Spatial Correlations of Community Needs to Justify CDBG & HOME Funding

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Abstract

The 2005-2009 Consolidated Plan for the City of Springfield, Illinois, is the city's guide for housing, economic, and community development. The Consolidated Plan is submitted to the Department of Housing and Urban Development (HUD) for the City's federal funding of Community Development Block Grants (CDBG) and HOME funds. To justify the funding requests, the City used GIS to correlate a variety of demographic and housing data with neighborhood development needs. The resulting maps establish various community needs and efficiently communicate the statistical analysis to simplify the Plan's approval by HUD.

Consolidated Plan

The Springfield Office of Planning and Economic Development (OPED) office identified five priorities for CDBG and HOME funding. These are affordable housing, business development, infrastructure, public service, and other community efforts.

To refine these priorities, a collaborative process was established with citizens and various agencies. Participants included:

> Springfield Housing Authority (SHA)
> Illinois Department of Public Health (IDPH)
> Housing and Urban Development (HUD)
> Chamber of Commerce
> Nonprofit agencies
> Charitable and religious groups
> Financial and lending institutions
> Neighborhoods and homeowners associations
> Homeless service providers
> Real estate professionals

The collaborative process provided OPED with anecdotal insights into neighborhood and community issues. Statistical analysis could then be applied to reconcile the anecdotal information with multiple sets of demographic, housing and local grant program data.

Study Data and Area

The data used in this analysis include Census data from the 1980, 1990 and 2000 Decennial Census. Special Census surveys relating to housing, income and employment are incorporated with HUD CHAS and HAMFI data. CHAS is the Comprehensive Housing Affordability Strategy required as part of the National Affordability Housing Act of 1991. HAMFI is the HUD Area Median Family Income survey.

OPED maintains a variety of records identifying various grant and community programs, the amount of the grant, and very importantly the address where the grant monies are applied. These data were not in a GIS database, but resided in multiple Excel spreadsheets. The addressing data lacked formatting standards, so considerable time was spent scrubbing the address data so that records could be geocoded to the GIS data.

The study area, termed the "Treatment Area" are those Census Tracts being "Low to Moderate Income." These are tracts 2.02, 3, 6-9, 13-19, 23-25, 27, 28.01 and 28.02.

Figure 1. Treatment Area

The Treatment Area is essentially the downtown and east region of Springfield, including the State Capitol, the central business district, the historic district, and also includes the oldest housing stocks.

Demographic Trends

The population grew for the whole city at 5.8% from 1990 to 2000 and is projected to have the same growth through 2010. While the City grows, housing change in the Treatment Area from 1990 to 2000 shows a loss 8.5% and that loss is expected to trend the same through 2010.

The map below shows population change from 1990 to 2000. Those tracts with a growth matching or exceeding the city's growth of 5.8% are in white, while the gray tracts show those loosing population.
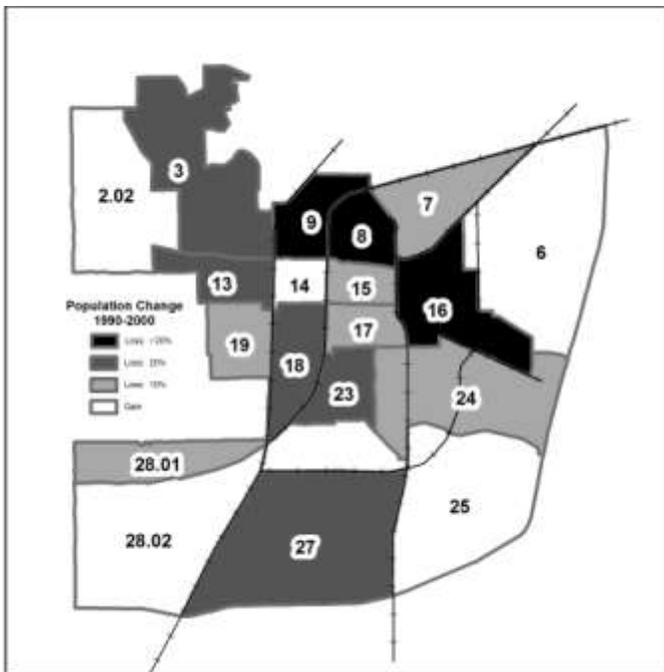

Figure 2. Population Change

The African-American group comprises the largest racial group after whites in the Treatment Area. In the City, the percentage of African-Americans is 15.3% compared to whites at 81.0%. The map below shows the relative concentration of African-Americans compared to the City's average.

Note the spatial correlation of the change in population with the racial composition of the Treatment Area.
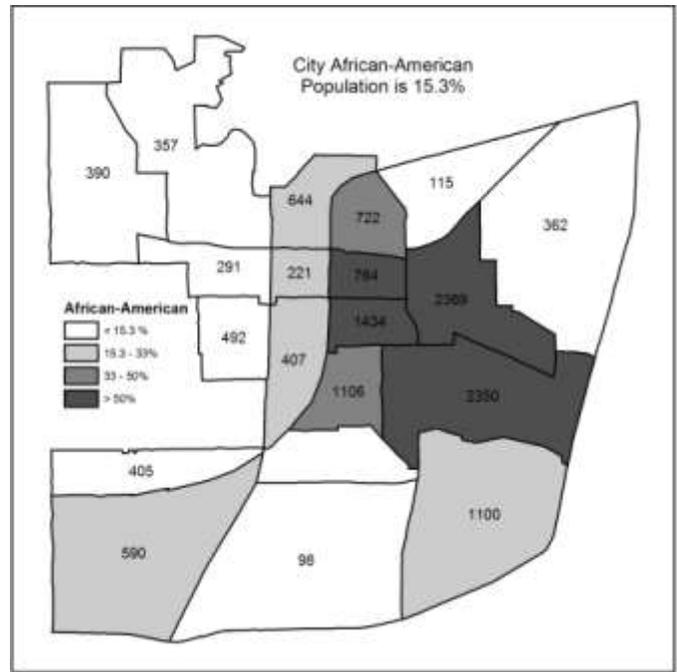

Figure 3. African-Americans

Housing & Household Trends

The whole city had a growth in housing units from 48,534 to 53,887 from 1990 to 2000. In the Treatment Area, housing units dropped from 29,957 to 28,902 in same time. Note that we will see this same map again later when we correlate housing change with city records on "boardings" and demolitions.
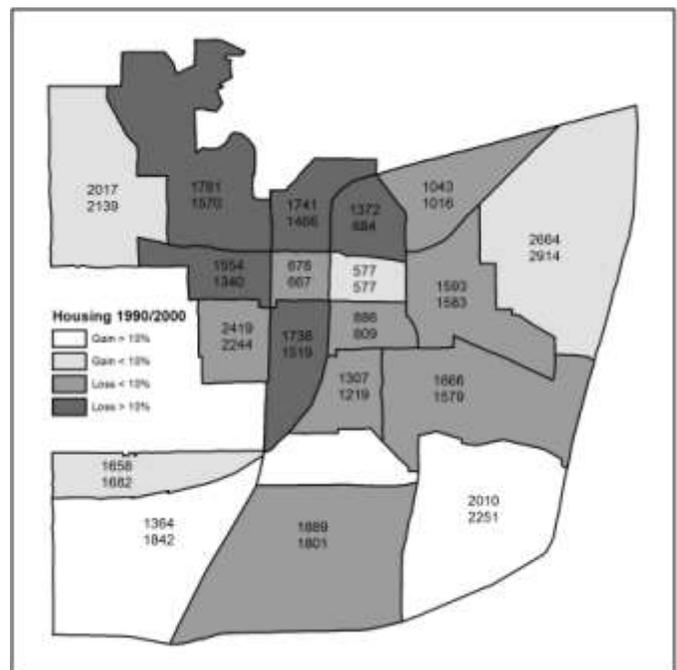

Figure 4. Housing Change

October 12, 2005

Now we are considering the spatial correlation between the map below of household size with population change and race.
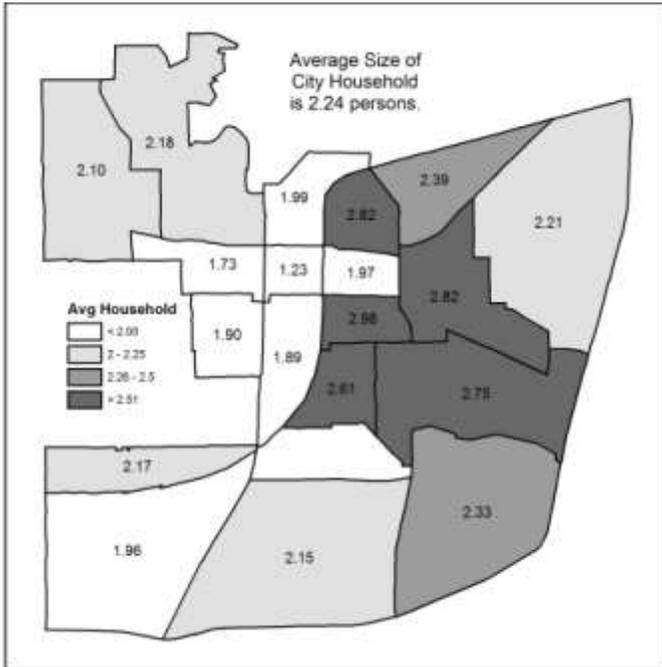

Figure 5. Household Size

This map shows the housing units vacant on Census Day. Housing vacancy for the City of Springfield in 2000 was 9.5%, while 15% in the Treatment Area. The vacancy rate for the State was 6.0%.
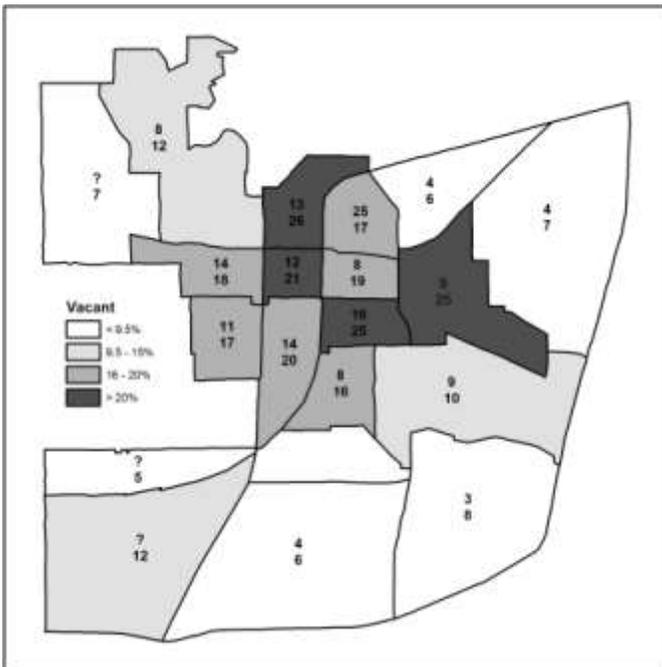

Figure 6. Vacancies

In each Tract, the top number is the 1990 vacancy rate and the bottom is the 2000 rate. When the 1990 data cannot be directly compared to the 2000 data due to a tract splits, a "?" is used.

To compare housing vacancies with housing rentals, the rental map below was created. The numbers on each census tract are the rented housing units, and the number below is the total housing units.
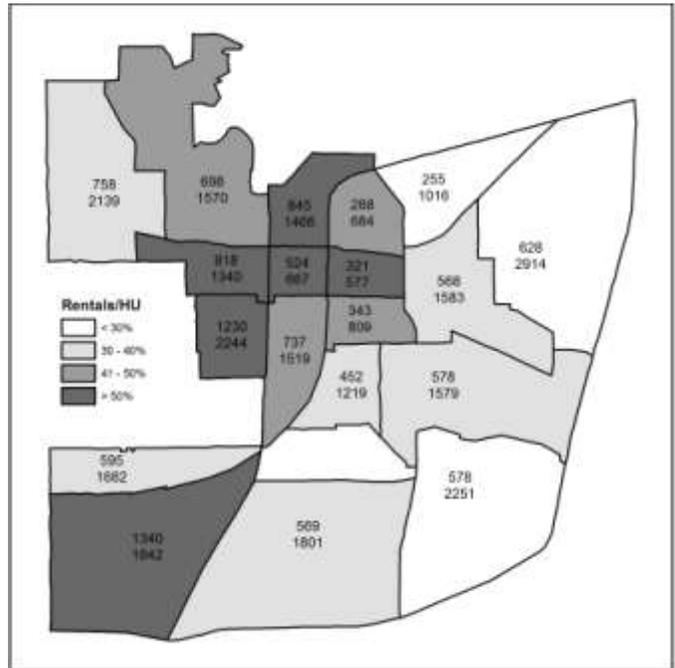

Figure 7. Rentals

High rental rates can be correlated with neighborhood vulnerability. This is because responsibility for maintenance is blurred between the owner and the renter, which may lead to property neglect. Run-down properties may lead to alternative uses (such as parking lots) that are incompatible with residential use, causing the destruction of the single-family residential fabric. One neighborhood in the study has a rental rate of 78%.

The next map displays a pie chart showing the age of the housing stock in each Census Tract. The size of the pie varies with the total number of housing units while the size of each pie slice represents the age of the housing stock.
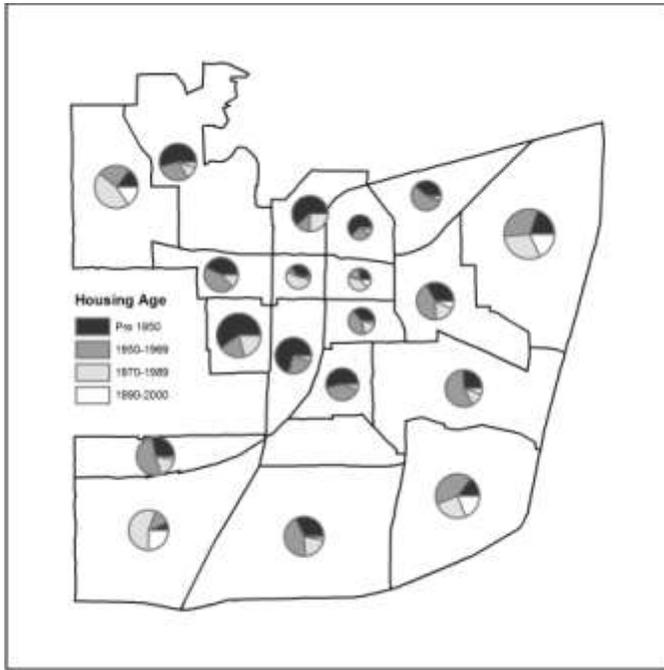
Figure 8. Housing Age

In the last section of this document, we will tie housing age to various housing programs at OPED.

OPED Programs & Analysis

OPED uses CDBG and HOME monies to fund about a dozen of the City's housing programs. These programs include home rehabilitation emergency home repairs, deferred-payment loans, single-family rental assistance & rental rehabilitation, removal of architectural barriers, homeownership assistance, owner-occupied home assistance, property acquisition and demolitions, and lead-paint remediation. The spending and activity of these programs often correlates to the patterns presented earlier.

The map below shows a black diamond at each address where OPED has allocated program monies for one of the above programs. The map shows those tracts in gray where home values are less than $50,000.
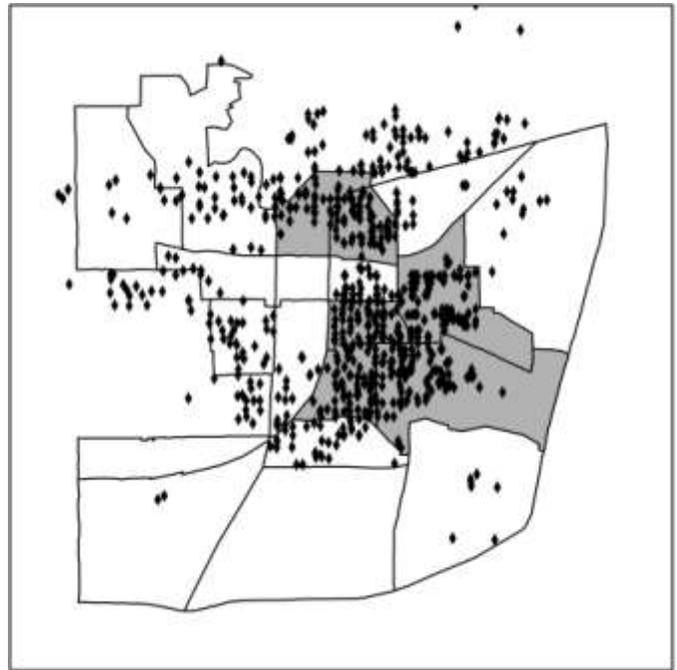

Figure 9. Housing Assistance

The next map shows the various Housing Assistance programs administered by OPED. Grants to individual citizens are the black diamonds. The white triangles are grants funding non-profit agencies for accessibility, rehabilitation and new construction. The grants to the non-profits can be over $100,000. Since 2000, the few non-profit grants value about $1 million, while the more numerous individual grants total about $3 million.
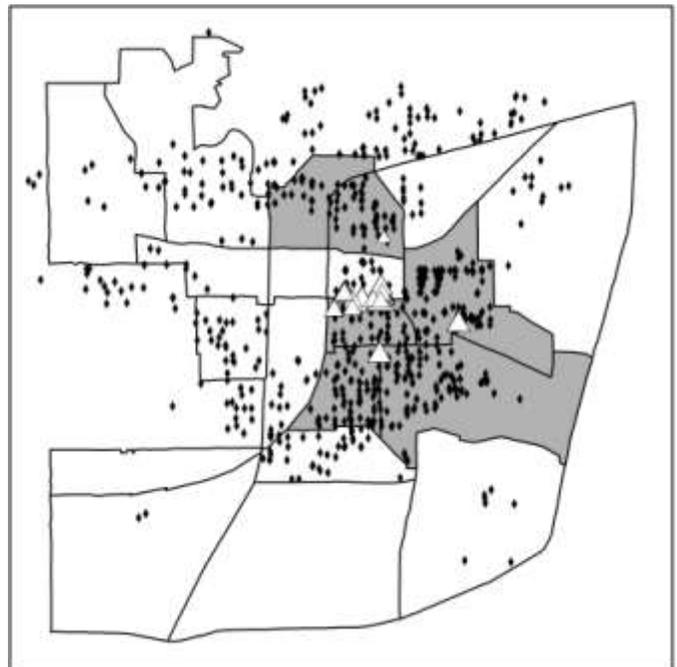

Figure 10. Housing Assistance

The map below shows a black diamond locating each demolition paid by OPED. The census tracts with a gray shade have median home values of less than $50,000 while those tracts with a home value of more than $50,000 are white. The housing age "pies" are also shown.
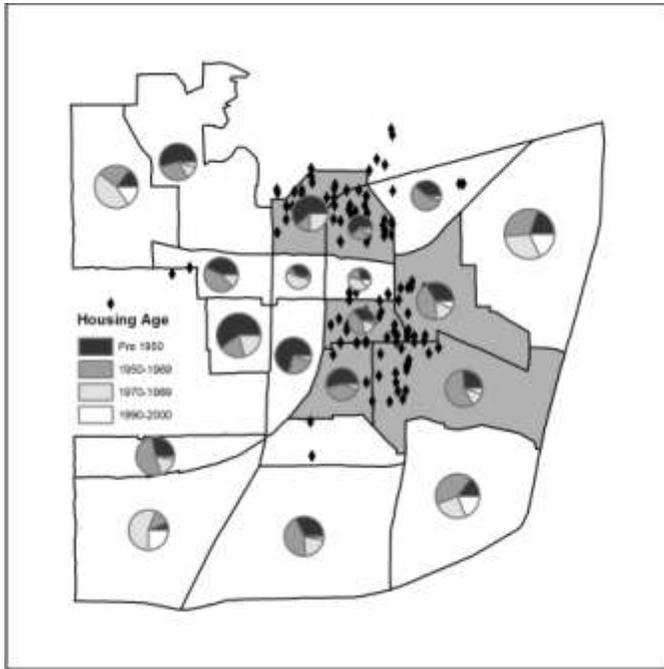

Figure 11. Demolition

Lead- paint mitigation is a recent project. This complex map shows housing age and children 5 years and less with an overlay of those addresses (black diamonds) receiving funds to mitigate lead hazards.
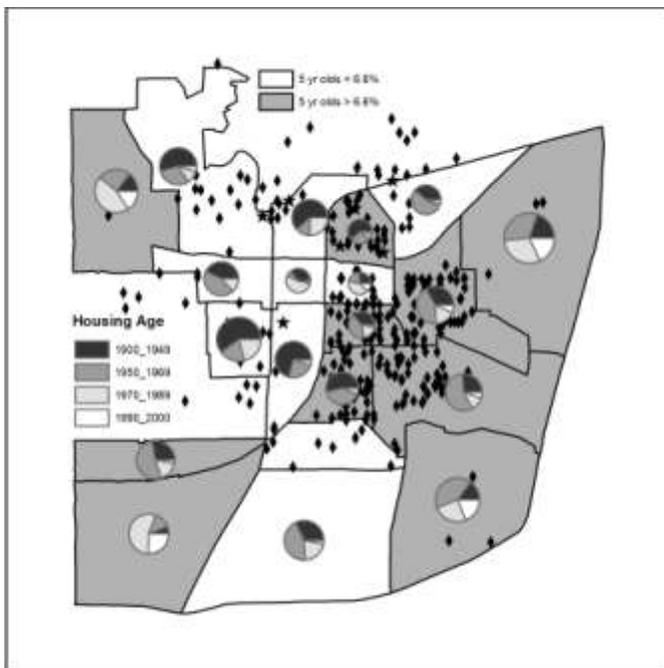

Figure 12. Lead Paint

There are also "stars" on the map showing where mitigation occurred due to a lead-poisoned child. Note the spatial correlation among the "at-risk" population, housing age, and program spending.

Lessons & Summary

OPED learned that visualization techniques can help make sense of many tables of statistics and demographics. This spatial analysis represents a new way - a clear and succinct way - of looking at its data.

OPED plans to use similar techniques to study other issues, including crime, health, education, homelessness, and business development. Housing issues for further study include housing market renewal, households without cars, utility data to determine occupant turnover, brownfields & remediation, community geographic barriers, neighborhood covenants, building codes, code enforcement, property lien forgiveness, etc.

An important lesson about GIS use is the "data silo" effect. While the City of Springfield has an active GIS department and grant data administered by other departments, these data could not be easily accessed. It is hoped that a memo-of-understanding will allow OPED access these other sources of data to allow a deeper analysis with more variables.

Also if the Census and HUD data can be accessed at a higher "resolution" it would facilitate further research. This is due to the aggregation of data by Census Tracts. OPED feels that access to statistical data by block group and even block-level would allow a more refined analysis. This resolution would also allow the City to then aggregate the block data into local geographies, such as neighborhoods, neighborhood associations, and by TIF districts.

OPED is now considering how to integrate GIS with its grant monitoring process. It is anticipated that this will help standardize records management, provide faster analysis and reporting, and improved data sharing among other City data users.

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Authors

Keith Cunningham has been working with GIS since 1985. He holds a PhD in Geography from the University of Kansas. Keith's first professional job was with the Census Bureau in Kansas City as a Statistician. Then for five years he helped build a GIS consulting firm specializing in telecoms. In 1993 he founded Spatial Data Research, which he sold 11 years later. Now he is President of Mobile Mapping Corporation.

Jan Sorenson is the Operations Director for the City of Springfield, Office of Planning and Economic Development. Jan has been with the City for 20 years, ensures compliance with CDBG & HOME regulations, and has authored the CDBG Consolidated Planning for the past 10 years.

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