Dynamic Neighborhood Taxonomy

A Project of

LIVING CITIES

By

RW Ventures, LLC

The Williams Institute

Dallas, May 22, 2008

Agenda

I | **Background:** The DNT Project

II | The Nature of Neighborhood Change

III | **Digging Deeper:** Specialized Drivers By Factors, Types of Neighborhood and Patterns of Change

IV | **Implications 1.0:** Dynamic, Specialized Neighborhoods

V | **Implications 2.0:** Specialized Tools - From Diagnostics to Investment

VI | **Discussion:** What Next?

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About Living Cities

"A partnership of financial institutions, national foundations and federal government agencies that invest capital, time and organizational leadership to advance America's urban neighborhoods."

LIVING CITIES PARTNERS:

AXA Community Investment Program
Bank of America
The Annie E. Casey Foundation
J.P. Morgan Chase & Company
Deutsche Bank
Ford Foundation
Bill & Melinda Gates Foundation
Robert Wood Johnson Foundation
The Kresge Foundation
John S. and James L. Knight Foundation
John D. and Catherine T. MacArthur Foundation
The McKnight Foundation
MetLife, Inc.
Prudential Financial
The Rockefeller Foundation
United States Department of Housing & Urban Development

Partners and Advisors

Participating Cities: Chicago, Cleveland, Dallas and Seattle

… And Over 70 Advisors including Practitioners, Researchers, Funders, Civic Leaders and Government Officials

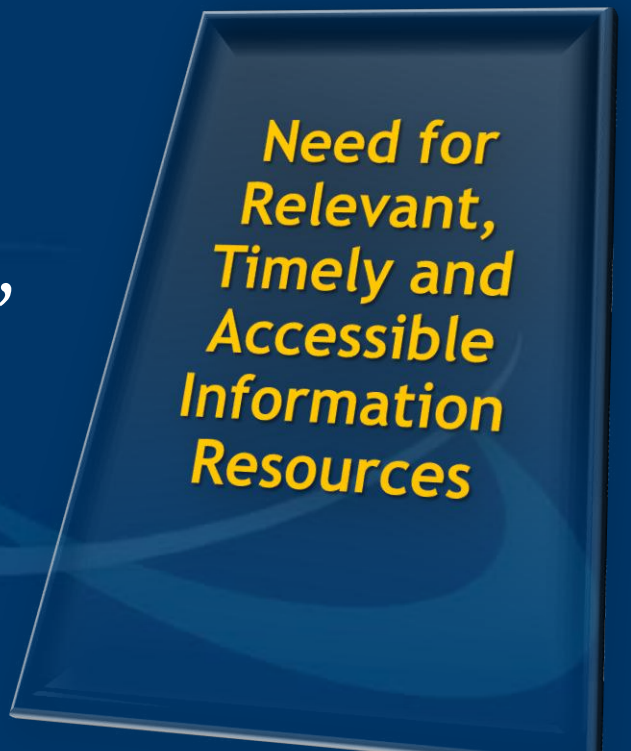
We Know Where We Want to Go...

Common Goal:

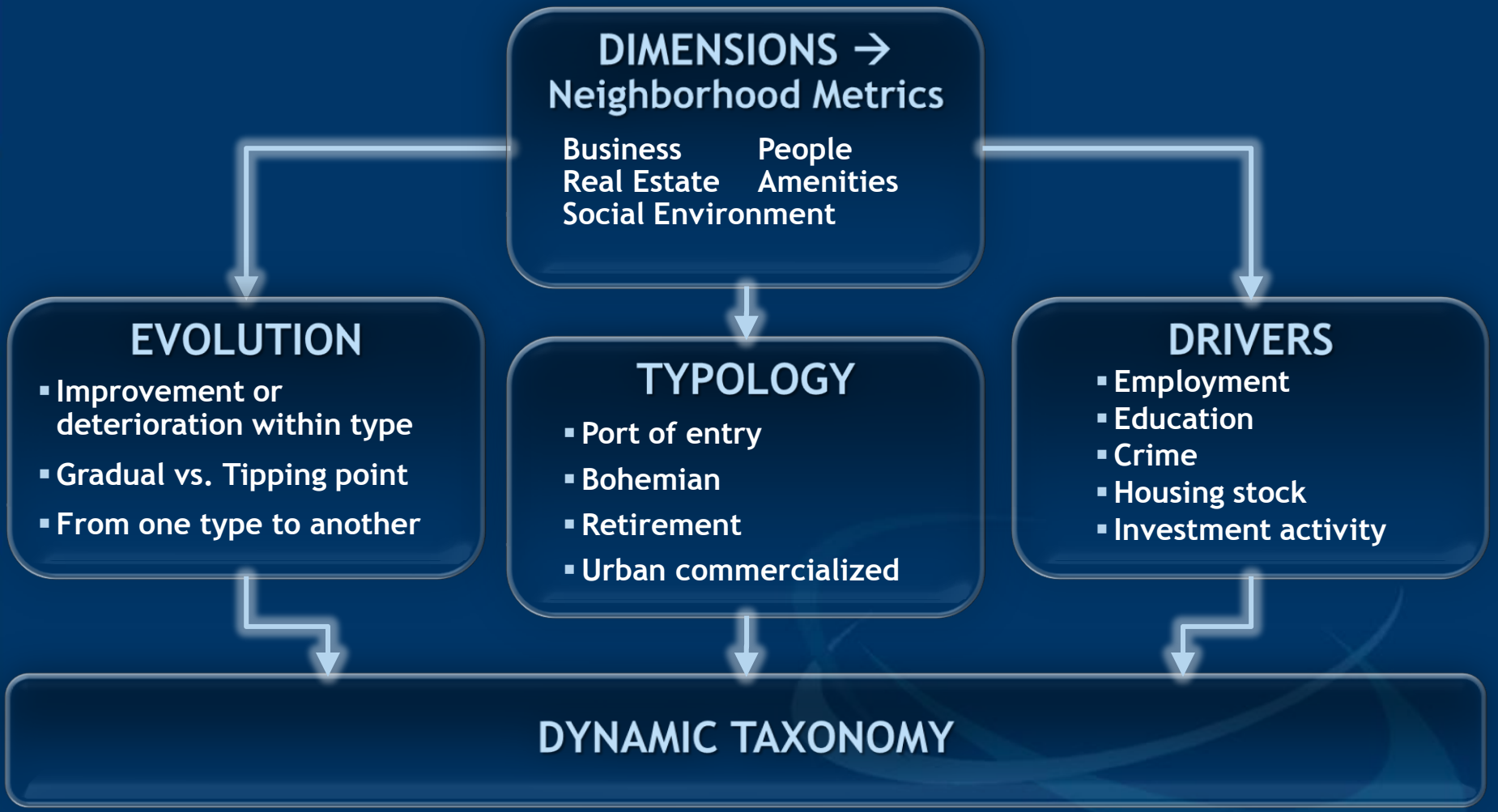
Building Healthier Communities

The Challenge: Scarce Resources, Many Options

- Community-Based Organizations: select interventions, identify assets and attract investment
- Governments: tailor policy and interventions
- Businesses: identify untapped neighborhood markets
- Foundations: target interventions, evaluate impacts



Comprehensive Neighborhood Taxonomy



Drivers Model and Data

PHYSICAL:
Distance from CBD, vacancies, rehab activity, …

TRANSPORTATION:
Transit options, distance to jobs, …

CONSUMPTION:
Retail, services, entertainment, …

PUBLIC SERVICES:
Quality of schools, police and fire, …

SOCIAL INTERACTIONS:
Demographics, crime rates, social capital…

Over 2,500 variables, spanning 15 years, covering over 2,000 census tracts

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II The Nature of Neighborhood Change

- a. Measuring Change: the RSI
- b. Overall Patterns
- c. Degree and Pace of Change
- d. Drivers of Change

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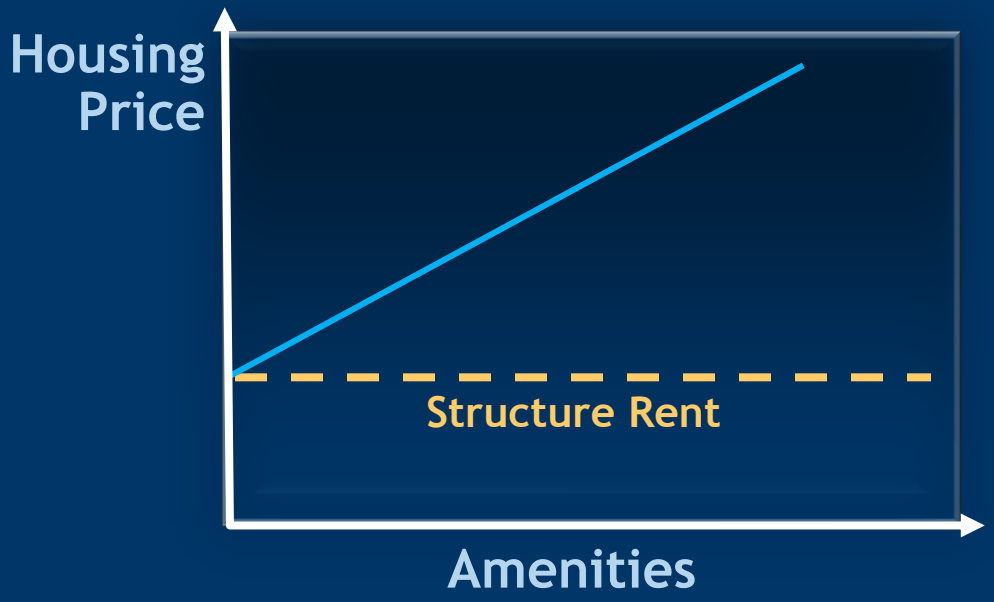
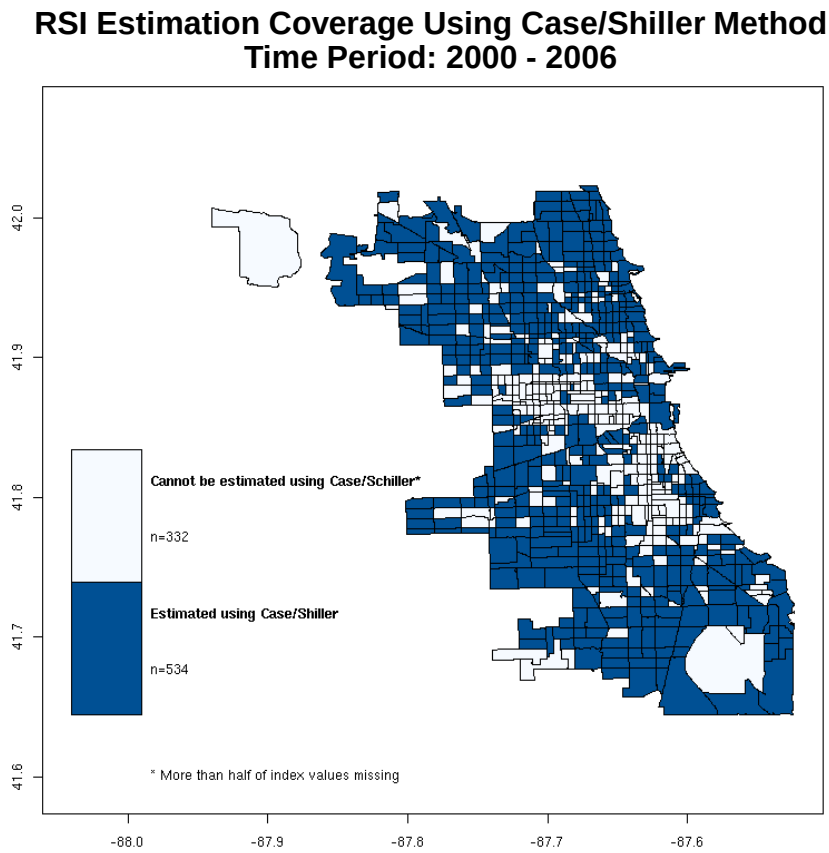
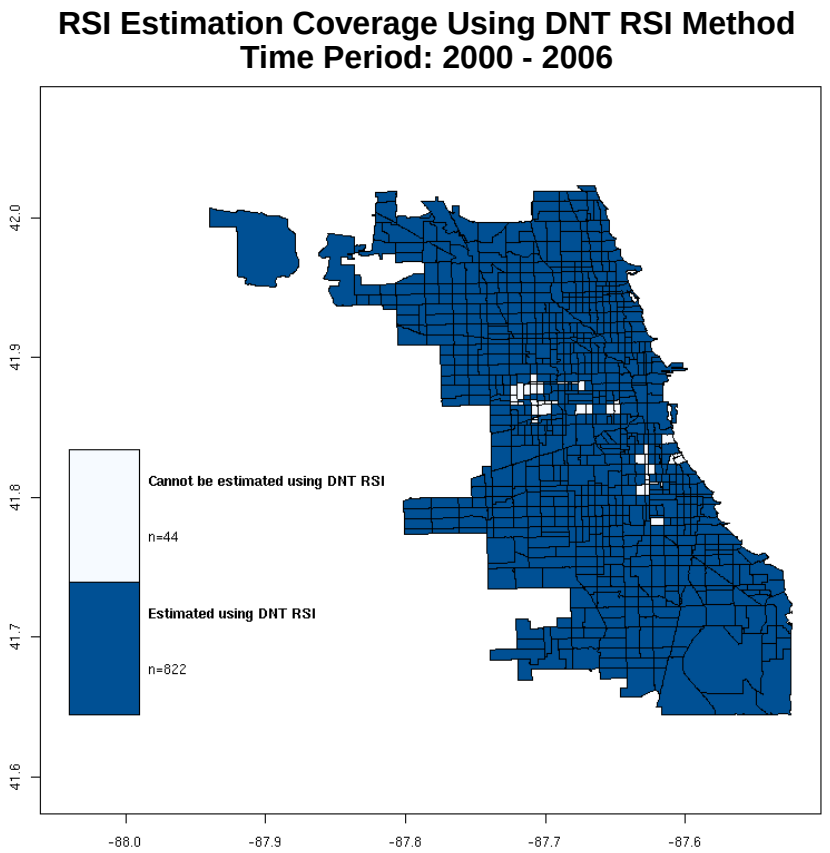
Theoretical Framework



- Use Demand for Housing as Proxy for Neighborhood Health
- Look at Quality Adjusted Housing Values to Capture Neighborhood Amenities
- Look at Change in Quantity of Housing to Account for Supply Effects

Finding a Metric that Works: The DNT RSI

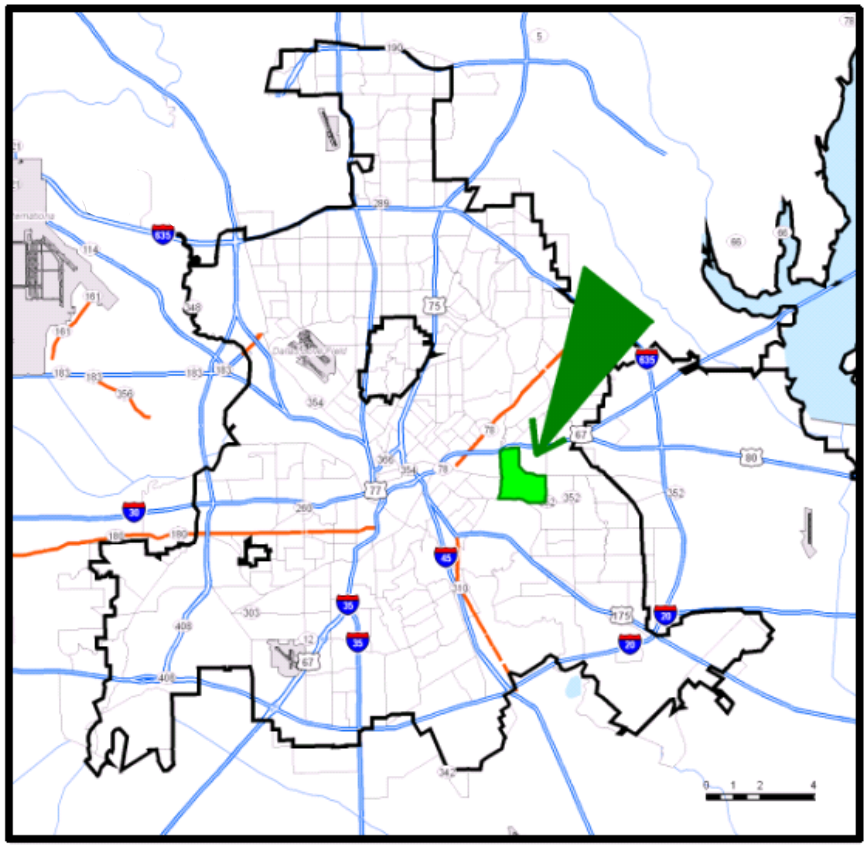




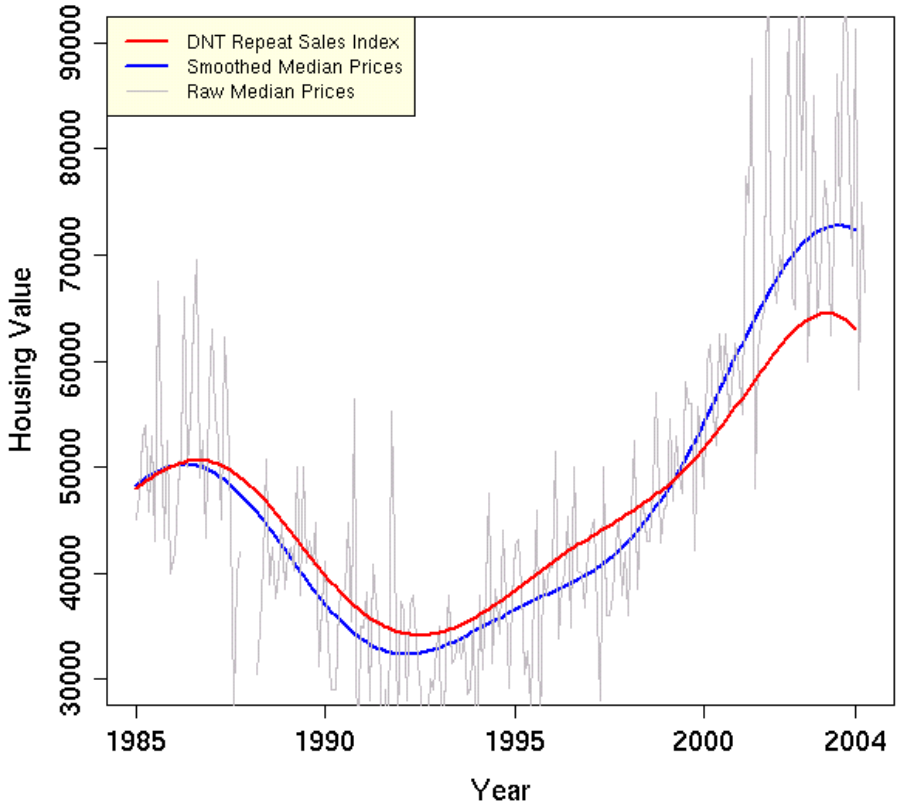
Improving upon traditional repeat sales indices, the DNT RSI can be estimated for very small levels of geography, and is more robust and less volatile.

Looking at Particular Tracts: Appreciation in Urbandale-Parkdale

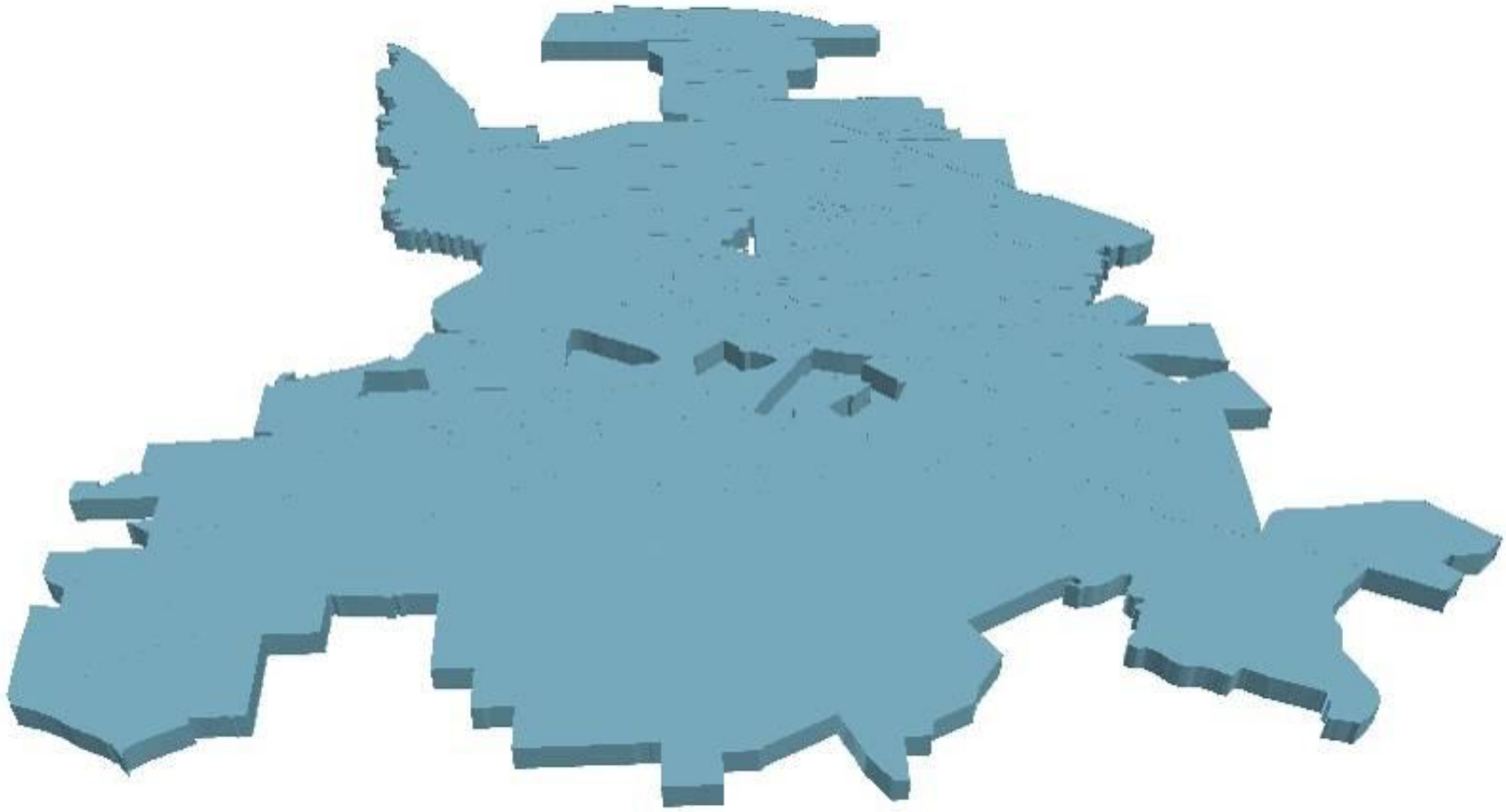
Location: Tract 008400 in Urbandale-Parkdale



Housing Price Trends



Dallas Neighborhood Change, 1985-2004



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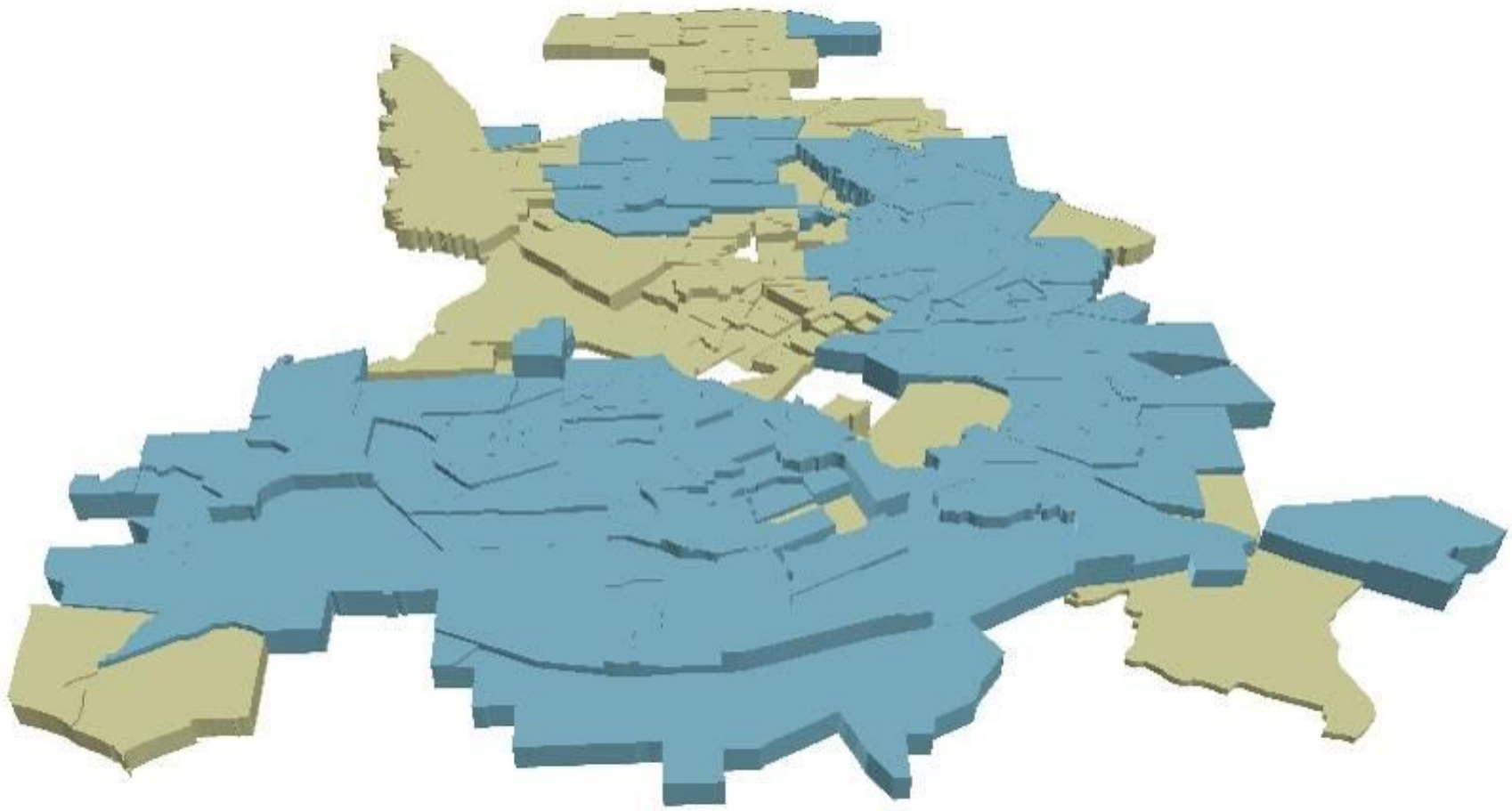

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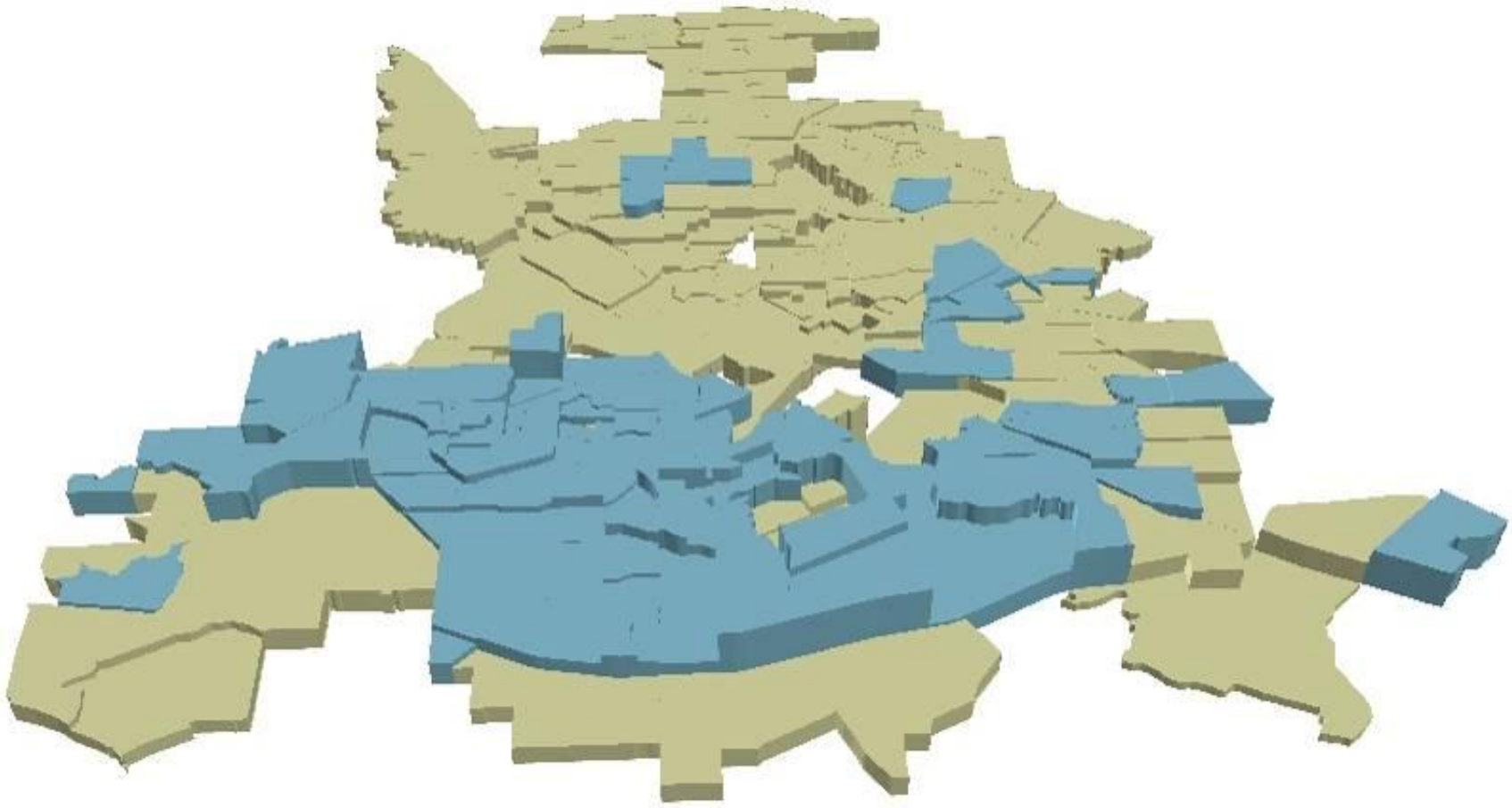

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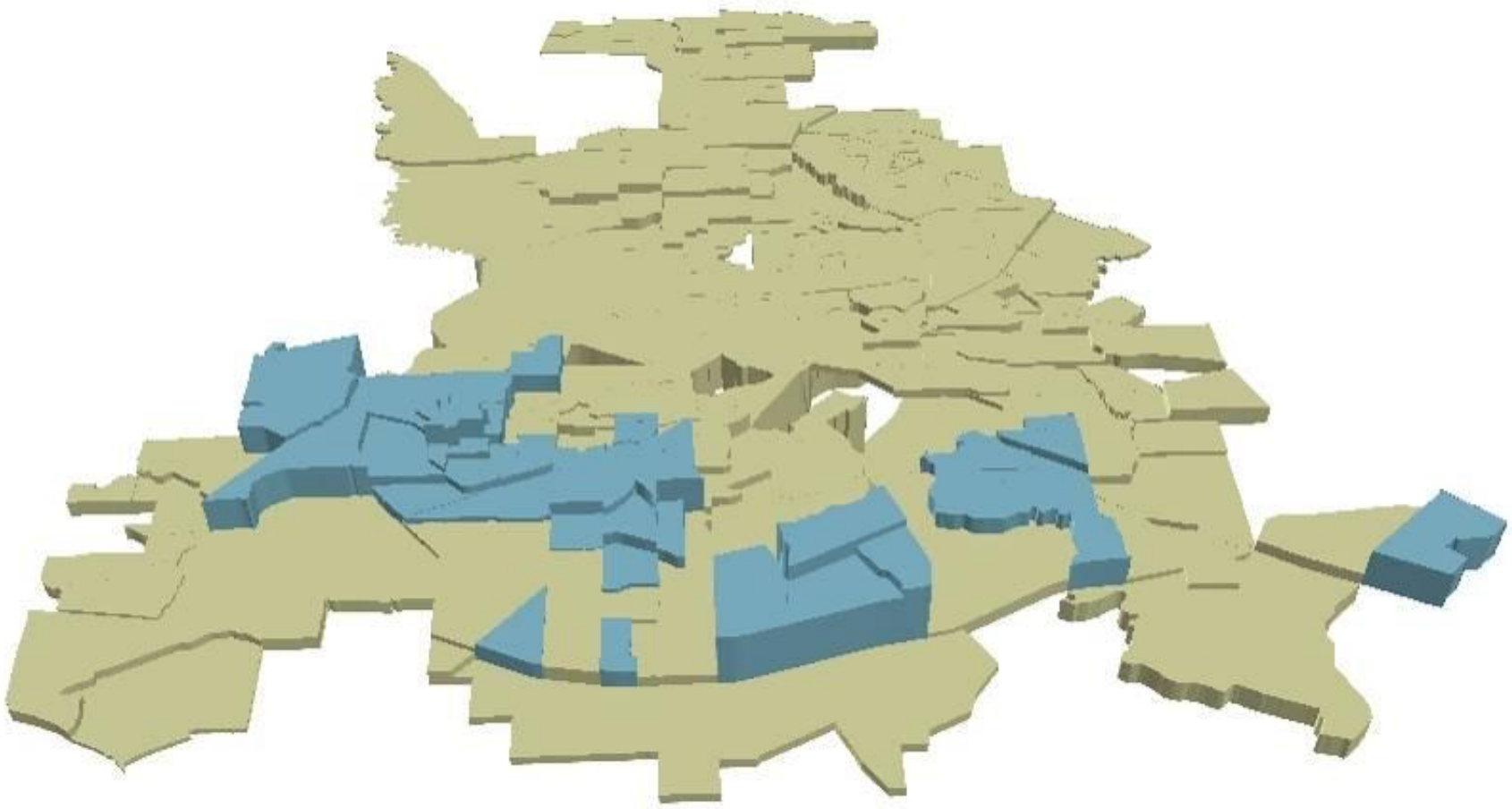

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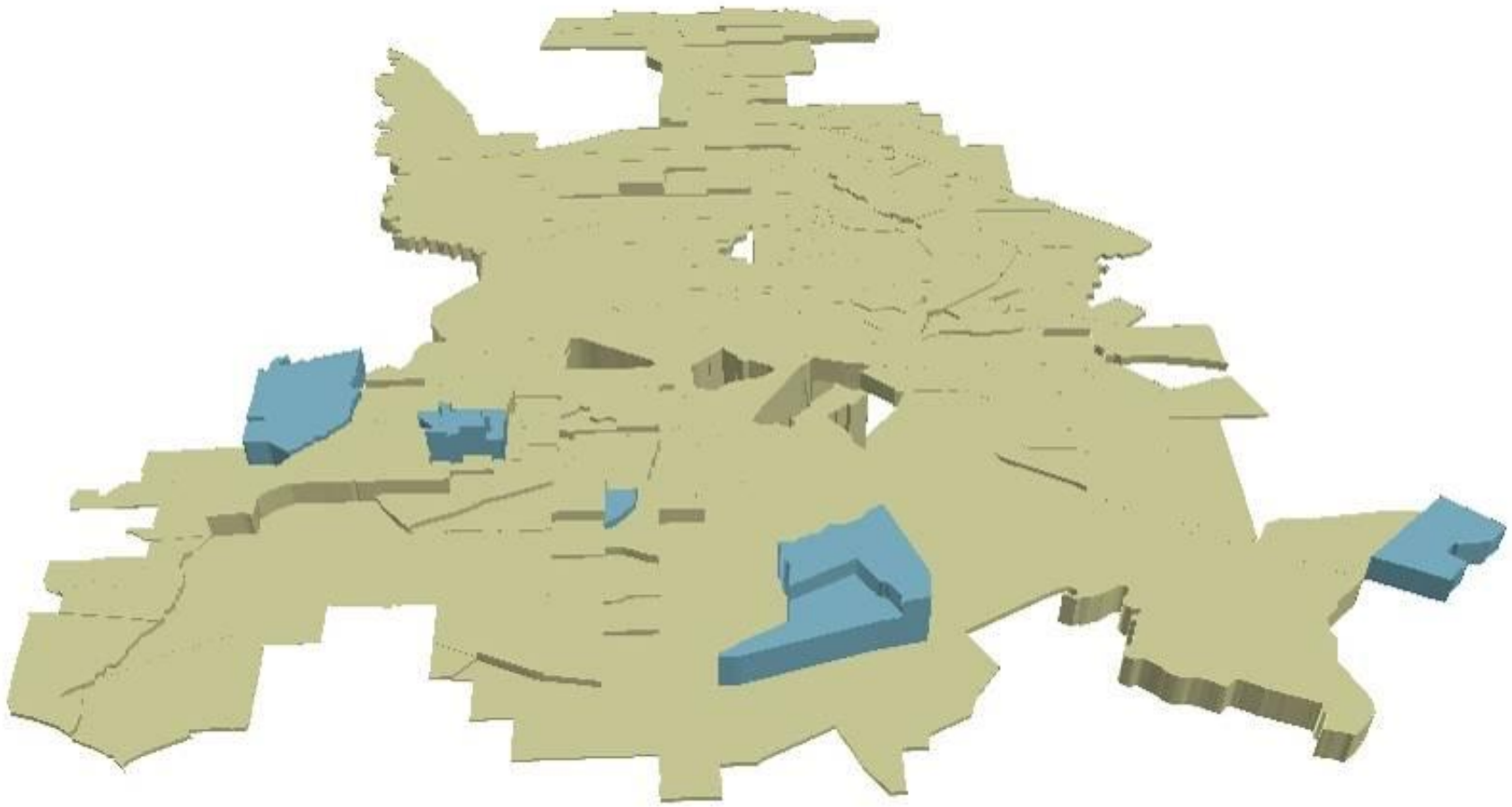

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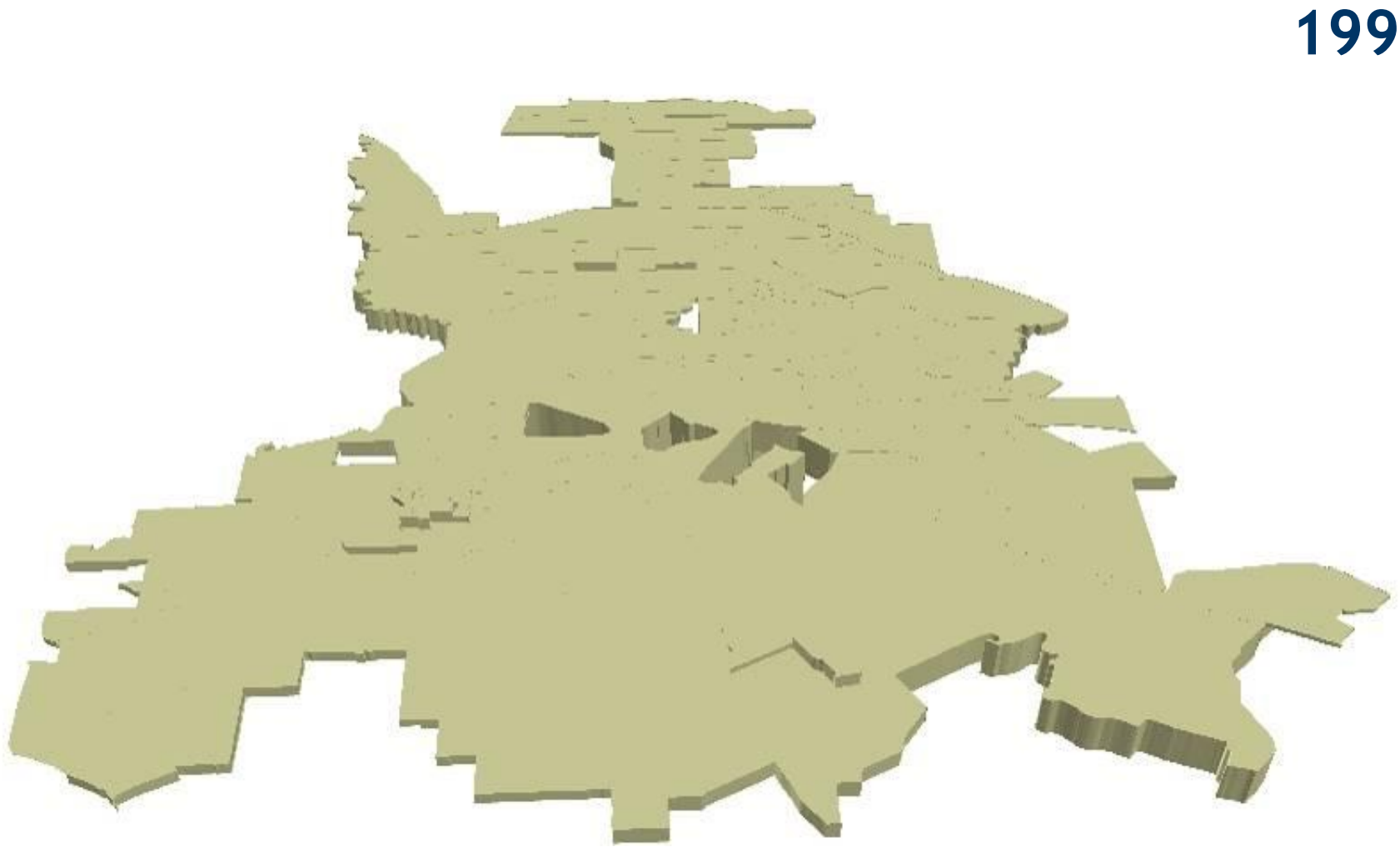

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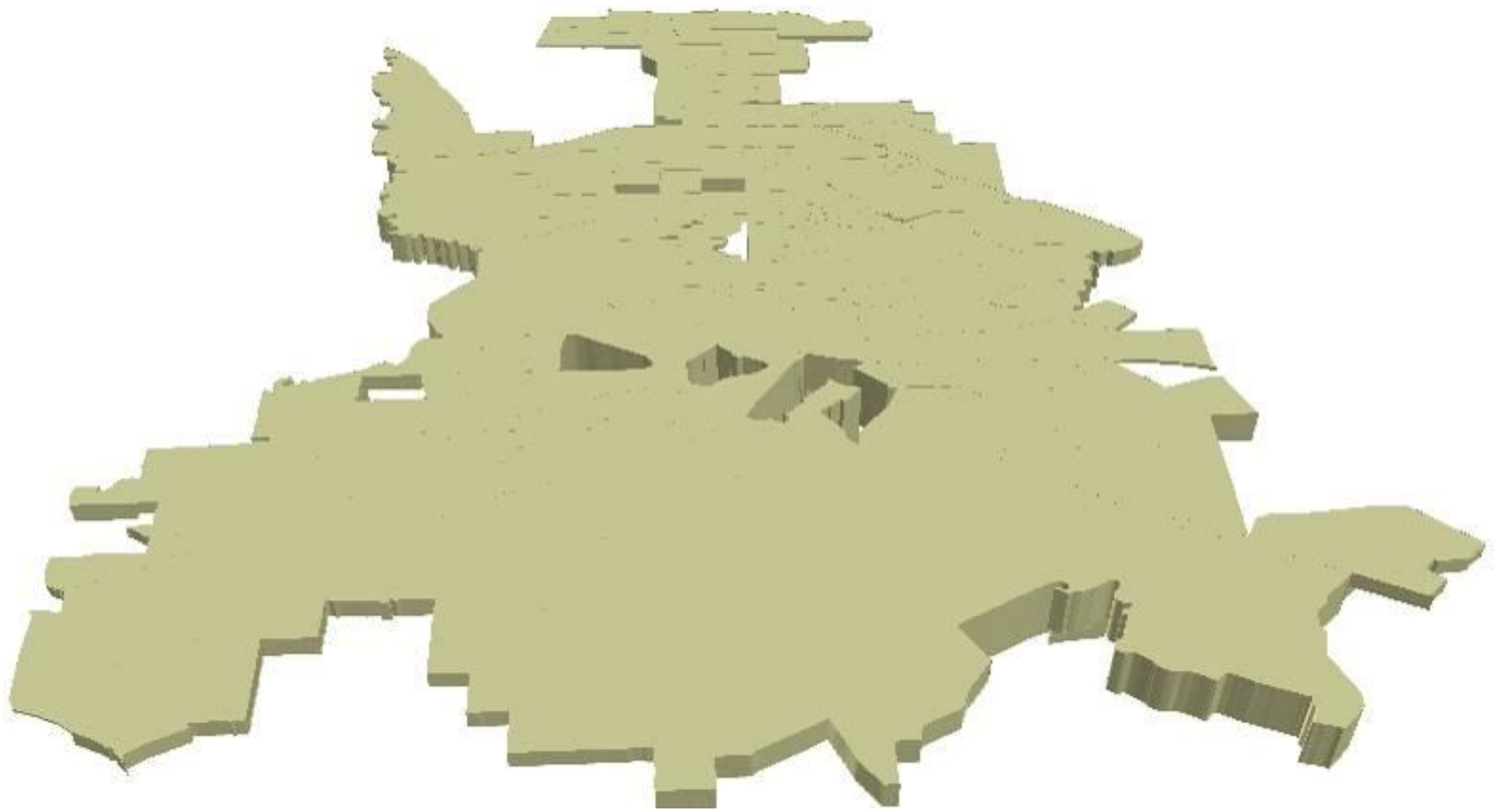

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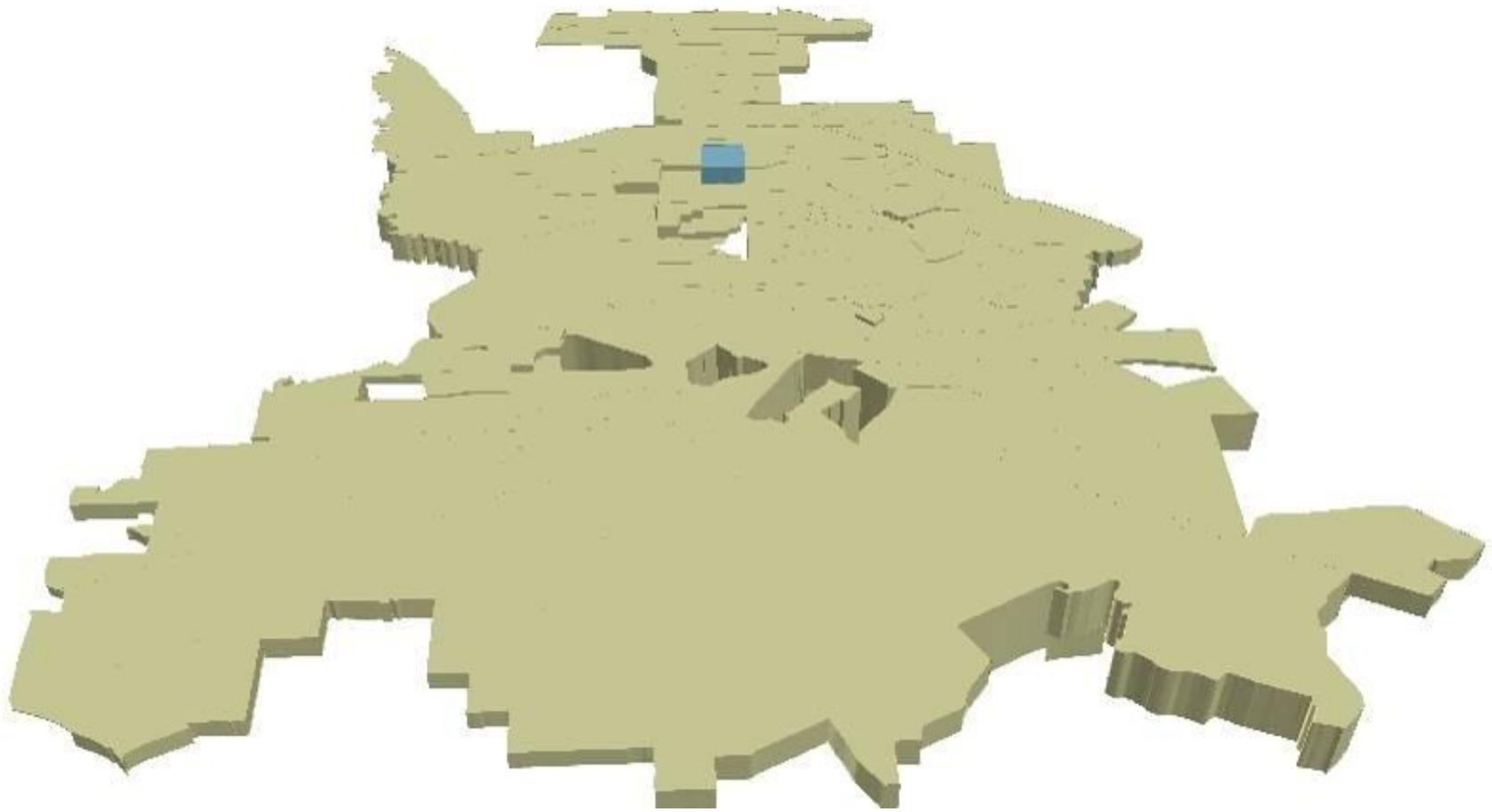

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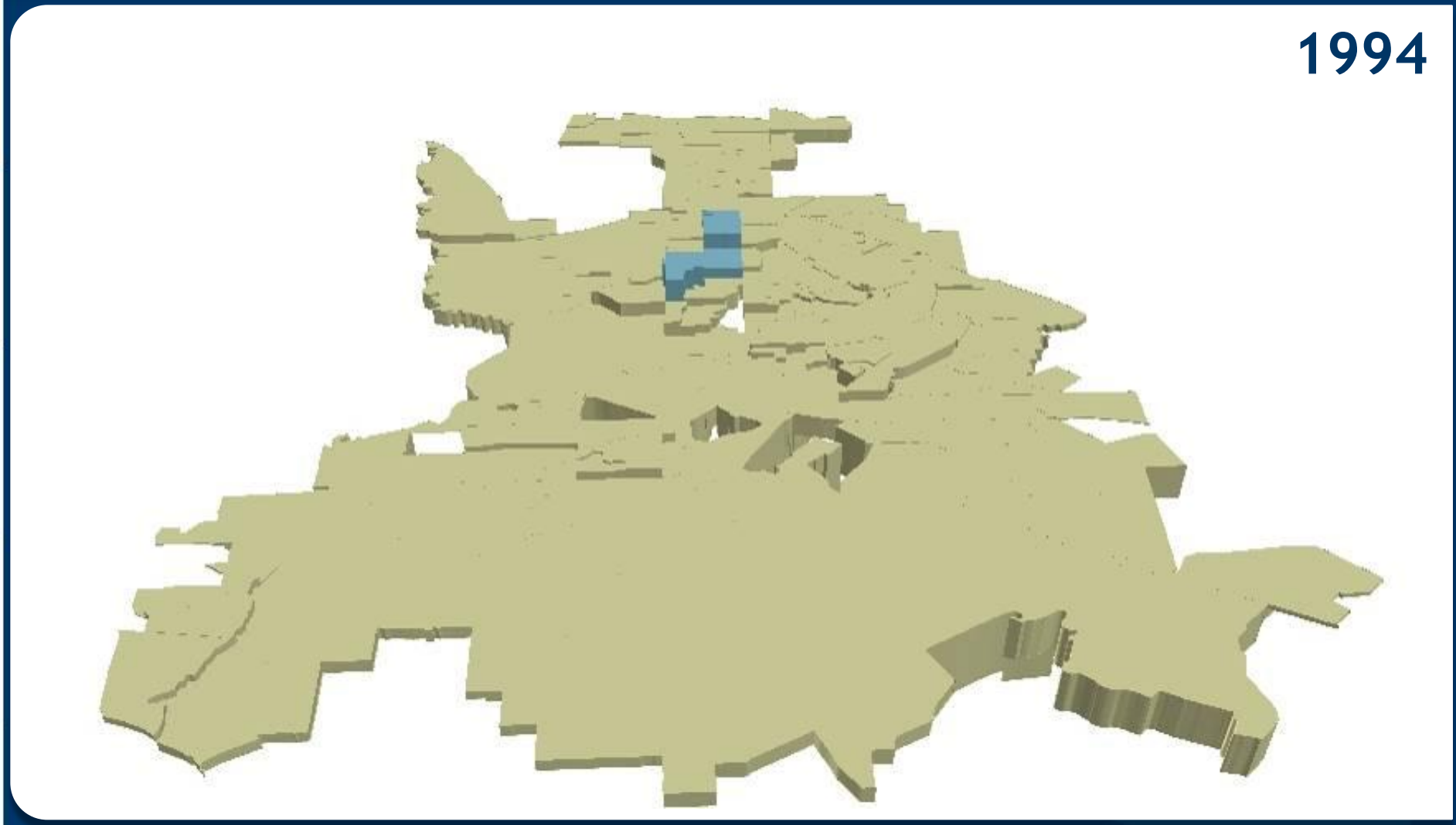

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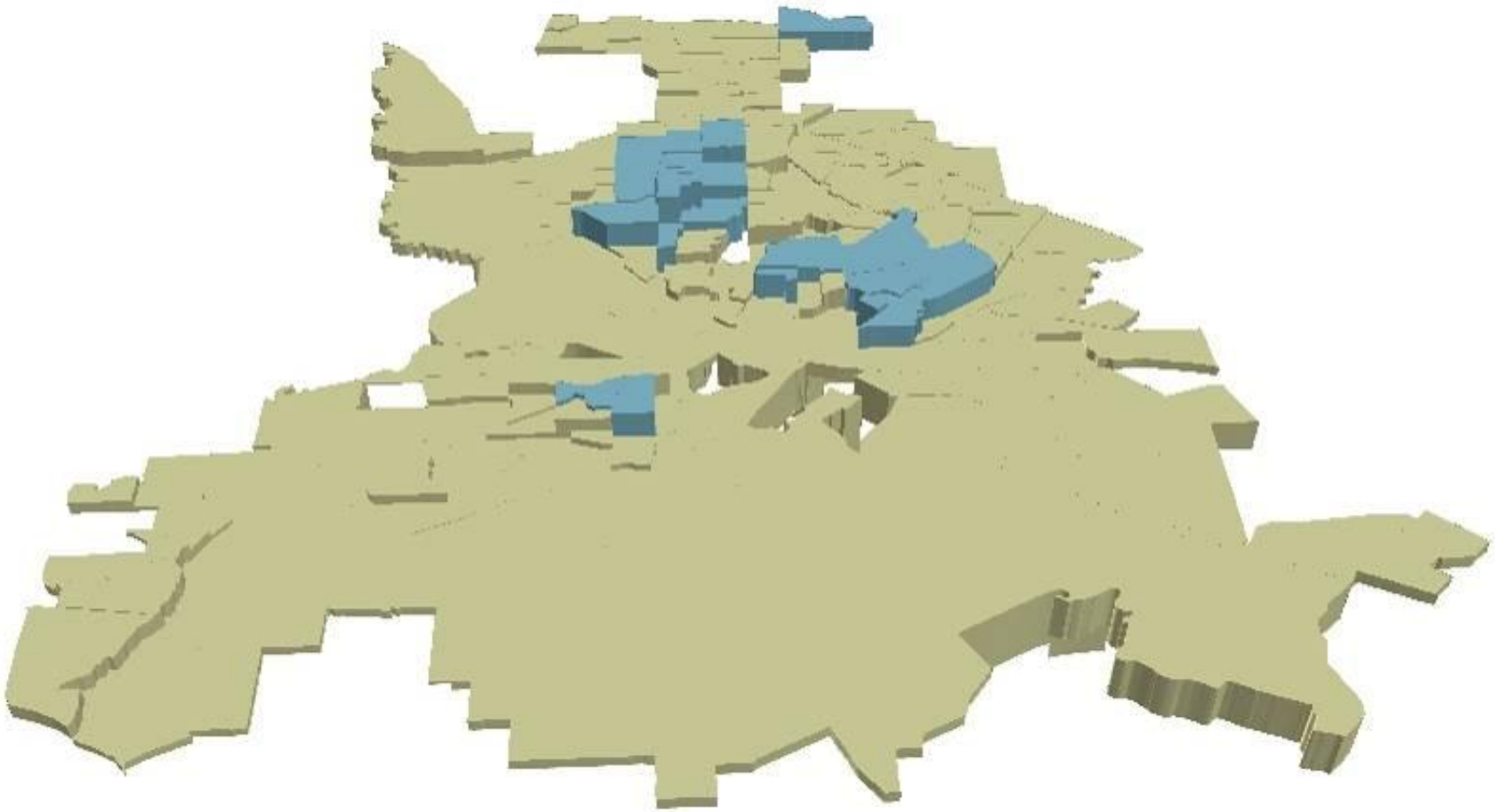

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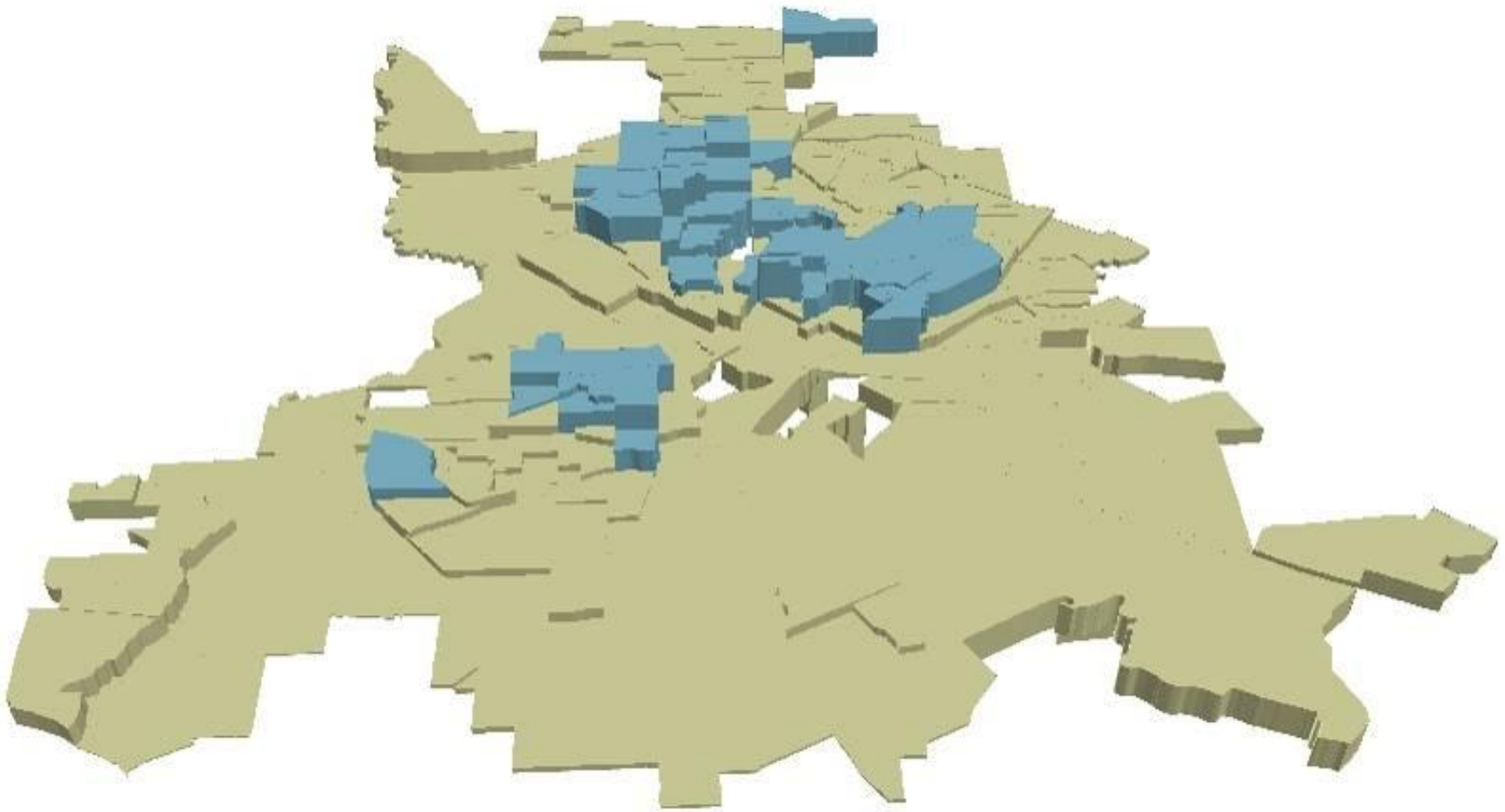

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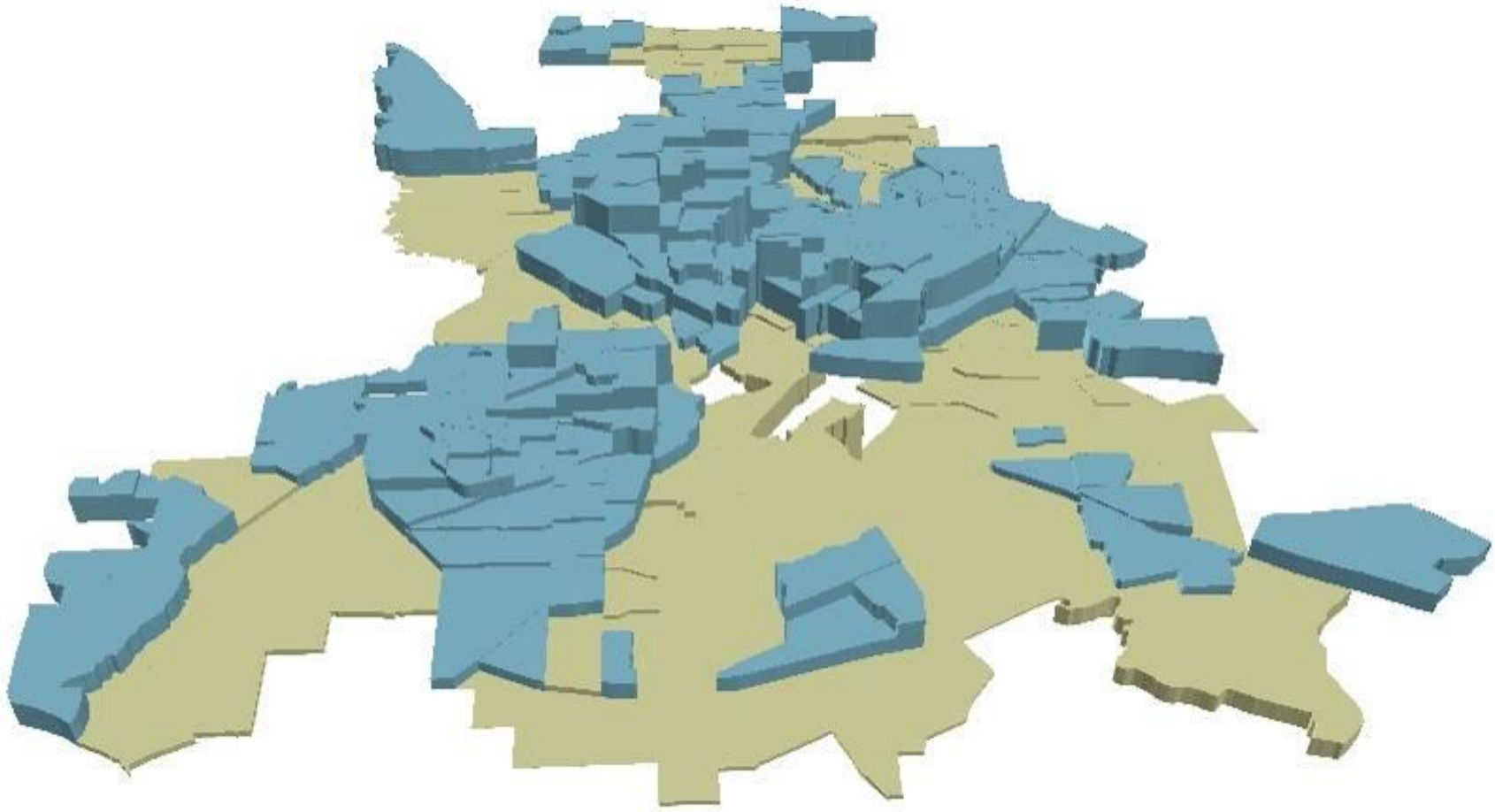

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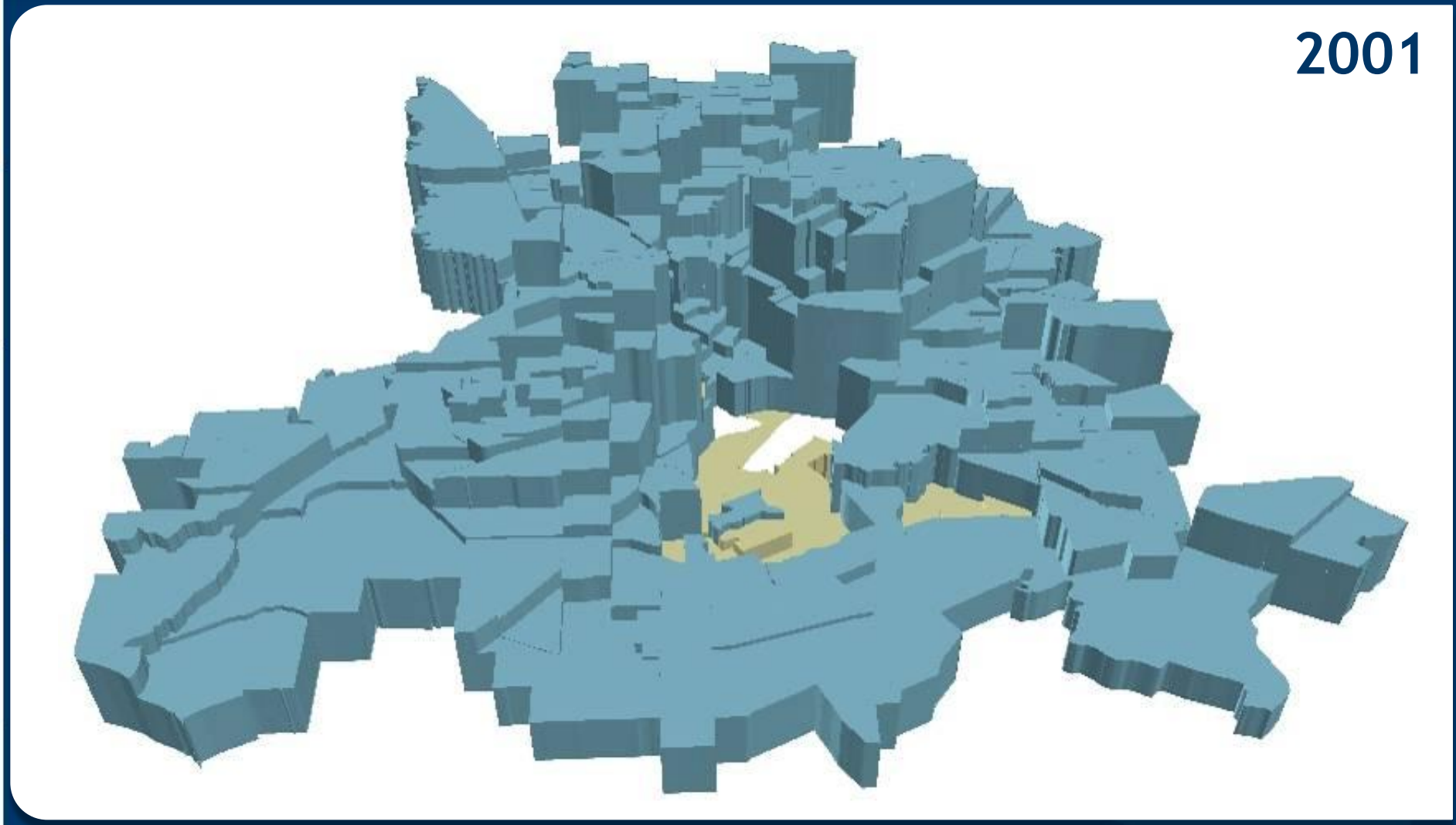

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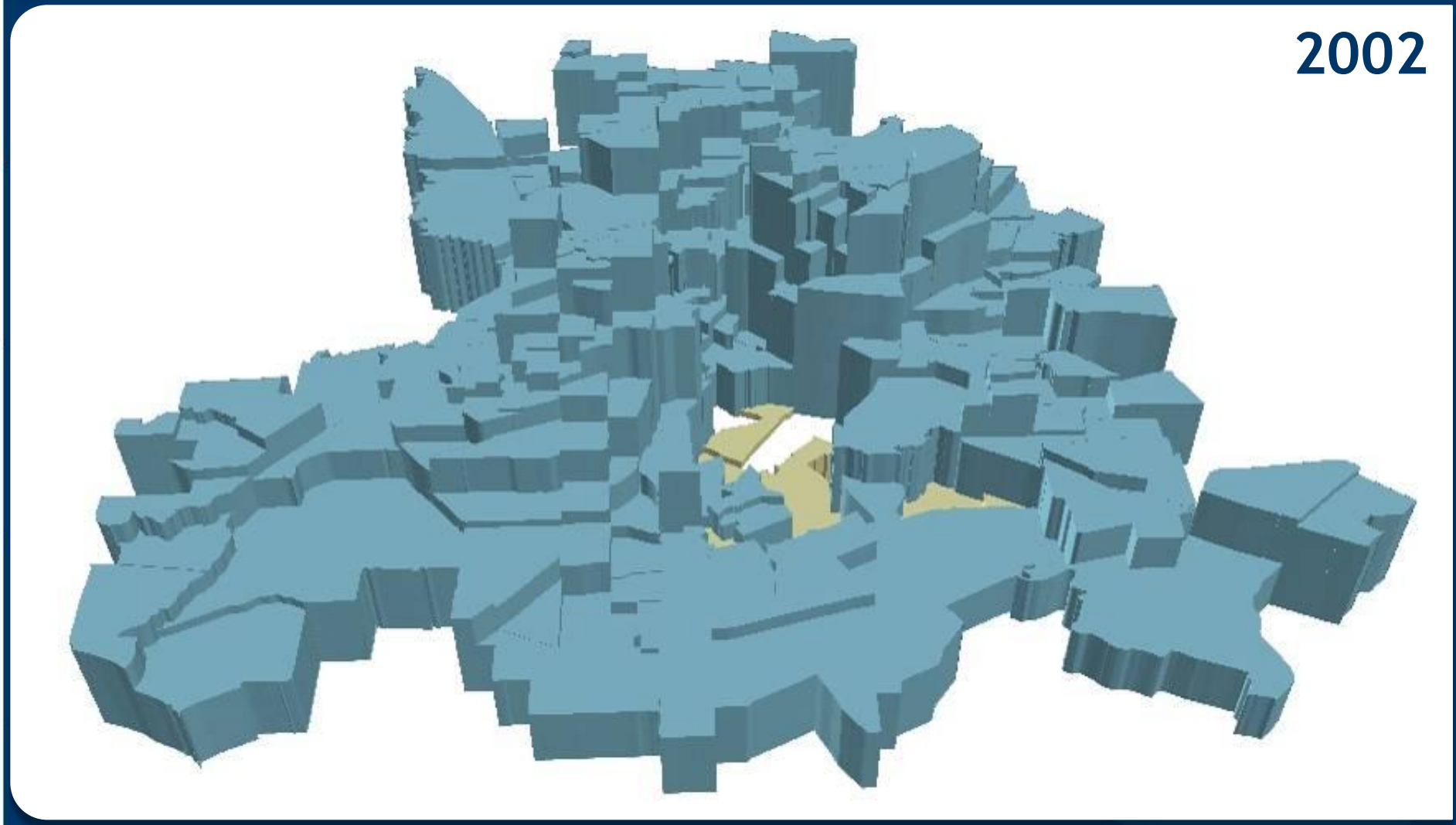

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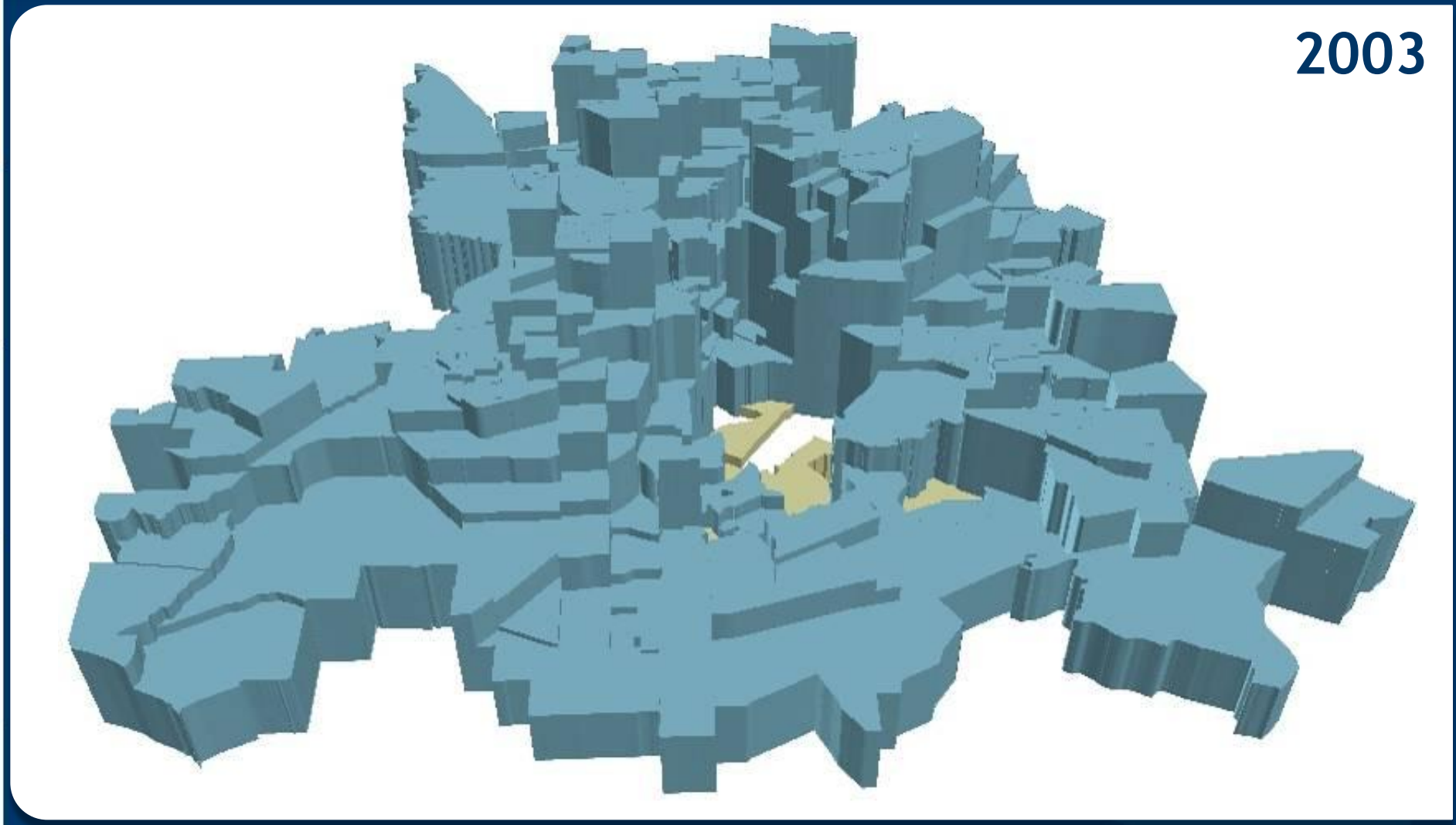

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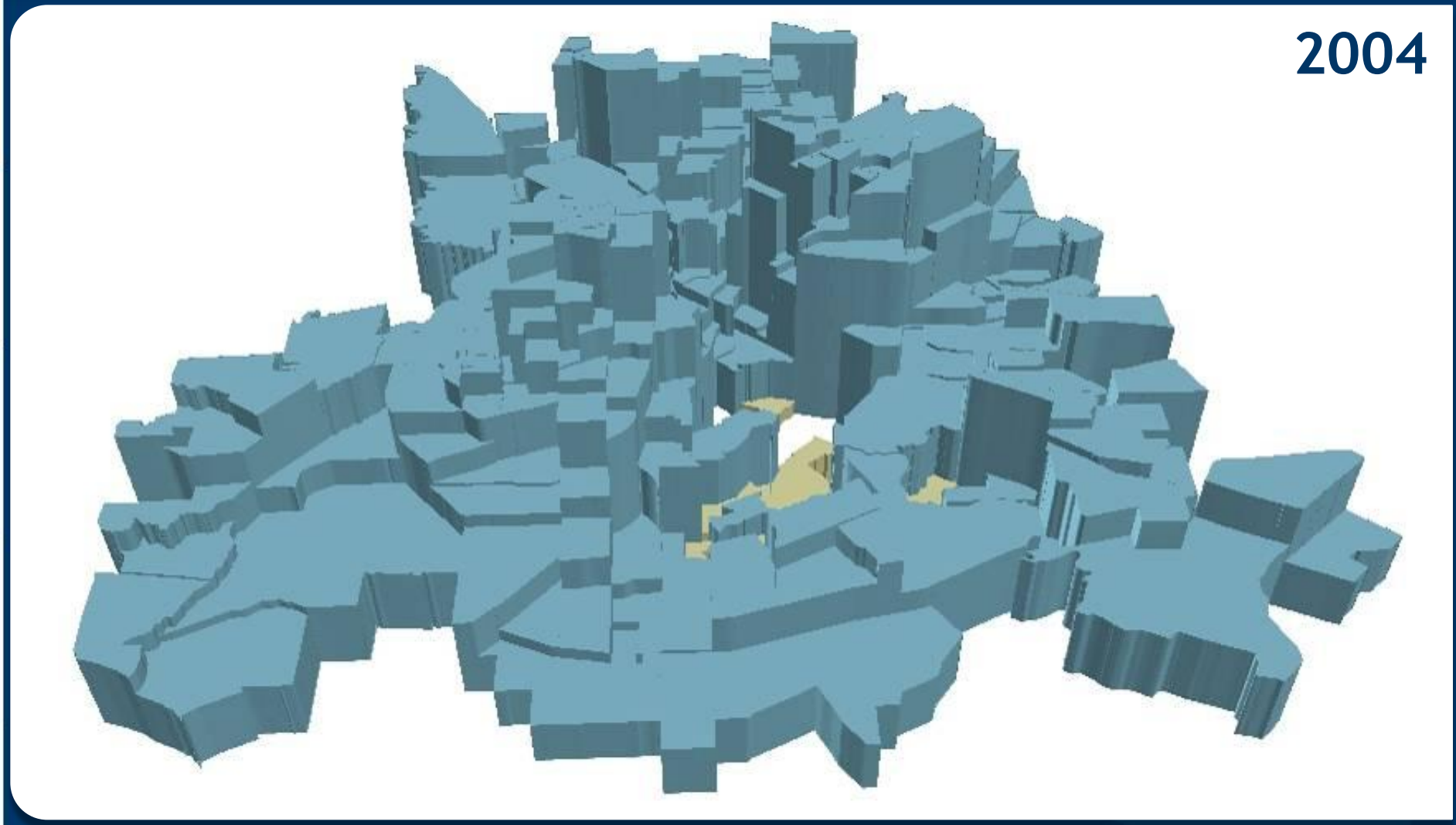
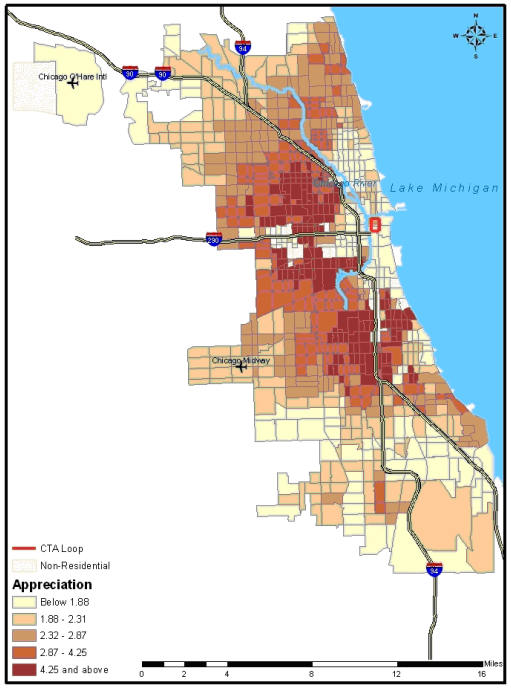
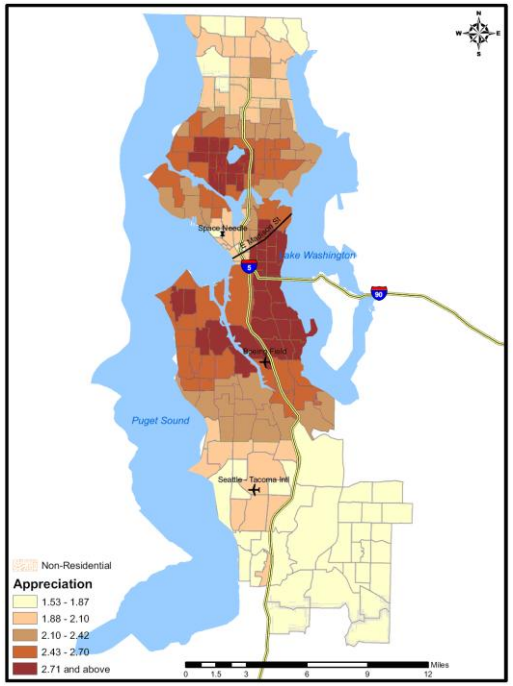


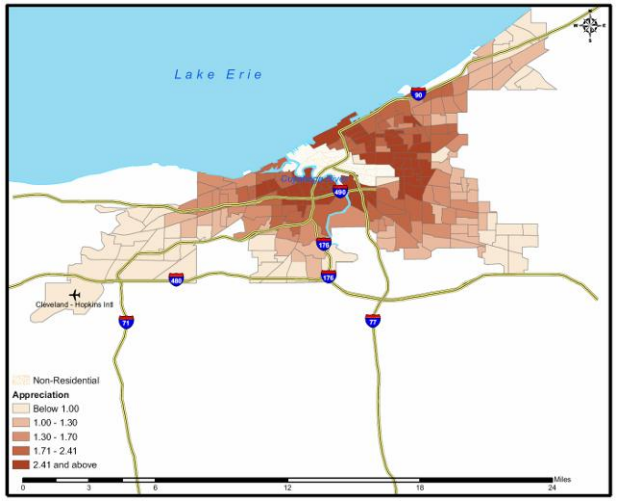
Initial Conditions and Appreciation

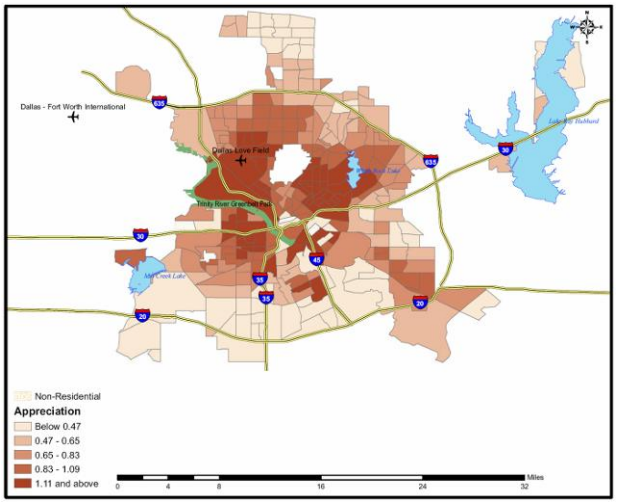
Initial Median House Prices and Change in Housing Values in Chicago, 1990-2006

Change in Price: Poor Neighborhoods Present the Most Opportunities for Investment



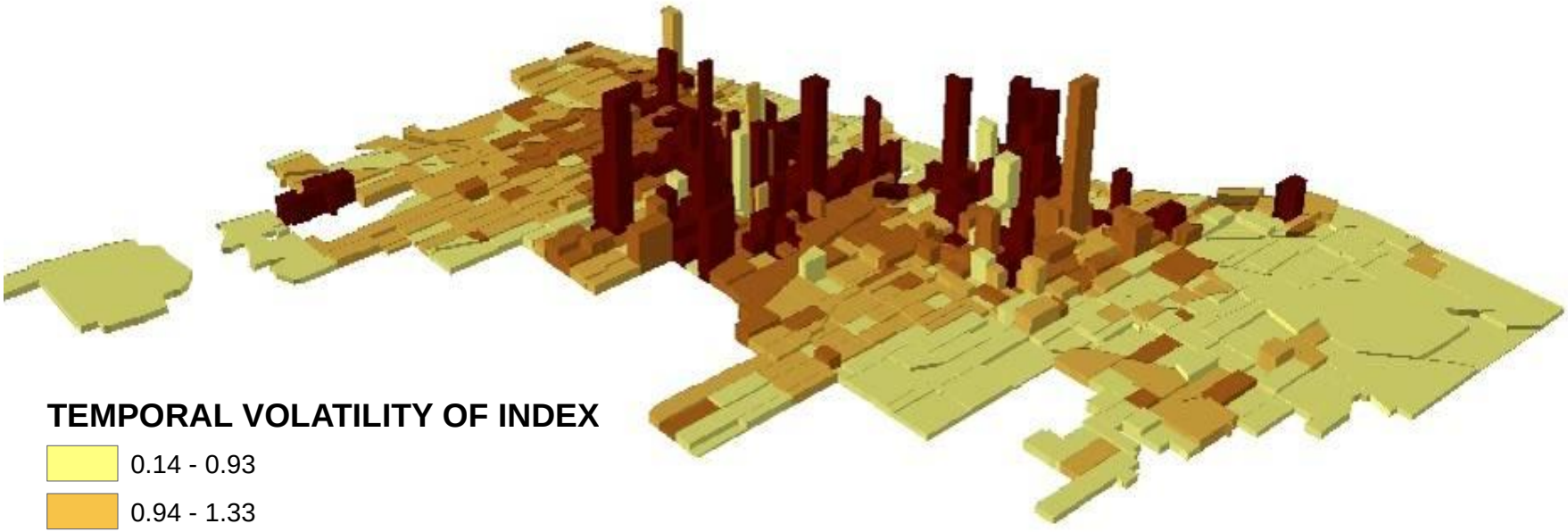






Many of the poorest neighborhoods are the ones that grew the most, outperforming wealthier communities in each of the four sample cities.

Partly Due to Lack of Information, These Areas Are Also the Most Volatile



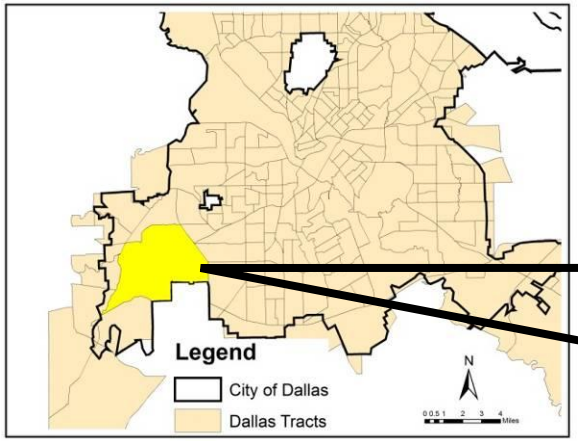
TEMPORAL VOLATILITY OF INDEX

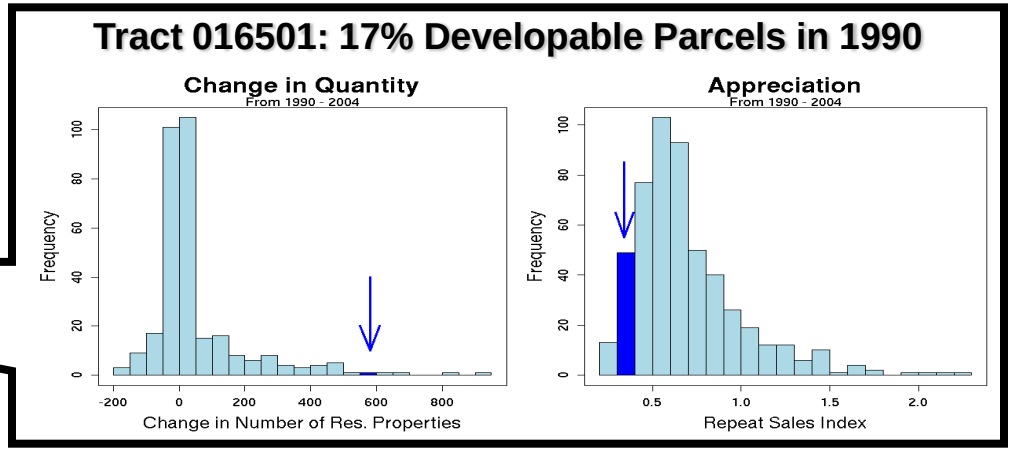
- 0.14 - 0.93
- 0.94 - 1.33
- 1.34 - 2.54
- 2.55 and above

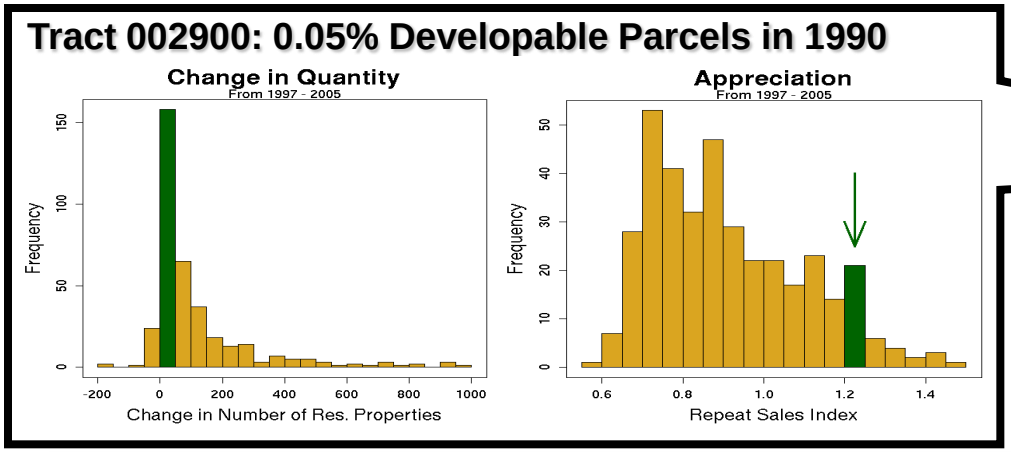
59.7
APPRECIATION
-1.0

By increasing the availability of information on these markets, we could reduce risk, increase market activity, and help stabilize these communities, further strengthening their performance.

Beyond Change in Price: Relationship of Price and Quantity



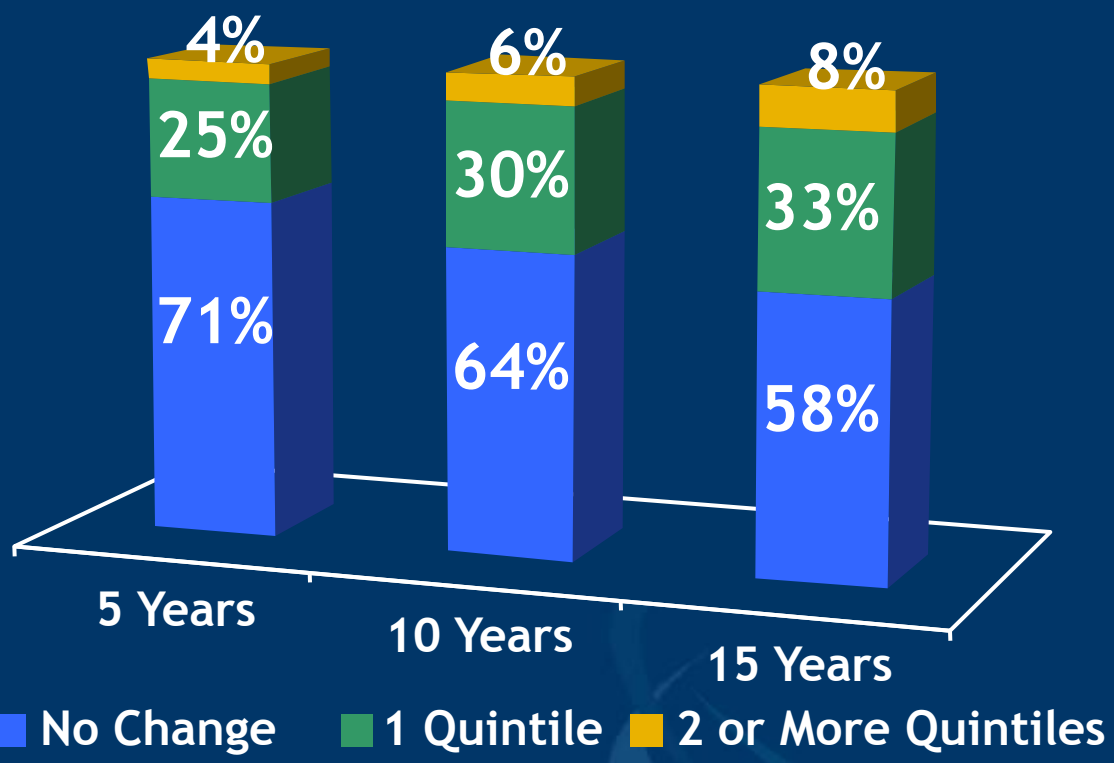




Neighborhoods with lower supply elasticity are at greater risk of displacement, as housing prices will increase faster than in areas where more housing can be developed

Neighborhood Change Is a Slow Process

Neighborhood Mobility by Time Interval



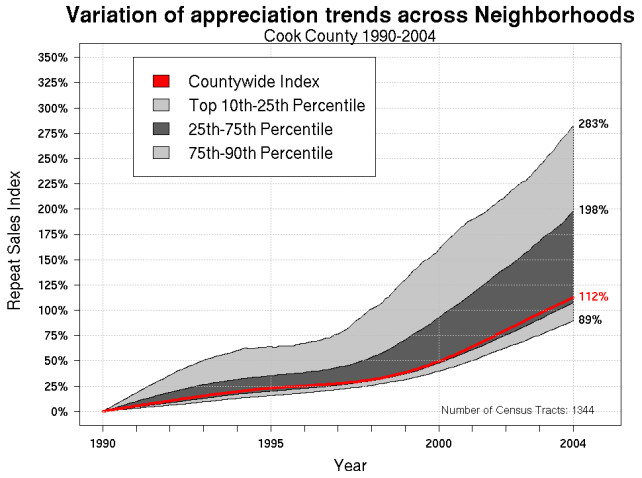
Even over 15 years, most neighborhoods do not change their position relative to other neighborhoods in the region.

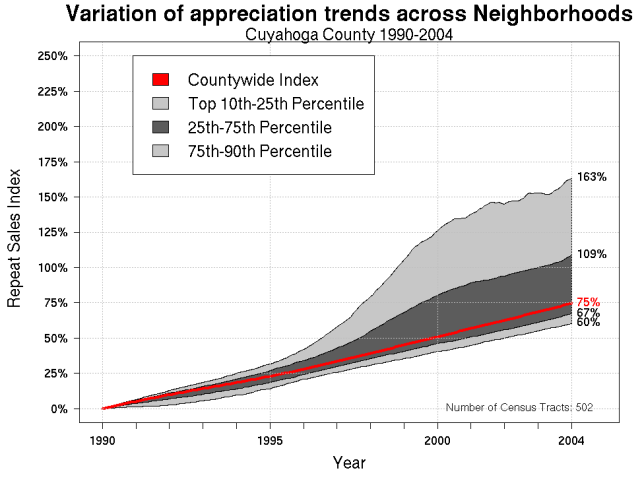
Yet Substantial Change Occurs in Select Neighborhoods

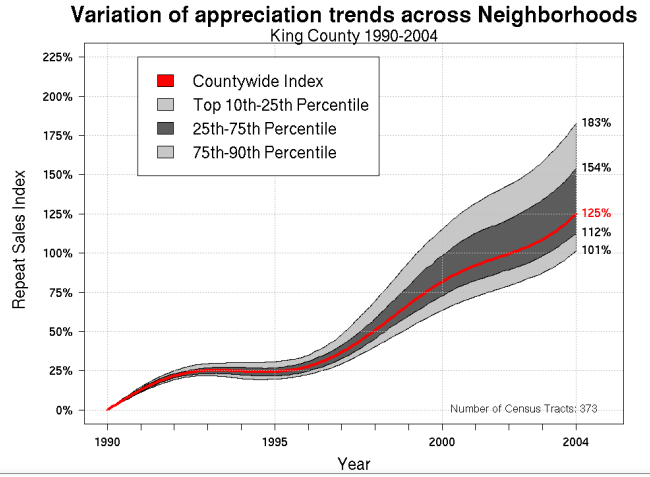
Median Sales Price Transition Matrix Cleveland, 1990-2004					
	Final Quintile				
Initial Quintile	1	2	3	4	5
1	76.9%	15.4%	7.7%	0.0%	0.0%
2	5.1%	51.3%	25.6%	15.4%	2.6%
3	2.6%	26.3%	26.3%	39.5%	5.3%
4	7.7%	2.6%	28.2%	23.1%	38.5%
5	**7.7%**	**5.1%**	10.3%	23.1%	53.8%

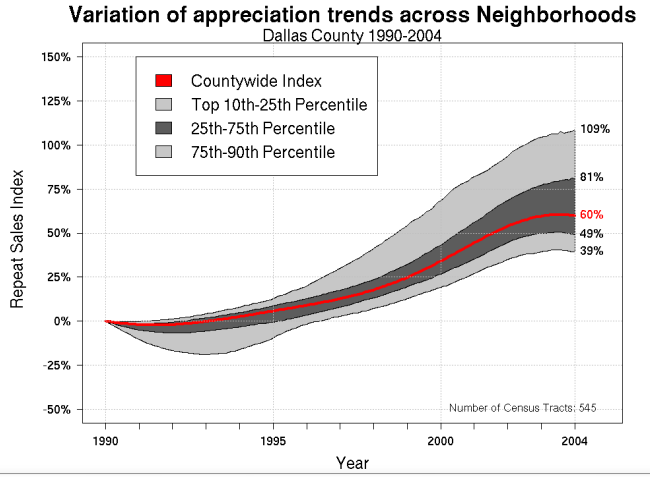
In Cleveland, 13% of all the tracts at the bottom of the distribution in 1990 moved up to the top 2 quintiles 15 years later.

Neighborhoods and Regions







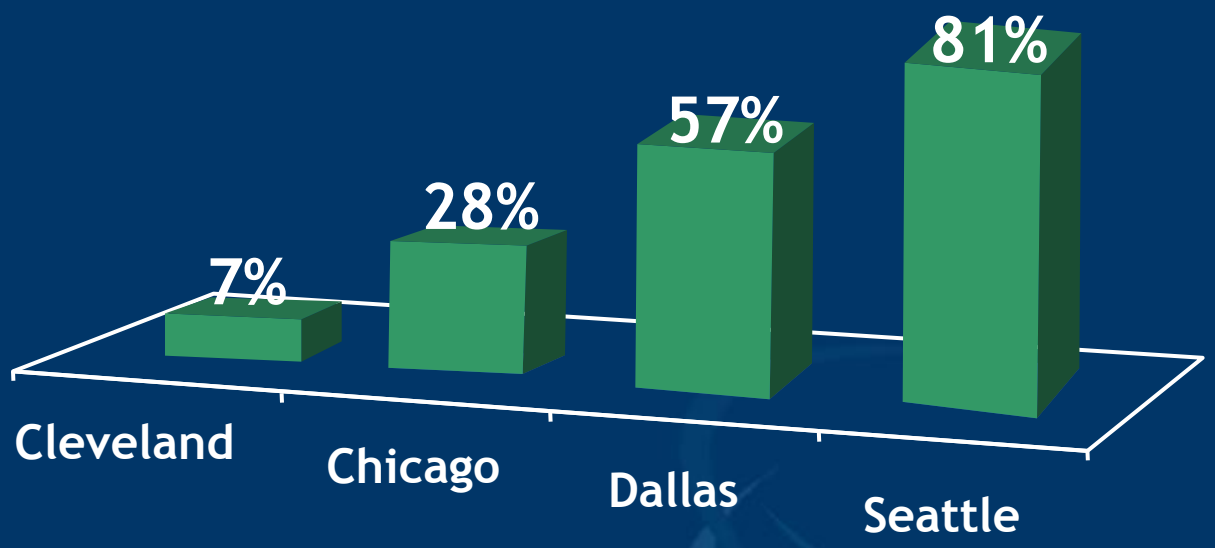


Most neighborhoods follow their region closely, but there are important exceptions.

Neighborhoods and Regions

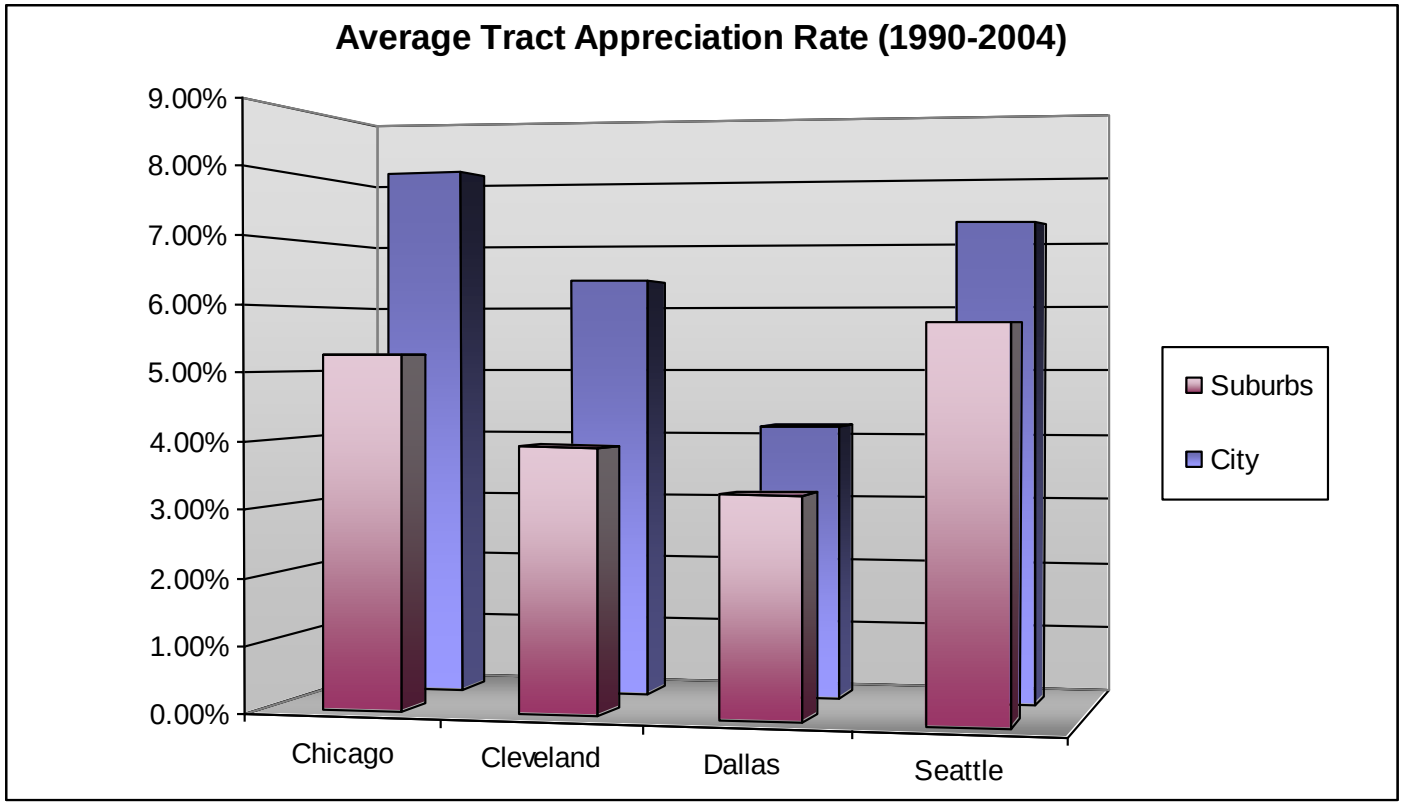
Across Cities, 35% of Neighborhood Change is Accounted for by Regional Shifts

R Squared from Regression Models of Tract RSI on Region



Regional effects vary greatly by area.

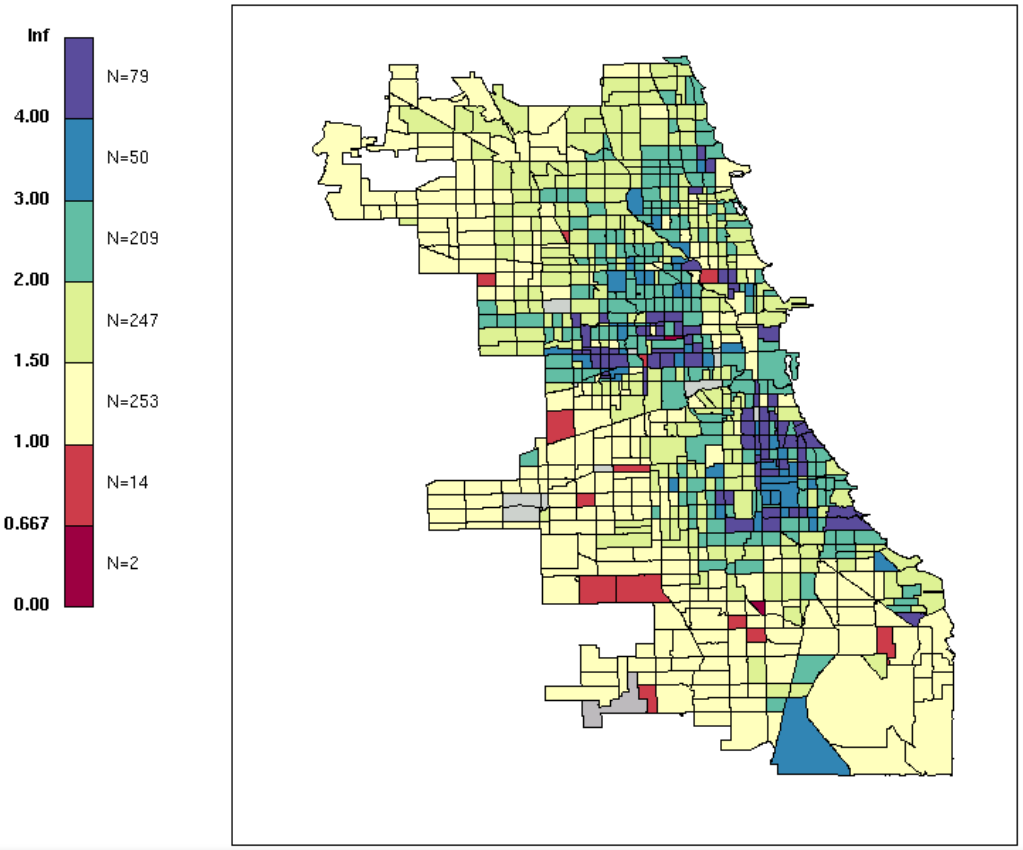
The Big Picture:
Urban Neighborhoods Are Coming Back



Over the past 15 years, tracts in the central city grew faster than tracts in nearby suburbs.

The Big Picture: Neighborhood Change = Changing Neighbors?

Ratio of HMDA Borrower Income (2000-2005) to Census Income (2000) in Chicago, IL



The primary mechanism of change overall appears to be the movement of people.

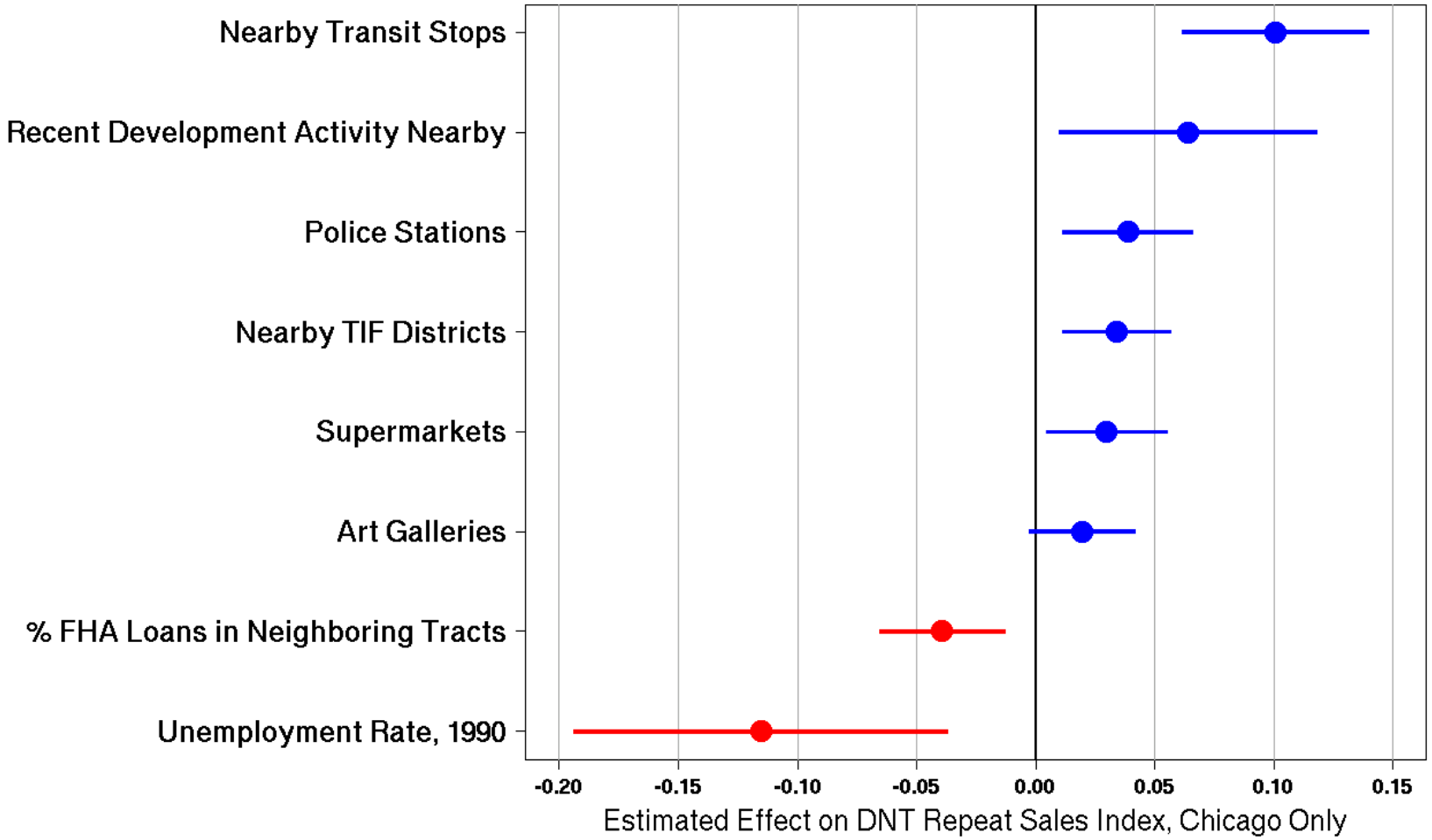
The Big Picture: Drivers of Neighborhood Change

"The Goldilocks Theory" …

- Mobility is the key mechanism of change
- Movers are attracted to areas with undervalued housing but sound economic fundamentals (employment, income, education, young adults)
- Being connected is important: proximity to job centers, access to transit, lower commuting times are positive
- Cultural and Recreational Amenities (art galleries, bars and restaurants) help, but are not the main event

… Neighborhoods of Opportunity are "Just Right."

Exploring the Relative Importance of Different Drivers of Change



(1994-2004 Random Effects Model, Standardized Coefficients with 95% Confidence Interval)

The Big Picture: Drivers of Neighborhood Change

- Race is still a factor: even controlling for income, influx of minorities in a neighborhood leads to lower appreciation – but there are important exceptions
- Neighborhood Spillovers are important: what happens in your neighborhood reflects what happens in the neighborhoods around you
- Context matters: substantial variation by type and stage; current conditions have large effects on degrees and patterns of change

The “Little” Picture: Few Silver Bullets

the ONION
America's Finest News Source

3'-By-4' Plot Of Green Space Rejuvenates Neighborhood

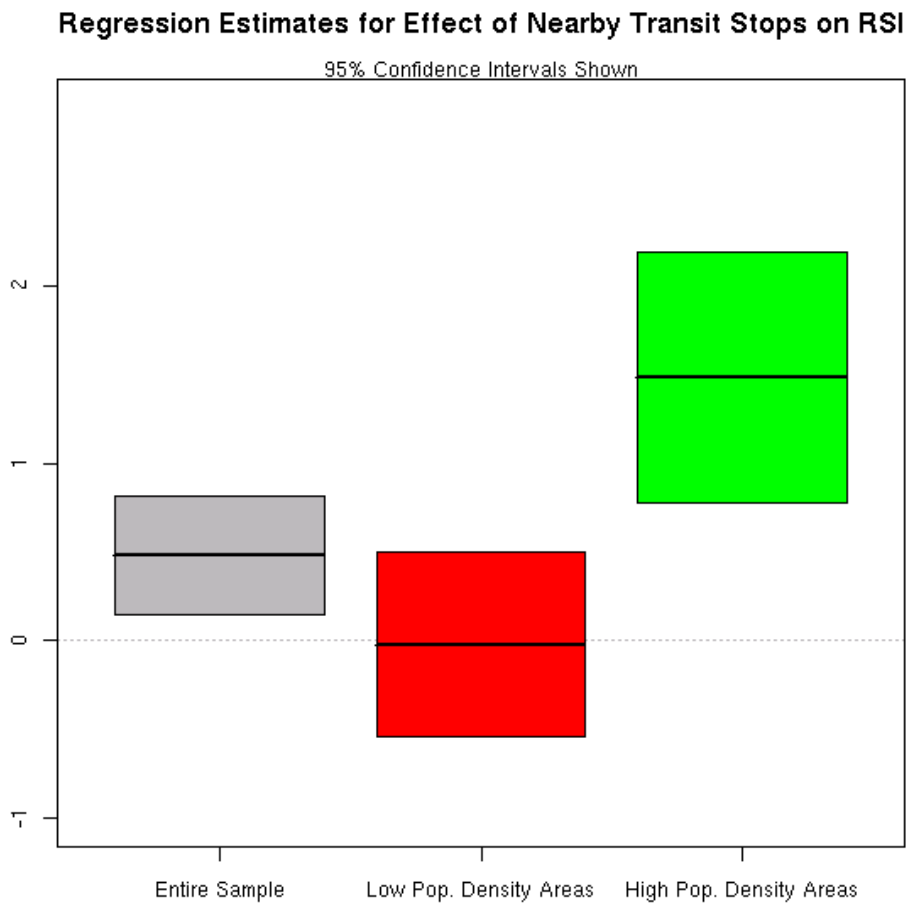
FEBRUARY 11, 2008 | ISSUE 44•07

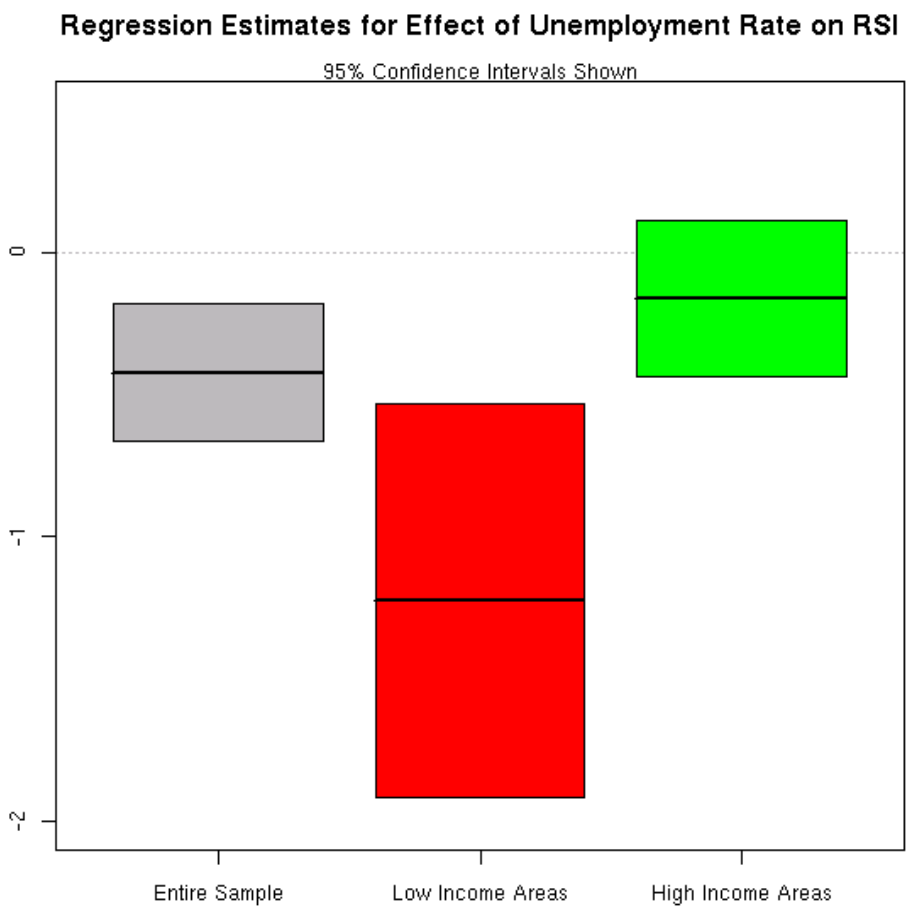
DETROIT—Notorious for its abandoned buildings, industrial warehouses, and gray, dilapidated roads, Detroit's Warrendale neighborhood was miraculously revitalized this week by the installation of a single, three-by-four-foot plot of green space.

The green space, a rectangular patch of crabgrass located on a busy median divider, has by all accounts turned what was once a rundown community into a thriving, picturesque oasis, filled with charming shops, luxury condominiums, and, for the first time ever, hope.

The Johansens, who just moved to Warrendale, enjoy some outdoor time.

The “Little” Picture: Few Silver Bullets





What matters varies a great deal by type of neighborhood.

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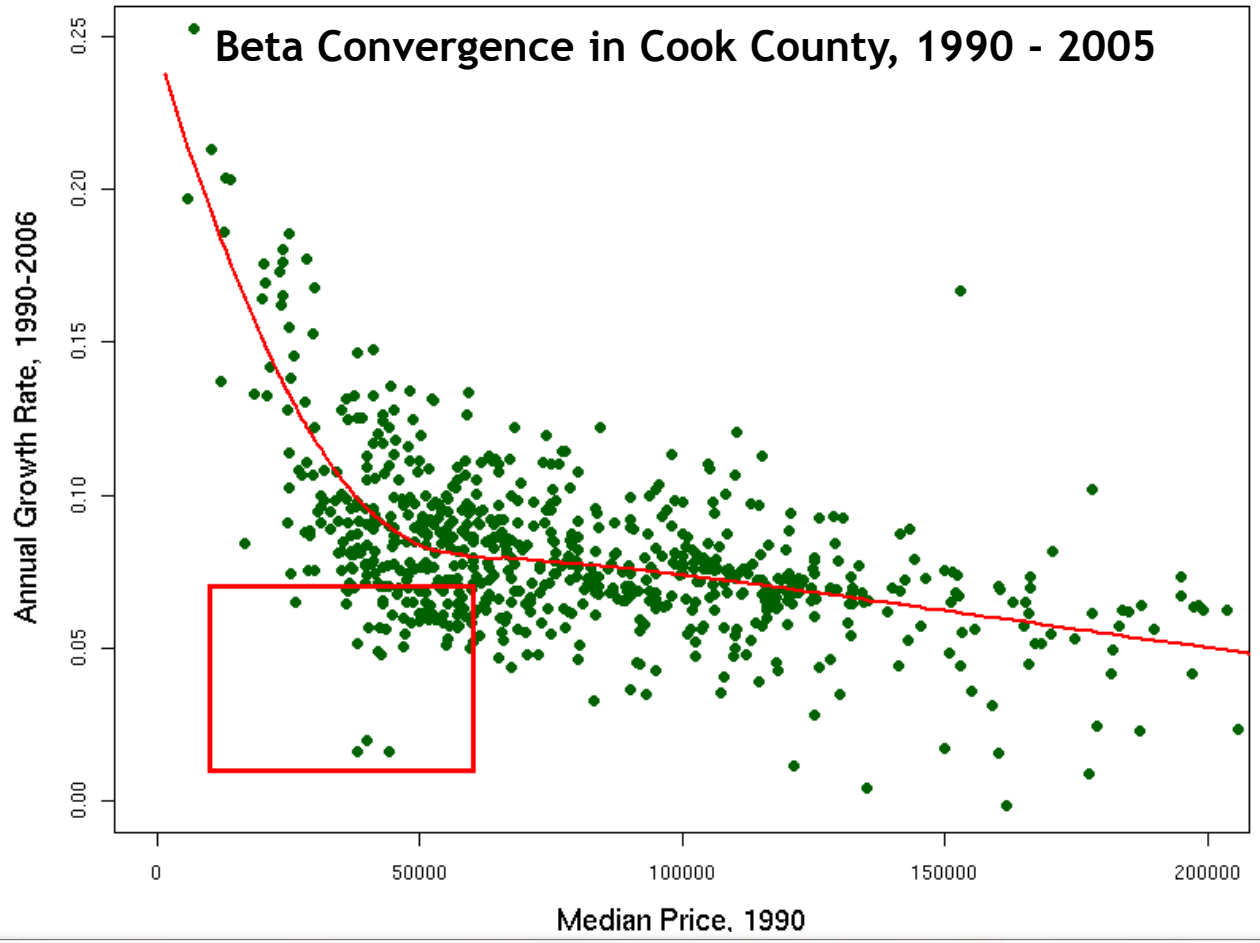
Neighborhood Convergence



Neighborhoods tend to grow at similar rates to each other.

Characteristics of Poorer Neighborhoods that Tend to Converge

Strong evidence suggests convergence is more likely:

- Closer to the Central Business District
- In neighborhoods with more turnover
- With more Social Capital
  - Civic, Social, Fraternal, Political, Religious, Business and other Membership Associations

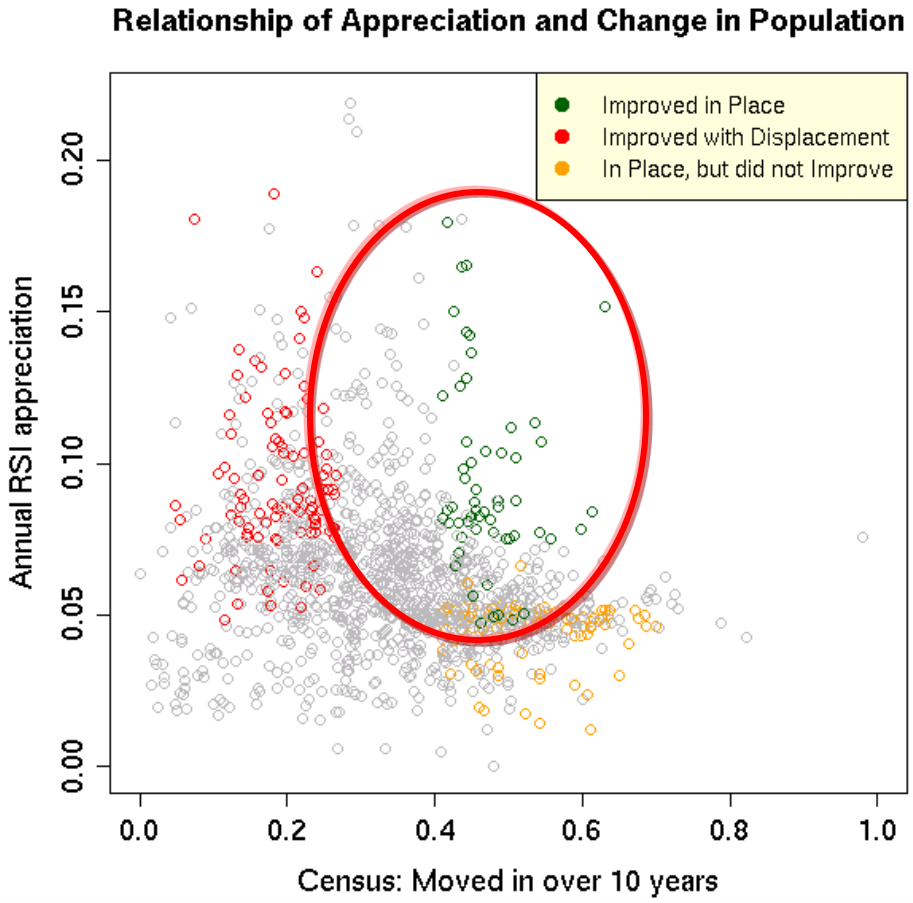
Characteristics of Poorer Neighborhoods that Tend to Converge

Moderate evidence favors:

- Educational levels
- Supermarkets
- Transit nearby
- Income diversity
- Art Galleries nearby
- Eating establishments nearby

Target investments to improve social capital, education and consumption amenities in areas further from CBD.

Improvement With High and Low Turnover



What characterizes the neighborhoods that improved with less displacement?

Drivers of “Improvement in Place”

Improvement with Low Turnover Is Associated With:

- High Home Ownership Rates
- Low Vacancy Rates
- Access to Transit
- Reduction in Unemployment
- Presence of Employment Services
- High Social Capital
- High Percentage of Young Adults

"Homeownership, Social Capital and Reduction of Unemployment are Key to Improving Neighborhoods with Less Displacement

Overall Summary → Implications

- Neighborhoods are highly specialized
- Neighborhood change is a function of people and money moving in and out
- This in turn varies based on neighborhood type and stage of development – different people and investors choose different neighborhoods in the context of larger markets and systems
- As a result, what matters varies by place. For any given neighborhood, the goal could be continuity or change in type, and implementation entails understanding who you want to stay or move in, and what factors matter to them

Summary → Implications

Two major implications:

1. We need a framework for understanding neighborhoods as dynamic, specialized, and nested in larger systems
2. We need much better tools for customized analysis of local economies

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III | **Digging Deeper:** Specialized Drivers By Factors, Types of Neighborhood and Patterns of Change

IV | **Implications 1.0:** Dynamic, Specialized Neighborhoods

V | **Implications 2.0:** Specialized Tools - From Diagnostics to Investment

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Neighborhoods are Complex

Neighborhoods are Complex

PEOPLE
Ethnicity, Age, Family Structure

AMENITIES
Physical environment, Entertainment venues, Public transit

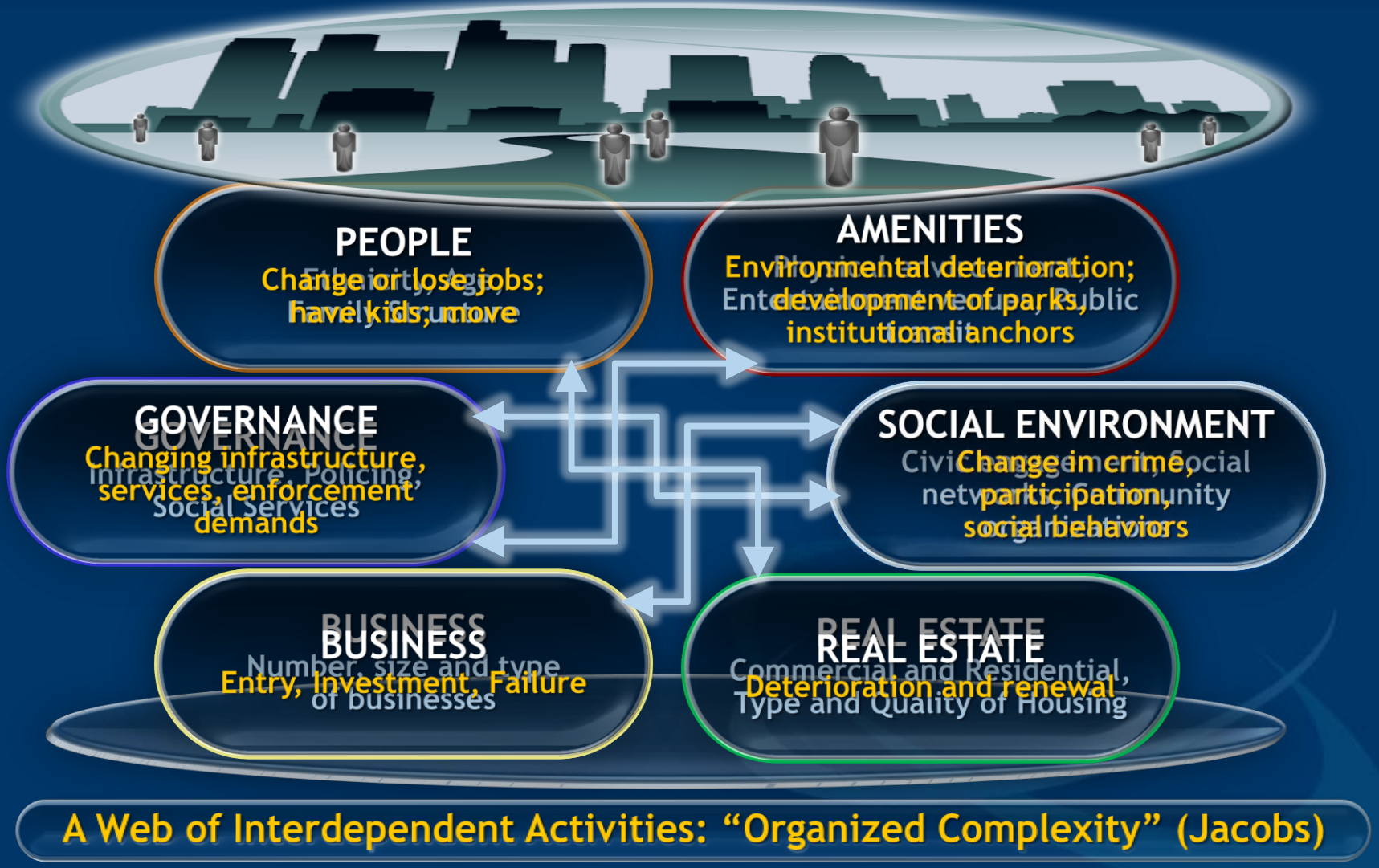
GOVERNANCE
Infrastructure, Policing, Social Services

SOCIAL ENVIRONMENT
Civic engagement, Social networks, Community organizations

BUSINESS
Number, size and type of businesses

REAL ESTATE
Commercial and Residential, Type and Quality of Housing

Neighborhoods are Dynamic



Neighborhoods are Dynamic

PEOPLE
Change or lose jobs; have kids; move

AMENITIES
Environmental deterioration; development of parks, institutional anchors

GOVERNANCE
Changing infrastructure, services, enforcement demands

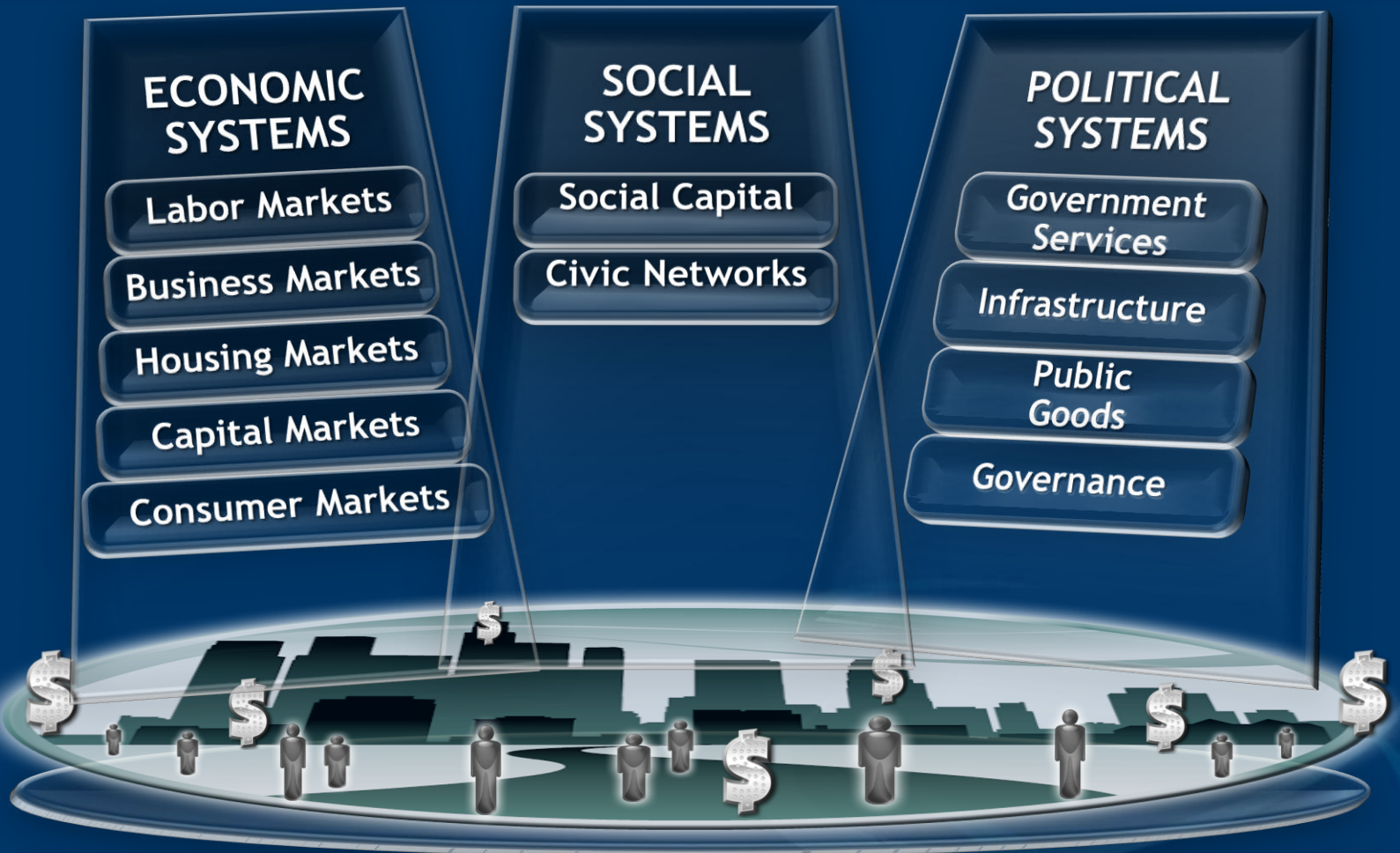
SOCIAL ENVIRONMENT
Change in crime, participation, social behaviors

BUSINESS
Entry, Investment, Failure

REAL ESTATE
Deterioration and renewal

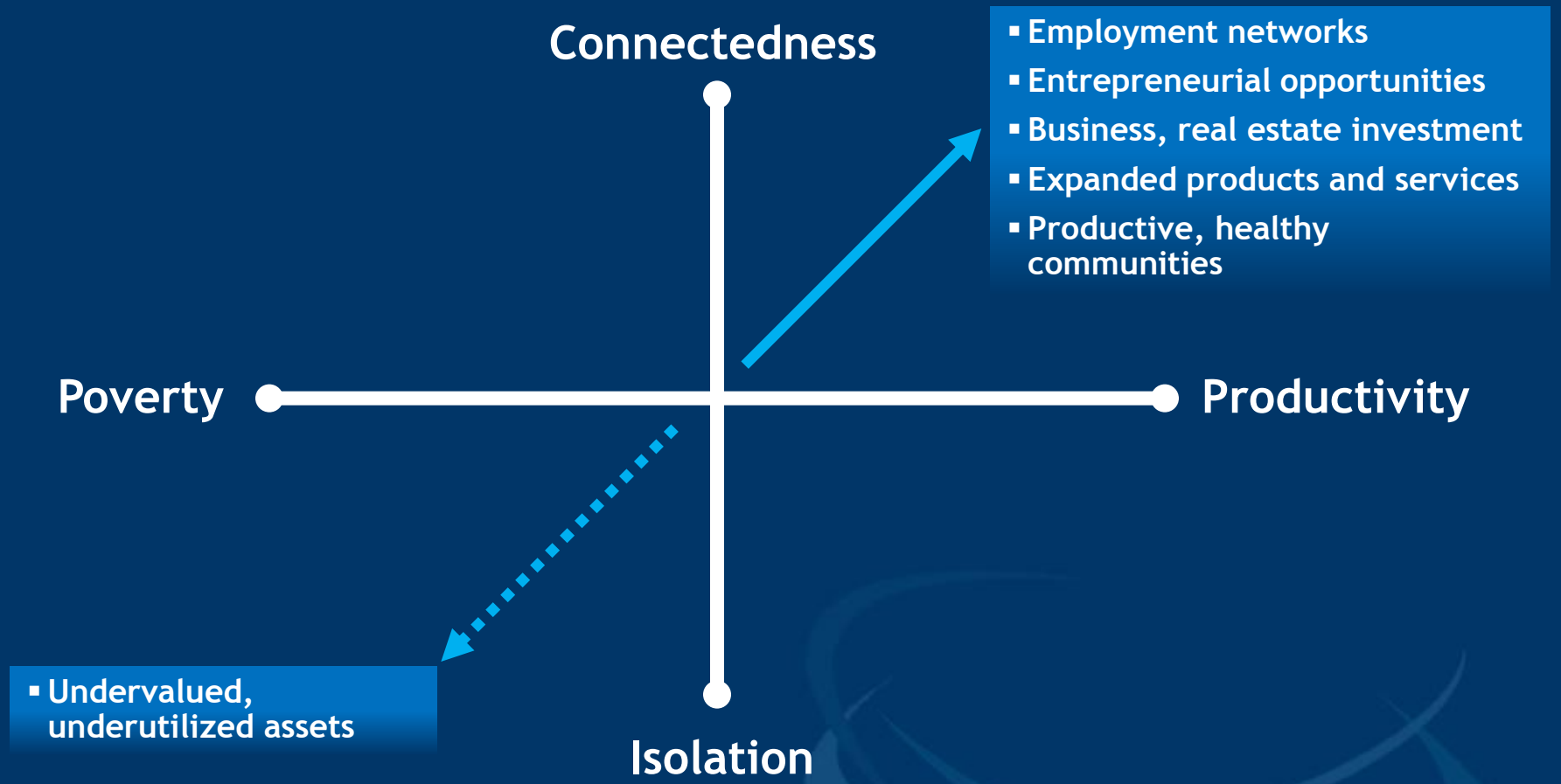
A Web of Interdependent Activities: "Organized Complexity" (Jacobs)

Neighborhoods are Nested in Larger Systems Which Drive the Flows of People and Capital



Neighborhoods arise from the interaction of regional economic, social and political systems with physical place.

Functioning Neighborhoods Connect Residents and Assets to Larger Systems



Goal: Neighborhoods that Build Capacity and Opportunity (Amartya Sen)

Applying the Framework

STEP 1A: What type of neighborhood do you want to be?

STEP 1B: What drivers will get you there?

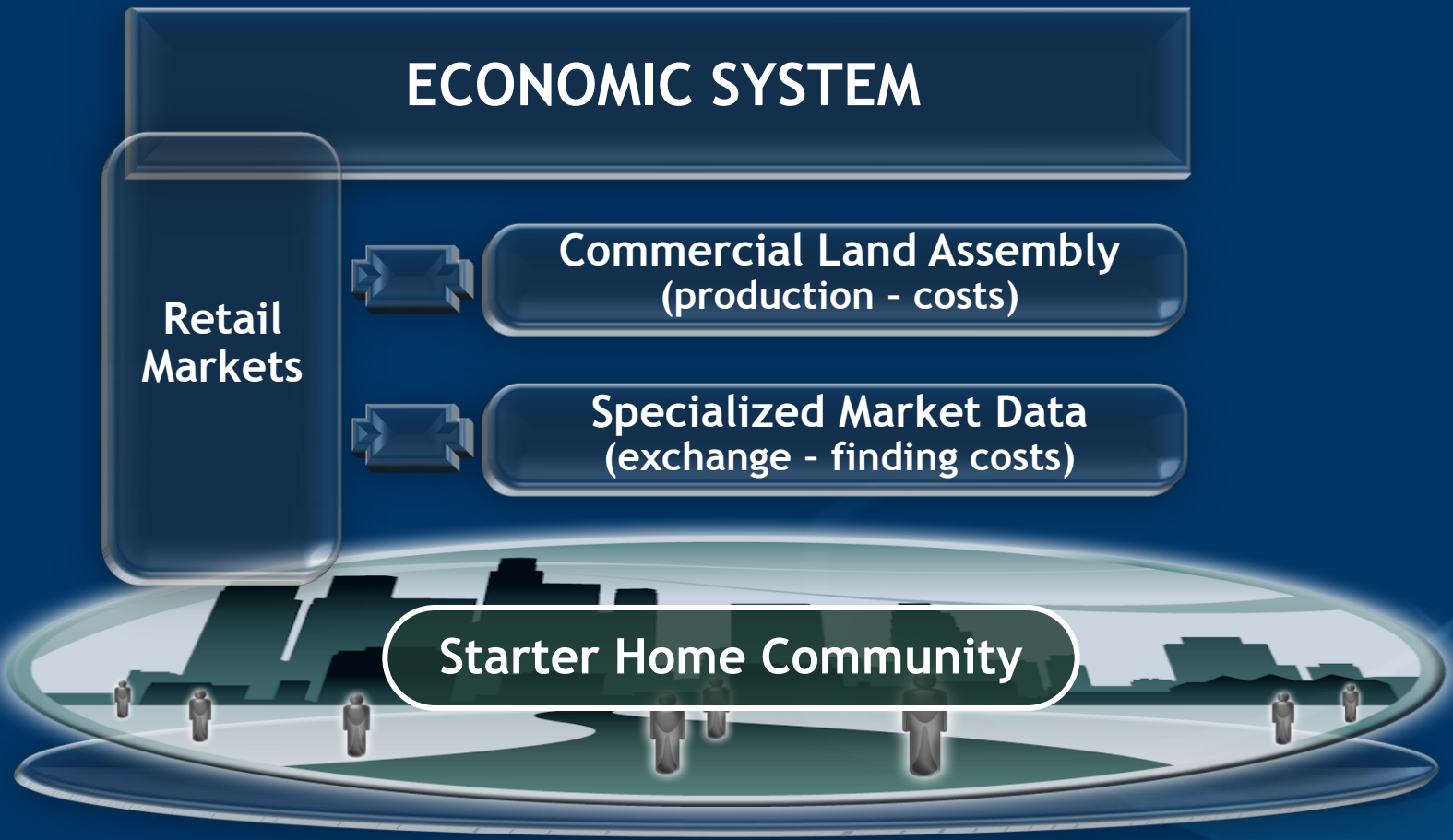
- Specific Retail Amenities
- Child Care
- Schools
- Safety
- Affordability

Applying the Framework

STEP 2: Identify Relevant System

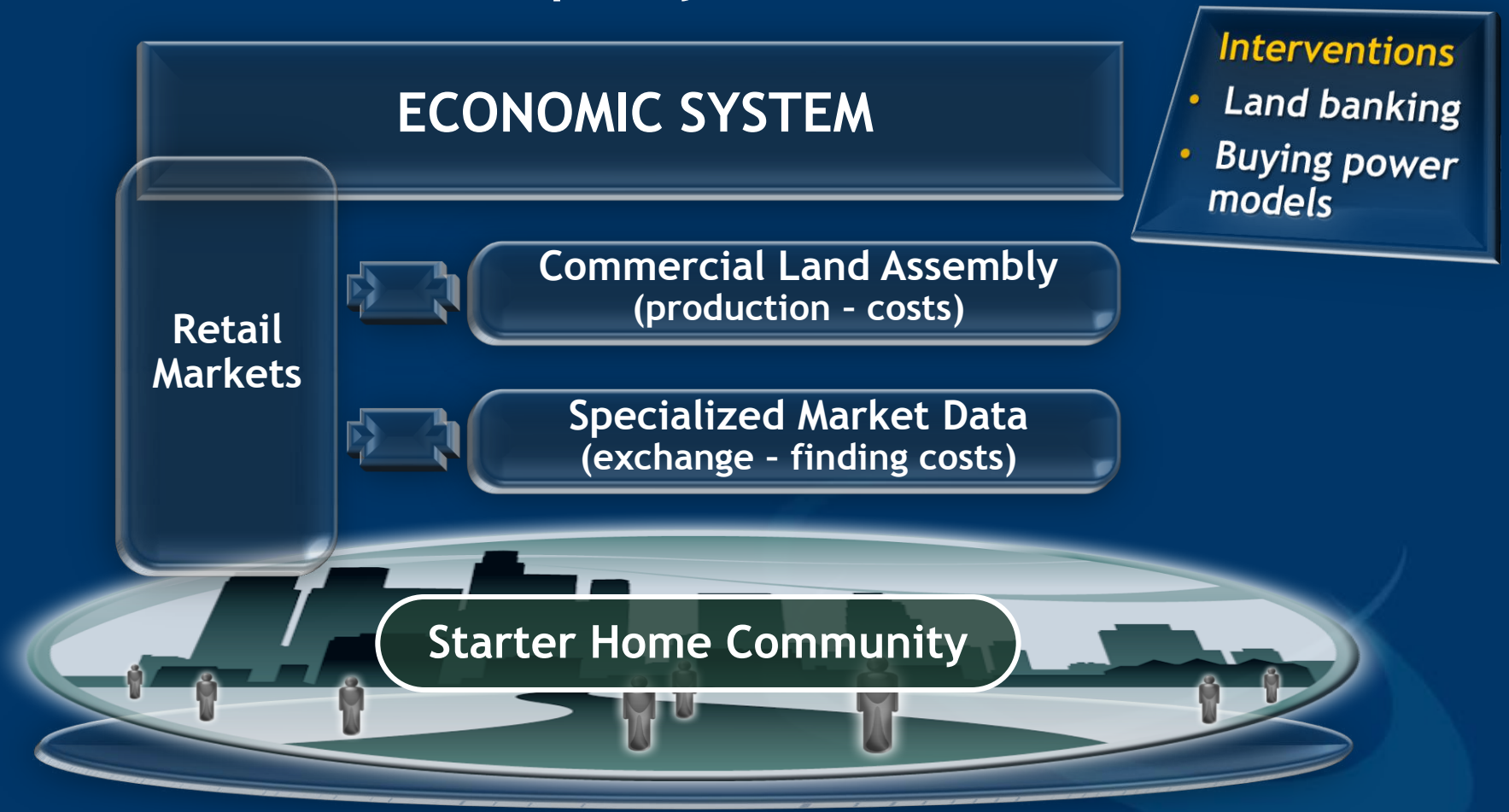
Applying the Framework

STEP 3: Identify Change Levers Within System



Applying the Framework

STEP 4: Specify Interventions



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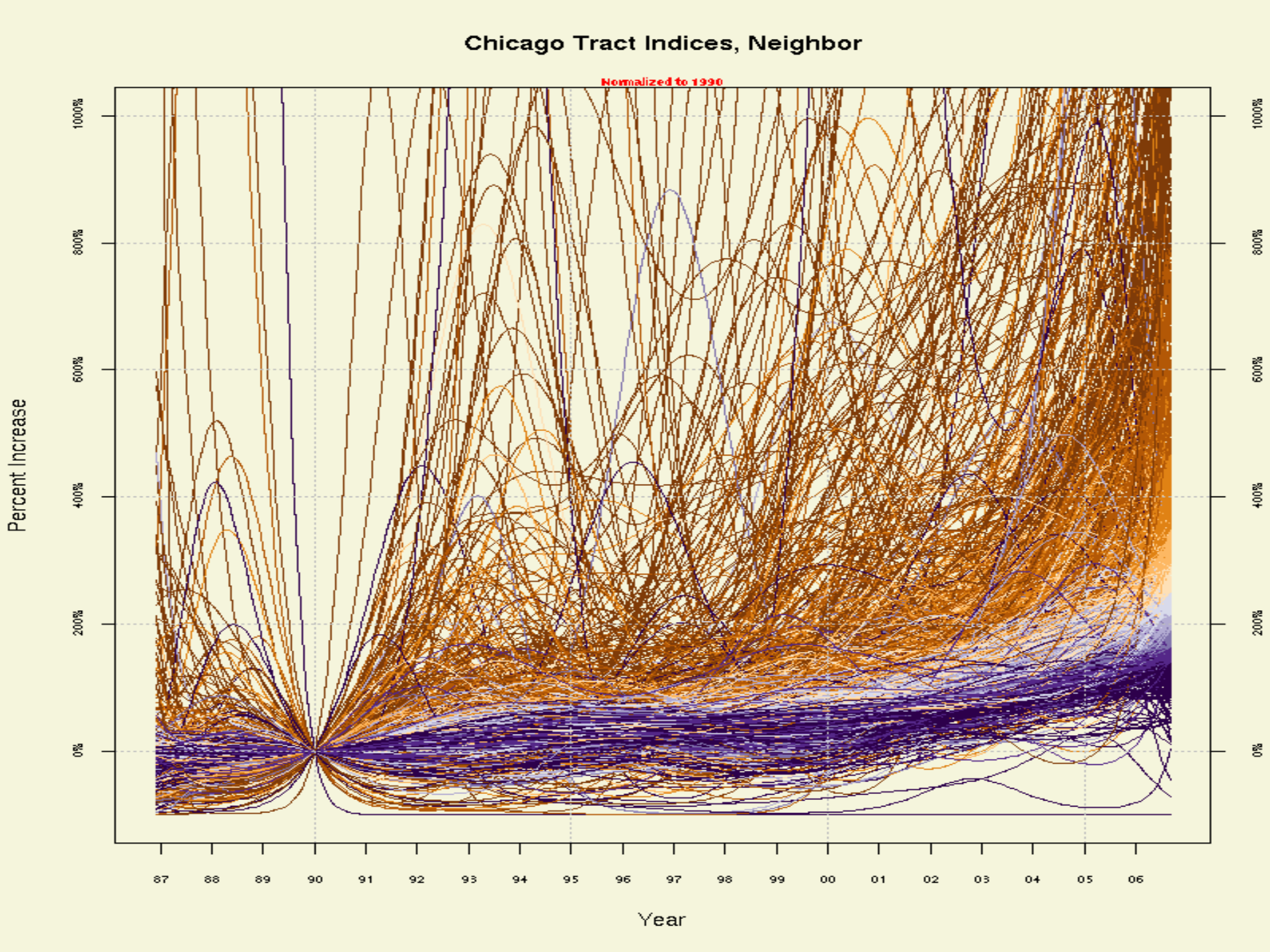
Chicago Tract Indices, Neighbor
Normalized to 1990
Percent Increase
0%
200%
400%
600%
800%
1000%
87
88
89
90
91
92
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05
06
Year

Developing New Tools for the Field

Question/Goal	Tool
Anticipate and manage neighborhood change	Pattern Search Engine
Enabling investment in inner city real estate markets	RSI → REIT
Track affordability and neighborhood housing mix	Housing Diversity Metric
Identify “true” neighborhood boundaries	Locally Weighted Regression
What neighborhoods are similar along particular factors of interest?	Custom Typologies
How does the impact of an intervention vary in different places?	Geographically Weighted Regression
What drivers differentiate neighborhoods with respect to a specific outcome of interest?	CART
How will a specific intervention affect its surrounding area?	Impact Estimator
Identify comparable neighborhoods based on drivers of change and other key characteristics	Neighborhood Typology

Pattern Search

What It Does:

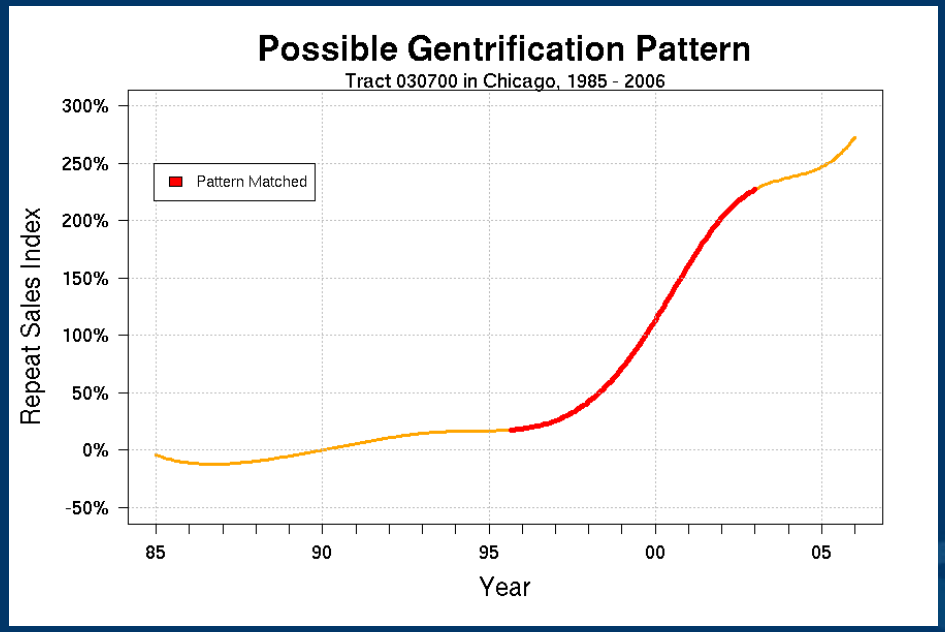
- For identified patterns of change, finds other neighborhoods that have been through or are going through the same pattern

Applications:

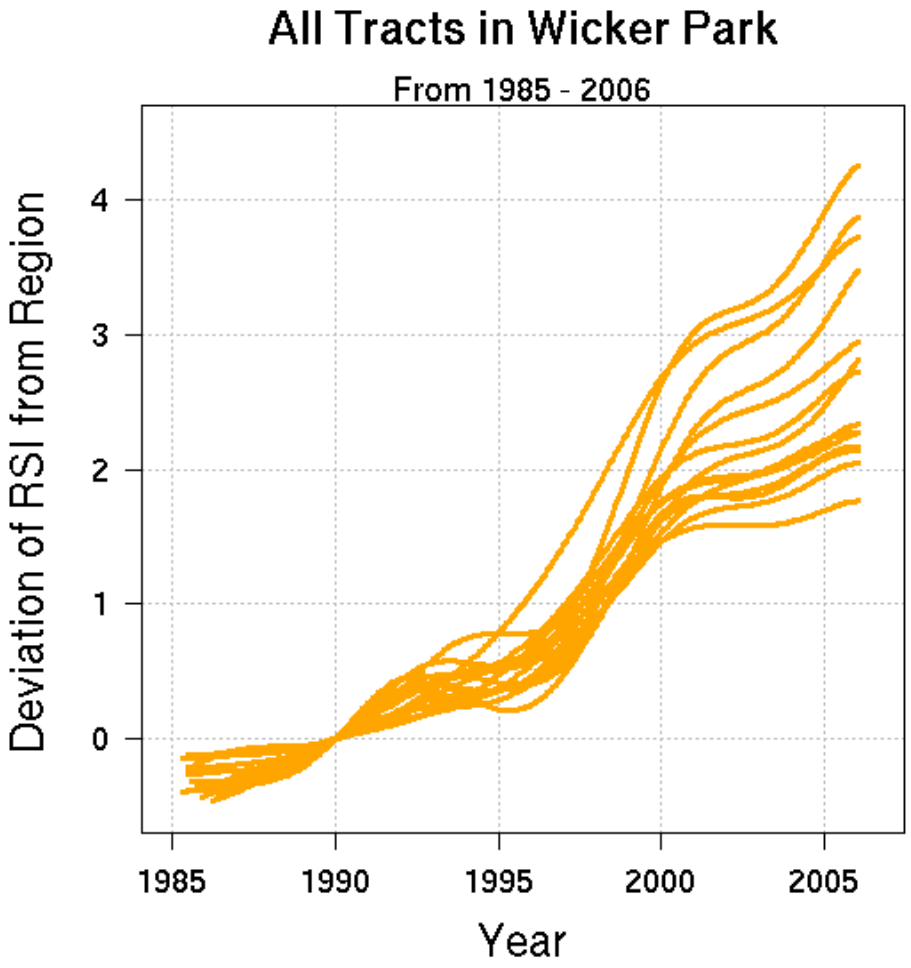
- Enables identifying comparable neighborhoods with respect to particular patterns of change in order to identify key factors and effects
- Enables anticipating and managing particular patterns of change

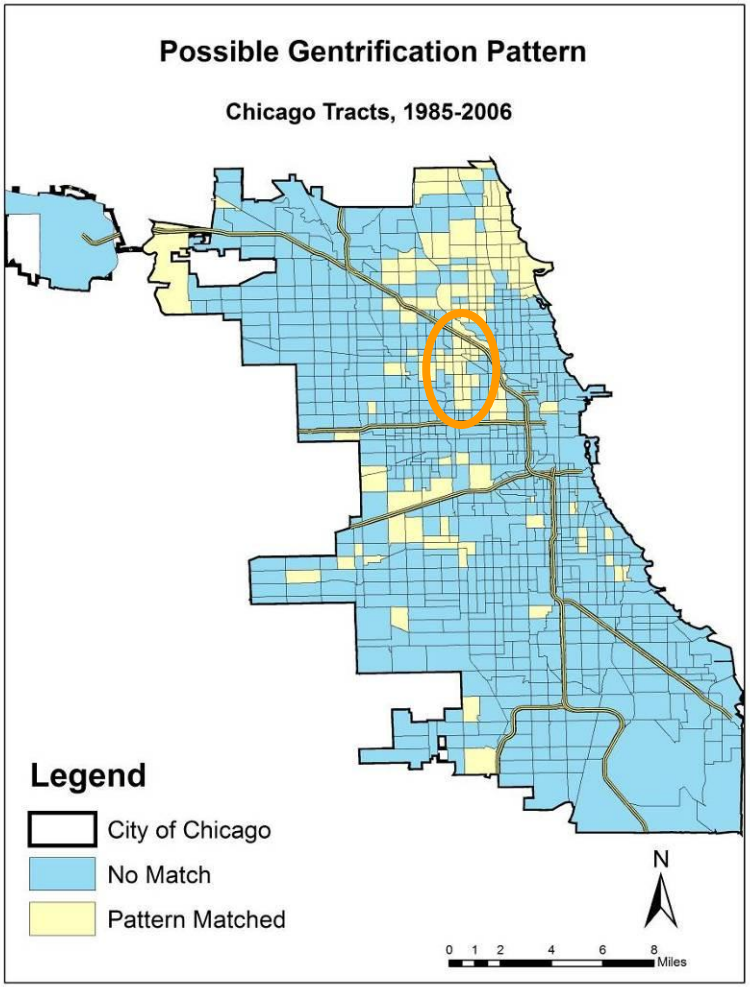
Pattern Search Example: Gentrification in Chicago

- **Goal:** Anticipating Neighborhood Change
- **How it Works:** Define a Pattern and Find Matching Cases
- **Example:** Possible Gentrification Pattern Defined Based on a Neighborhood in Chicago

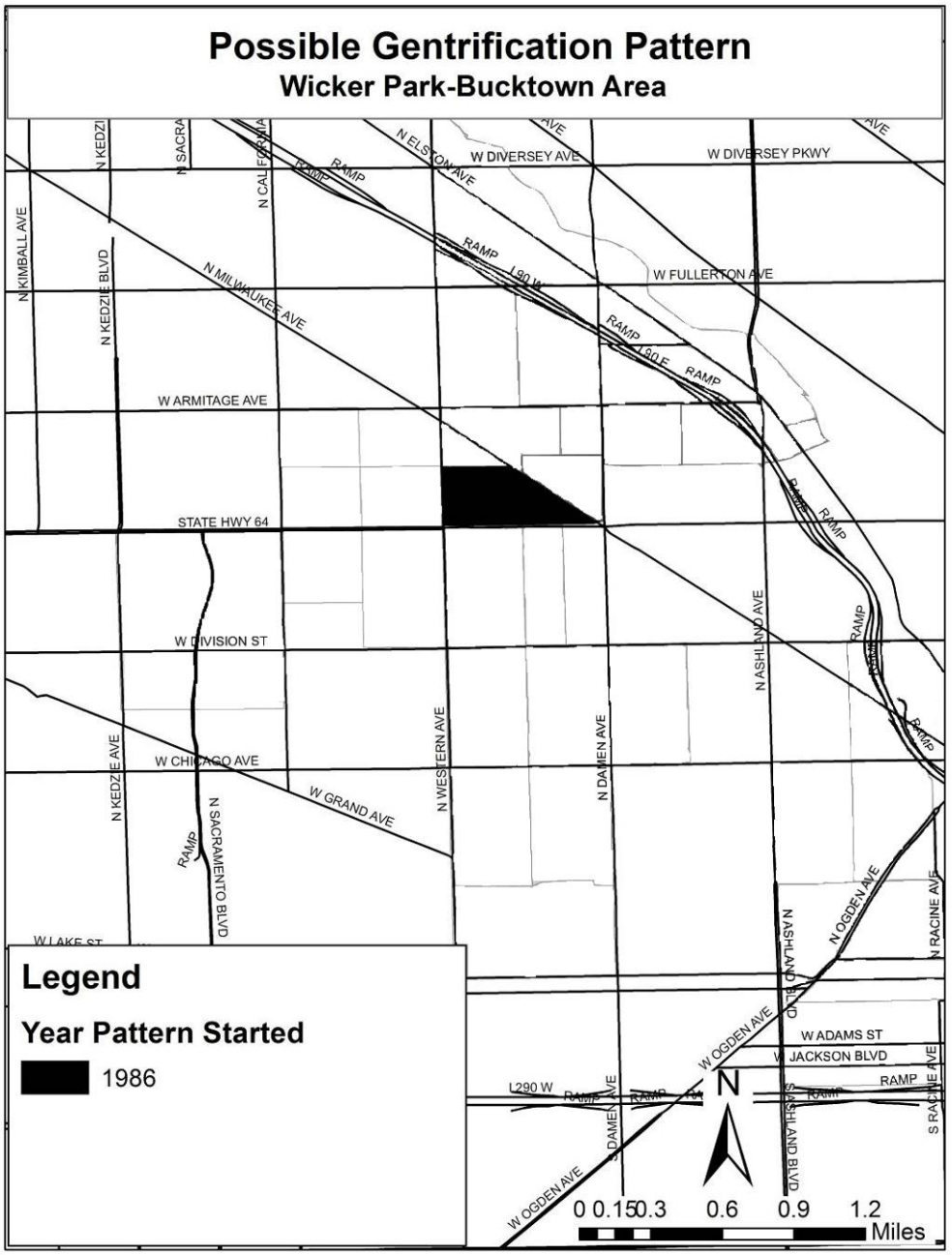


Zooming In: Wicker Park Area





Pattern "Spreading" to Nearby Tracts



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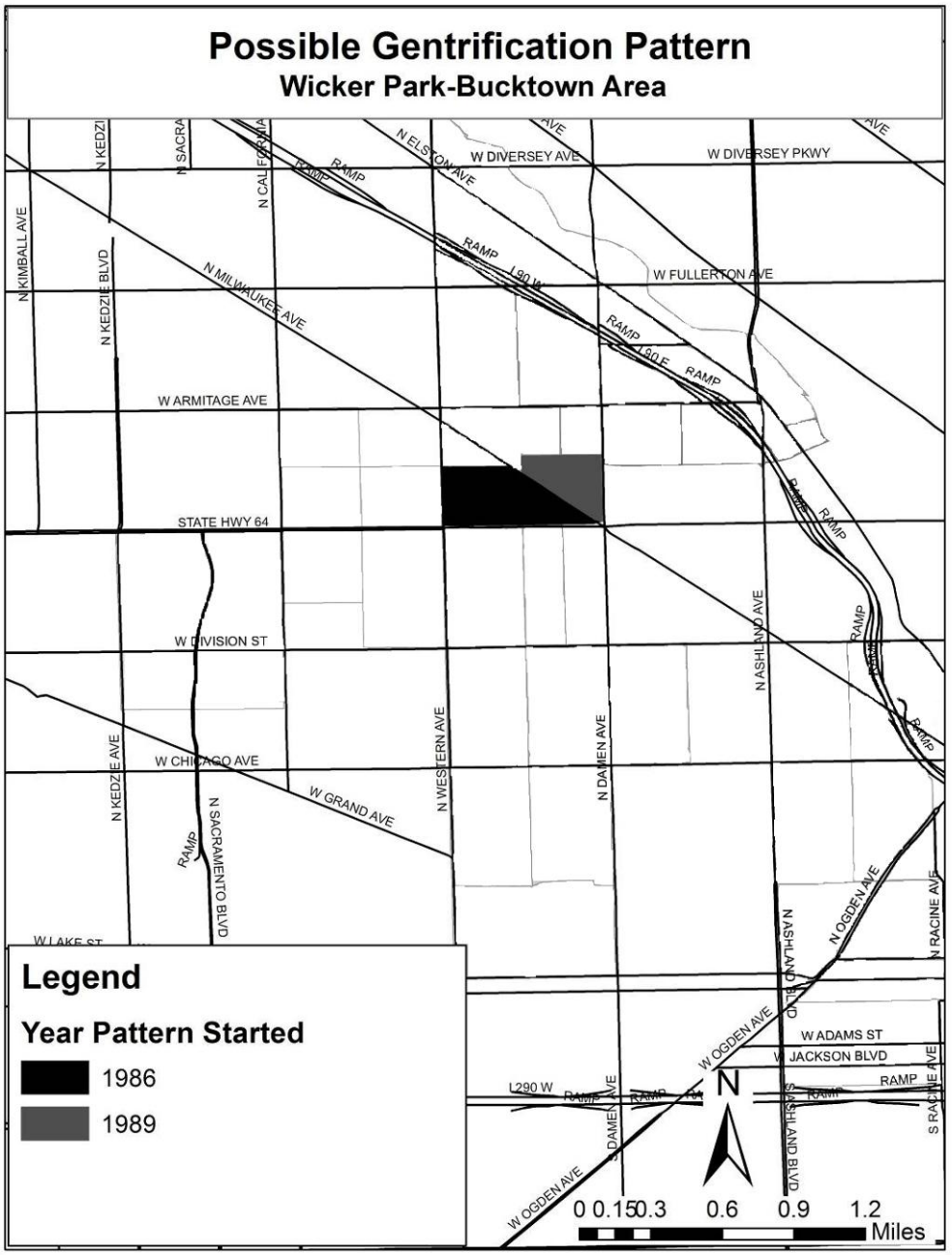

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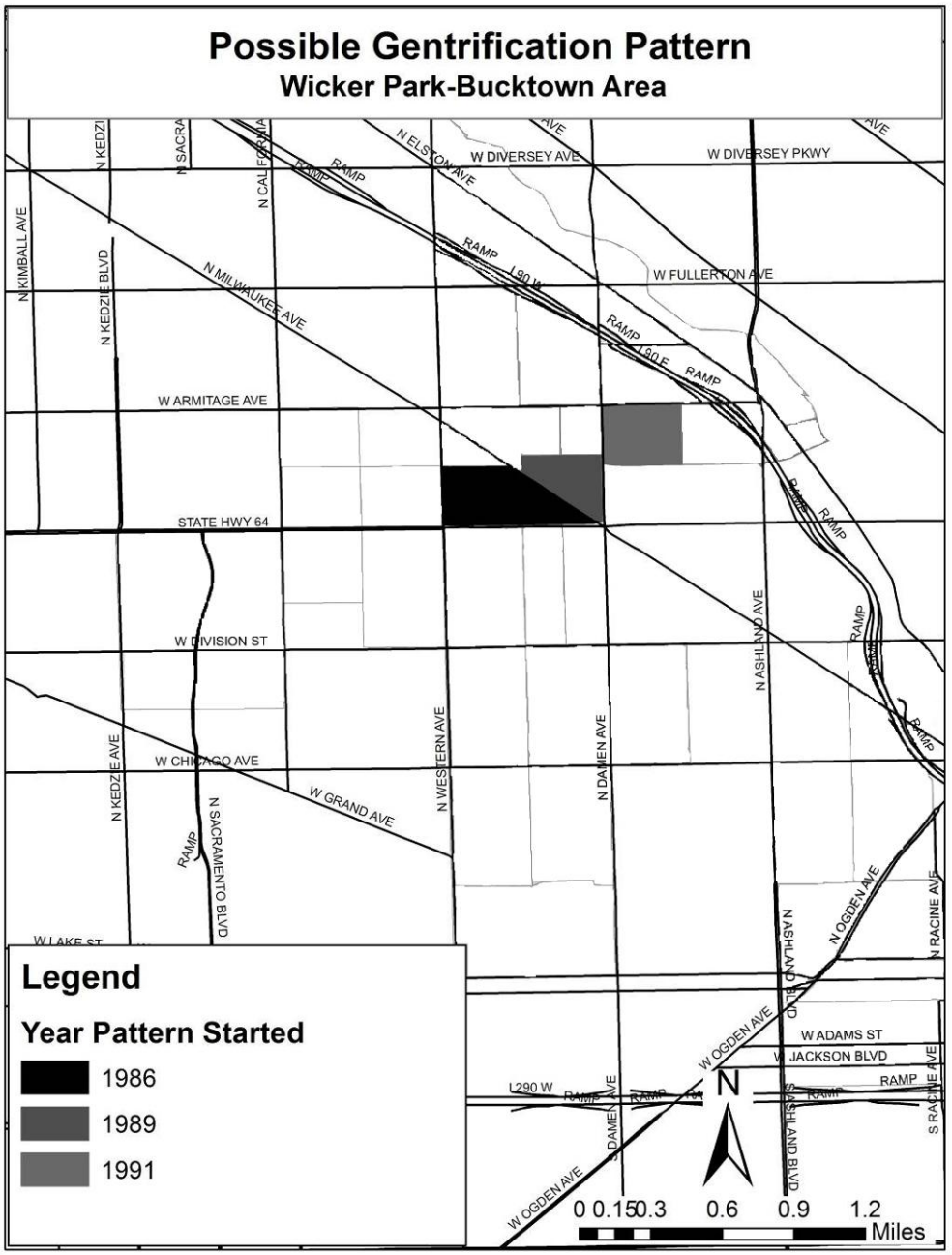

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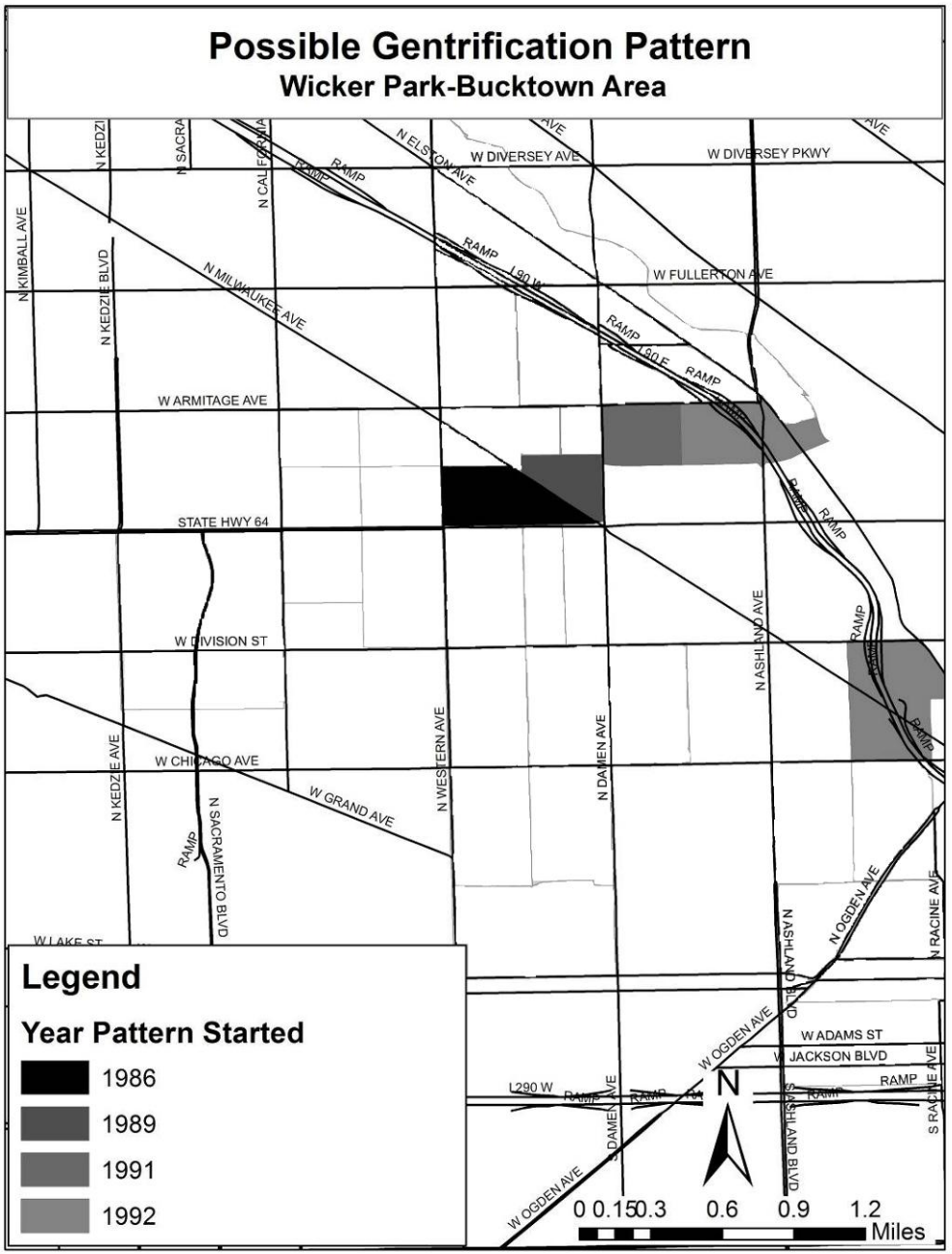

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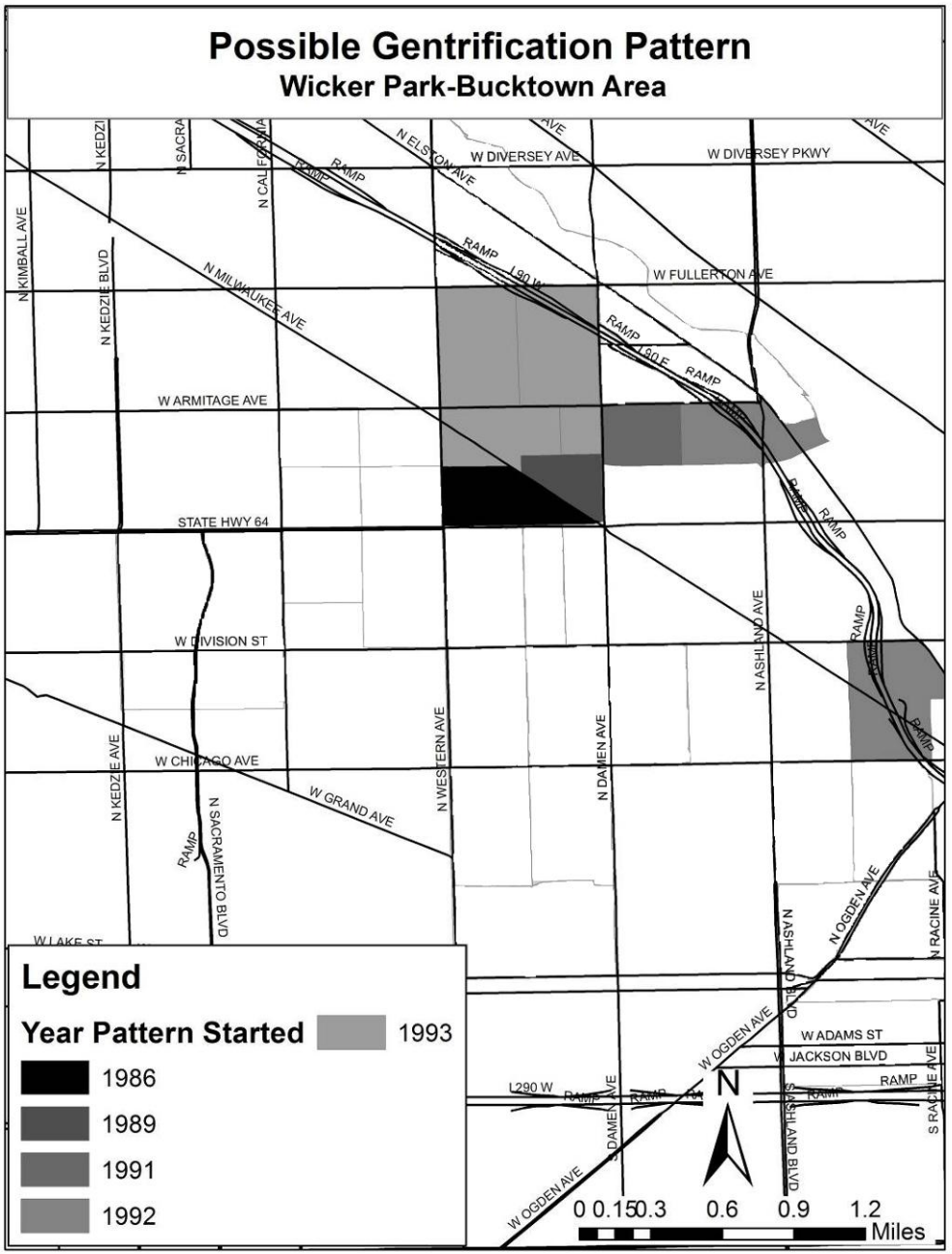

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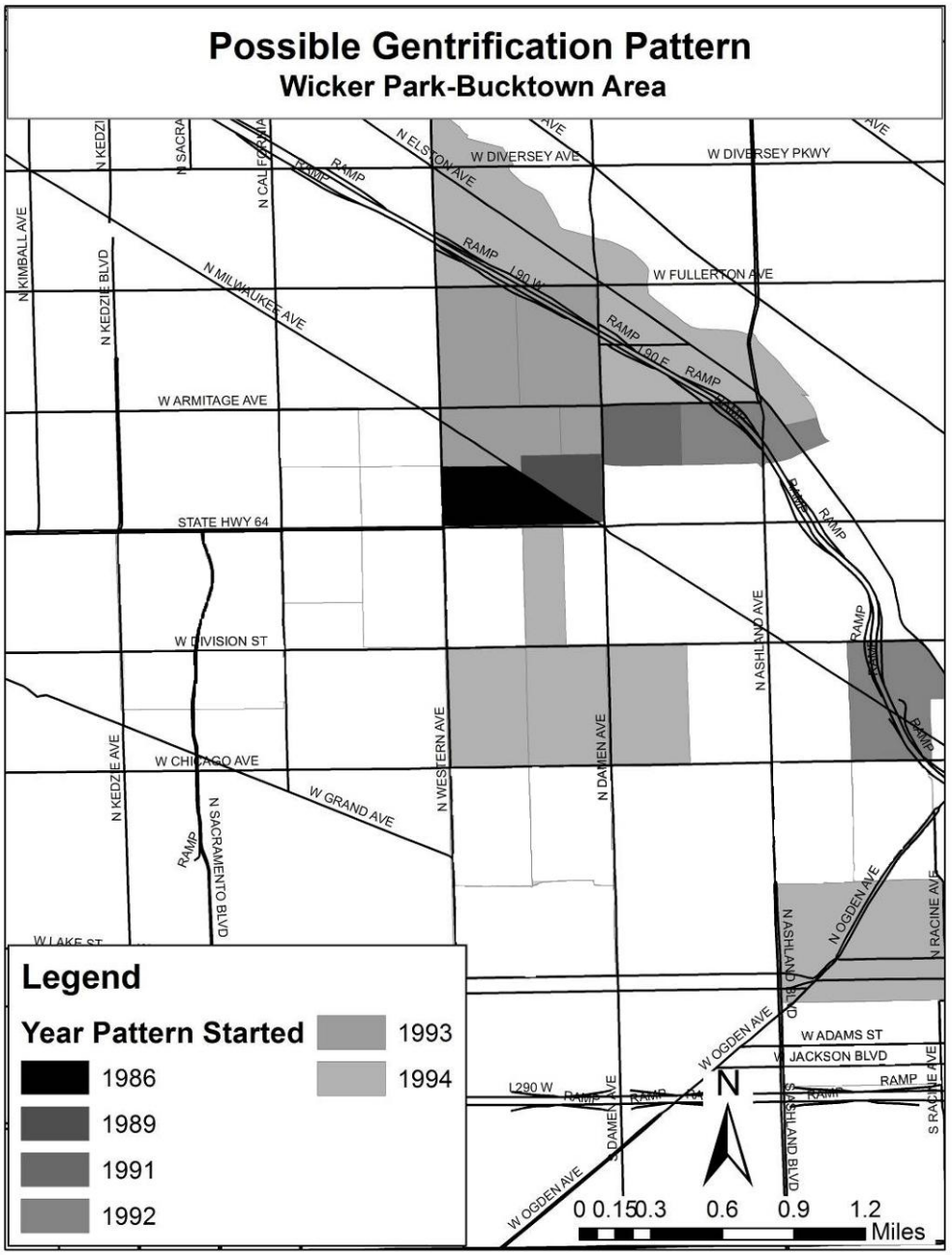

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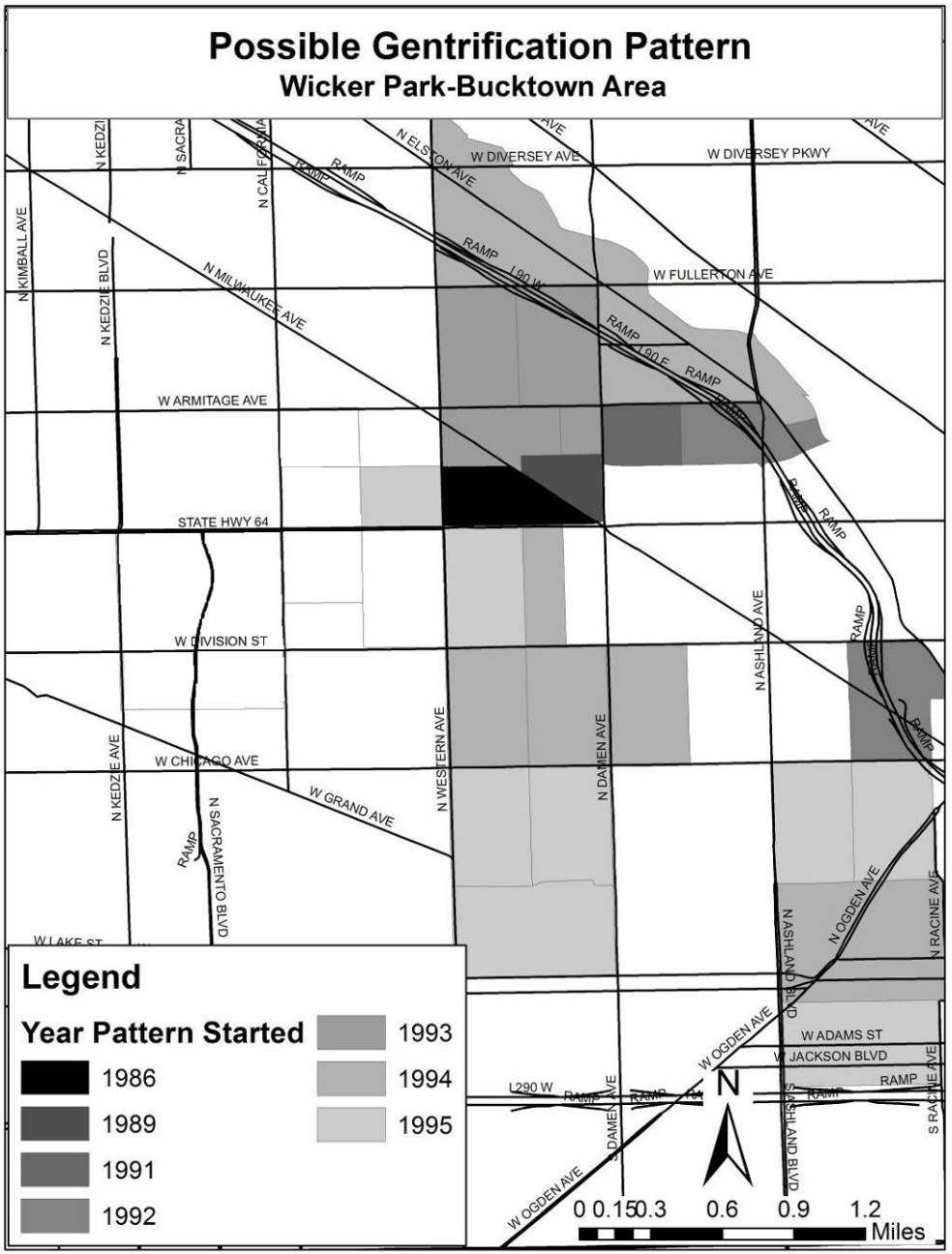

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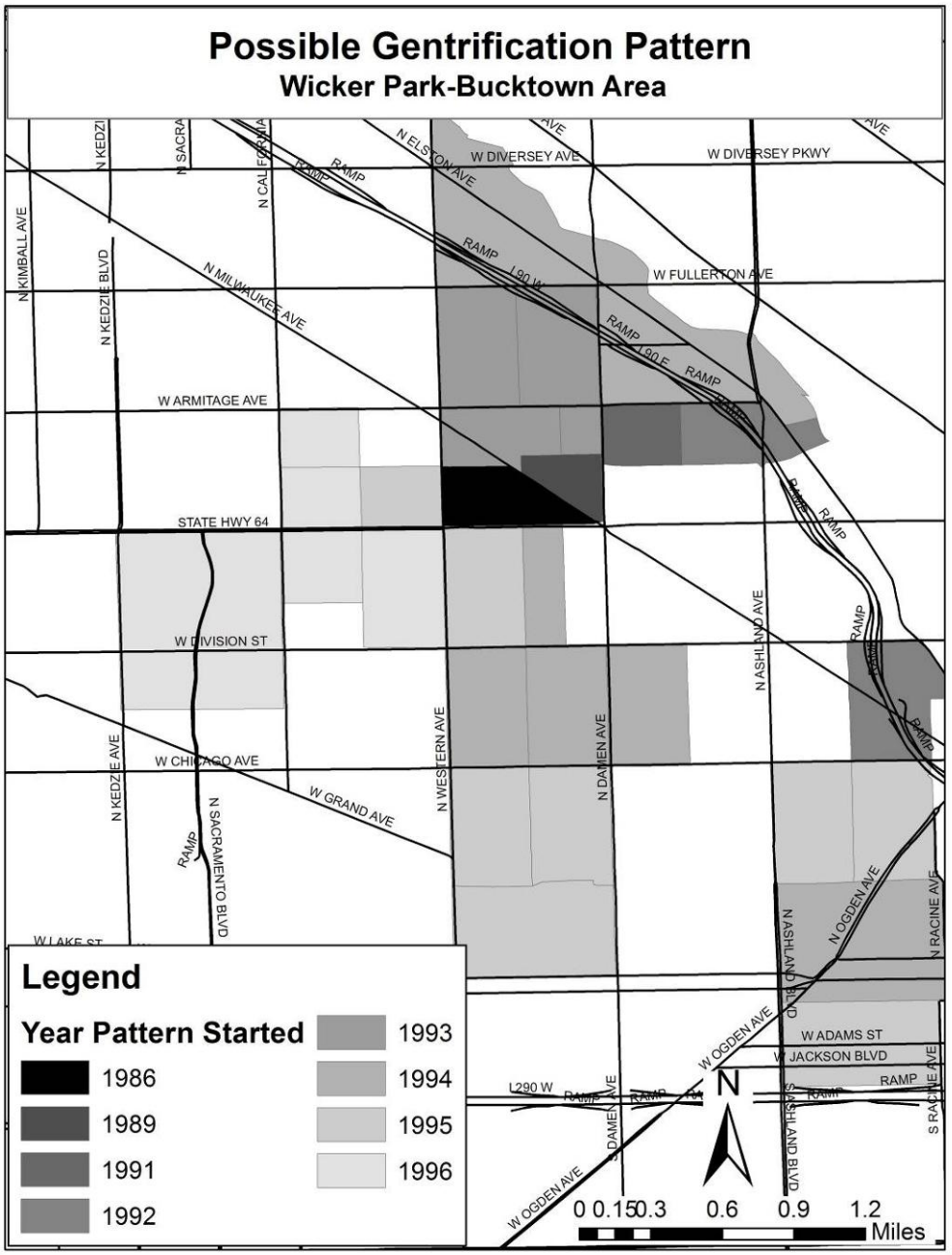
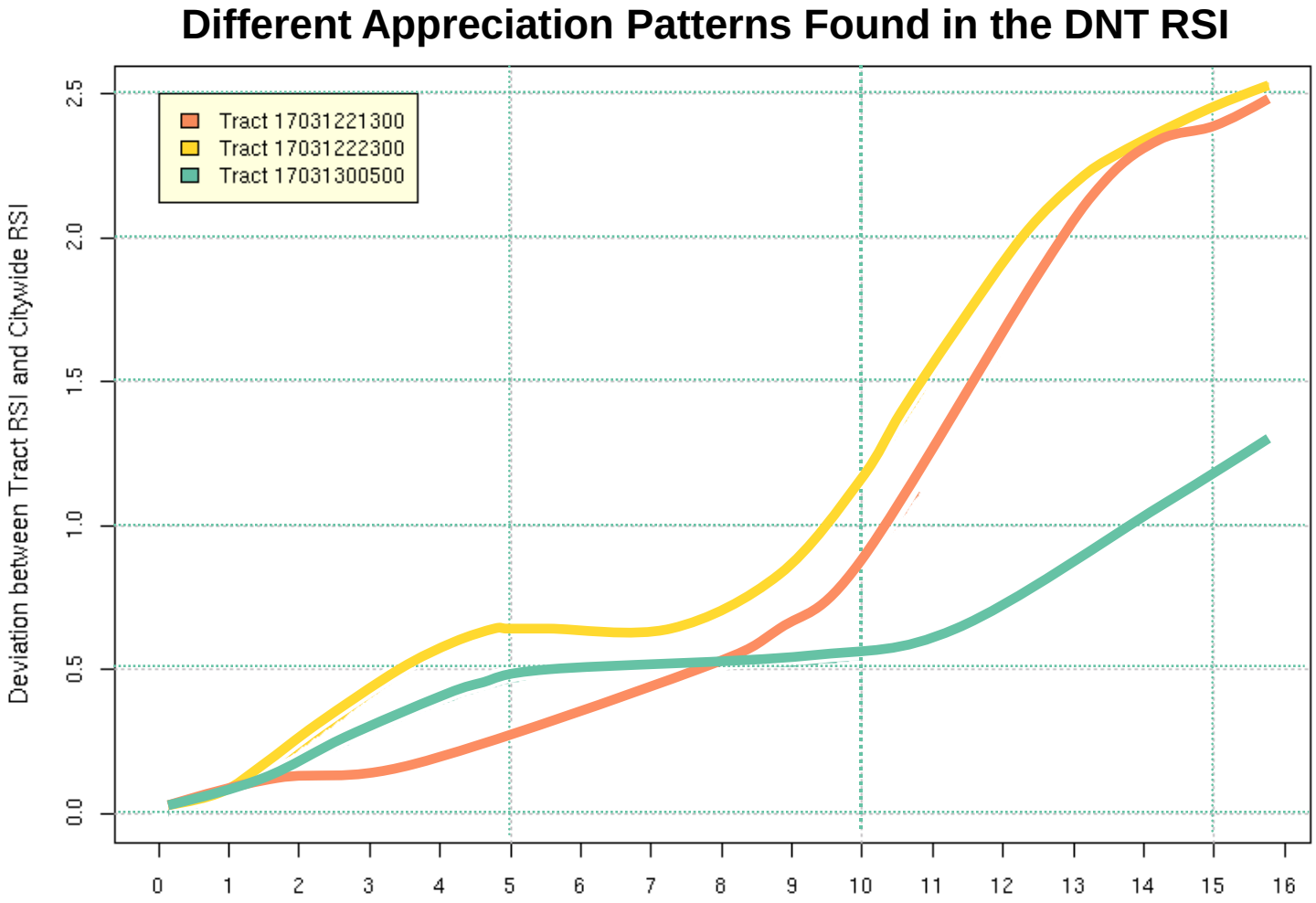


Possible Application:
Anticipating and Managing Gentrification



Housing Diversity Metric

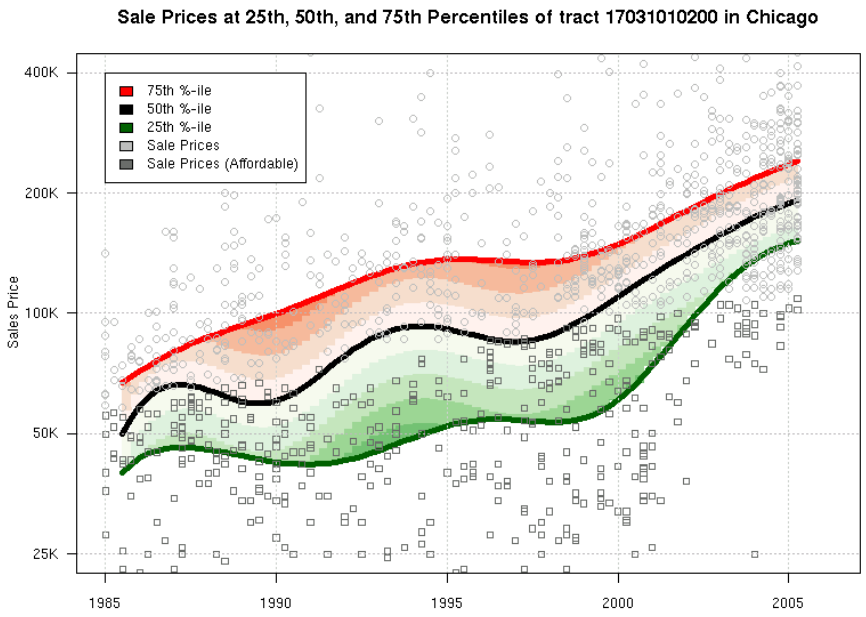
What It Does:

- Tracks the affordability and mix of the housing stock (distribution, not just median)

Applications:

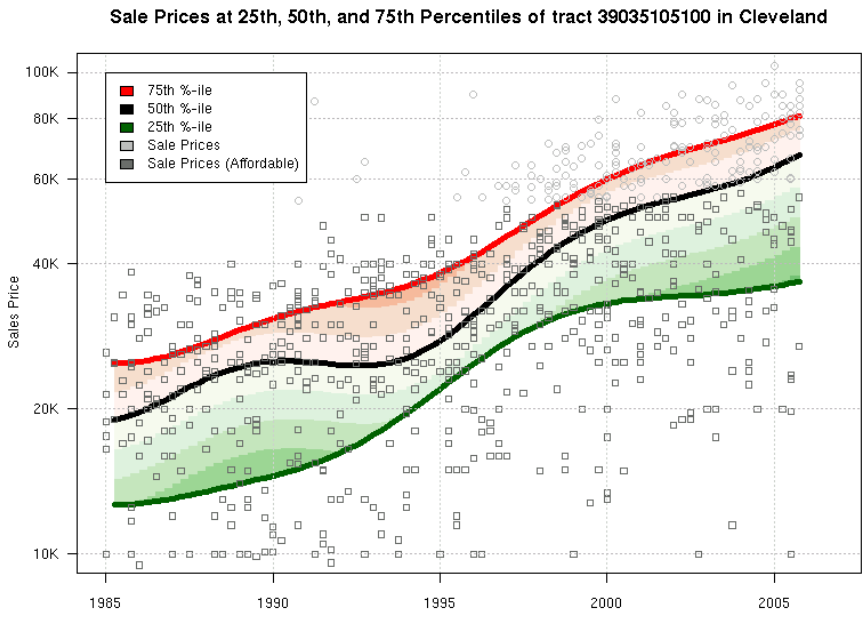
- Enables tracking the range of housing available in the neighborhood
- Better indicator of possible displacement than median prices alone

Example: Tracking the Price Mix



Strong Overall Appreciation, Range of Housing Options Is Narrowing

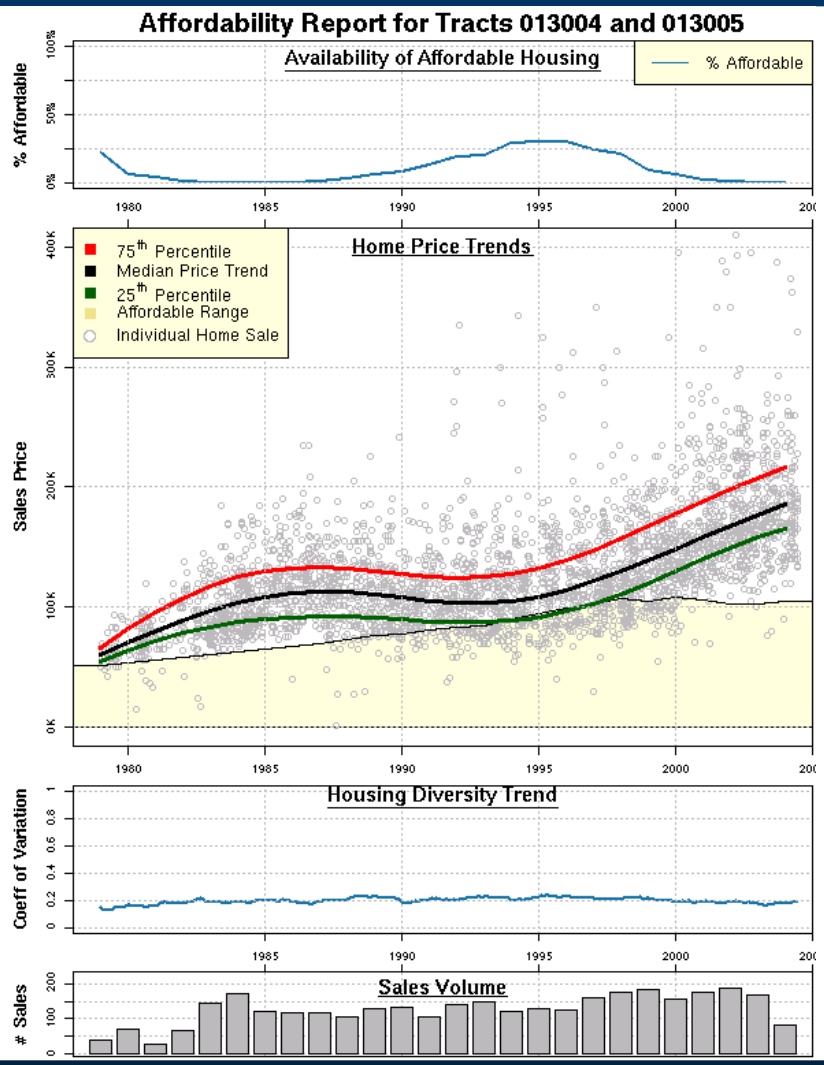
Lack of Affordable Housing



Strong Overall Appreciation, but Range of Housing Options Is Still Wide

Large Share of Housing Remains Affordable

Sample “Affordability Report”



Impact Estimator

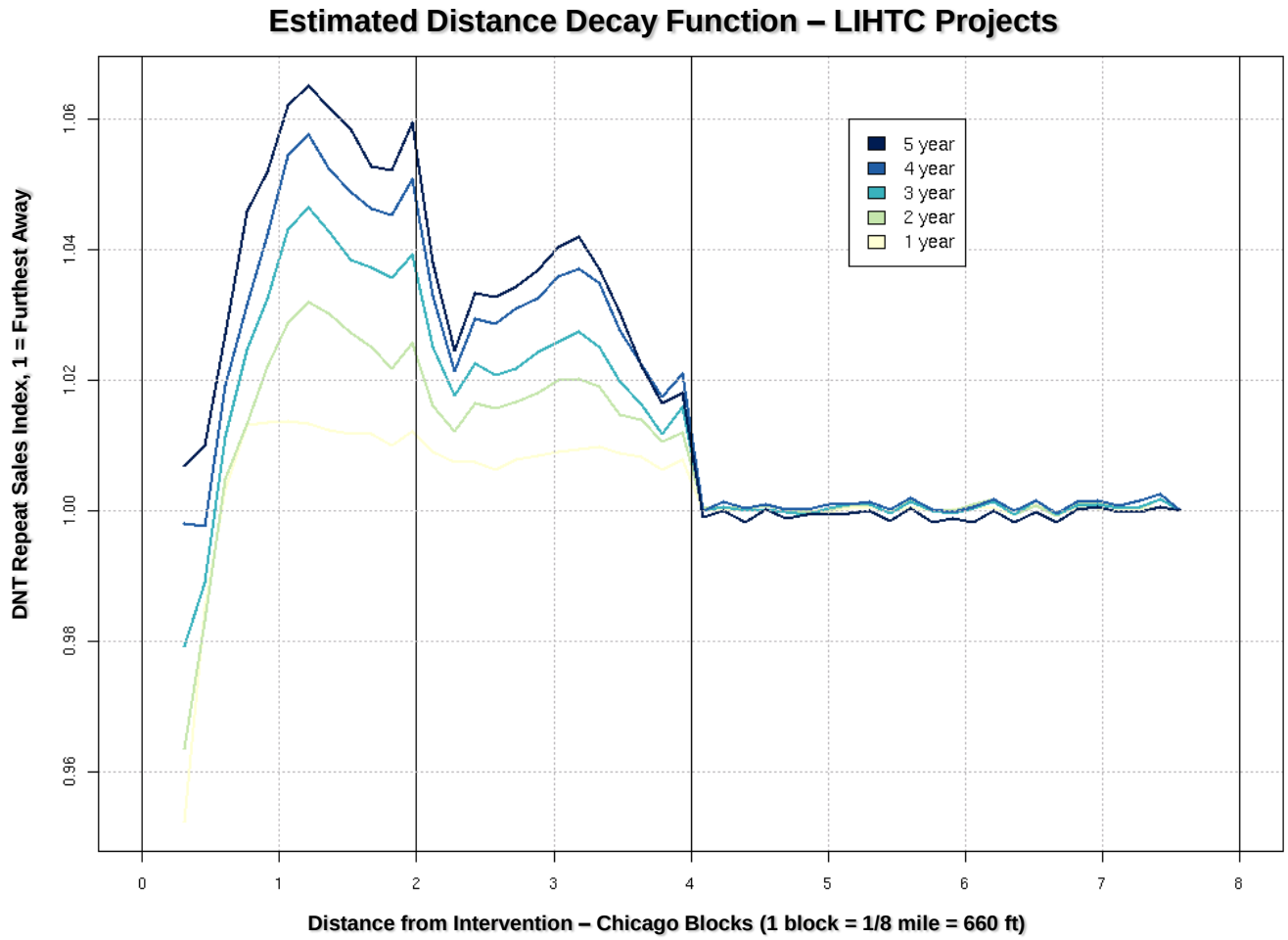
What It Does:

- Estimate impact of an intervention on surrounding housing values (or on other outcome, e.g. crime)

Possible Applications:

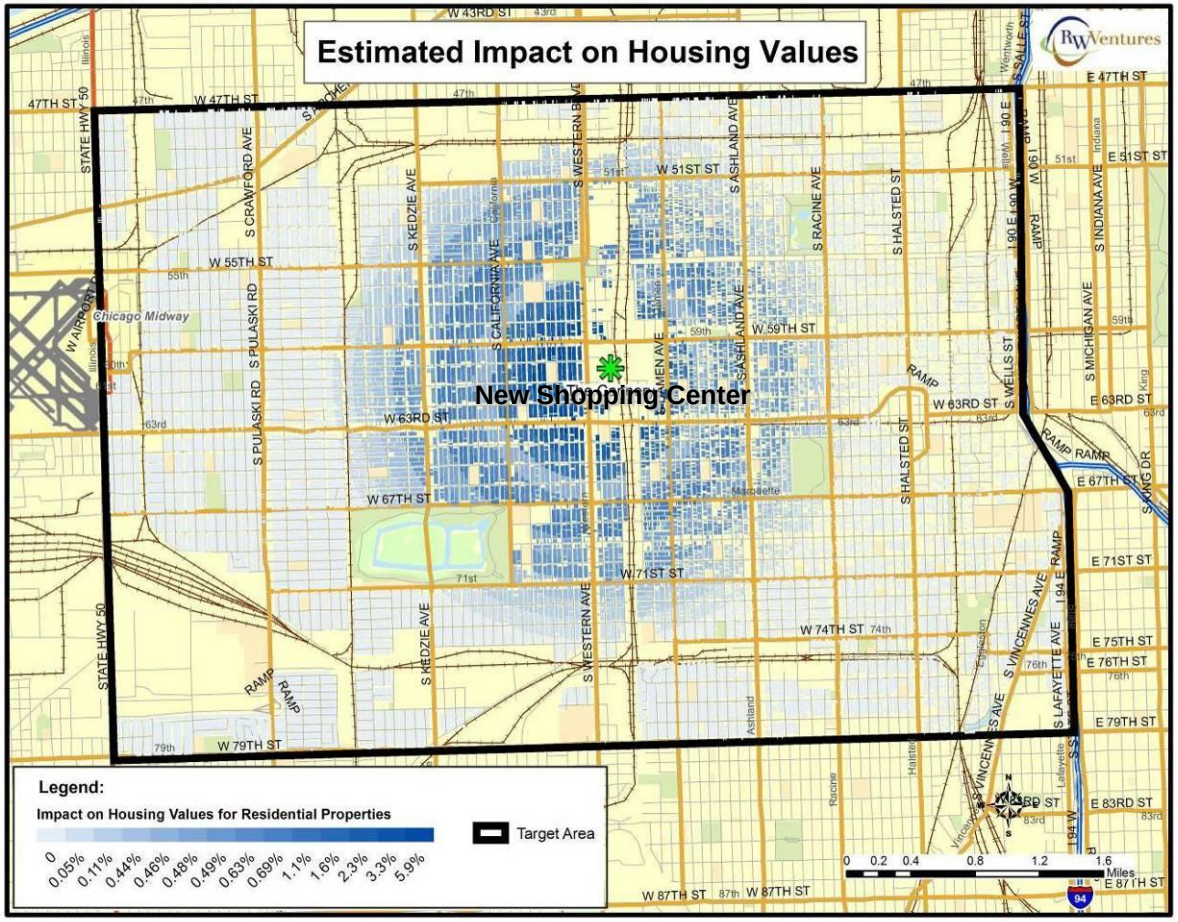
- Evaluate the impact of a development policy
- Choose among alternative interventions based on estimated benefits to the surrounding community
- Advocate for a specific intervention

Impact of LIHTC on Surrounding Properties



PRELIMINARY – FOR ILLUSTRATION PURPOSES ONLY

Applying the Estimator to a Specific Project: New Shopping Center in Chicago



Estimated benefits to the community: $29 million in increased property values, or an average of $1,300 per home owner.

Classification and Regression Tree (CART)

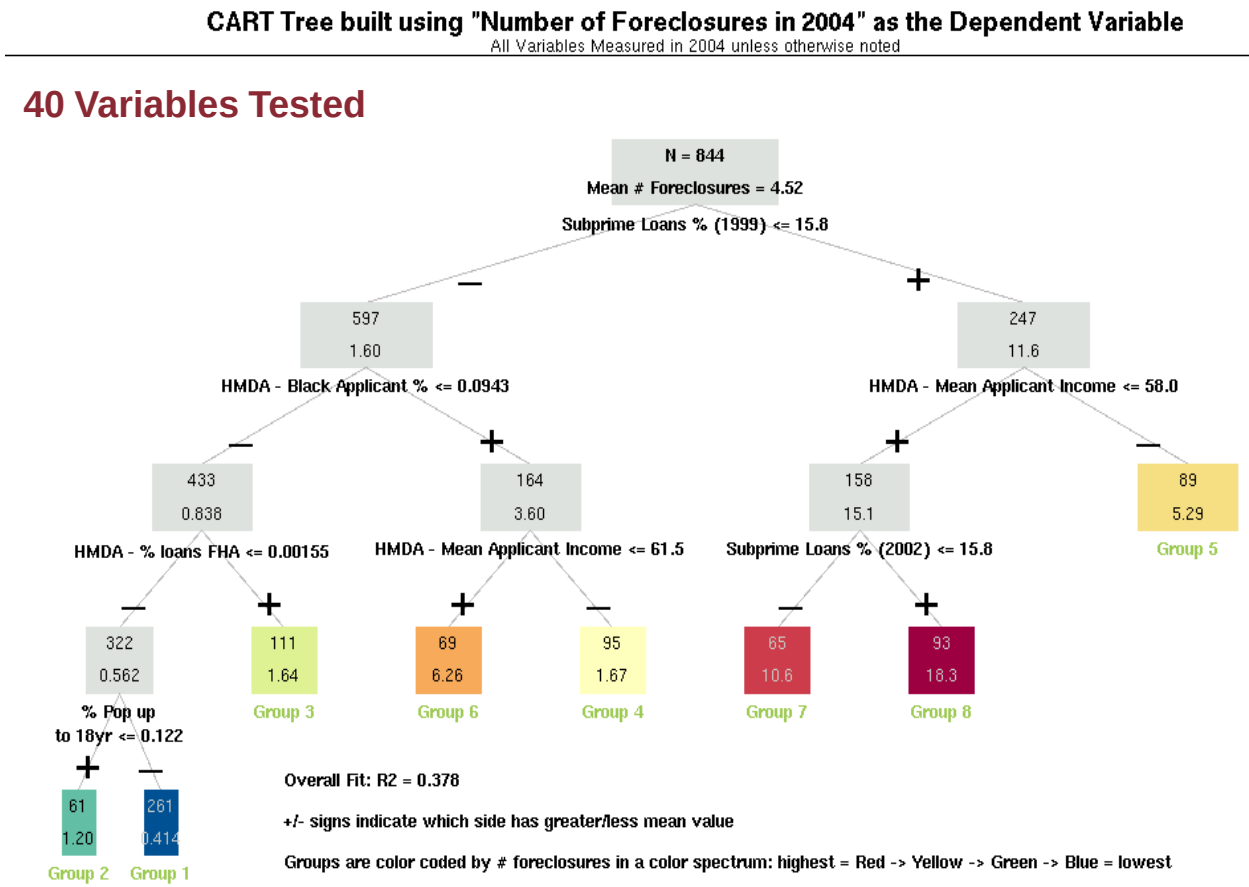
What It Does:

- Identify similar neighborhoods with respect to an outcome of interest and its drivers

Applications:

- Identify leverage points to affect the desired outcome
- Meaningful comparison of trends and best practices across neighborhoods

Sample CART: Foreclosures



Outcome:

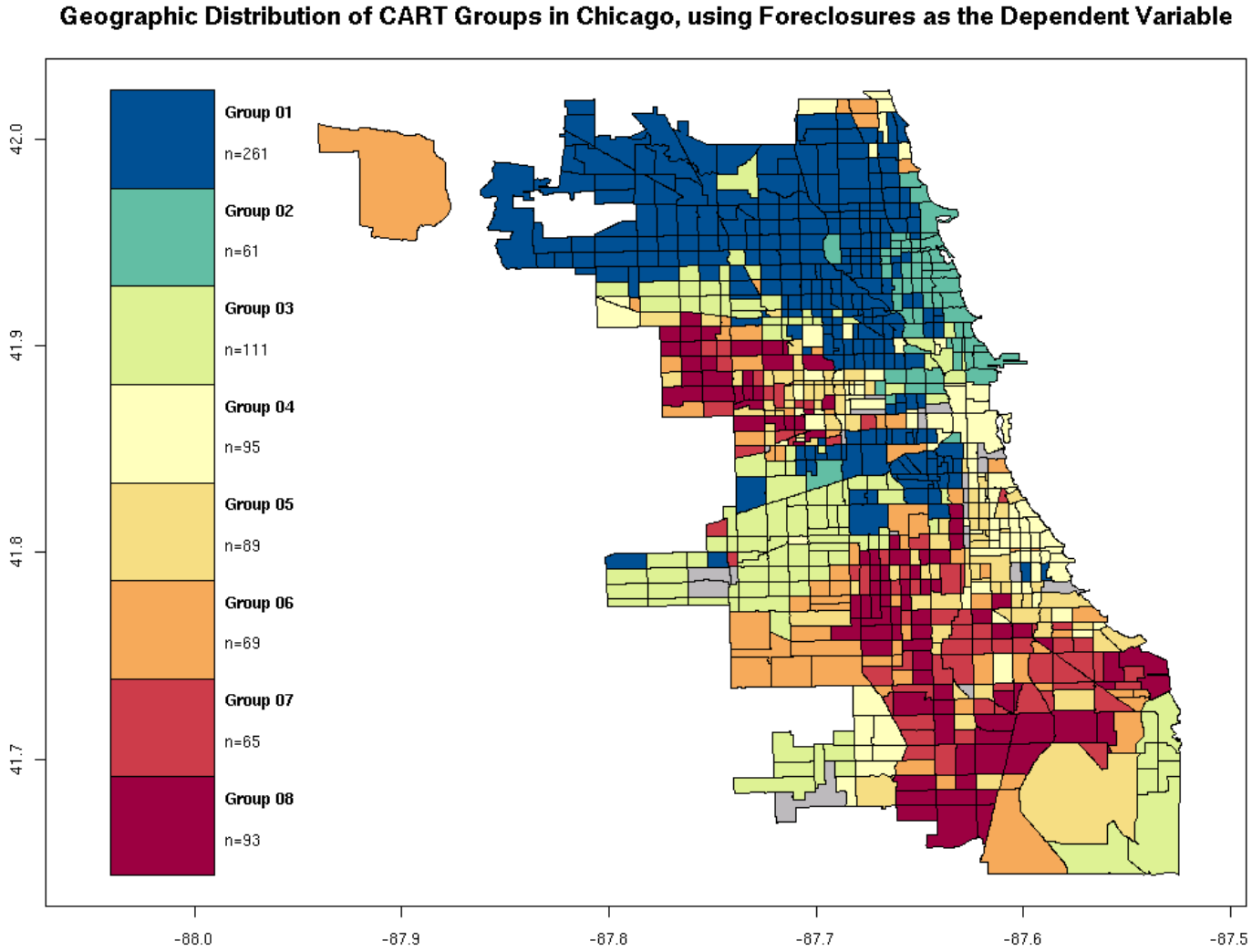
- Number of Foreclosures (2004)

Drivers:

- % Subprime Loans in Previous Years
- Mean Loan Applicant Income
- % FHA Loans
- % Black Borrowers

What Neighborhoods Have Similar Numbers of Foreclosures, and Why?

CART Output: Chicago Segments



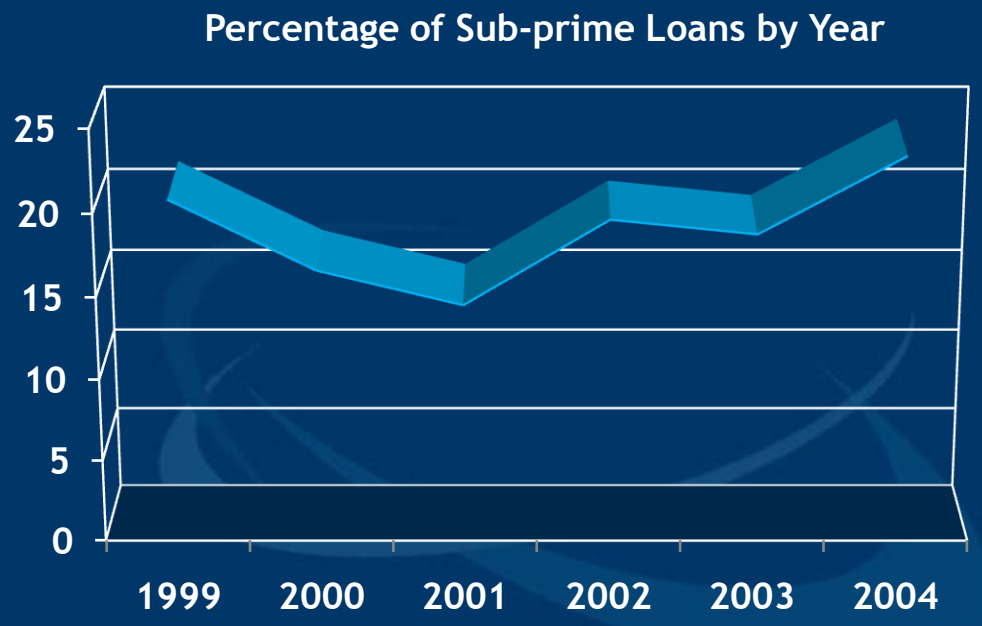
Cluster 8: Defining Traits and Risk Factors

Segment Profile:

- Isolated, underserved, predominantly African American communities. High rates of unemployment and sub-prime lending activity.

Primary Risk Factor:

- Percentage of sub-prime loans (primary driver of foreclosures) is at its highest and still on the rise



DNT Neighborhood Typology

What It Does:

- Identifies distinct neighborhood types based on drivers of change and other characteristics

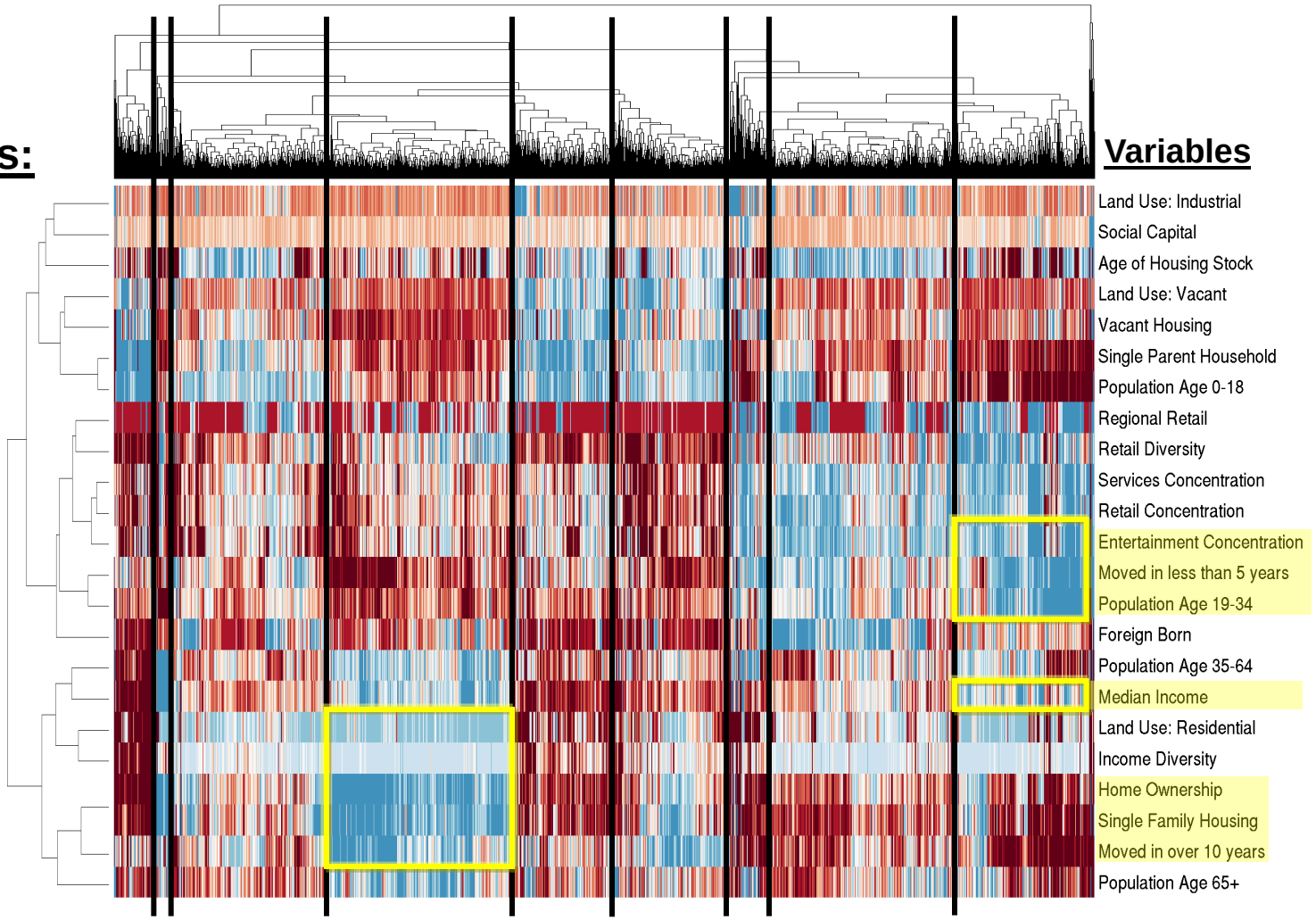
Possible Applications:

- Tailor strategies to specific neighborhood types
- Benchmark neighborhood performance
- Peer analysis and relevant best practices
- Facilitate impact analysis

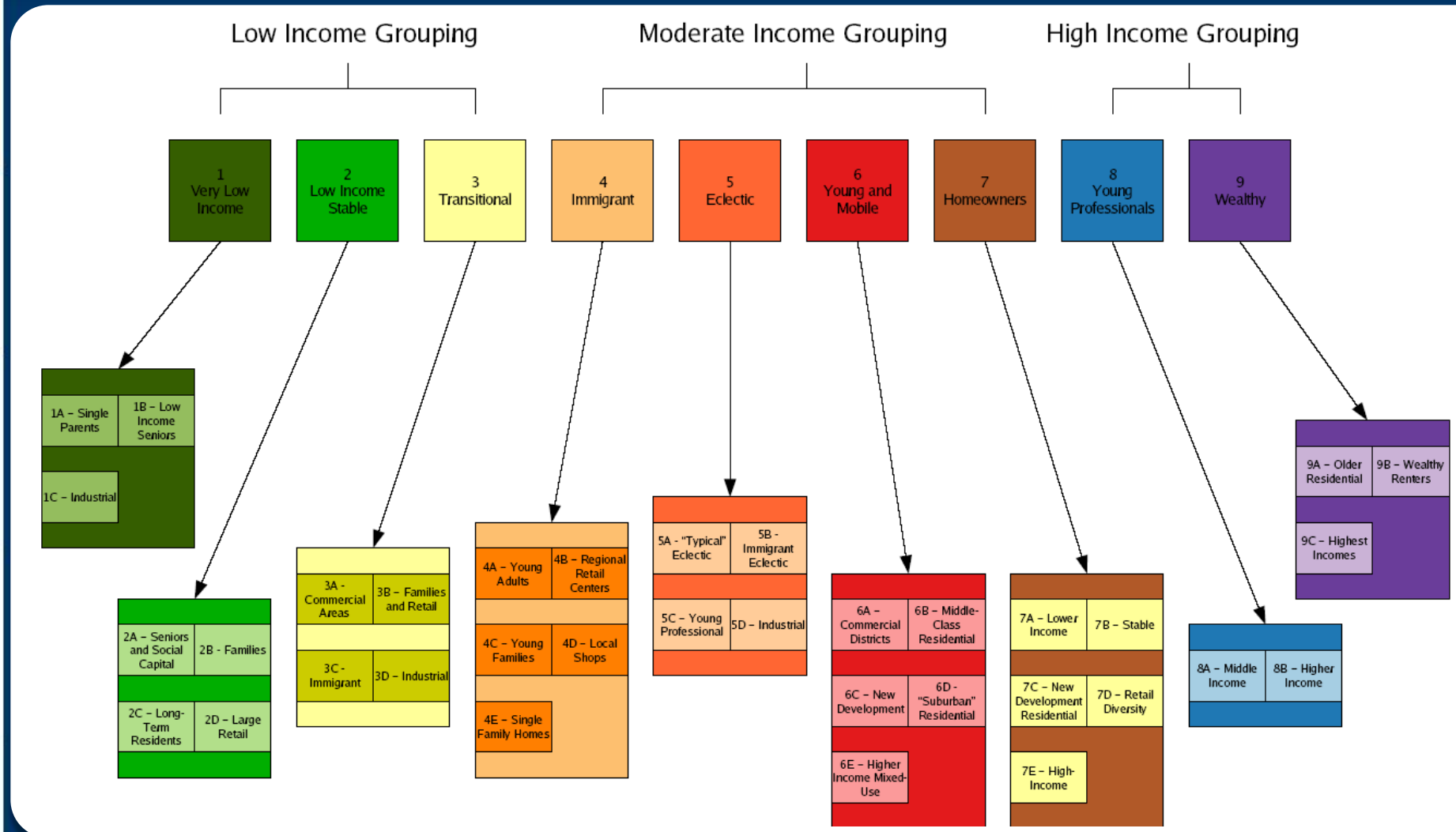
A Preliminary Taxonomy of Neighborhoods

Key Dimensions:

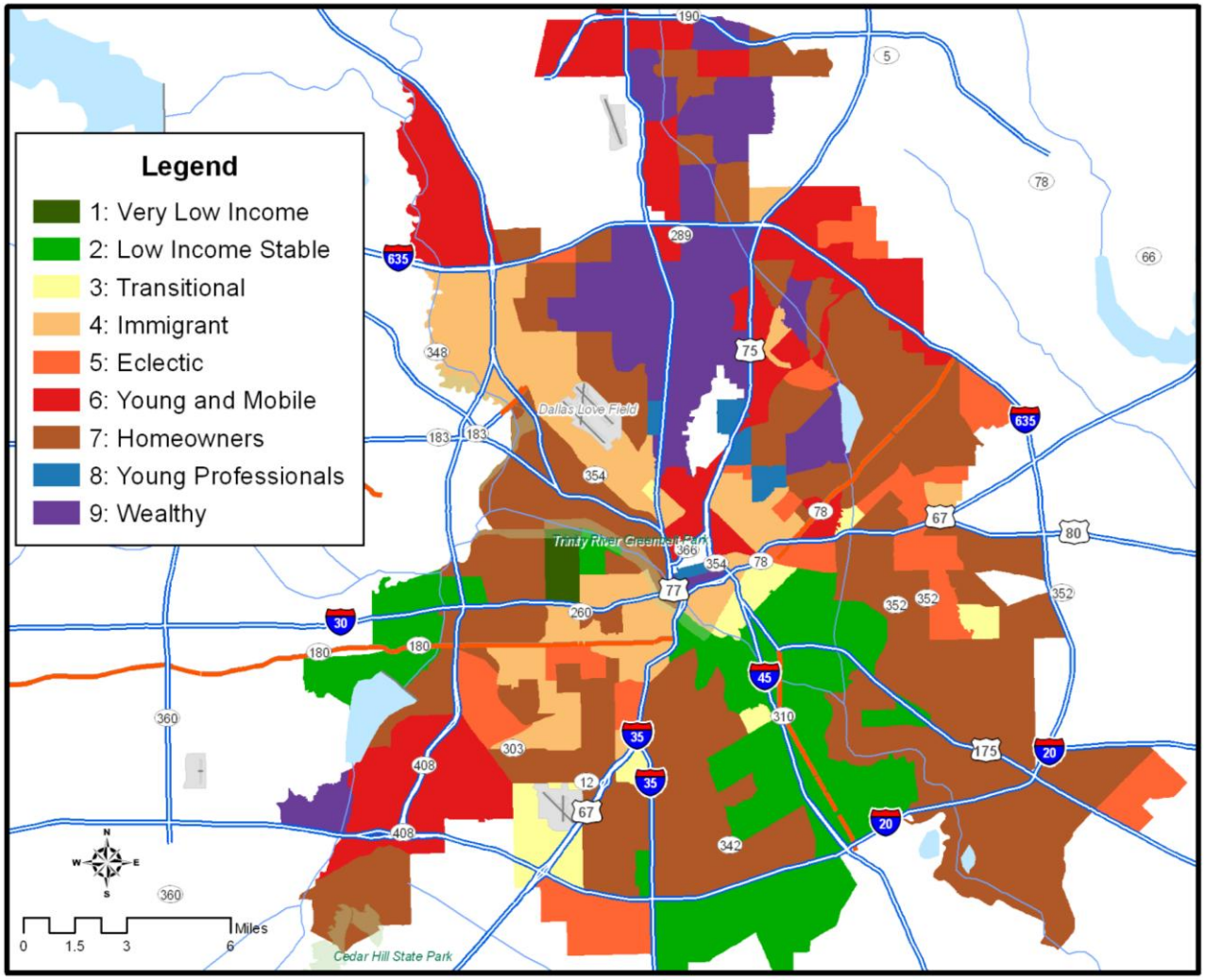
- **People**
  - Income
  - Age
  - Foreign Born
- **Place**
  - Land Use
  - Housing Stock
  - Business Types



Taxonomy Structure: “Genus, Phylum, Species”



Dallas Neighborhood Types



Example: Type 7, “Homeowners”

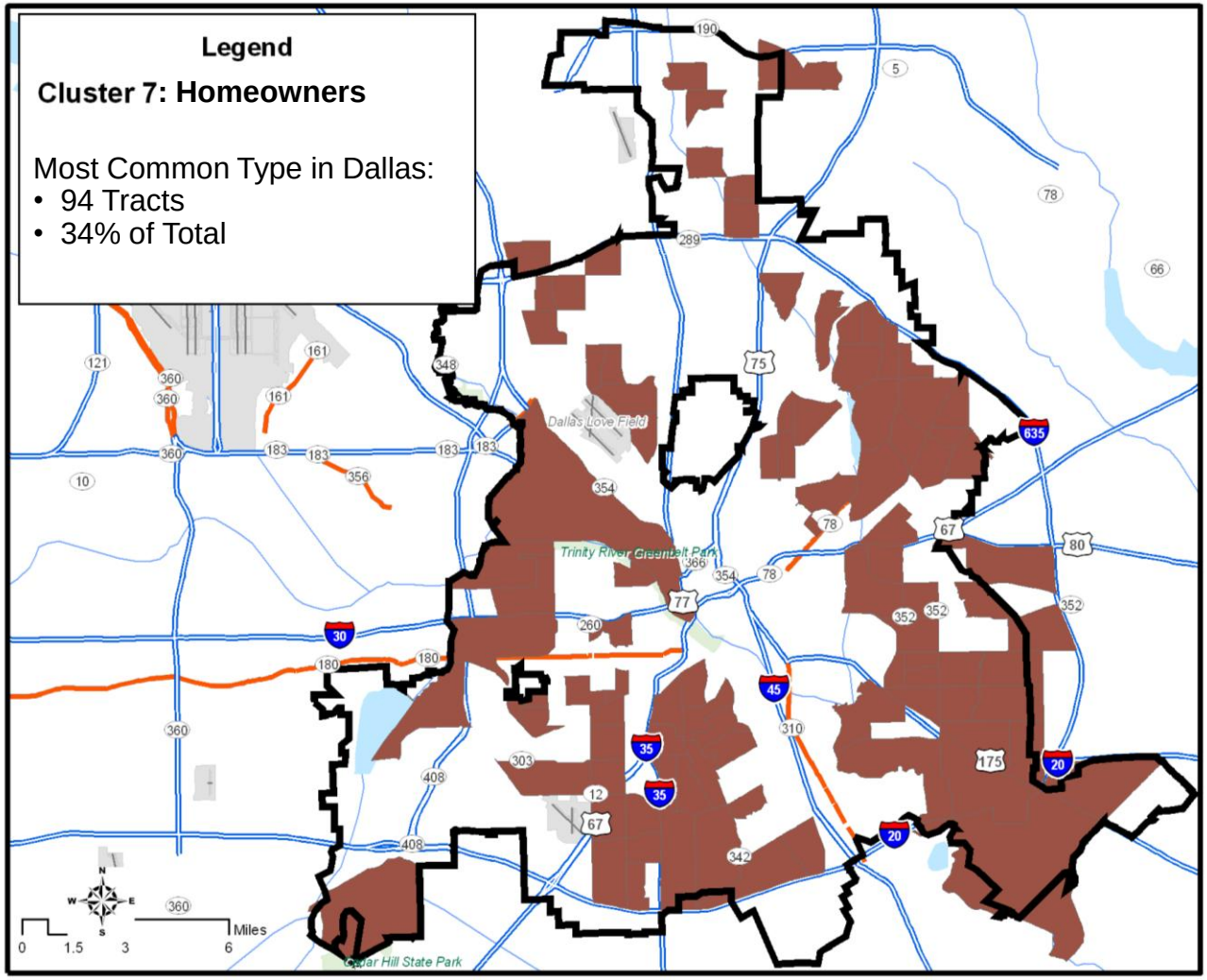
Cluster Profile:

- Highly residential neighborhoods, with high rates of homeownership, generally in single family homes, located further from downtown. Residents tend to be employed in professional occupations and have middle to high incomes. Crime rates in these neighborhoods are typically low.

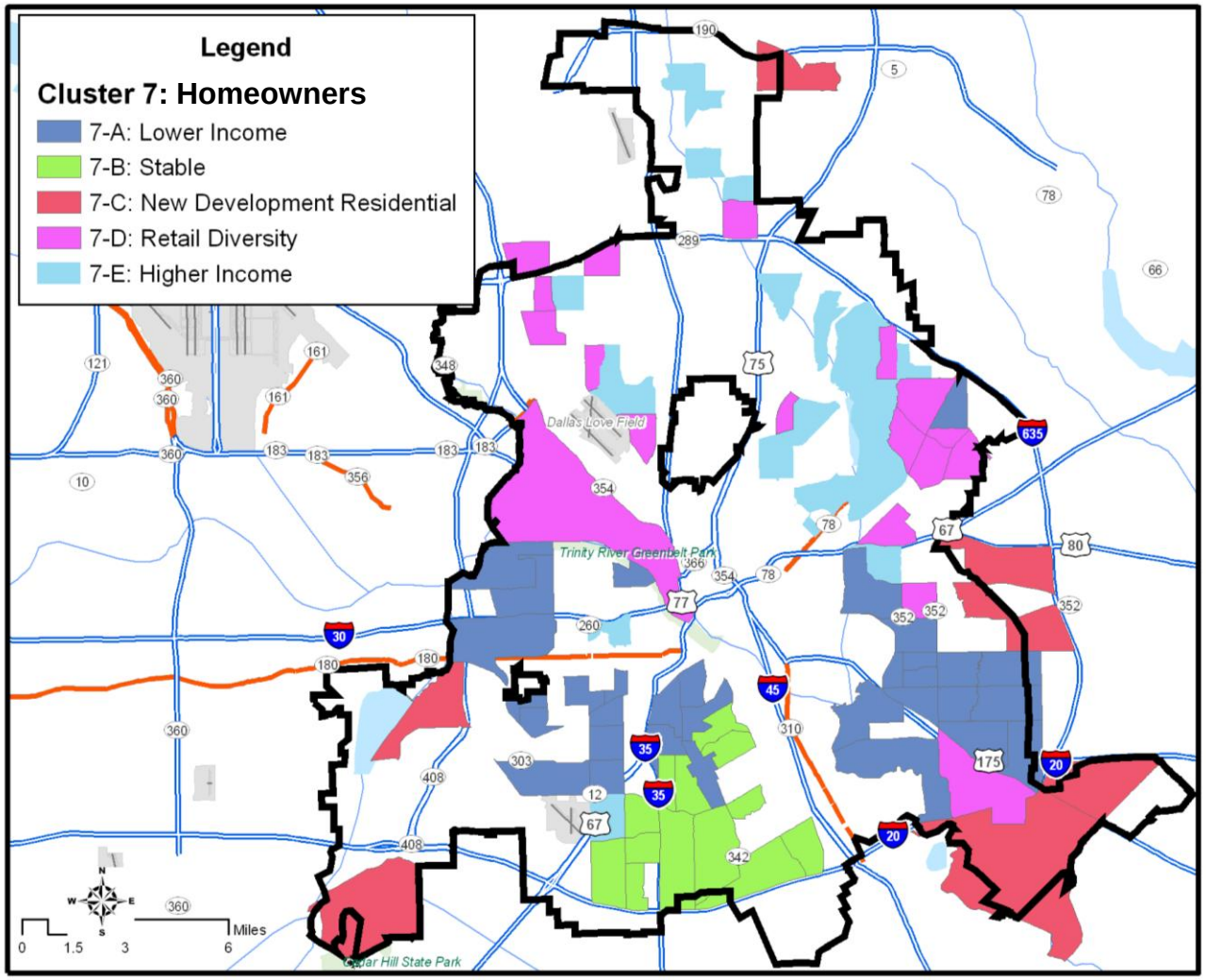
Other Characteristics:

- Tends to move in sync with the region
- Stable type, though 8% transitioned to Type 5 (“Eclectic”)

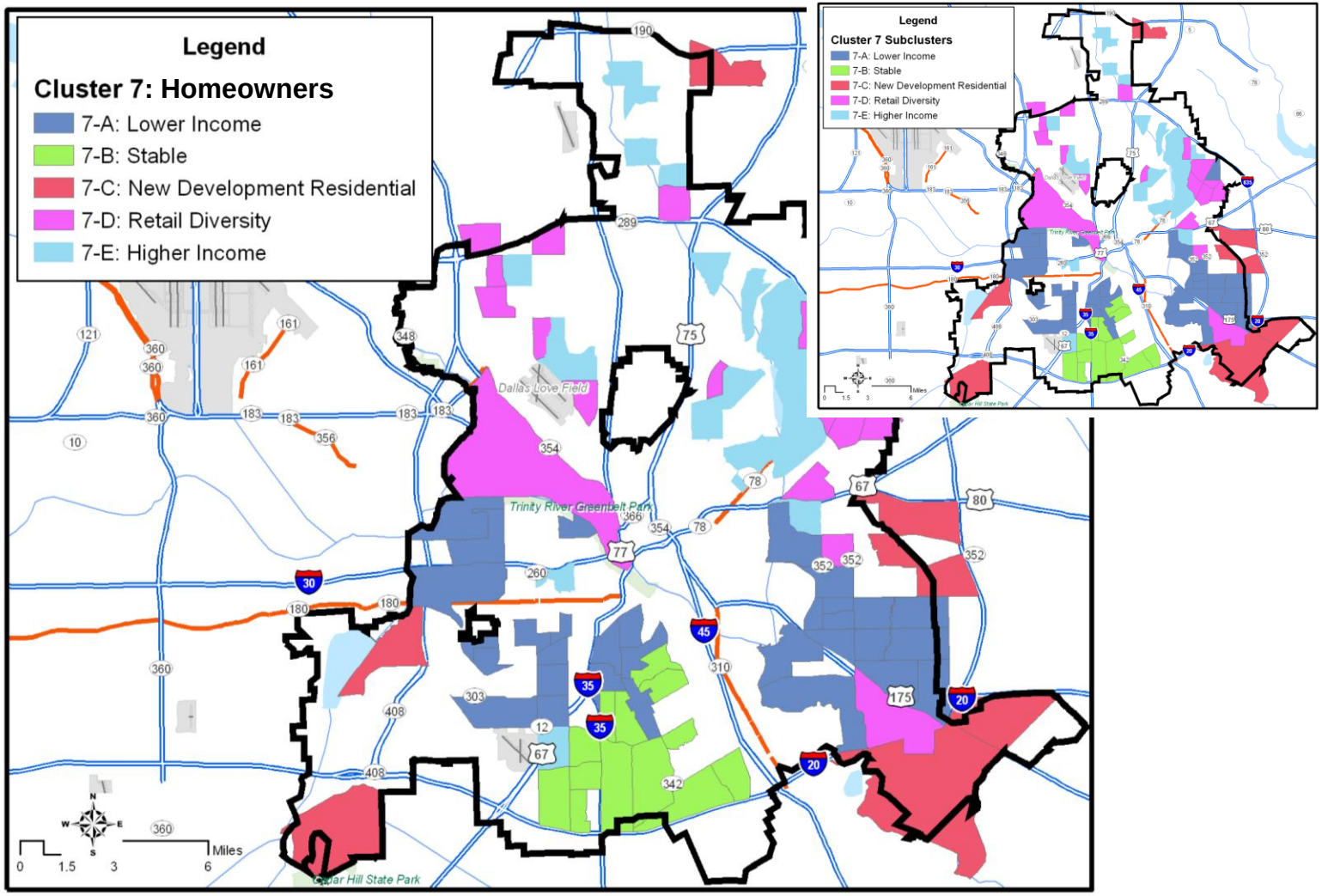
Example: Type 7, “Homeowners”



Moving Down the Taxonomy: From “Phylum” to “Species”



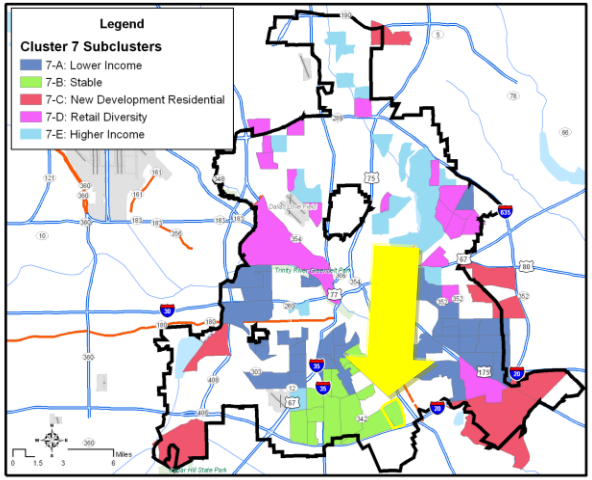
Applying the Taxonomy...



Applying the Taxonomy…

Comparing Within Type:

	Tract 016901	Type 7-B, "Stable Homeowners"
Change in Value	**12.3%**	**63%**
Median Income	$31,242	$41,330
Percent Single Parent Households	19.9%	9.3%
Homeownership Rate	70.6%	73.9%
Turnover (% Moved in over 10 Years Ago)	61%	68.8%
Retail Diversity	35	20.6
Unemployment Rate	15.6	10.4
Vacancy Rate	3.4%	4.8%

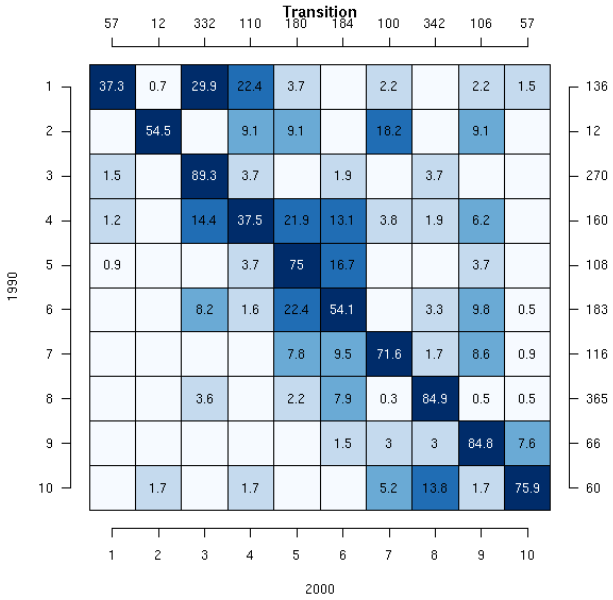


Identify Factors Affecting Neighborhood Performance Compared to Peers

Applying the Taxonomy…

Comparing Across Types:

	Type 6-D New Development	Cluster 8 Young Professionals	Cluster 7 Homeowners
Age 19-34	35%	49%	24%
Stability (Less than 5)	69%	71%	39%
Single Family Housing	27%	11%	71%
Commercial Land Use	8.4%	7.7%	3.9%
School Quality (reading test scores)	76	55	60
Homeownership	33%	34%	69%



What Would it Take to Become a Different Type of Neighborhood?

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Open Source: Multiple Parties Are Already Interested in Moving the Work Forward

- LISC – Analysis of Impact of LIHTC Projects
- UMI/NNIP – Embed Tools in Existing Web Platforms
- Preservation Compact – Affordability Reports and Real Estate Metrics
- Chicago Department of Children and Youth Services – Targeting Location of Child Care Centers and Youth Programming
- Metropolitan Mayor's Caucus/Chicago Metropolis 2020 – Affordability Reports, Real Estate Metrics, Patterns of Change Analysis
- MCIC – RSI and Other Housing Values Indicators
- MDRC – Analysis of Impact of New Communities Program
- Case Western – Analysis of Mixed-Income Communities
- Ansonia Properties, LLC and CityView – Apply Tools to Guide Investment in Workforce Housing

Building on the DNT Foundation: Possible Next Steps

- Make the tools available to practitioners and investors (e.g. by embedding them in existing web-based data platforms)
- Apply the work to particular neighborhoods and interventions: improve the analysis and tools based on repeated application
- Extend the analysis to the rest of the region and to other cities: expand data, metrics, models and tools
- Maintain and update core metrics (particularly RSI) going forward
- Create a “learning network”?

Building on the DNT Foundation: Possible Next Steps

Further Investigation of the Effects of Specific Factors:

- Detailed Analysis of Effects of Different Types of Crime
- Comparative Analysis of the Impact of Different Types of Business Establishments
- Detailed Analysis of the Effects of Access to and Use of Credit
- Analyze the Impact of Specific Development Interventions (from Human Development Programs to Sub-Prime Remedies)
- Return on Investment Analysis: Tie Magnitude of Effect to Cost of Interventions to Assess which Strategies are Most Cost Effective

Further Investigation of Specific Neighborhood Segments:

- Exploratory Analysis of Stable Mixed-Income Communities
- Analysis of Drivers of Improvement in Place for Specific Subsets of Neighborhoods (e.g. Immigrant, Startup Family, etc.)
- Build on Typology Results to Identify Drivers by Type

Address Other Issues in the Field:

- Gentrification Early Warning System
- Identify What Amenities Attract Different Demographics

Discussion

- General Comments and Questions
- What are You Trying to Better Understand About Neighborhoods?
- What Impacts are You Trying to Achieve and Measure?
- What Tools and Applications Would Be Most Useful?
- Partners: Corollary Research, Tool Development and Testing, Other?

Dynamic Neighborhood Taxonomy

A Project of

LIVING CITIES

By

RW Ventures, LLC

The Williams Institute

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