NUMERITICS

Client: East Liberty Development, Inc. (ELDI)

January 2018

The Population Impact of East Liberty Revitalization

Tayo Fabusuyi & Victoria Hill, *Numeritics**

---

* Tayo Fabusuyi and Victoria Hill are with Numeritics (www.numeritics.com), a Pittsburgh-based consulting practice. All inquiries regarding the report should be directed to Tayo Fabusuyi at Tayo.Fabusuyi@numeritics.com. We would like to express our gratitude to the HELP Initiative for funding the study and to Eric Jester and the staff of ELDI who gave generously of their time during the preparation of the report.

Executive Summary

What factors explain the loss of approximately 940 African Americans in East Liberty between 2007 and 2015? Our analysis reveals that the loss happened mainly in two waves. The first wave occurred before the neighborhood was revitalized, and was related primarily to foreclosure and abandonment that accelerated around 2007. The second wave began as the neighborhood transitioned; the result of increased market forces and the conversion of multiple (typically three) apartment structures back to single family properties. Using a mixed methods approach, our analysis revealed that close to 70% of the population loss is accounted for by units simply being abandoned and/or uninhabitable in the timeframe 2005-2011. This loss was comprised primarily of low income, at risk residents who were predominantly African American. This finding is notable not just to counteract the misguided narrative that the displacement of African Americans happened only after the neighborhood was deemed a desirable place to live in but also to guide our knowledge of what's happening in other Pittsburgh neighborhoods facing similar conditions.

In our assessment, the first wave of population loss was driven by the neighborhood characteristics of a fading Victorian neighborhood. The age and upkeep of the properties, and the prevalence of inexpensive apartments with negative equity have a lot to do with the rash of foreclosures and abandonments observed in East Liberty prior to 2011; a situation exacerbated by the financial crisis that started in 2007. For example, the lifespan of major components of these century-old homes, such as plumbing and electrical systems, had long expired. However, with the neighborhood in decline and with low property values, these major renovations were not undertaken precisely because the market provided no incentive for home owners to make the investments. It is also relevant to note that low rental rates; typically, less than $500 for a two-bedroom apartment, meant the slumlord was operating with extremely thin margins. Consequently, needed maintenance was delayed or simply not undertaken at all. When the property eventually became uninhabitable because of neglected maintenance, and the slumlord was shouldering a negative equity on the property, the slumlord abandoned the building and/or entered foreclosure. Our assessment uncovered many examples of this.

The smaller second wave of population loss is related to rising market forces. As the neighborhood improves, an inflection point is reached when it becomes economically feasible to take currently cannibalized multi-unit properties back to their original form as single-family homes. Caught up in the conversion process are occupied apartment units. It is in this wave that we observed another loss of African American population starting around 2012/3. This observation, coupled with the loss of 120+ housing choice voucher (HCV) holders in the neighborhood provides plausible evidence that HCV holders or households using some form of government assistance are being edged out. This observation indicates that housing types that cater to specific cohorts or population sub-segments are being taken out of the market and repurposed for a totally different clientele. Further compounding the population loss is the neighborhood's current vacancy rate. In a situation where vacancy exists within the neighborhood, the displaced population could be re-absorbed internally. However, this is not the case in Ease Liberty where the neighborhood has close to a zero-vacancy rate.

Introduction and Rationale for the Study

In 2016, Numeritics, a Pittsburgh-based research and consulting practice, was asked to update the data and analysis from the "East Liberty Crime Data Analysis[1]" report published in 2013. The objective of the updated study was to determine the sustainability of the impact of the East Liberty Development Inc. (ELDI) crime reduction strategy after the intervention was scaled down in 2012 and document changes, if any, to the neighborhood's socio-demographic profile. Although the updated study revealed a sustained decrease in crime incidents in East Liberty over the 2008-2015 eight-year period analyzed, a testament to the effectiveness of the ELDI crime reduction strategy, there was an appreciable loss in the African American population. The observed loss in African American population provided the impetus for carrying out a comprehensive examination of the drivers of the neighborhood's population changes.

Specifically, between 2009 to 2015, using the US Census American Community Survey (ACS) data, the point estimate of the population of African American in East Liberty fell by 940; from 4190 to 3250, representing a 22% decrease in African American population. Within the same time span, the population of Whites increased by approximately 100; from 1658 in 2009 to 1755 in 2015. Proportionately, African Americans were 66% of the total population in 2009; in 2015 they were 59% of the population. What is particularly revealing is that the population of African Americans in Census Tract 1115 increased by 250, but declined by 1165 in Census Tract 1113. The loss in African American population was most noticeable between 2009 and 2010 and then again between 2013 and 2014.

What factors explain this loss in the population of African Americans? Our analysis reveals that the loss happened mainly in two waves: The first and most significant wave that occurred ***before*** the neighborhood was revitalized and which was related primarily to foreclosure and abandonment; and, the second wave began when the neighborhood began to be revitalized, driven by market forces and the conversion of occupied multi-unit apartment structures back to single family properties. The present analysis addresses the identified reasons for the population loss and provides recommendations on how measures could be taken to ameliorate the impact of the process on vulnerable populations in other neighborhoods.

Data Sources and Study Approach

Our analysis used a mixed methods approach that included a virtual street scan, examination of Allegheny County Property Assessment records and an analysis of proprietary and interview data. To begin, we conducted an in-depth housing census of East Liberty seeking to identify changes that occurred to the housing stock, particularly after 2005/2006. For each property, we examined both Allegheny County Property Assessment records that show ownership transfers and purchase prices, and we examined visual records of the properties from 2007-2016 using Google Maps Street Views. In addition, given the latency of the official assessment records from the county and inaccuracies contained therein, we used long term residents and subject matter experts who were intimately acquainted with East Liberty and who were able to detail many property transitions within the neighborhood

East Liberty Housing Stock Analysis

Data from the 2009 ACS data, using five-year estimate figures from 2005, show that 52% of the neighborhood housing was built before 1950, though variation exists across US Census tracts or census block groups (CBG). Most of the older housing stock is concentrated in Census Tract 1113 where 84% of all properties were built before 1950, a figure three times the proportionate representation of pre-1950 properties for Census Tract 1115 (28%). Historic records from G. M. Hopkins Company Maps[2] show that much of Census Tract 1113 was built between 1890 and 1910. Most of these structures, substantial brick homes for wealthier buyers, still stand today. However, during urban renewal efforts in the 1960's, entire city blocks of Census Tract 1115 were removed and replaced by high-rise apartment buildings inhabited by low-income tenants. Subsequent redevelopment efforts over the last 20 years saw these buildings razed and replaced by low-rise mixed income housing.

The number of older properties is even higher when we look at the census block group level; 94% of all the housing stock in the 1st CBG of Census Tract 1113 was built before 1950 compared to only 25% for the 4th CBG of Census Tract 1115. The older housing stock is even more pronounced in the 4th CBG of Census Tract 1113, where approximately 70% of all the properties were built before 1939. Many of the residential homes in Census Tract 1113 were 3,000 to 4,000 square feet with 4-6 bedrooms, solid brick, with some smaller wood frame-type homes mixed in within the neighborhood as well.[3] In their heyday, these homes were beautiful, with many unique architectural features. In 1937, the George F Cram Map Company[4] gave the area now known as Census Tract 1113 mixed reviews, listing the housing stock as "obsolete", an appraisal term that means the housing stock is no longer suited to the demands of the market. And while it assigned a higher risk profile for lenders in that area, it did not cut off access to credit. Homeowners were thus able to continue to invest in upgrading their properties. A screengrab of the thumbnail summary assessment of Census tract 1113 area is shown in Figure 1.

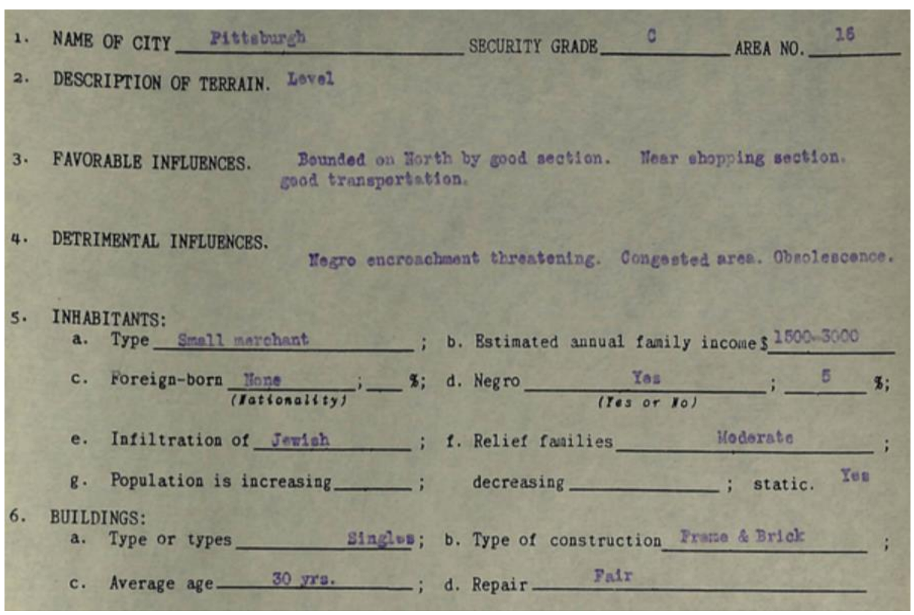
1. NAME OF CITY Pittsburgh SECURITY GRADE C AREA NO. 16
2. DESCRIPTION OF TERRAIN. Level
3. FAVORABLE INFLUENCES. Bounded on North by good section. Near shopping section. good transportation.
4. DETRIMENTAL INFLUENCES. Negro encroachment threatening. Congested area. Obsolescence.
5. INHABITANTS:
   a. Type Small merchant ; b. Estimated annual family income $ 1500-3000
   c. Foreign-born None (Nationality) ; ___ %; d. Negro Yes (Yes or No) ; 5 %;
   e. Infiltration of Jewish ; f. Relief families Moderate ;
   g. Population is increasing ___ ; decreasing ___ ; static. Yes
6. BUILDINGS:
   a. Type or types Singles ; b. Type of construction Frame & Brick ;
   c. Average age 30 yrs. ; d. Repair Fair

Figure 1: Subset of a G. F. Cram 1937 thumbnail summary assessment of the Census tract 1113 area.

On the other hand, the Cram Map Company listed an area that largely corresponds to Census Tract 1115 as 'hazardous' in 1937, which essentially cut off access to loans for home improvements, and has had a devastating ripple effect. Twenty years later, that very same area was certified by the City Planning Commission on May 27, 1959, as "blighted."[5] On June 17, 1966, the Commission approved a sweeping urban renewal plan largely targeting the previously designated "hazardous" portion of census block 1115 that foresaw its wholesale destruction.[6] Arguably, "urban renewal" was a response to the absence of ongoing investment in that part of the neighborhood.

Though Census Tract 1113 was not designated as "hazardous" in the Cram Map Company's 1937 street index, and was largely spared the wrecking ball, the impact of urban renewal reverberated throughout the neighborhood. Wealthier residents voted with their feet, and many of the large homes were subdivided into multiple apartments.[7] This accelerated neighborhood blight, and East Liberty suffered throughout the rest of the 20th century from increased crime and violence, with the corresponding disinvestment in property and decline in property values.

This disinvestment and resultant blight over time explains East Liberty's housing stock and population dynamics at the turn of the present century. Our analysis reveals that approximately 70% of the African American population loss can be accounted for due to housing units simply being abandoned and/or becoming uninhabitable in the timeframe 2005-2011. Within this time window we find that an estimated 550 bedrooms which were available prior to 2012 to renters who were paying low market rates or subsidized rates, were no longer available at those rates by 2012. Of this figure, nearly 90% were due to properties that were either foreclosed upon, abandoned, became uninhabitable and/or lost structural integrity.

There is significant relevance of the age of the property in explaining the population trend observed in East Liberty. Post-World War II Pittsburgh enjoyed a population boom, which likely prolonged the lifespan of housing stock in Census Tract 1113. Upgrades to housing stock in the form of copper plumbing, fuse boxes, forced-air heat, aluminum siding, newer windows and other products typical of the 1960's were installed in homes in this area. The older housing stock in Census Tract 1115, starved of credit and deemed "hazardous" and then "blighted" by city planning, was largely demolished in 1960. One could assume that in 1960, the remaining housing stock that existed in East Liberty was largely in good repair.

In the approximate 40-year period from 1960 to 2000; a timespan which corresponds to the average life cycle of major home maintenance items like a roof or HVAC system, East Liberty was in a continued state of decline. With falling property values and market trends strongly favoring suburban developments, these major renovations were not undertaken because the market provided no incentive for home-owners to do so. Many of the now-subdivided large homes were literally worth less than the cost of a new roof. Compounding this issue is that most of the homes built between 1890 and 1910 would have had slate roofs, which have an approximate 75-100 year lifespan. Replacing a 100-year slate roof is no small expense. Given the low property values in East Liberty, it did not make economic sense for a property owner to put a new roof on a 3000-square foot turn of the century home. Even after the Community Reinvestment Act was passed in 1977[8], it was difficult to finance improvements that were in excess of the value of the home. Without critically needed investments, homes become uninhabitable. In the worst-case scenario, the owner abandons the property and walks away.

Adding to this dilemma, many of the subdivided apartments were renting for extremely low rents. A landlord who is renting out an apartment for $400/month literally cannot afford to make major investments. In actuality, when rents are below $500/month, it is extremely difficult for landlords to stay above water. It is precisely rental units of this type that are often managed by slumlords, who maximize their income stream by reducing maintenance costs to near zero. A repair as simple as a new bath vanity could take a substantial chunk out of a slumlord's annual income. A more involved renovation like installing a new kitchen complete with new cabinets, counters and flooring could cost the slumlord years of annual revenue. Rather than properly address these problems, a slumlord resorts to shortcuts like smothering tar on the property's roof instead of replacing it, delaying repairs or ignoring aesthetics.

Absent needed maintenance, the property's integrity suffers but a more pernicious byproduct of this development is the attending negative effect on the immediate surroundings as the property provides a conducive environment for criminal activities. At or below a critical rent threshold, there exists a vicious cycle wherein the tenant tacitly agrees not to make demands of the landlord, and the landlord tacitly agrees not to question activities in which the tenant is engaged. This vicious cycle tends to have a contagious effect within the neighborhood (Numeritics, 2013[9]; Fabusuyi, 2018[10]), with the age of the housing stock playing a key role in this cycle.

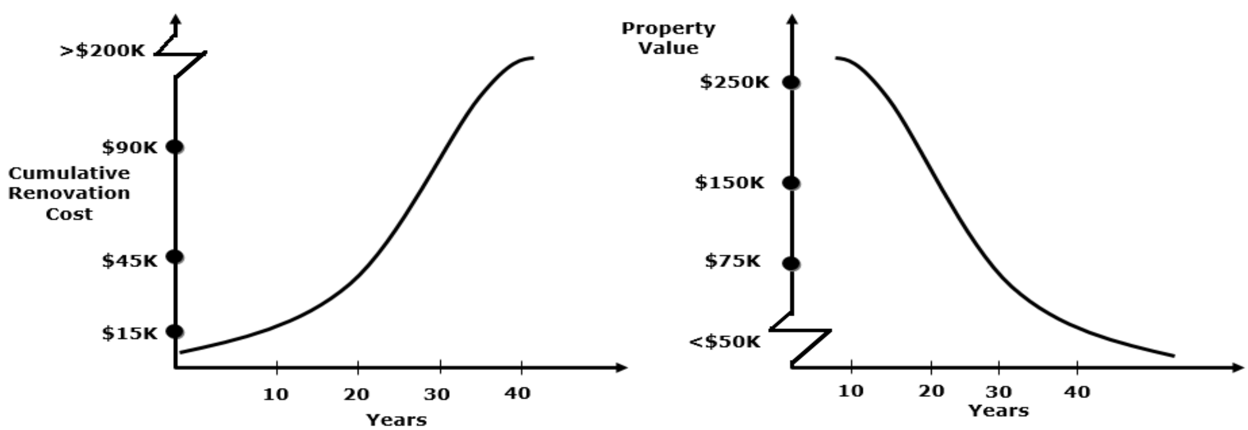

Figure 2: Relationship between cumulative renovation cost and property value (circa 2010 constant $)

The figures above show a hypothetical relationship between cumulative renovation cost and property value overtime, and demonstrate that a property's value strongly tracks the cumulative renovation cost – as the renovation cost piles up, the property value decreases. Renovation costs for different housing components are based on actual costs for several properties in East Liberty and are used to depict the representation using real dollar figures circa 2010. Most of the properties of this type are rentals and as argued in an earlier report (Numeritics, 2013), the main characteristic that most of the properties have is that they are owned by slumlords.

Box 1: Property transformation and population attrition

Figure 3a-c: Property showing the transformation stages

We find that the population loss of African Americans in East Liberty can be attributed to two factors: dwellings that have fallen below the "rot point" and have been abandoned, foreclosed upon and/or become uninhabitable, and the conversion of multi-unit properties back to single family homes even though the property may still be habitable. In both cases, the result is a reduction in the number of available rental properties in East Liberty. The figures above depict an actual property in East Liberty that is transformed from an abandoned 3-unit building to a completely renovated single family home.

Figure 3a, a picture taken in 2007, represents the first stage of the transformation. This is a 3-apartment unit property that has been boarded up with obvious signs that it has been abandoned with neglected maintenance, even though it is still structurally intact. The abandonment of this property has come at the loss of six to eight residents for the neighborhood well before the neighborhood was perceived to be on the upswing.

In Figure 3b, the second stage of the transformation, typically after 2012, the same property had been foreclosed upon and bought by or sold to an investor. Renovation work began in earnest as evidenced by the dumpster in front of the house, and further corroborated by the blue portable toilet that confirms that it is an active work site. And finally, in Figure 3c (after 2014/5), we see a newly renovated single-family home that is geared to a higher market rate buyer with the attendant loss of the three apartment units. On average, these transformations represent a net loss in population for the neighborhood – a single household coming in compared to the loss of three households that would have otherwise occupied the previous apartment units.

The cumulative effect of this property transformation is estimated to be a population loss in excess of 600 individuals; more than 10% of East Liberty's population, and happened well before East Liberty was revitalized. The affected population was primarily comprised of low income, at risk residents who were predominantly African American. This is a critical revelation and counteracts the misguided narrative that the displacement of African Americans happened only after the neighborhood was deemed a desirable place to live in.

We have coined the phrase "rot point" to indicate the point at which a home becomes uninhabitable when the cost of critical repairs needed to maintain occupancy exceeds the home's value. As previously mentioned, two factors determine this point; the value of the structure and the rental rate if rented, and the age of the structure. Weak housing markets necessarily translate into lower rental rates and lower home values given reduced demand. Older structures require, on average, more investments to maintain the property. This is a significant challenge in blighted neighborhood where neither cash flow nor home values justify investments. Maintenance, large and small, is ignored. Not surprisingly, in East Liberty, the accumulation of neglect led to abandonment.

The "rot point" for many of the grand old East Liberty homes occurred when the value of the structure was insufficient to justify making critical repairs, like replacing a roof or updating wiring. It began during a long downward slide in values between 1970 and the turn of the 20th century. It was in this timeframe that many property owners, heirs and slumlords simply abandoned their properties as property prices fell. What exacerbated this trend was the major U.S. financial collapse and recession beginning in 2007. The financial crisis negatively impacted the value of the properties, consequently increasing the number of homes and apartments with mortgages but having negative equity, and made it much more difficult to obtain credit which could be used for home maintenance.

Extrapolating the Analysis to Pittsburgh

This situation is not unique to the neighborhood of East Liberty. On the contrary, it is the norm for many distressed neighborhoods where rents are typically low and vacancy rates are relatively high. Figure 4 shows a scatterplot of Pittsburgh's neighborhoods by rental rates and vacancy. We define a distressed neighborhood as one where the vacancy rate is higher than 20% and where the rent for at least 40% of the rental units is less than $450. Rental rate figures are monthly and exclude all other fees or charges such as utilities, furnishings or services. Figure 4 was created using the US Census ACS data. The analysis was conducted at the census tract level, and the rental rate figures are 2016 estimates while the percentages of residential units that are vacant are based on 2015 5-year estimates. The quadrant of interest is the upper right one where more than 40% of the rental properties have rates less than

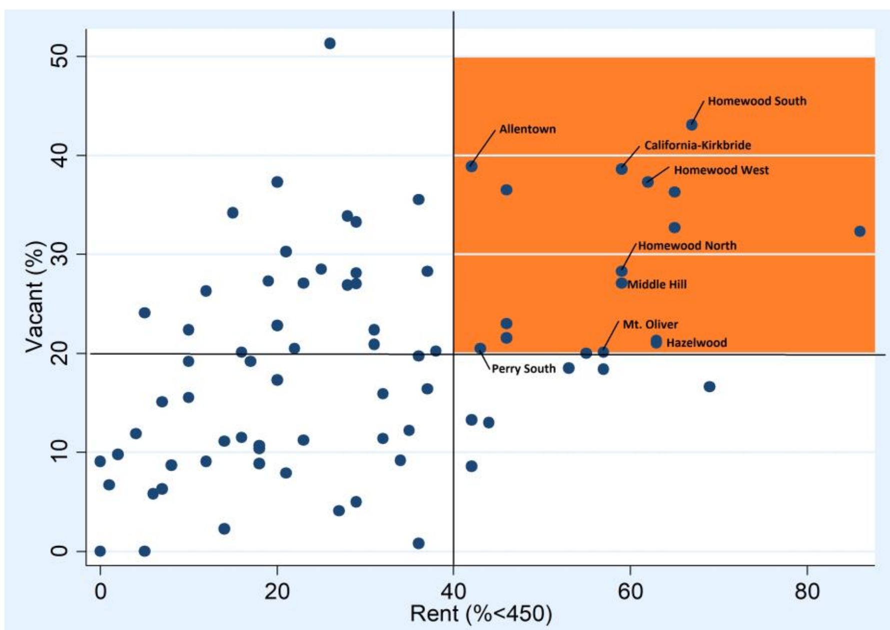

Figure 4: Scatterplot of Pittsburgh's neighborhoods by rental rates and vacancy

$450/month and have relatively high vacancy rates; in excess of 20%. To de-clutter the chart, neighborhoods whose characteristics may have been influenced by the presence of public housing developments have not been labeled. The $450 threshold is tied to the "rot point" defined earlier. At this rate, landlords cannot properly maintain their units. As mentioned previously, one plumbing disaster could wipe out an entire year's worth of revenue. The high vacancy rate for some of the neighborhoods analyzed further exacerbates the rot.[11]

East Liberty Housing Characteristics and Population Loss Scenarios

We found that, before the properties fell into abandonment or foreclosure, most of them housed tenants, who were predominantly low-income households. These makes intuitive sense given that these apartments had low rents and were typically owned by landlords who were making little to no investment in the property. Due to neglected ongoing maintenance, when something like a large roof leak or bad plumbing inevitably happened, these properties became literally uninhabitable, with the result being that the tenants had no choice but to move out. Our analysis revealed that it is these marginal tenants who primarily fell through the cracks well before the neighborhood was revitalized.[12] In this *first wave*, nearly 540 bedrooms; equivalent to approximately 90 former single-family homes, were "lost" prior to the revitalization efforts in East Liberty. At an estimated 1.2 persons per bedroom, this accounts for close to 70% of the 900+ population loss.

The *second wave* of population loss directly related to housing type began once the neighborhood started turning the corner. The transformation of this type is typically associated with a neighborhood on the upswing. As the neighborhood improves, the normal trend where the value of single family homes is tracked relatively well by the value of apartment units fails to hold. As the difference widens, a point is reached when it becomes economically feasible to take these typically cannibalized single-family homes out of circulation and convert them back to their original use. Evidence of that abounds in East Liberty on the 500, 600 and 700 blocks of

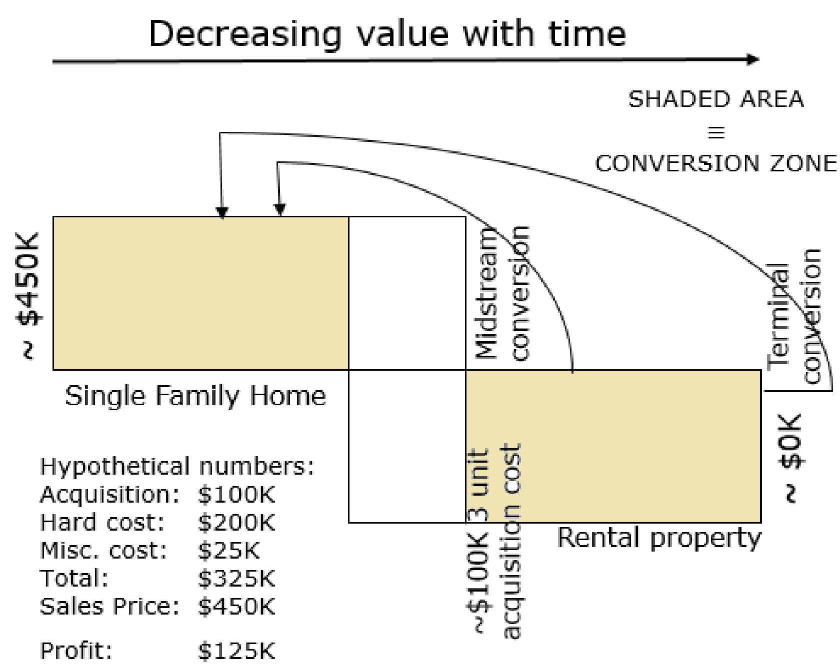

Figure 5: Second wave population loss driven by midstream conversion and market forces

Euclid Avenue and on St Clair Street where properties which had been sub-divided into multiple apartment units have virtually all been converted back to single family homes.

Caught up in the conversion process are apartment units that are still habited and or still habitable. As the area improved, property owners realized that it makes economic sense to convert a livable three apartment unit property back to a single-family home. Prior to the revitalization of East Liberty, the apartments may have been rented out using (then low) fair market rate or to holders of housing choice vouchers (HCV), also called Section 8 housing. With rising market rental rates in the neighborhood, landlords could choose to stop renting to Section 8 tenants without losing income or potential tenants. Between 2011 and 2016, there has been a loss of 120+ HCV holders in the neighborhood. This observation provides plausible evidence that HCV holders or vulnerable households are being squeezed out through housing units that typically cater to this population sub-segment being repurposed for a different market with a totally different clientele. Figure 5 shows a visualization of how this scenario is playing out.

Further compounding the population loss is the neighborhood's vacancy rate. In a situation where vacancy exists within the neighborhood, the displaced population could be re-absorbed. However, this is not the case in situations where the neighborhood has close to a zero-vacancy rate, which is presently the situation in revitalized East Liberty. A parallel development that may be fueling the displacement of low income households that we have not considered is affordability for households that (used to) live in similar properties.[13] The thinking here is that the property may be kept for rental purposes but with investment for extensive renovations made that justifies the landlord raising the rent. The rent increase may be to a degree that prices current tenants out of the units. Demand for these units, given a more desirable neighborhood, may also mean that HCV holders may no longer be desired as tenants by the landlord. This strand of the report merits further study.

Relevance to Other Distressed Neighborhoods

Mapping the processes that explain the loss in African American population in East Liberty provides a cautionary tale in two ways – how the narrative is presented to the public and how to plan for safety nets that ensure that low income families can still be a part of the neighborhood. ELDI saw the need to proactively manage foreclosed, vacant and/or abandoned properties and a concerted attempt was made to keep vulnerable properties out of the hands of slumlords. In addition to ensuring that properties do not fall into the hands of slumlords, ELDI used LIHTCs (Low Income Housing Tax Credits) and a host of soft monies to renovate and maintain affordability for a significant number of properties. However, given that these resources are limited, the CDO recognized that a sustainable change necessitates that market forces, a requirement for attracting private sector investments to the neighborhood, have to be embraced but that must be done in such a way that establishes a safety net for lower income families.

We have shown in previous studies how slumlord properties can become centers of criminal activity (Numeritics, 2013, Fabusuyi 2018). In Pittsburgh's distressed neighborhoods, a concern moving forward is that initial efforts towards revitalization may incentivize slumlords to make cosmetic changes to properties, and then rent them out to unscrupulous characters. More importantly, assuming crime is reduced appreciably for existing high crime neighborhoods, it is probable that the scenarios discussed with regards to housing conversion and population loss in East Liberty may repeat themselves. Although the crime reduction and a revitalized neighborhood will impact the second wave, these neighborhoods will continue to lose population before the neighborhoods are revitalized, driven primarily by the attrition in the housing stock and the reduction in housing quality. In Homewood, for example, an appreciable number of properties presently sit empty and/or abandoned and the neighborhood continues to lose population (US Census ACS). Consequently, the potential to intervene is enormous but there will be challenges in managing the narrative particularly once the neighborhood has stabilized.

Other take-aways with direct relevance to distressed neighborhoods include the following:

- Personal safety is critical to attract residents to the area. The crime reduction strategy that ELDI developed over time was instrumental in selling East Liberty as a neighborhood of choice. Without people having a sense of personal safety, a neighborhood will not be able to attract new residents.

- Creating a market for investors for the area is also critical, and works in conjunction with the personal safety argument. An appreciable number of these neighborhoods have relatively wealthy neighborhoods in close proximity. In the same way that East Liberty used the market edge with Highland Park, these neighborhoods could create a market edge with these wealthy neighborhoods. This strategy also contributes to creating a mixed income neighborhood rather than one with concentrated poverty.

- To use the ELDI strategy of revitalization while maintaining affordable housing in a more strategic manner would call for an increased ability to borrow funds to acquire properties without the same level of concern for the debt service. This would allow for more time to set up affordability measures using tax credits rather than selling as many properties to investors to pay the debt on the borrowed funds. ELDI was only able to intervene in about 10% of the rental units in East Liberty, and their purchases were done only in an opportunistic manner; what was available at the time, and what ELDI had funding for.

- Nearly 90% of the properties that went to market rate in East Liberty were either uninhabitable, vacant, abandoned, foreclosed upon, or structurally unsound, with many being a combination of these. Several vacant multi-unit properties burned down as well, with those units lost. These vulnerable properties are key to a redevelopment strategy. They are often the hotbeds of criminal activity. Acquiring and renovating the abandoned but still structurally sound properties with funding to maintain affordability is critical. However, this doesn't come cheap given that an old foursquare house that has been neglected to the point of abandonment needs approximately $250K for renovation. For these distressed neighborhoods, the vacant and abandoned properties provide not only the ideal environment for crime to flourish, but also are the most in danger of going to market rate once investors come in.

- East Liberty's strategy was unique in that it focused mainly on existing properties, scattered throughout the neighborhood, so that the renovated properties, whether affordable or market rate housing, were indistinguishable from one another. This scattered site approach helps to create a mixed income neighborhood that benefits all residents.

Endnotes

[1] East Liberty Crime Data Analysis, 2013. Numeritics. Accessed August 10, 2016 online at http://www.eastliberty.org/sites/default/files/page/files/Report_of_the_ELDI_Crime_Study.pdf

[2] Pittsburgh's detailed historic maps from 1872-1940. Available at http://historicpittsburgh.org/maps-hopkins

[3] An appreciable number of the lower quality housing units was a result of the 1893 panic and comprised many of the problematic properties purchased by ELDI.

[4] Digitized archives obtained from University of Richmond website at https://dsl.richmond.edu/panorama/redlining/

[5] "…(T)he area bounded by Negley Avenue, (East Liberty Boulevard), and the Pennsylvania Railroad Right of Way to South Negley Avenue… recognizes the existence in this area of conditions which the Urban Redevelopment Law of 1945 specified as constituting blight." Certificate of Planning Commission's Actions, May 27, 1959.

[6] "Proposal for the Redevelopment of Redevelopment Area no. 10, in the Seventh, Eighth, Eleventh and Twelfth Wards of the City of Pittsburgh, County of Allegheny, Pennsylvania." Submitted by the Urban Redevelopment Authority to City Council. June 1966.

[7] This trend seems to be what obtains in neighborhoods that are in decline. The reverse is the case when a neighborhood is on the upswing when three apartment units are typically converted back to single family homes.

[8] An Act of Congress that sought to reverse age-old state sanctioned credit discrimination in the housing market against low-income neighborhoods.

[9]http://helppgh.org/wp-content/uploads/2016/04/Report_of_the_ELDI_Crime_Study.pdf

[10] Fabusuyi, T. (2018). Is Crime a Real Estate Problem? A Case Study of the Neighborhood of East Liberty, Pittsburgh, Pa. *European Journal of Operational Research*. Special Issue on Community Operational Research, in press. Preprints available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3061018

[11] Even assuming a 100% occupancy rate and a monthly rent of $450 with, on average $300/month in expenses, this translates to a net monthly operating income of $150/month or $1,800 per annum. Given a 9% market capitalization rate[11] and reflecting the fact that a Pittsburgh three apartment converted house is a worse asset stock compared to a Class C demands a risk premium, say 3% being added to the CAP that results in a market valuation of $15,000 for the rental unit. This arithmetic works out to the property value hovering around $40-50K, a range that provides no incentive for a bank to, for example, loan the homeowner $20,000 to put a new roof on the property.

[12] These figures lend some credibility to the assertion that marginal tenants are the population segment most affected by the foreclosure. This may explain why we observed significant increase in per capita income for African Americans in particular. In Census Tract 1113, where the population loss of African American was pronounced, per capita income of African Americans increased by 49% from 2009- 2014 compared to 38% for Whites. In Census Tract 1115, African American per capita income increased by 32% from 2009-2014, while White per capita income increased by just 5%. Within the same time span for the neighborhood as a whole, African-American per capita income increased by 16% from $15,100 in 2009 to $17,500 in 2014.

[13] Typically, properties of this type will be on the "good" end of the property spectrum – representing a subset of the population loss driven by investment being made in these properties by investors interested in long term cash-flows. The ones that are really on the bad end will be assumed taken out of the market entirely and converted to single family homes – driven more by flippers. Conceptually, these are two separate processes – population displacement driven by higher rental rates and another, driven by the property being repurposed.