Housing in Madison

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Motivation

- U.S's economy is expanding right now. How does this affect Madison's housing?
  - Even though residential property build in 2017 is only 29.0% of residential property build in 2004, it has doubled ever since the great depression of 2009.
- Should you buy a new home or an older home? Or how tax for residential properties changes depending on the year build?
- How much of the property tax comes from new development? And what kinds of properties are in new development?

Overview

- Housing price
- Number of houses build from 1837 to 2017
- Relationship between Total Net Tax and year build for houses
- Take a look at some of interesting variables selected from Lasso
- Understand how the value of Madison's residential properties change over time
- Net tax for different property class and wards

Data (Where did I get it? And what is in it?)

- Madison's public website
- The data contains the value for Madison's property, taxes, ward, year build, Property Class, ect
- There are zero as a year(what are in year zero?)
  - Industry and Commercial only has zero year
  - In this presentation, we will mainly explore residential property, which only has 0.5% of net tax from zero year
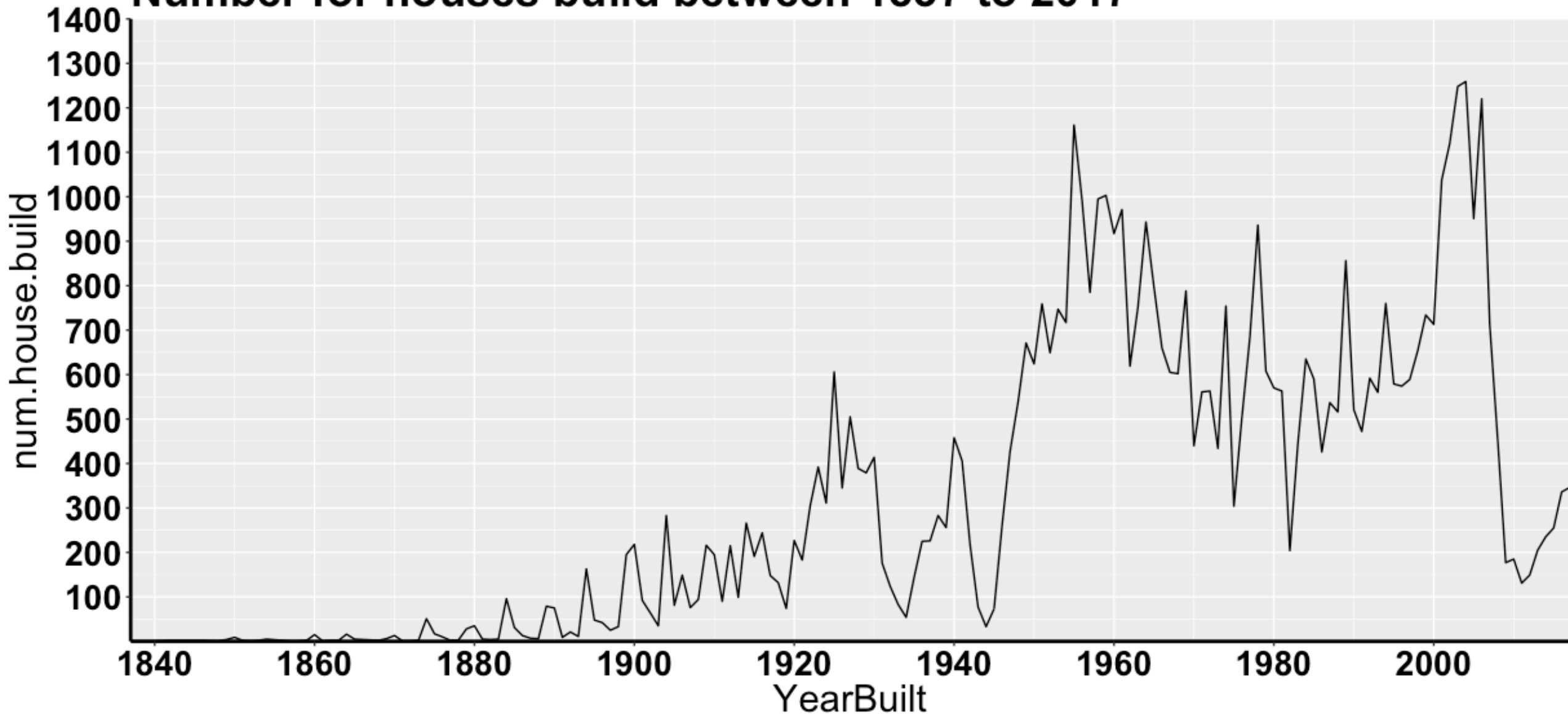
Overview of housing price

Interpretation of the red line:
Median house value in Madison has a total assessed Value of around $224,400. This is slightly lower than the national median of $ 226,300.
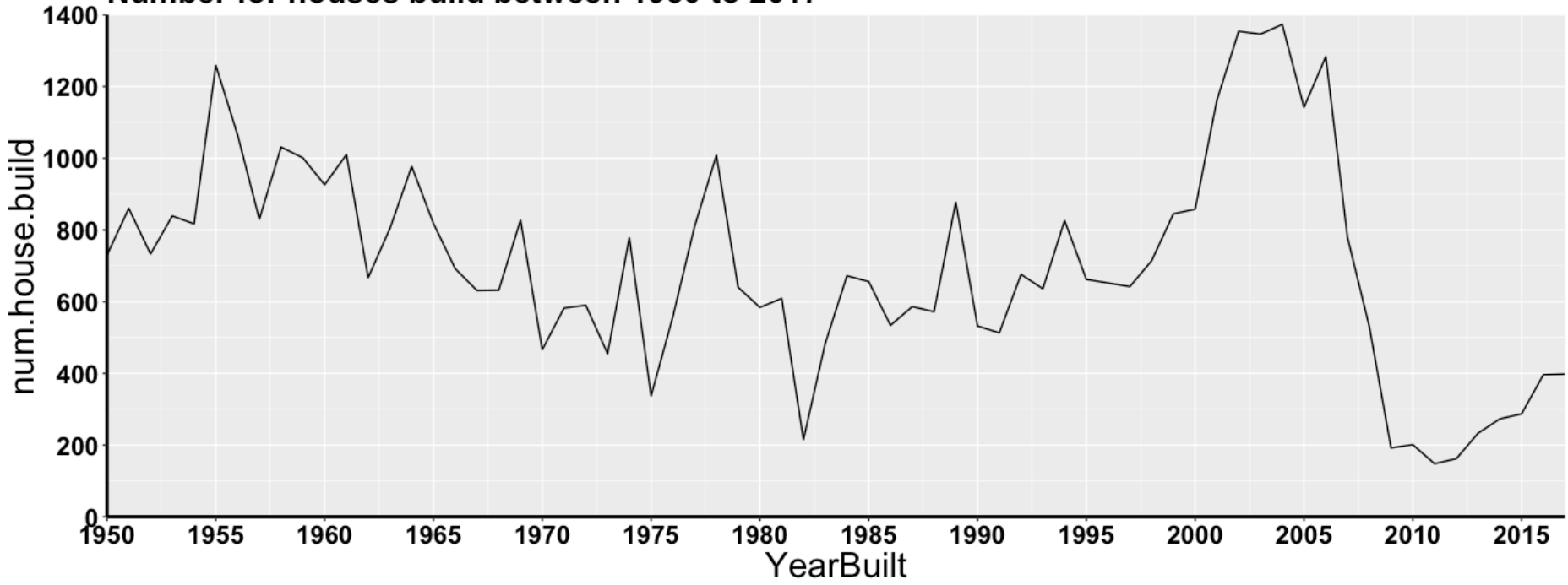
CDF for TotalAssessedValue less than a million
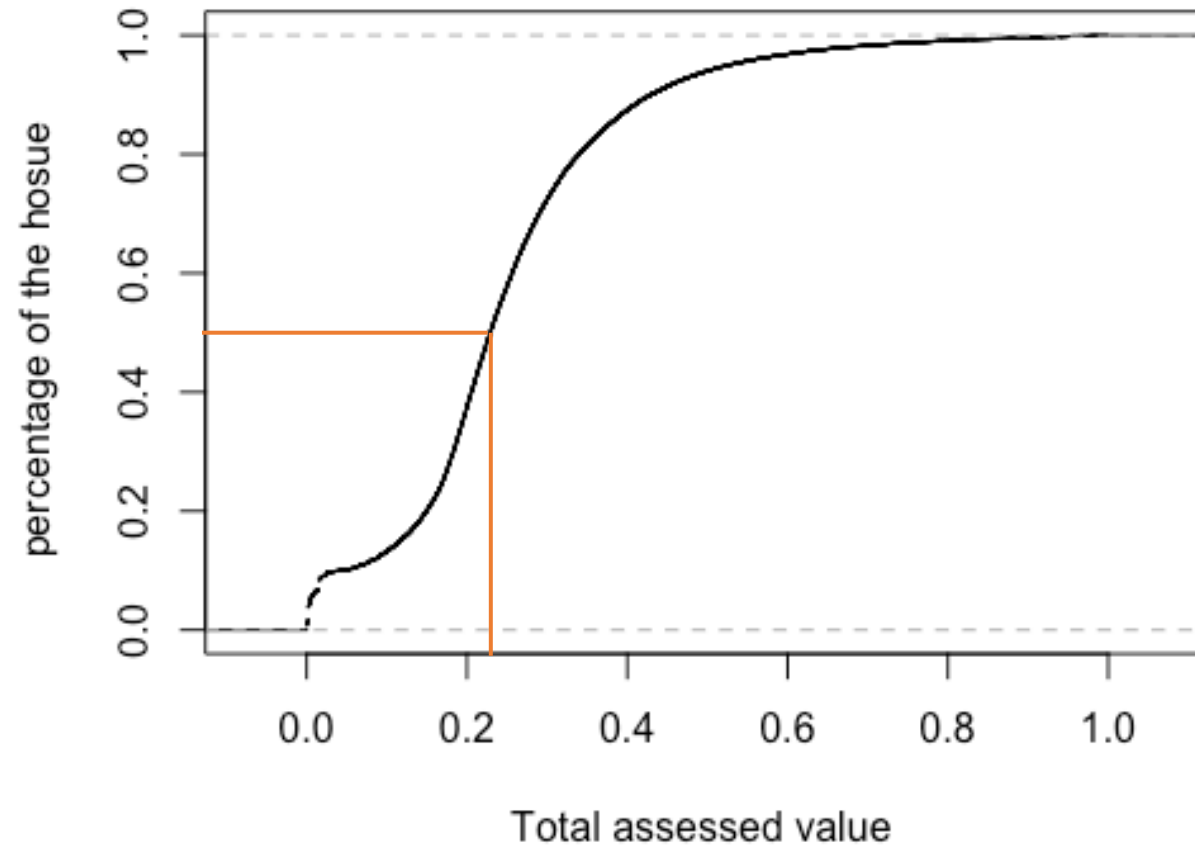
Number for houses build between 1837 to 2017
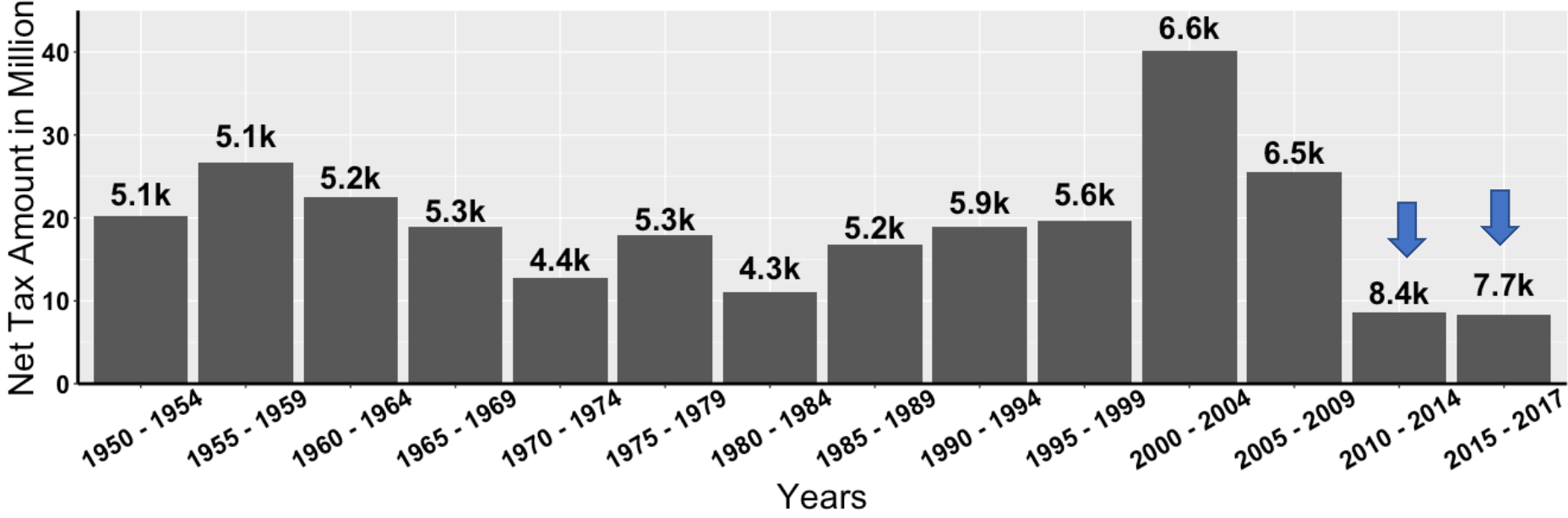
Zero year is excluded, only account of 0.5% of net tax

Number for houses build between 1950 to 2017

Net Tax in million houses build between 1950 to 2018

Residential property contains houses and condos

Residential houses build in 2017 is only 29% of the houses build in 2004 and double of the houses build in 2009(great depression)

4.52% of total net tax came from residential property build in 2010 to 2017

New property (2010 – 2017)are all residential

Variables Given in the Dataset

- Address
- DateParcelChanged
- PropertyClass
- YearBuilt
- AssessedByState
- CurrentLand
- CurrentImpr
- CurrentTotal
- PreviousLand

- PreviousImpr
- PreviousTotal
- NetTaxes
- SpecialAssmnt
- OtherCharges
- TotalTaxes
- Ward
- StateAssemblyDistrict
- PreviousLand2

- PreviousImpr2
- PreviousTotal2
- HouseNbr
- StreetDir
- StreetName
- StreetID

Variables Chosen by Lasso

- Address
- DateParcelChanged
- PropertyClass
- YearBuilt
- AssessedByState
- CurrentLand
- CurrentImpr
- CurrentTotal
- PreviousLand

- PreviousImpr
- PreviousTotal
- NetTaxes
- SpecialAssmnt
- OtherCharges
- TotalTaxes
- Ward
- StateAssemblyDistrict
- PreviousLand2

- PreviousImpr2
- PreviousTotal2
- HouseNbr
- StreetDir
- StreetName
- StreetID

Interesting Variables we are going to look at

- Address
- DateParcelChanged
- ➡️ PropertyClass
- ➡️ YearBuilt
- AssessedByState
- CurrentLand
- ➡️ CurrentImpr
- ➡️ CurrentTotal
- PreviousLand

- PreviousImpr
- PreviousTotal
- NetTaxes
- SpecialAssmnt
- OtherCharges
- TotalTaxes
- ➡️ Ward
- StateAssemblyDistrict
- PreviousLand2

- PreviousImpr2
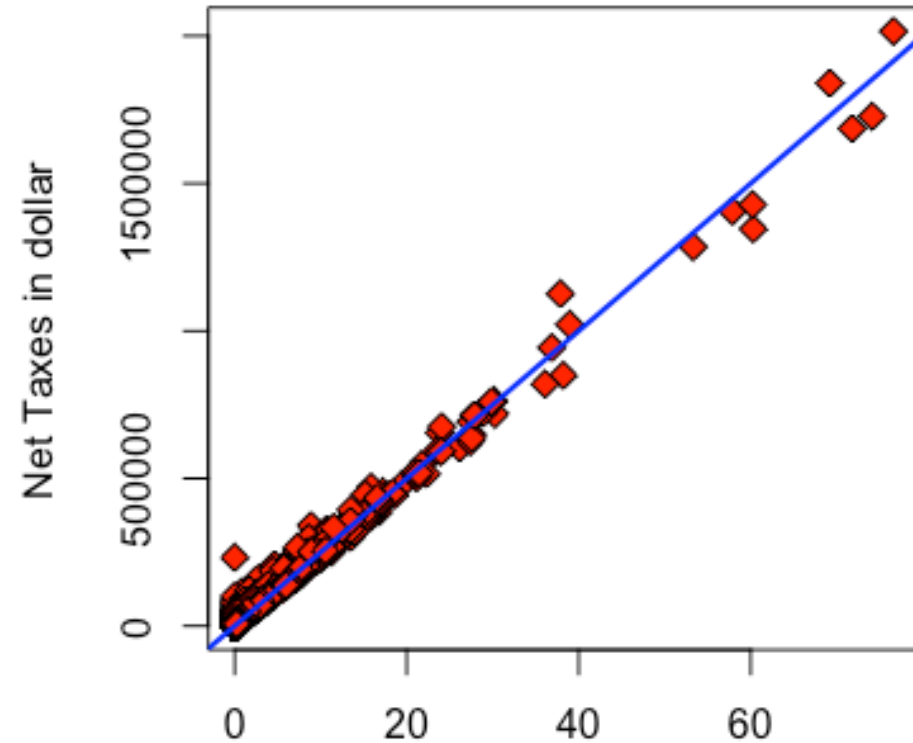- PreviousTotal2
- HouseNbr
- StreetDir
- StreetName
- StreetID

Variable: CurrentImpr and CurrentTotal

Current Total value vs NetTaxes

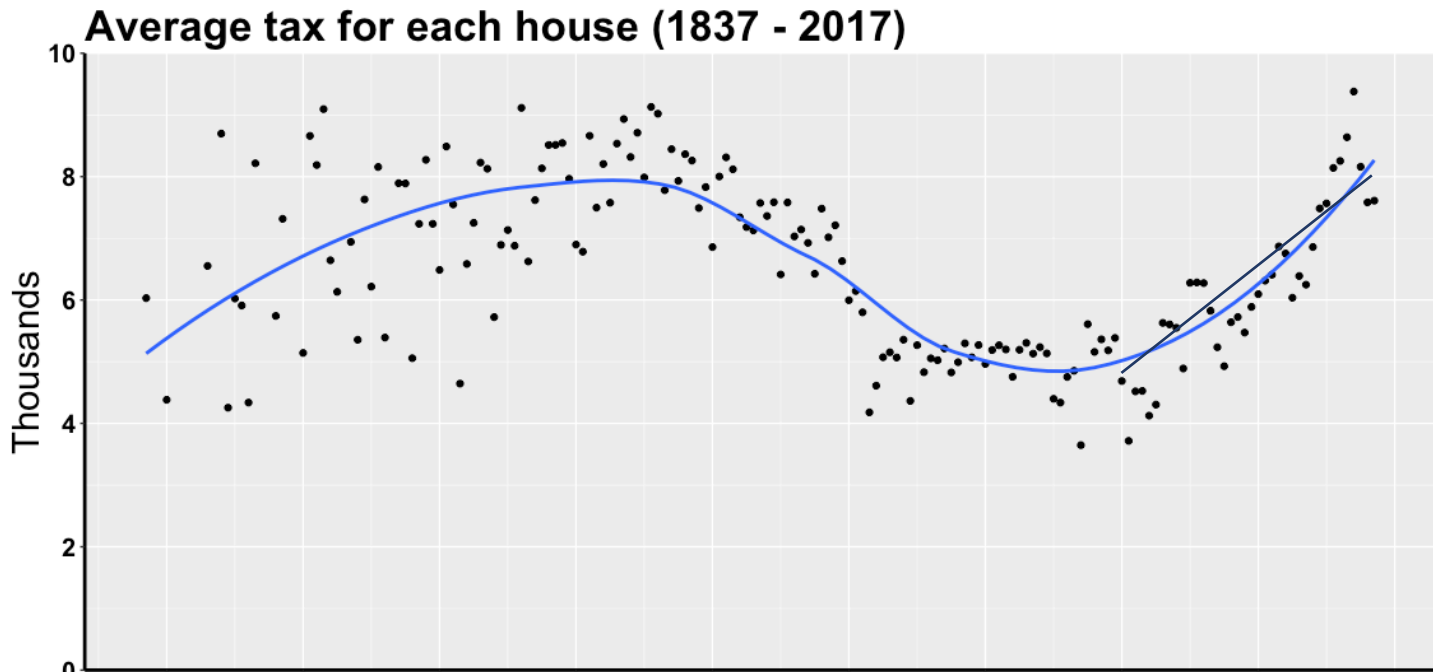Net Taxes in dollar
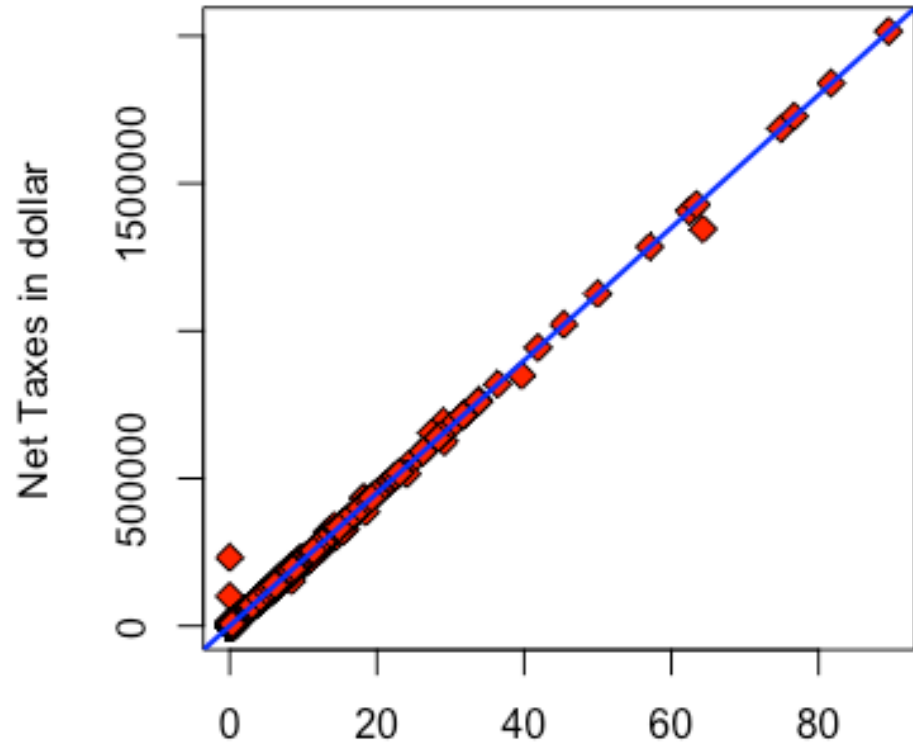
Current Total value in million
Correlation: 0.9455

Current Improvement vs NetTaxes

Net Taxes in dollar

Current Improvement in million
Correlation: 0.9455

Average tax for each house (1837 - 2017)

**Average Total Value for each house (1837 - 2017)**

Year Build

Variable: YearBuild

Main Observations

There are more variance in older houses' average tax and average total value.

Houses build between 1880 and 1920 have an almost equivalent average tax and average total value as new properties.

Average net tax and average total value for properties after 1980 are growing at an almost linear rate.
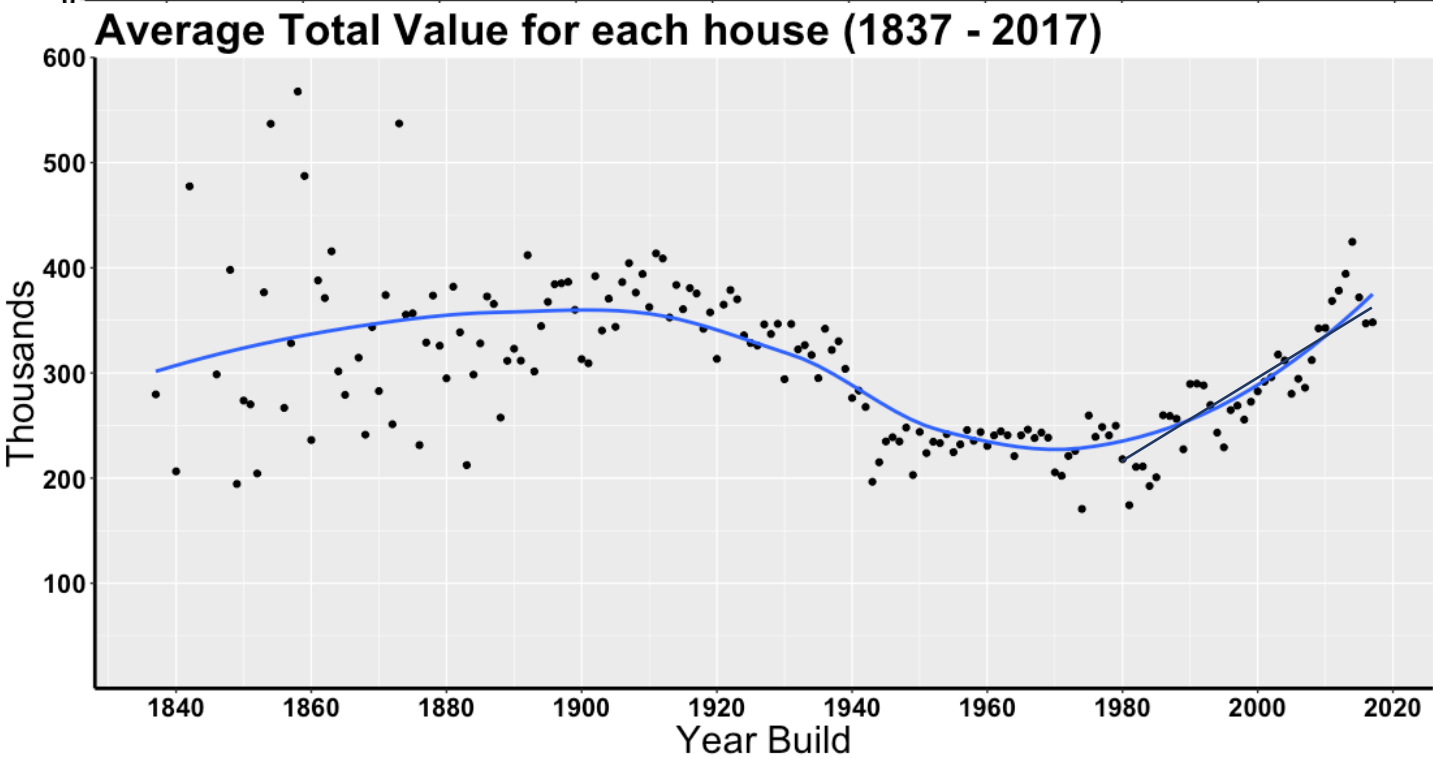
Measured in 2019 currency.

CDF of Property class's Tax

Variable: Property Class

Property Class
- Agricultural
- Commercial
- Industrial
- Residential
- Overall

1042 properties are not Included in this plot. Meaning they have net Tax larger than $100,000

Property class	Agricultural	Commercial	Industrial	Residential	Overall
Counts	1452	6239	135	72369	80195
Median Tax in $	2.39	8738.97	23942.01	4826.03	4826.03

Variable: Ward
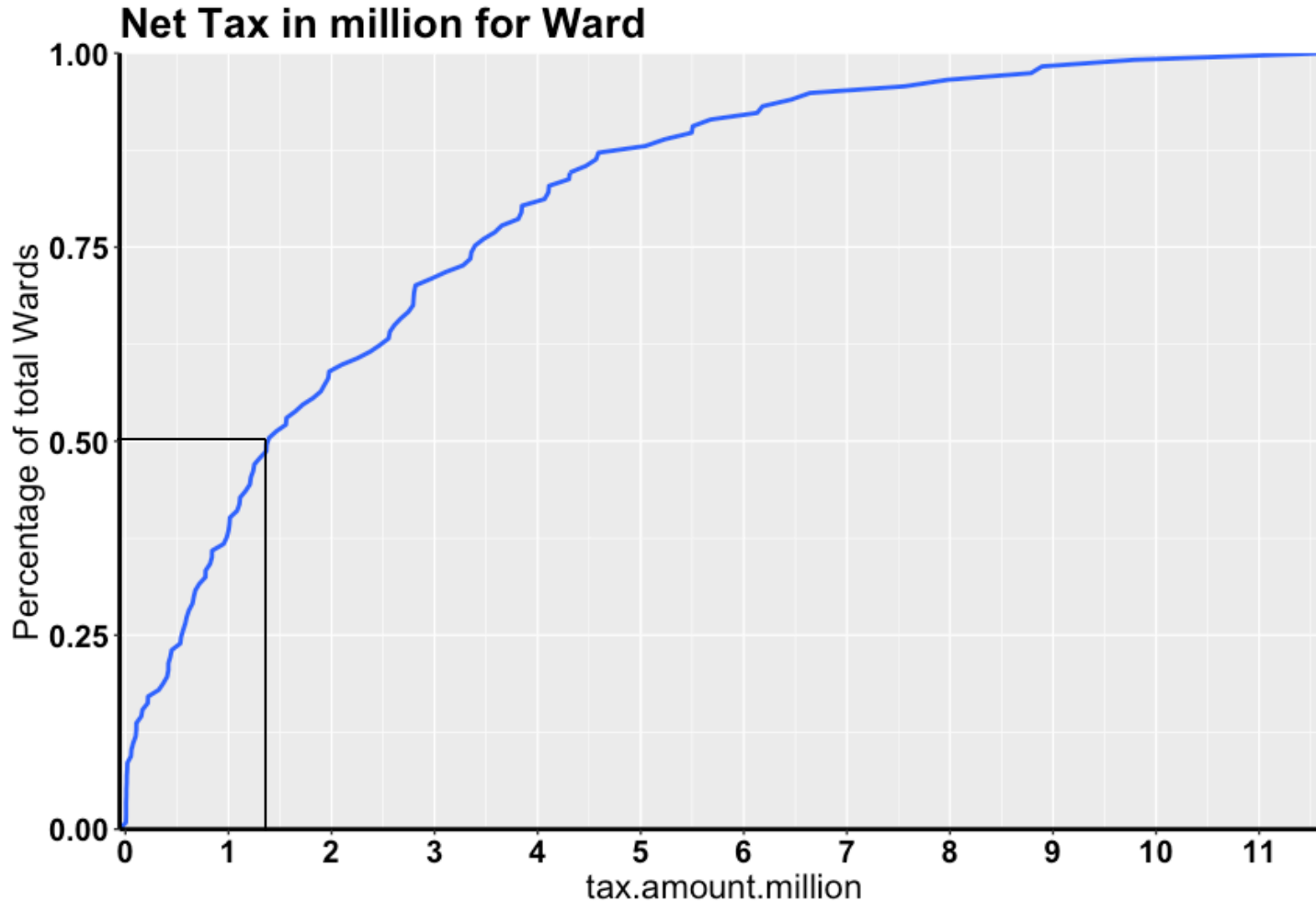
What is a Ward?
A **ward** is a local authority area, typically used for electoral purposes. (equivalent to neighborhood). There are 136 wards in Madison. This plot only used house build after 1949 because there are some change in ward after 1949.

Interpretation of the orange line:
Median amount of Net Tax paid for Wards is 1.39 Millions

Why is this important?
There is ward pay up to 11.62 millions and ward pay As little as 0.0039 millions. So it is important to differentiate between wards.

City of Madison
Aldermanic Districts
and Wards
May 1, 2015

City of Madison Department of Planning and Community & Economic Development, Planning Division
Document Path: M:\ARC\ArcSDE_Maps\Aldermanic_Districts_and_Wards_Letter.mxd
Map Generated By: plwhl
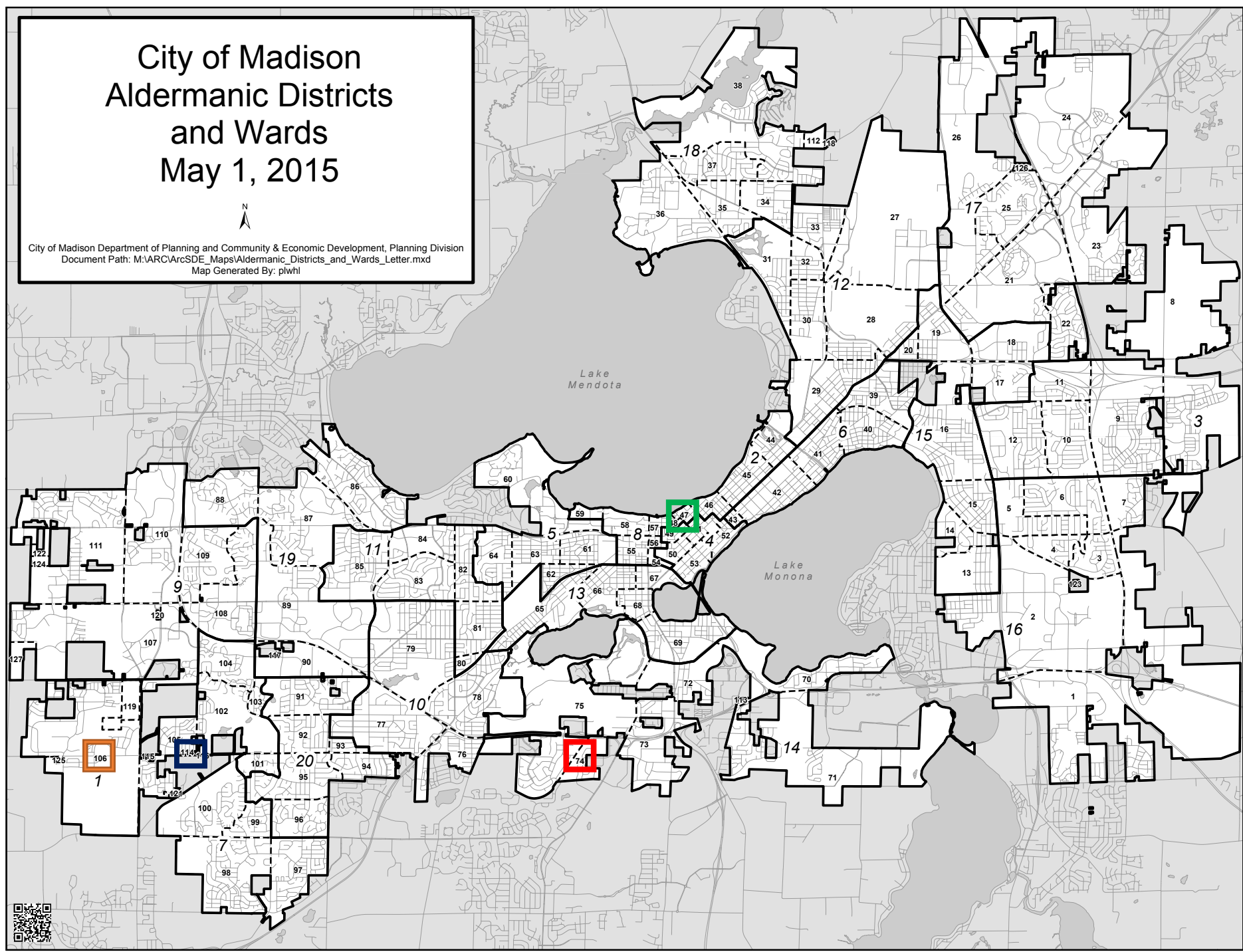
Ward 106 with highest Net tax of 11.62 M and has 1263 properties

Ward 114 with lowest Net tax of 0.0039 M and has 1 properties

Ward 47 with highest mean net tax of 0.027 M, sum net tax 0f 0.054 M and has 2 properties

Ward 74 with lowest mean net tax of 0.0029 M, sum net tax 0f 0.61 M and has 213 properties, built around 1980s.

Take away points

- Housing market in Madison is slowly recovering from the Great depression, so the number of property built is doubled.
- Value of houses around early 1900s are greater but has higher variance.
- Even though not many houses are built in recent years, they are increasing in average total value and have higher net tax
- Residential properties have the most influence on the overall net tax