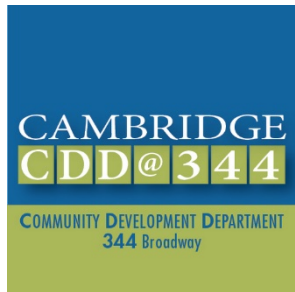
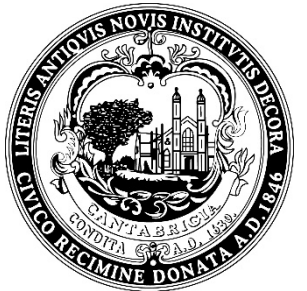


# Privatized Data in City Planning

## CNSTAT Workshop on 2020 Census Data Products: Data Needs and Privacy Considerations December 11, 2019



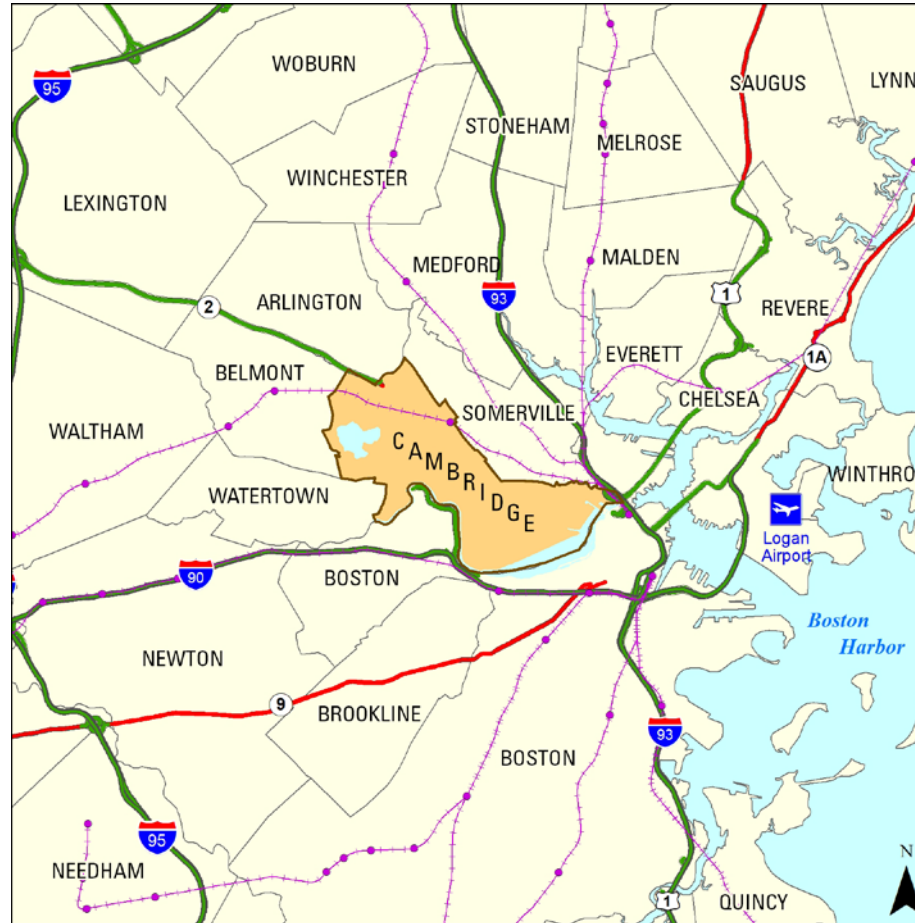
Clifford Cook  
Senior Planning Information Manager  
Cambridge MA Community Development Department  
[ccook@cambridgema.gov](mailto:ccook@cambridgema.gov)



# About Cambridge, Massachusetts

## 2010 Statistics:

- **Total Population: 105,152**
- **Group Quarters: 17,102**
- **Households: 44,032**
- **Families: 17,420**
- **Housing Units: 47,291**
- **Vacant Units: 3,259**
- **Vacancy Rate: 7%**



- **6.4 Square Miles**
- **32 Census Tracts**
- **88 Blockgroups**
- **1,109 Blocks**

# Critical Role of Census Bureau Data for Planners

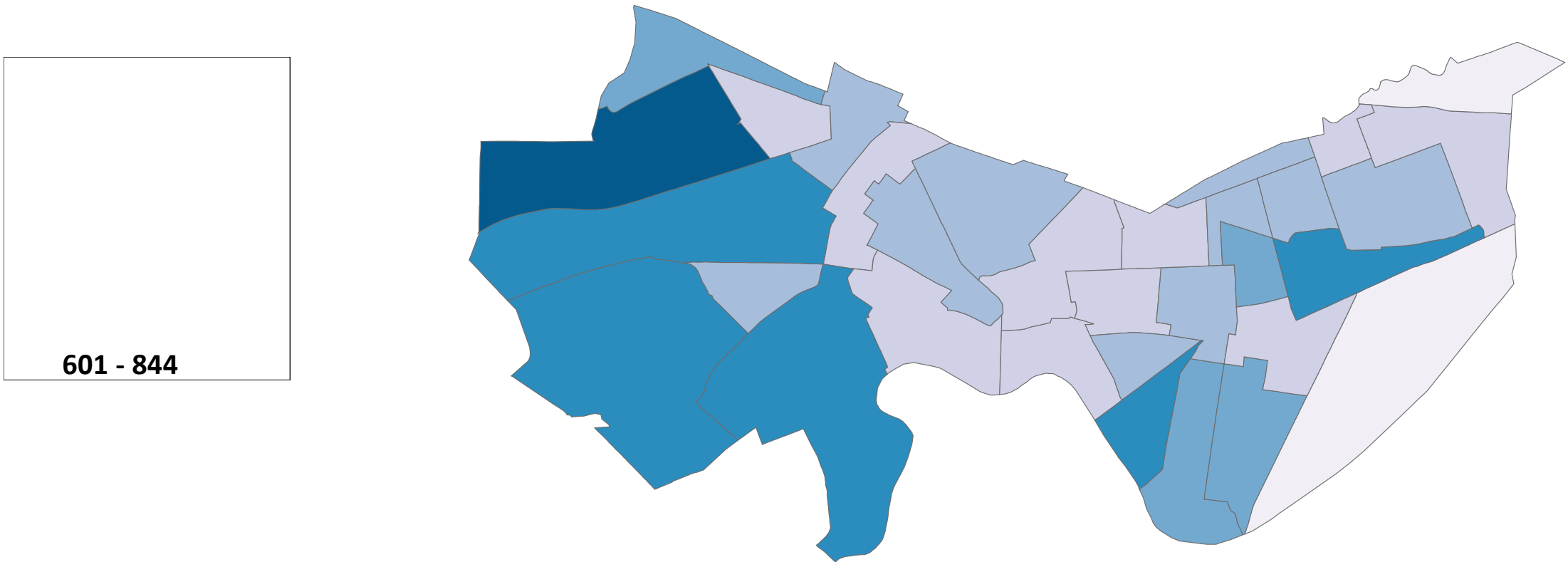
**Among other uses, planners use decennial census data to:**

- **Understand the current composition of their communities**
- **Understand the dynamics of community change**
- **Evaluate the potential effects of private sector development and the provision of public goods, particularly with regard to equitable access**
- **Model the effects of changes to dynamic systems such as transportation and population change**

# **Case 1:**

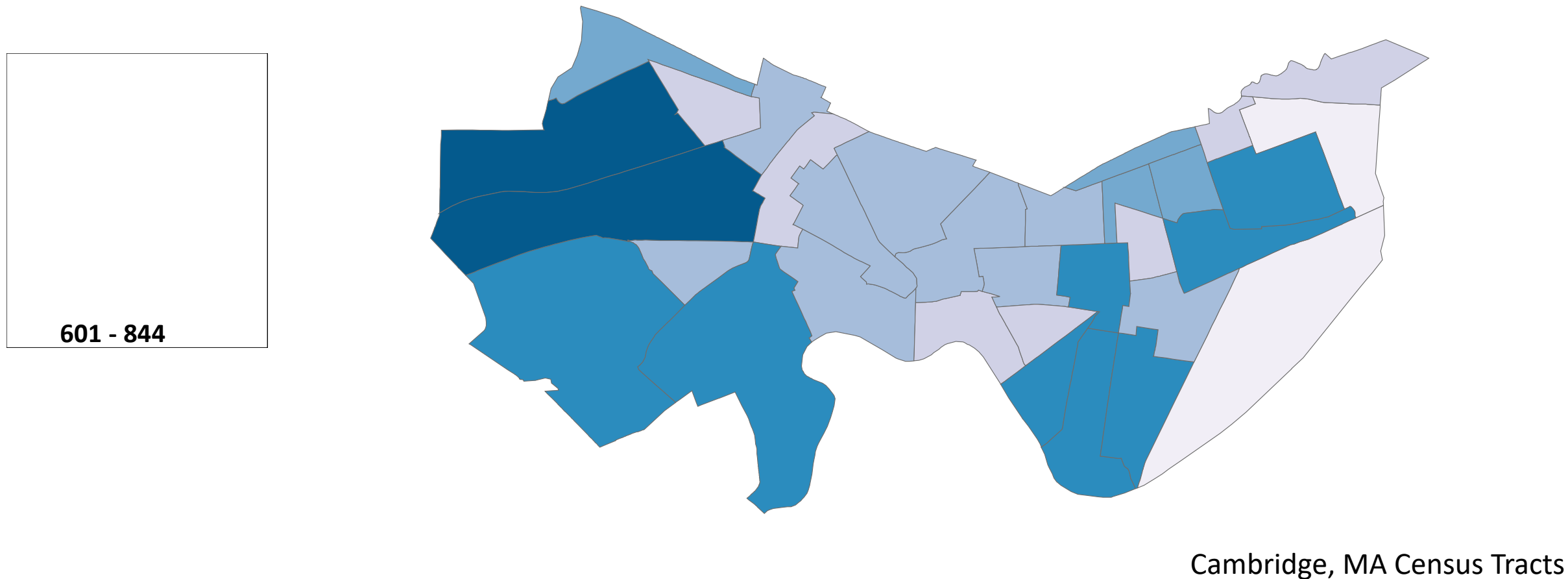
## **5 – 17 Year Old Cohort**

# Case 1: 5 – 17 Year Old Cohort – SF1

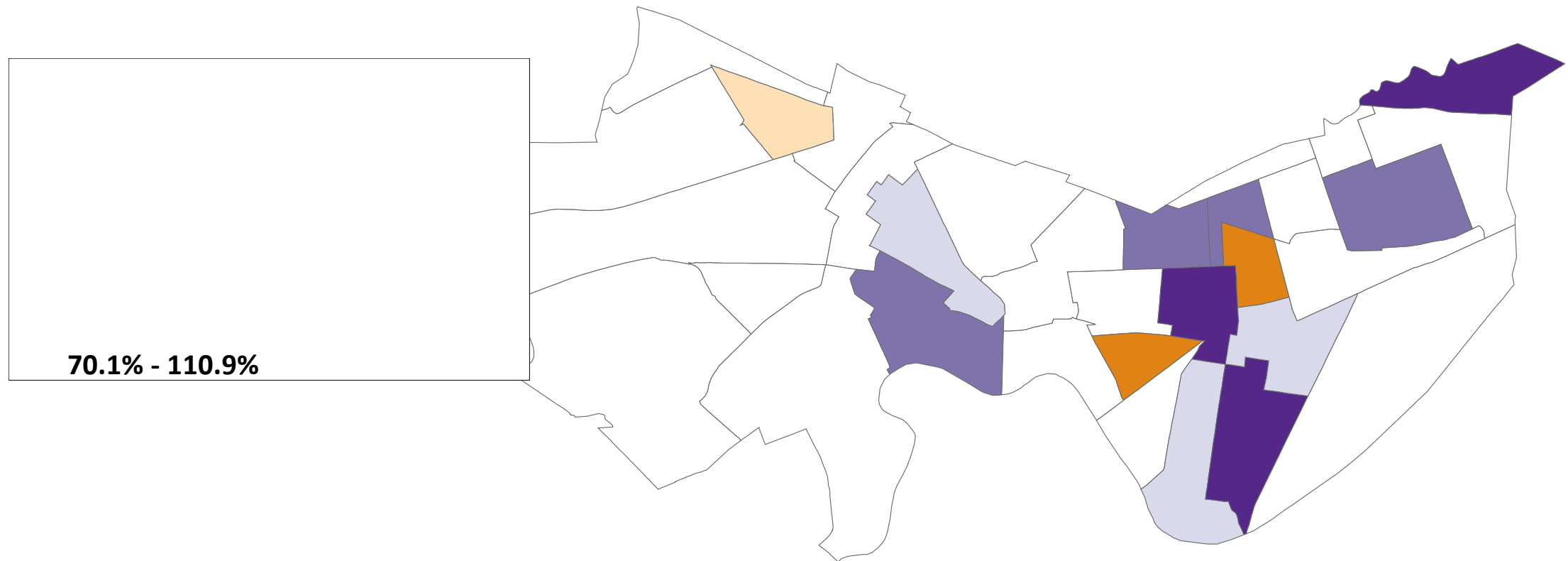


Cambridge, MA Census Tracts

# Case 1: 5 – 17 Year Old Cohort – Demo. Data



# Case 1: 5 – 17 Year Old Cohort – Percent Change

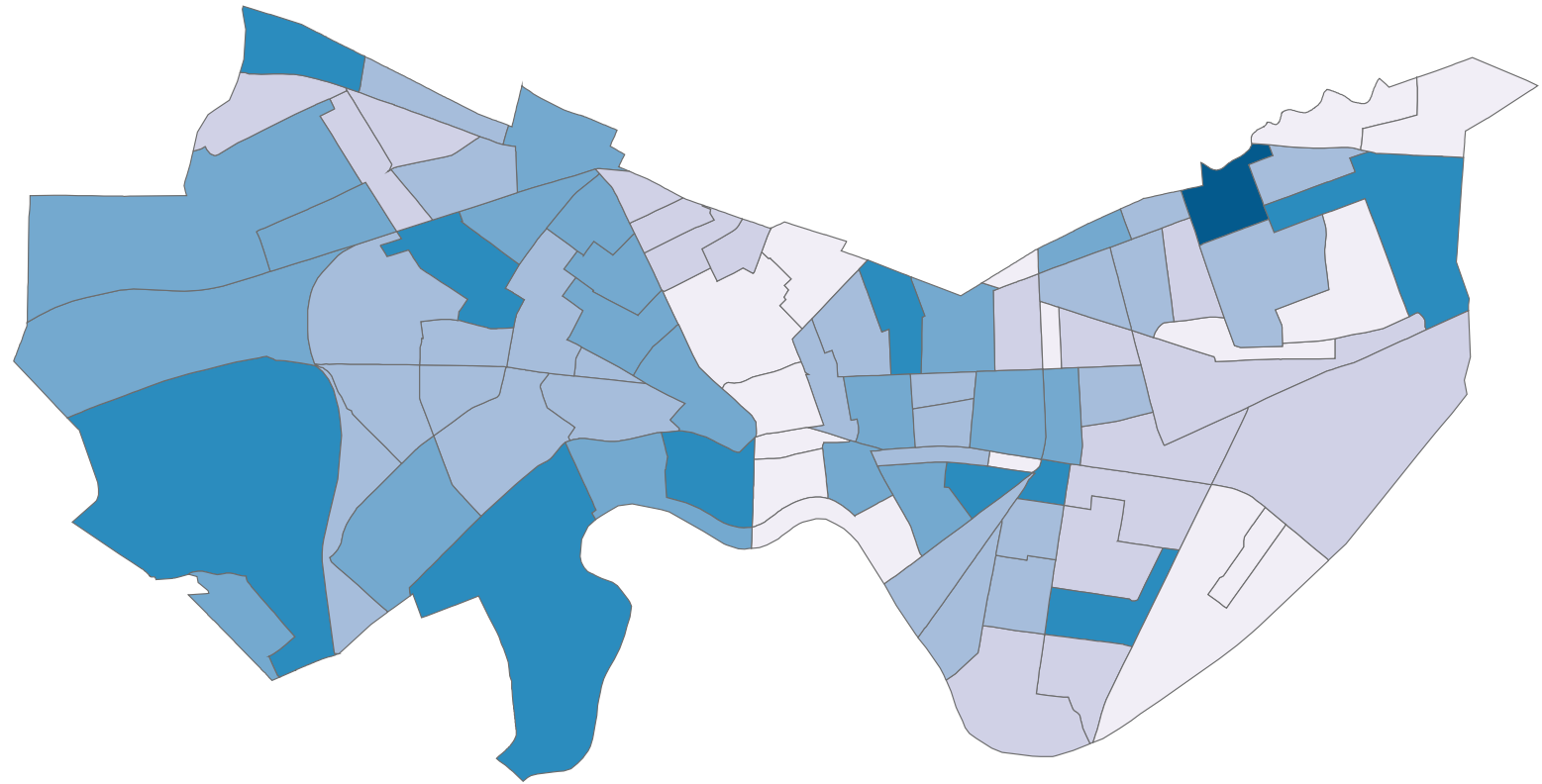
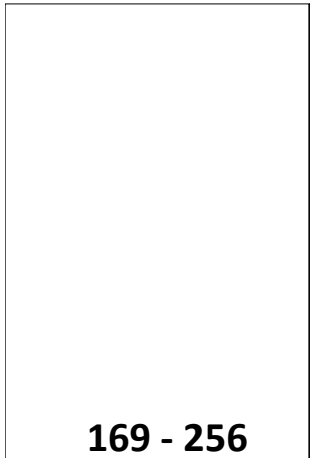


Cambridge, MA Census Tracts

# **Case 2: 65 & Older Living Alone**

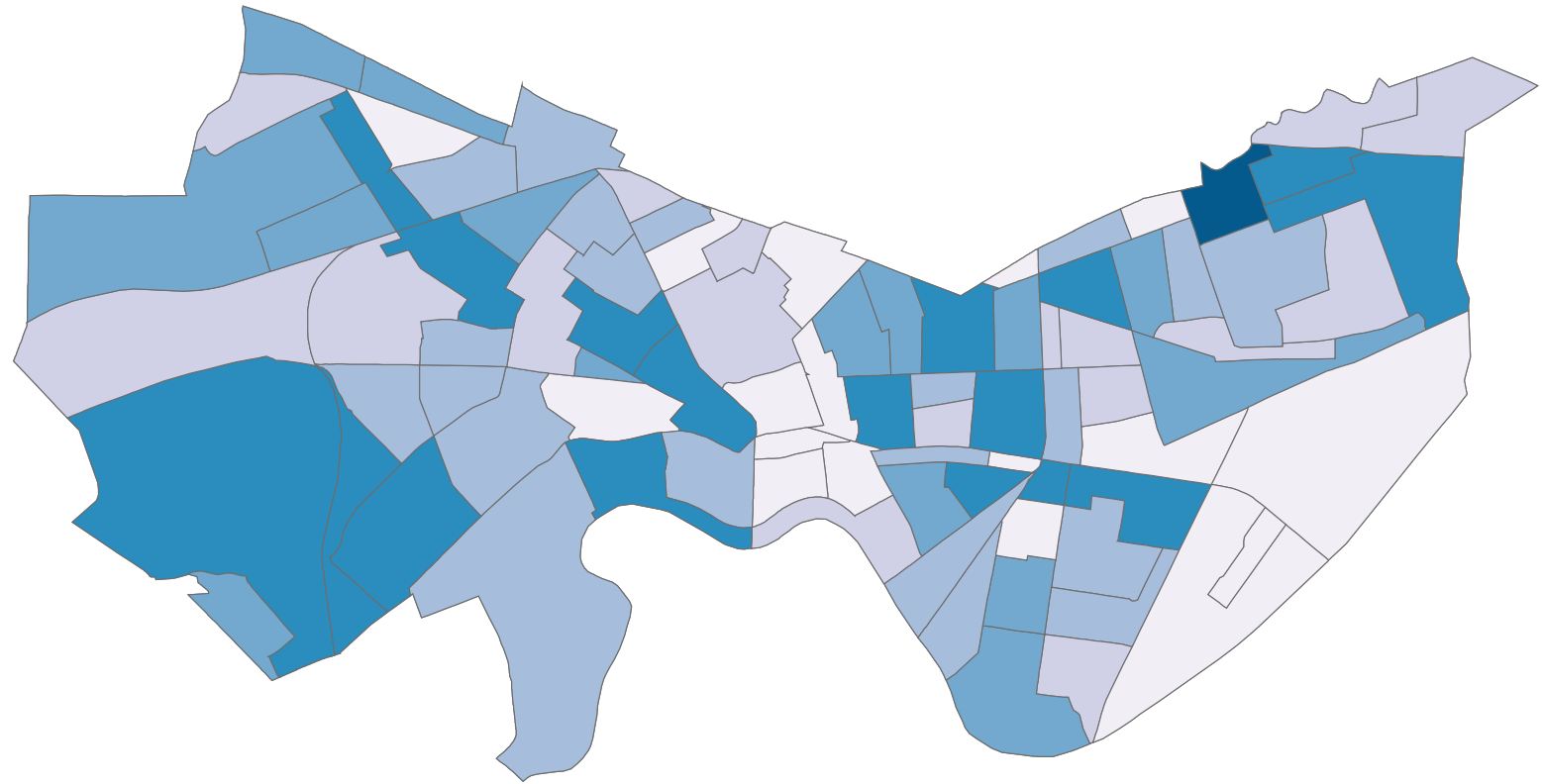
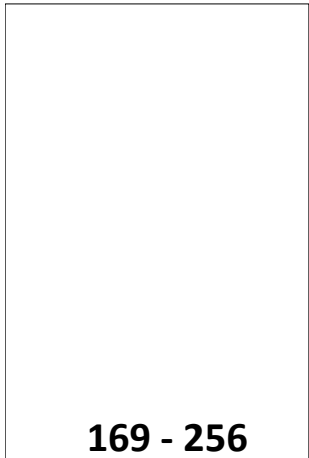


## Case 2: 65+ Living Alone – SF1



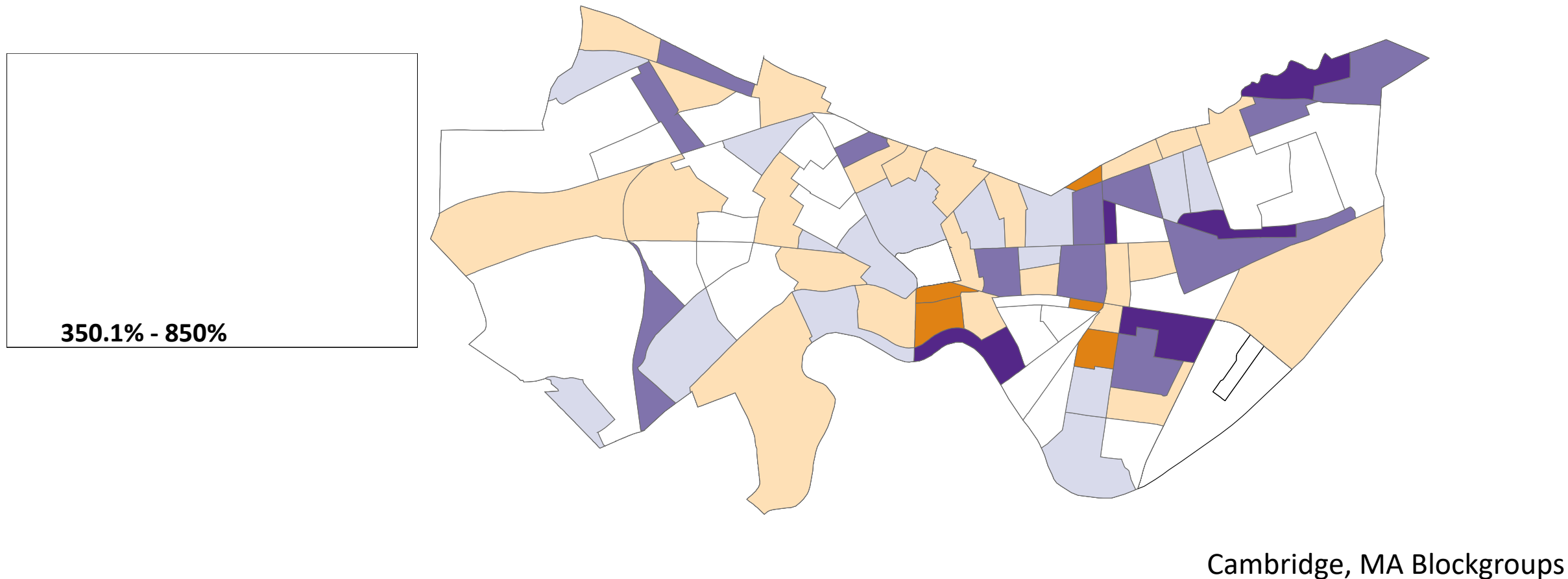
Cambridge, MA Blockgroups

# Case 2: 65+ Living Alone – Demo. Data

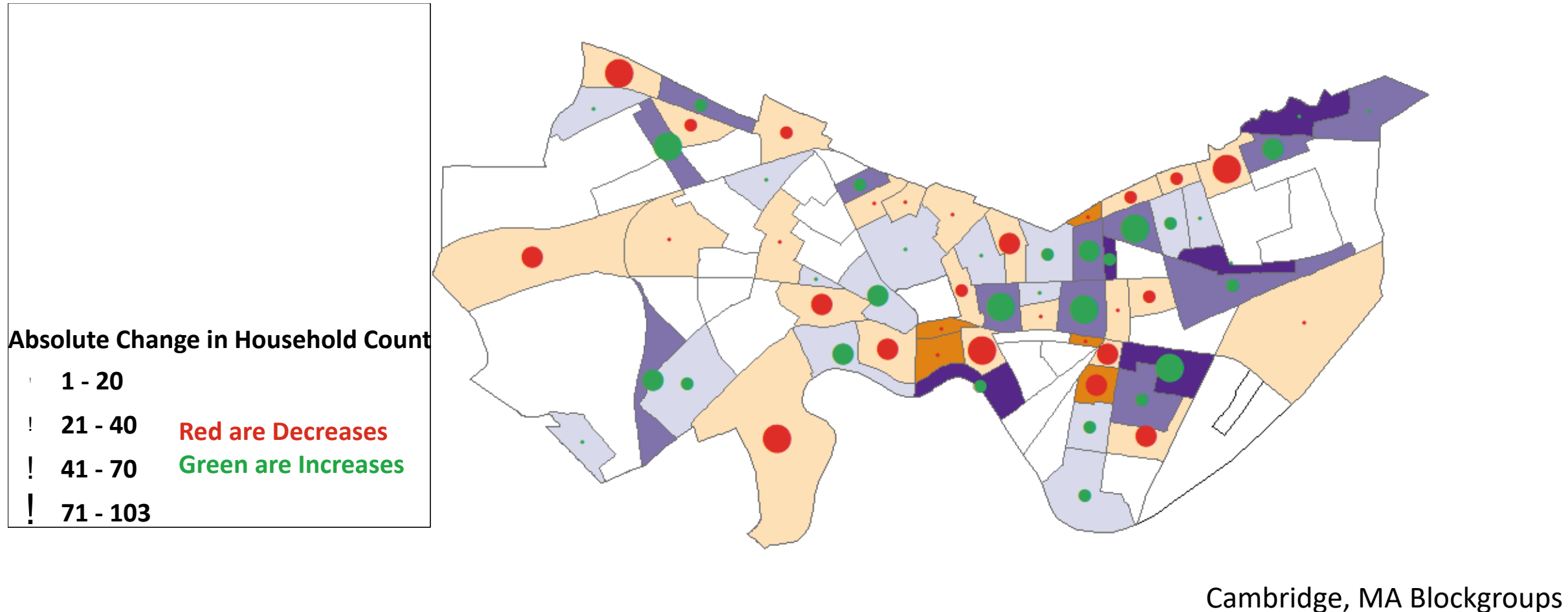


Cambridge, MA Blockgroups

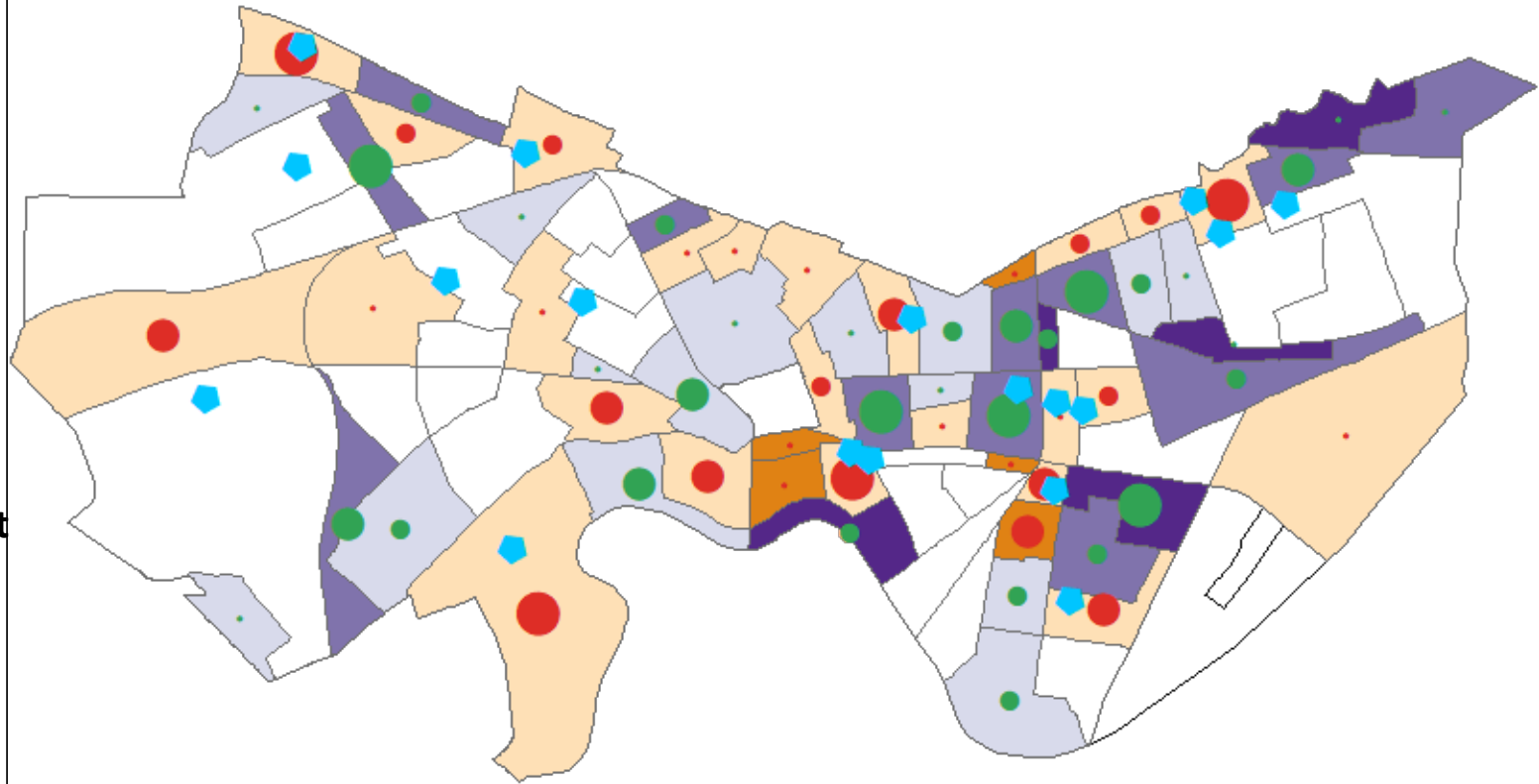
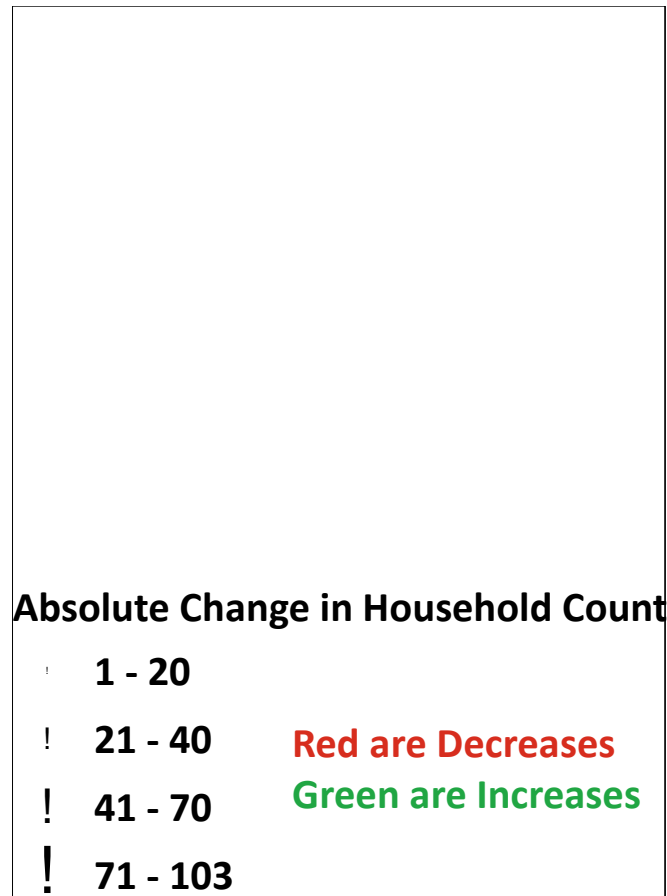
# Case 2: 65+ Living Alone – Percent Change



# Case 2: 65+ Living Alone – Absolute Change



# Case 2: 65+ Alone – Elderly Housing Sites

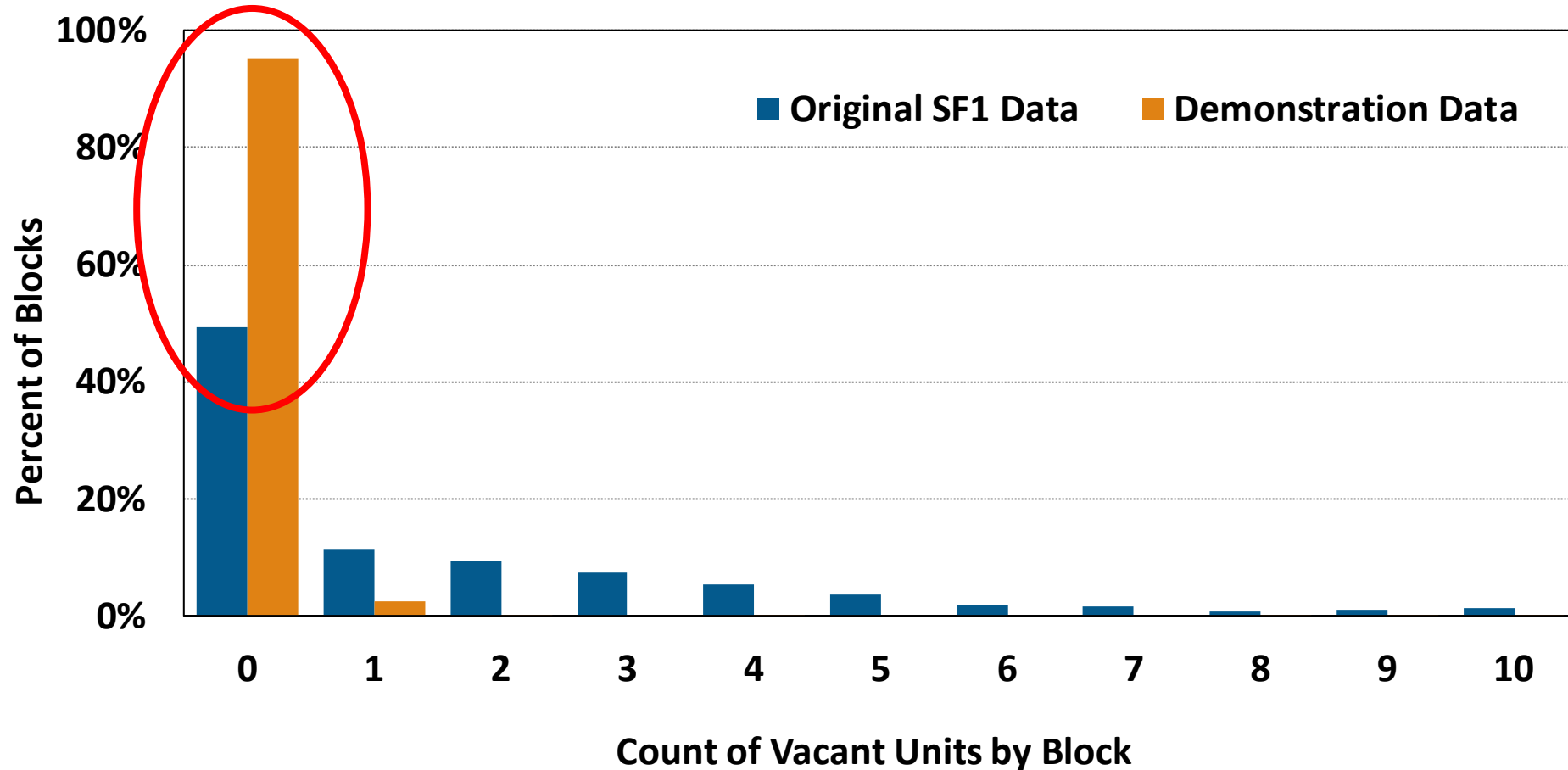


Cambridge, MA Blockgroups

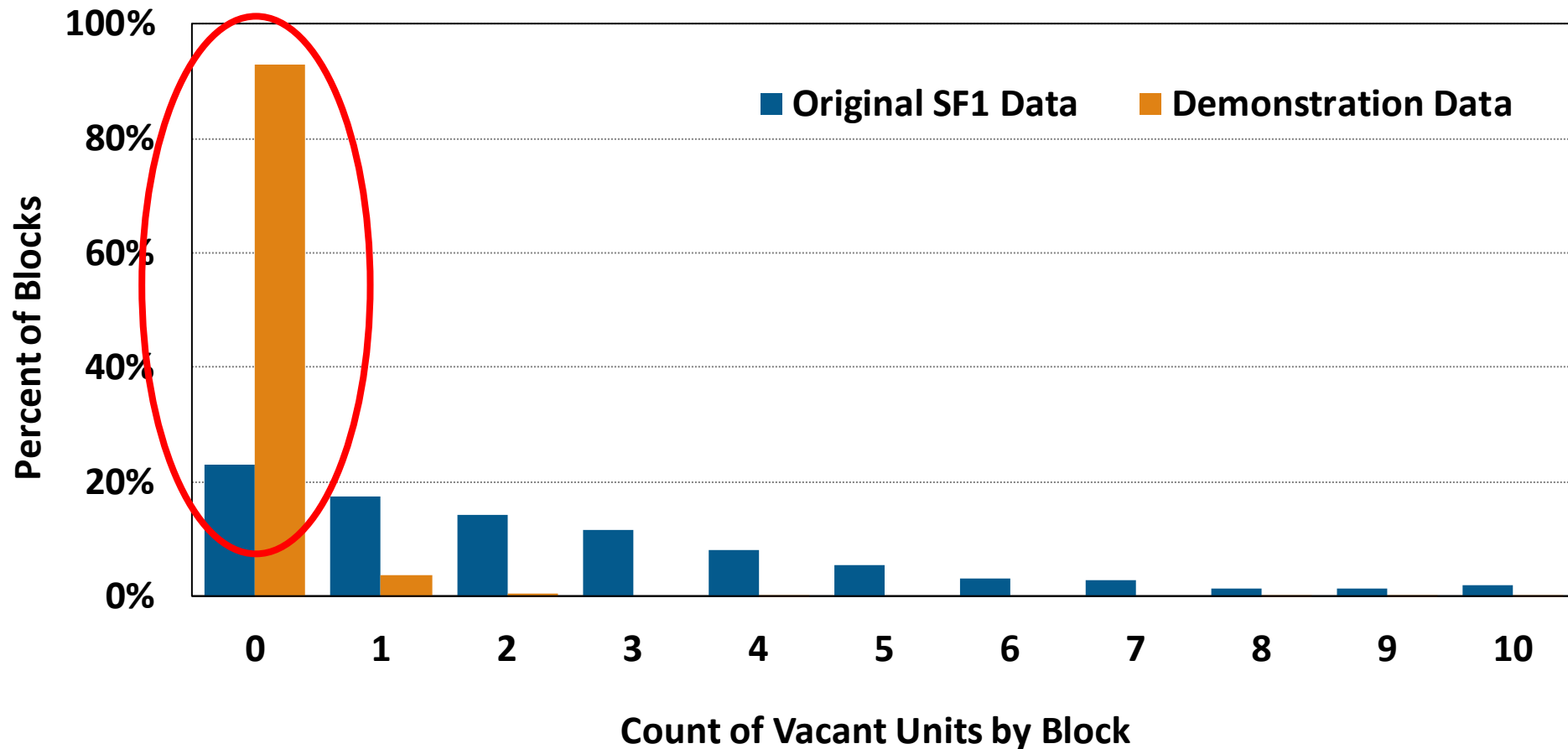
# **Case 3:**

# **Vacancy Rate**

# Case 3: Vacancy Rate x Block – with “0” Blocks

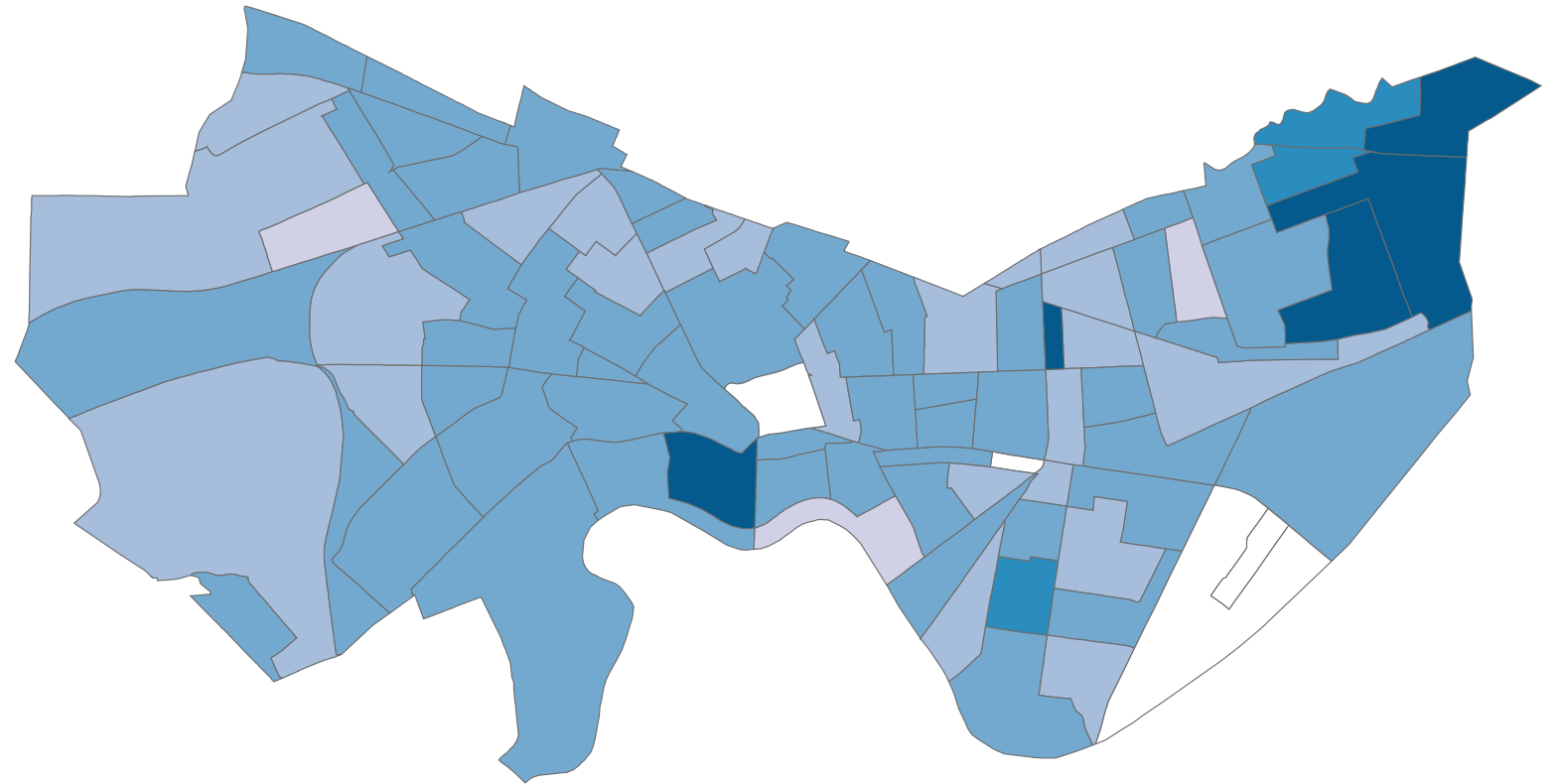
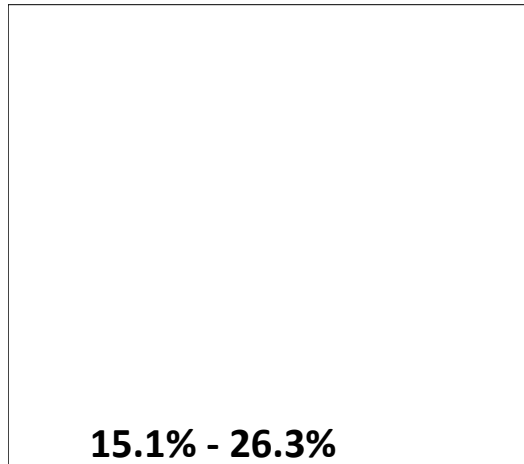


# Case 3: Vacancy Rate x Block – w/o “0” Blocks



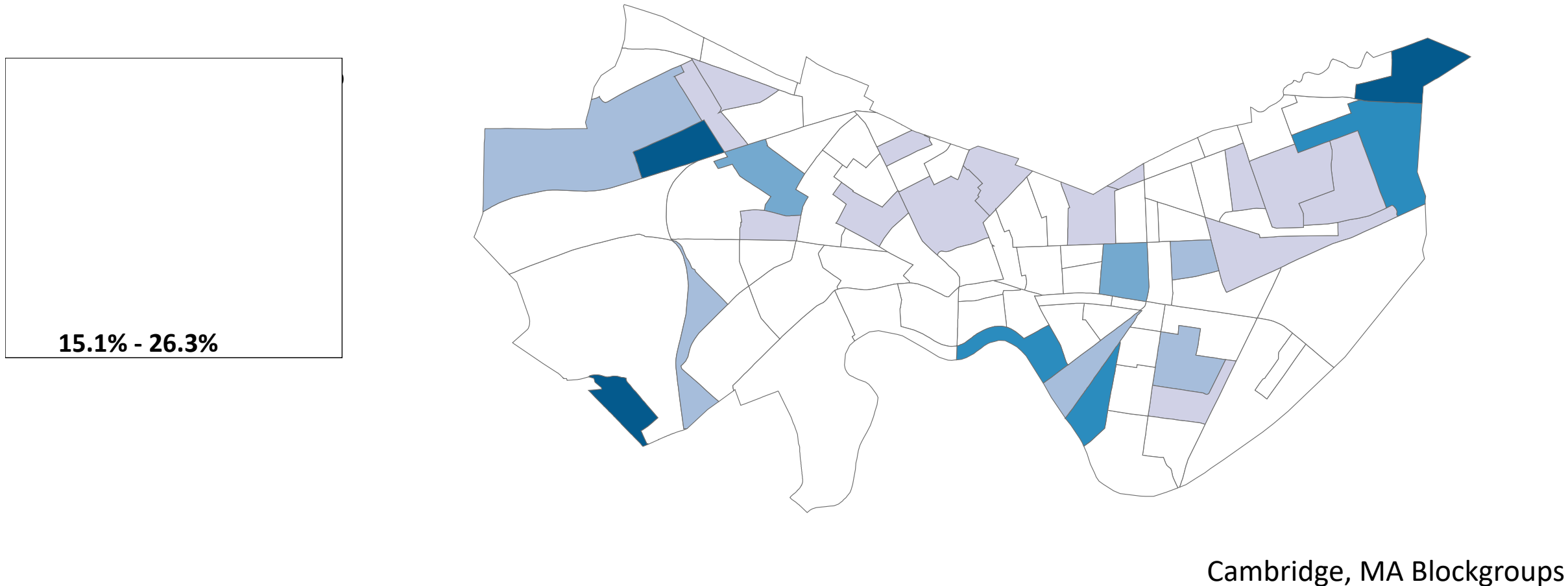


# Case 3: Vacancy – SF1

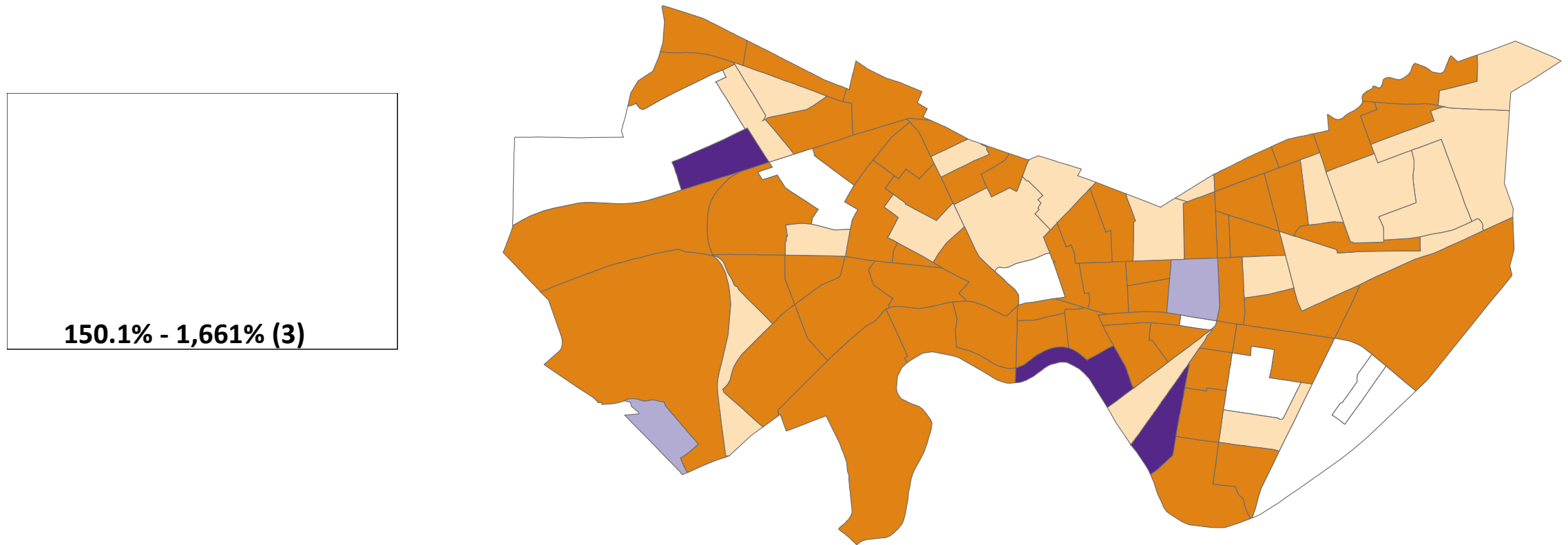


Cambridge, MA Blockgroups

# Case 3: Vacancy – Demonstration Data

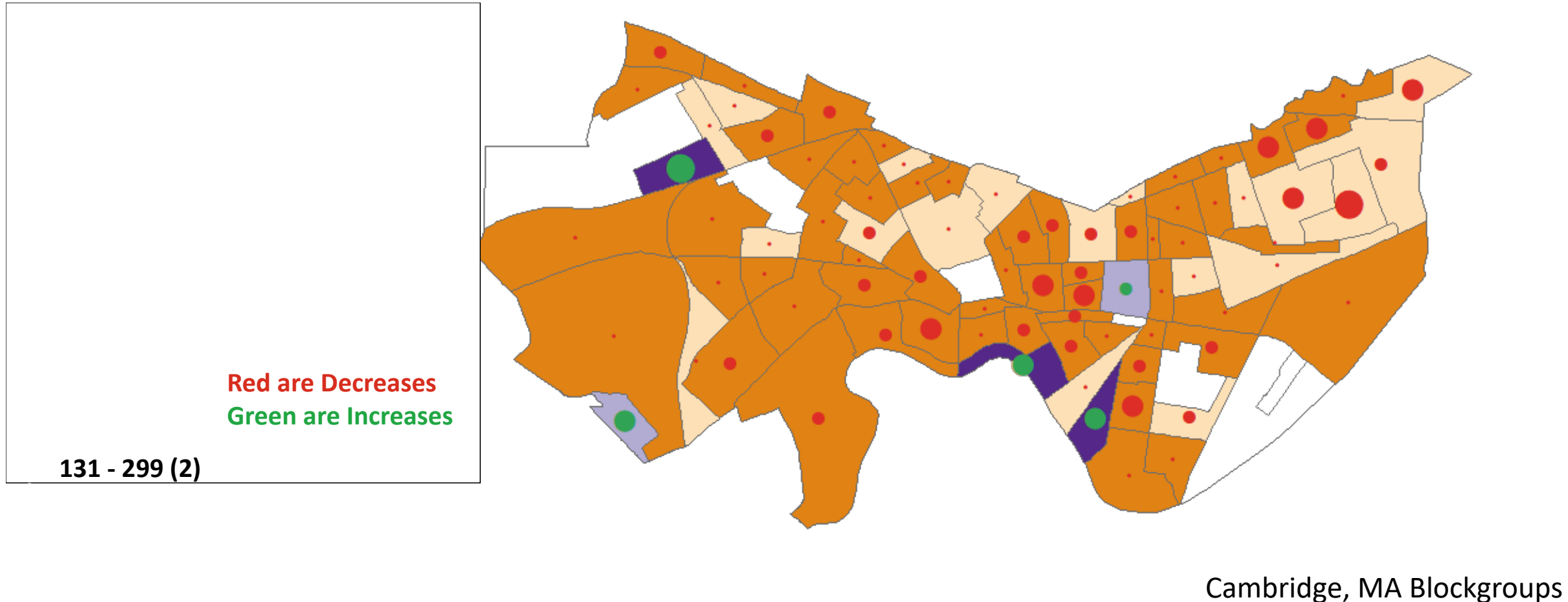


# Case 3: Vacancy – % Change in Rate

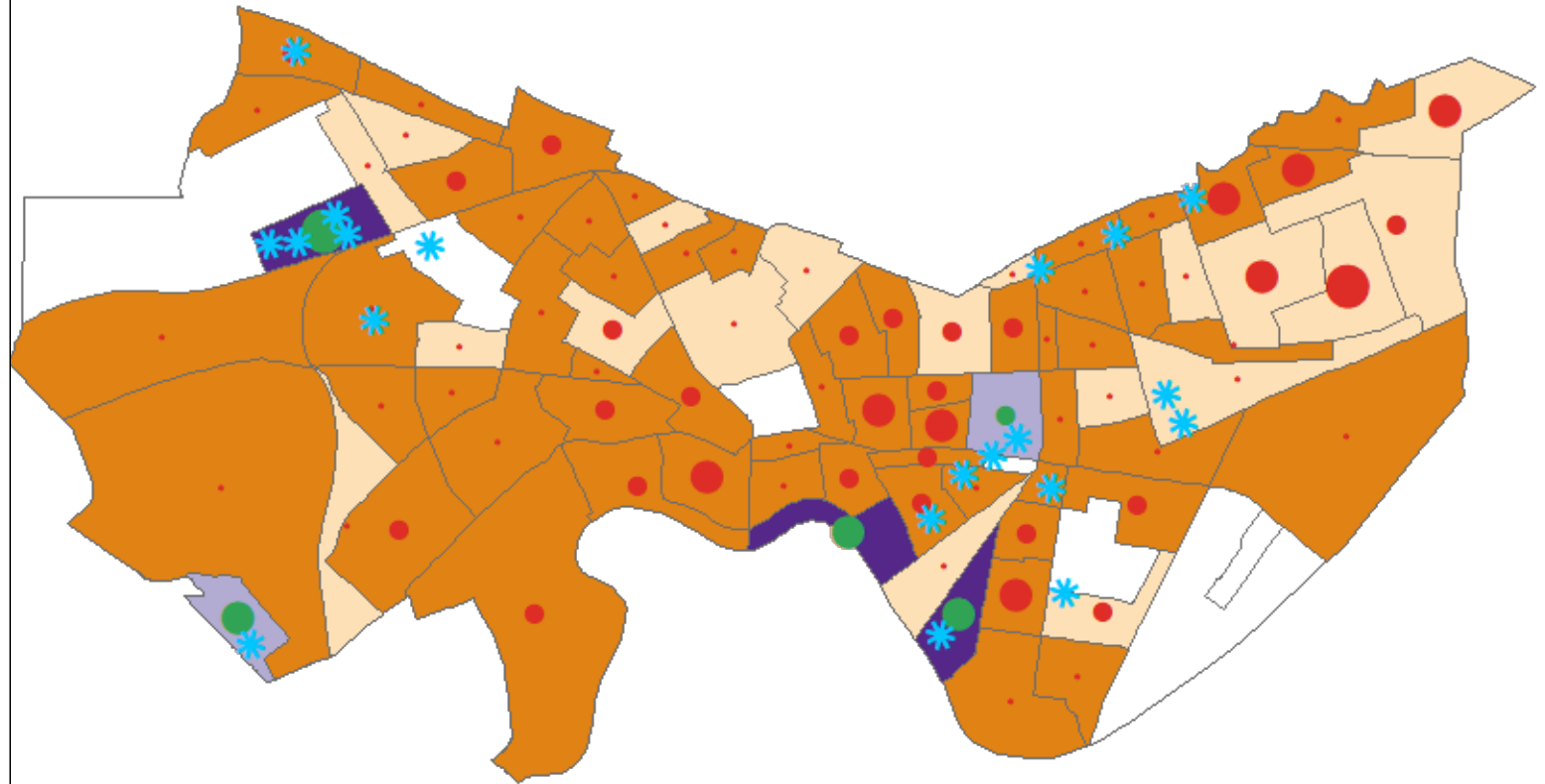


Cambridge, MA Blockgroups

# Case 3: Vacancy – Absolute Change

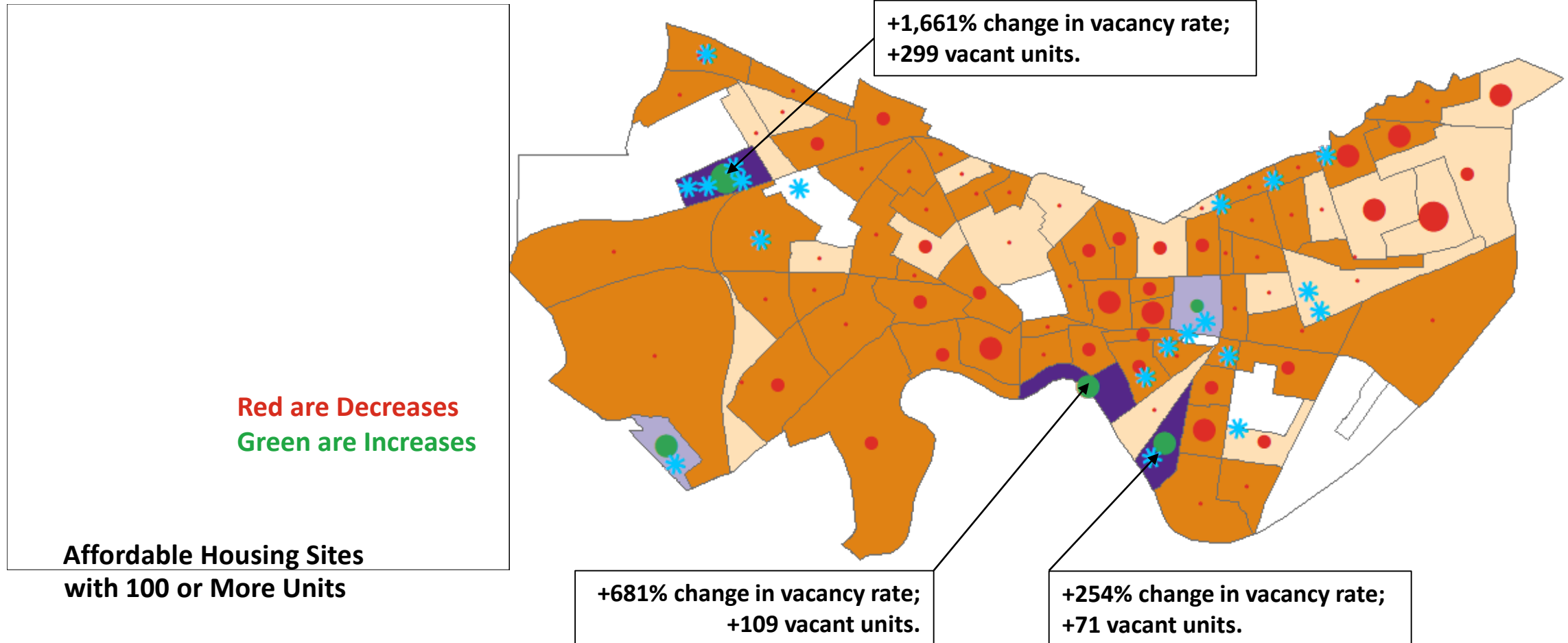


# Case 3: Vacancy – Major Affordable Housing Sites



Cambridge, MA Blockgroups

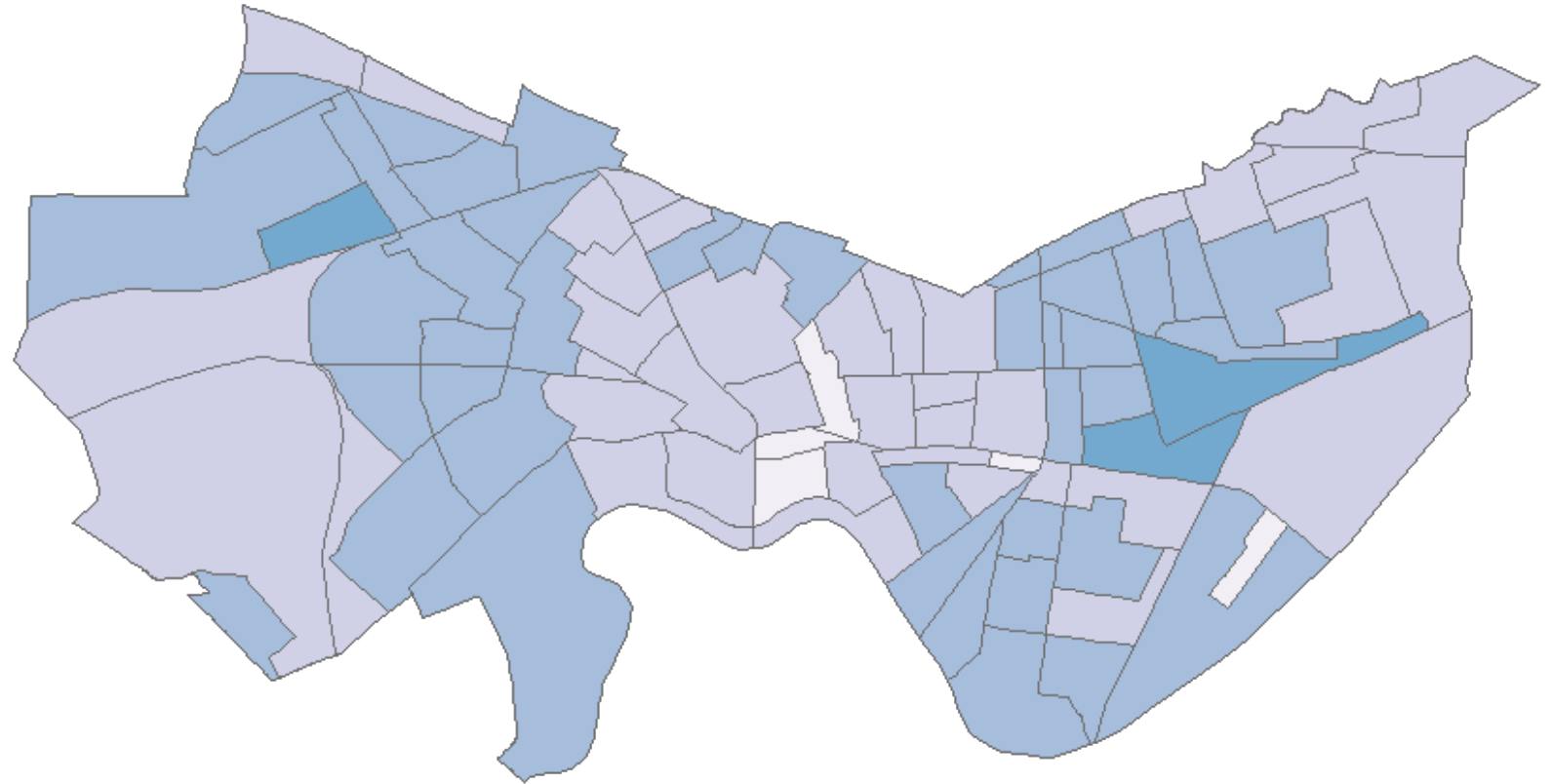
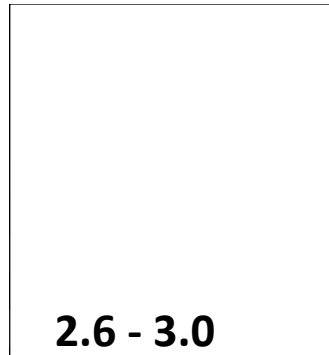
# Case 3: Vacancy – Major Affordable Housing Sites



# **Case 4:**

# **Average Household Size**

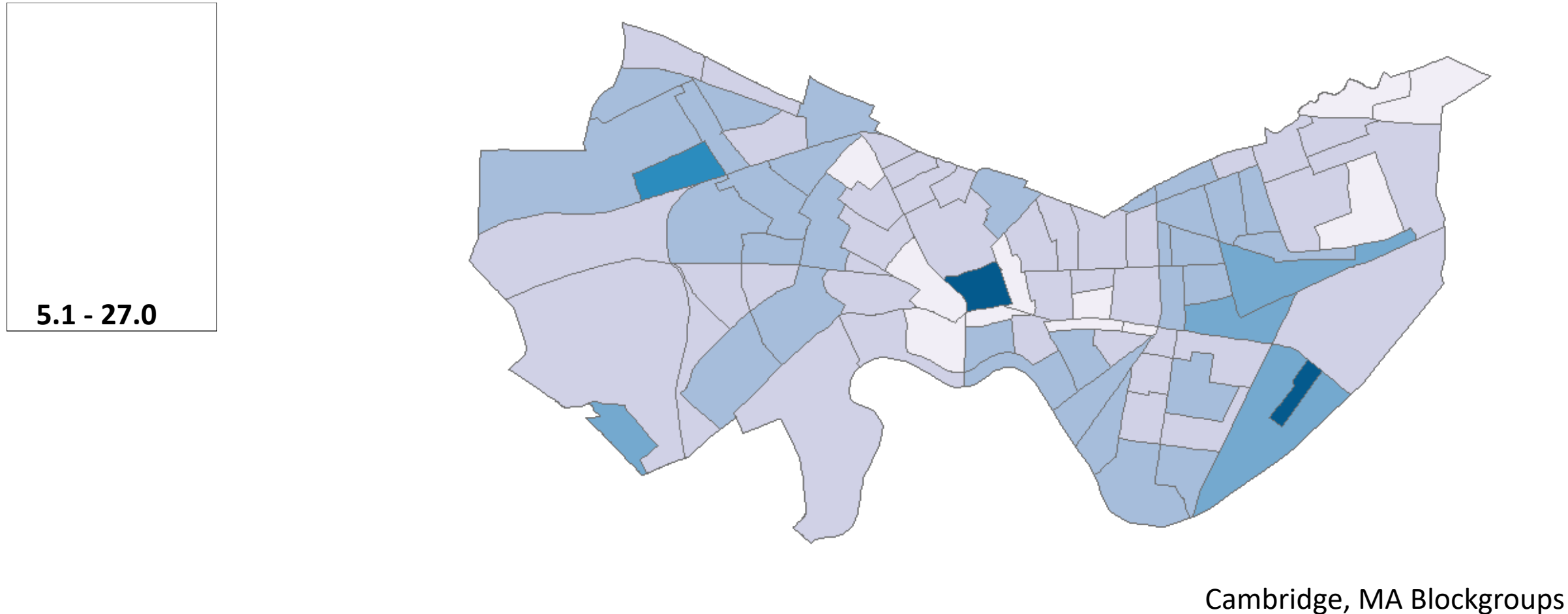
## Case 4: Household Size – SF1



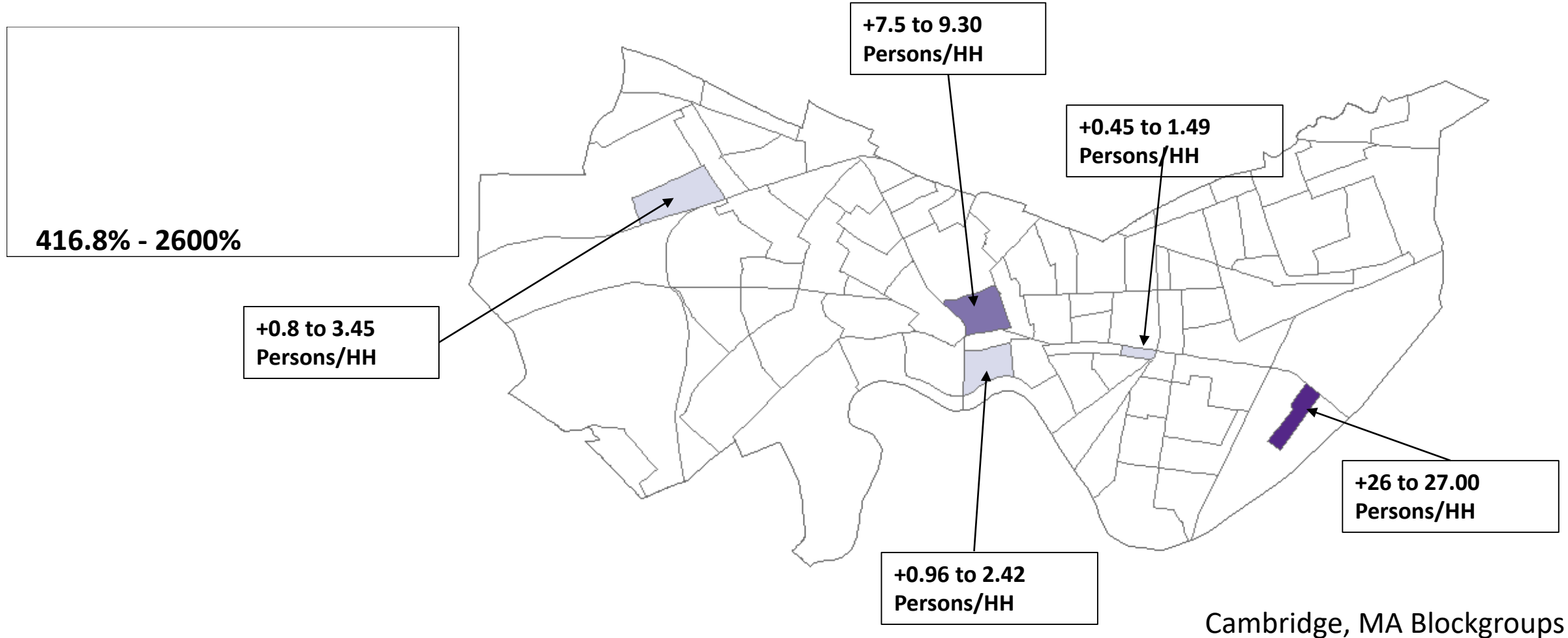
Cambridge, MA Blockgroups



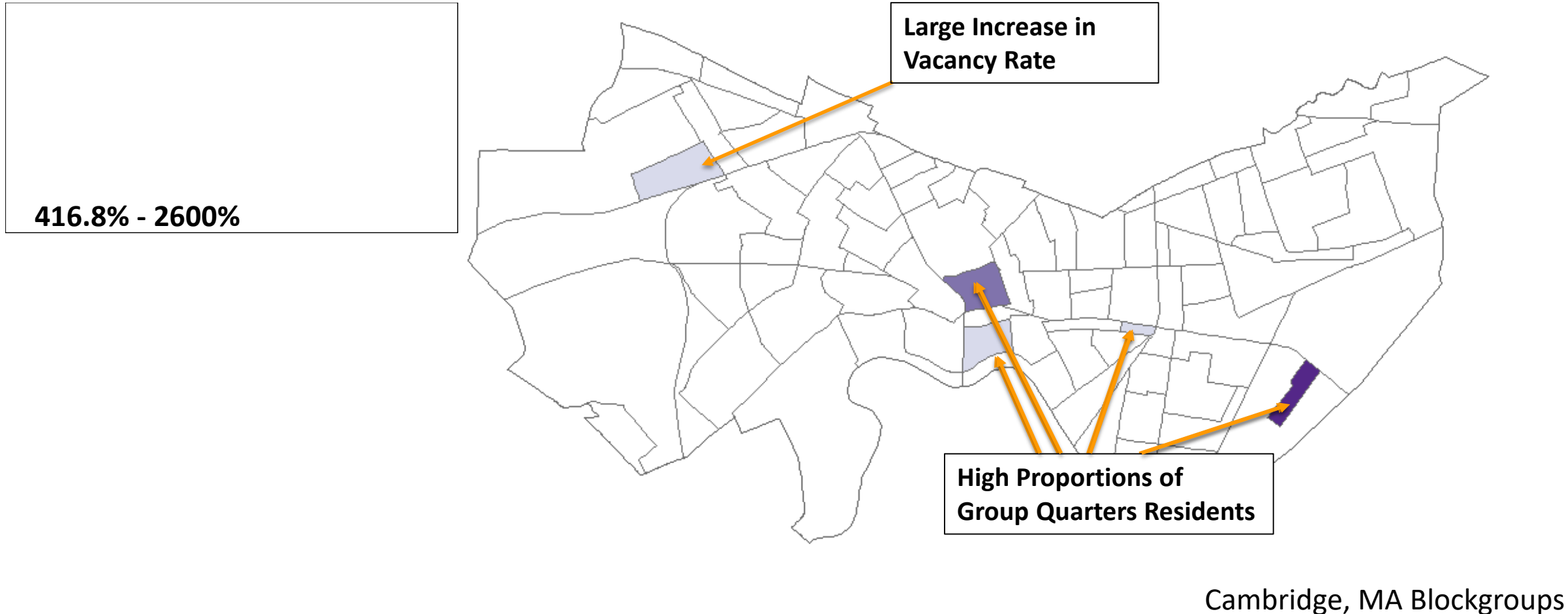
# Case 4: Household Size – Demonstration Data



# Case 4: Household Size – Extreme Cases



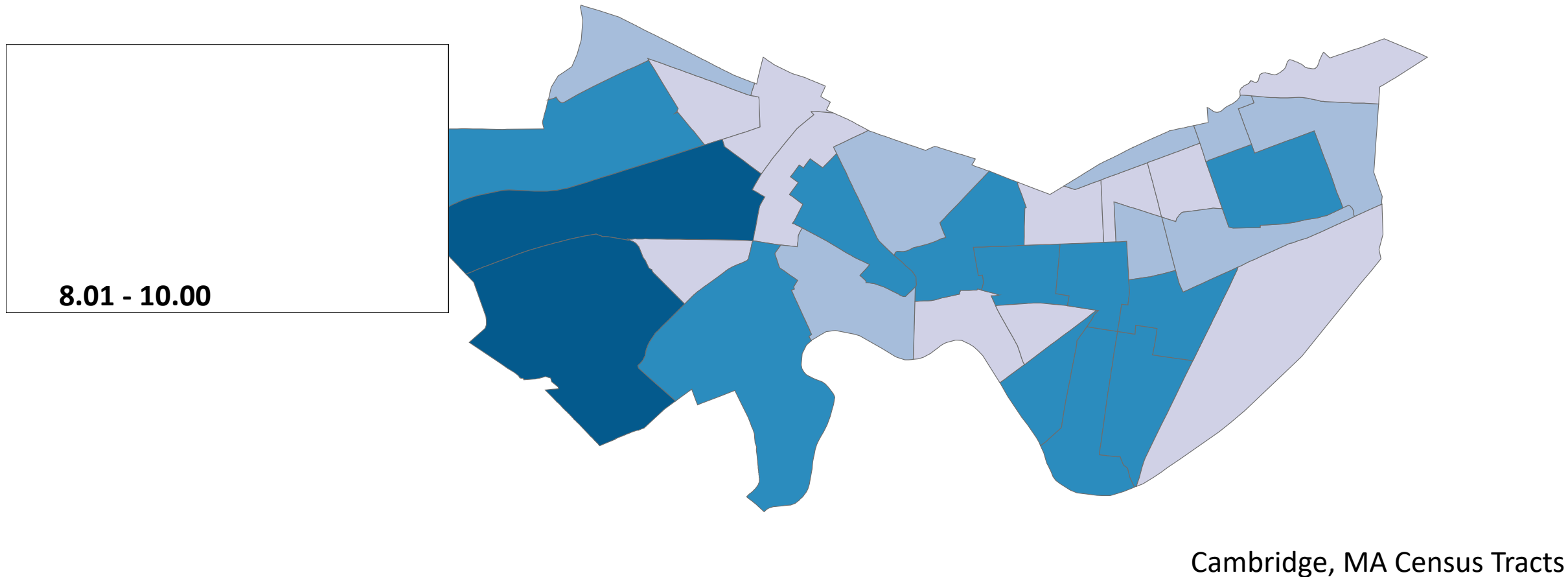
# Case 4: Household Size – Apparent Causes



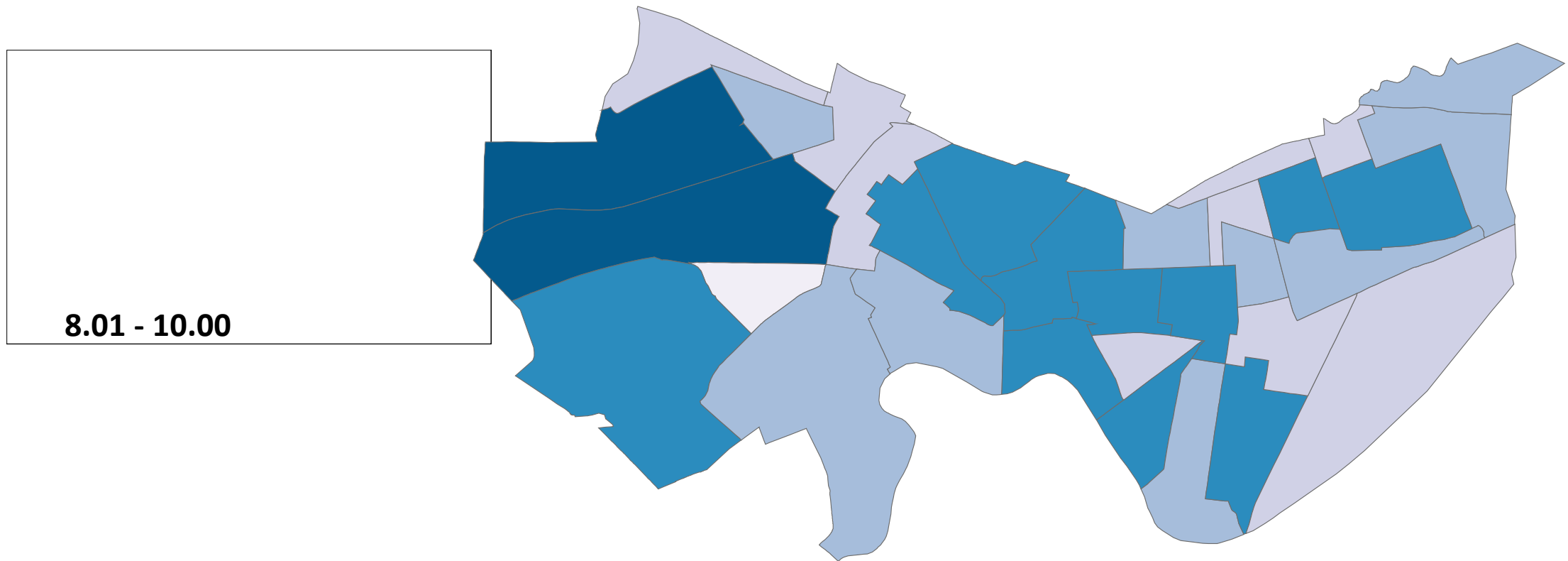
# **Case 5:**

# **Environmental Justice Screen**

# Case 5: Environmental Justice Screen- SF1 Data

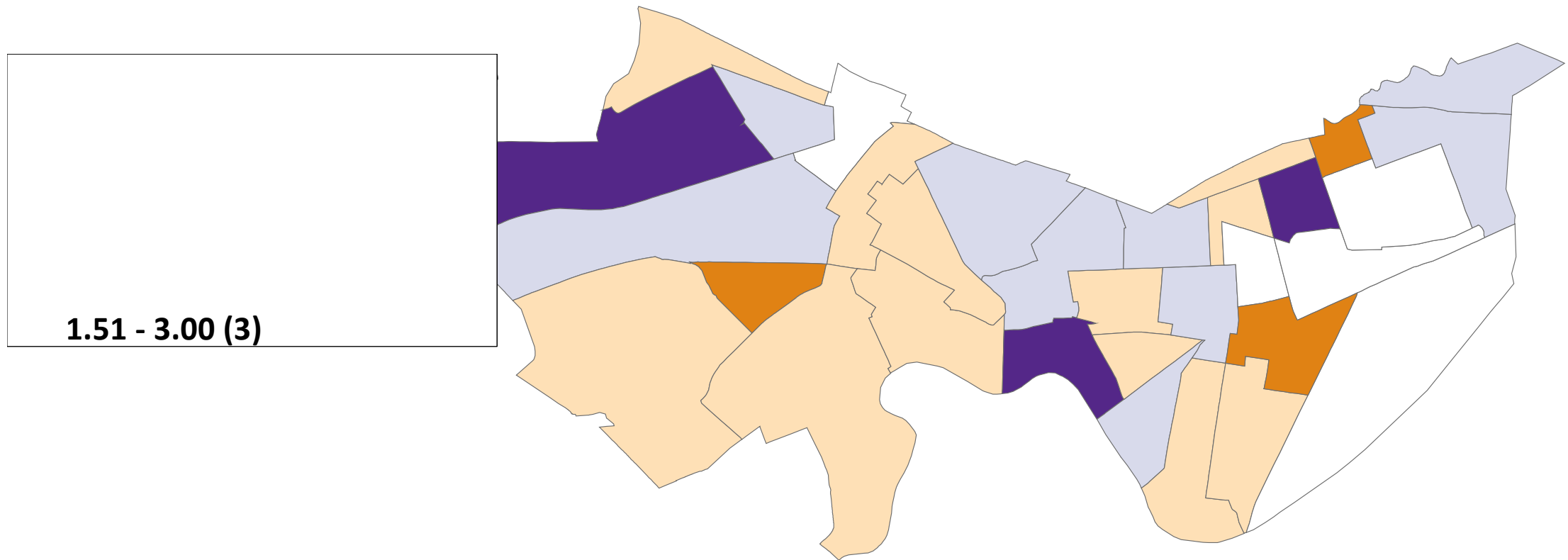


# Case 5: Environmental Justice Screen- Demo. Data



Cambridge, MA Census Tracts

# Case 5: Environmental Justice Screen- Abs. Change



Cambridge, MA Census Tracts

# Observations

- **Effects of differential privacy are equal but not equitable**
- **Scale of change for some topics from the SF1 to the Demonstration Data is what might be expected to occur across a decade or more.**
- **Disproportionately large effects on geographies with relatively small or large numbers of cases for a given variable.**
- **Areas dominated by GQ population are not demographically suited to absorb added household population or households.**
- **Geography matters – not employing a local geographic boundary to redistribute cases in reasonably close proximity to their actual location severely undermines the accuracy and utility of the data.**



# Possible Places for Improvement

- **Add invariants at lower levels of geography**
  - Persons at the tract level (alternatively at the place level where present)
  - Households at the tract level
  - Housing vacancy at the blockgroup level
- **Control spatial redistribution of cases by taking into account physical distance when adding privacy to the data**
- **Protect the relationship between Person and Household data**
- **Treat geographies dominated by GQ differently from those where most residents live in households**
- **Place bounds on the proportion of change to avoid absurd results**

# Protecting the Integrity of the Data

- If reported results are at odds with obvious conditions on the ground or what is reliably reported elsewhere, the result will be to undermine confidence in the Census Bureau's work.
- If the decennial census is deemed unreliable data users may turn to other, more sensitive, private data sources.
- One result could be the privatization of some or many of the public functions now performed by decennial data.