

Shrinking Cities: Are We Siting Affordable Housing in Neighborhoods of Opportunity?

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Preliminary Analysis From

2013 HUD Sustainable Communities Research Grant (SCRG)

“Sustainable Affordable Housing in Shrinking US Cities:
Developing an Analytic Tool for Siting Subsidized Housing
and Evaluating HUD Program Outcomes.”

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General Project Focus

- Examine the location of HUD subsidized housing in shrinking cities
- Identify any linkages between anchor institutions and affordable housing
- Develop a housing suitability model (HSM) to use when siting affordable housing in neighborhoods of opportunity

Project Area

The 10 fastest shrinking cities in the US between 2000 and 2010

CITIES	PERCENT POPULATION CHANGE 2000-2010
Birmingham, AL	-12.6
Buffalo, NY	-10.7
Cincinnati, OH	-10.4
Cleveland, OH	-17.2
Dayton, OH	-14.8
Detroit, MI	-22.2
New Orleans, LA	-29.1
Pittsburgh, PA	-8.6
Toledo, OH	-8.4
Youngstown, OH	-18.3

Source: Frey, W.H. (2012). *Population growth in metro America since 1980: Putting the volatile 2000s in perspective*. Washington D.C.: Metropolitan Policy Program at Brookings.

General Research Question for Today

Is HUD subsidized housing located in *neighborhoods of opportunity*?

- **Some characteristics of neighborhoods of opportunity:**
 - **Low levels of socio-economic distress**
 - **Mixed income / racially diverse / multi-generational**
 - **Mix of housing opportunities (tenure mix, tiers of housing present)**
 - **Accessible to transit, walkable, etc.**
 - **Density of public services and amenities (libraries, museums, parks, public safety)**
 - **Proximate to job/employment clusters**
 - **Proximate to anchor institutions (eds & meds, etc.)**
 - **access high performing public schools**

Preliminary Analysis

Regression models for the 10 cities in the aggregate
&
case studies (Pittsburgh & Detroit)

Summary of the 10 Cities

Population, Housing
&
Institutional Characteristics

Geography of HUD Subsidized Housing in the 10 Cities

	Core City Tracts (n=1,228)	Suburban Tracts (n=3,438)	All Tracts (n=4,666)
HUD subsidized households 2012	163,292	178,623	341,915
% units in tracts, HUD subsidized	11.4	3.2	5.4
% of HUD subsidized units receiving housing choice vouchers	69.4	72.2	71.4
% of HUD subsidized units that were public housing	12.2	9.1	10.1

Source: US Department of Housing and Urban Development, 2012 HUD Picture of Subsidized Households Database

2012 Population Characteristics of the 10 Cities

	Core City Tracts (n=1,228) Pop. = 3.1 million
% black	56.8
% less than a high school education	19.5
Median household income (\$)	32,588
% unemployed	19.2
% public transit to work	10.7
Median gross rent as a % of household income	38.5
% below poverty	32.7
% households with social security income	28.8
% households with SSI	6.9
% public assistance/SNAP	30.3
GINI index of income inequality (0= none, 1=perfect inequality)	0.47

Housing Characteristics of the 10 Cities

	Core City Tracts (n=1,228)
Housing units	1,602,467
Median year built	1948
% single family homes	61.5
Median value (\$)	104,886
% owner occupied	48.4
% renter occupied	51.6
% vacant	22.3
%vacant “other”	54.8

Sources: US Census, American Community Survey 2012 5yr estimates; and US Census

Factors Representing Socio-Economic Characteristics

Principal Component Factor Analysis of Variables (n=19) Measuring Census Tract Characteristics in US Shrinking Cities

Components Extracted	% of Variance Accounted for by Component	Eigenvalue
SOCIO-ECONOMIC DISTRESS	39.6	7.5
SINGLE-FAMILY SETTING	12.9	2.5
SOCIAL SECURITY COHORT	8.0	1.5
INCOME INEQUALITY (MIXED-INCOME SETTING)	5.8	1.1

Note: the natural log of median household income and median housing value were used in the factor analysis

Institutional Characteristics of the 10 Cities

	Core City Tracts (n=1,228)
% of tracts with a hospital	12.5
% of tracts with a college/university	4.6
% of tracts with a public library	12.9
% of tracts with a park	49.9
% of tracts on a public transit line	97.2
% of tracts with at least one school	53.1
% of tracts with at least one school meeting AYP in 2012	18.7
% of tracts with at least one school not meeting AYP in 2012	34.8
Ratio of total jobs to total population	.92

Sources: ESRI supplemented with sources from: respective federal, state and local agencies, 2012 and Google Maps; Respective state's education department 2012; US Department of Justice / FBI, Uniform Crime Report Data 2010; US Census, 2011 LEHD Origin-Destination Employment Statistics (LODES).

Multiple Linear Regression Results for the Percent of Total Housing HUD Subsidized in US Shrinking Cities		
Variable Name	Core City Tracts (n=1,228)	
	b	β
CONSTANT	10.167***	
SOCIO-ECONOMIC DISTRESS	4.730***	.368***
SINGLE FAMILY SETTING	-3.459***	-.297***
SOCIAL SECURITY COHORT	-1.018**	-.075**
INCOME INEQUALITY (MIXED-INCOME SETTING)	-1.306*	-.054*
Percent of HUD subsidized units with housing choice vouchers (HCVs)	-.115***	-.296***
Percent of HUD subsidized units that were public housing	.143***	.245***
Ratio of jobs per tract to total tract population	-.112	-.019
Public transit line in a tract	1.664	.018
Hospital in a tract	.541	.013
College/university in a tract	.930	.014
Public library in a tract	.952	.024
Park in a tract	-.265	-.010
At least one school in a tract	-1.596	-.058
At least one school in a tract that met AYP in 2012	.016	-.001
At least one school in a tract did not meet AYP in 2012	1.158	.041
Adjusted R-square	.494***	

*p<.05, ** p<.01, ***p<.001

Case Study 1

Pittsburgh, PA

Geography of HUD Subsidized Housing in Pittsburgh, PA

	Core City Tracts (n=137)
HUD subsidized households 2012	17,962
% units in tracts, HUD subsidized	11.7
% of HUD subsidized units receiving housing choice vouchers	61.2
% of HUD subsidized units that were public housing	16.1

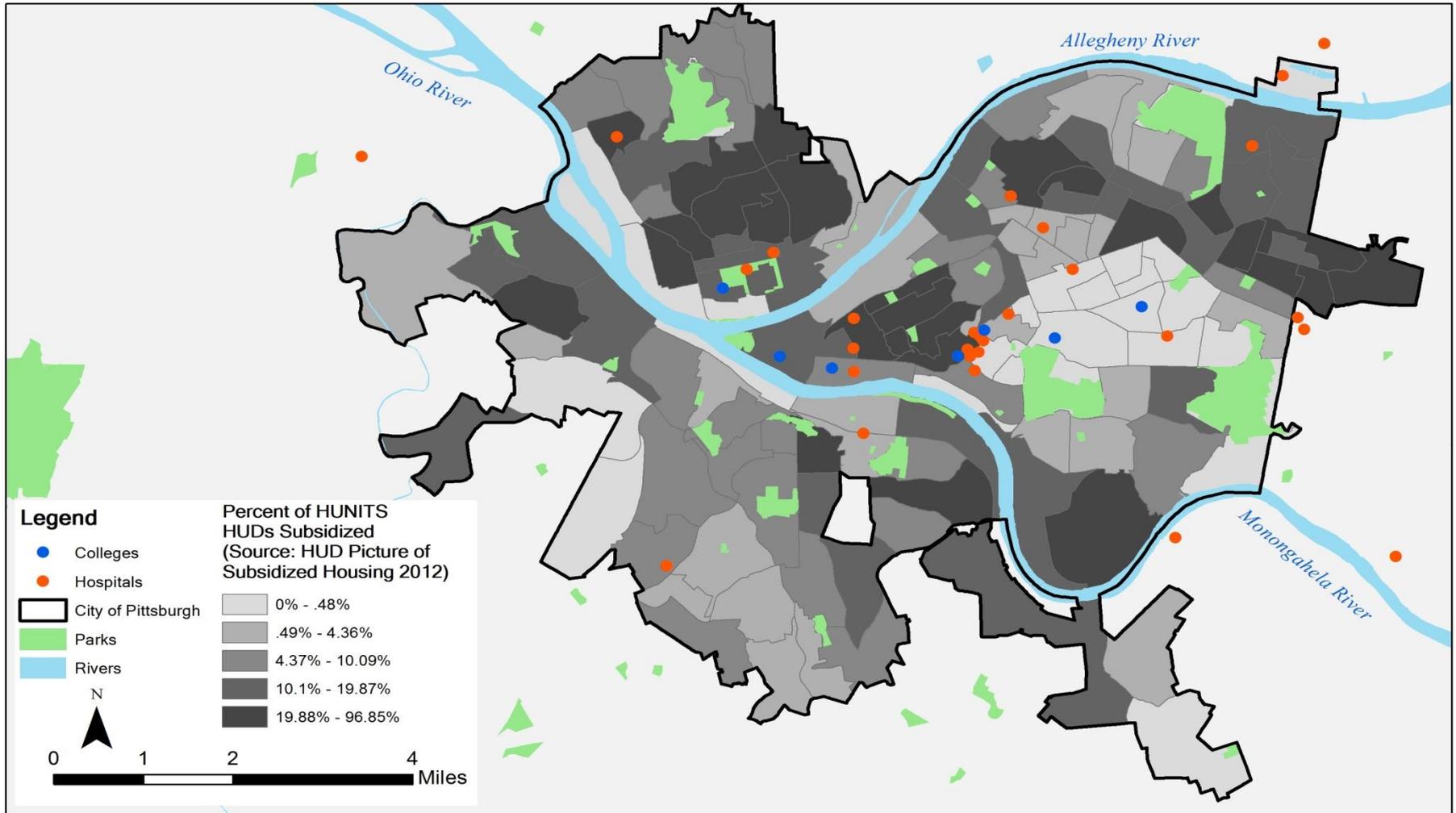
Source: US Department of Housing and Urban Development, 2012 HUD Picture of Subsidized Households Database

Location of HUD Subsidized Housing Units

(Public Housing, HCV, Moderate Rehab, Sec236, project-based Sec8, multi-family other)

Percent of HUNITS HUDs Subsidized

City of Pittsburgh

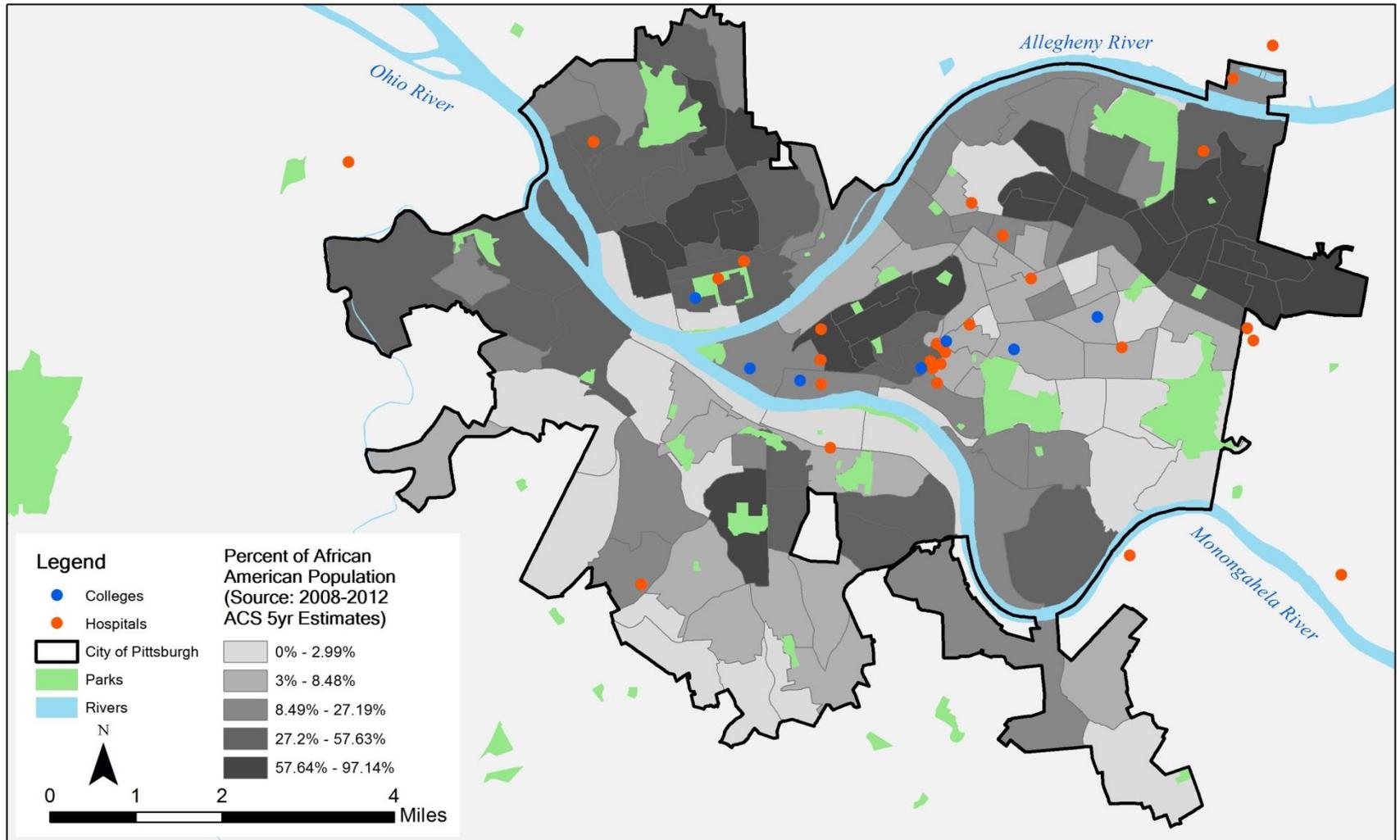


2012 Population Characteristics of Pittsburgh, PA

	Core City Tracts (n=137) Pop. = 306,430
% black	30.3
% less than a high school education	11.3
Median household income (\$)	40,601
% unemployed	10.9
% public transit to work	20.8
Median gross rent as a % of household income	32.4
% below poverty	24.0
% households with social security income	28.3
% households with SSI	7.6
% public assistance/SNAP	19.9
GINI index of income inequality (0= none, 1=perfect inequality)	.48

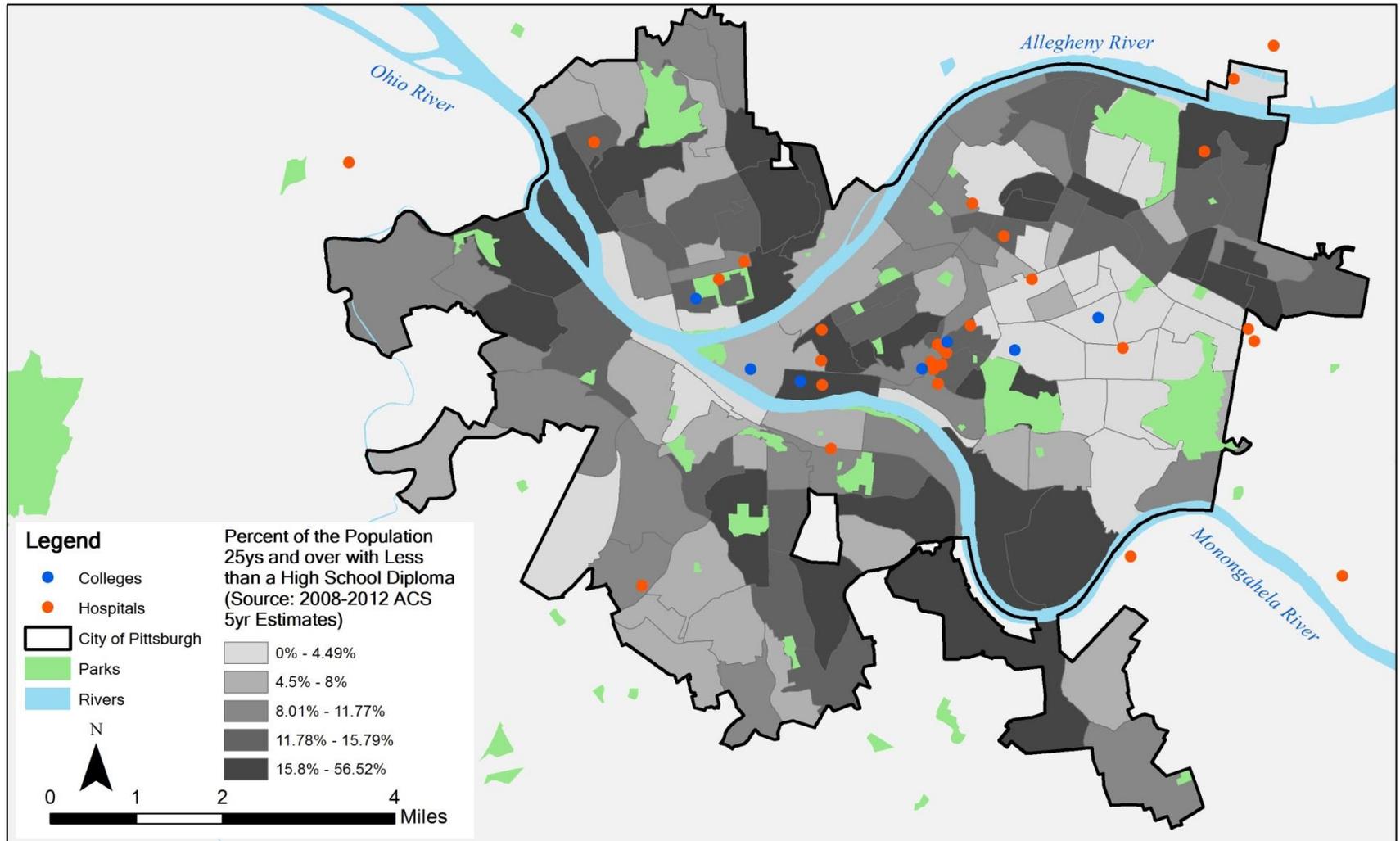
Race ↔ Socio-Economic Distress

Percent of African American Population City of Pittsburgh



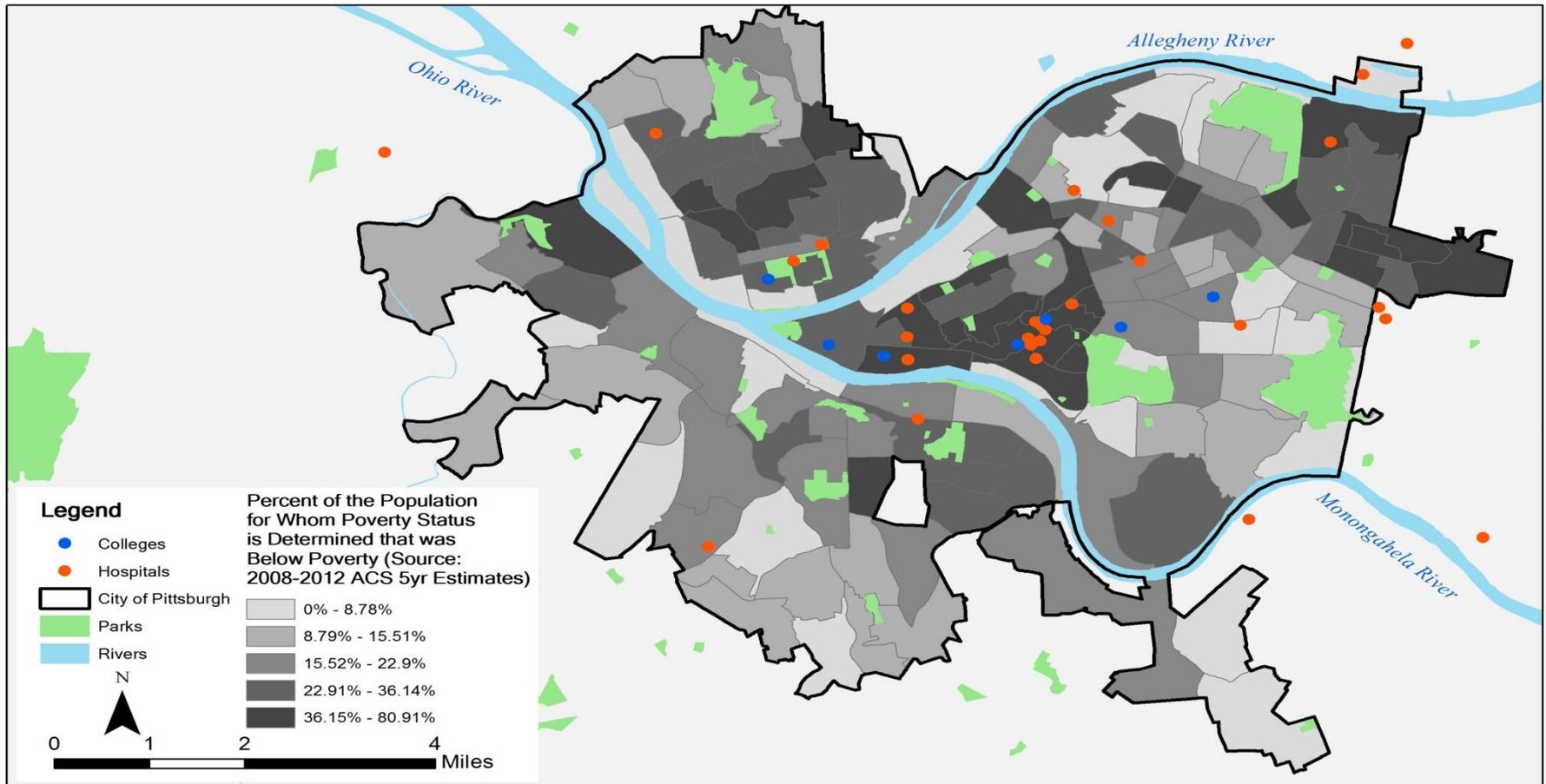
Education ↔ Socio-Economic Distress

Percent of the Population 25ys and over with Less than a High School Diploma
City of Pittsburgh



Poverty ↔ Socio-Economic Distress

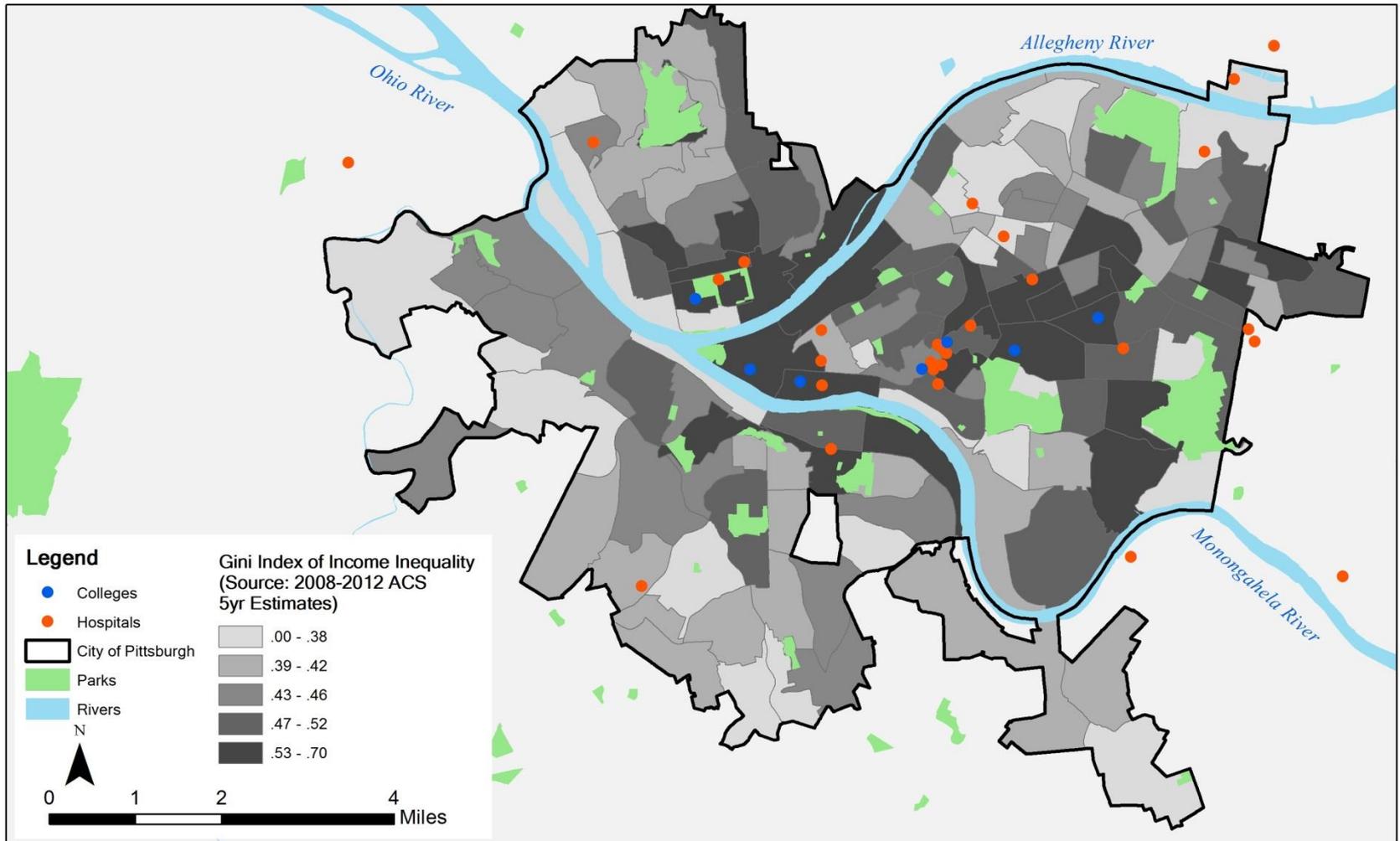
Percent of the Population for Whom Poverty Status is Determined that was Below Poverty
City of Pittsburgh



GINI index ↔ Income Inequality

Gini Index of Income Inequality

City of Pittsburgh



2012 Housing Characteristics of Pittsburgh, PA

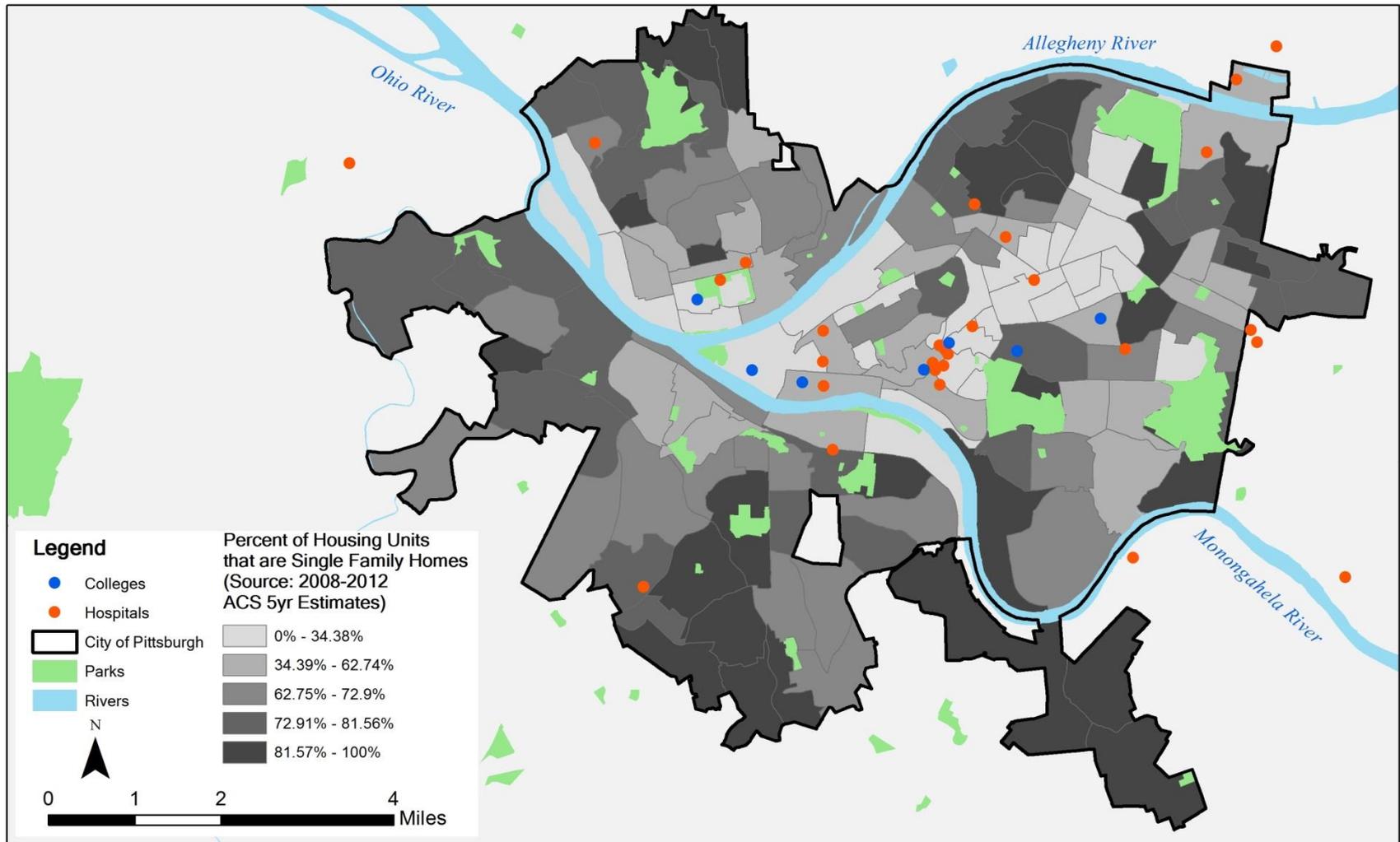
	Core City Tracts (n=137)
Housing units	157,228
Median year built	1945
% single family homes	62.7
Median value (\$)	104,886
% owner occupied	49.8
% renter occupied	50.2
% vacant	15.4
% vacant “other”	54.3

Sources: US Census, American Community Survey 2012 5yr estimates; and US Census

Single Family Homes ↔ Single Family Setting

Percent of Housing Units that are Single Family Homes

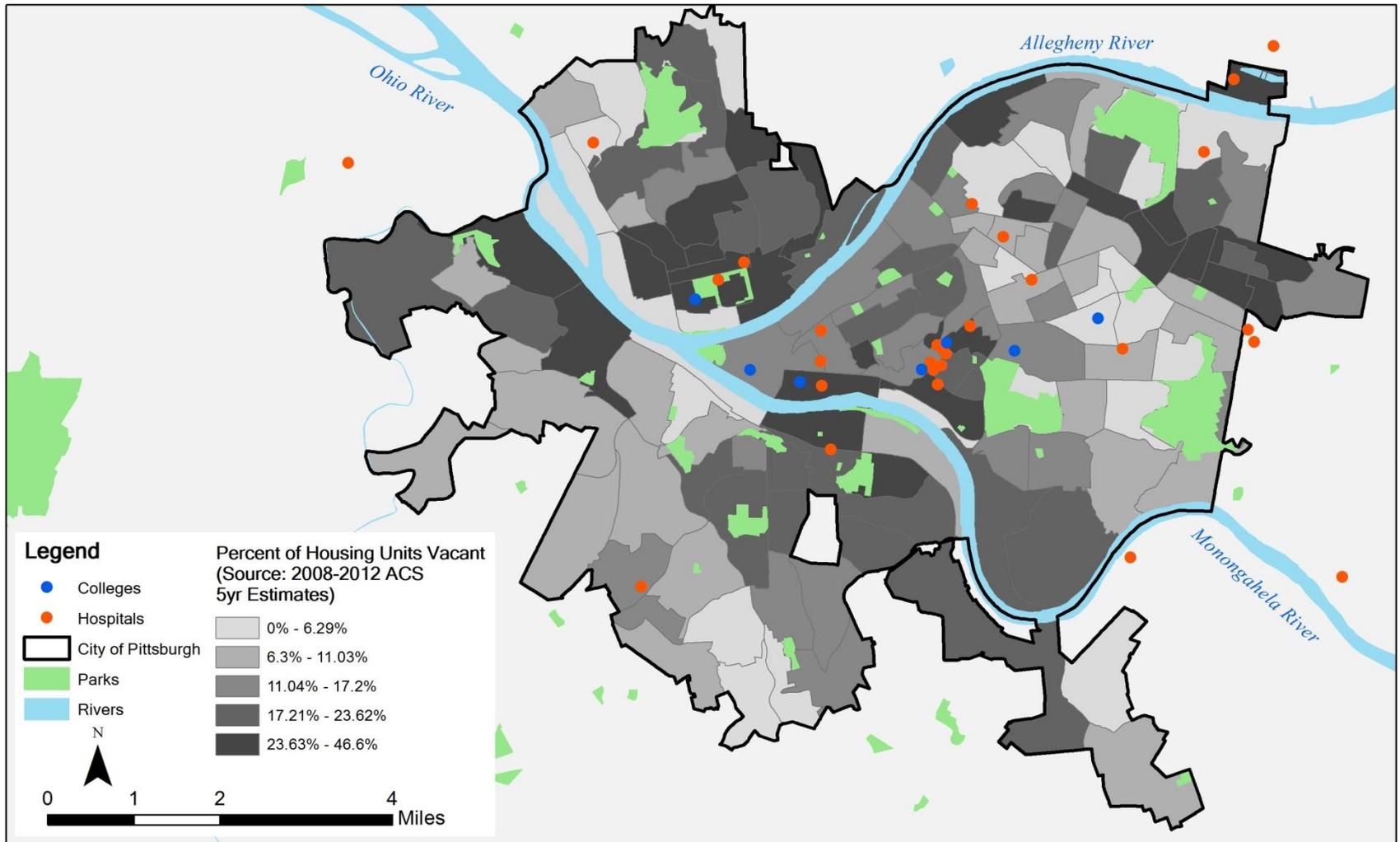
City of Pittsburgh



Vacancy ↔ Socio-Economic Distress

Percent of Housing Units Vacant

City of Pittsburgh



2012 Institutional Characteristics of Pittsburgh, PA

	Core City Tracts (n=137)
% of tracts with a hospital	13.1
% of tracts with a college/university	2.9
% of tracts with a public library	11.6
% of tracts with a park	50.4
% of tracts on a public transit line	97.1
% of tracts with at least one school	41.6
% of tracts with at least one school meeting AYP in 2012	5.8
% of tracts with at least one school not meeting AYP in 2012	33.6
Ratio of total jobs to total population	2.09

Sources: ESRI supplemented with sources from: respective federal, state and local agencies, 2012 and Google Maps; Respective state's education department 2012; US Department of Justice / FBI, Uniform Crime Report Data 2010; US Census, 2011 LEHD Origin-Destination Employment Statistics (LODES).

Multiple Linear Regression Results for the Percent of Total Housing HUD Subsidized in Pittsburgh

Variable Name	Core City Tracts (N=137)	
	b	β
CONSTANT	11.075	
SOCIO-ECONOMIC DISTRESS	10.628***	.618***
SINGLE FAMILY SETTING	-3.897**	-.235**
SOCIAL SECURITY COHORT	1.091	.082
INCOME INEQUALITY (MIXED INCOME SETTING)	-3.619*	-.120*
Percent of HUD subsidized units with housing choice vouchers (HCVs)	-.115***	-.265***
Percent of HUD subsidized units that were public housing	.068	.107
Ratio of jobs per tract to total tract population	.240	.038
Public transit line in a tract	1.339	.015
Hospital in a tract	-1.637	-.036
College/university in a tract	-3.453	-.043
Public library in a tract	2.955	.069
Park in a tract	.396	.013
At least one school in a tract	-2.486	-.082
At least one school in a tract that met AYP in 2012	-.599	-.009
At least one school in a tract did not meet AYP in 2012	3.236	.105
Adjusted R -square	.683***	

*p<.05, ** p<.01, ***p<.001

Birmingham – Buffalo – Cincinnati – Cleveland – Dayton - New Orleans – Toledo - Youngstown

- **In General, Eight of the Other Cities Paralleled the Aggregate (& Pittsburgh's) Results:**
 - Socio-economic distress was a consistently strong indicator of where subsidized housing (particularly public housing) clustered
 - Subsidized housing was less clustered as the percent of single family homes, the social security cohort, and HCVs increased in a tract
 - There was no relationship between the concentration of subsidized housing and institutional characteristics of a tract
 - anchor institutions, public services and amenities, school performance*, transit accessibility, housing mix, employment clusters

Multiple Linear Regression Results for the Percent of Total Housing HUD Subsidized

	Birmingham	Buffalo	Cincinnati	Cleveland	Dayton	New Orleans	Toledo	Youngstown
SOCIO-ECONOMIC DISTRESS		+	+	+	+	+	+	+
SINGLE FAMILY SETTING			-	-			-	
SOCIAL SECURITY COHORT		-						
INCOME INEQUALITY (MIXED INCOME SETTING)		-				-		
% HCVs	-	-	-	-	-	-	-	-
% public housing	+	+		+				
At least one school in a tract that met AYP in 2012			+					
Adjusted R -square	.791	.640	.594	.636	.476	.669	.611	.656

Case Study 2

Detroit, MI

Geography of HUD Subsidized Housing in Detroit, MI

	Core City Tracts (n=297)
HUD subsidized households 2012	29,432
% units in tracts, HUD subsidized	6.8
% of HUD subsidized units receiving housing choice vouchers	74.9
% of HUD subsidized units that were public housing	5.6

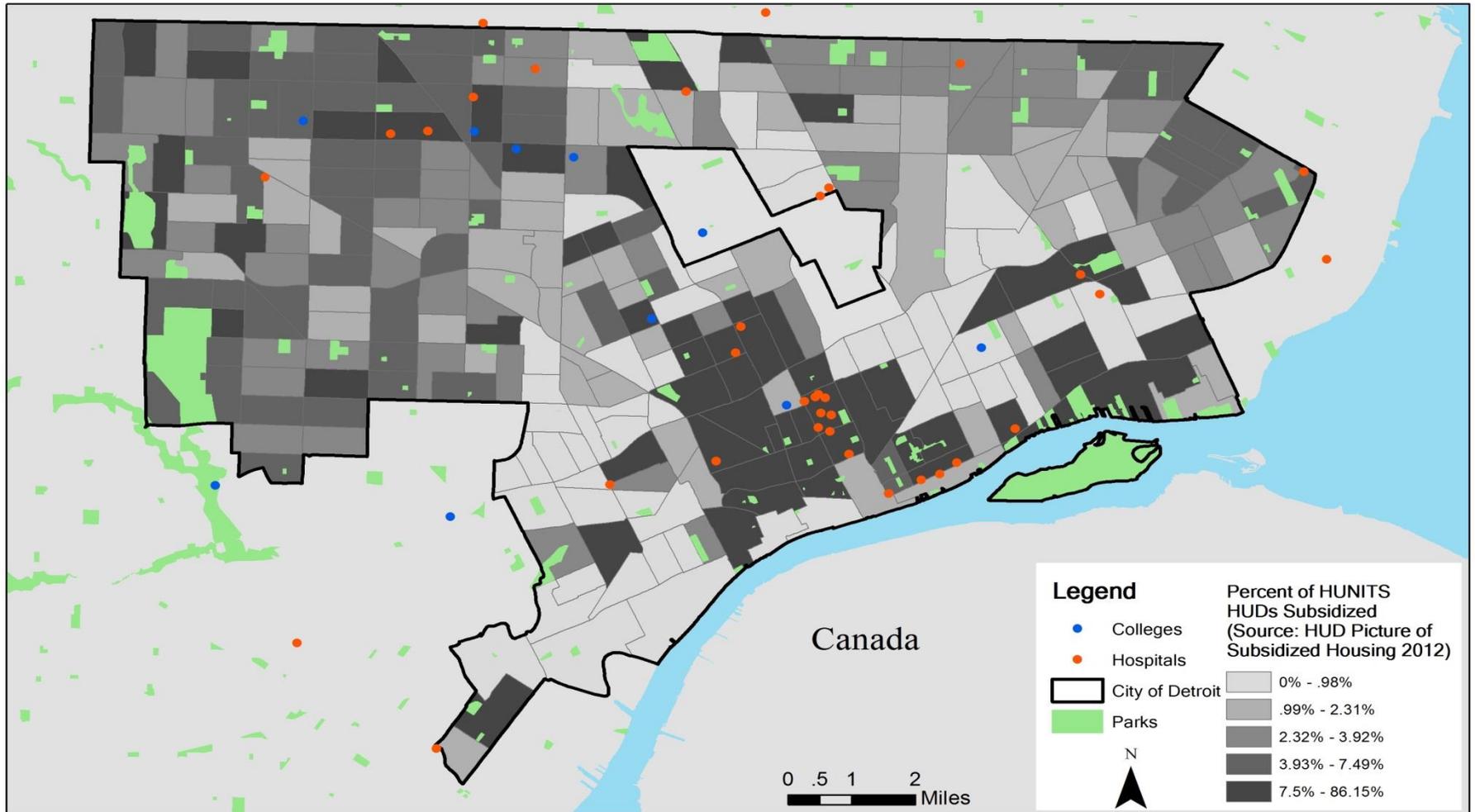
Source: US Department of Housing and Urban Development, 2012 HUD Picture of Subsidized Households Database

Location of HUD Subsidized Housing Units

(Public Housing, HCV, Moderate Rehab, Sec236, project-based Sec8, multi-family other)

Percent of HUNITS HUDs Subsidized

City of Detroit

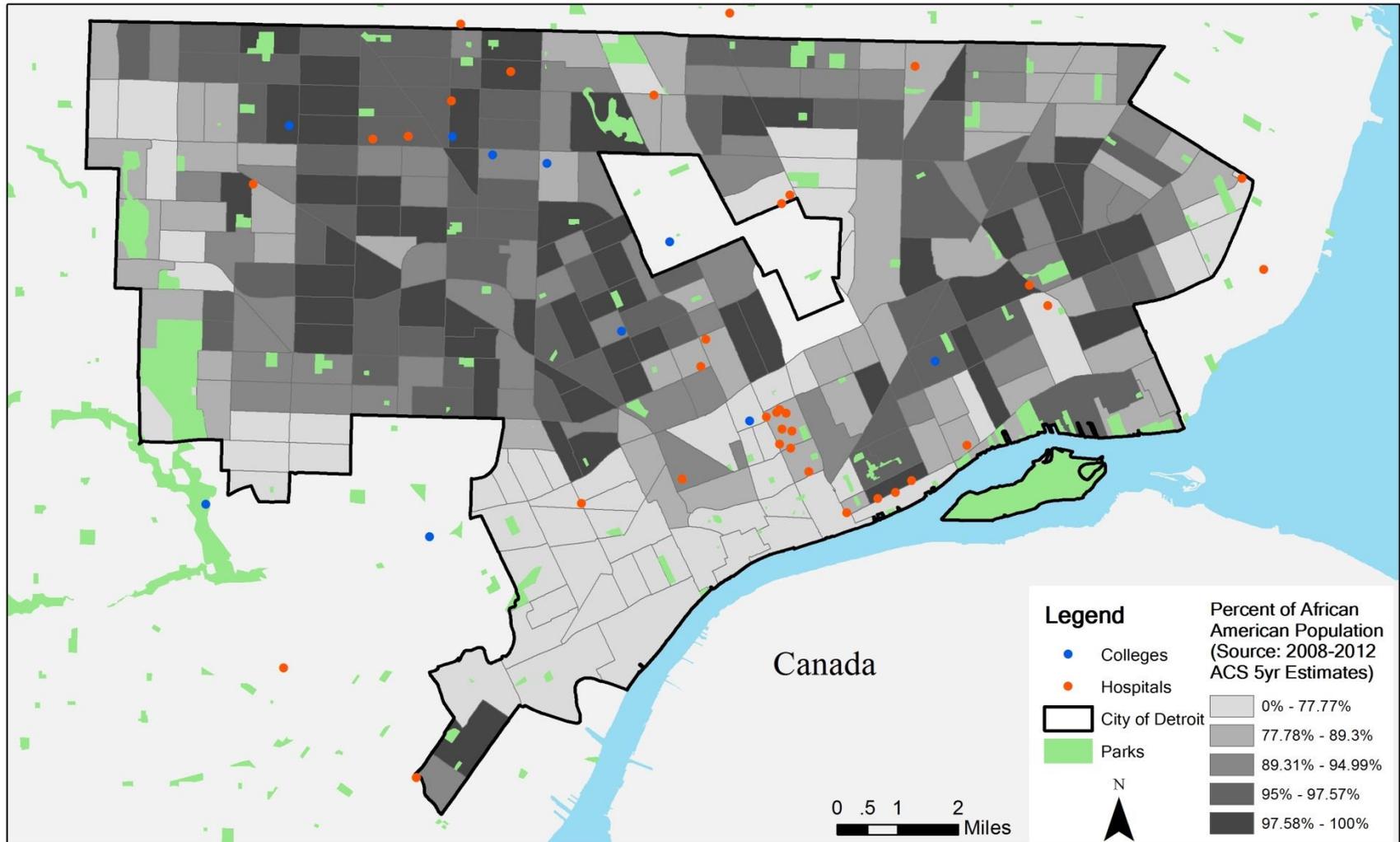


2012 Population Characteristics of Detroit, MI

	Core City Tracts (n=297) Pop. = 721,459
% black	83.4
% less than a high school education	23.6
Median Household Inc. (\$)	27,609
% unemployed	29.0
% public transit to work	10.1
Median gross rent as a % of household income	43.2
% below poverty	39.3
% households with social security income	32.0
% households with SSI	12.4
% public assistance/SNAP	40.3
GINI index of income inequality (0= none, 1=perfect inequality)	.47

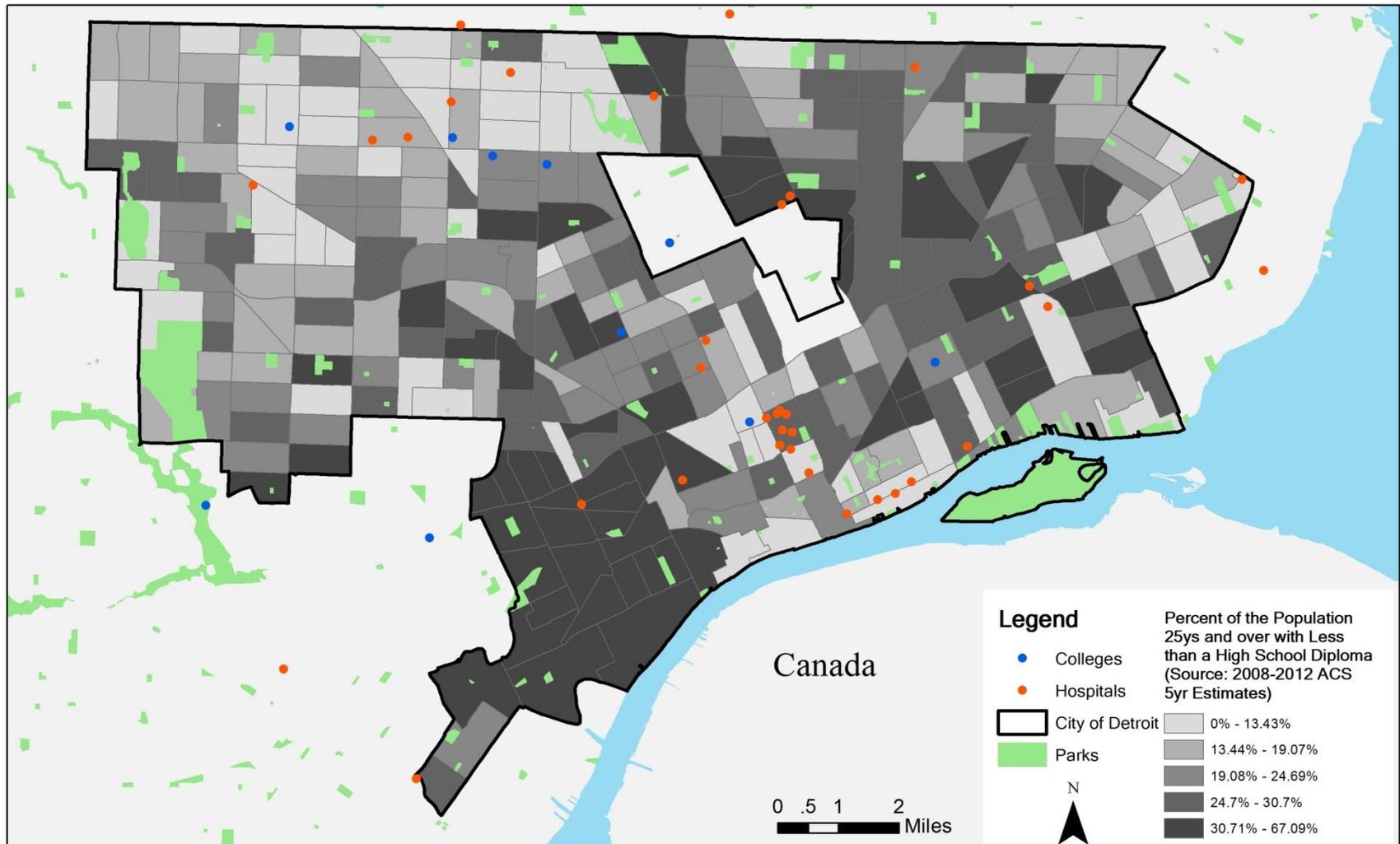
Race ↔ Socio-Economic Distress

Percent of African American Population City of Detroit



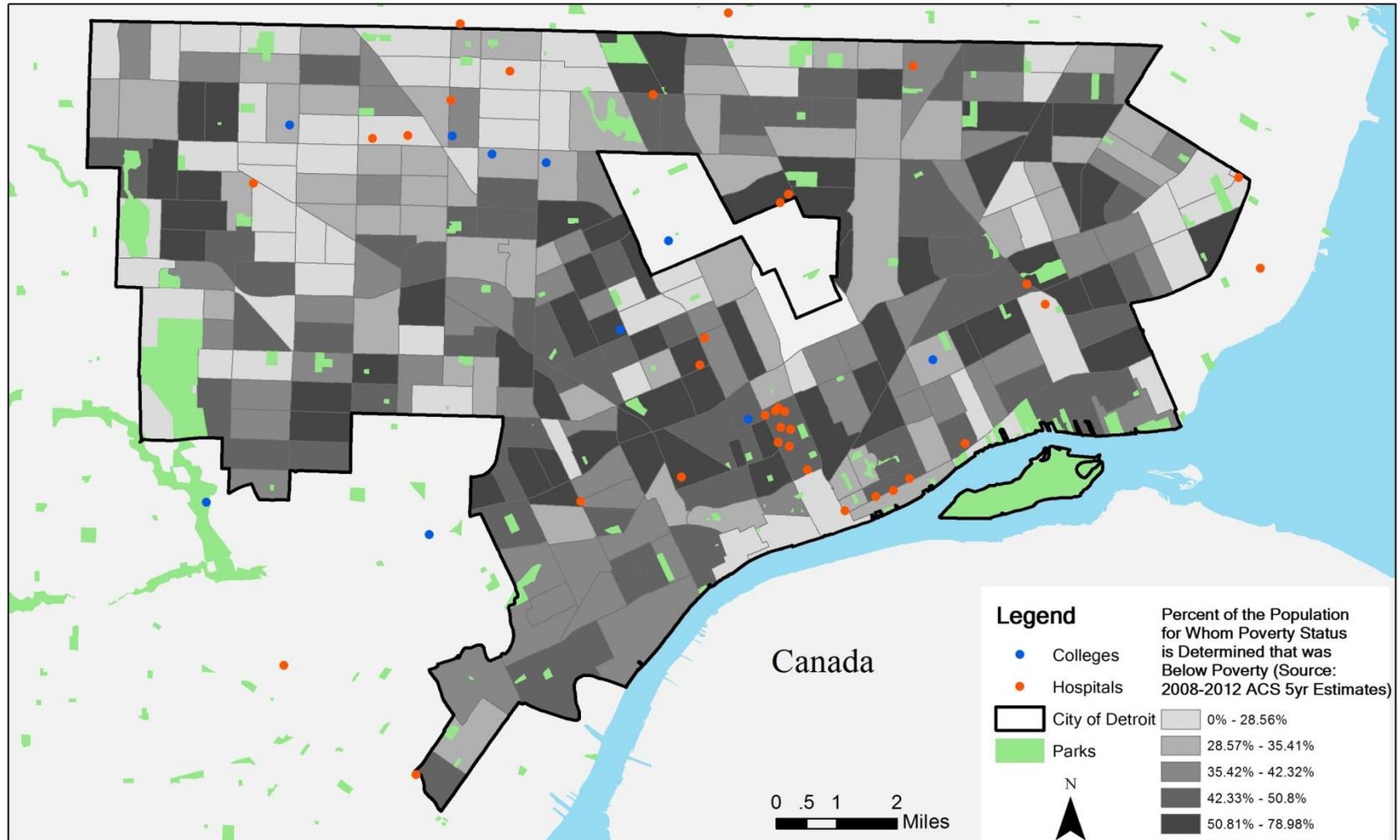
Education ↔ Socio-Economic Distress

Percent of the Population 25ys and over with Less than a High School Diploma
City of Detroit



Poverty ↔ Socio-Economic Distress

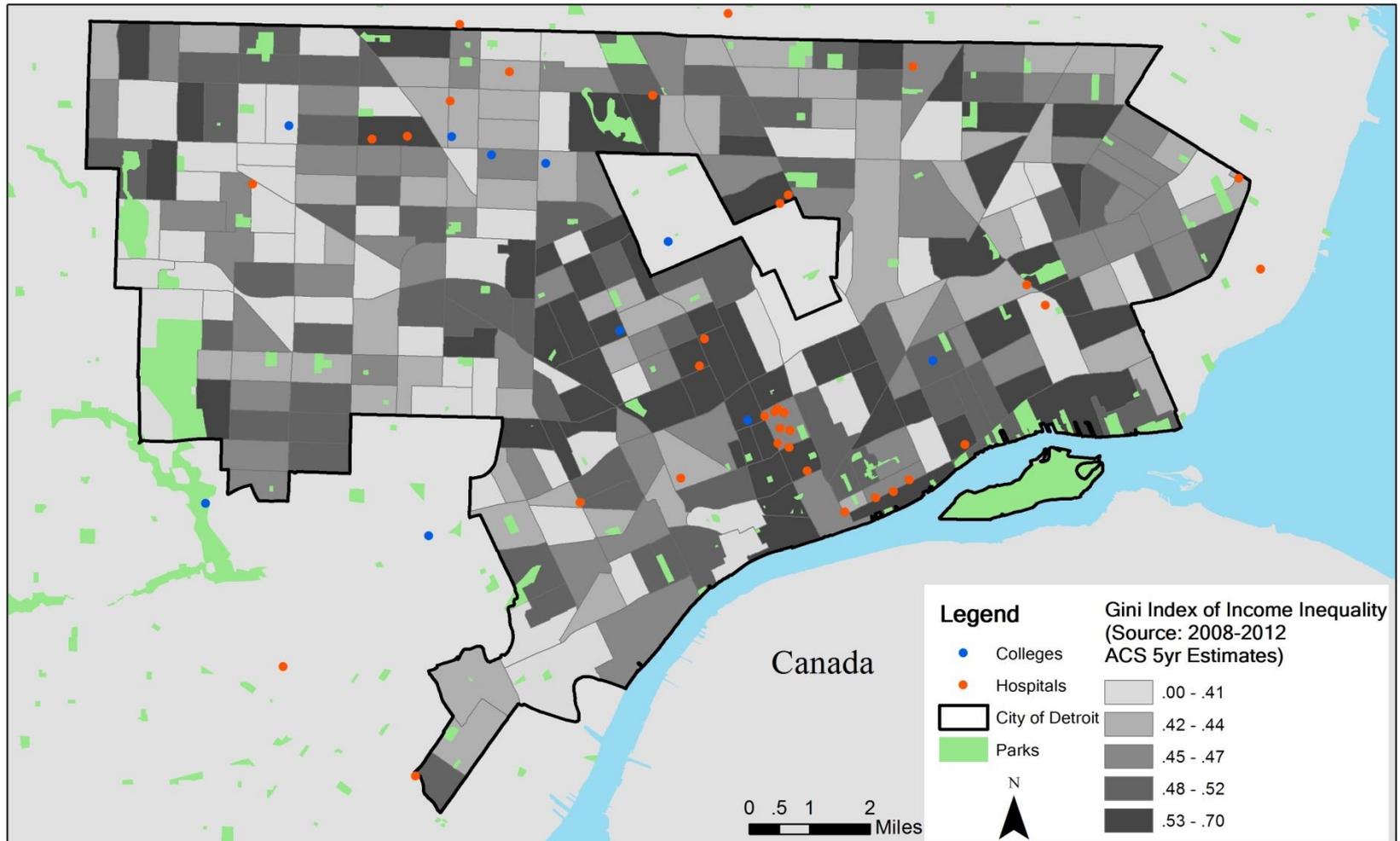
Percent of the Population for Whom Poverty Status is Determined that was Below Poverty
City of Detroit



GINI Index ↔ Income Inequality

Gini Index of Income Inequality

City of Detroit



2012 Housing Characteristics of Detroit, MI

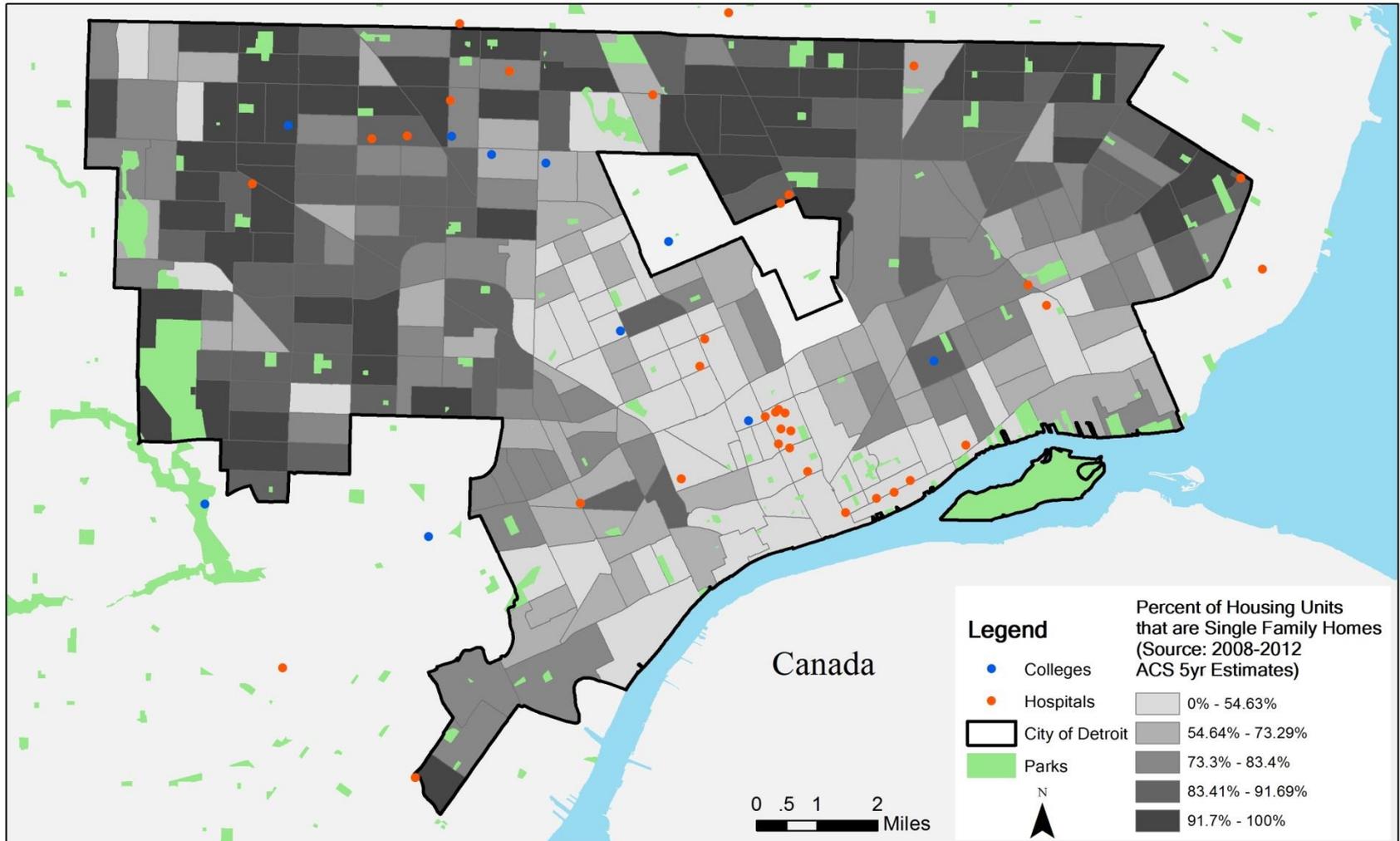
	Core City Tracts (n=297)
Housing units	363,010
Median year built	1947
% single family homes	72.8
Median value (\$)	62,621
% owner occupied	51.9
% renter occupied	48.1
% vacant	29.4
%vacant “other”	58.8

Sources: US Census, American Community Survey 2012 5yr estimates; and US Census

Single Family Homes ↔ Single Family Setting

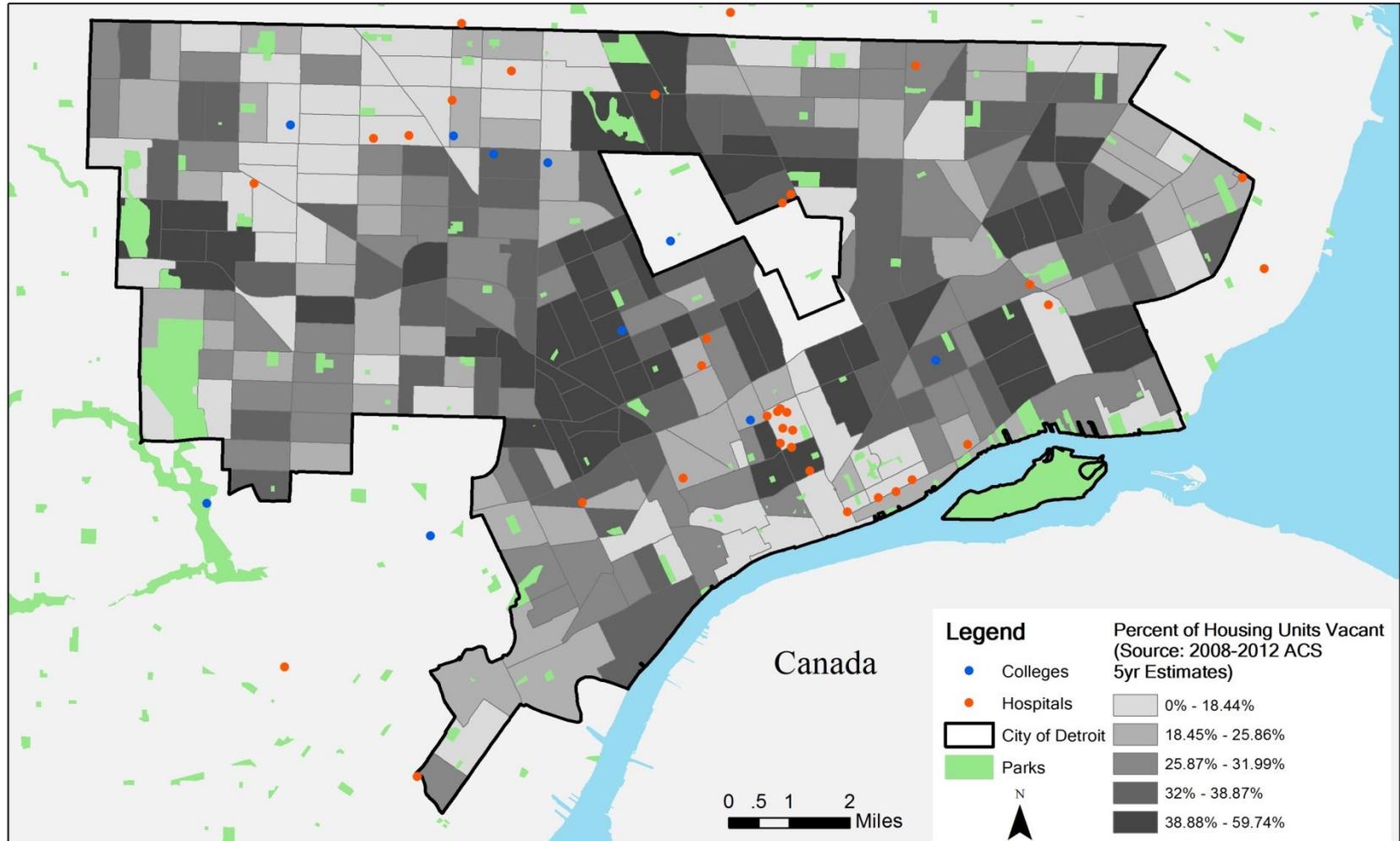
Percent of Housing Units that are Single Family Homes

City of Detroit



Vacancy ↔ Socio-Economic Distress

Percent of Housing Units Vacant
City of Detroit



2012 Institutional Characteristics of Detroit, MI

	Core City Tracts (n=297)
% of tracts with a hospital	6.7
% of tracts with a college/university	2.7
% of tracts with a public library	7.4
% of tracts with a park	35.7
% of tracts on a public transit line	97.3
% of tracts with at least one school	54.9
% of tracts with at least one school meeting AYP in 2012	18.2
% of tracts with at least one school not meeting AYP in 2012	29.6
Ratio of total jobs to total population	.52

Sources: ESRI supplemented with sources from: respective federal, state and local agencies, 2012 and Google Maps; Respective state's education department 2012; US Department of Justice / FBI, Uniform Crime Report Data 2010; US Census, 2011 LEHD Origin-Destination Employment Statistics (LODES).

Multiple Linear Regression Results for the Percent of Total Housing HUD Subsidized in Detroit

Variable Name	Core City Tracts (N=297)	
	b	β
CONSTANT	12.166**	
SOCIO-ECONOMIC DISTRESS	.621	.044
SINGLE FAMILY SETTING	-2.612***	-.269***
SOCIAL SECURITY COHORT	-2.259***	-.174***
INCOME INEQUALITY	-.642	-.031
Percent of HUD subsidized units with housing choice vouchers (HCVs)	-.106***	-.326***
Percent of HUD subsidized units that were public housing	.241***	.370***
Ratio of jobs per tract to total tract population	-.605*	-.112*
Public transit line in a tract	1.887	.026
Hospital in a tract	4.061*	.089*
College/university in a tract	7.730**	.115**
Public library in a tract	.948	.022
Park in a tract	.328	.014
At least one school in a tract	-.829	-.037
At least one school in a tract that met AYP in 2012	-1.594	-.055
At least one school in a tract did not meet AYP in 2012	1.913	.079
Adjusted R -square	.558***	

*p<.05, ** p<.01, ***p<.001

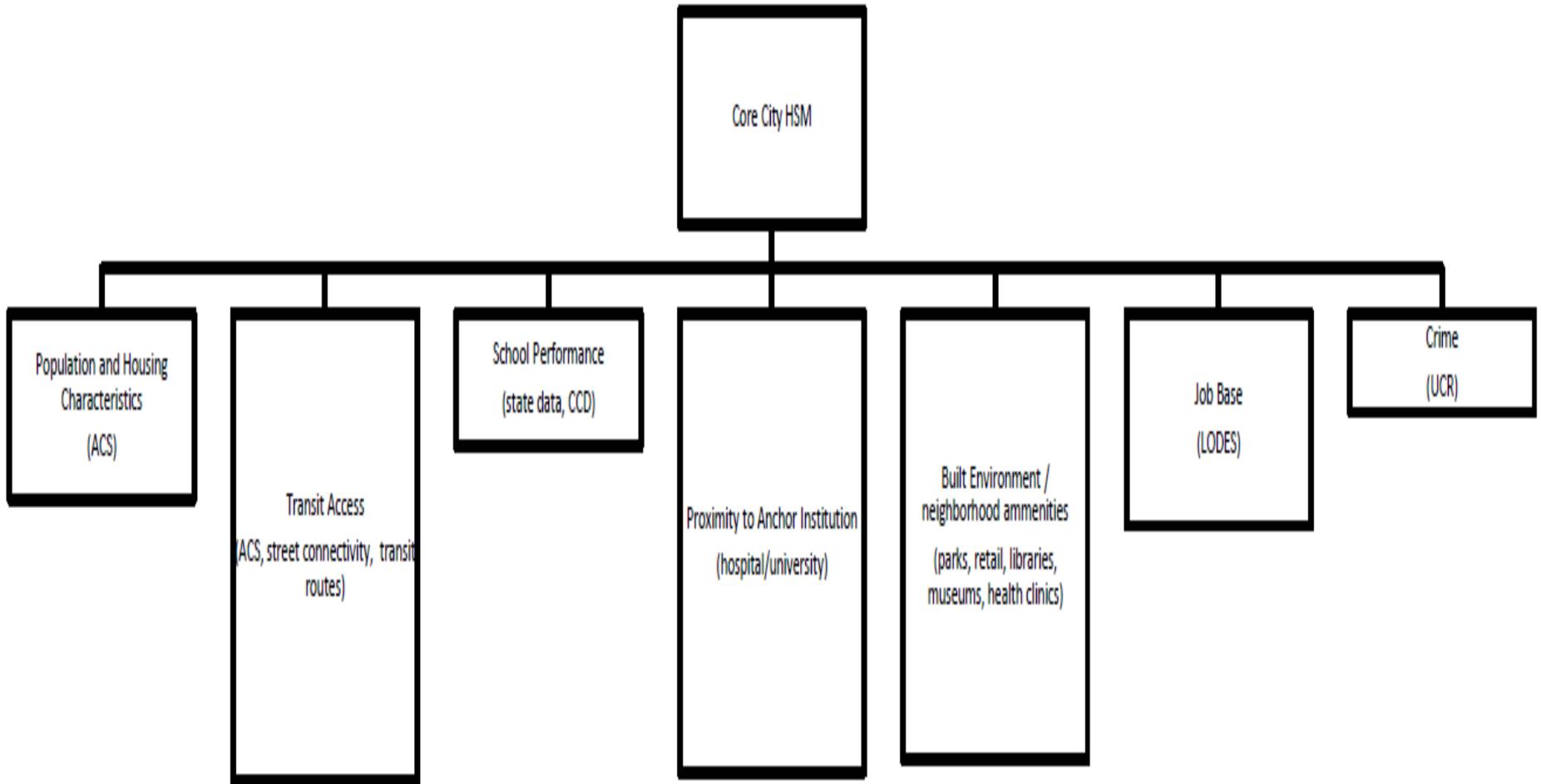
Is HUD subsidized housing located in *neighborhoods of opportunity*?

- **In the aggregate (Pittsburgh and eight of the other cities parallel these results):**
 - Socio-Economic distress was a strongest indicator of where subsidized housing (particularly public housing) clustered
 - Subsidized housing was less clustered as the percent of single family homes , the social security cohort, and HCVs increased in a tract
 - There was no relations between the concentration of subsidized housing and institutional characteristics of a tract (anchor institutions, public services and amenities, school performance, transit accessibility, housing mix, employment clusters)
- **Detroit (outlier/exception):**
 - Anchor institutions (eds and meds) were the strongest indicator of where subsidized housing (particularly public housing) clustered
 - Subsidized housing was less clustered as the percent of single family homes , the social security cohort, the concentration of jobs, and HCVs increased in a tract
 - There was no relations between the concentration of subsidized housing with socio-economic distress and other institutional characteristics of a tract (public services and amenities, school performance, transit accessibility, housing mix)



Core City Housing Suitability Model

(size of box reflects weight for HSM)



Discussion - Questions