

21st Annual GIS/CAMA Technologies Conference Chattanooga Convention Center

GIS/CAMA • Chattanooga, TN



March 6-9, 2017

·Continuing Education (CE) Credit

·Recertification Credit forms for CE credit can be collected from the Registration Desk on Thursday.

Housekeeping

The conference proceedings will be available approximately 8 weeks after the conference.



Bock Face Points and Their Application in Retail Property Valuation Modeling

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Outline

- The Problem of Location
- New York City Properties
- The Problem of Distance
- Block Face Centroids and their Projections to the Street Center Lines
- When Should It Be Considered
- How To Get The Block Face Points
- What Is The Next Step?



A Brief Of The Problem

- Location, location, location
- How is a location described?
- What is the influence of a retail property to my retail property?
- Then, how is it measured?
- And, what does it mean to property valuation?

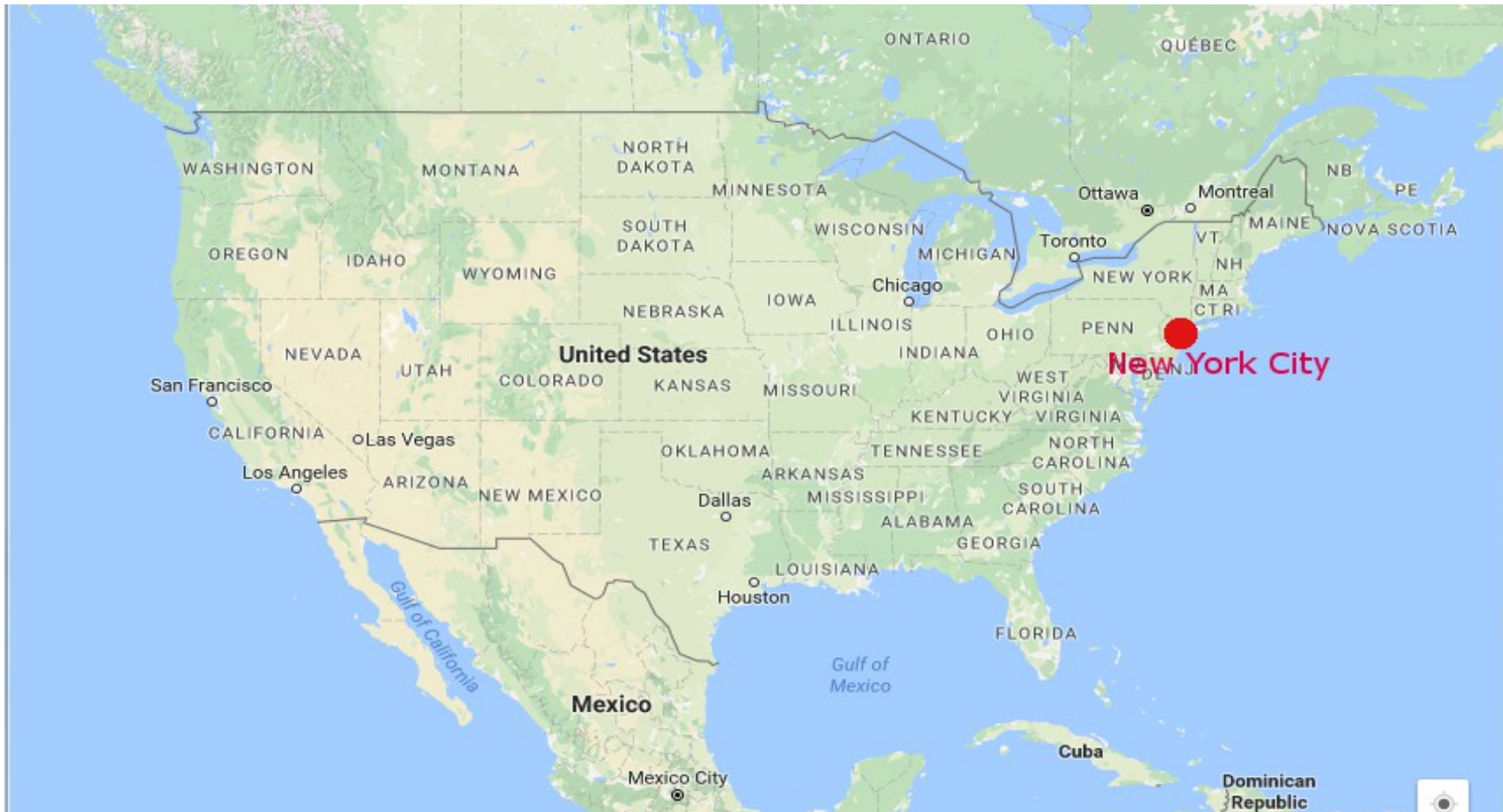


How is a location described?

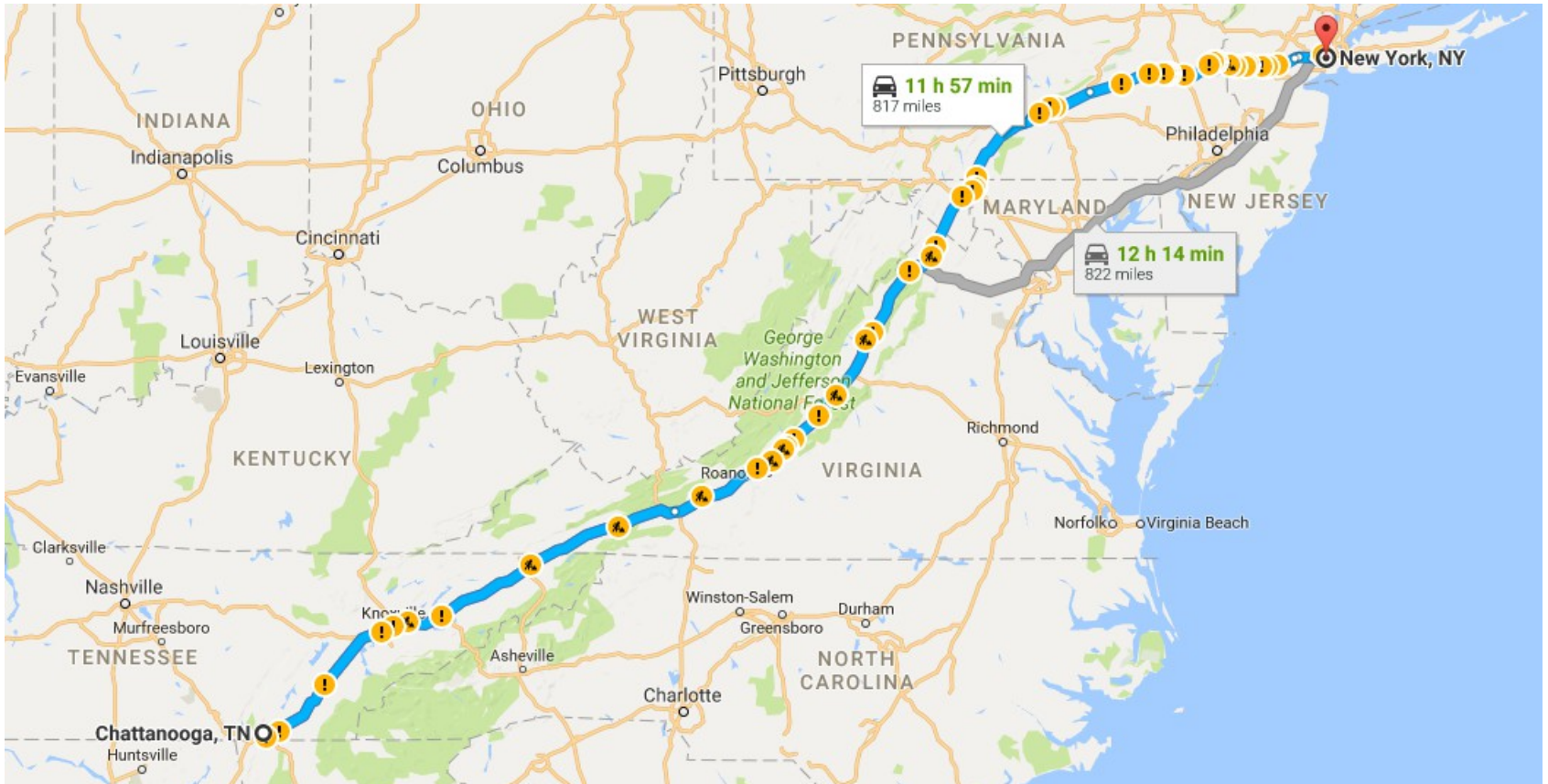
- It depends on how detail you want to know
 - Describe by relative location
 - New York City on the map of North-America
 - Distance from NYC to Chattanooga
 - Distance from City Hall to Charging Bull
 - Describe by address
 - Describe by coordinates



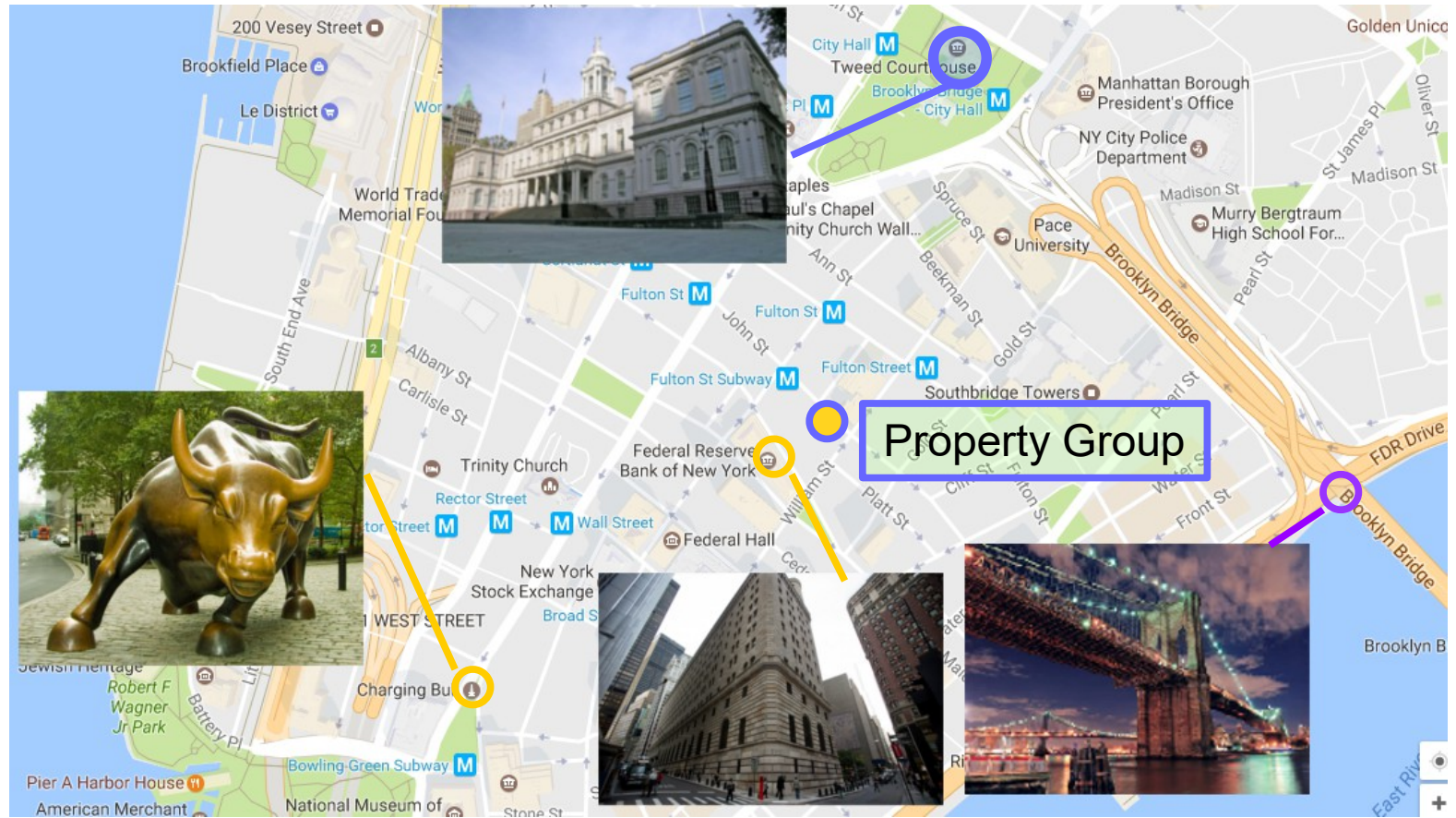
New York City on the map of North-America



Distance from NYC to Chattanooga



Distance from City Hall to Charging Bull



The New York City Properties by Tax Classes

Tax Class	Property Type	# of Parcels
1	1 - 3 FAMILY	635,964
	CONDOMINIUMS	24,061
	OTHER	23,574
	VACANT LAND	15,239
2	CONDOMINIUMS	165,782
	COOPERATIVES	4,852
	RENTALS	23,915
	OTHER	69,785
3	UTILITIES	292
4	HOTELS	902
	INDUSTRIAL	9,539
	LOFT	636
	OFFICES	6,535
	RETAIL	19,213
	CONDOMINIUMS	32,749
	OTHER	23,717
	VACANT LAND	4,686
Total # of Parcels		1,061,441

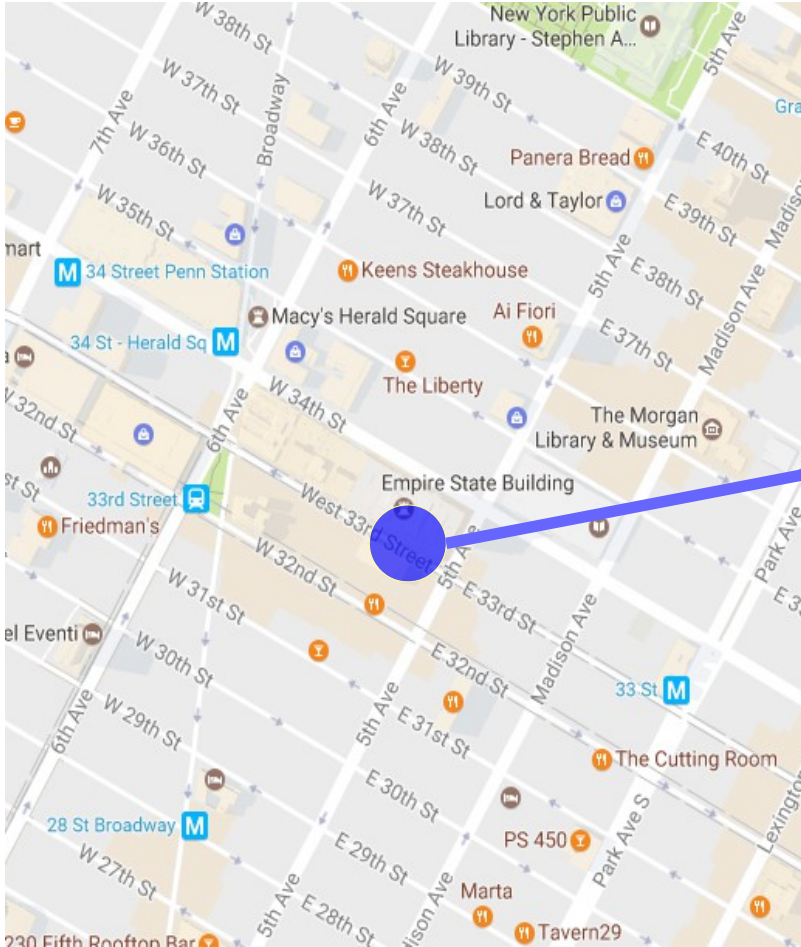


Geographical Features In New York City

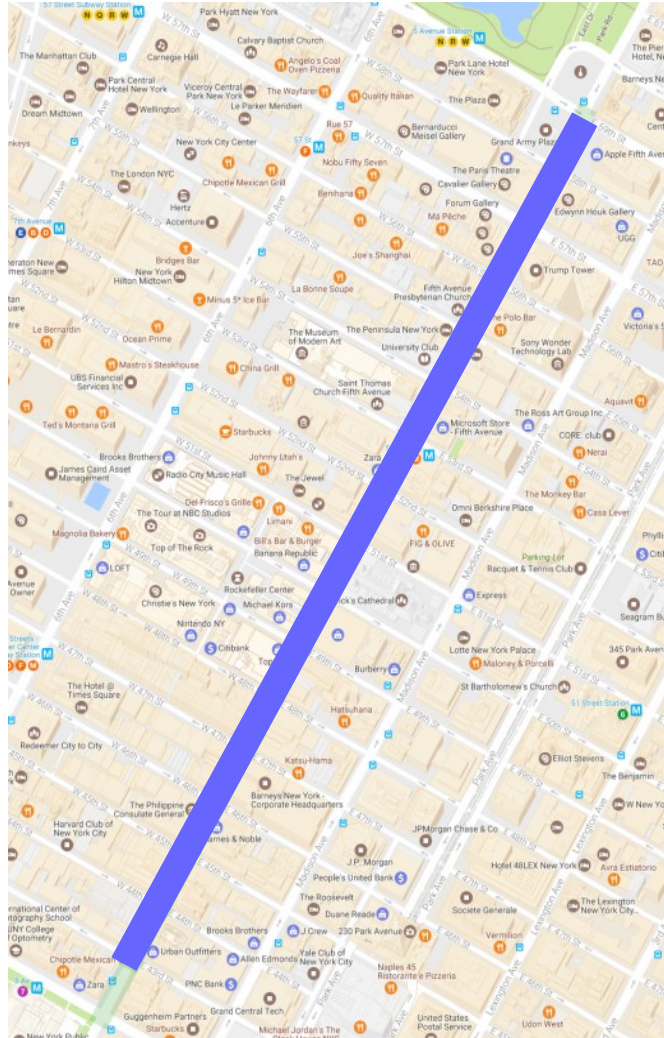
- Point Features Of Interest
- Linear Features Of Interest
- Area Features Of Interest



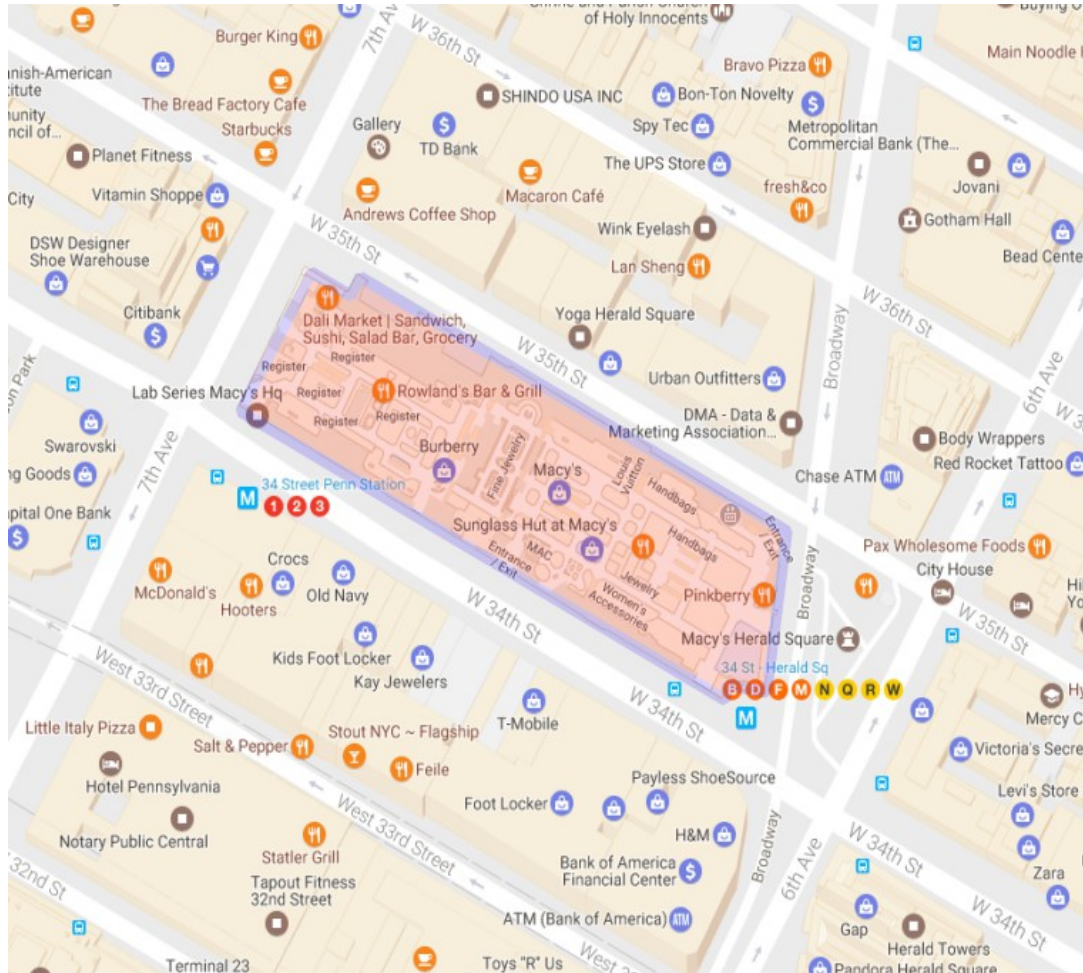
Point Features Of Interest



Linear Features Of Interest



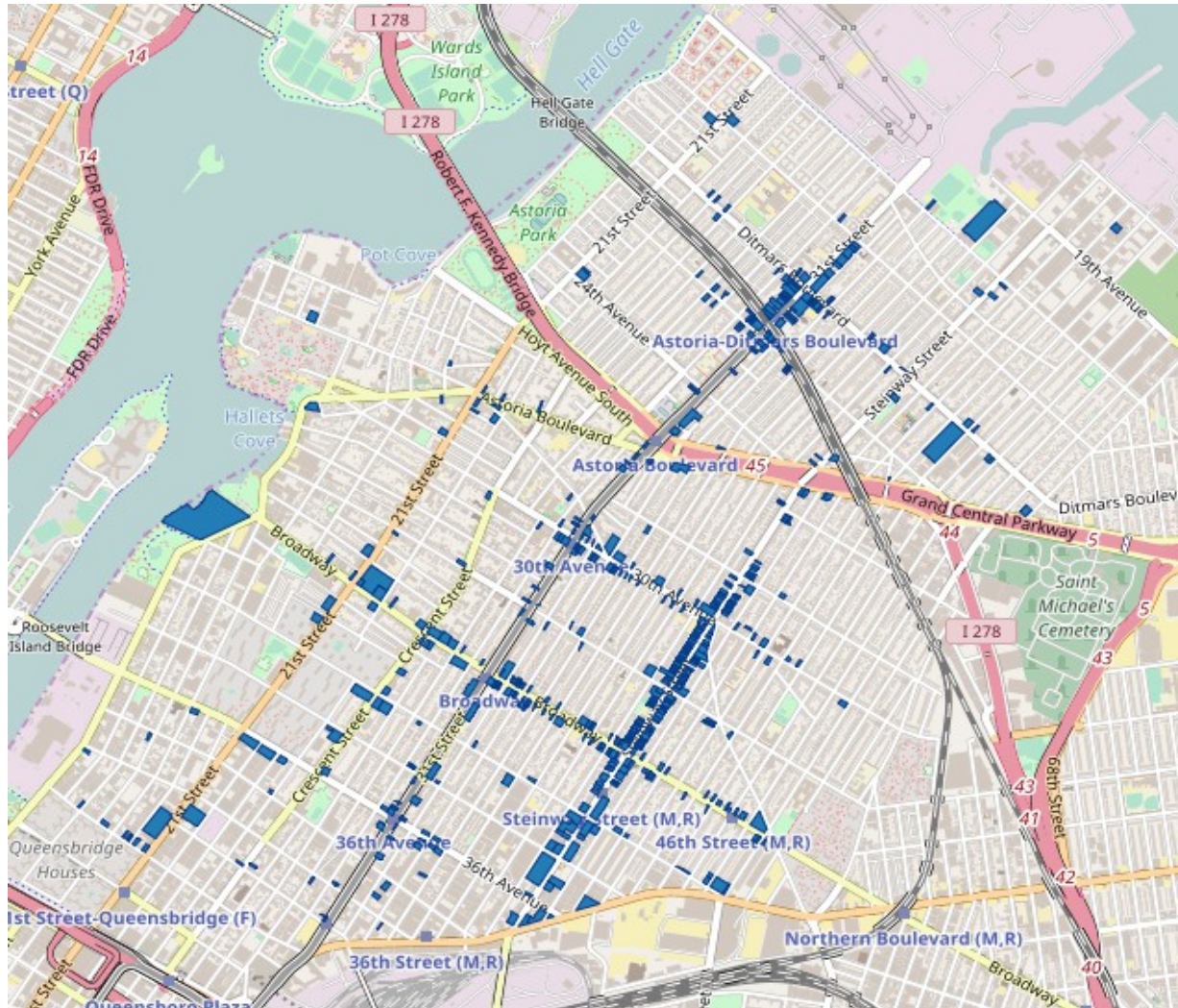
Area Features Of Interest



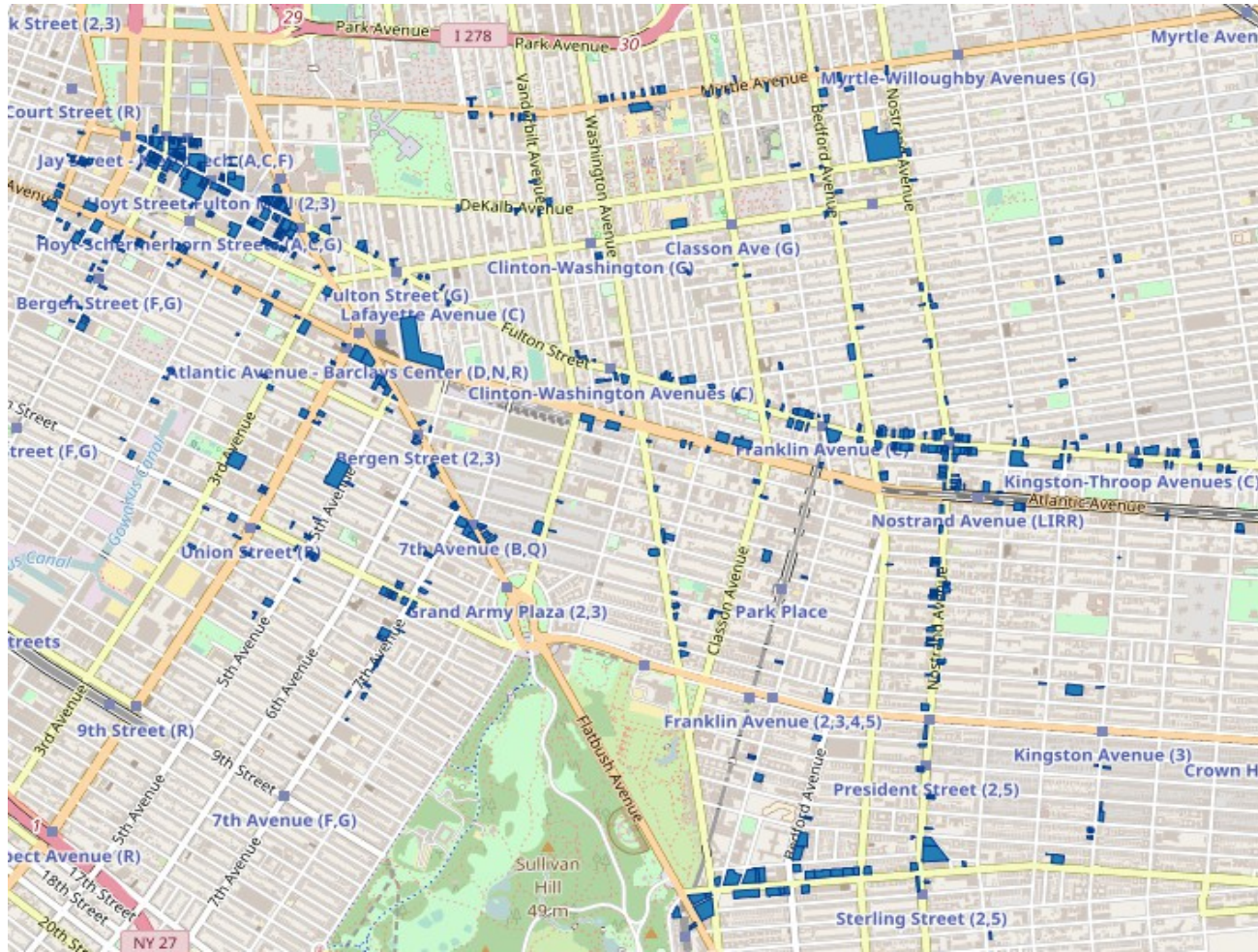
The New York City Retail Properties by Borough

Borough	Retail Parcels
Manhattan	2,396
Bronx	2,623
Brooklyn	6,231
Queens	6,372
Staten Island	1,591
New York City	19,213

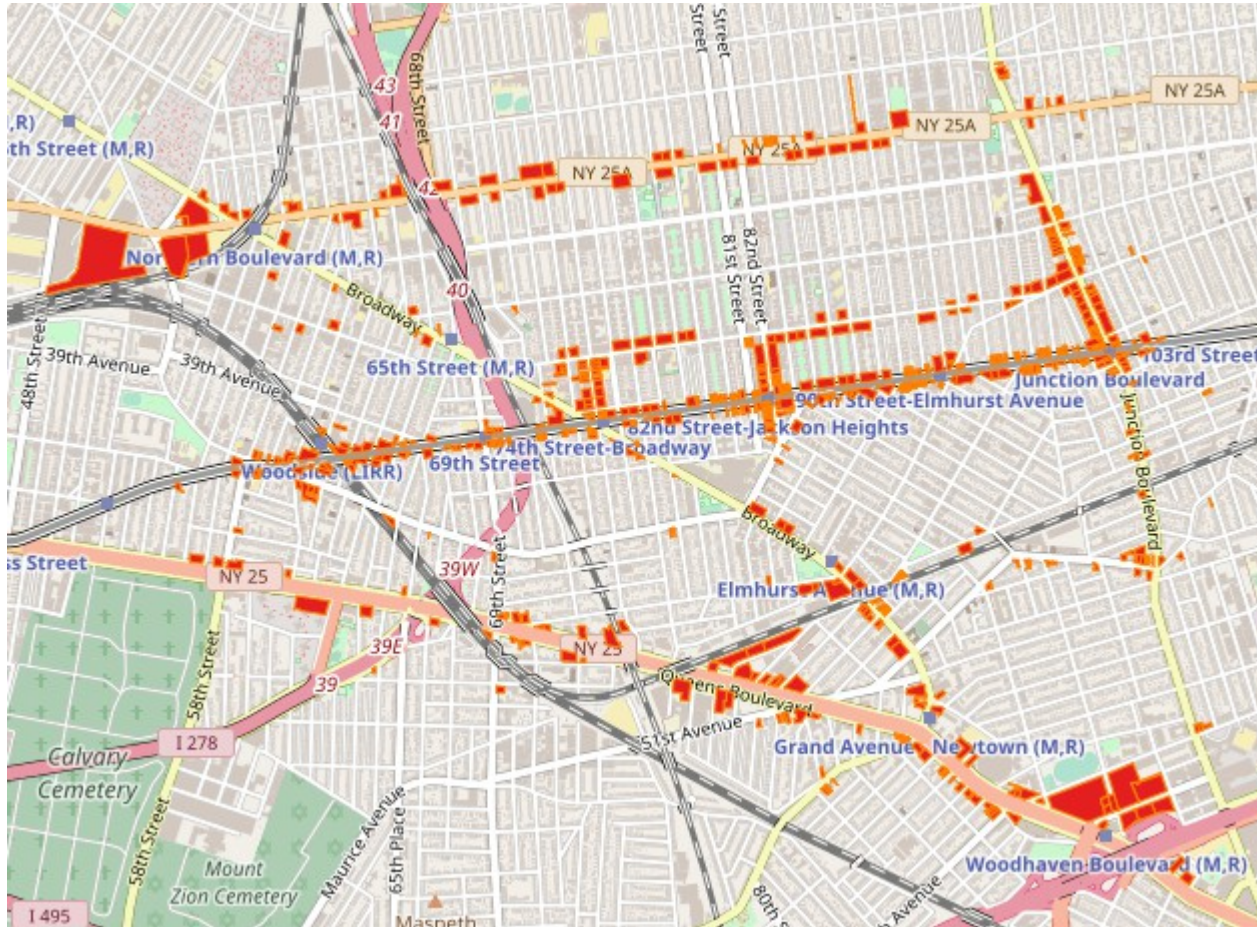
Retail Stores in Astoria Neighborhood



Retail Stores along Fulton Street



Retail Stores along Roosevelt Avenue



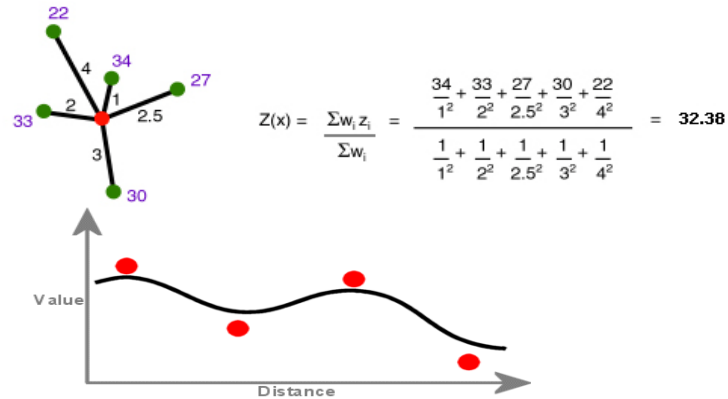
The Distance Factor in Property Valuation

- Multiple regression
- Comparable properties in income approach
- Local property level aggregation of economic conditions in the cost approach
- Stratification of properties in different approaches
- Spatial Analysis Process



Euclidean Distance used in Spatial Analysis

- IDW
- Spline
- Kriging



Basic principles of kriging

- Optimise interpolation by dividing spatial variation into three components
 - ✓ Deterministic variation
 - ✓ Spatially autocorrelated
 - ✓ Uncorrelated noise
- Kriging uses the semivariogram in calculating estimates of the surface at the grid nodes.

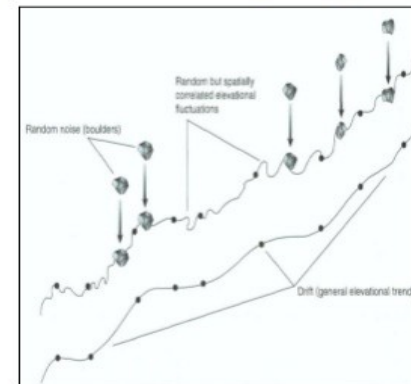
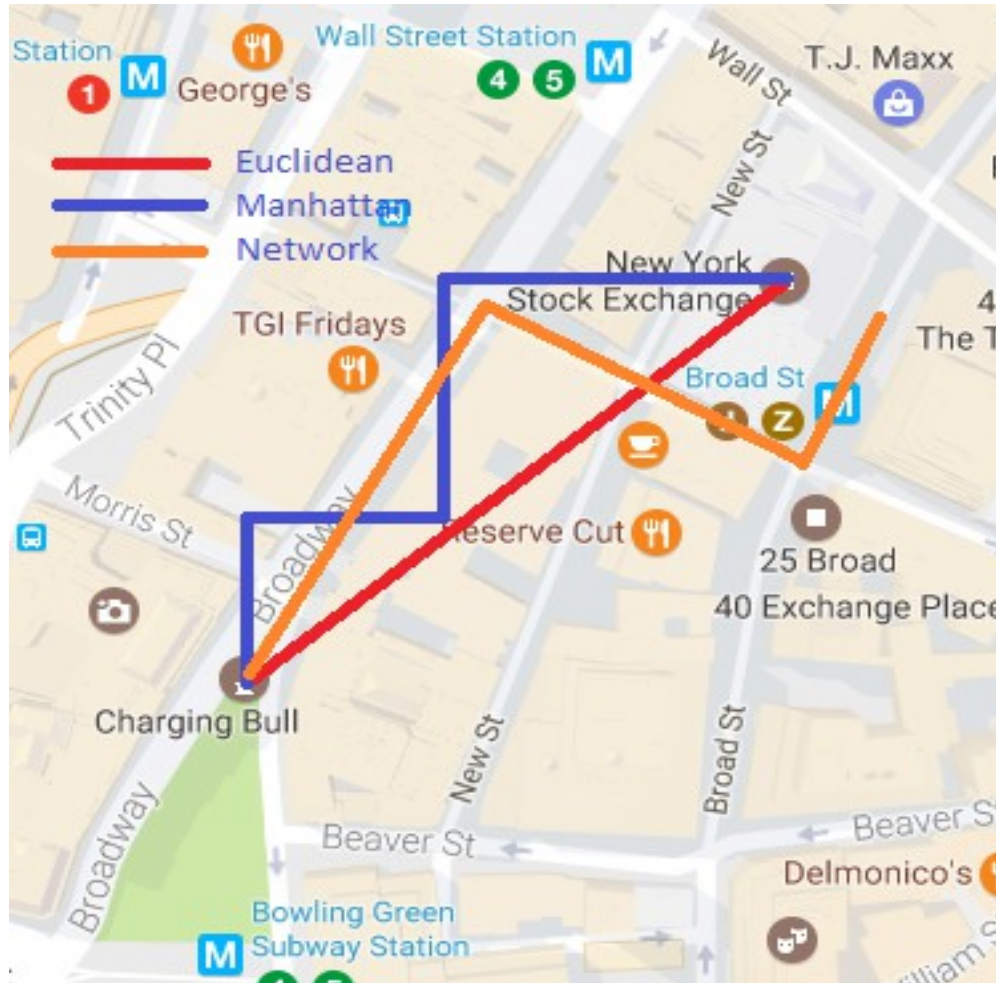


Fig.1 Fig showing how spatial variation can be considered in kriging



Distance Measurement from Point to Point

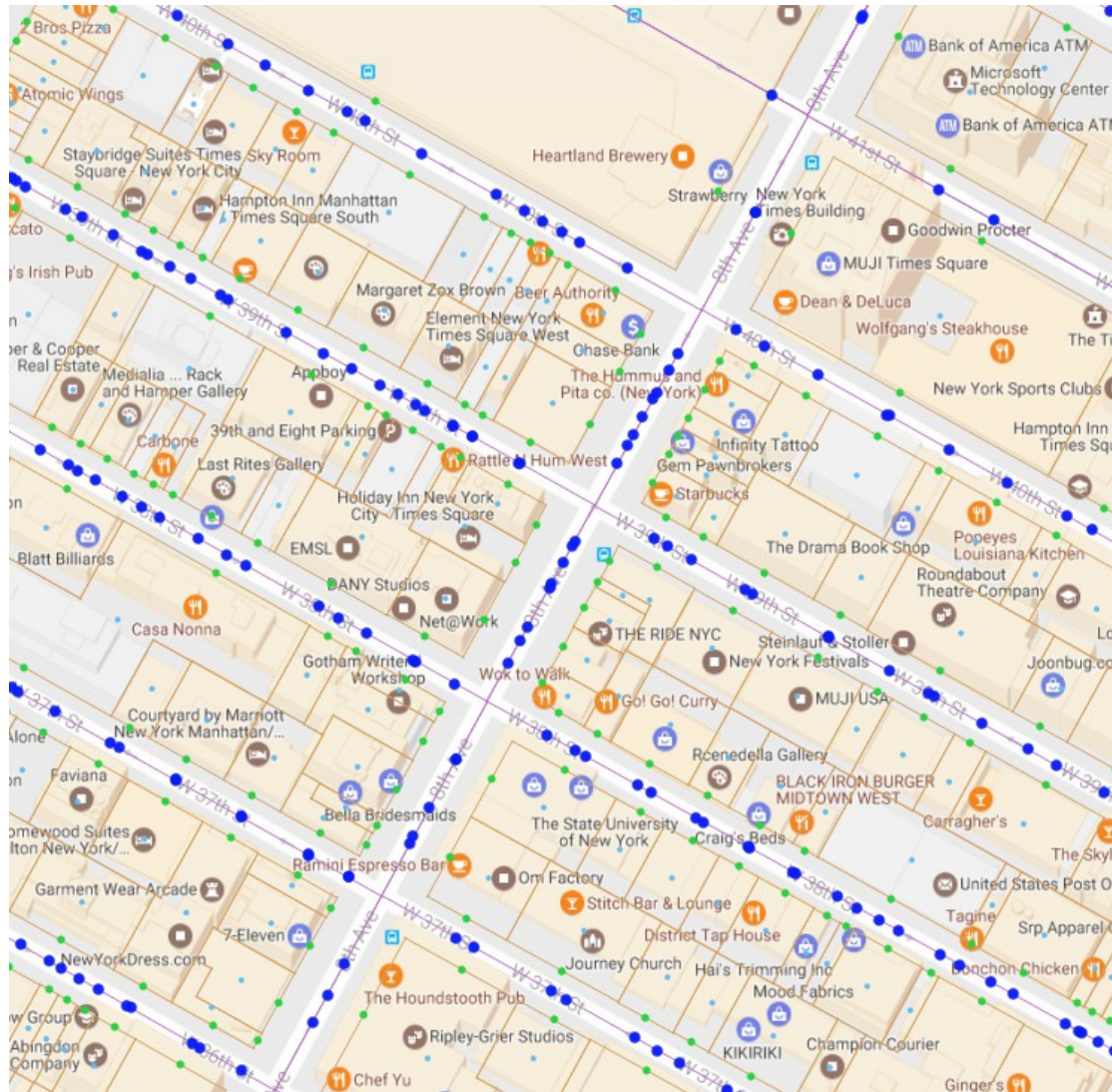


Geo-reference of a lot

- Lot centroids – most commonly used method
- The block-face centroids
- The projection of the block-face centroid to the center line of the street



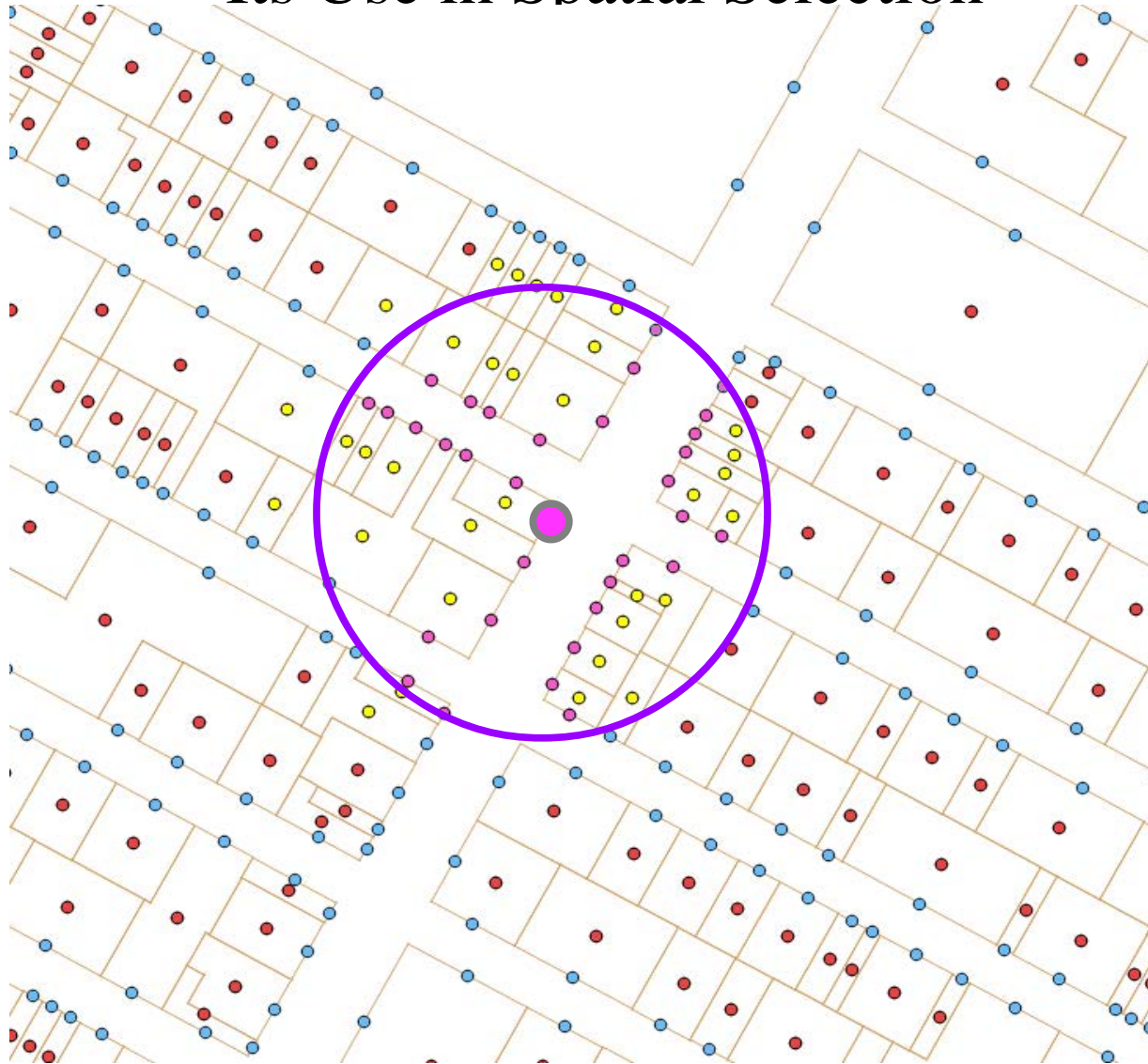
Geo-reference of lots



Lot Centroid Based Distance and Its Use in Spatial Selection



Block Face Centroid Based Distance and Its Use in Spatial Selection



Discussion

When Do We Need To Consider It?

- Is it necessary at all?
- It is depends on the followings:
 - Purpose of distance measurement
 - The geographic scale of problem
- For NYC Tax Class 4 Retail Properties



How To Get the Block-Face Points

- What do you need?
 - Lot, block and street center line
 - ArcGIS, QGIS
- Steps:
 - Get block face polylines
 - Get block face line features
 - Get the centroids of the lines
 - Get the near point on the center line



What is the next step?

- To test it's significance in valuation models for the properties of different tax classes
- To develop a set of procedures to measure the significance of network distance with block-face centroid, namely, how does the significance vary along the increase of geographic scale
- To experiment the height factor in different aspects



Questions & Suggestions





GIS-Pro 2017

October 23-26, 2017
Jacksonville, Florida

The logo for GIS-Pro 2017 is set against a background of a city skyline at dusk. It features a stylized globe with a grid of latitude and longitude lines, overlaid with several white, curved lines that suggest motion or data flow. The text 'GIS-Pro 2017' is written in a large, bold, teal font. Below the main title, the dates 'October 23-26, 2017' and the location 'Jacksonville, Florida' are displayed in a smaller, white, sans-serif font.





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