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Racist housing practices as a precursor to uneven neighborhood change in a post-industrial city

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ABSTRACT

Racial dynamics and discrimination have been extremely important in influencing decline in the American Rust Belt. The mid-twentieth century departure of white and middle-class populations from cities was precipitated by a breakdown of discriminatory housing practices. This study examines the relationship among housing condition, vacancies, poverty, and demographics in Flint, Michigan, from 1950 to 2010. Historical census data from the National Historical GIS and housing condition data from the City of Flint government are aggregated to neighborhoods defined by economic condition factor (n = 102). Results of rank-difference correlation and geographically weighted regression indicate that, across neighborhoods with the greatest decline in housing condition, the strongest correlate was most often the increase in vacancy rates driven initially by racially motivated suburbanization – suggesting that demographic change alone is not primarily responsible for neighborhood decline. This research is important to understanding the long-term and ongoing consequences of mid-twentieth century racist housing practices, particularly as it relates to the implications of maintaining legacy infrastructure.

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KEYWORDS

Discrimination; property condition; residential mobility

Background

Urban dwellers of, and migrants to, the nineteenth and twentieth century American Industrial Belt experienced rapid changes to their built and social environments. The urban job market precipitated by industrialization propelled the growth of cities well into the early twentieth century. But while cities brought opportunities for building wealth, they also brought contrasting racial and ethnic groups into direct contact, which proved to be a source of consternation for the largely Anglo-American power structure in these cities. Urban migration of minority populations was perceived as 'a necessary evil that brought much-needed labor, but also the threat of insurrection, insolence, disease, and abject poverty' (Schein, 2012, p. 951). This aversion to ethnic integration stemmed from a long history of racism against many immigrants and black Americans. The result was a set of racist housing practices and policies that aimed to perpetuate racial segregation. In the study of housing decline, we see a dearth of work that attempts to find the implications of social policy and racism on housing decline. Thus, the central objective of this study is to demonstrate how the legacy of racist housing practices has influenced the uneven spread of poor housing conditions through geospatial analyses of historical data.

Given the primacy of housing to opportunities for wealth creation, social interaction, and family stability, strong incentive existed for some families to 'search for neighborhoods with the overall goal of minimizing economic risk and social conflict' (Can, 1998, p. 66). In cases where such feelings existed, this meant a strict separation of housing along racial/ ethnic lines. Municipalities often used explicitly racist exclusionary practices in home own-ership and mortgage lending, including through 'redlining' (Sugrue, 2005). Such practices, though supported by federal housing policy and carried out by real estate and mortgage lending companies, were encouraged at the local level to address the social stresses of rapid urbanization and the increasing demand from white Anglo-Americans (who constituted the largest and most dominant homeowner demographic at the time) for social homogeneity.

From the inter-war period into the 1960s, the private sector and public policy both aimed to restrict housing options for minorities (Rose-Ackerman, 1977). For black Americans especially, this meant a major restriction on where they could procure financing for home mortgages (Rose-Ackerman, 1977). Where filtering (or significant white flight) took place, the practice of blockbusting sometimes lowered housing prices for minorities. While residential filtering could benefit minorities by increasing the range of housing options, this housing transition typically occurred in neighborhoods with higher maintenance costs related to aging housing stock, including asbestos and lead remediation, electrical system upgrades, roof and siding repair, mold, and structural problems. Thus, incoming residents (who may have purchased their home for less than market rate) were less able to keep up with costly repairs and simultaneously faced declines in public services (Rose-Ackerman, 1975). Conversely, homes in these neighborhoods were sometimes sold above market rates to exploit minority residents seeking to leave overcrowded inner-city neighborhoods (Sugrue, 2005).

The practice of blockbusting along racial/ethnic lines created further problems: 'once the pattern of price inflation (or deflation) starts in a neighborhood, it can very quickly become a contagious and self-perpetuating process and take over the entire neighborhood' (Can, 1998, p. 67). The persistent pattern of artificially depreciating the value of housing was thus well entrenched in the post-war industrial cities of North America; in other words, urban decline began well before the more visible social unrest of the 1960s (Sugrue, 2005). Such practices are indicative of the notion that public policies often bring about or exacerbate the so-called 'natural' decline of urban neighborhoods (Roberts, 1991). Already in the 1970s, Coleman noted that 'the city declines simply because we actively pursue ends that bring about its decline' (1977, p. 24) – this recognition is fundamental to the premise of this paper.

Simultaneously, the suburbanization of cities accelerated, ushering out middle-class residents while inner-city neighborhoods continued patterns of racial segregation and deliberate disinvestment through redlining practices, uneven development patterns which are frequently related to internal conflict between race or social classes (Squires & Kubrin, 2005). Indeed, the vacant geographies so commonly illustrated in Detroit have been argued by Hoalst-Pullen *et al.* as 'part of a larger process of uneven development and neighbourhood change for which the primary catalysts include socio-economic and racial segregation as well as deindustrialization' (2011, p. 418).

Historically, white Americans believed suburbanization to be market-driven, frequently ignoring government subsidies that supported suburban mortgages and road construction (Avila & Rose, 2009). Perversely, the support for suburban developments implicitly diminished central city investment (Bradford & Rubinowitz, 1975), and redevelopment in core areas often meant slum clearance or urban renewal policies to fix 'blighted' areas (Ryan, 2008), in part because of a belief that decline was natural and inevitable (critiqued by Aalbers, 2014; Wallace & Wallace, 1998). Yet Roberts' assertion that 'in a world of natural, inevitable causal processes, policy would be ineffectual' (1991, p. 437) suggests that the neighborhood life cycle must not necessarily be inevitable, while the continued usage of the term creates a pre-determined outcome for areas at later 'stages' of the cycle.

While middle-class white Americans were initially able to buffer themselves from racial integration through these segregatory housing and lending practices, the pent-up demand for housing experienced during the period of racial segregation was released with the civil rights movement and the eventual passage of fair housing laws in the 1960s. This rapid shift in housing availability spurred a massive relocation of people, as white flight occurred in neighborhoods where minority home ownership was present or emerging (Highsmith, 2009a), and black families unencumbered by the racist policies that had limited their geographic range now found better housing.

Disinvestment from core areas and the emphasis on suburbanization in mid-twentieth century America drove the development of a built environment premised more on individual wealth creation than collective social causes or the creation of strong public spaces such as public parks, community centers, or shopping districts. Because housing was seen as an investment, homeowners were quick to sell housing which was perceived to soon be declining in value, despite evidence to the contrary showing that racial mixing did not cause lower property values (Duncan et al., 1975). The result was often the rapid flight of the middle class and the emergence of impoverished urban areas increasingly unable to provide regional services and cultural amenities, and later even basic civic services like public safety and transportation (Avila & Rose, 2009; Strait, 2001; Wiewel & Schaffer, 2001). While these areas have become more racially integrated, they have borne the weight of a long history of discrimination. Thus, cities have remained segregated along class lines, with most wealth remaining in suburban fringe areas or elite historic neighborhoods socio-spatially segregated from the rest of the urban core. As Schein indicates: 'That legacy does not necessarily determine contemporary activity, but its presence is nonetheless inescapable as the material condition we confront and negotiate on a daily basis' (p. 943). Neighborhoods which experienced deliberate disinvestment are therefore more likely to experience contemporary blight and abandonment (Aalbers, 2006).

The notion of a natural neighborhood life cycle has been normalized in the public consciousness over many years (Hollander & Németh, 2011). Aalbers (2014) recently discussed the parade of scholars who conceptualize neighborhood change and decline as a natural consequence of aging housing, including Hoover & Vernon (1959), Downs (1973), and Grigsby *et al.* (1987). While racially motivated exclusionary housing policies have influenced this decline (Highsmith, 2011), many studies frame decline from a strictly economic perspective (as in Glaeser & Gyourko, 2005), and thus may miss the influence of demographic changes or white flight on neighborhood change. Yet it is well known that white flight and deliberate disinvestment are precursors to abandonment (Duncan *et al.*, 1975). Because of the enormous social and economic impacts of this disinvestment, a need exists to understand the process of decline and advocate for redevelopment in urban areas to counter the negative effects of American federalism and home-rule (Buzbee, 2003).

A conceptual inspiration for this research comes from Ryan (2008) and Siksna (1997), who note that the rapid changes to urban morphology in North American cities have been relatively understudied when compared to long processes of change seen in older European cities. While European cities have remained relatively stable in their urban form, American Rust (née Industrial) Belt cities have changed on a massive scale – and the racist housing practices perpetrated throughout the twentieth century undoubtedly played a role in this transformation. Thus, the historical processes which created the current conditions of uneven abandonment should be understood to create best practices in future urban planning and development policy. Furthermore, while many scholars have discussed the implications of racist housing practices as they relate to neighborhood decline (Frey, 1979; Smith, 2007), geospatial studies on this topic which visualize and quantify their effects remain scant. This study presents a GIS-based approach which demonstrates how the legacy of racist housing practices has influenced the uneven spread of poor housing conditions.

Study context

The study area for this research is Flint, Michigan, the birthplace of General Motors. Explosive growth in the automobile industry in the 1910s and 1920s (and continuing well into the 1960s) brought many people seeking work to the region, including a net in-migration of 26 713 during the 1950s alone – 39 per cent of whom were from the American South (Cross, 1968). The growth created by the automobile industry, however, brought growing pains: explicit residential segregation contributed to an observed 1960 segregation index of 94.4 (at the time the highest in the nation; 100 is considered compete segregation; Taeuber & Taeuber, 1969) as exclusionary housing practices took hold (Lewis, 1965).

During this period, many poorer immigrant families – and most black American families in Flint – were steered into the densely populated, poorly built homes closest to the factories (and therefore most affected by air, noise, and water pollution; Highsmith, 2009a). As the black population grew, the 'acceptable' boundaries for their neighborhoods inched northward alongside existing industrial land, increasingly replacing upwardly mobile white families who could more easily obtain mortgages elsewhere. By the 1940s, explicitly racist housing policies gave way to 'less explicit tactics that included mortgage redlining, blockbusting, and racial steering' (Highsmith, 2009b, pp. 322–323). The 'color line' in Flint thus eventually marked the boundary between segregated white neighborhoods and segregated black neighborhoods.

Similar to most growing industrial cities in North America, Flint was surrounded by a ring of separate suburbs built in the early twentieth century. In the 1950s, attempts were made to consolidate the Flint region into one metropolitan government. Resulting resistance from tax-wary or anti-big government suburban residents and continued white suburbanization contributed to a capital migration of 'thousands of jobs and millions of dollars in tax revenues from the city to neighboring suburbs' (Highsmith, 2013, p. 12). Thus, the seeds of economic decline in the city were sown, as Flint became 'surrounded by a wall of hostile

suburbs' (Highsmith, 2013, p. 12) who were legally enabled by state law to incorporate into separate municipalities.

Making matters worse for the remaining city population, the neighborhoods occupied by minority residents became a contested space, with city leaders eyeing whole neighborhoods for clearance under the guise of economic development or infrastructure programs (Fine, 1997). This racially motivated practice is clearly illustrated by Henthorn (2005): 'In 1962 urban-renewal projects began sweeping through Flint's older neighborhoods... The residents who were displaced by these renewal programs were predominantly African American. Neighborhoods to the south and east were inaccessible to African Americans in 1962. Housing covenants, city ordinances, and higher home prices forced them to move ...' (p. 14). As a result of these housing pressures and the commitment of realtors to uphold the 'color line' while increasing the stock of available housing, blockbusting practices in allwhite neighborhoods began first in the southeast of the city (Highsmith, 2009b) and later in the northwest (Henthorn, 2005) to carve out new all-black neighborhoods.

As Flint continued to grow, and the civil rights movement simultaneously gained momentum, local leaders increasingly pushed for housing equality. The passage of the fair housing ordinance in Flint on 20 February 1968, formally codified the right to open housing regardless of the color of one's skin (Fine, 1997) – though this ordinance did not apply to suburban municipalities. Simultaneously, public housing began to be used as a means of social support for low-income, often minority, residents (Henthorn, 2005). But 'decisions regarding the locations of the units provoked a torrent of discontent among homeowners and politicians, many of whom blamed Section 235 [public housing] for creating ghettoes' (Highsmith, 2012, p. 574). Ultimately, the construction of these public housing units and the newly emerging mobility of black Flint residents 'fueled widespread blockbusting and white panic selling across wide swaths of Flint' (Highsmith, 2012, p. 593). These social factors had the effect of increasing white flight, generating a population decline within the city 10 years before General Motors began layoffs at local plants, thus serving as evidence of disinvestment divorced from economic decline.

Yet social unrest was not the only determinant of the declining housing market in Flint. Flint peaked at nearly 200 000 residents in the 1960s and was expected to nearly double in size within 50 years (Segoe & Associates, 1960). Instead, manufacturing employment in Flint declined 77 per cent in the 30 years following 1980, translating into a 41 per cent overall decline in jobs (Jacobs, 2009). As a result, the city population shrank to 102 434 by 2010 (US Census Bureau, 2010), even as the population in the suburban municipalities surrounding Flint continued to grow. A casual examination of Flint's built environment in light of its racist past supports the assertion that 'a prejudiced city is less dense at the core, more dense in the suburbs, and covers a larger area than its unbigoted counterpart' (Rose-Ackerman, 1975, p. 86). Flint has now seen nearly 50 years of persistent decline and urban sprawl driven by deindustrialization and racism. In its struggles to stem the outflow of population and the onset of abandonment, Flint exemplifies Mayer and Greenburg's declining Medium-Sized American City (2001): infrastructure is in poor condition, legacy costs of high wages plague both the city government and employers, and the community long dependent on a single employer (in this case, General Motors) has not recovered economically.

Population decline and racially motivated disinvestment are manifest in the current quality of the housing stock. As with typical declining cities, Flint has seen a rate of abandonment faster than the rate of decay, resulting in an abundance of vacant buildings (Glaeser *et al.*, 2005) and a decline in housing condition overall. While forced demolitions of occupied neighborhoods were highly unpopular during the mid-century 'slum clearance' era (Power, 2008), present-day demolitions in Flint focus on removal of abandoned housing units. This change in renewal strategy is reflected in redevelopments in Flint during the 1970s (Avila & Rose, 2009) vs. the present day, as the city is now working through \$20 million in blight elimination funds to demolish 1700 homes (Adams, 2013). Flint is only now beginning to catch up with the needed demolition of vacant, derelict homes, and the landscape is changing considerably as these homes are demolished.

This landscape of uneven blight and abandonment was not inevitable, however, if housing decisions were only motivated by economic principles and not influenced by social or cultural differences, as discussed both by Roberts (1991) and Aalbers (2014). As Can (1998) has shown: 'to the extent that income correlates with race and ethnicity, spatial segmentation results in residential segregation' (p. 68). Given that income and race are strongly correlated in Flint, this creates confusion in the public's perception of race with income-based issues (e.g. crime, poverty, built environment disrepair). The misperception that a minority group is responsible for social issues – even while failing to account for the racist practices perpetuated against said minority group – has likely exacerbated abandonment, as suburbanites have for many years claimed absolution from the social causes of decline. The belief in the inevitability of the neighborhood life cycle enables such feelings, for as Roberts notes: 'the removal of power from the human also removes notions of responsibility or blame. No person or group can be held accountable for the condition of the cities, neighborhoods, or their inhabitants' (1991, pp. 437–438). Such sentiment likewise supports policies of 'benign neglect,' which become self-fulfilling prophecies of urban decline (Roberts, 1991).

Indeed, the rapid decline of neighborhoods which have experienced racial change illustrates the results of abandonment far exceeding that which would be expected by economic change alone. Thus, the built environment of the Flint region is marked by the legacy of racist housing practice: even in neighborhoods where explicitly racist practices did not take place, the cascading effects of initial redlining, blockbusting, and other racist housing practices have influenced uneven decline. The striking shift in population out of Flint has contributed to a local discourse around abandonment as a result of the incursion of the weak and powerless, rather than as one created by the departing population. But those who remain cannot stop abandonment alone, and subsequently suffer a deprivation amplification effect (Macintyre, 2007) of increased crime and blight through the decline of servicing and economic development (Hollander & Németh, 2011; Sadler & Pruett, 2015). This study will highlight neighborhoods most affected by rapid demographic/racial change and population decline, and thus those parts of Flint most likely to exhibit severe declines in housing condition due to this change.

The central objective of this study contributes to the need to understand the long-term effects of rapid demographic change and is thus: to demonstrate how the legacy of racist housing practices has influenced the uneven spread of poor housing conditions through geo-spatial analyses of historical data. The authors hypothesize that decline will be more strongly correlated to racially motivated abandonment than to neighborhood racial or economic transition, further supporting the evidence base that racism, not race, exacerbated housing decline. A spatial model is created which evaluates determinants of and illustrates differences in present housing condition. The study contributes to the growing body of literature which seeks to provide geospatial models of declining urban form which reflect

on the assumed root causes of decline. This will address Accordino and Johnson's (2000) concern, re-iterated later by Cohen (2001), that: 'there is a dearth of literature by researchers and policy makers on the problem of housing abandonment because it is viewed mainly as a symptom of urban decline rather than as a cause' (p. 416). As it pertains to this study, special attention is given to the influence of (primarily white) housing abandonment at the temporal intersection between de facto segregation and advances made by the civil rights movement toward fair housing legislation. Furthermore, this study advances the theoretical and conceptual research by scholars who have argued that the neighborhood life-cycle – and, therefore, neighborhood-level abandonment – is neither natural nor inevitable (Aalbers, 2014; Hollander & Németh, 2011; Metzger, 2000; Roberts, 1991).

Data and methods

The data for this research came from two sources: the City of Flint Planning Department (City of Flint, 2013) and the National Historical Geographic Information System (Minnesota Population Center, 2011). Data from the City of Flint contained 2012 housing condition and the neighborhood economic condition factor (ECF) for each parcel. The dependent variable of housing condition was assessed through a community-based assessment procedure whereby community groups were trained in assessing exterior condition along a 4-point scale of good (1), fair (2), poor (3), or structurally deficient (4). Key assessment elements included integrity of the roof and siding, intact windows and doors, and inspection of the foundation.

Data from the NHGIS included census tract (CT) or census block group (CBG) boundaries for 1950–2010 (inclusive) and attribute data used as independent variables including: population of white, black, and other residents; poverty rate; and vacancy rate. From this data, additional independent variables were generated for the change in (Δ) attributes from one census period to another (e.g. Δ white population, Δ poverty rate); the inclusion of socioeconomic variables was inspired by Hillier (2003). Census tract-level housing condition as defined in the US Decennial Census (available only for 1960) was also obtained as a benchmark (Minnesota Population Center, 2011). The original data was aligned along a seven-point scale; these were collapsed to match the four-point scale above for relative comparison with contemporary data where 'sound' ~ good, 'deteriorating' ~ fair, 'deteriorating, lacking facilities' ~ poor, and 'dilapidated' ~ structurally deficient. In creating this variable, visual inspection of the mapped result showed that the neighborhoods with the worst scores were areas confirmed in past research as suffering from redlining and other forms of (often racist) disinvestment practices (Highsmith, 2009b). Thus, comparison could be made between contemporary and historical housing condition data. In both cases, poorer housing condition is used as a proxy of neighborhood-level disinvestment because of its ties to the closure of community businesses, schools, and other amenities, and eventual property abandonment.

Neighborhood-level ECFs are an appraisal term assigned to parcels similar in age, quality of construction, and average sale value, and thus represent what Moudon referred to as *tessuti*, or neighborhood units (1997). Because of the issues with the modifiable areal unit problem created by changes in census boundaries over time, ECFs were used as the aggregation unit by dissolving the parcels according to their ECF values in a GIS. Since ECFs suggest morphologically similar neighborhood units and thus serve as a proxy for neighborhoods, this method provides for stability in assumptions about housing and neighborhood quality while maintaining the same geographic area through time. This is also of particular value in Flint, where official neighborhood designations are not routinely or consistently applied city-wide.

For aggregating disparate geographic data, ECFs are also more useful as a unit of analysis for housing research because they represent only the land taken up by residential uses. The first step in aggregating the data required all census units to be intersected and clipped to the shape of the ECFs. Then, census units were split such that (for instance) if *x* per cent of a unit fell within a particular ECF, that ECF would receive *x* per cent of the values (e.g. population by race, *#* living in poverty) from that unit. While this practice has limitations with regard to the ecological fallacy, using ECFs ultimately provides a more robust option for aggregation than attempting to correct for CT or CBG changes from one census to another through some other method. Ultimately, 102 ECF neighborhoods were produced as the unit of all analyses. Parcel-level data (including the 2012 housing condition variable) were joined to the ECF, and an average value was obtained for each (ranging between 1 and 4).

Two sub-objectives help resolve the primary objective of this study. First, social and built environment variables were modeled at 10-year intervals from 1950 to 2010 to understand the evolution of Flint neighborhoods. This provided the opportunity to run a series of spatial rank-difference analyses (inspired by Glick, 1982) to observe neighborhoods where housing condition had declined more rapidly in some neighborhoods than in others.

Second, exploratory spatial data analysis (ESDA) was used to examine spatial and temporal trends in the historical census data (re-attributed to ECFs). When employing ESDA, the primary activity is visual inspection of available descriptive spatial data, thus strengthening one's understanding of potential spatial relationships and informing the use of spatial-analytical tools. Following from this, a combination of exploratory regression analysis and ordinary least squares regression (OLS) was run to predict determinants of changes in the built environment. The results of OLS analyses helped determine the feasibility of using geographically weighted regression (GWR) for further understanding the evolution of housing condition in Flint; that is, whether the determinants of decline in housing condition followed a spatial pattern.

Results/discussion

Mapping

In the first stage of analysis, general socioeconomic characteristics were mapped for each decade from 1950 to 2010 (1950, 1980, and 2010 are shown in Figures 1–3). These figures show that the change in the white and black populations illustrate a significant shift in population between 1950 and 1980, as many neighborhoods rapidly changed – coinciding with the conclusion of officially sanctioned redlining, the passage of a fair housing ordinance, and the institution of public housing on the edge of the City of Flint. As civil rights activism ramped up in the 1950s and 1960s, (leading to the fair housing ordinance being passed in 1968), the 'color line' which confined black residents to poor quality housing north and southeast of downtown began to slowly inch out toward the city's edge. White residents, meanwhile, moved into newer neighborhoods in the northwest of Flint. In the 1970s and 1980s, white residents left newly built neighborhoods in the north while remaining in older



Figure 1. Density of black and white residents, 1950.



Figure 2. Density of black and white residents, 1980.

established neighborhoods (Civic Park in the central/west, the Cultural Neighborhood east of downtown, and the 'East Side' northeast of downtown). From the 1950s to the 1970s, many neighborhoods experienced blockbusting to varying degrees (Henthorn, 2005;



Figure 3. Density of black and white residents, 2010.

Highsmith, 2009a, 2012), accounting for much of this flight. Simultaneously, upwardly mobile black families moved out of the previously redlined, nearly exclusively black neighborhoods inside the 'color line' into newer neighborhoods previously occupied by exclusively white residents. By the 1990s and 2000s, more established neighborhoods started to see racial integration, while Flint overall was experiencing a significant decline in population density, thus contributing to the surplus of housing.

Additional housing-related characteristics were mapped for inclusion in subsequent models and are described in text here. The change in vacancy rates across Flint follows a diffusive pattern coinciding closely with initial abandonment by the white population and the lack of a replacement population to occupy surplus housing. Early vacancy was concentrated among housing closer to the core, while later vacancy was much more dispersed, even among newer housing which structurally should not yet have been declining. Poverty follows a similar diffusion from a previously concentrated core area (north and southeast of downtown) to a spread across the city. Part of the diffusion of poverty away from centercity neighborhoods coincides with the construction of public housing in the far northeast, southeast, and northwest parts of Flint, while general economic decline also contributed to this increase in poverty throughout the city.

The postulated racially motivated abandonment of many neighborhoods and the subsequent spread of poverty and vacancy suggest that housing condition will decline, because the presence of vacant homes and deteriorating neighborhood quality are strong predictors of residential maintenance, as existing homeowners begin to neglect their own properties (Helms, 2012; Smith, 1979; Spivack, 1991). That decline has been shown to be related to vacancy highlights the presumed inevitability of the neighborhood life cycle idea (Metzger, 2000): as community-level socioeconomic status filters downward, residents become less



Figure 4. Average housing condition by ECF neighborhood, 1960 and 2012.

able to maintain their homes, and the decreasing desirability reduces maintenance and increases abandonment. Furthermore, the process of abandonment itself decreases average housing conditions as vacant homes are no longer maintained.

Figure 4 shows the average housing condition of all residences in 1960 and 2012. Notable is that in 1960, poorer housing conditions are more clustered around the core (i.e. older neighborhoods) than in 2012. The poorest quality housing in 1960 is found in neighborhoods close to downtown and on the sites where early redlining took place (north and southeast of downtown). While the poorest quality housing in 2012 encompasses these same older neighborhoods, it is also seen on the northern and western edges of Flint where newer, originally white-dominated, developments and established middle-class neighborhoods lie. Thus, while larger economic forces are at play in the spread of poverty and vacancies, housing condition is likely strongly affected by racially motivated abandonment and/or disinvestment.

This assumption seems especially strong in a band of significant changes in racial composition, vacancy rates, and housing condition emanating directly north and west from downtown (shown as sites of probable blockbusting in Figure 5). These previously all-white neighborhoods experienced a turnover of at least half of the white population within one decade (the 1950s, 1960s, or 1970s), and coincide with population pressures released by civil rights activism and the passage of the fair housing ordinance, which enabled black residents to procure mortgages beyond the 1960 'color line' outlined in Figure 5. When considering that these blockbusted neighborhoods comprise a range of newer and older neighborhoods, it suggests that the changes in the built environment in these ECFs are not merely attributable to the natural life cycle of houses. This raises specific questions such as: why has housing condition deteriorated much more rapidly in certain neighborhoods when compared to others? And how do social factors contribute to poor housing condition?



Figure 5. The 1960 'Color Line' – majority black neighborhoods and probable sites of blockbusting.

Rank-difference correlations

The first step entailed a rank-difference correlation between 1960 and 2012 housing condition by assigning a rank to each ECF. These helped geographically visualize where housing condition is better or worse than its rank according to 1960 housing condition. Each ECF's housing conditions and other variables were ranked from a standardized (z) score. Then the arithmetic difference between ECF-level housing condition rank and other variables was taken to show the magnitude of difference, such that high positive scores indicated neighborhoods 'better off' than their 1960 scores would suggest, while high negative scores indicated neighborhoods 'worse off' than their 1960 scores would suggest (e.g. if a unit ranked 10th out of 102 in time-point A but 60th in time-point B, it dropped 50 places, and the magnitude of the z-score would be suggestive of a significant difference). A map without substantial changes would have few significantly high or low values; they would fall within a standard deviation from the norm, as all neighborhoods deteriorated along a similar trajectory. In other words, this analysis suggests specific sites where deliberate disinvestment or abandonment may have occurred.

This disinvestment looks apparent in neighborhoods diverse in terms of age and location, but which have largely all been affected by significant demographic change. Figure 6 shows the difference between 1960 and 2012 housing condition. Neighborhoods in much worse shape in 2012 than would have been suggested by 1960 housing condition included Civic Park in the central/west and around Flint Park Lake in the far northwest. Some neighborhoods which deviated most are also where large-scale demographic change (e.g. potential blockbusting) occurred during the 1960s and 1970s. This further supports the notion that demographic change exacerbates housing decline in unique ways across the city. As expected, three neighborhoods removed by urban renewal – all within the 'color line' of 1960 shown in Figure 5 – show up as significant deviations. These neighborhoods were in relatively good condition in 1960 but had 'declined' significantly by 2012 (no houses remained in any of these three neighborhoods so the housing condition was effectively nil; this served as a good control of the method). By contrast, neighborhoods with newer construction (one on an urban redevelopment site north of downtown) and many neighborhoods on the southern fringes of the city ranked higher in housing condition than they did in 1960. The reason for the latter may have to do with the distance from other declining neighborhoods and thus the lack of 'contamination' from these areas.

Ordinary least squares regression

The rank-difference analysis suggested neighborhoods that were declining more or less quickly than would be anticipated based on 1960 housing condition, but it did not indicate *what* variables may have caused certain neighborhoods to experience an inordinate decline in housing condition. Thus, the next step was to see if OLS would be effective at defining a set of variables which help explain current housing condition. OLS is a statistical regression that examines the relationship between a response variable (in this case current housing condition) and one or more explanatory variables. High adjusted *R*-squared values suggest stronger influence of the explanatory variable on outcomes.

We ran several OLS models which addressed common groups of potential explanatory variables, including change in and percentage of: vacancy rates, poverty levels, black residents, and white residents from 1950 to 2010, as well as incorporating all variables for each decade from 1950 to 2010 (Table 1). As expected, vacancy rates and change in vacancy rates had the highest adjusted r-squared values, or influence on current housing condition, of any of the variable-specific models (67 and 54 per cent, respectively). Poverty rates also predicted 53 per cent of the variation in housing condition, while the models on demographic change (e.g. change in white or black population) only predicted between 20 and 34 per cent of the variation. The predominance of non-demographic determinants supports the



Figure 6. Difference between standardized scores of 1960 and 2012 housing condition.

thesis of this study that the movement of black residents into established neighborhoods was *not* the primary reason for decline in housing condition. To the contrary, the increases in vacancies, precipitated by white flight, are the strongest predictor of decline. Year-specific models incorporating all variables for a given year (i.e. vacancy, poverty, demographics) yielded a range of adjusted r-squared values, ranging from 26 per cent in 1950 to 75 per cent in 2010. Given the goal of understanding potential long-term causes of decline in housing condition, variables from 1990 to 2010 were omitted from further analysis.

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Model	AIC	R ²	Adj R^2	F-Stat	F-Prob	Wald	Wald-Prob	K (BP)	K (BP)-Prob	JB	JB-Prob	Sig ²
∆ vacancy	83.42	0.57	0.54	18.15	00.0	69.58	0.00	43.43	0.00	4.29	0.12	0.12
% vacancy	49.80	0.69	0.67	30.47	0.00	189.52	0.00	16.53	0.02	3.40	0.18	0.09
Δ poverty	135.84	0.27	0.23	6.00	0.00	54.19	0.00	11.68	0.07	23.29	0.00	0.20
% poverty	84.46	0.56	0.53	20.30	00.0	131.60	0.00	16.58	0.01	8.28	0.02	0.12
Δ black	137.32	0.26	0.22	5.69	0.00	61.26	0.00	33.78	0.00	10.29	0.01	0.21
% black	121.00	0.39	0.34	8.42	0.00	71.91	0.00	35.97	0.00	0.24	0.89	0.17
Δ white	138.82	0.27	0.21	4.92	0.00	15.15	0.03	36.61	0.00	10.87	0.00	0.21
% white	139.97	0.26	0.20	4.71	0.00	59.76	0.00	42.55	0.00	13.87	0.00	0.21
1950	132.18	0.30	0.26	6.80	0.00	318.57	0.00	21.38	0.00	11.56	0.00	0.20
1960	116.26	0.40	0.36	10.63	0.00	249.08	0.00	27.60	0.00	13.54	0.00	0.17
1970	127.37	0.33	0.29	7.90	0.00	77.93	0.00	41.98	0.00	4.94	0.08	0.19
1980	88.85	0.54	0.51	18.78	0.00	1444.99	0.00	28.92	0.00	7.63	0.02	0.13
1990	23.80	0.76	0.74	49.66	0.00	4417.72	0.00	19.96	0.00	2.51	0.29	0.07
2000	24.79	0.76	0.74	49.04	0.00	4457.08	0.00	19.05	0.00	3.24	0.20	0.07
2010	21.34	0.76	0.75	60.58	0.00	4790.18	0.00	13.44	0.02	11.30	0.00	0.07
Note: AIC: Akaike's in joint <i>F</i> -statistic prol probability (p-value	formation criteri bability (p-value 2); JB: Jarque-Be	ion; AICc: corr); Wald: Wald ra statistic; JB-	ected Akaike's statistic; Wald -Prob: Jarque-	s information c -Prob: Wald sta -Bera probabili	riterion; <i>R</i> ² : <i>R</i> -s atistic probabil ty; Sig ² : sigma	squared, coeff lity (p-value); -squared.	icient of determi K (BP): Koenker's	ination; Adj <i>H</i> s studentizec	? ² : adjusted <i>R-</i> squ I Breusch–Pagan	lared; F-Stat: statistic; K(B	joint <i>F</i> -statistic P)-Prob: Koenke	value; F-Prob: · (BP) statistic

Table 1. Ordinary least squares regression models with key variable groups.



Figure 7. Strongest predictors of housing condition from geographically weighted regression and neighborhoods with significant negative deviations in housing condition.

By incorporating this information into an exploratory regression analysis, a series of 'best-fit' models were run to return higher *R*-squared values. The residuals found in the revised models showed less spatial clustering than analysis on only one variable category showed. The extent of spatial autocorrelation was tested, which seeks to determine if spatial clustering is an explanatory variable. We found a random spatial pattern, indicating that these models were not missing any key explanatory variables. As well, results of the

Jarque-Bera goodness-of-fit test suggest that any variations were more due to random noise than an unexplained variable. These models showed that increases in vacancy resulting from extreme racial change were correlated with poorer present-day housing condition.

Geographically weighted regression

Because of the need to see *why* certain neighborhoods varied significantly from others in terms of housing condition change (as suggested by the rank-difference analysis), and because the OLS models did not address spatial variation in housing condition, GWR was run to show areas where certain variables most strongly predict housing condition. GWR is a form of regression analysis which incorporates the influence of spatial proximity to create further parameter estimates (Fotheringham *et al.*, 1998). GWR can be used to answer where poverty, vacancy, or demographic change is the strongest predictor of housing condition.

Using the best fit models from the previously run OLS regression, a model was built to examine which variables were most strongly correlated to 2012 housing condition throughout different parts of the city (shown in Figure 7). Reflecting the results of OLS analysis and the study's central thesis, demographic change itself was typically *not* the strongest predictor of housing condition change in neighborhoods that had experienced the most severe demographic change.

Notably, an increase in vacancies resulting from an imbalance in population replacement was the strongest predictor of the decline of remaining housing throughout the middle of northwest Flint, where most of the significant deviations from 1960 housing condition were found. As well, neighborhoods which remained largely white enclaves through the 1970s but which were more recently abandoned (such as Civic Park in the central/west of the city) also show vacancy change as the strongest predictor of housing condition change. Generally, the breakdown of the racially motivated 'color line' and the ensuing population shift generated enormous white flight and a rapid increase in vacancy rates. But it is the increase in vacancies, not the demographic change associated with white flight, which is primarily responsible for this decline in housing condition.

By contrast, in the older East Side northeast of downtown, sustained poverty is most closely correlated to the decline in housing condition. This may be due in part to the longer history of the East Side as a poor white enclave, and the subsequent difficulty black residents would have faced moving into this neighborhood even after the fair housing ordinance was passed. Decline thus came from the existing poorer population remaining in place rather than through the increase in vacancies associated with white flight.

1960 housing condition was most strongly correlated with current housing condition in newer, more stable subdivisions to the far northwest and southeast of the city; the magnitude of neighborhood change from Figure 6 was typically weak or slightly positive. Likewise, areas whose strongest predictor was demographic change were typically in neighborhoods with only minor changes in demographic composition and housing condition (including in the southwest and the northeast). One exception is a neighborhood in the far north center of the city, which experienced a longer but slower demographic transition than the more desirable neighborhoods to its south and west.

Importantly, significant declines in housing condition are not primarily due to the racial integration of neighborhoods, but rather we suggest due to either: (1) the flight of the previous white and/or middle-class population, and the consequent lack of an equivalently

sized replacement population, causing vacancies to increase; or (2) poverty levels naturally rising as the number of middle-class families declines, providing contemporary support to Duncan *et al*.'s (1975) earlier work. Rather, racially motivated fears have in some cases accelerated the filtering process in the housing market. In neighborhoods which experienced non-significant or positive changes in 2012 housing condition (neighborhoods not outlined in Figure 7), change in housing condition, poverty, and demographics are more strongly correlated to current housing condition.

Conclusions

This analysis suggests that the dramatic, uneven (and, most likely, racially motivated) population shift in Flint during the middle of the twentieth century - characterized by an exodus of black residents from previously redlined neighborhoods into more suitable housing and an exodus of white residents from previously all-white neighborhoods via the practice of blockbusting and panic selling into the suburbs – played an important role in the deterioration of the housing stock in the most affected neighborhoods and led to rapidly increasing vacancy rates. This is important because the neighborhoods that experienced these increasing vacancy rates earliest are currently in the worst condition (running in a line northwest from downtown). Thus, if the patterns suggested in this paper continue unabated over the next few decades, the neighborhoods that more recently experienced demographic change (such as Lincoln Park in the south center, Mott Park in the west near the river, Ballenger Park in the west, and Chatham Village in the far northwest) may see continued decline in housing condition due to the lack of a replacement population and concomitant increase in abandoned homes. By contrast, the neighborhoods unaffected by significant demographic or socioeconomic change (in the middle belt of the city) would continue to maintain housing condition in the foreseeable future in spite of economic change or the natural deterioration process because of lower rates of abandonment. Given these two outcomes, it is therefore important to rebuff historical racist patterns in housing abandonment and devise targeted policy changes which encourage urban redevelopment.

The work of Henthorn (2005) and Highsmith (2009a, 2009b, 2011, 2012, 2013) has been valuable in providing a social-historical view into the reasons behind racially motivated housing abandonment in Flint. The current study has built on this understanding – and research on racism and housing more generally – by lending a spatial lens to the effects of demographic change. As expected, issues arising from residential abandonment such as increases in vacancy rates were a stronger determinant of decline in neighborhood housing condition than demographic change in many parts of Flint, particularly in the neighborhoods with the most dramatic deviations in housing condition shown in Figure 7. Yet these issues were not played out evenly across the city: some places were likely insulated from demographic change by geographic barriers or through sustained, covert practices in housing that prevented unwanted residents from penetrating into certain neighborhoods. The broader east side of the city – consistently mainly of white, working-class neighborhoods – is one such example, as the primary predictor of housing condition through much of this neighborhood was related to poverty change.

While housing decline in the more recent past is a factor of a multitude of issues (including a stronger relationship with poverty and obsolescence), the seeds of race-based housing decline have been sown and have had enduring consequences. Places that experienced the most sudden demographic change 40 or 50 years ago are still declining, and the population levels in these neighborhoods have been decimated beyond the point of near-term rehabilitation. This is largely attributable to the fact that the departing majority white population was not replaced by an incoming group large enough to sustain these vacant houses, and that layoffs by General Motors diminished the overall size of the home-owning middle-class. As well, Flint has not experienced the pressures of high housing cost (even prior to the 2008 housing market collapse) that have led to gentrification in other Rust Belt cities such as Chicago, Cleveland, Pittsburgh, and more recently, Detroit. Additionally, a long history of wage discrimination against black Flint residents meant that new occupants of formerly white enclaves were not financially in a position to cover the costs of large, aging houses. All of this supports Henthorn's (2005) assertion that 'fear, not reality, spurred the exodus from [Flint]' (p. 3).

Limitations

In light of the novel methods employed, our study bears a few limitations. The first is rooted primarily in the use of discordant housing condition variables which employed different scoring methods, owing to their temporal separation. Both variables did, however, use exterior characteristics as a primary measure, and the 1960 variable was normalized to a four-point scale to match the 2012 variable. Further, in all cases, variables were converted to standardized (z) scores – and all variables were geographically aggregated to the ECF – so that relative comparisons could be drawn. Additionally, our analysis is limited by the housing and socioeconomic data that were available for all time periods. Certainly, larger economic forces were at play in influencing housing abandonment and increases in vacancy rates in Flint during the second half of the twentieth century. What our study shows, however, is the extent of this abandonment contextualized across a range of consistent variables in a way not done previously.

Future directions

This study reported on the creation of a historical GIS for Flint, Michigan, a post-industrial city with a history of racially motivated housing discrimination. Many reasons exist for a city-wide decline in housing, but this study examined the reasons for neighborhood-specific housing condition decline. A multi-method approach was used to better understand the spatial impacts of mid-twentieth century racist housing practice on modern-day housing condition. Most prominently, the close relationship between neighborhoods experiencing significant negative changes in housing condition and the concentration of vacancy rate change as the strongest predictor of modern housing condition (both shown in Figure 7) demonstrates that it is deliberate abandonment, not merely increases in poverty or demographic change, that created Flint's modern urban landscape. Essentially, a self-fulfilling prophecy of urban abandonment and decline brought about Flint's current situation.

Such research is now particularly salient in light of the public health crisis that has recently plagued Flint. While under the direction of a state-appointed emergency financial manager (the State of Michigan's reactive policy attempt to correct financial difficulties often caused in inner-urban areas by long-term disinvestment), the city's water was changed to a less expensive but more corrosive source that leached lead off of lead service lines, which

are more frequently found in older housing. The effect was a doubling in the percentage of children with elevated blood lead levels (Hanna-Attisha *et al.*, 2016). Particularly troubling is the fact that much of the highest concentration of elevated blood lead levels are found in areas that have experienced the largest declines in housing condition (north and west of downtown). Given the close relationship between Flint's urban decline, the ensuing crisis with lead leaching from water pipes, and the concentration of lower income groups in these areas, this study is instructive for state and local governments in understanding the implications of government-sponsored suburbanization, the abandonment of core urban areas, and the infrastructure crises that result.

The results of this study are thus broadly useful for many interest groups. Social advocacy groups may use this as evidence of the continued negative effects of housing discrimination, and to explain the long-term culpability for infrastructure crises such as the one currently facing Flint. Historians and social scientists will find the combination of methods useful for better understanding neighborhood-level influences on housing condition. City policy-makers will find the results of spatial analysis useful for understanding which neighborhoods may be near a tipping point in terms of decline. This could be used for targeting demolition or beautification efforts toward neighborhoods that may be nearing a significant decline, since such efforts have been shown to help stem declines in housing value (Conway *et al.*, 2010) and improve neighborhood perceptions of quality of life (Sadler & Pruett, 2015).

Future work should consider comparative studies of similar Great Lakes Rust Belt cities, using the same methods outlined here, to validate that this approach can be applied to other shrinking or legacy cities. Further analysis of Flint's spread of abandonment could help unpack whether other symptoms of decline (violent crime, vandalism, social disorder, business abandonment, school closures) may be attributable to the history of racism in housing. Ultimately, this and future research can help not only make clear the effects of racism on housing, but also help propose neighborhood-level targeted solutions for stabilizing housing markets.

Disclosure statement

No potential conflict of interest was reported by the authors.

References

- Aalbers, M. B. (2006) 'When the banks withdraw, slum landlords take over': The structuration of neighbourhood decline through redlining, drug dealing, speculation and immigrant exploitation, *Urban Studies*, 43(7), pp. 1061–1086.
- Aalbers, M. B. (2014) Do maps make geography? Part 1: Redlining, planned shrinkage, and the places of decline, *ACME: An International E-Journal for Critical Geographies*, 13(4), pp. 525–556.
- Accordino, J. & Johnson, G. T. (2000) Addressing the vacant and abandoned property problem, *Journal of Urban Affairs*, 22(3), pp. 301–315.
- Adams, D. (2013) Genesee county land bank gets \$20 million in demolition funds to fight flint blight, *The Flint Journal*, August 20.
- Avila, E. & Rose, M. H. (2009) Race, culture, politics, and urban renewal: An introduction, *Journal of Urban History*, 35, pp. 335–347.
- Bradford, C. P. & Rubinowitz, L. S. (1975) The urban-suburban investment-disinvestment process: consequences for older neighborhoods, *Annals of the American Academy*, 422, pp. 77–86.

- Buzbee, W. W. (2003) Urban form, health, and the law's limits, *American Journal of Public Health*, 93(9), pp. 1395–1399.
- Can, A. (1998) GIS and spatial analysis of housing and mortgage markets, *Journal of Housing Research*, 9(1), pp. 61–86.
- City of Flint (2013) City of flint master plan (Flint, MI: Print).
- Cohen, J. R. (2001) Abandoned housing: Exploring lessons from baltimore, *Housing Policy Debate*, 12(3), pp. 415–448.
- Coleman, J. S. (1977) Can we revitalize our cities?, Challenge, 20(5), pp. 23-34.
- Conway, D., Li, C. Q., Wolch, J., Kahle, C. & Jerrett, M. (2010) A spatial autocorrelation approach for examining the effects of urban greenspace on residential property values, *The Journal of Real Estate Finance and Economics*, 41(2), pp. 150–169.
- Cross, R. D. (1968) Origin of the population increase and changes in population distribution in the flint, Michigan, SMSA, 1950–1960, *Proceedings of the Oklahoma Academy of Science*, 49, pp. 142–149.
- Downs, A. (1973) *Opening Up the Suburbs: An Urban Strategy for America* (New Haven, CT: Yale University Press).
- Duncan, M., Hood, E. T. & Neet, J. L. (1975) Redlining practices, racial resegregation, and urban decay: Neighborhood housing services as a viable alternative, *The Urban Lawyer*, 7(3), pp. 510–539.
- Fine, S. (1997) Michigan and housing discrimination, 1949–1968, *Michigan Historical Review*, 23(2), pp. 81–114.
- Fotheringham, A. S., Charlton, M. E. & Brunsdon, C. (1998) Geographically weighted regression: A natural evolution of the expansion method for spatial data analysis, *Environment and Planning A*, 30(11), pp. 1905–1927.
- Frey, W. H. (1979) Central city white flight: Racial and nonracial causes, *American Sociological Review*, 44(3), pp. 425–448.
- Glaeser, E. L. & Gyourko, J. (2005) Urban decline and durable housing, *Journal of Political Economy*, 113(2), pp. 345–375.
- Glaeser, E., Gyourko, J. & Saks, R. (2005) *Why have Housing Prices Gone Up?* Harvard Institute of Economic Research Discussion Paper 2061 (Cambridge, MA: National Bureau of Economic Research).
- Glick, B. J. (1982) A spatial rank-order correlation measure, Geographical Analysis, 14(2), pp. 177–181.
- Grigsby, W., Baratz, M., Galster, G. & Maclennan, D. (1987) The dynamics of neighborhood change and decline, *Progress in Planning*, 28, pp. 1–76.
- Hanna-Attisha, M., LaChance, J., Sadler, R. C. & Schnepp, A. C. (2016) Elevated blood lead levels in children associated with the flint drinking water crisis: A spatial analysis of risk and public health response, *American Journal of Public Health*, 106(2), pp. 283–290.
- Helms, A. C. (2012) Keeping up with the Joneses: Neighborhood effects in housing renovation, *Regional Science and Urban Economics*, 42(1), pp. 303–313.
- Henthorn, T. C. (2005) A catholic dilemma: White flight in northwest flint, *The Michigan Historical Review*, 31(2), pp. 1–42.
- Highsmith, A. R. (2009a) Demolition means progress: Race, class, and the deconstruction of the American dream in flint, Michigan, Unpublished Doctoral dissertation, University of Michigan, Ann Arbor, MI.
- Highsmith, A. R. (2009b) Demolition means progress: Urban renewal, local politics, and statesanctioned ghetto formation in flint, Michigan, *Journal of Urban History*, 35, pp. 348–368.
- Highsmith, A. R. (2011) Decline and renewal in North American cities, *Journal of Urban History*, 37(4), pp. 619–626. doi:http://dx.doi.org/10.1177/0096144211403095.
- Highsmith, A. R. (2012) Prelude to the subprime crash: Beecher, Michigan, and the origins of the suburban crisis, *Journal of Policy History*, 24(4), pp. 572–611.
- Highsmith, A. R. (2013) Beyond corporate abandonment: General motors and the politics of metropolitan capitalism in flint, Michigan, *Journal of Urban History*, 40(1), pp. 31–47.
- Hillier, A. E. (2003) Spatial Analysis of Historical Redlining: A Methodological Exploration, *Journal of Housing Research*, 14(1), 137–167.

- Hoalst-Pullen, N., Patterson, M. W. & Gatrell, J. D. (2011) Empty spaces: Neighbourhood change and the greening of Detroit, 1975–2005, *Geocarto International*, 26(6), pp. 417–434.
- Hollander, J. B. & Németh, J. (2011) The bounds of smart decline: A foundational theory for planning shrinking cities, *Housing Policy Debate*, 21(3), pp. 349–367.
- Hoover, E. M. & Vernon, R. (1959) Anatomy of a Metropolis: The Changing Distribution of People and Jobs within the New York Metropolitan Region (Cambridge, MA: Harvard University Press).
- Jacobs, A. J. (2009) The impacts of variations in development context on employment growth: A comparison of central cities in Michigan and Ontario, 1980–2006, *Economic Development Quarterly*, 23(4), pp. 351–371.
- Lewis, P. F. (1965) Impact of Negro migration on the electoral geography of flint, Michigan, 1932– 1962: A cartographic analysis, *Annals of the Association of American Geographers*, 55(1), pp. 1–25.
- Macintyre, S. (2007) Deprivation amplification revisited; or, is it always true that poorer places have poorer access to resources for healthy diets and physical activity?, *International Journal of Behavioral Nutrition and Physical Activity*, 4(32).
- Mayer, H. J. & Greenburg, M. R. (2001) Coming back from economic despair: Case studies of smalland medium-sized American cities, *Economic Development Quarterly*, 15(3), pp. 203–216.
- Metzger, J. T. (2000) Planned abandonment: The neighborhood life-cycle theory and national urban policy, *Housing Policy Debate*, 11(1), pp. 7–40.
- Minnesota Population Center (2011) *National Historical Geographic Information System: Version 2.0* (Minneapolis, MN: University of Minnesota).
- Moudon, A. V. (1997) Urban morphology as an emerging interdisciplinary field, *Urban Morphology*, 1, pp. 3–10.
- Power, A. (2008) Does demolition or refurbishment of old and inefficient homes help to increase our environmental, social and economic viability? *Energy Policy*, 36, pp. 4487–4501.
- Roberts, S. (1991) A critical evaluation of the city life cycle idea, Urban Geography, 12(5), pp. 431-449.
- Rose-Ackerman, S. (1975) Racism and urban structure, Journal of Urban Economics, 2(1), pp. 85–103.
- Rose-Ackerman, S. (1977) The political economy of a racist housing market, *Journal of Urban Economics*, 4(2), pp. 150–169.
- Ryan, B. D. (2008) The restructuring of Detroit: City block form change in a shrinking city, 1900–2000, *Urban Design International*, 13(3), pp. 156–168.
- Sadler, R. C. & Pruett, N. K. (2015) Mitigating blight and building community pride in a legacy city: Lessons learned from a land bank's clean and green programme, *Community Development Journal*, doi: http://dx.doi.org/10.1093/cdj/bsv052.

Schein, R. H. (2012) Urban form and racial order, Urban Geography, 33(7), pp. 942–960.

- Segoe, L. & Associates (1960) *Comprehensive Master Plan of Flint, Michigan, and Environs* (Cincinnati, OH: Ladislas Segoe and Associates).
- Siksna, A. (1997) The effects of block size and form in North American and Australian city centres, *Urban Morphology*, 1(1), pp. 19–33.
- Smith, N. (1979) Toward a theory of gentrification: A back to the city movement by capital, not people, *Journal of the American Planning Association*, 45(4), pp. 538–548.
- Smith, C. L. (2007) Economic deprivation and environmental inequality in postindustrial Detroit a comparison of landfill and superfund site locations, *Organization & Environment*, 20(1), pp. 25–43.
- Spivack, R. N. (1991) The determinants of housing maintenance and upkeep: A case study of providence, Rhode Island. , *Applied Economics*, 23(4), pp. 639–646.
- Squires, G. D. & Kubrin, C. E. (2005) Privileged places: Race, uneven development and the geography of opportunity in urban America, *Urban Studies*, 42(1), pp. 47–68.
- Strait, J. B. (2001) The disparate impact of metropolitan economic change: The growth of extreme poverty neighborhoods, 1970–1990, *Economic Geography*, 77(3), pp. 272–305.
- Sugrue, T. J. (2005) *The Origins of the Urban Crisis: Race and Inequality in Postwar Detroit* (Princeton, NJ: Princeton University Press).
- Taeuber, K. E. & Taeuber, A. F. (1969) Negroes in Cities: Residential Segregation and Neighborhood Change (New York, NY: Atheneum).
- US Census Bureau (2010). Census 2010. Available at http://2010.census.gov/2010census/ (accessed 20 September 2015).

- Wallace, D. & Wallace, R. (1998) A plague on Your Houses: How New York City was Burned Down and National Public Health Crumbled (New York, NY: Verso).
- Wiewel, W. & Schaffer, K. (2001) Learning to think as a region: Connecting suburban sprawl and city poverty, *European Planning Studies*, 9(5), pp. 593–611.