

Matching-Based Housing Price Index

A new and better way to track housing markets

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Realtors usually ask...

What do I need to know about the Housing Market?

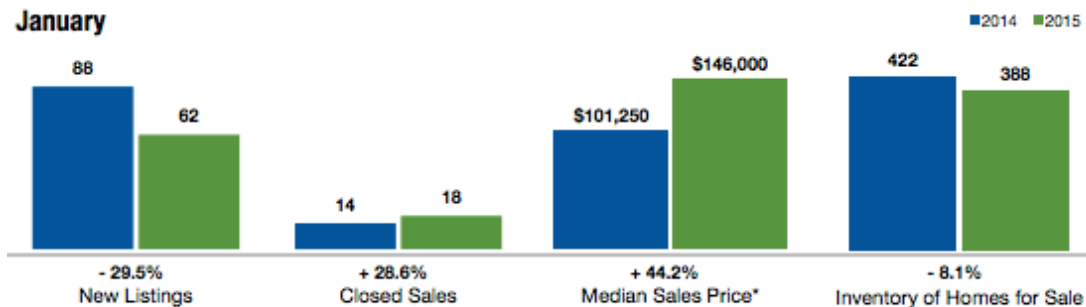
- **Statistics** (Number of Sales, Ave. and Median Sale Prices, Statistical Spreadsheets)
- **Analysis** (Trends, year-over-year comparisons, etc.)
- **Great variety of aggregation levels** (Chicago, 77 neighborhoods)
- **Speaking Points**
- **Other resources** (MRED, REALTOR.org)

How limited is this information?

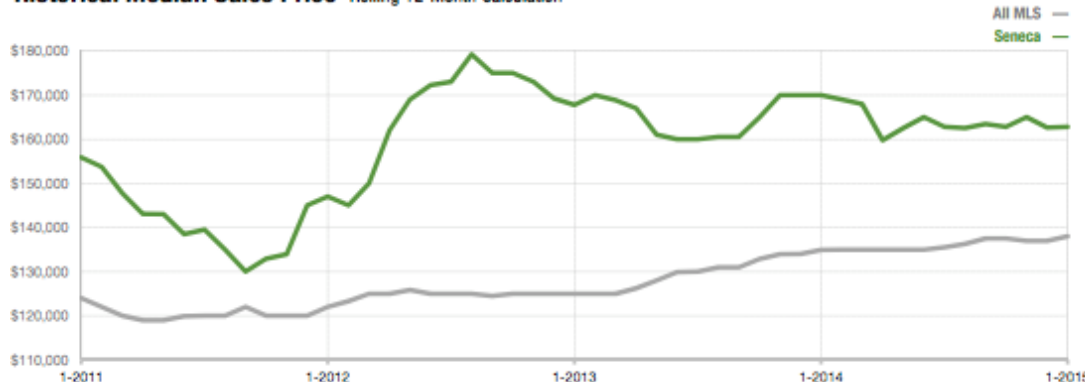
Seneca

Key Metrics	January			YTD		
	2014	2015	Percent Change	2014	2015	Percent Change
New Listings	88	62	- 29.5%	88	62	- 29.5%
Closed Sales	14	18	+ 28.6%	14	18	+ 28.6%
Median Sales Price*	\$101,250	\$146,000	+ 44.2%	\$101,250	\$146,000	+ 44.2%
Percent of List Price Received*	88.4%	94.8%	+ 7.2%	88.4%	94.8%	+ 7.2%
Days on Market Until Sale	103	123	+ 19.4%	103	123	+ 19.4%
Inventory of Homes for Sale	422	388	- 8.1%	--	--	--

* Does not account for sale concessions and/or downpayment assistance. † Percent changes are calculated using rounded figures and can sometimes look extreme due to small sample size.



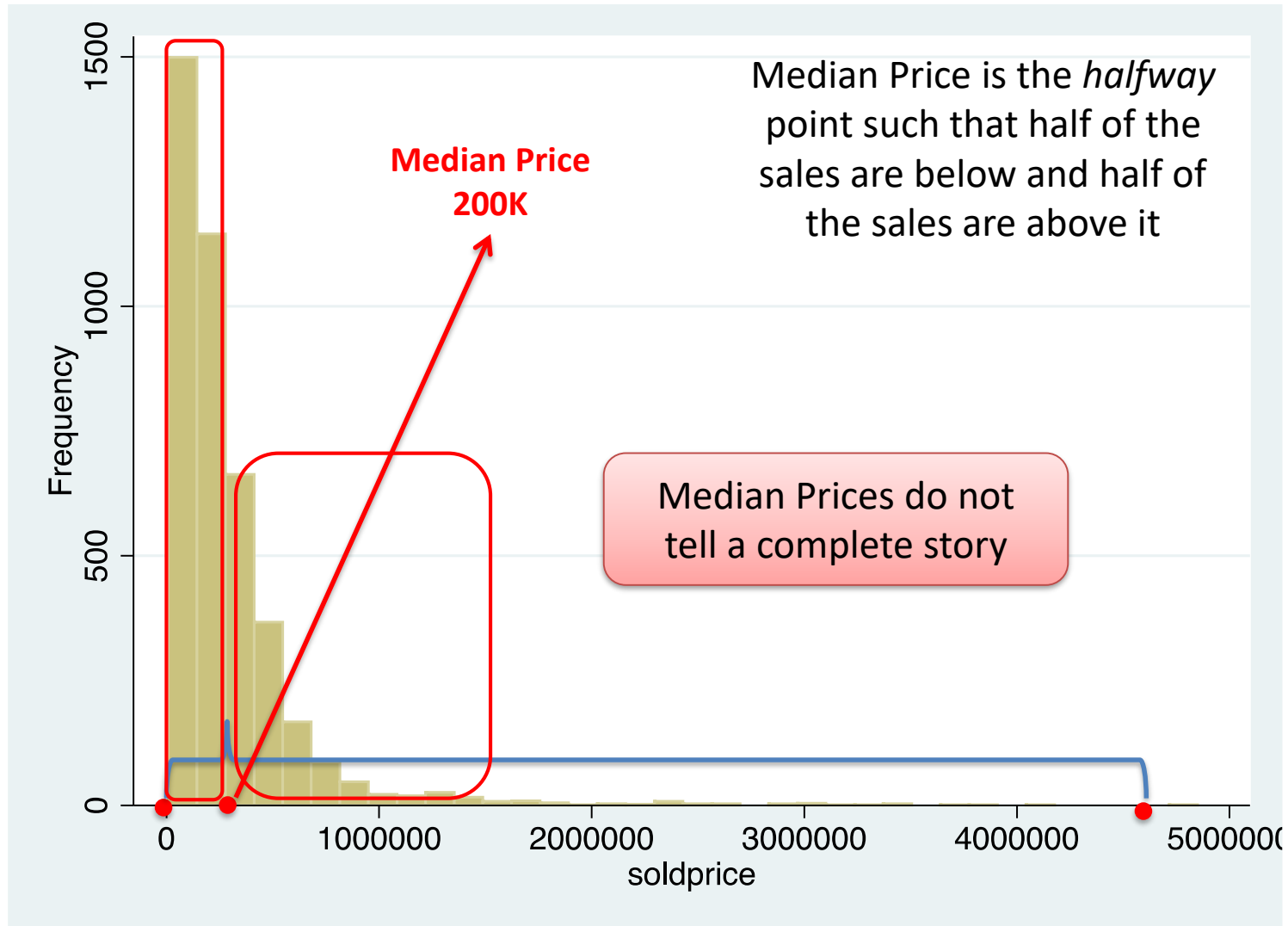
Historical Median Sales Price Rolling 12-Month Calculation



- What if I want to know this same information but for more detailed type of houses?
- How close is the Median Price to my target type of dwelling I want to sell?
- Did two bedroom houses also increase their sale prices in 44%?
- Is it possible that small houses' sales decreased rather than increased?
- What Median Sale Prices are actually telling me?

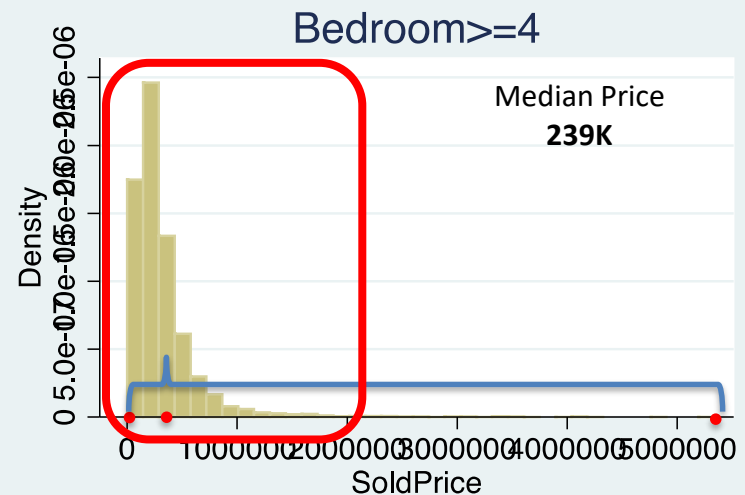
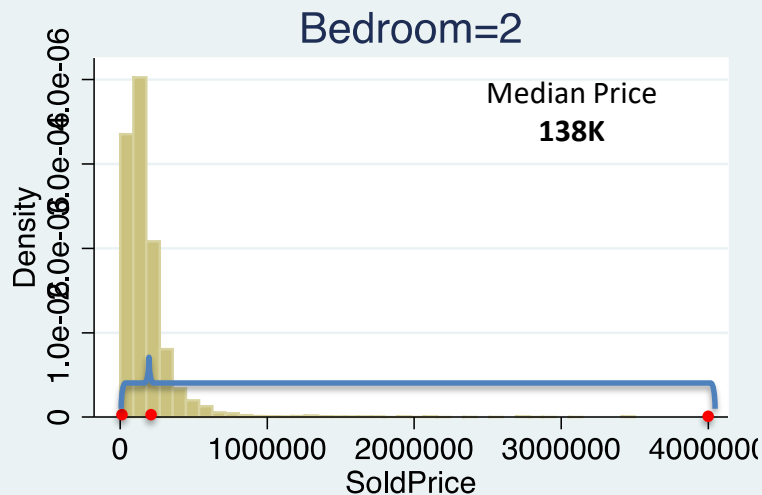
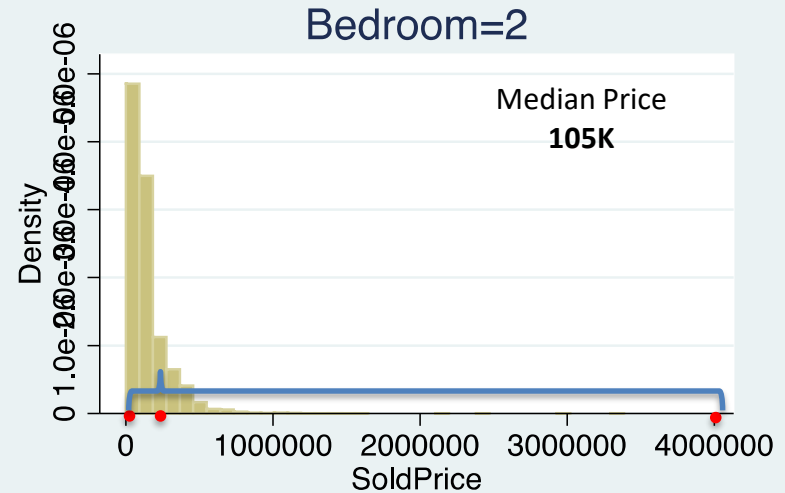
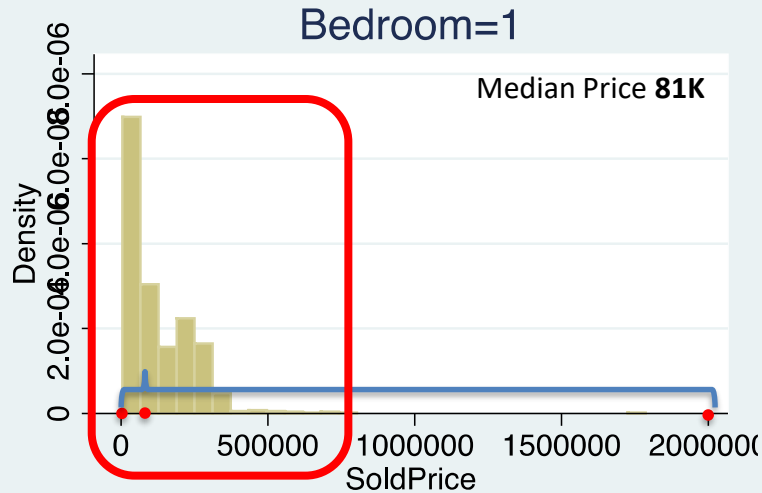
Median Price 2014:q1 (Jan-Mar)

The city of Chicago as an example



Median Price 2014:q1 (Jan-Mar)

The city of Chicago as an example



What's this proposal about?

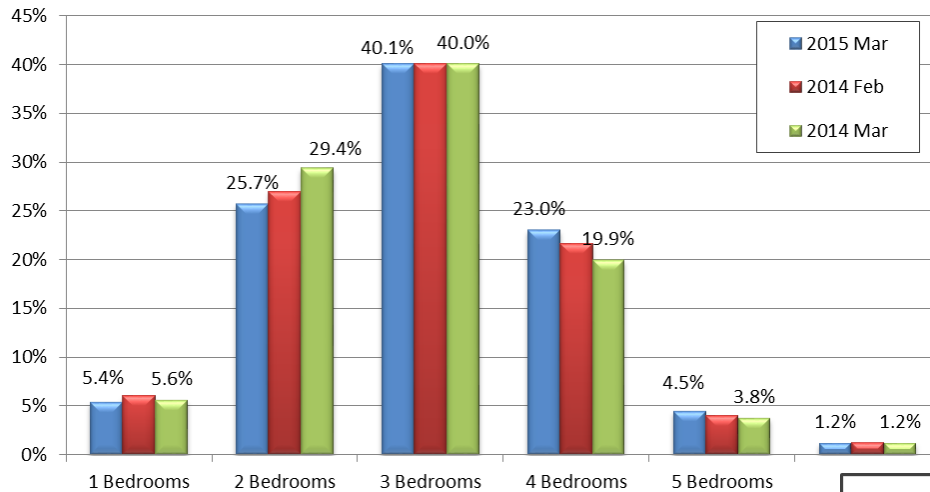
- **Part 1:** Mean Prices are not a complete measure changes in housing characteristics
 - *Current Solution:* Repeated Sales Price index (Case-Shiller)
 - *Limitation:* Only possible for big MSAs (e.g. Chicago in Illinois)
 - ***New Solution:*** REAL HPI – Small MSAs and Community Areas
 - Advantages: Tracks Case-Shiller, Free of Spatial Scale, Forecasting
- **Part 2:** Housing Characteristics are only one dimension of the story
 - *Current Solution:* Mean prices by Dwelling type (Single vs. Multi)
 - Limitation: Many other dimensions are important
 - ***New Solution:*** Research and Development
 - Characterization of by price brackets, house size, access to amenities, foreclosures, school choices, interaction between community areas, etc.

As good as Case-Shiller, and available for small areas

THE REAL HPI FOR SMALL AREAS

Considering Housing Characteristics makes a difference

Chicago PMSA House Characteristics Stratification by Bedroom

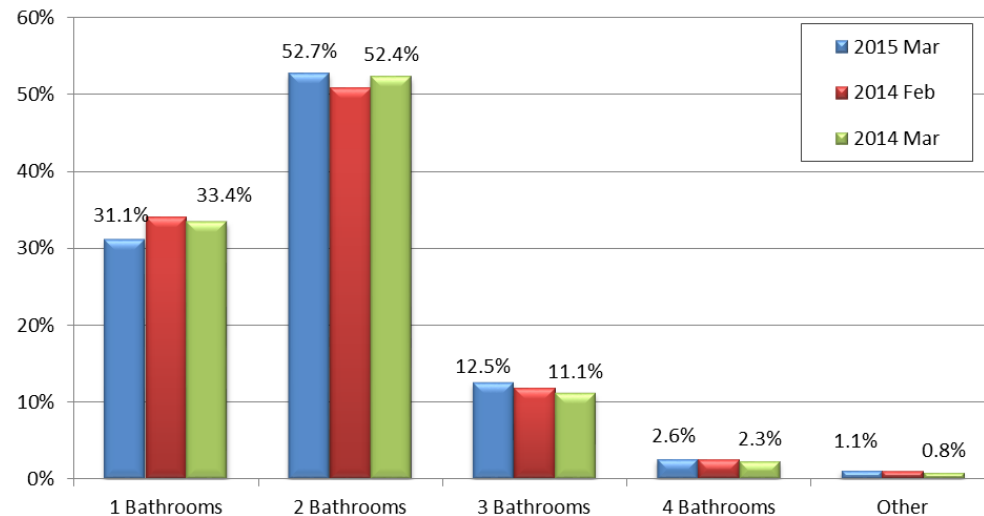


Chicago PMSA: Cook, DeKalb, DuPage, Grundy, Kane, Kendall, Lake, McHenry and Will counties
Source: University of Illinois REAL, Illinois Association of REALTORS®

Homes with more bathrooms and bedrooms are sold in this March compared to last March.

Knowing the type of houses being sold is crucial for understanding how the housing market is changing and what consumers/investors are preferring

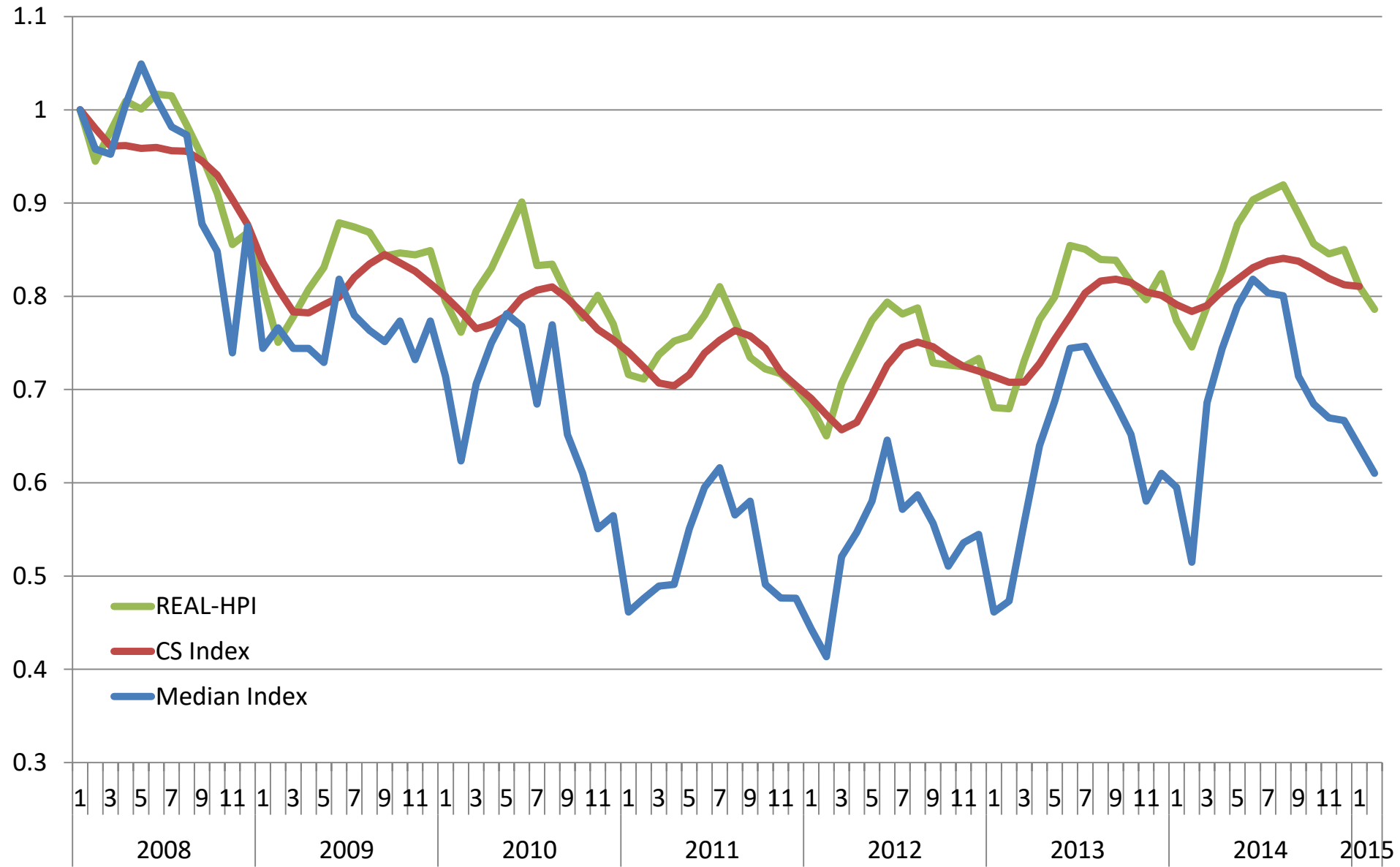
Chicago PMSA House Characteristics Stratification by Bathroom



Chicago PMSA: Cook, DeKalb, DuPage, Grundy, Kane, Kendall, Lake, McHenry and Will counties
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Median, Case-Shiller & REAL-HPI

City of Chicago



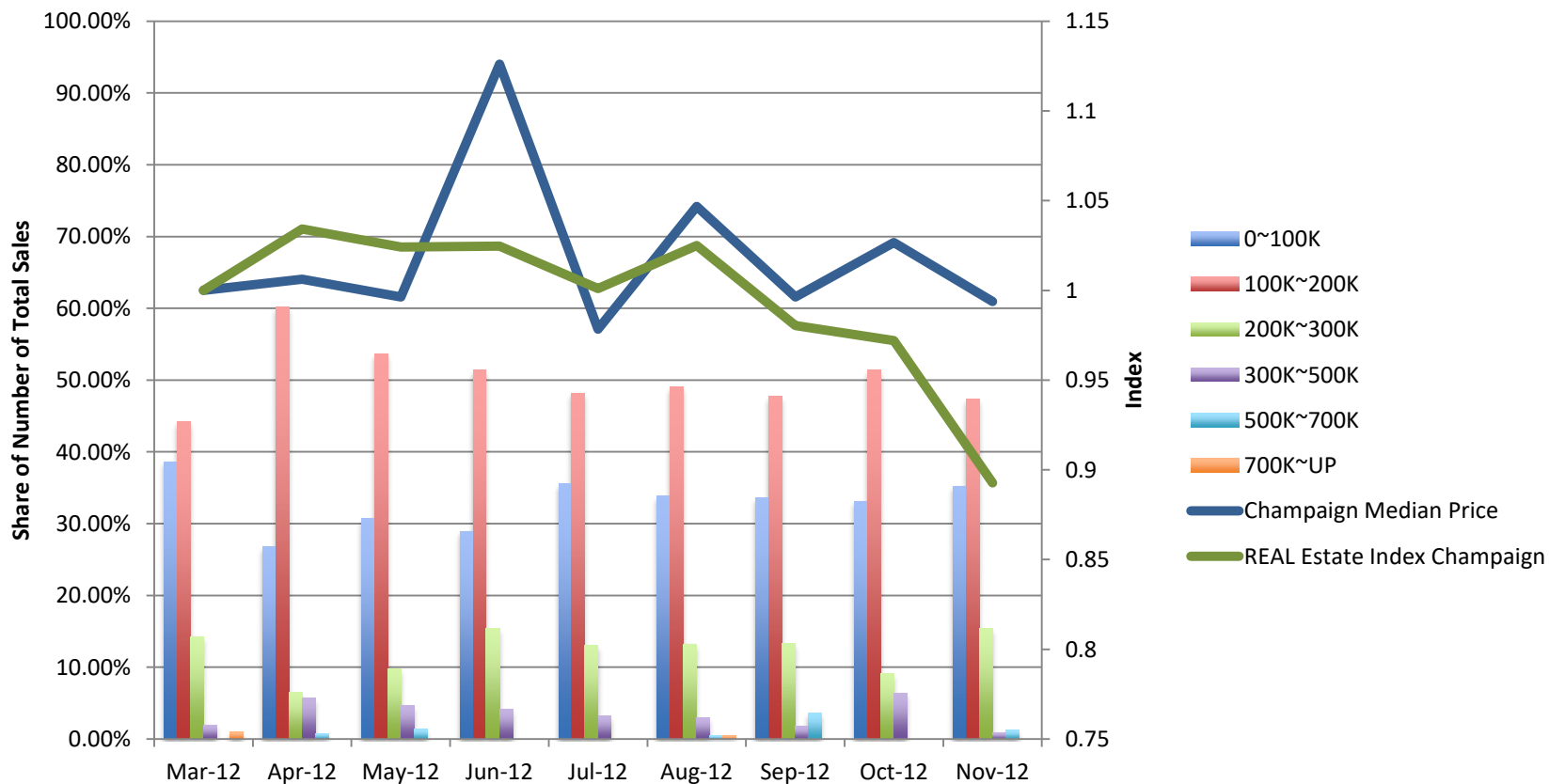
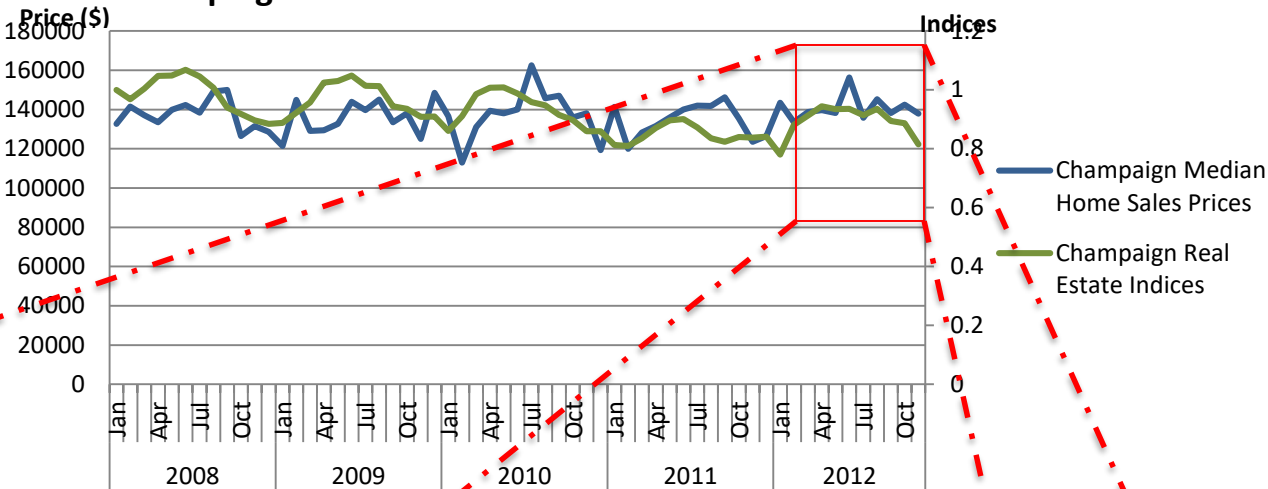
The Matching-Based HPI

- Works as well as CS, but is applicable to small areas.
- How it works?
 - Based on a Matching Algorithm finds ‘clone’ houses in terms of their characteristics
 - Repeated sales is an extreme type of Matching
- Advantages
 - Applicable to Neighborhoods/Community Areas
 - We are using more of the data you have available
 - Much more representative summary of what’s going on

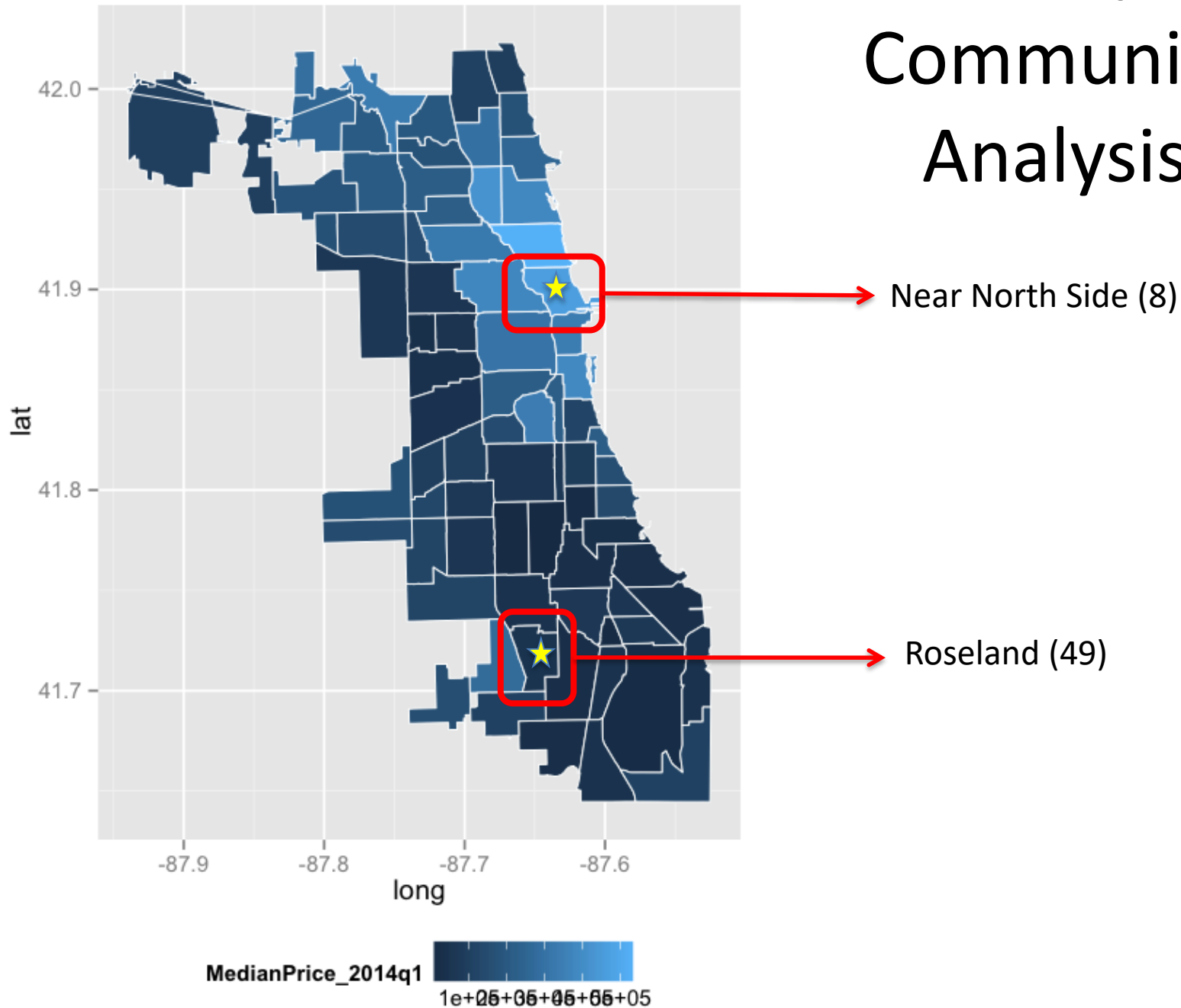
REAL-HPI on 10 Illinois SMSAs



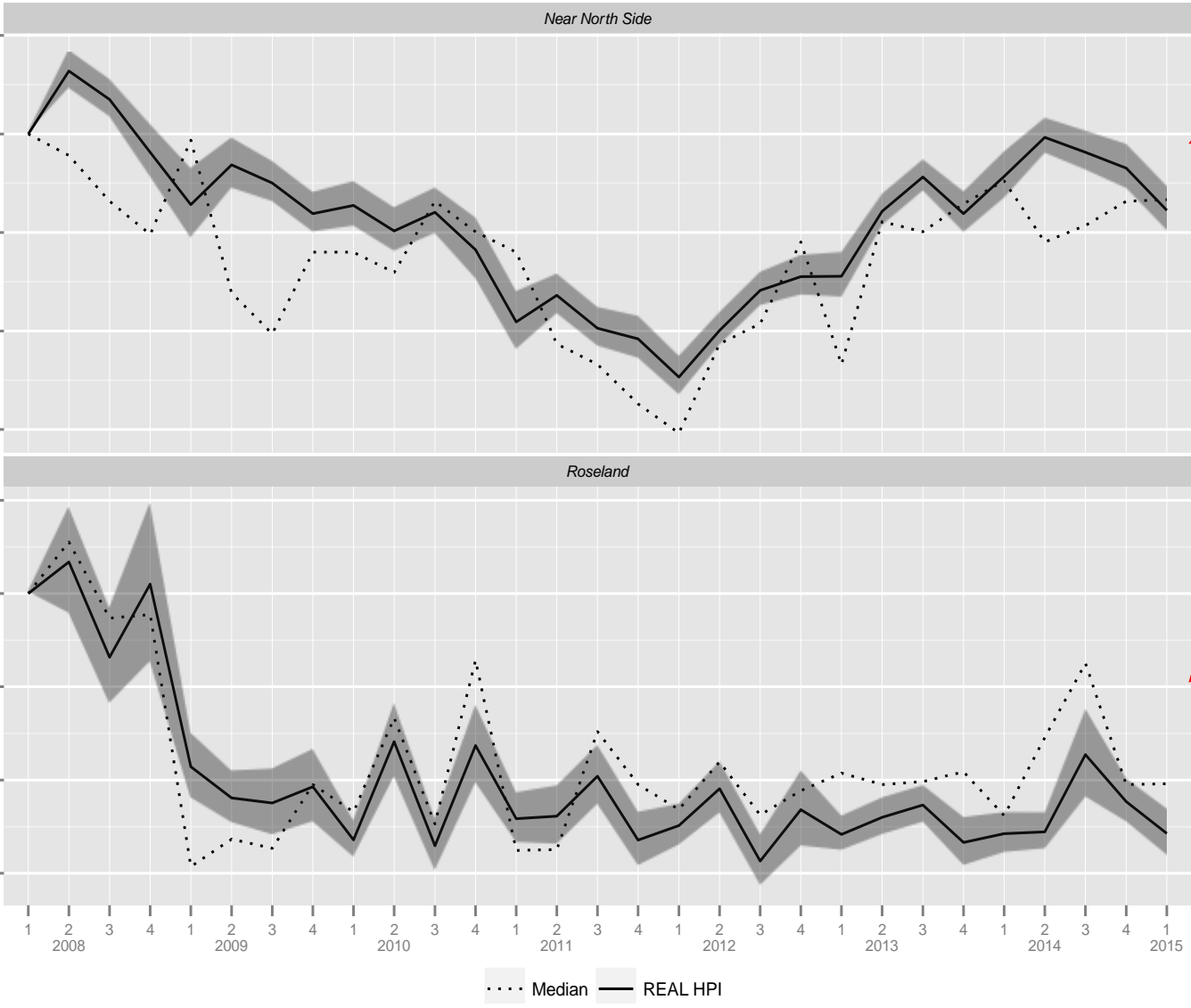
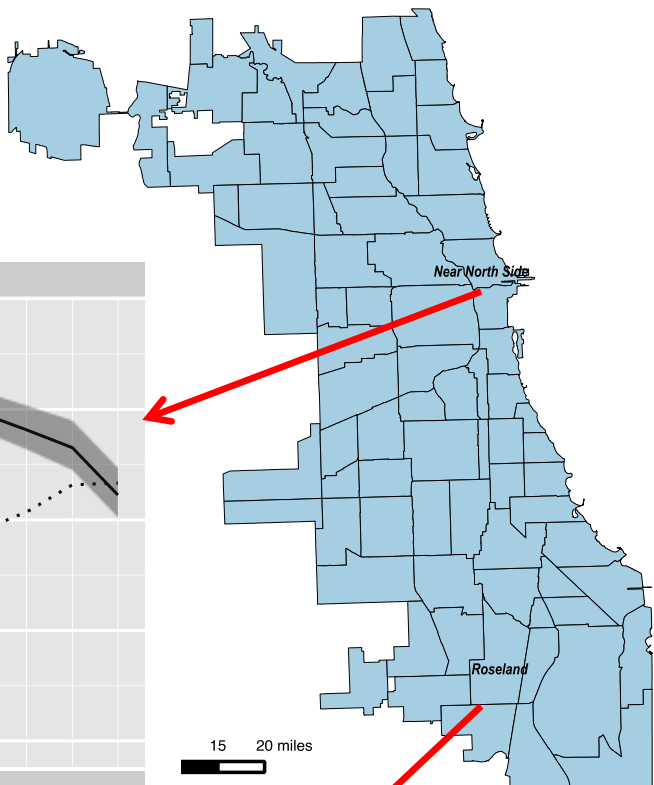
Champaign REAL HPI vs. Median Home Sales Prices



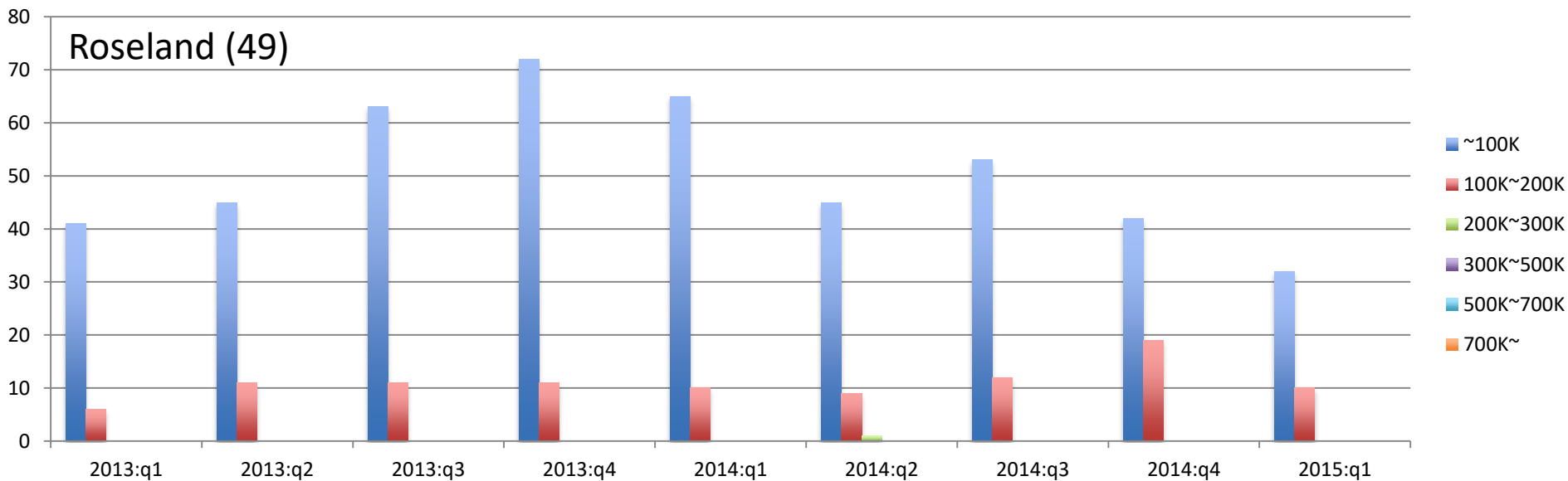
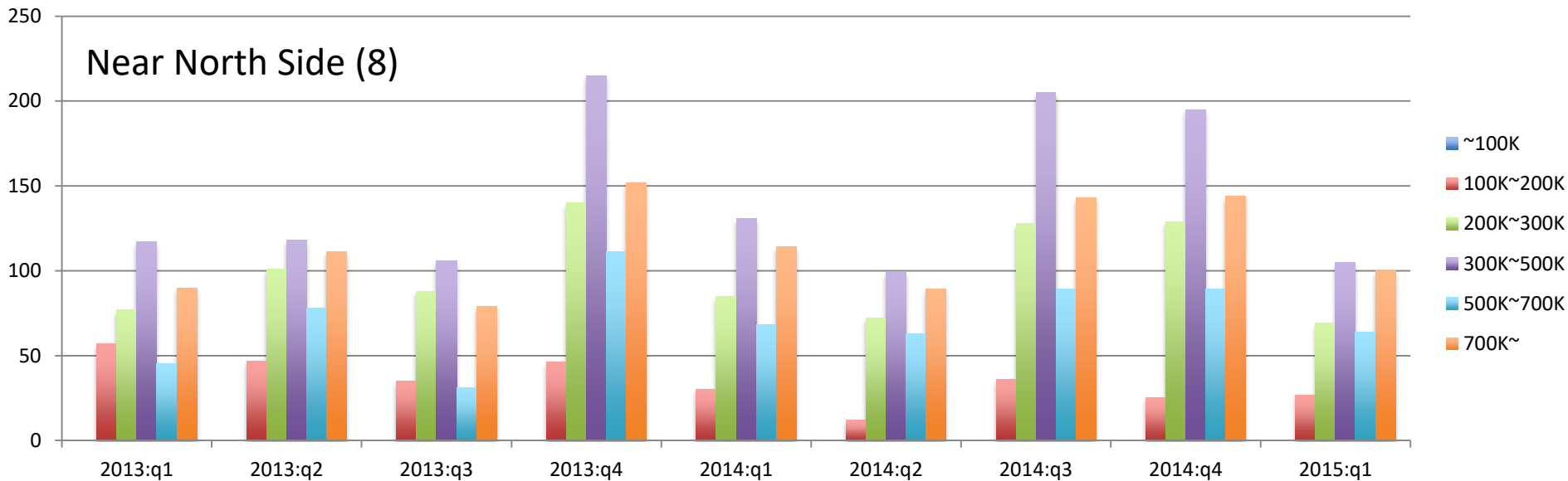
Two Examples of Community Analysis



Neighborhood Results

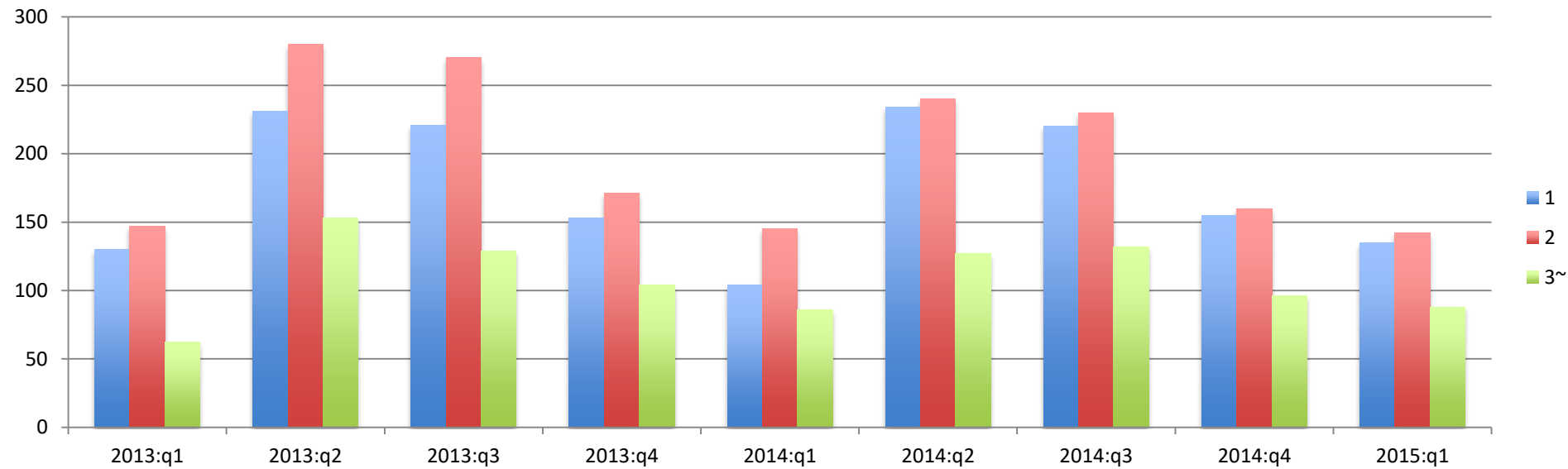


Number of Sales by Price Brackets

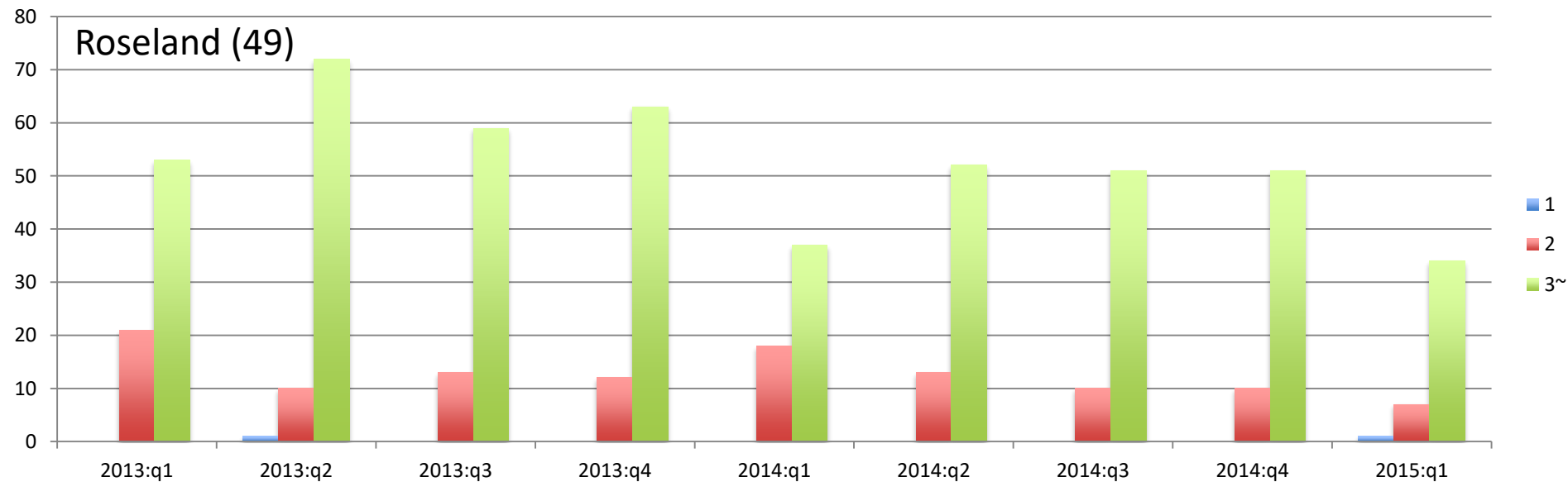


Number of Sales by Bedrooms

Near North Side (8)

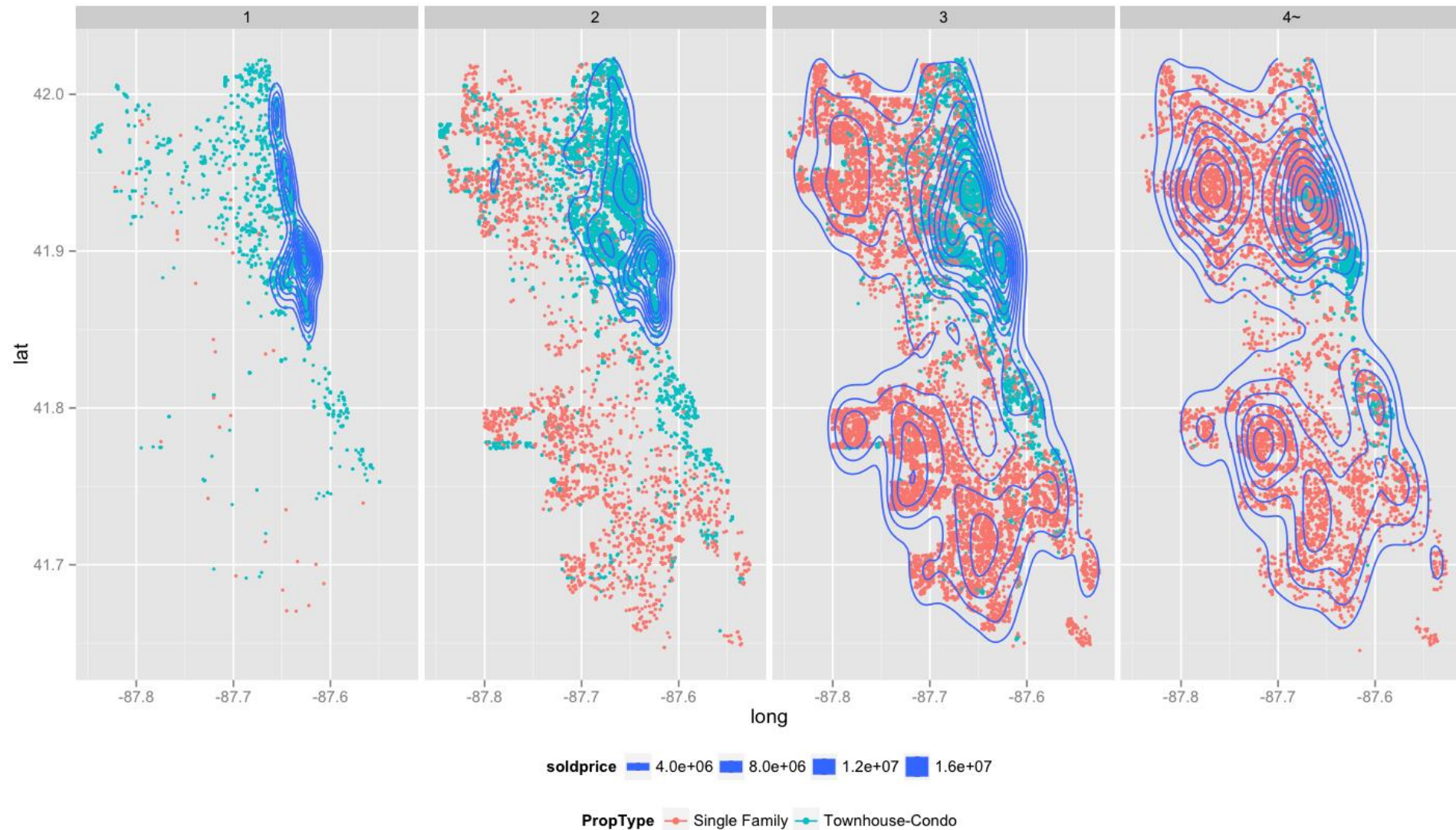


Roseland (49)



Where do sales cluster?

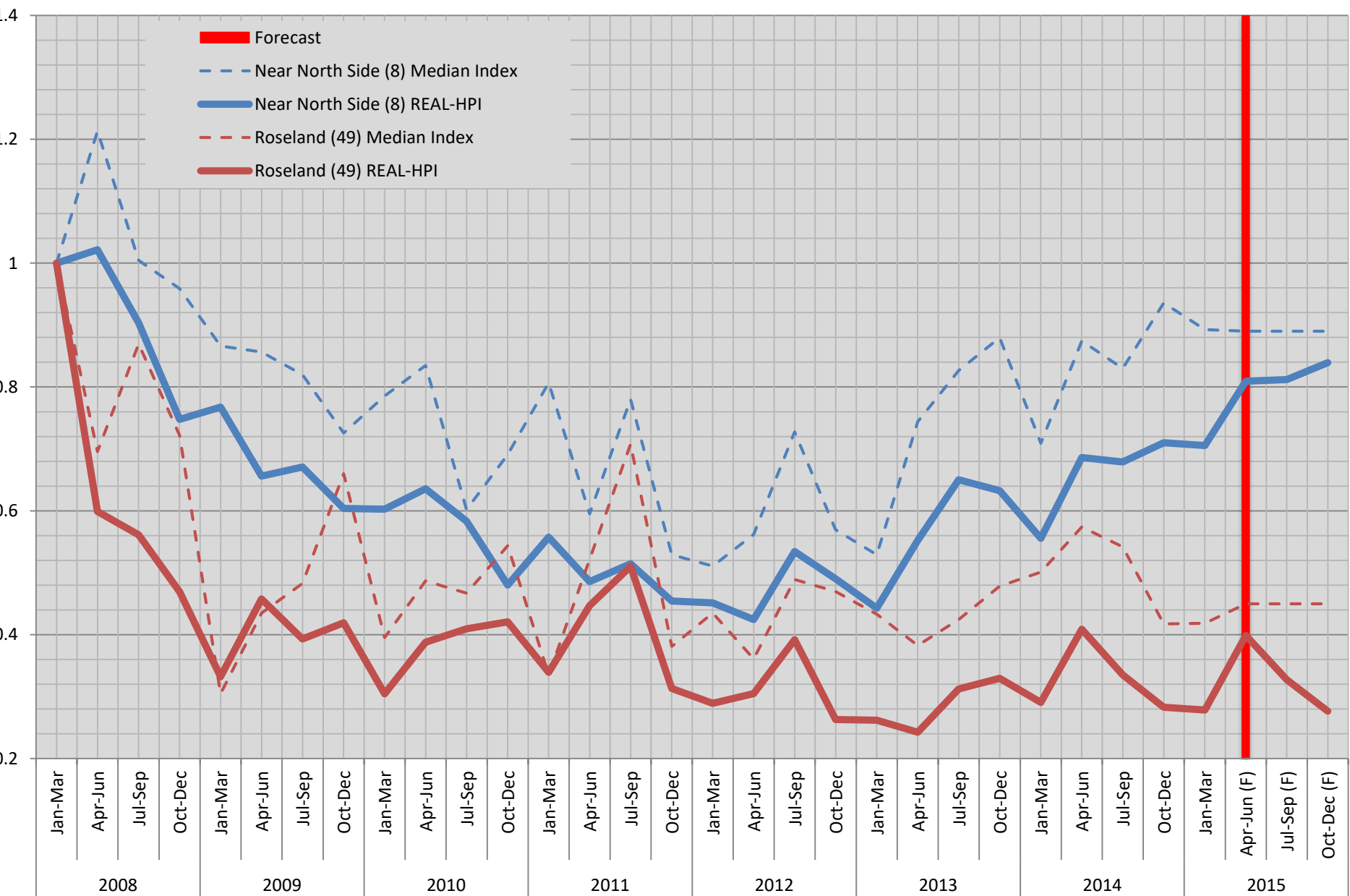
By Number of Bedrooms and dwelling type



What are we proposing?

- Replicate Matching-Based HPI for small spatial units that only have median-based indices
 - Looking at the last 3 months
 - Forecast prices and sales for the next 3 months
 - Once a year an annual forecast
- Additional Analysis looking at:
 - Sales by housing characteristics
 - Sales hot-spots

REAL-HPI and Median Indices with Forecast

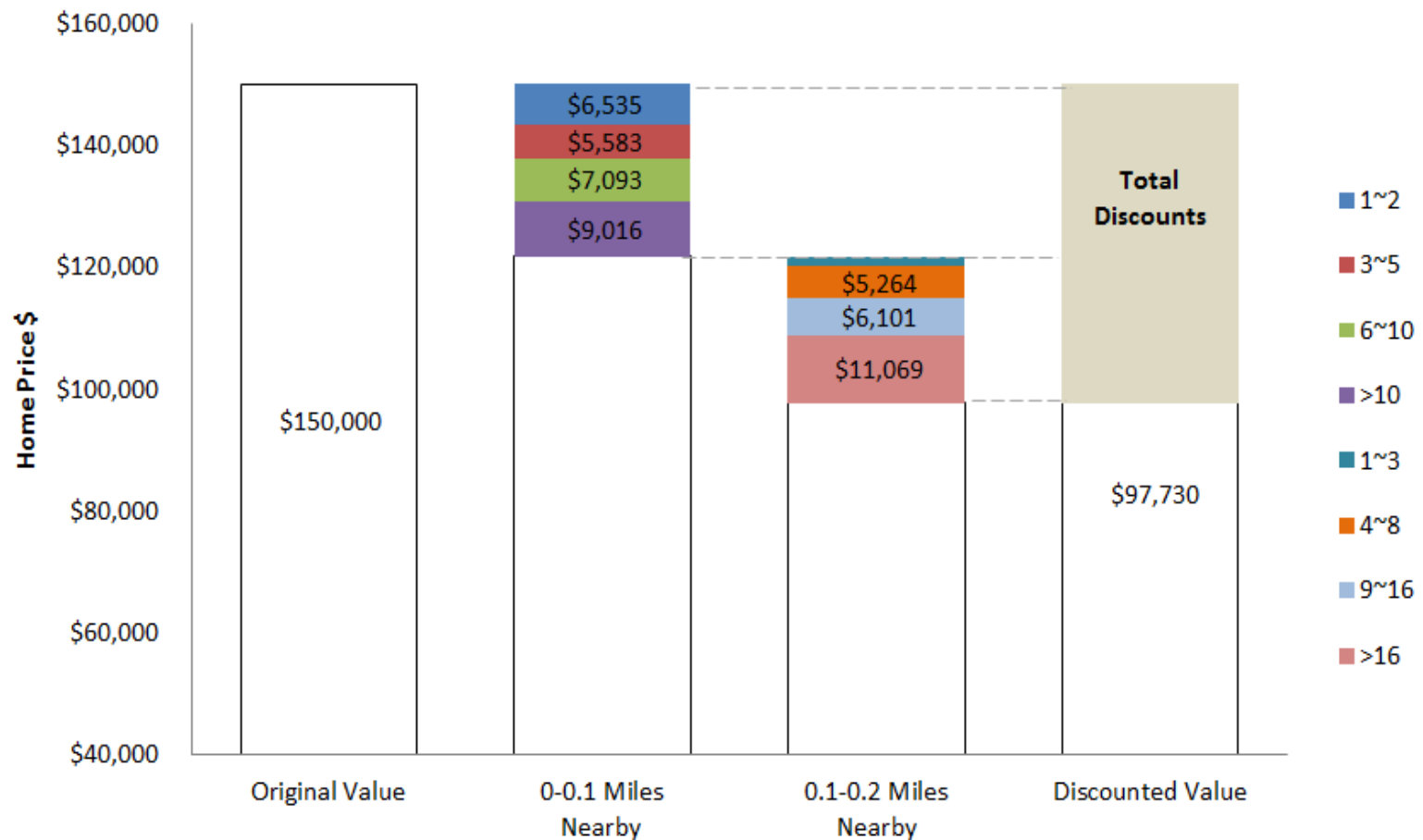


Housing Characteristics are only one dimension of the story

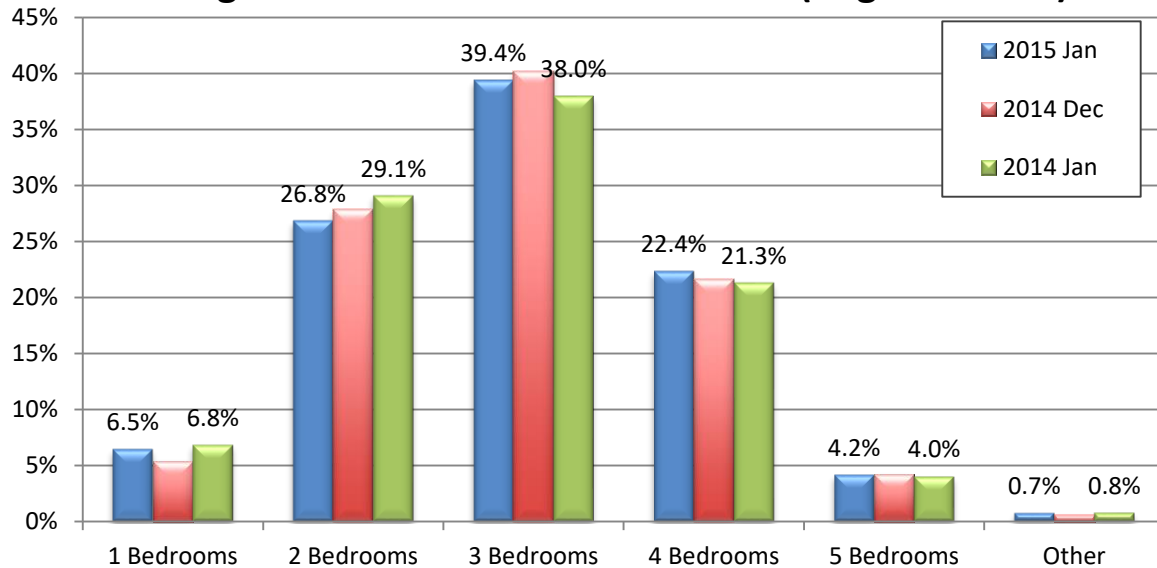
REAL R&D

Contamination Effects

Figure 1. Accumulated Property Value Discounts by Nearby Foreclosures



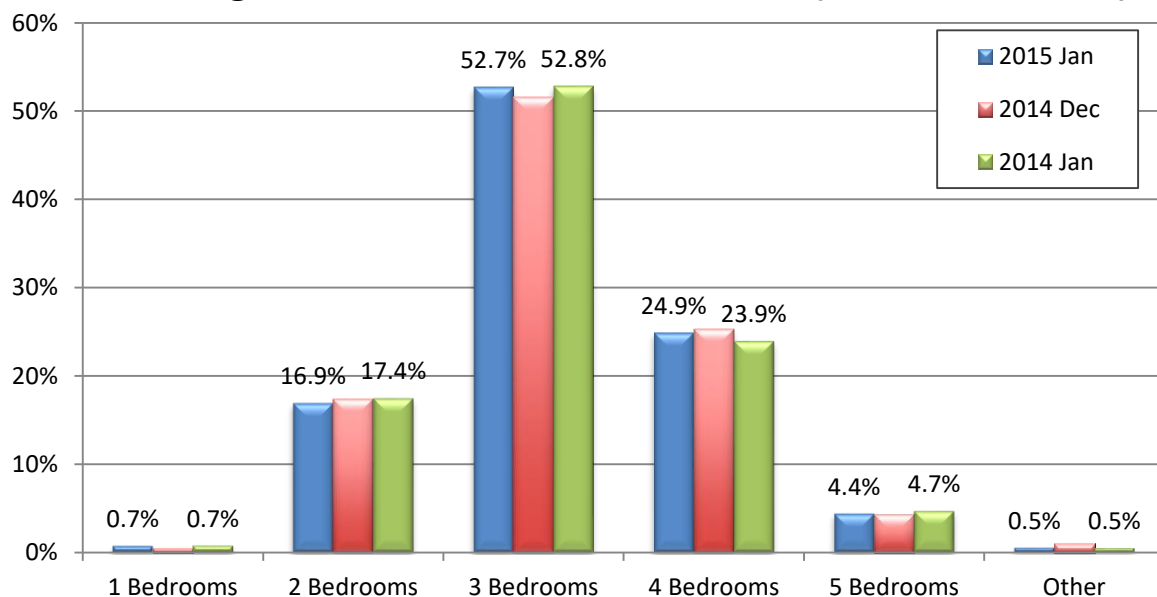
Chicago PMSA Bedroom Stratification (Regular Sales)



Source: University of Illinois REAL, Illinois Association of REALTORS®

- *More than half of the foreclosed sales have 3 bedrooms*
- *Regular sales are not as concentrated in the type of 3 bedrooms as foreclosed sales: more spread out to 2 and 4 bedrooms types*

Chicago PMSA Bedroom Stratification (Foreclosed Sales)

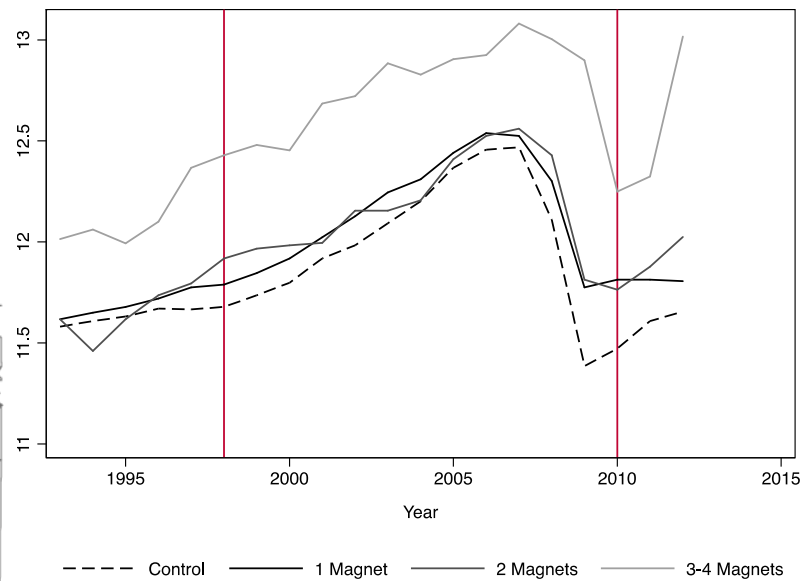
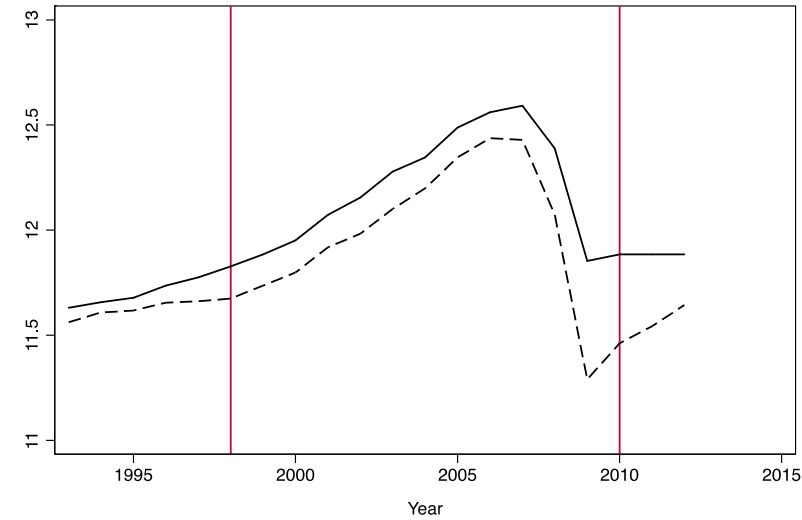
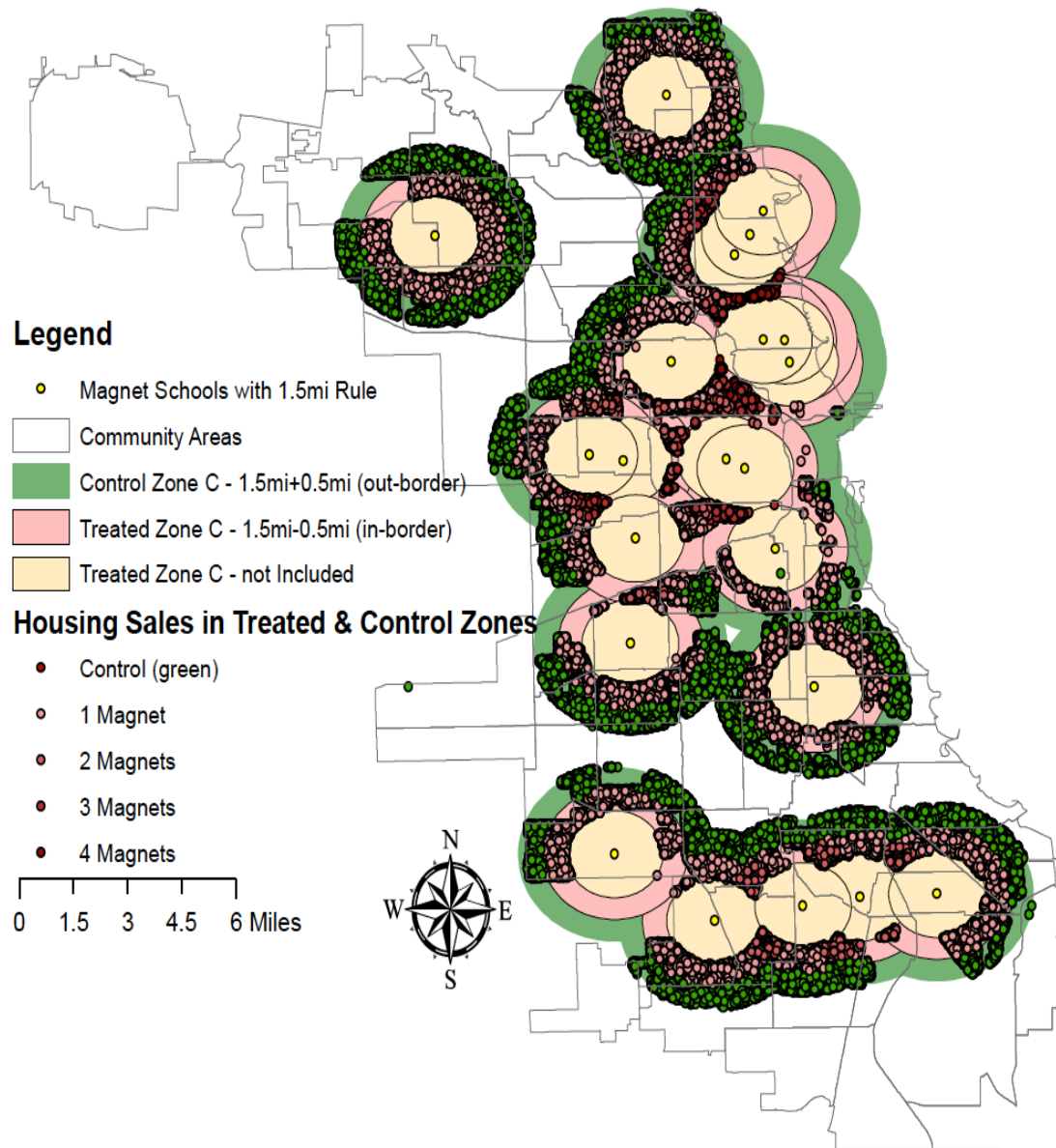


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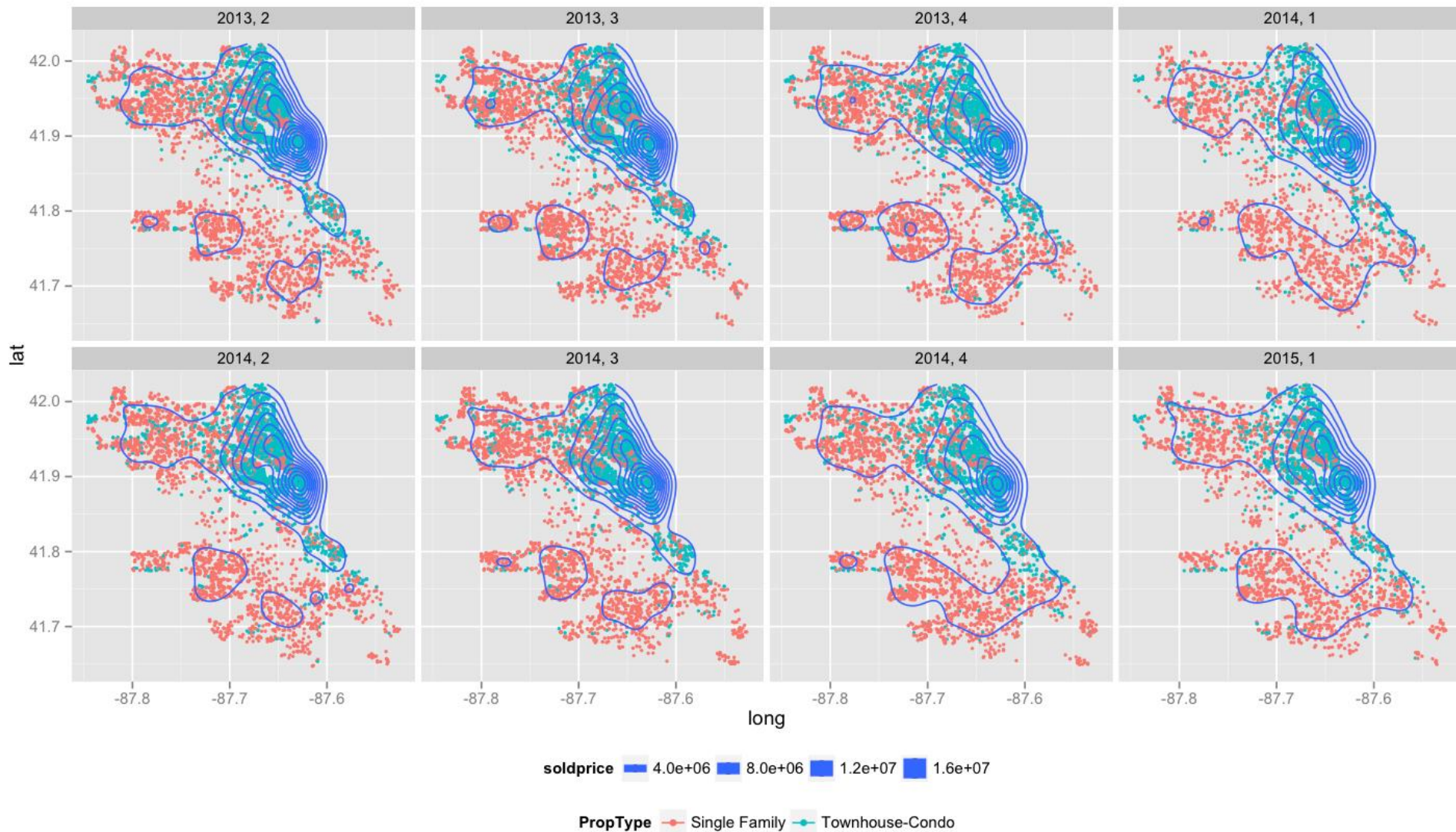
A south side rehabbed property, before and after.

Effects from School Choice



Where do sales cluster?

By quarter of the year 2013:1-2015:1



Additional Dimensions for R&D

- Price Formations
 - Ripple effects between communities, price followers/leaders?
 - What changes on community A affects community B, C D???
 - Interactions with CAR to get a sense of the perceived competition between community areas.
- Macro Model for an specific City or Neighborhood
 - Impact of economic variables on housing sales
- Web-development for tracking the behavior of particular housing markets
 - The age of big data

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