with transformational neighborhood change. Due to the limitations of factor analysis and the available data, it was impossible to test the statistical relationship of the indicators and neighborhood change. Second, the assumption is that the aggregate of these indicators, not their change over time or per capita activity, is the appropriate measure. Due to data limitations, some variables are not available at different points in time so in the interest of uniform definition of variables, point-in-time data was used. Third, we assume that each variable has equal predictive power (i.e. they are not weighted based on the strength of their relationship to neighborhood change).

The variables that were identified for each subject area and index can be seen in Table 1. Indicators that are highlighted green are available for update at least once a year. Many of the variables utilized in this report are available on a quarterly or even more frequent basis. Identifying these indicators was a key component of the project.

Table 1: Index Variables

Index Variables				
Social Advantage	Housing Stability	Crime	Business	Protective Activities
Residential Vacancy	Blight Violations	Property Crime	Commercial Addresses	Residential Addresses
Demolition Permits	Rental Count	Violent Crime	Commercial Vacancies	Construction Permits
Tax Foreclosures	Sales Count			Fire Alarm Calls
Blight Violations	Speculator Owned Properties			
Inactive DTE Agreement				
Water Shutoffs				

The final Neighborhood Change Index was created from the average z-scores of each of the five indices. The final map, which is available in the findings section, indicates (1) which blocks in Detroit are eligible for neighborhood change and (2) which blocks have conditions that make them more vulnerable to experience transformational neighborhood change.

Findings

Combining the quantitative and qualitative research, D3 gained a much deeper understanding of the factors related to transformational neighborhood change and the impacts of both physical and cultural displacement on communities. This section will start with a general overview of the qualitative research, providing the perspectives of residents and business owners who are currently living through this transformational neighborhood change. Then, we will review each index in-depth, including what indicators make up the index and how they impact our understanding of neighborhood change. Finally, we will review the Neighborhood Change Index and explore how it can be used in concert with each individual index to be actionable in Detroit’s communities.

Qualitative Findings Overview

Speaking with business owners and residents provided invaluable perspectives on neighborhood change. Many interviewees and focus group participants heavily emphasized the need to view a longer arc of neighborhood change even when considering more recent developments. Conversations identified long-term cycles of abandonment and divestment, hyper-local examples of resiliency, organizing to independently develop a community, attraction of speculative investment, and subsequent accolades for the “success” of the community. Interviewees identified changes in infrastructure, such as street lights and resurfacing, as well as non-profit investment in small business corridors as early indicators of accelerating transformational neighborhood change. As change continues, they identified increased police presence, an influx of services that cater to higher-income clients and shifts in governmental management as additional indicators to monitor. However, at the core of the lived experience of neighborhood change, is a cultural shift in the community. As one resident put it, “It feels strange, like I’m not displaced *but I am* somehow.”

Residents identified creative solutions in both focus areas to address economic insecurities and lack of government services over many years. Hyper-local housing associations, a park coalition, advocacy groups, and immigrant-driven business corridors were oft-used examples of how neighborhoods in Southwest Detroit stayed responsive to the needs of residents in the face of missing city services. Similarly, in the North End, block clubs, food sovereignty organization, safety patrols, and a park coalition served to anchor residents to their neighborhood. These community efforts built up a social fabric in the neighborhood. Through them, residents continued to improve their neighborhood's food, safety, and housing resources, which became attractive assets in the eyes of new residents and developers. As neighborhoods begin to experience transformational change, this carefully crafted social fabric is being threatened by an influx of externally directed dollars from for-profit and nonprofit investment. The influx of money has created a cultural deviation as property becomes valued for its investment prospect instead of as a place for connection between families and neighbors.

Many homeowners were happy with rising property values; however, they expressed concern over tax assessments increasing and the impacts on neighborhood continuity. Continuity meant many things to residents including knowing neighbors, preserving a shared cultural and historical understanding within the neighborhood, and consistency in government services. Business owners described how increased targeting of drivers impacted their customer base over the last 8 years. The focus on ticketing drivers caused many unlicensed drivers to shy away from Southwest Detroit's international border policing zone, and led some Mexican grocers to open stores outside of Detroit. More recently, residents described their undocumented friends and family avoiding more developed parts of the commercial corridor in the neighborhood due to heightened police presence. Residents notice this effect spilling over from the corridors to other parts of Southwest, "Now that (new) people live in the deeper parts of Southwest, not just (near) the restaurants, they're calling the police, bringing them into other areas, making the safe spaces not safe."

With a focus from both governmental and non-governmental efforts on closer-to-stabilized neighborhoods, residents expressed frustration when new systems and externally-oriented businesses (i.e. businesses serving regional higher income people vs. the immediate community) encroached on existing neighborhood structures. These systems include the City's English-speaking bureaucracy that's swiftly ramping up enforcement efforts and can be confusing to residents who weren't required to utilize it in the past or who primarily speak languages other than English. One resident said, "They don't provide police for 20 years and now (they) want to know everything you're doing. These new people are waving around their wealth and their privilege and access, and I can't even navigate the permit system." Externally-oriented businesses speak to a pattern of "trendy" restaurants and breweries focused on visitors instead of fresh markets and services that are more focused on the residents of the neighborhood. The impact of losing Latino neighbors as Southwest Detroit is continually marketed for its ethnic authenticity also makes residents feel culturally used. These changes in culture can cause feelings of cultural displacement even without forcing people to leave the neighborhood.

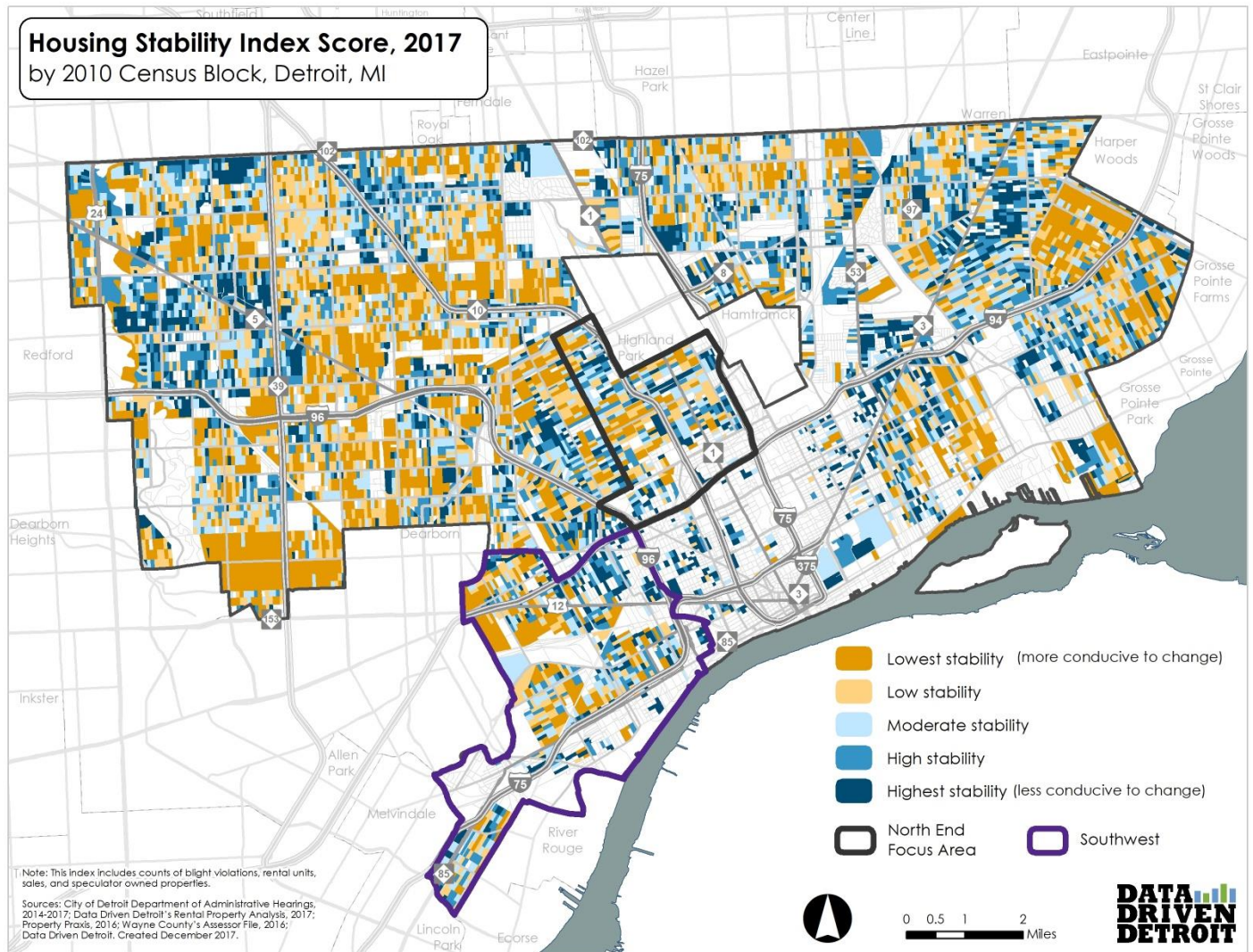
These conversations with community members and leaders provided D3 with invaluable insights to the impact that an early warning system could have for neighborhoods. The context provided by residents and business owners who are experiencing transformational change in their current communities add an important dimension to our quantitative work. In many cases, the interviews and focus groups helped us identify new data sources or approach existing data with new perspectives.

Indices Overview

The indices were informed primarily by the factor analysis with indicators in each index often supported by the findings from the qualitative research. Prior to reviewing the findings and implications of each index, we review the specific indicators used in compiling the indices and discuss the rationale for each.

Housing Stability

Figure 3: Housing Stability Index



Housing stability is an important topic in talking about neighborhood change. Neighborhoods with high rates of resident turnover are generally more vulnerable to transformational change as there are more opportunities for landlords to increase rents and speculators have more opportunities to acquire property. Based on our interviews in Southwest Detroit, residents are very aware of the impact that turnover can have on the social dynamics of the community. The Housing Stability Index includes variables that measure blight violations, rental properties, number of property sales, and speculator-owned properties.

Each of the indicators in the Housing Stability Index measure different aspects of housing market stability and resident transiency. Property sales indicate that there is some activity in the market and that owners, both of businesses and homes, have an incentive to sell. The qualitative interviews reinforce the inclusion of property sales as factors of neighborhood change. Some residents talked about neighbors selling their homes or renting their properties to benefit from the increased interest in the community. Residents recognize that many buildings are for sale, but neither they nor their neighbors can afford to buy them. In addition to promoting resident turnover, increased property values can create additional uncertainty in the community as residents may be unsure if they can afford higher property taxes.

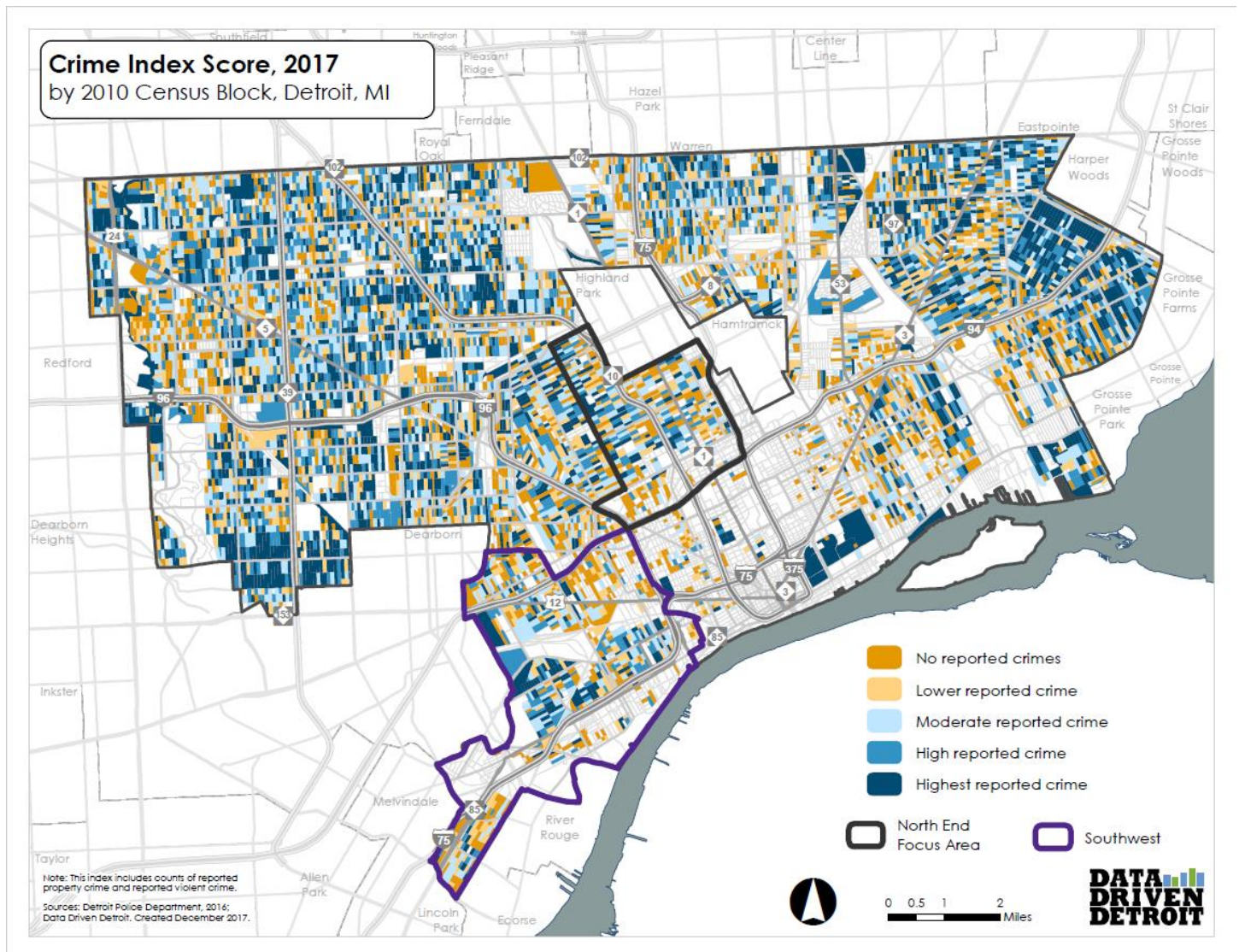
The number of rental properties can also indicate some level of instability, especially in quickly changing neighborhoods as long-term owners convert to landlords when the financial incentive is high. One interviewee expressed shock at the amount a neighbor received in rent, \$1,500 a month, which the owner-now-landlord utilized to pay for a new home's mortgage. In the Community Advisory Group, a member remarked that the opening of AirBNBs in a neighborhood can also be both a sign and cause of neighborhood change as the repetitive turnover of short-term renters creates further social and economic instability. The number of rental units is also a measure of transiency because rentals are more likely to have higher turnover than owner-occupied homes. Renters have a higher risk of being displaced, a theme we heard through many interviews from business owners who were priced out of their previous spaces to residents who could no longer afford their rent or watched their neighbors struggle as rents increased.

Speculator-owned properties were included in the index because it shows where people are choosing to invest money. Speculators contribute to instability by flipping houses and changing rental property management styles. Speculators are also infamous in Detroit for sitting on properties and preventing small-scale local development because they have enough money to wait for larger scale buy-outs. One North End resident said their apartment was bought by an Asian woman who had never visited Detroit and while they hadn't been forced to move, the management company said to "expect many changes". The uncertainty that speculator-ownership brings to communities contributes to instability of individual lives and the community's housing market. Renovating inexpensively-purchased homes is also more challenging than most people expect, and slow-to-finish renovations become attractive sites for theft.

In this index, blight violations help triangulate more specifically on blocks where high rates of speculator-owned properties, rentals, and property sales may contribute to instability, identifying situations where owners may be less likely to maintain their properties. Increases in ticketing can also be the result of new types of people moving into a neighborhood who don't understand the community's norms. For example, one resident spoke about how a long-time neighbor received social pressure from new residents who threatened to call the police over his work truck being parked on the street because they thought it was an unattractive addition to the neighborhood. Current residents feel that newer residents intend to "...impose our [the new residents'] standards, our culture, our criteria for what is quality of life and what it should be...".

Crime

Figure 4: Crime Index

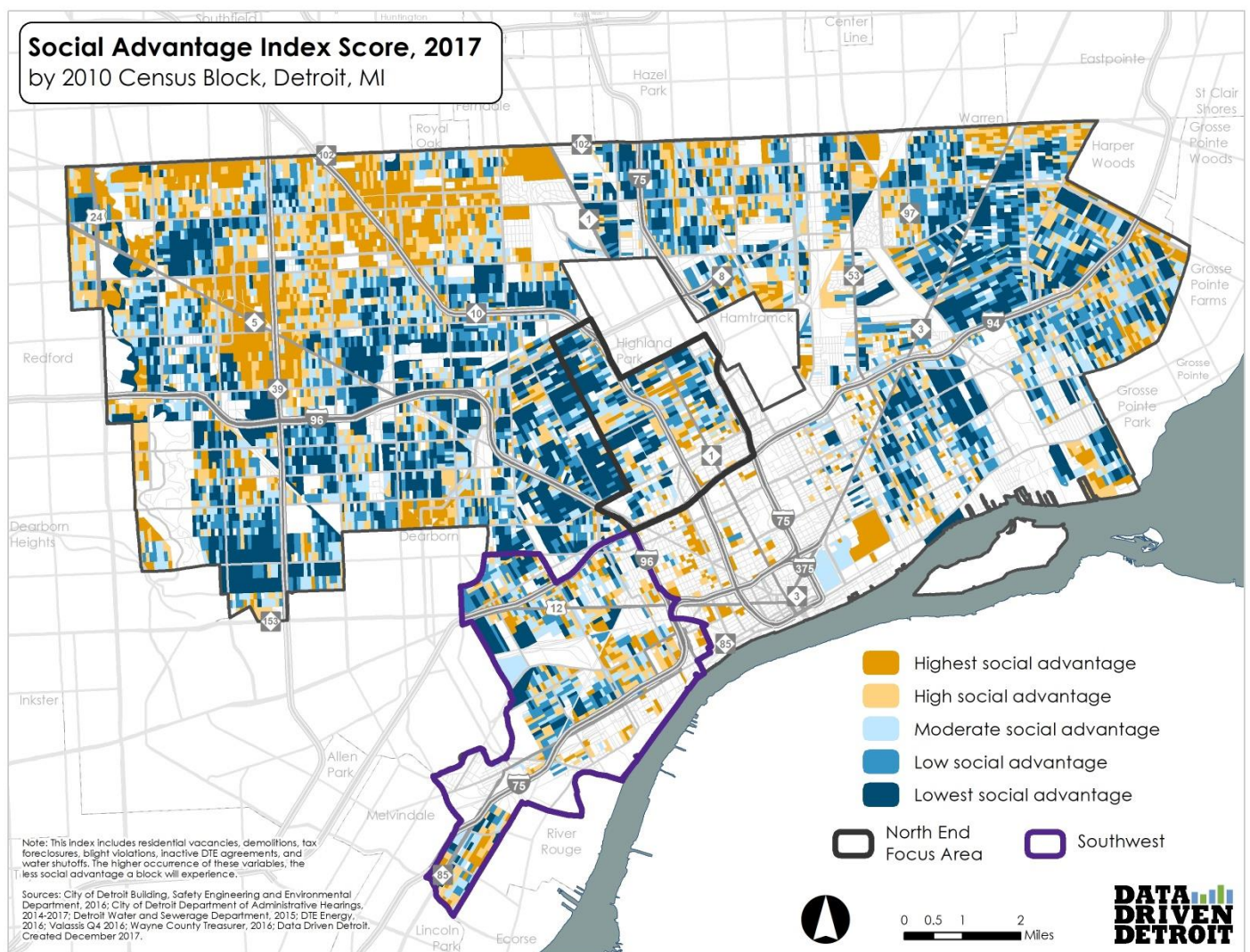


Crime incidents are an important measure of community health. However, there are limitations to our ability to infer a specific relationship between crime and neighborhood change, as we must rely on what is reported and recorded by the police department. Changes in enforcement policies – for example, in neighborhoods that begin to organize block clubs – can increase the reported crime rate without there being an actual increase in criminal activity, as can an influx of new residents who call the police on neighbors with whom they don’t have a relationship. For this analysis, we ultimately decided that blocks with low levels of crime are more likely to be vulnerable to neighborhood change when considered in conjunction with the other indices, because neighborhoods with low levels of crime are more likely to attract the type of catalytic investment that drives transformational change. The Crime Index assembled for this analysis includes property crime and violent crime.

It's important to note that crime and perception of safety are two different things. Many residents note that new residents are less likely to talk to others and integrate into a close-knit community. One resident said, "When we had no resources, remember when they didn't pick up the trash, you're kind of protected. You're forced to talk to your neighbor." As mentioned above, some longer-term residents also feel less safe walking around their neighborhood due to the breakdown of neighborly communication, as well as an increased police presence. One community member said, "even though safety is getting better, the last 2-3 years I've felt unsafe walking out this front door and I never felt like that before."

Social Advantage

Figure 5: Social Advantage Index



The Social Advantage Index is a measure of neighborhood change because communities with heightened social advantage are more likely to attract catalytic investments that could quickly spur transformational change. However, blocks that score low on this index, but are adjacent to neighborhoods with high potential to change, are also

particularly vulnerable to displacement as low levels of social advantage could contribute to higher turnover rates. This index incorporates variables that measure residential vacancy, demolitions, tax foreclosures, blight violations, inactive DTE Energy customer agreements, and water shutoffs.

Blocks with high rates of residential vacancy show that there's a lack of market interest. Detroit is a predominantly residential city, so residential vacancy tends to work differently than commercial vacancy. There are strong residential neighborhoods in the city with weaker commercial corridors (for example, Grandmont-Rosedale and Indian Village). In interviews and focus groups, residents mentioned that they've noticed higher occupancy rates in their communities as the neighborhood changes.

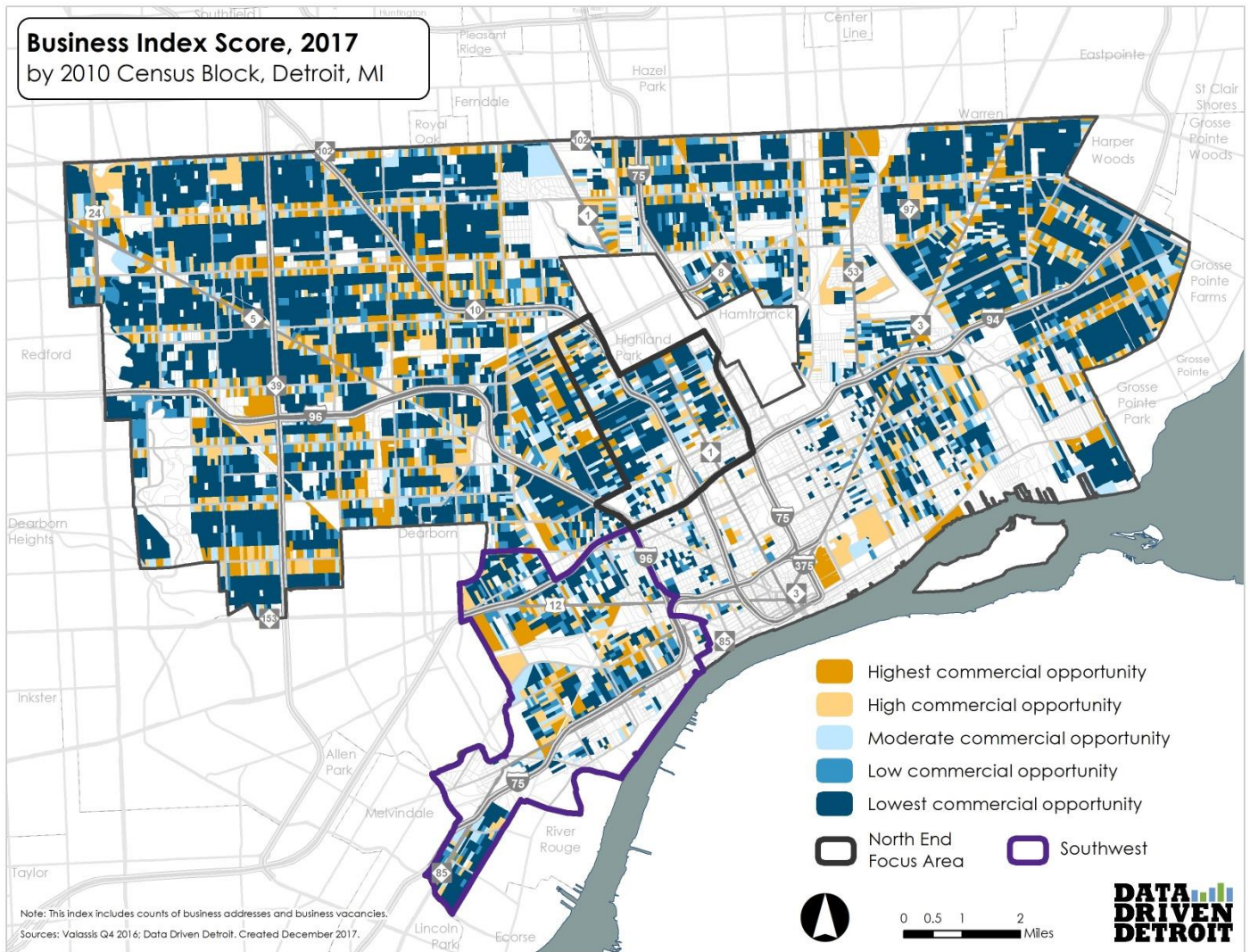
Demolitions are an indicator of social advantage because high rates of demolitions in a community are indicative of long-term disinvestment in the area. Demolitions usually limit the built environment, leading to fewer opportunities for new businesses and residents to move in. Residents also mention that demolitions can contribute to blight in the neighborhood when the debris is not promptly removed. The interviews also revealed examples of the city not replacing sidewalks after demolishing residential homes, which decreases walkability of the neighborhood including accessibility for residents in walkers and wheelchairs, particularly in the North End.

Along with demolitions, tax foreclosures indicate a large interruption in normal market activity. Tax foreclosures can identify both situations where owners may be struggling to pay existing property taxes, and also areas where residents may be living in substandard housing, as owners that do not pay property taxes on rental properties are not likely to make other investments in their property.

Inactive DTE Energy customer agreements, blight violations, and water shutoffs can indicate financial disinvestment from the area. This may be due to inability to maintain occupied homes and could also indicate inability to pay for basic services. These contribute to the likelihood of neighborhood change in a similar way as the previous factors. In this index, the factor analysis uses concentrations of blight violations in conjunction with the other variables in the index to better triangulate blocks with low social advantage.

Business

Figure 6: Business Index



Commercial activity is an important indicator of neighborhood change. It provides employment and financial investment in the community and helps indicate market activity. The Business Index includes commercial addresses and vacancies as a proxy for the potential within a neighborhood to experience commercial investments. Concentrated commercial investments in neighborhoods can be the catalytic investment that triggers transformational change for current business owners and community members as new businesses open and new customers begin to frequent neighborhood establishments.

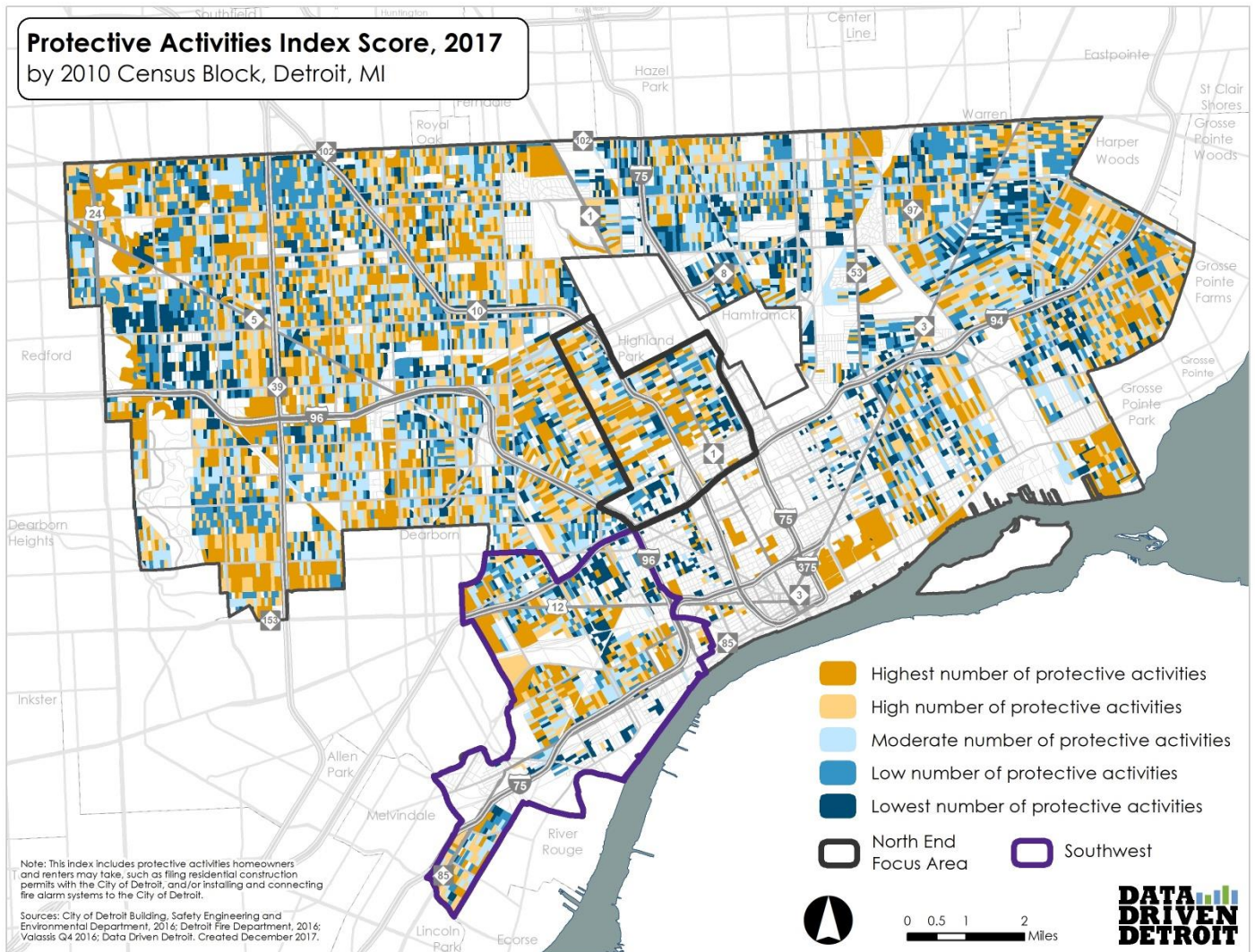
Higher scores on this index indicate greater availability of commercial space within a community. Vacancy rates are included because open space leaves more opportunity for rapid investments as businesses move into the neighborhood. Vacancies also create more opportunities for investors. While this index weights neighborhoods connected to commercial corridors more heavily, a significant amount of community advocacy and investment is

currently happening in initiatives tied to commercial corridors and this focuses investments that could trigger transformational change on those neighborhoods. Of note, the data for commercial addresses excludes buildings that no longer exist, so former commercial corridors such as Oakland Ave. in the North End are not strongly identified on the index.

Our qualitative research supported the idea that new businesses in a neighborhood can signal a shift towards transformational neighborhood change. Several people cited a new club/bar in a residential community, finding the new business to be loud and associated with an increase from crime. The patrons are overwhelmingly young, white, and not from the neighborhood. There were many conversations about how Southwest doesn't need "trendy commercial investments", but fresh markets and other businesses that serve the community that lives in Southwest. One resident said, "there's a huge disconnect between what a community wants and what they're getting."

Protective Activities

Figure 7: Protective Activities Index



Protective activities indicate confidence in the market through specific investments such as construction permits and buildings protected by alarm systems. These investments are different than other types of investments because they aim to protect the owner from liability and indicate a level of disposable income to reinvest into properties. The Protective Activities Index includes residential addresses, construction permits, and fire calls that were caused by an alarm system or fire detector.

Construction permits are included in this index as a measure of confidence in the market. Pulling permits to make improvements on a building indicates that the owner is trying to protect themselves from liability either through hiring a professional who is required to pull the permit or that the city may be enforcing the codes that prohibit unpermitted activity. One of the many reasons construction permits might be enforced is the neighborhood is attracting heightened attention, possibly due to transformational change. In the qualitative research, residents spoke about how newer residents tend to report issues to the city more frequently, often times before talking to the building owner in question. As one resident put it, new residents seem to think: “Oh hey, this is nice, but that ain’t up to code. I’m going to call the inspectors.” This heightened enforcement of building permits for building improvements can indicate changes in the neighborhood’s characteristics.

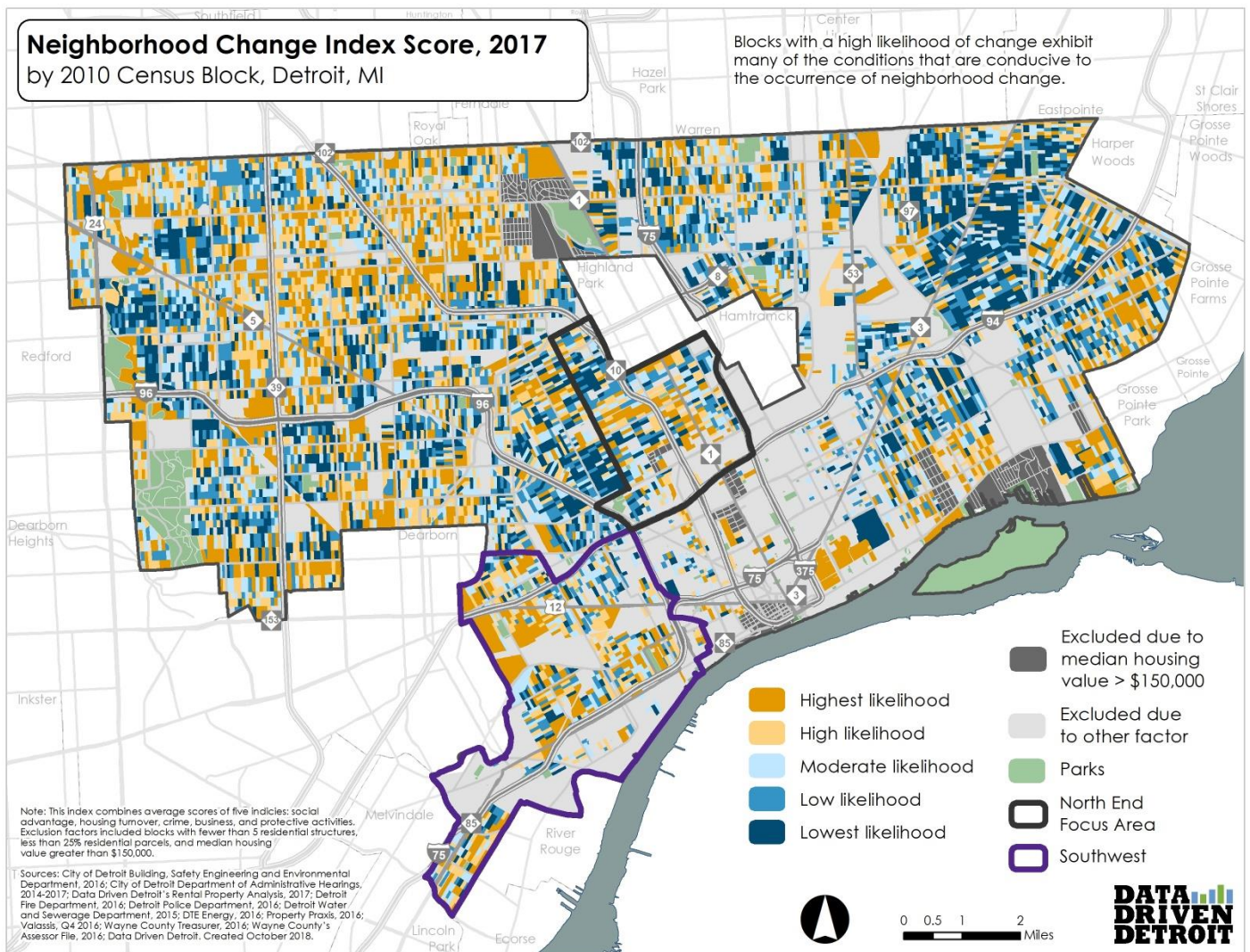
In data from the Detroit Fire Department, some calls identify whether alarm systems and smoke detectors are present. These investments in homes can indicate both more regularly-enforced rental standards and higher confidence in the market. Installing an alarm system indicates a certain level of willingness to invest in buildings, either because it is a more valuable investment or because there may be requirements from their insurance that include certain standards for alarm systems.

Lastly, residential addresses are a measure of density. While this is partially a legacy of the built environment, density is a measure of interest in the area. Residents in our focus neighborhoods recognize that their communities have seen higher occupancy rates and more people attempting to buy vacant homes and rehab them. This indicator of density does not take into account the social impact of new neighbors’ demographics. Many existing residents pointed out that new residents are younger, more affluent, less racially diverse, and less likely to have families, which significantly changes the dynamics of the communities.

What Do the Indices Tell Us About Detroit?

While the individual indices provide an understanding of a specific aspect of neighborhood change, the Neighborhood Change Index combines them to better understand which blocks have the most factors that could contribute to a vulnerability to neighborhood change. The overall index can help residents and community advocates in any neighborhood better understand where action needs to be taken. Appendix D also contains a map of the blocks that fall in the top 5% of the Neighborhood Change Index, illustrating the geographic patterns for communities that this analysis found to be most likely to be vulnerable to transformational change.

Figure 8: Neighborhood Change Index



The Neighborhood Change Index and five indices included therein can help identify the types of action that may be most helpful in addressing the negative impacts of transformational neighborhood change. For example, if a neighborhood has numerous blocks in the first quintile (highest likelihood for potential change), more immediate policies to prevent displacement might be needed. Communities that are near high-income or rapidly changing neighborhoods can be more aware of their potential for change and can regard changes in this index as early warning flags for vulnerability to potential future changes (particularly if those changes are accompanied by a large investment). This index could also help deploy neighborhood stabilization and block grant funds more effectively in distressed neighborhoods that are in close proximity to blocks with a high score on the neighborhood change index.

High scores on the Neighborhood Change Index, like in West Village or East Riverfront, show the neighborhoods are not just anecdotally changing, but that they are experiencing a series of factors that are associated with increased likelihood of transformational neighborhood change. In Southwest Detroit, the blocks closer to Clark Park and east

of it— those closer to Corktown – are most densely highlighted in the higher levels of the index. From the interviews and focus groups, we found that residents of Southwest recognize that this area is currently bearing the brunt of the community’s change. However, further west, there are still many blocks that have multiple characteristics that could support transformational neighborhood change. In the North End study area, the blocks on the west side of Woodward are more concentrated in the higher ends of the Neighborhood Change Index, but there are blocks on both sides of Woodward that rate high on the index for transformational neighborhood change. Interestingly, Boston Edison and Virginia Park do not show up on this index, which is indicative of their relatively high home ownership rate and longer-term stability.

Once a neighborhood is identified in the Neighborhood Change Index as having conditions that could increase its vulnerability to transformational neighborhood change, the individual indices provide a method for drilling down deeper into the area to better understand what factors may be most likely to contribute toward this change (and toward potential displacement).

The Housing Stability Index helps measure the volatility of a neighborhood and the speed at which neighborhood change can have an impact. It also helps demonstrate which neighborhoods have more transient populations. A neighborhood that is vulnerable to transformational neighborhood change and ranks highly on this index would likely benefit from targeted policies to reduce housing turnover and create more stable residential populations. For example, the index highlights Warrendale, a neighborhood with a relatively high immigrant population and housing turnover. Blocks located in the North End and Southwest Detroit are also highlighted in the index, corroborating findings from the qualitative research.

Traditionally stronger and weaker markets fall into the lower quintiles of the Housing Stability Index. Neighborhoods with strong markets generally have long-term, stable ownership. These neighborhoods may be adjacent to areas excluded by the >\$150,000 median home value criteria, but also include neighborhoods like Brightmoor and areas in Northeast Detroit that are traditionally weaker housing markets.

The Crime Index highlights areas with predominantly higher or lower levels of crime. Though few policy prescriptions may exist for addressing displacement caused by an area that has lower rates of crime, this index is nevertheless a useful potential warning mechanism for a community if this potential indicator is highlighted in addition to several of the other indices. This index may be particularly useful as an early warning sign if perception does not necessarily align with the data about a community. For example, many blocks in the North End are highlighted as low crime neighborhoods, which contrasts somewhat with perceptions of crime in the community. When combined with qualitative research and other indices, this could be indicative of a greater likelihood of transformational neighborhood change.

Neighborhoods that are highlighted on the Social Advantage Index, such as Grandmont-Rosedale, Livernois/McNichols, Midtown, and Corktown are generally more stable neighborhoods with lower rates of housing turnover and higher levels of investment. Blocks in the North End and Southwest Detroit fall into every quintile on this index, indicating a potential for rapid change in these neighborhoods, since blocks with lower levels of social advantage may be particularly vulnerable to displacement as people choose to relocate to these areas due to their proximity to higher social advantage areas. These blocks highlight several portions of the city where policies

could be put in place that help ensure that current residents don't get displaced as the neighborhood continues to improve.

Similar to the Crime Index, the Business Index is also useful in contextualizing areas highlighted by the Neighborhood Change Index and its other component indices. While businesses on their own may not contribute to transformational neighborhood change, available commercial space in areas of high prestige and lower housing stability could create additional opportunities for commercial investments that do not match the existing fabric of the community. Areas that are highlighted strongly on this index in conjunction with other indices may be good candidates for community engagement to ensure that commercial investment is responsive to the desires and culture of existing residents.

The Protective Activities Index shows that these activities are beginning to seep through North End, Chadsey-Condon and neighborhoods adjacent to Lafayette Park. Other neighborhoods that are highlighted by this index include Greater Downtown, Midtown, West Village, Islandview, and Jefferson Chalmers. This reflects commonly held impressions of those communities. Neighborhoods like West Village and Midtown are very dense and have many open businesses, which can contribute to the sense of safe investment. Historically divested neighborhoods like those around Gratiot and McNichols in Northeast Detroit score low on the Protective Activities Index, indicative of the low rate of return and lack of enforcement on these activities.

All neighborhoods can utilize the five indices to identify what types of investments might be most impactful not only in mitigating the harmful impacts of transformational neighborhood change, but also on economic development more broadly. A low score on the Neighborhood Change Index can be an opportunity for neighborhoods to delve in to the individual indices to better understand how to work to shape perceptions around their community. For example, some Southwest Detroit residents mentioned that safety hadn't changed in the community, but merely outsiders' perception of safety, which influenced new residents to begin moving into the Southwest neighborhoods. Another historical example is how Midtown rebranded itself from the Cass Corridor to market the neighborhood as a new place to new people.

Conclusion

While neighborhood change can be a polarizing issue in a community, this analysis gives communities additional tools that can inform how vulnerable a neighborhood may be to rapid, transformational changes, and how to focus conversations related to potential displacement. The structure of these findings can also inform the content of these conversations through deep analysis of the indices and factors that may be most likely to drive these changes in neighborhoods should a catalyst occur. This analysis also has further applications – not only does it identify neighborhoods where the potential for rapid change is a more immediate consideration, it also allows communities on the periphery of significant neighborhood change to understand and plan for factors that could change in the future.

In future research, D3 hopes to incorporate additional datasets into the analysis, many of which are listed in Appendix B. During this project, we identified unique data sources, such as Craigslist data of rental prices, that required longer-term efforts to collect and clean for analysis. Furthermore, we observed qualitative evidence that suggests certain types of crime increase when neighborhoods undergo transformational change. Many residents

reported an increase in certain types of property crime that they associated with changes in their communities, like theft from vehicles in upscaled business corridors and vacant homes being renovated with expensive supplies left unattended inside. While both property and violent crime acted in a similar direction in this analysis, disaggregating these data further in future analyses could provide valuable insight into neighborhood change.

Efforts to create a predictive regression model could also continue, building on the knowledge base assembled during this project. Methods to better capture an accurate dependent variable have continued to be a topic of discussion, and as additional datasets become available, the likelihood that a predictive model would be successful continues to increase. Spatial lags might also be incorporated because areas with significant levels of change are not likely to be isolated, and therefore the level of change in surrounding blocks should be incorporated into the model.

Finally, transformational neighborhood change not only has quantitative impacts, but also impacts day-to-day life and changes how people feel about their community. The quantitative and qualitative research done for TTC shows that these two streams of data can inform and often mirror each other in measuring neighborhood change. The qualitative interviews show how deep the impact of neighborhood change can be felt, changing the entire social fabric of a community. In future work, we recommend exploring avenues to develop deeper and more automated mechanisms to collect additional qualitative data, using this valuable information to complement the Neighborhood Change Index and its component indices to help inform future economic development practices aimed at ensuring the inclusive recovery of Detroit's neighborhoods.

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Appendix A: Predictive Regression Model

Creating a predictive model requires a dependent variable to predict. At this point, D3 has not identified a dependent variable for a regression model, but this appendix highlights the history of the process and where that process currently stands. Defining neighborhood change as a quantitative measure has been challenging. The variable must be available for the vast majority of blocks in Detroit, fit our parameters for “closer to real time”, and be a result of activities that could indicate change happening like building permits.

The dependent variable identification process has been a learning experience of how parcel-level data interact within regression models, as well as conceptualizing what neighborhood change and displacement actually look like, who it affects, and how it can be effectively measured quantitatively. In the appendix, we offer a more in-depth look at the process at each step of the analysis.

Originally, a dummy variable measuring some threshold of change in the block rating between 2009 and 2014 was used as a dependent variable. Initial correlation matrices indicated that demolitions and block rating increases were correlated. Thus, an additional layer was added to the dependent variable, requiring the number of structures on the block to remain constant or increase to be considered positive. That means the dependent variable will predict that there will be the same number of structures in a future year *and* they will be in better condition than in the previous year. This accounts for blocks which obtained positive increases in block condition, but did not actually have an improvement in the structural components of the block, which might indicate positive neighborhood change.

Building permits were originally considered as a candidate for the dependent variable. Based on their behaviors in correlations and what we anecdotally know about building permits (i.e. they tend to be pulled more often in certain areas than others), we decided instead to include them as an indicator of neighborhood change, rather than the measurement of change. Building permits are interpreted in this case as an indicator of market confidence and planning, especially in the commercial sector.

One of the original candidates for the dependent variable was building permits, specifically rehabilitation building permits (i.e. excluding demolitions). The aim was to create a parcel-level predictive system. However, after discussion this concept made less sense as we’re trying to predict neighborhood behaviors and chances of neighborhood residents facing displacement issues, not a particular structure’s chance at being improved. Furthermore, there are not enough building permits at the parcel level to create an effective regression model. Lastly, building permits conceptually make more sense as a measurement of activity and interest which could predict neighborhood change, not the actual quantitative measurement of neighborhood change.

The other original candidate for the primary dependent variable was a dummy variable equal to 1 if the average rating of a block increased from 2009 to 2014 according to the Detroit Residential Parcel Survey (DRPS). The DRPS was carried out in both 2009 and 2014 during which all residential structures with fewer than 4 addresses were surveyed and given a rating from 1-4. So if the residential structures on a block increased their scores on average from 2009 to 2014 the dependent variable would be coded as one. So therefore:

Dependent Variable = 1 if AvgRating2009 < AvgRating2014

Upon further analysis, however, it was discovered that the block change variable was correlated strongly with demolitions, not necessarily a positive change. An additional layer was added to the dependent variable to ensure that positive change to the structures on a block was being measured. Thus, the dependent variable equals one if the above criteria is true (change is >0) and the number of structures on a block remained consistent or increased between 2009 and 2014. Therefore:

**Dependent Variable = 1 if AvgRating2009<AvgRating2014 AND
StructureCount2009<=StructureCount2014**

As we progressed, we realized that a threshold might be more effective to capture significant levels of neighborhood change (i.e. an increase of merely .01 in the average block rating could be contributed to random error and not intentional improvement in the neighborhood). A threshold could help us identify blocks with substantial neighborhood change that might cause displacement of long-term residents. The threshold also prevented blocks with miniscule amounts of change from being considered improved outright. Therefore:

**Dependent Variable = 1 if (AvgRating2014-AvgRating2009) > X AND
StructureCount2009<=StructureCount2014**

Where X is equal to a threshold that indicates significant change. The threshold is still being tested, but somewhere around .25 seems effective at identifying neighborhoods that undergo change.

After mapping the distribution of the dependent variable, we discovered that large portions of the city, primarily in Downtown, Corktown, and Midtown were not registering as having undergone significant neighborhood change. This called the dependent variable's validity into question because downtown and midtown were seen to be anecdotal examples of strong neighborhood change over that time period. The gap in coverage is due to the DRPS's lack of coverage of multifamily housing units. So we developed a third layer of the dependent variable to attempt to capture improvements on multifamily housing structures with more than 4 units which weren't captured by DRPS. The new dependent variable would look like:

**Dependent Variable = 1 if [(AvgRating2014-AvgRating2009) > X] AND
StructureCount2009<=StructureCount2014 OR [MultiFamPermits2010 > 1]**

Unfortunately, upon closer inspection of the Multifamily Permits data it was discovered that very few of the permits taken out during 2010 corresponded to multifamily housing unit structures. Only 8 of those permits exist on blocks where DRPS did not have an existing block rating. Therefore, it did not increase the coverage of the dependent variable substantially enough for better predictive results.

Appendix B: Variables Included in Factor Analysis

Table 2: Index Variables

Index Variables		
Variable Name	Definition	Source
Exclusion Criteria		
Median Value	Median value of owner-occupied housing units	American Community Survey, 5 year estimates, 2015
Structure Use Residential	Number of residential structures	Motor City Mapping, 2014
Percent Parcels Residential	Number of residential parcels	Motor City Mapping, 2014
Component Analysis Variables		
Commercial Addresses	Number of commercial addresses	Valassis, Q4 2016
Commercial Vacancies	Number of commercial addresses identified as vacant	Valassis, Q4 2016
Residential Addresses	Number of residential addresses	Valassis, Q4 2016
Residential Vacancies	Number of residential addresses identified as vacant	Valassis, Q4 2016
Construction Permits	Number of building permits pulled for improvements on building	City of Detroit, 2016
Demolition Permits	Number of building permits pulled for demolitions	City of Detroit, 2016
Structure Fires	Number of structure fires reported	Detroit Fire Department, 2016
Fire calls where a detection mechanism is present	Number of fires reported resulting from an alarm system or detector	Detroit Fire Department, 2016
Tax Foreclosures	Number of tax foreclosures	Wayne County Treasurer, 2016
Total number of amenities within 1/2 mile of block	Number of parks, hospitals, colleges, community activity centers, fire stations, libraries, police stations, or recreation facilities within a half-mile radius of block	Data Driven Detroit
Blight Violations	Number of blight violations written by the Detroit Police Department, Department of Building Safety, Engineering, and Environmental, and Public Works	Department of Building Safety, Engineering, and Environmental, 2014-2017
Inactive DTE Agreement	Number of addresses with inactive DTE agreements	DTE Energy, 2016
Water Shutoffs	Number of addresses with water shutoffs	Detroit Water and Sewage Department, 2015
Number of Rental Properties	Number of rental properties identified by D3 through an in-depth analysis	Data Driven Detroit, 2017
Total number of sales	Number of buildings sold, including commercial property	Wayne County Assessor's, 2016
Speculator-owned properties	Number of speculator-owned properties	Property Praxis, 2016
Property Crime	Number of property crimes as defined by the FBI's Uniform Crime Reporting Codes	Detroit Police Department, 2016
Violent Crime	Number of violent crimes as defined by the FBI's Uniform Crime Reporting Codes	Detroit Police Department, 2016

Table 3: Descriptive Statistics

Descriptives for blocks in Detroit, 2016							
Variables	Time Period of Observation	Min	Max	Mean	Median	Sum	Standard Deviation
Exclusion Criteria							
Median Value	2015	10,600	137,200	42,808	40,600	n/a	19,408
Structure Use Residential	2014	6	237	24.8	24	234,656	12
Percent Parcels Residential	2014	0	1	0.7	0.8	n/a	0
Component Analysis Variables							
Commercial Addresses	Q1 2016	0	146	1.4	0	13,435	4
Commercial Vacancies	Q1 2016	0	40	0.4	0	4,152	1
Residential Addresses	Q1 2016	0	1,717	28.8	26	272,108	36
Residential Vacancies	Q1 2016	0	123	7.3	5	68,476	7
Construction Permits	2016	0	23	0.3	0	3,696	0.8
Demolition Permits	2016	0	15	0.3	0	3,139	
Structure Fires	2016	0	11	0.3	0	2,952	0.7
Fire calls where a detection mechanism is present	2016	0	30	0.3	0	2,696	0.9
Tax Foreclosures	2016	0	21	0.9	0	8,206	1.3
Total number of amenities within 1/2 mile of block	Various	0	6	1.4	1	13,676	0.8
Blight Violations	2014-2017	0	231	19.1	15	180,368	16.0
Inactive DTE Agreement	2016	0	71	8.8	7	82,787	7.6
Water Shutoffs	2015	0	57	7.5	7	71,173	5.2
Number of Rental Properties	2017	0	81	12.1	11	114,042	8.2
Total number of sales	2016	0	46	2.9	2	27,435	2.8
Speculator-owned properties	2016	0	56	4.5	4	42,755	3.6
Property Crime	2016	0	83	1.1	0	10,652	2.8
Violent Crime	2016	0	15	0.6	0	6,066	1.1

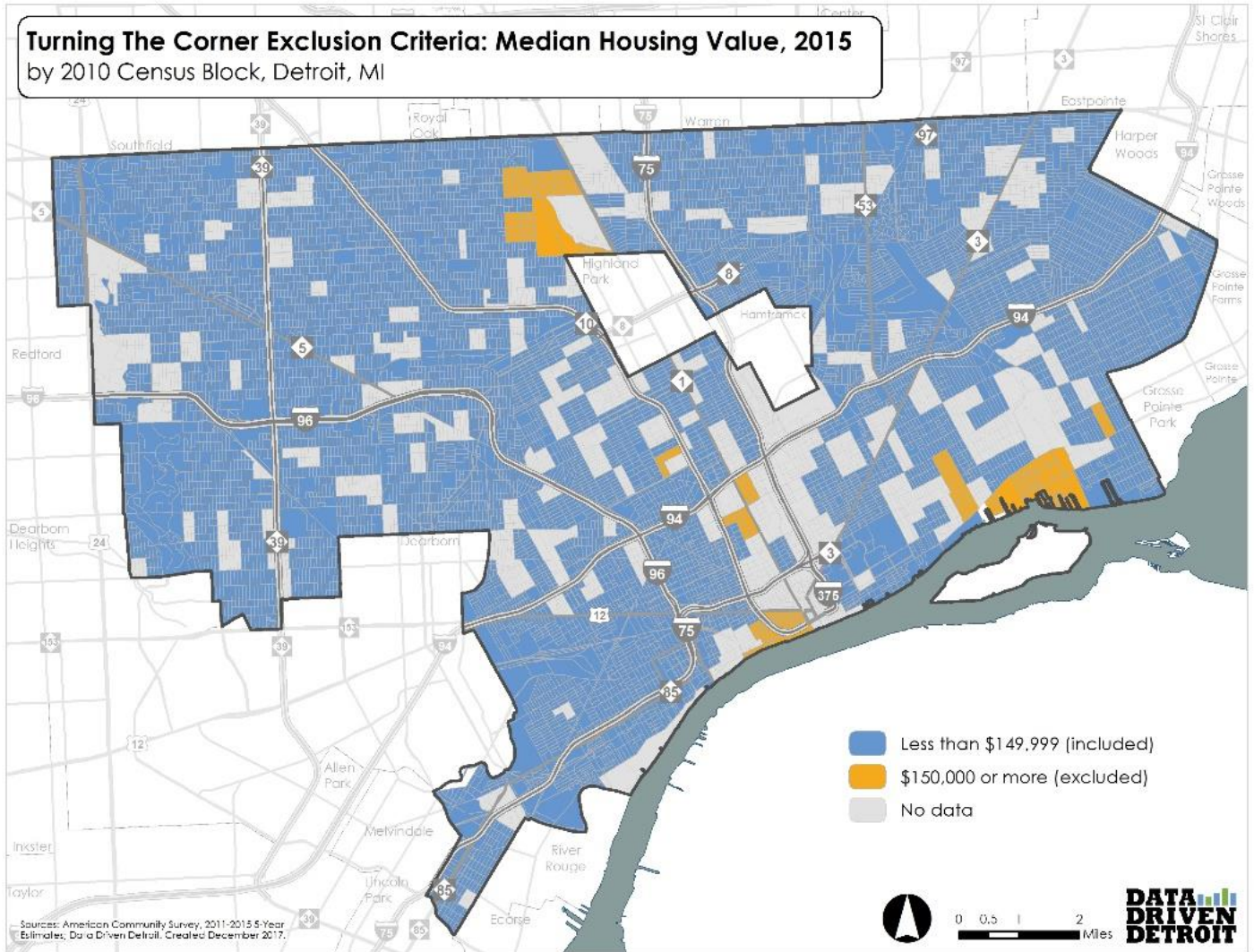
Many variables were considered for the project. Some were excluded due to the nature of this project’s requirement that they must be updated in closer to real time. Others were theorized, but lack accessible data within the timeframe of this project. This list is not exhaustive, but mentions most of the variables suggested through the Community Advisory Group, internal brainstorming, and qualitative interviews and focus groups.

- Asbestos Notifications
- Building Permits
 - Total Permits
 - Commercial Permits
 - Residential Permits
 - Residential Construction Permits
 - Residential Demolition Permits
 - Commercial Construction Permits
 - Commercial Demolition Permits
 - Multi-Family Permits
- Valassis
 - Total Addresses
 - Total Vacancies
 - Commercial Vacancy Rate
 - Residential Vacancy Rate

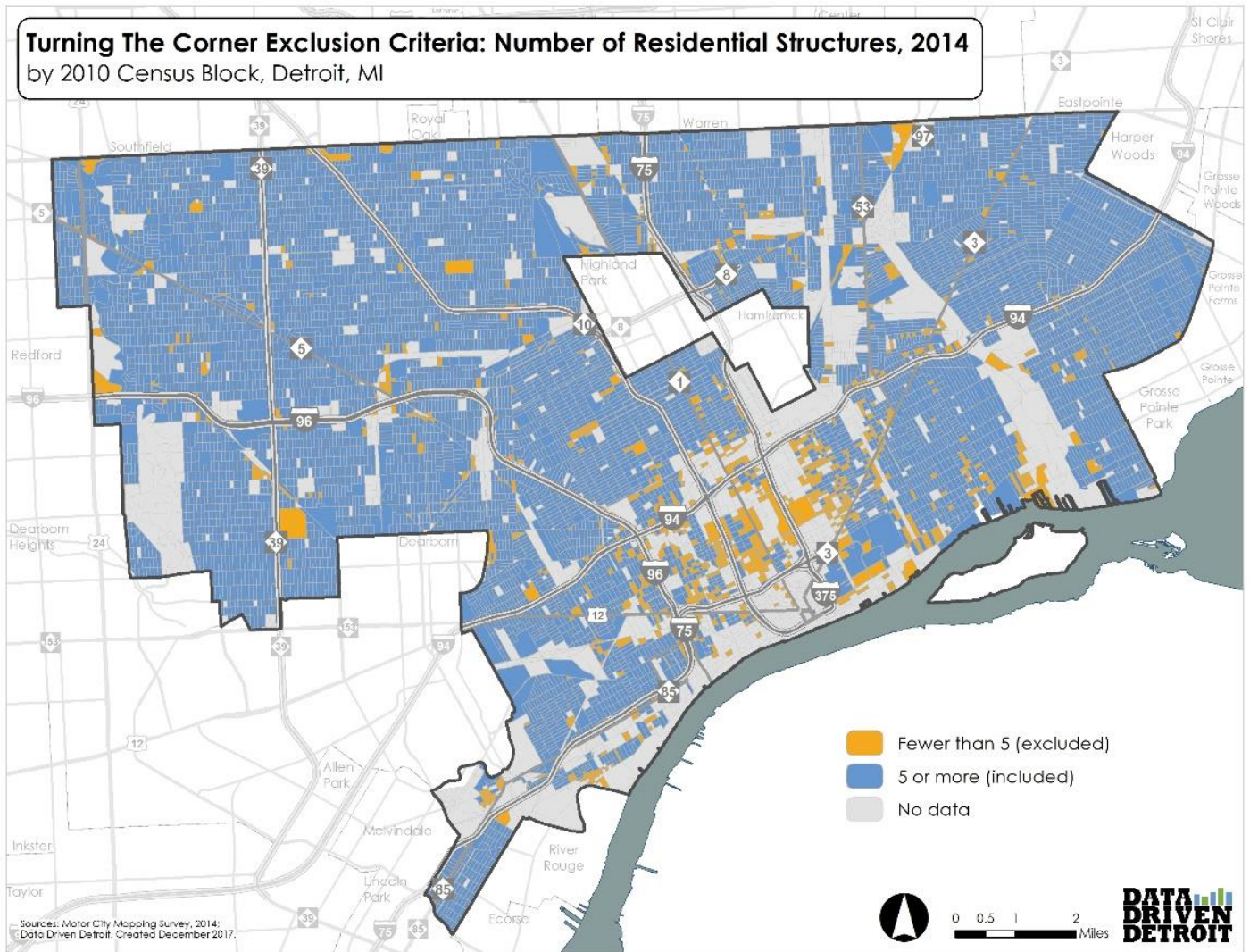
- Residential Density
- Commercial Density
- Trade Permits
 - Total Number of Permits
 - More than 5 permits
 - More than 3 permits
 - Owner not living in Detroit
- Fires
 - All Fires
 - Outdoor Fires
 - Trash Fires
 - Vehicle Fires
- Open High schools
 - Public high schools
 - Any high school
 - Half mile of public school
 - Half mile of any high school
- Liquor Licenses
 - Number of on premise licenses
 - Number of off premise licenses
 - Number of other types of licenses
- Mortgage foreclosures
- Commercial Building inspections
- United Way 411 data
- 911 Calls for Service
- Wayne County Register of Deeds
- Community Development Block Grants
- Additional public subsidy expenditure data
- Program sales from land bank
- Airbnb (number and price)
- Craigslist rental data
- Uber/Lyft
- Twitter and other social media check ins
- Social media emotional analysis
- Targeted funding programs from foundations and governments
- Combined public/private ownership data
- Mortgage data
- Public and Charter schools
- Transportation availability

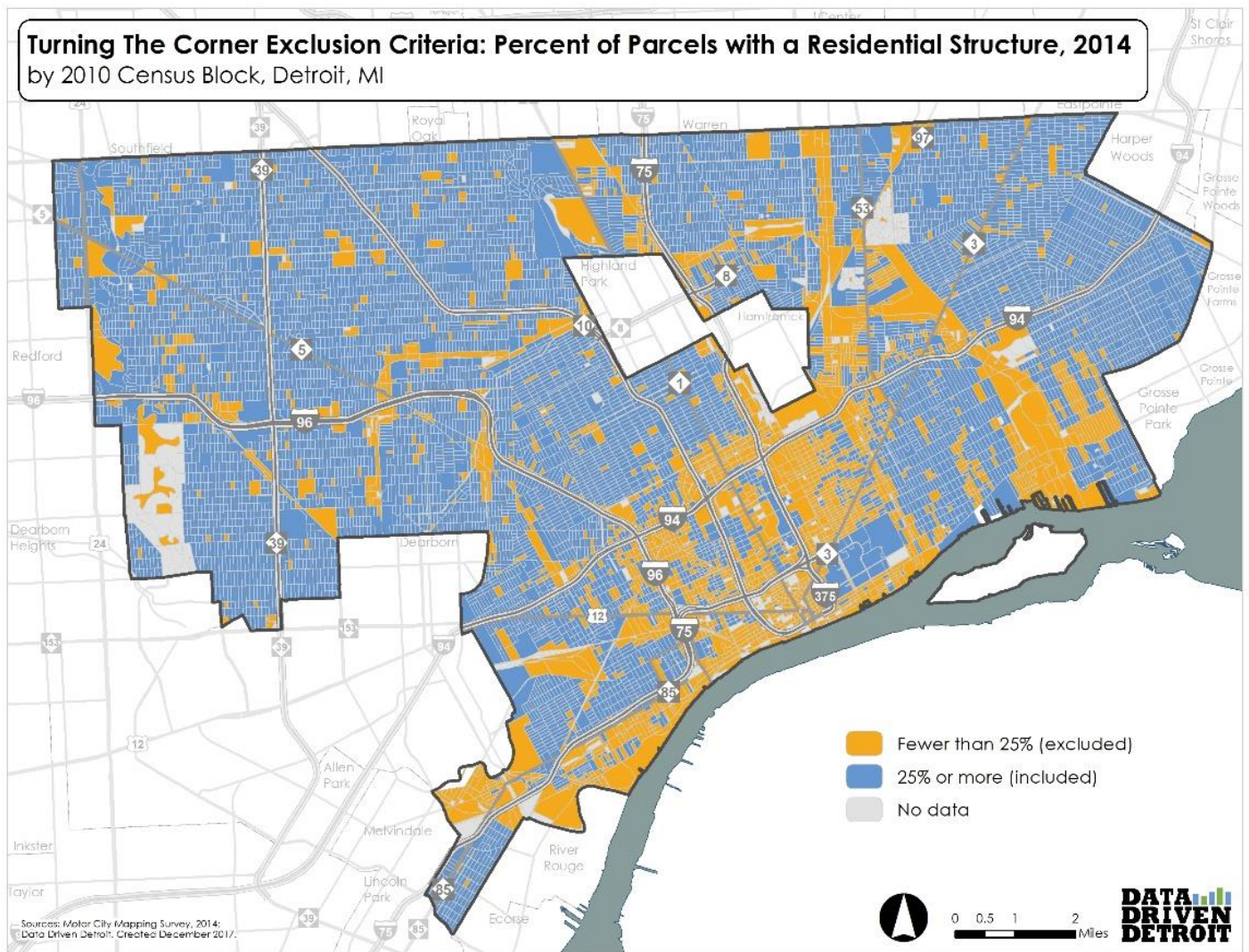
- Proximity to pawn shops
- Proximity to grocery stores or stores with WIC
- Jobs (If find a more regularly-updated source than LEHD)
- Property Taxes
- Philanthropic Targeting
- Open/Closed Post Offices
- Utility Data
- Credit Scores
- Retail Information
- Commercial activity (like credit card data)
- Gun permits
- Home delivery services (like Flash Delivery)
- Investment activity
- Community organizations
- Arts and cultural activities
- Workforce gentrification
- Access to opportunity for kids
- Houses sold at auction
- Quality of Schools
- Tickets written by police department

Appendix C: Exclusion Criteria Maps



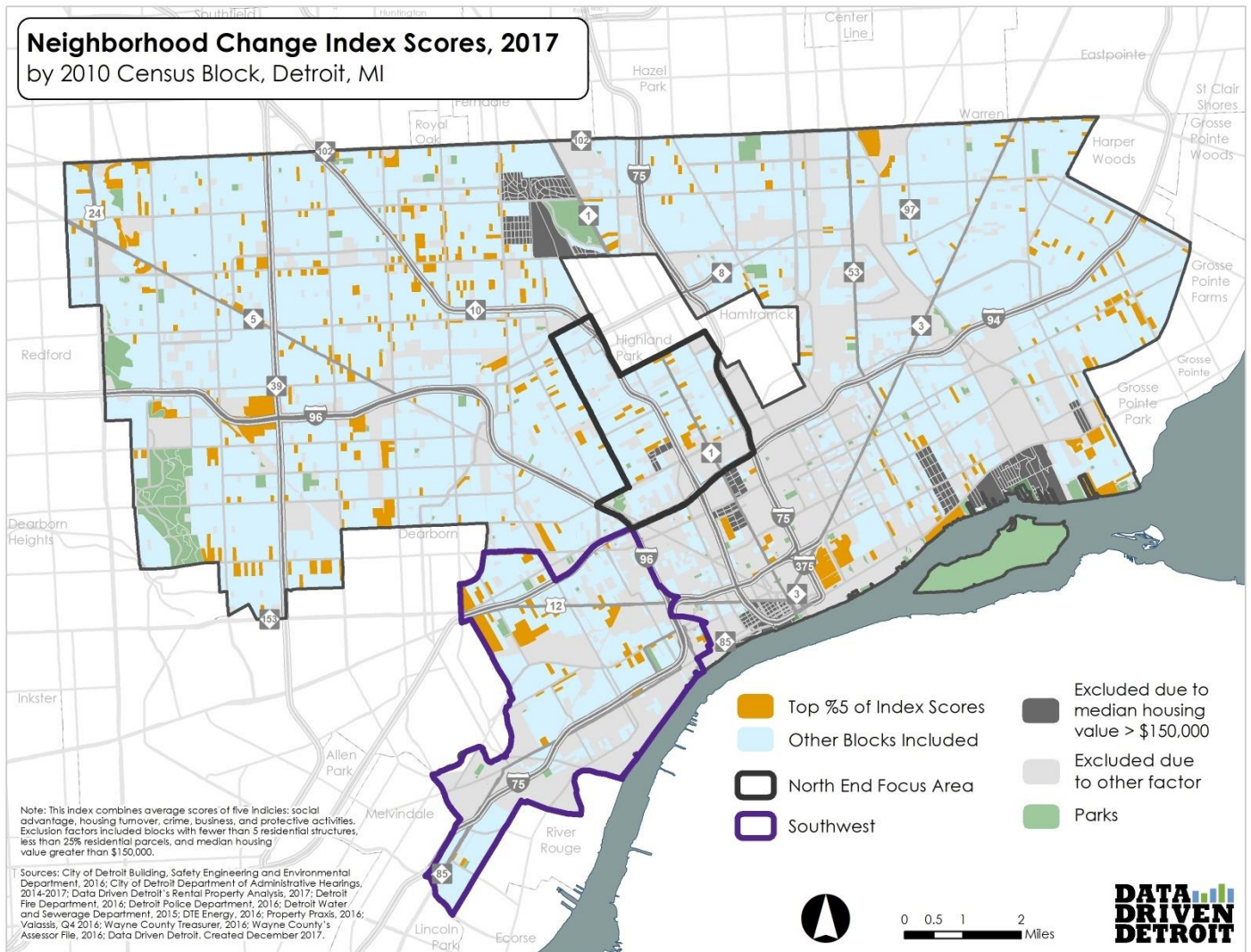
Turning The Corner Exclusion Criteria: Number of Residential Structures, 2014
by 2010 Census Block, Detroit, MI





Appendix D: Blocks in the Top 5% of the Neighborhood Change Index

The map of city blocks in the Top 5% of the Neighborhood Change Index provides additional insight into the usability of the Neighborhood Change Index. Many of the blocks are spread out, but a few clusters of blocks in the Top 5% draw interest. Isolating only the Top 5% highlights the importance of context in using these maps. Some of the blocks that fall in the Top 5%, especially those blocks in Southwest, North End, and West Village, are surrounded by other blocks in the Top 20%, further painting a picture of vulnerability to transformational neighborhood change.



Looking at the map of the blocks in the top 5% of the Neighborhood Change Index score, a few clusters of high-scoring blocks stand out. The Neighborhood Change Index highlights neighborhoods like West Village and the East Riverfront, and both of these neighborhoods have blocks that fall in the top 5%. While the Jefferson Chalmers and Southwest Detroit areas had a wide variety of high and low scores on the Neighborhood Change Index, this map shows that the high scores are concentrated in both of these communities (near Jefferson and the Vernor/Clark St intersection, respectively), providing a better understanding of which areas may have the highest vulnerabilities to transformational change in those communities.