

Urban Ecology: Patterns and processes linking urban commercial patches



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Why do we care?
Why should we care?

Presentation agenda

1. How the brain works
2. Typhoid
3. Math as a language
4. Sudoku
5. Putting it all together :
Times Square/Theater District

How the brain works

“We shape our buildings, and they shape us.”

Winston Churchill

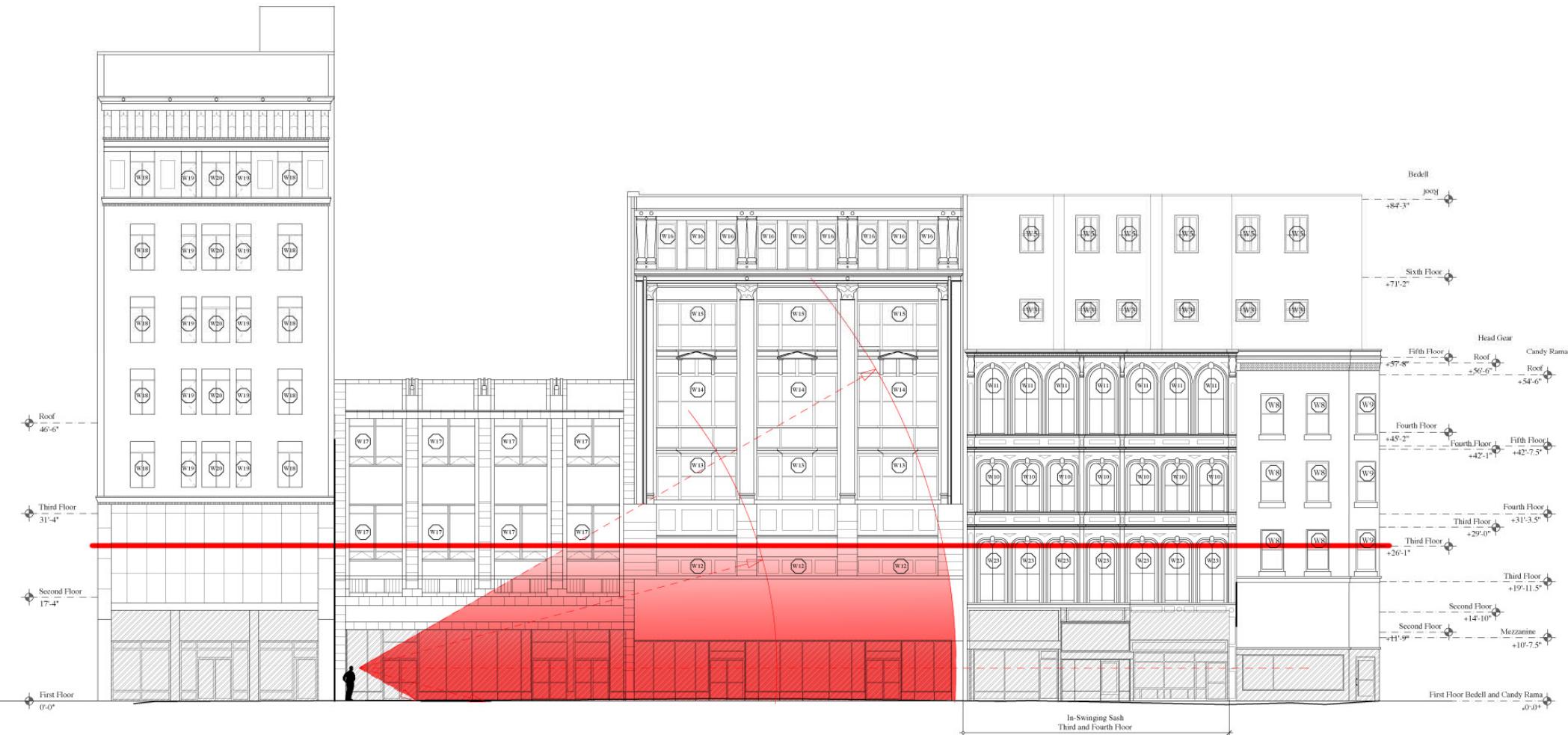
Edges



Edges



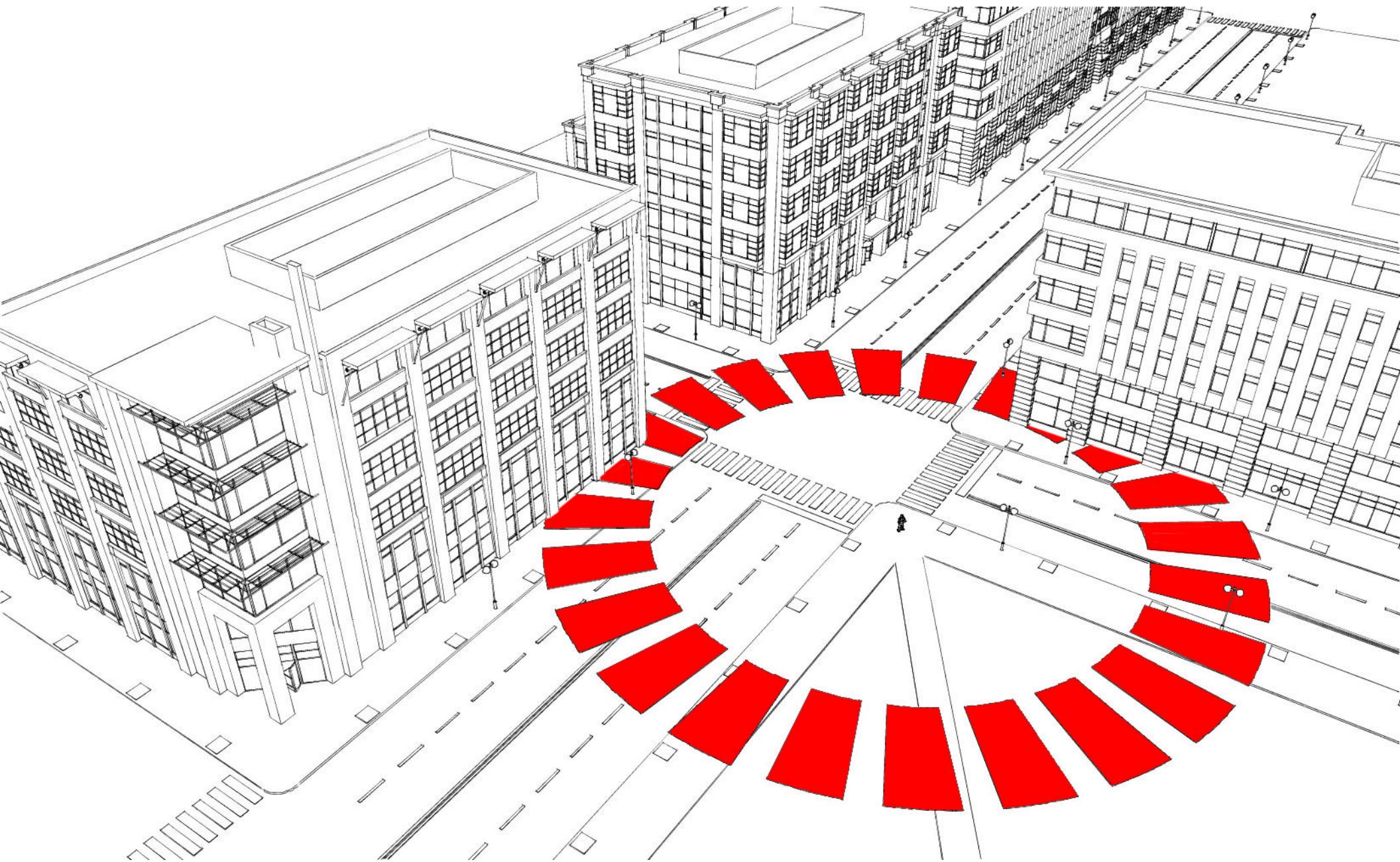
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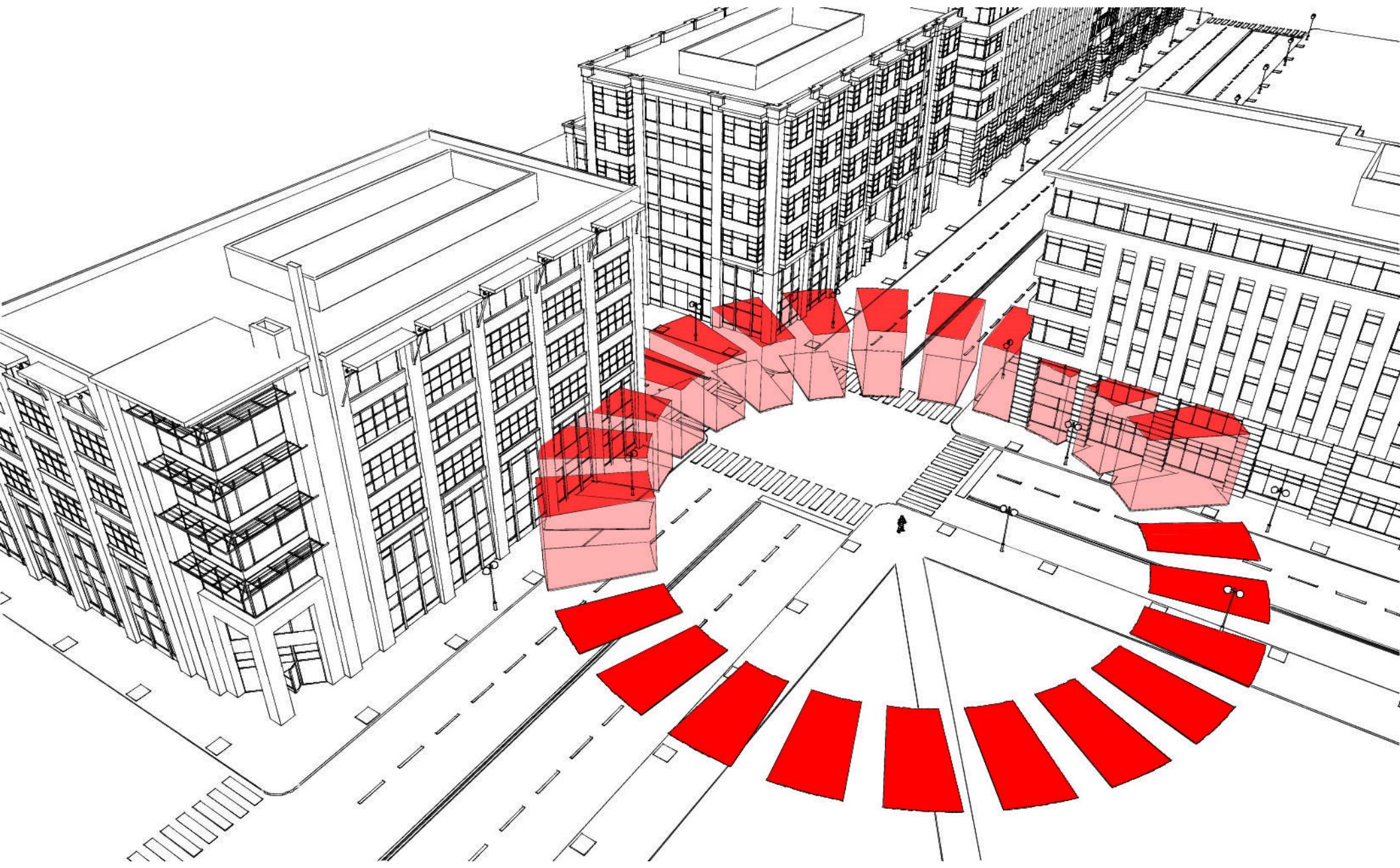
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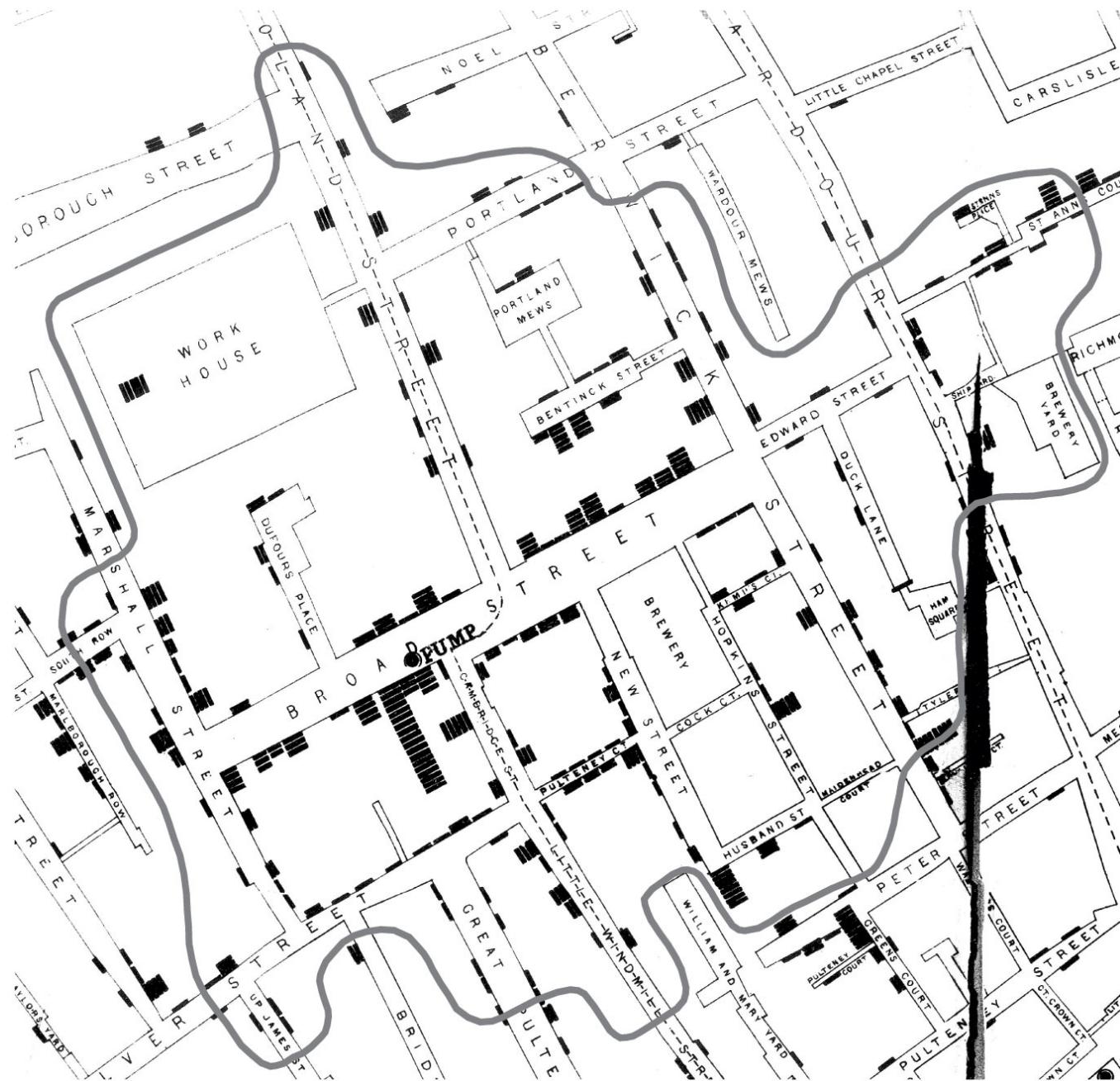


Edges



Typhoid

Patterns and Processes



Patterns and Processes

- Patterns are ‘fossilized’ remains of processes.
- Patterns can occur in both spatial and temporal (time) dimensions.
- Pattern causes are typically one order of magnitude lower in scale than the pattern itself.
- Understanding the patterns allow you to work with the underlying processes, rather than against them.

Patterns and Processes

TYPE OF RETAIL

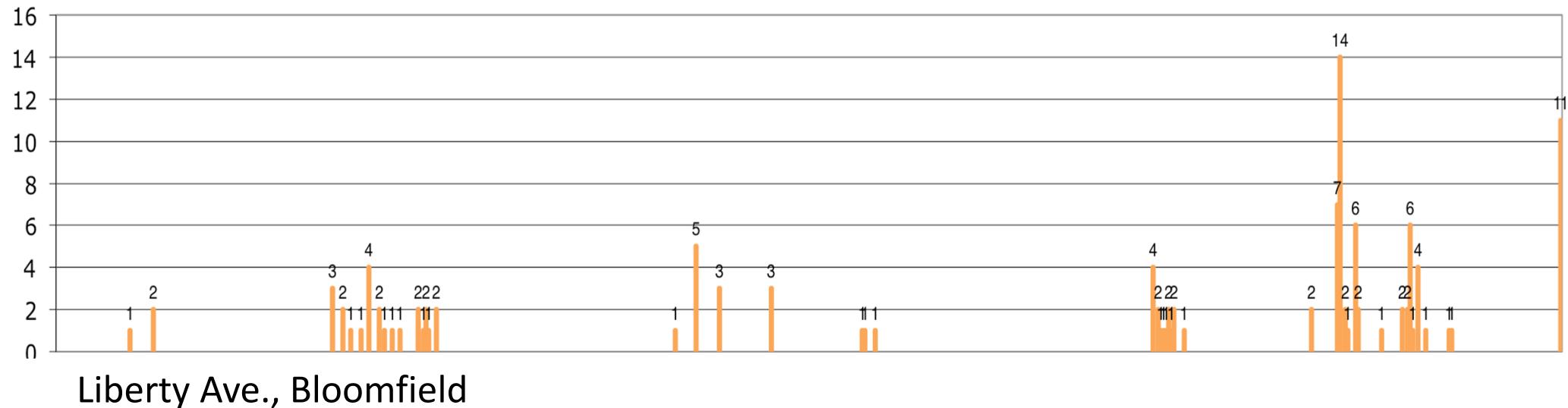
- █ TYPE A - SERVICE (BANK, BARBER, FLORIST, ETC.)
- █ TYPE B - GENERAL MERCHANDISE (CLOTHES, CONVENIENCE STORE, ETC.)
- █ TYPE C - FOOD & BEVERAGE (RESTAURANT, BARS, COFFEE SHOPS, ETC.)
- █ TYPE D - CULTURAL ENTERTAINMENT (THEATERS, GALLERIES, ETC.)
- NON-RETAIL
- VACANT



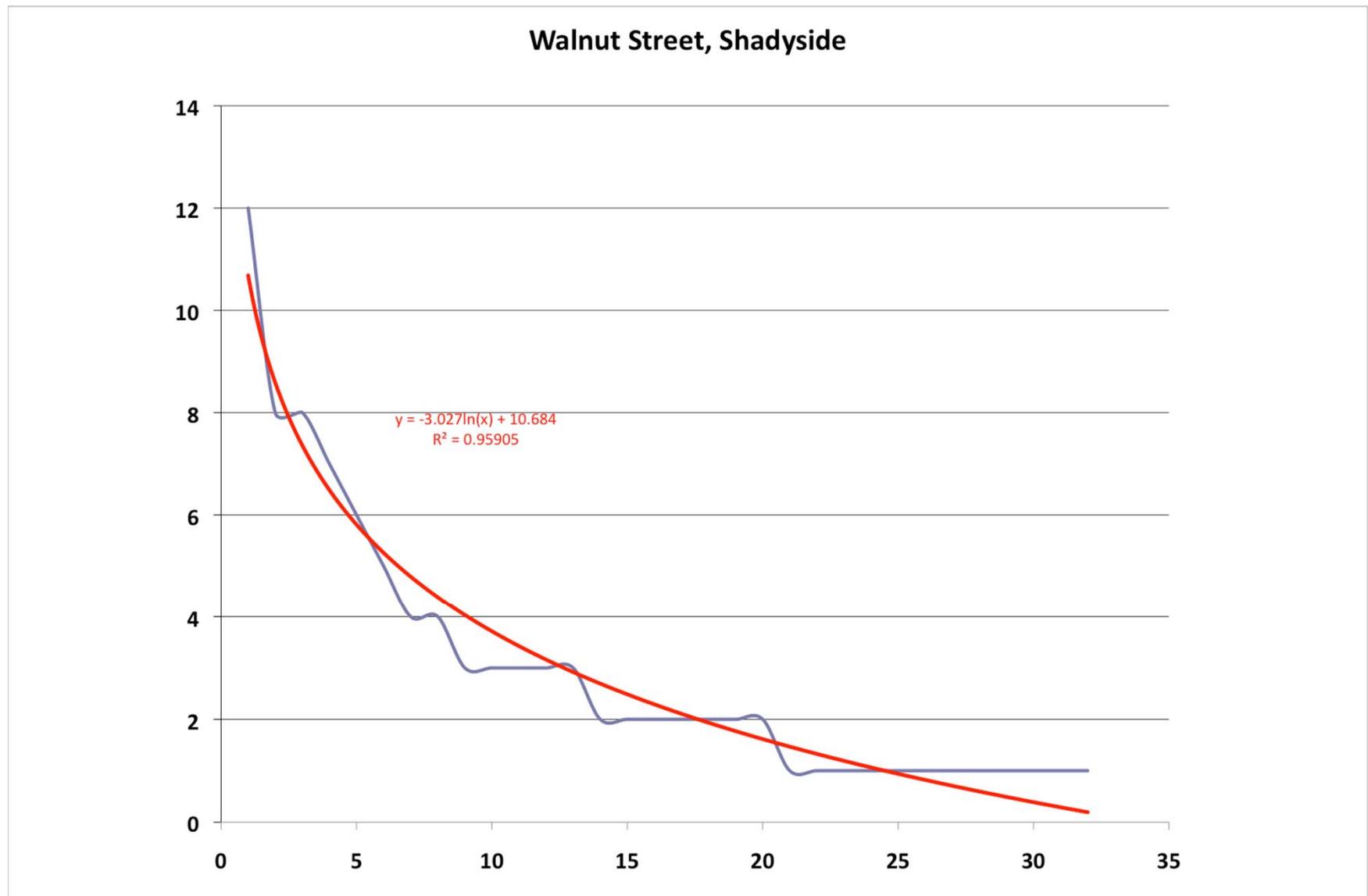
Walnut Street mapping



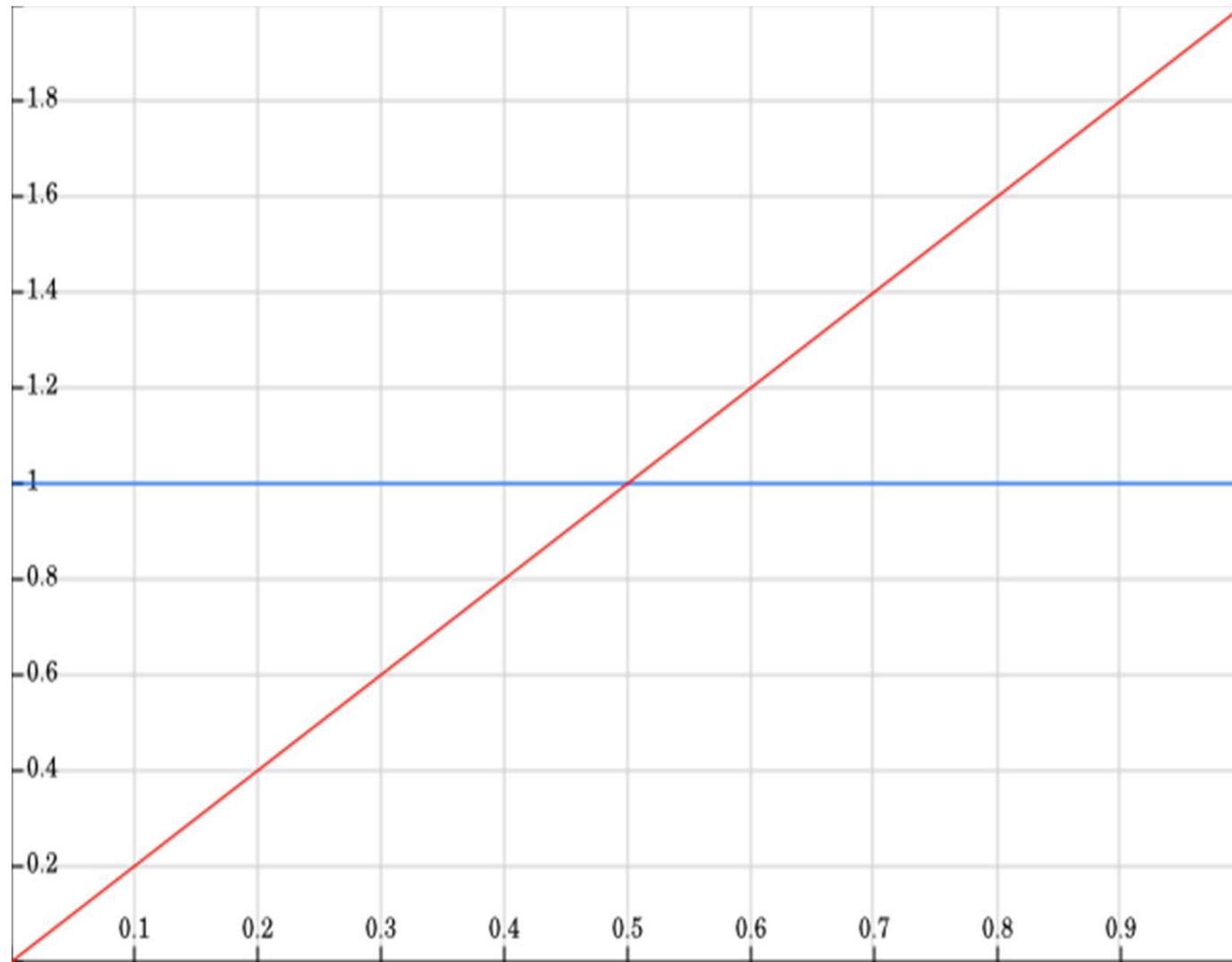
Comparative Patch Spectrograph data



Patch Count distribution

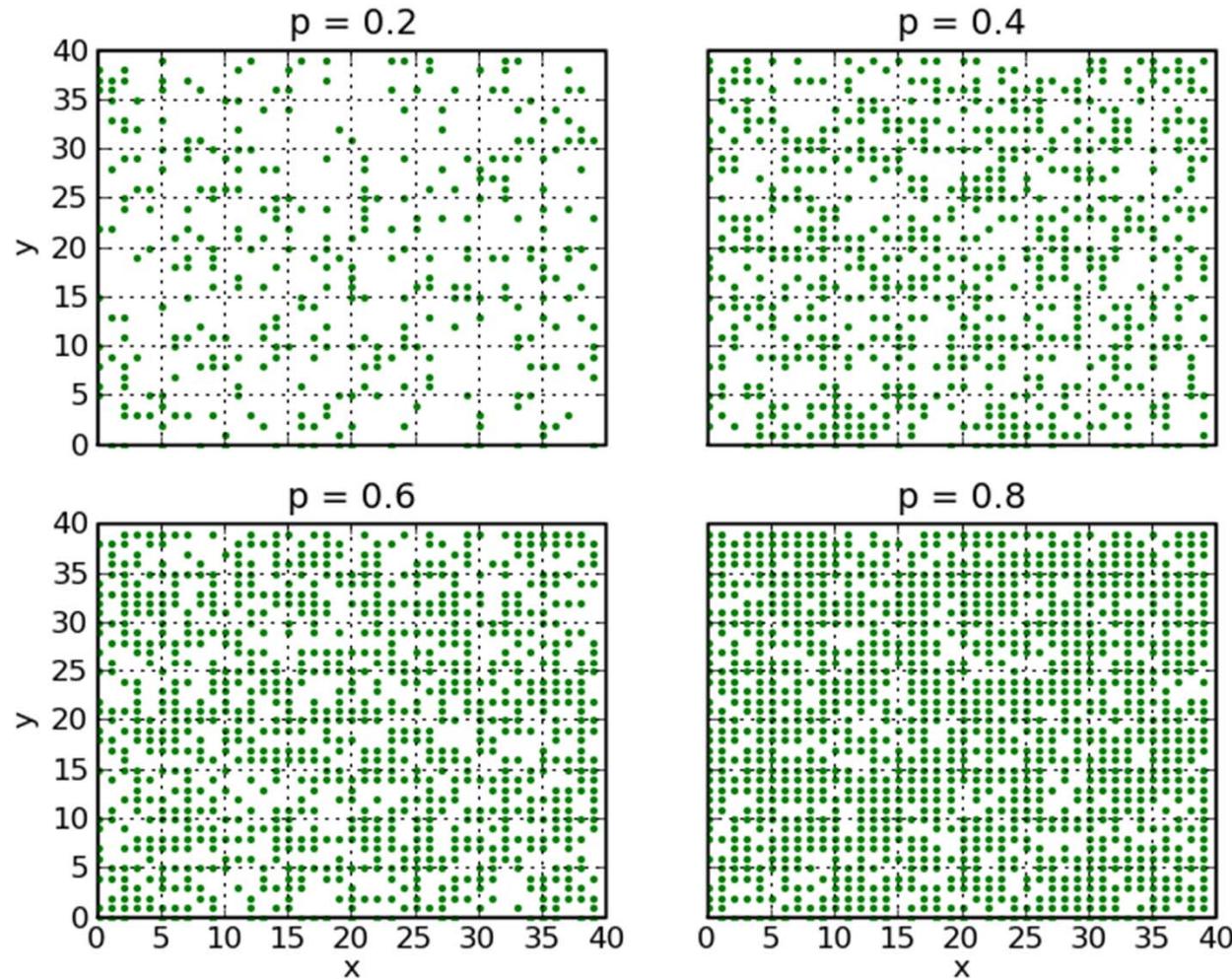


Math as a language

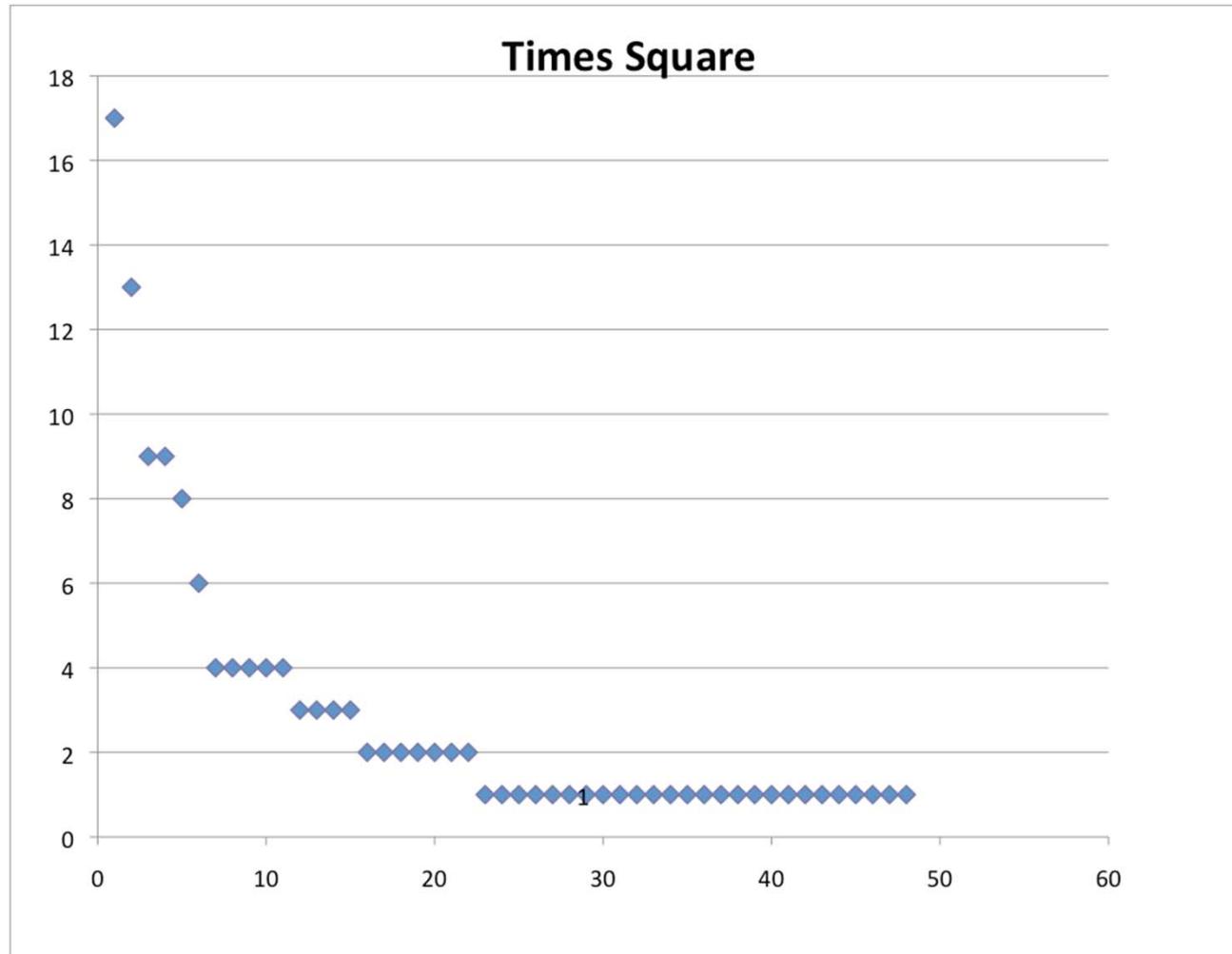


Coherence from Chaos

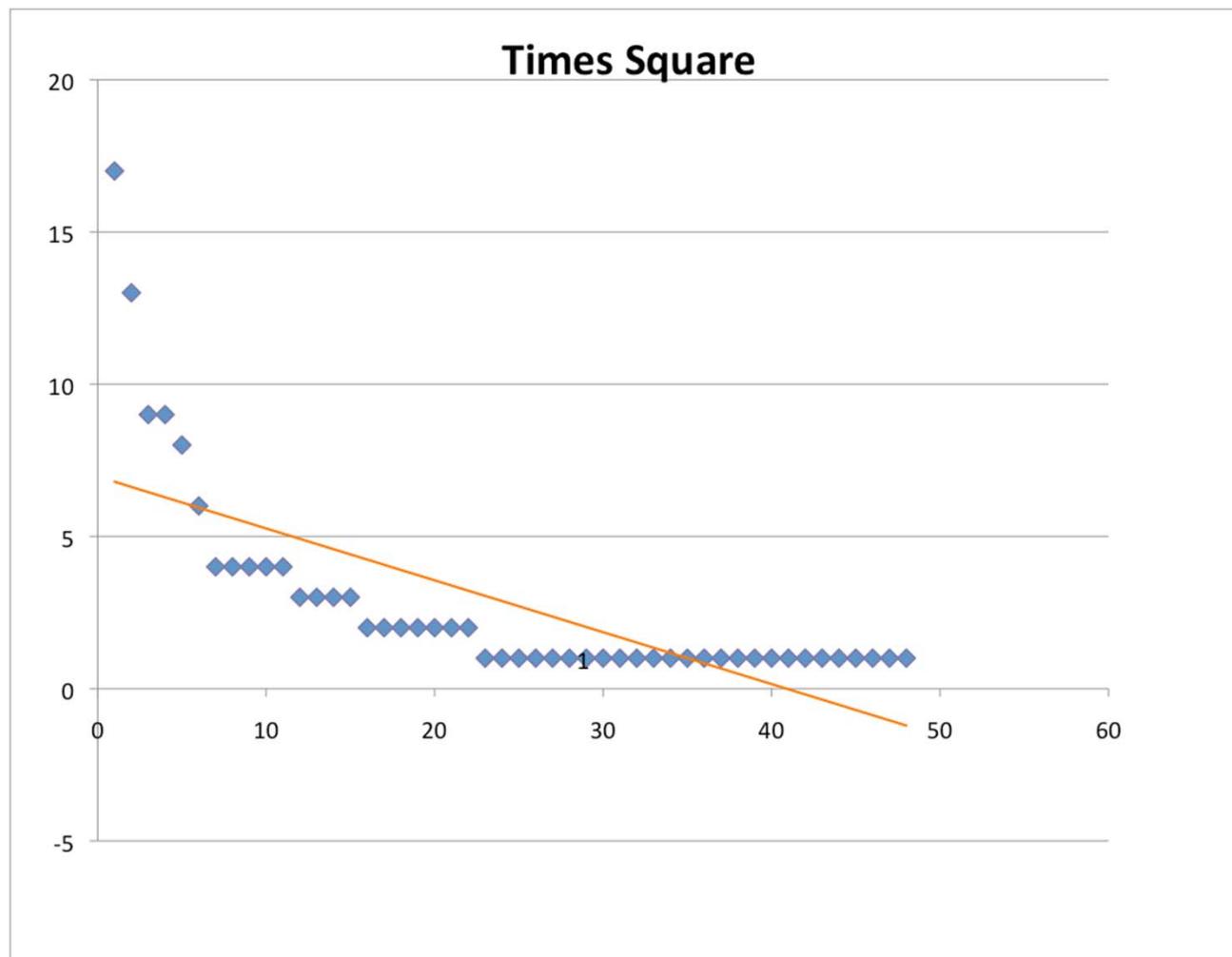
Percolation Theory



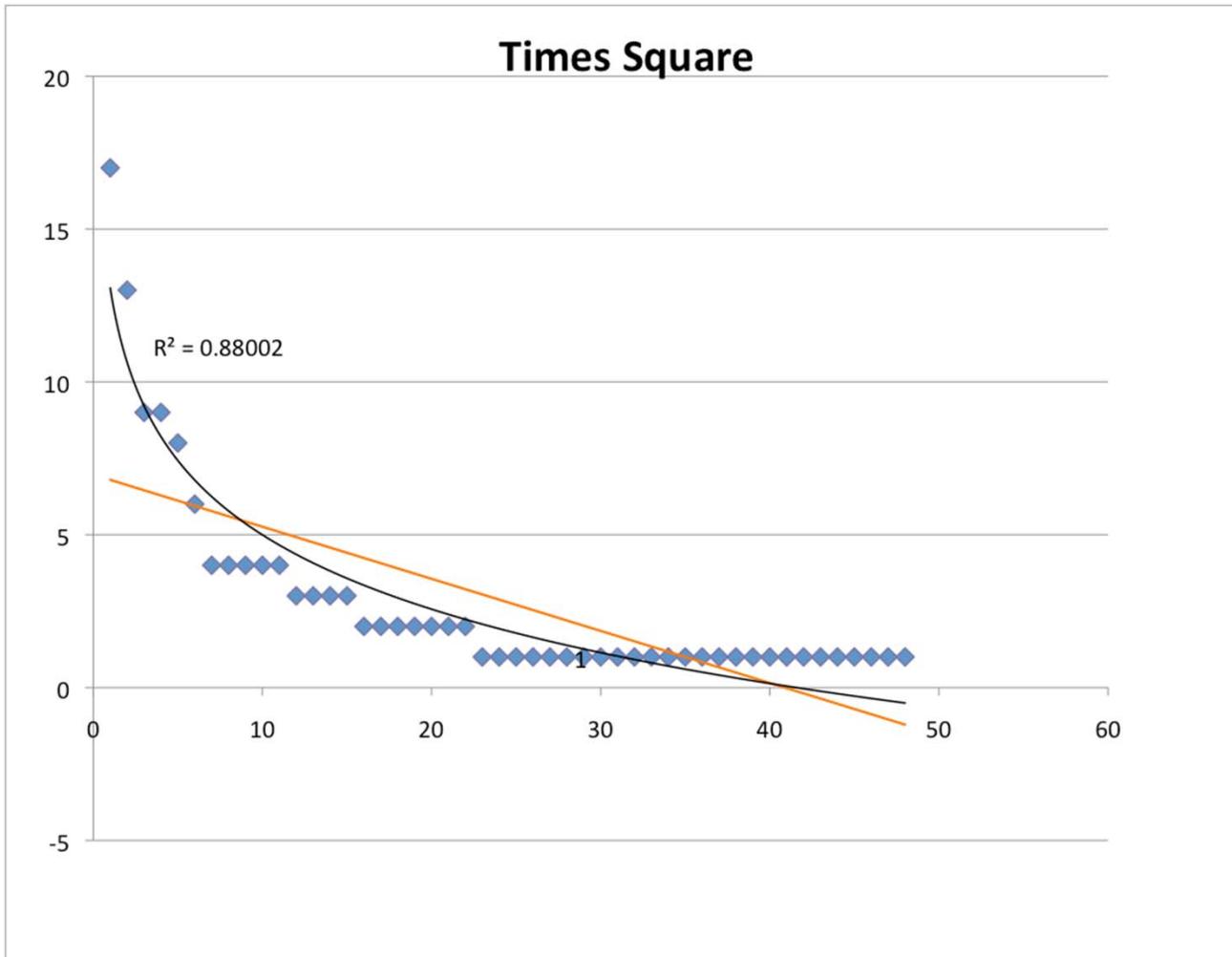
Math as a language



Math as a language



Math as a language



Sudoku

	7			6				
9					4	1		
		8		9		5		
9				7		2		
		3			8			
4			8			1		
	8		3		9			
1	6						7	
			5			8		

Putting it all together

Population analysis

	population R	area (SM)	visitors (V)	perform. Theaters	R density (sm)
Manhattan	1,619,000	34	47,000,000	40	47,899
San Francisco	825,863	47	16,900,000	16	17,572
Boston	636,479	48	18,000,000	9	13,260
Pittsburgh	306,211	56	3,900,000	7	5,468
Chicago	2,715,000	237	45,600,000	30	11,456
Orlando	249,562	111	57,300,000	6	2,254

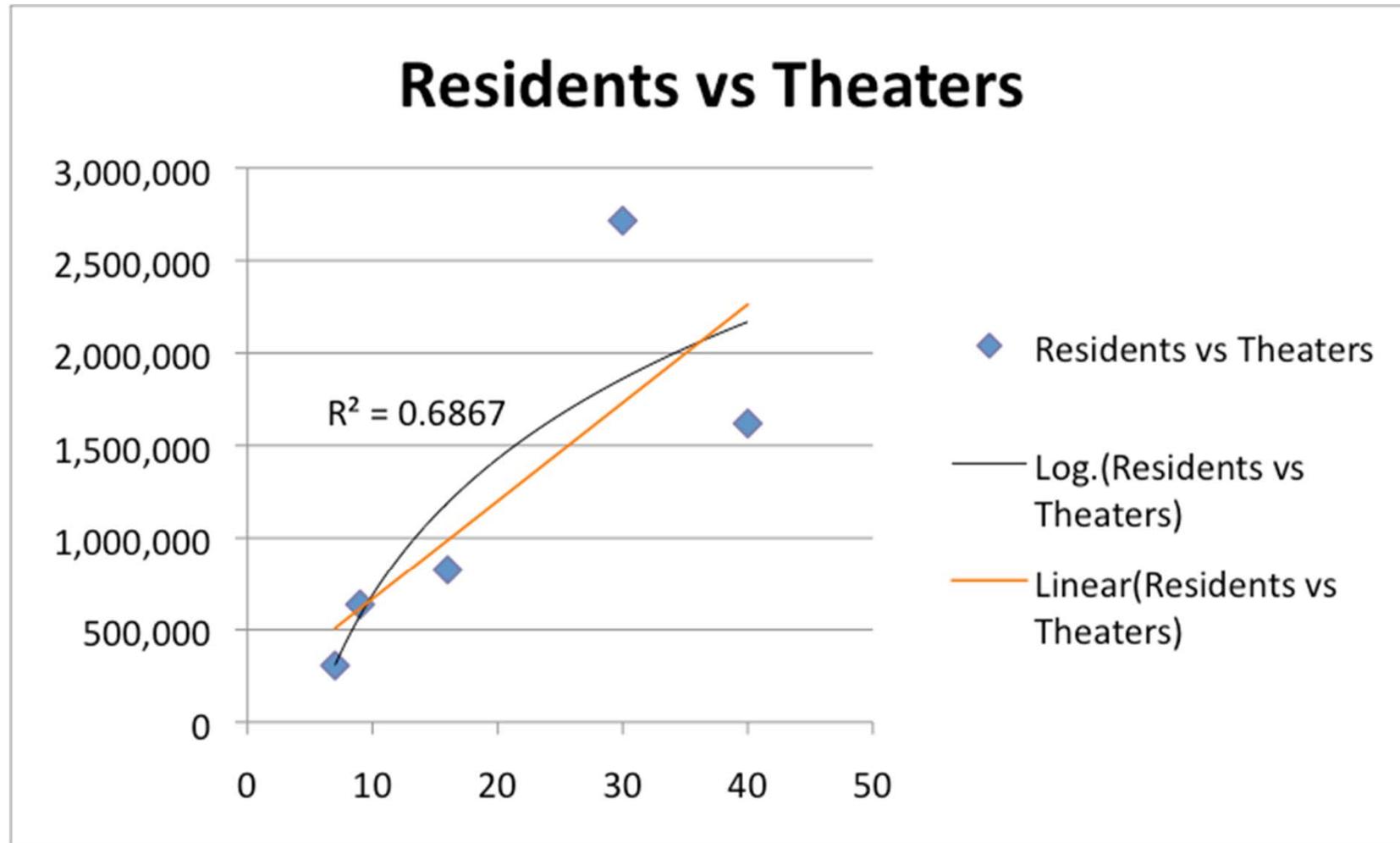
Population analysis

	R+V density/sm	R+V/theater	R as % of R+V total	R/theater	theater/SM
Manhattan	1,438,432	1,215,475	3.33%	40,475	0.85
San Francisco	377,146	1,107,866	4.66%	51,616	2.94
Boston	388,260	2,070,720	3.42%	70,720	5.33
Pittsburgh	75,111	600,887	7.28%	43,744	8.00
Chicago	203,861	1,610,500	5.62%	90,500	7.90
Orlando	519,870	9,591,594	0.43%	41,594	18.45

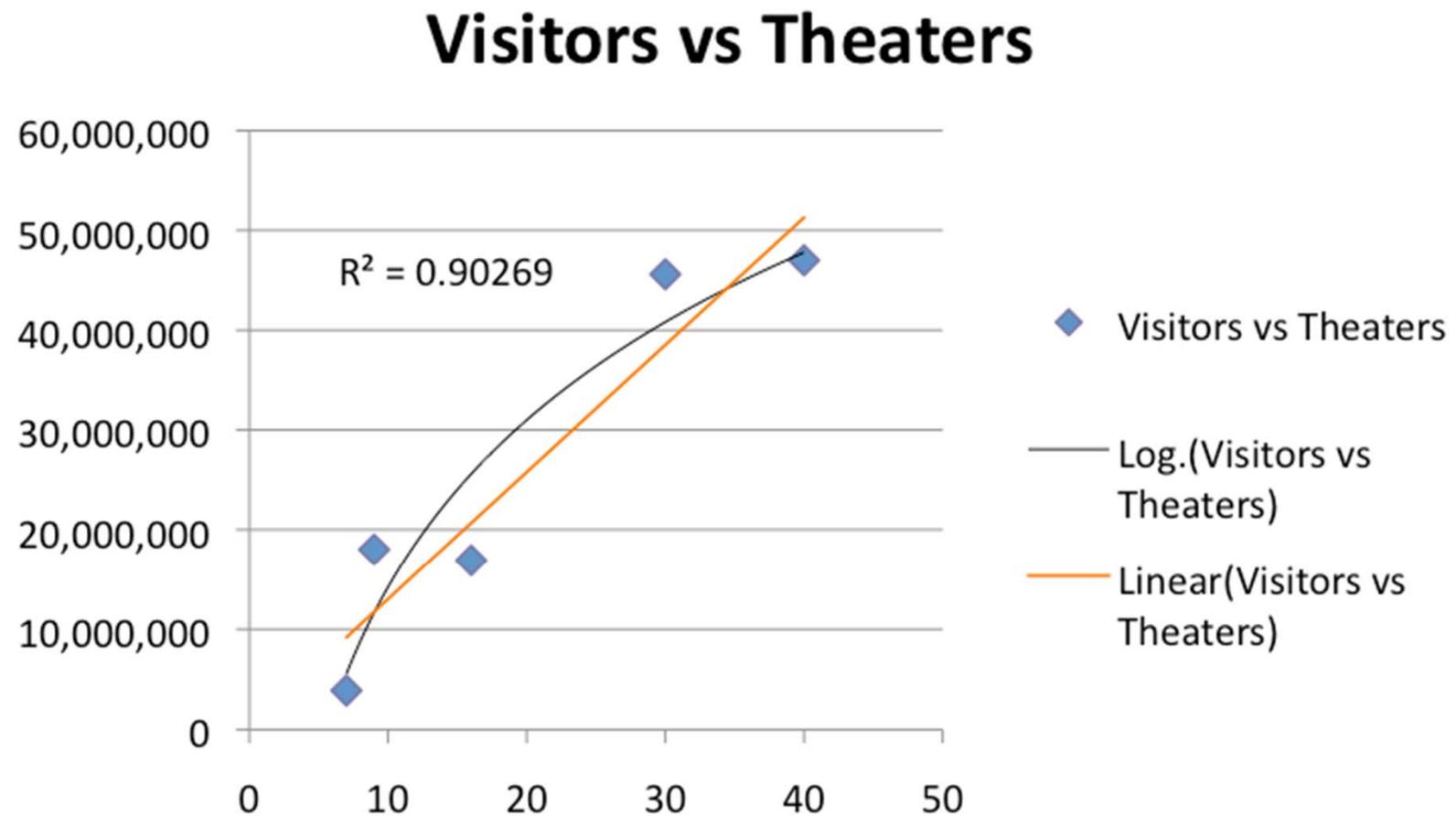
Population analysis

	V adjusted	R+V	R+V adj	V adj/R
Manhattan	386,301	48,619,000	2,005,301	23.9%
San Francisco	138,904	17,725,863	964,767	16.8%
Boston	147,945	18,636,479	784,424	23.2%
Pittsburgh	32,055	4,206,211	338,266	10.5%
Chicago	374,795	48,315,000	3,089,795	13.8%
Orlando	470,959	57,549,562	720,521	188.7%

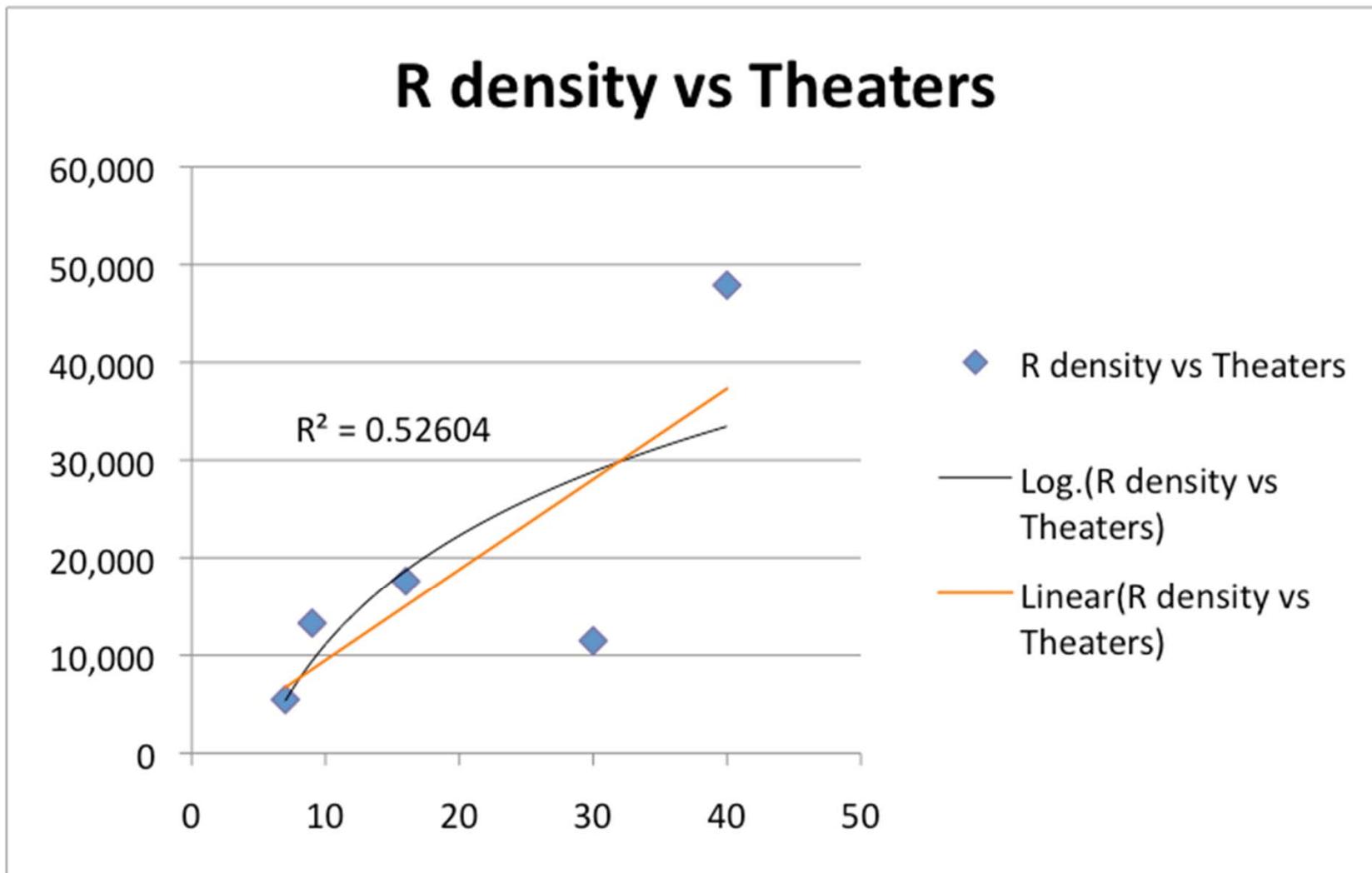
Putting it all together



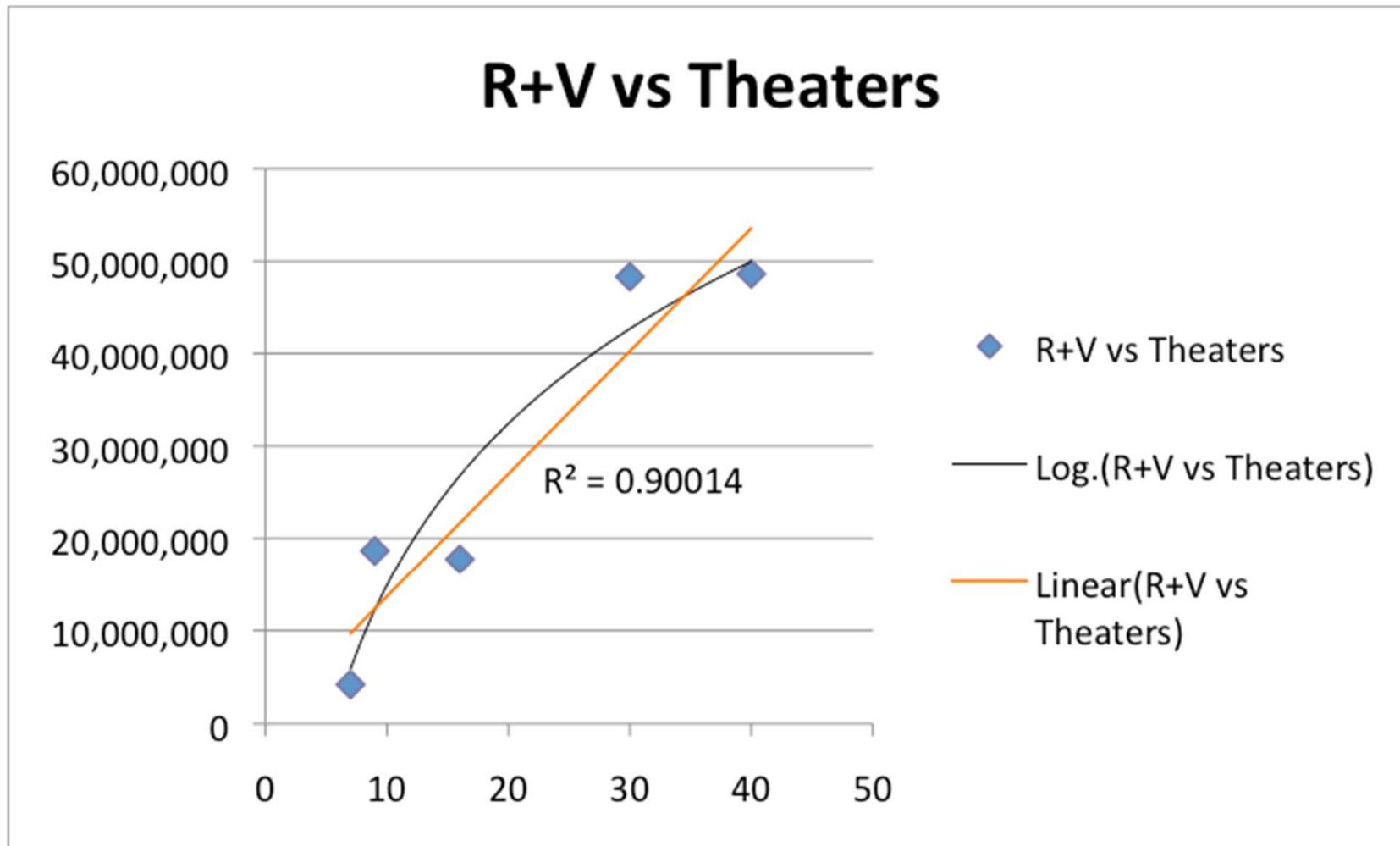
Putting it all together



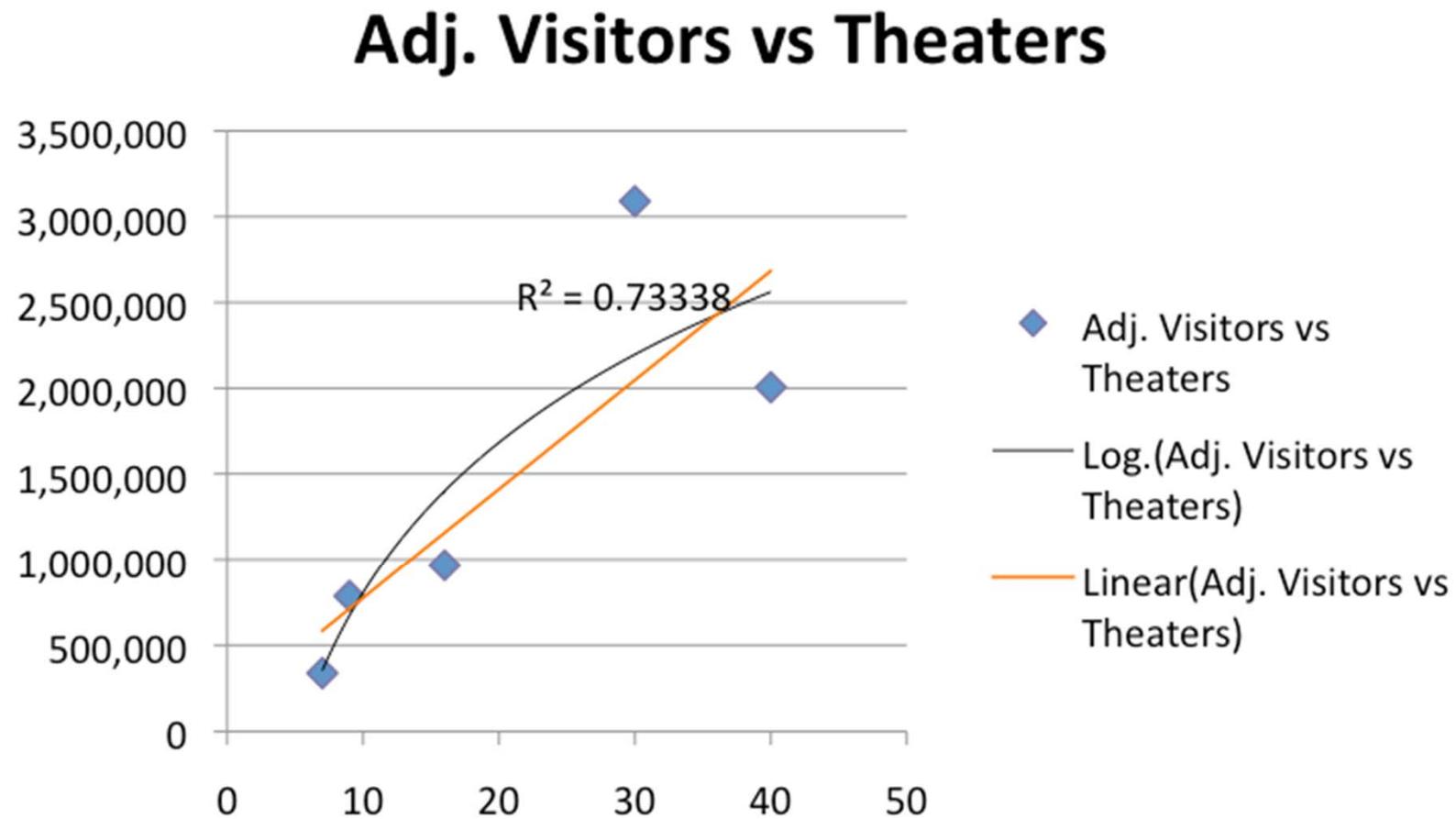
Putting it all together



Putting it all together



Putting it all together



T I M E S S Q U A R E D I S T R I C T

Times Square, NYC



Golden Triangle, Pgh



TYPE OF RETAIL	
TYPE A- SERVICE (BANK, BARBER, FLORIST, ETC.)	
TYPE B- GENERAL MERCHANDISE (CLOTHES, CONVENIENCE STORE, ETC.)	
TYPE C- FOOD & BEVERAGE (RESTAURANT, BARS, COFFEE SHOPS, ETC.)	
TYPE D- CULTURAL ENTERTAINMENT (THEATERS, GALLERIES, ETC.)	
NON-RETAIL	
VACANT	
PARKS/OUTDOOR SPACES	

T I M E S S Q U A R E D I S T R I C T



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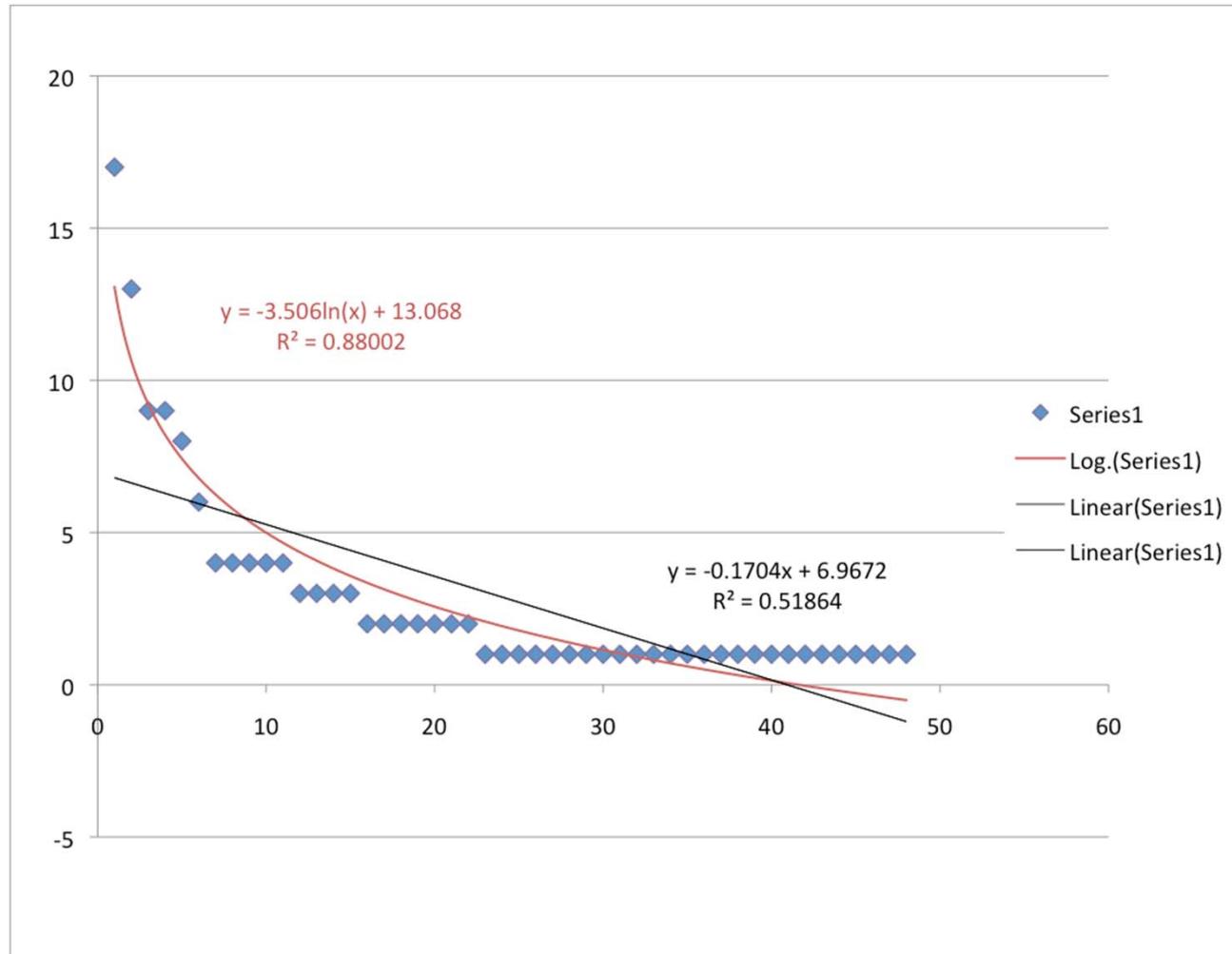
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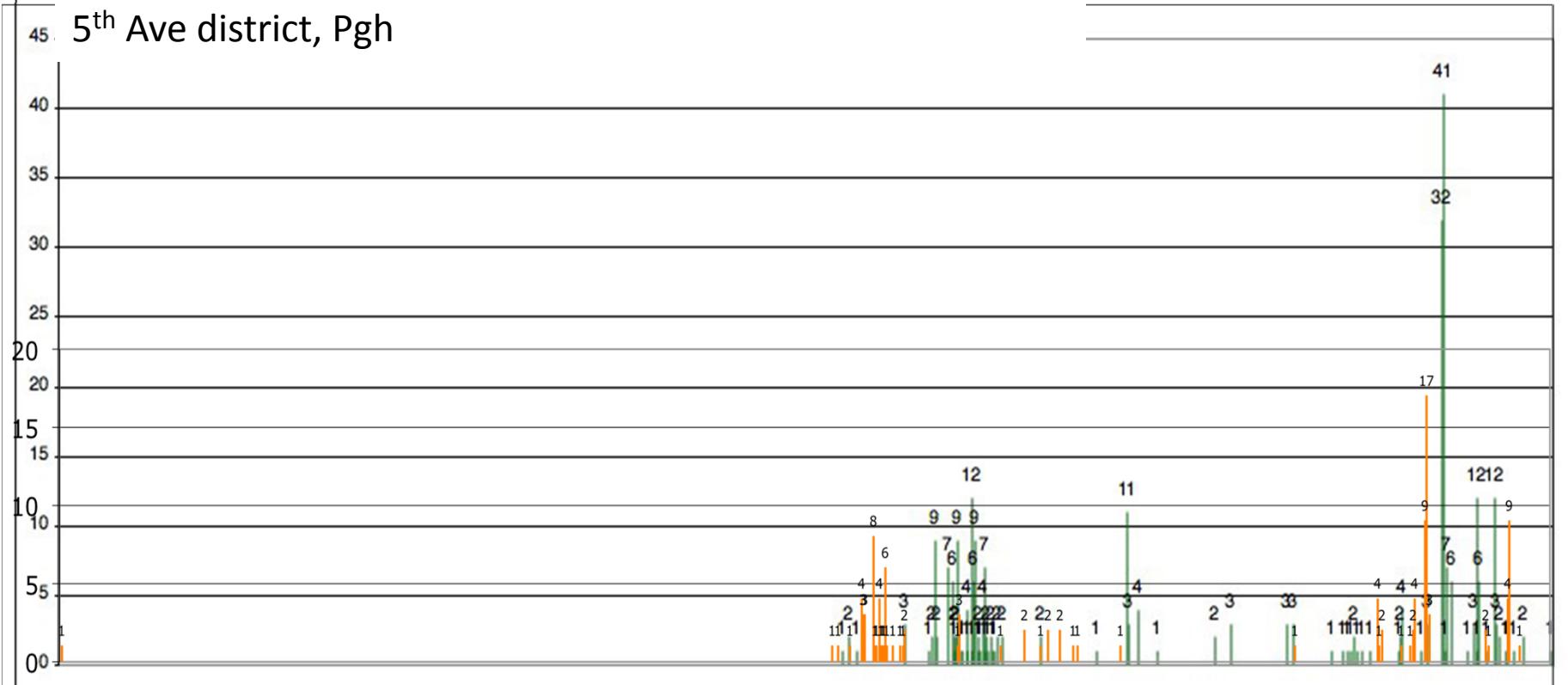
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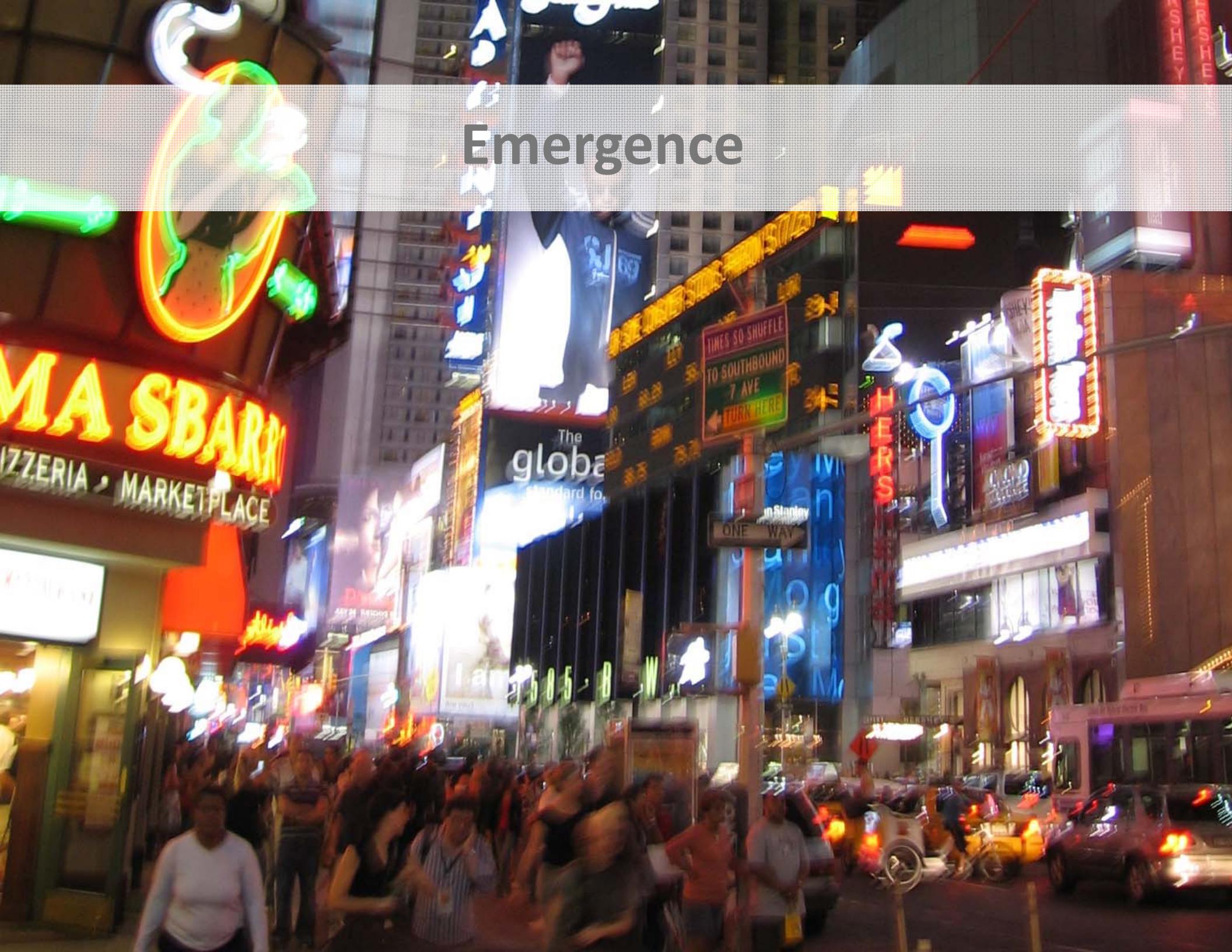
NAICS distribution and diversity

45. 5th Ave district, Pgh



Times Square, NYC

Emergence



Conclusions, hypotheses, & lines of inquiry

- Connectivity is critical
- Emergence is the goal
- Percolation Theory
- Measuring emergence