

Accessing Energy Efficiency in Massachusetts

An Initial Review of Data

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Overview

In 2017, Massachusetts’ “Mass Save” energy efficiency programs ranked number one in the annual efficiency scorecard produced by American Council for an Energy-Efficient Economy (ACEEE) for the seventh consecutive year. Mass Save’s high ranking is not, however, a good indicator of whether low-income households are getting the services they need. Only 2 percent of a state’s overall energy efficiency score is based on how well a state’s program serves low-income families, and these scores do not consider any other differences in how well various communities are served.

According to the Mass Save program administrators, in 2016, the electric efficiency program had a benefit-cost ratio of 2.66 (that is, for every \$1 of cost to the administrators there were \$2.66 of benefits) and the gas efficiency program of 1.95 (\$1 of cost to every \$1.95 of benefits). These numbers indicate strong performance on a broad scale, but, like the ACEEE ranking, average performance of the program as a whole may obscure uneven outcomes for distinct demographic groups.

Ten years after the passage of the law that established the Mass Save programs, a fundamental question remains: How well are Massachusetts’ efficiency programs reaching under-served communities and harder-to-reach families?

Limits to available data

At present, it is not possible to answer that question completely. A rigorous examination of access to energy efficiency programs in Massachusetts would require data from the companies that administer Mass Save. These companies have not yet made these data publicly available.¹

When approving and funding efficiency services and incentives, Mass Save program administrators have the capacity to track both energy savings from each measure used and basic characteristics about the family being served. Currently, efficiency program administrators have access to—but do not include in publicly available statistics—information regarding families that:

- have incomes that fall below 60 percent of the state median income,
- have incomes that fall below 80 percent of the state median income,
- have incomes that fall between 80 and 120 percent of the state median income,
- rent in one-to-four-unit buildings,
- rent in larger apartment buildings, and/or
- need language assistance to communicate with efficiency providers.

¹ The DPU ordered the Mass Save program administrators in 2014 to develop a comprehensive Mass Save database. Order, D.P.U. 14-141, http://170.63.40.34/DPU/FileRoomAPI/api/Attachments/Get/?path=14-141%2fOrder_120114.pdf. Certain obligations under this order have been stayed, but the Order as a whole has not been stayed or withdrawn.



Though not publicly available, these data both exist and are necessary to properly evaluate who benefits from the successes of Mass Save and determine where improvement is needed. Additional data would be helpful to more fully evaluate how Mass Save is reaching underserved households. This includes information on household member's age, race, and ethnicity. While not currently tracked, such data can be produced via anonymous surveys of program participants and reported frequently along with other evaluation, measurement and verification (EM&V) studies.

Findings of initial data review

Though working with limited available data, Applied Economics Clinic has produced this initial review of data through maps and other graphics. Table I (below) summarizes some of the differences in energy savings from town to town. A spreadsheet showing all the data used in this review is available at www.aeclinic.org/publicationpages/2018/2/26/accessing-energy-efficiency-in-massachusetts.

- **There are substantial differences in energy savings among Massachusetts towns.** On average, across the whole of Massachusetts, families used 2.8 percent less energy between 2013 and 2015 than they would have without these programs. Energy savings ranged from 0.3 percent of total energy usage in Taunton to 6.7 percent in Tisbury.
- **On average, Boston has achieved more efficiency savings than the rest of the Commonwealth.** While the average savings for Boston reached 3.2 percent, towns outside of Boston only achieved 2.7 percent savings.
- **Boston neighborhoods, however, show wide disparities in efficiency savings.** Average savings among Boston's neighborhoods ranged from 1.7 percent in Allston (02134) to 6.6 percent in Fenway (02115).
- **Lower-income communities are receiving lower efficiency savings.** Families in towns and Boston neighborhoods with median household incomes of \$45,000 or less averaged 1.9 percent in savings, while the remaining towns and neighborhoods averaged 2.7 percent. The median household income for Massachusetts as a whole is \$71,000.
- **Savings differ by efficiency program administrator.** Across the different gas distributors, total average savings by town or neighborhood for both gas and electric efficiency programs ranged from 2.0 to 4.3 percent. Across the electric distributors, total average savings by town or neighborhood for both gas and electric efficiency programs ranged from 1.6 to 2.7 percent.



Data and methodology

This initial review of geographic data available on www.masssavedate.com—maintained by the Mass Save program administrators—provides information about efficiency savings and the composition of the population for each town in Massachusetts as well as 29 Boston neighborhoods by zip code. Mass Save’s geographic data suffer from numerous limitations² and, when aggregated to the state level, do not match state total data presented elsewhere on the same website and submitted by the efficiency program administrators to the Massachusetts Department of Public Utilities. In addition, the information presented regarding these geographic data do not make clear whether or not the data include electric savings from gas programs, gas savings from electric programs, and/or oil and propane savings from any programs. To derive a value for energy savings for this review, we combined gas and electric savings on the basis of their greenhouse gas emission reductions.

All demographic data are taken from the U.S. Census Bureau’s annual American Community Survey’s average 2011 to 2015 tables (www.factfinder.census.gov), which present data at the zip code level. It should be emphasized that the demographic information considered here—median income, renters, nativity, English language skill, and race/ethnicity—refers to each town in its entirety, and is not limited to the group of families that have received efficiency services. It is not possible, therefore, to make conclusions regarding uneven provision of efficiency services to different Massachusetts groups. The findings of this review point towards unequal access to energy efficiency in Massachusetts, but do not provide conclusive proof. Further data and analysis are needed to provide insight into how Massachusetts’ distribution of energy efficiency access can be improved.

² Including the limitations described on the www.masssavedata.com website:

This data is sourced from residential and C&I customer profile studies...which use gross savings and incentives data collected from a combination of PA customer tracking and other vendor data (such as upstream lighting sales by store location) to geographically represent savings and spending across the Commonwealth. The study data does not always tie directly to the PA customer tracking systems and DPU reported savings, which take into account other factors, such as evaluation impact factors and attribution...Since actual purchasers of bulbs through the residential upstream lighting core initiative are not known a model was used to allocate savings and incentives to the census block group level. Behavioral savings were modeled at the block group level by assuming average monthly savings were attributed to participating households in each block group. The C&I data includes all upstream lighting installs and savings that could be geocoded.



Table I. Overview of Average Total Energy Efficiency Savings (2013-2015)

	2013-2015 Average Total Savings (%)		
	Town/Neighborhood Count	Residential & Low-Income	Commercial & Industrial
By Electric Utility			
Eversource	153	2.7%	2.5%
National Grid	162	2.6%	2.2%
Unitil	3	1.6%	2.0%
Municipal	40	1.6%	1.0%
By Gas Utility			
Eversource	42	2.7%	3.4%
National Grid	138	2.8%	2.1%
Columbia	51	2.1%	2.1%
Berkshire	20	2.3%	2.5%
Liberty Utilities	6	2.0%	2.6%
Municipal	3	4.3%	N/A
None	90	3.5%	2.8%
Same Electric/Gas (1=Yes, 2=No)			
1	78	2.7%	2.9%
2	300	2.5%	2.4%
Median Income (MA: \$70,954)²			
<\$45,000	17	1.9%	2.1%
\$45,000-71,000	132	2.6%	2.2%
\$71,000-110,000	180	2.7%	2.8%
>\$110,000	49	2.6%	2.4%
Renters			
40%+	68	2.5%	2.5%
20-40%	128	2.7%	2.2%
0-20%	181	2.6%	2.2%
Percent White			
95%+	86	2.5%	2.3%
85-95%	175	2.7%	2.2%
75-85%	59	2.7%	2.2%
0-75%	58	2.4%	2.5%
Foreign Born			
0-5%	140	2.7%	2.2%
5-20%	191	2.6%	2.2%
20%+	47	2.6%	2.5%
Speaks English "Less Than Very Well"			
0-5%	280	2.7%	2.2%
5-20%	83	2.5%	2.5%
20%+	15	2.5%	1.9%
Boston			
Boston	28	3.2%	2.4%
Not Boston	350	2.7%	2.6%



Figure 1. Residential & Low-Income Savings in Massachusetts (2013-2015)

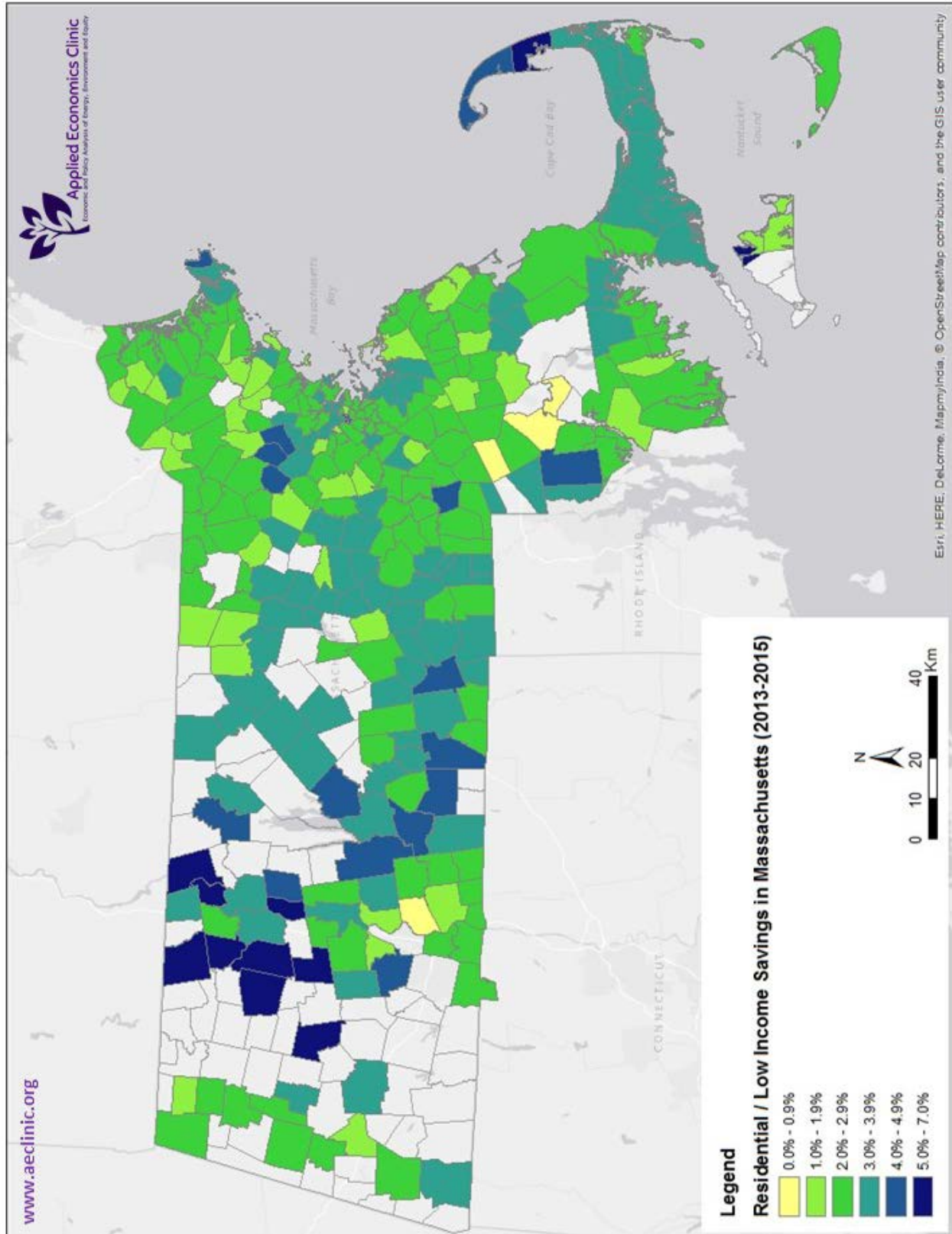




Figure 2. Residential & Low-Income Savings in Boston (2013-2015)

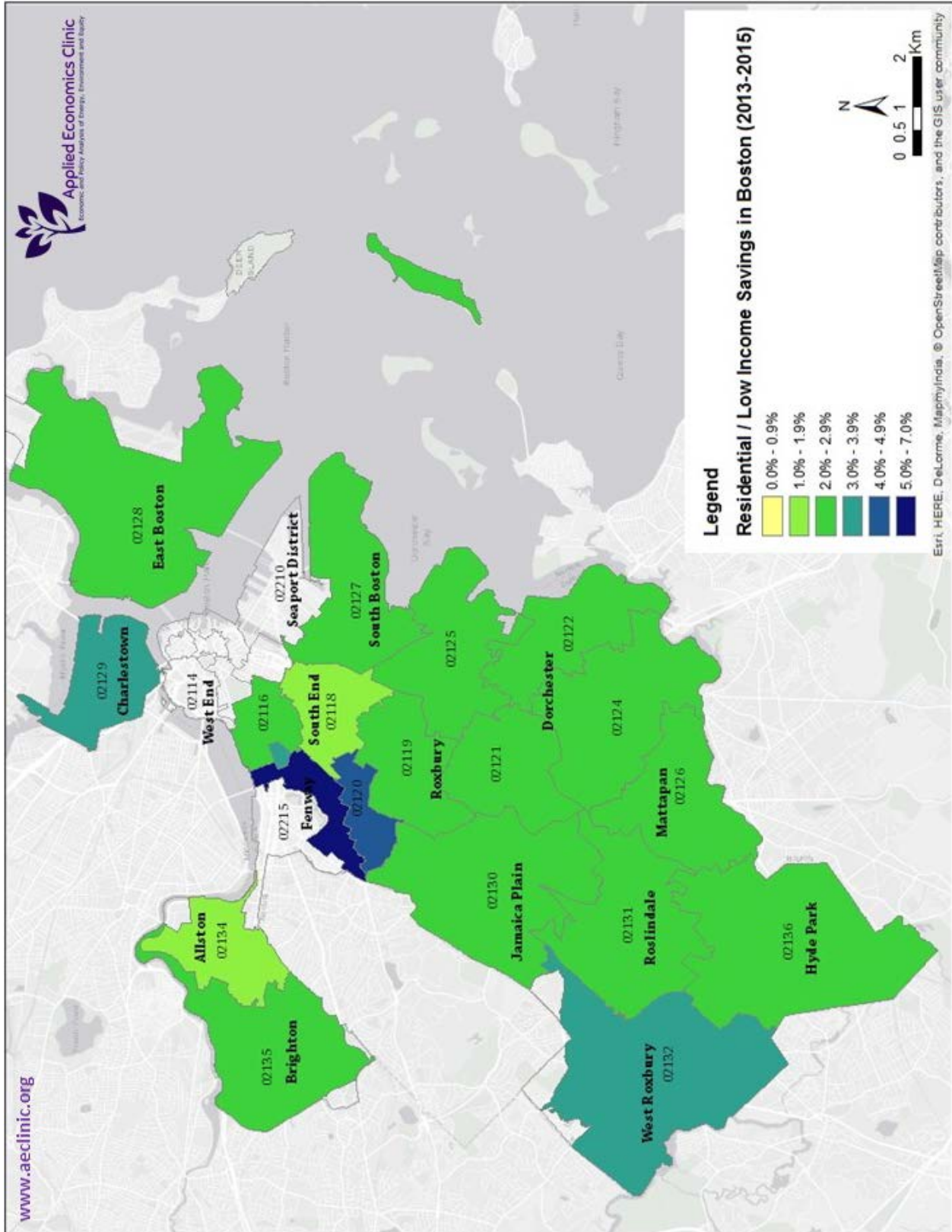




Figure 3. Commercial & Industrial Savings in Massachusetts (2013-2015)

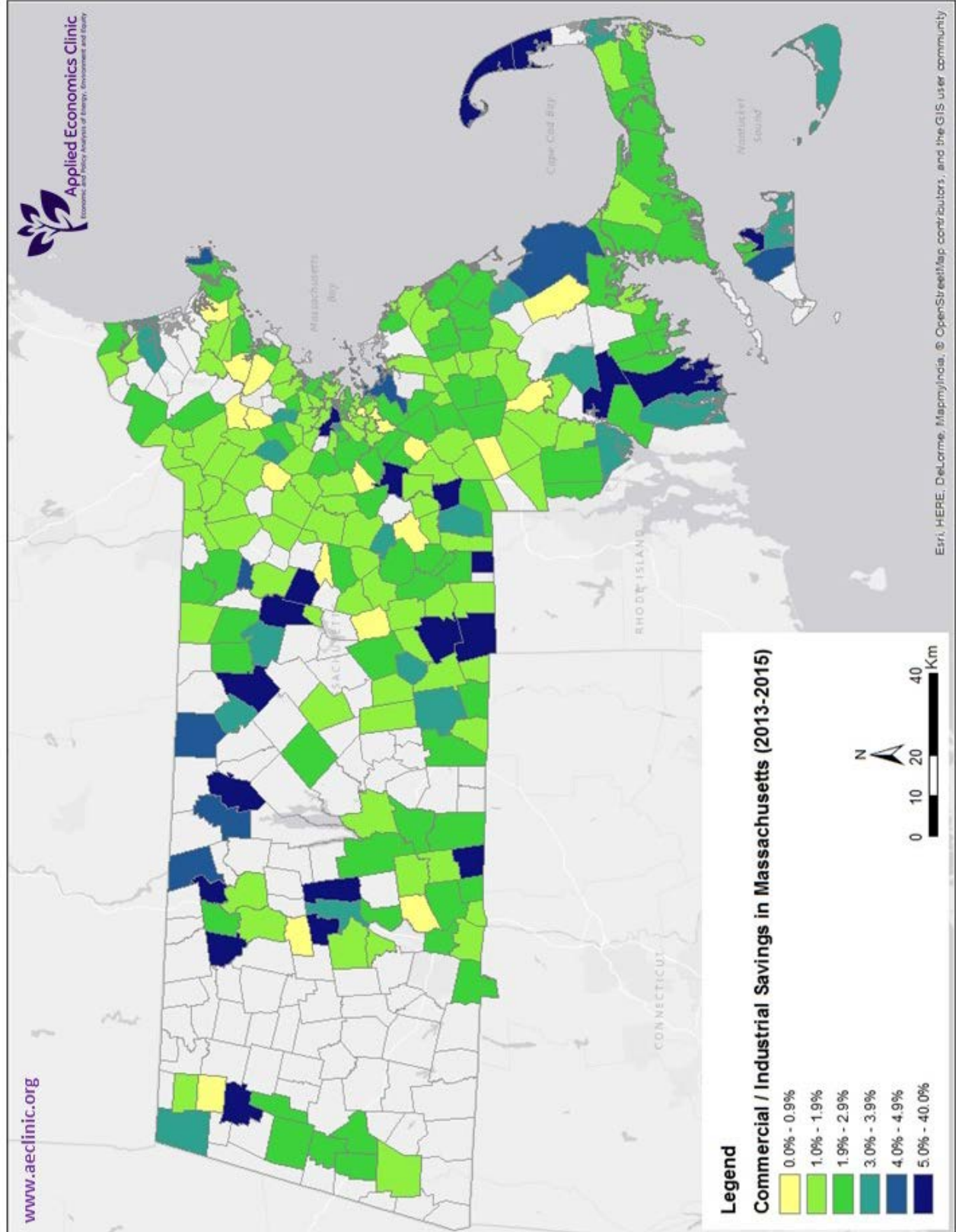




Figure 4. Commercial & Industrial Savings in Boston (2013-2015)

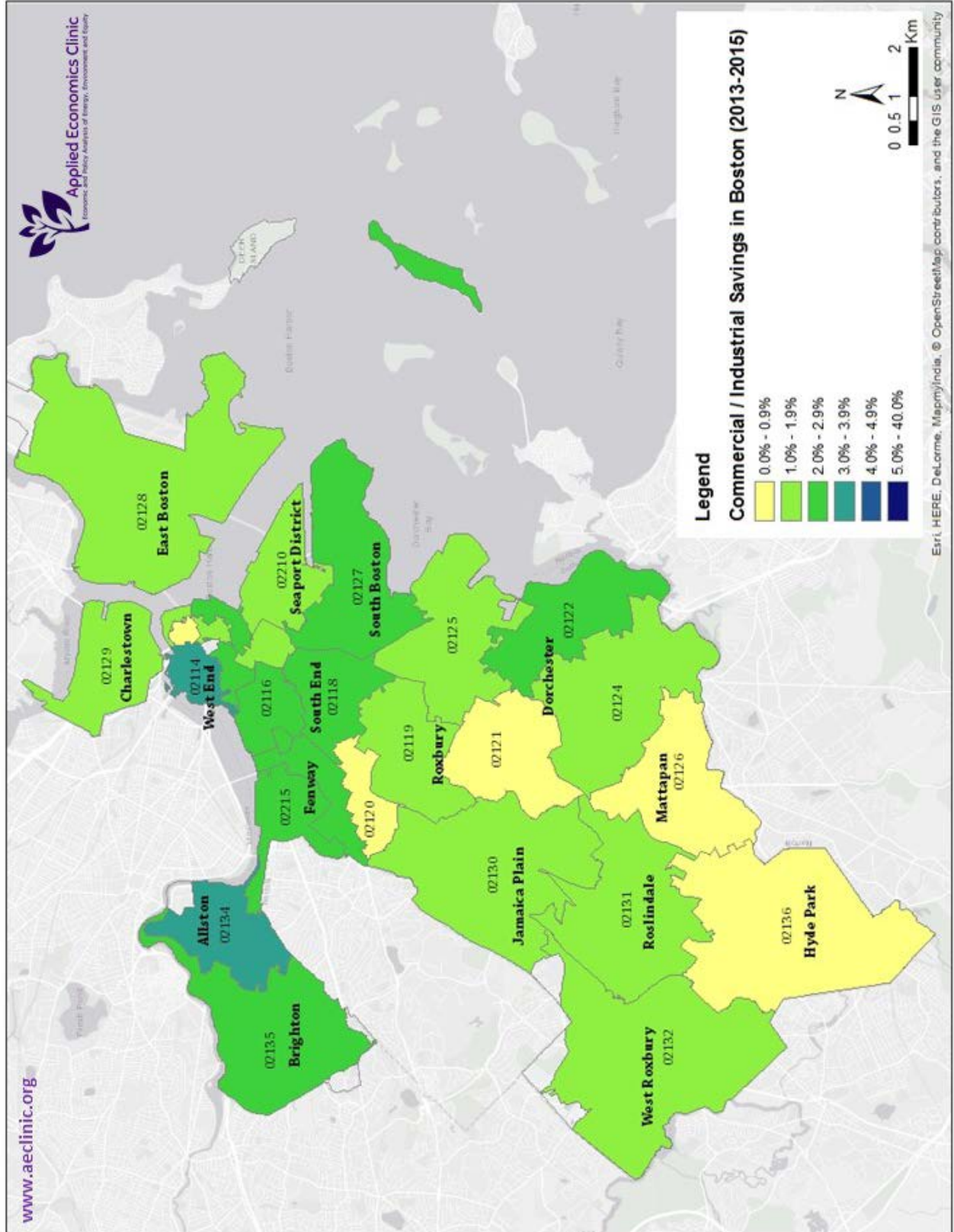




Figure 5. Median Income in Massachusetts (2016)

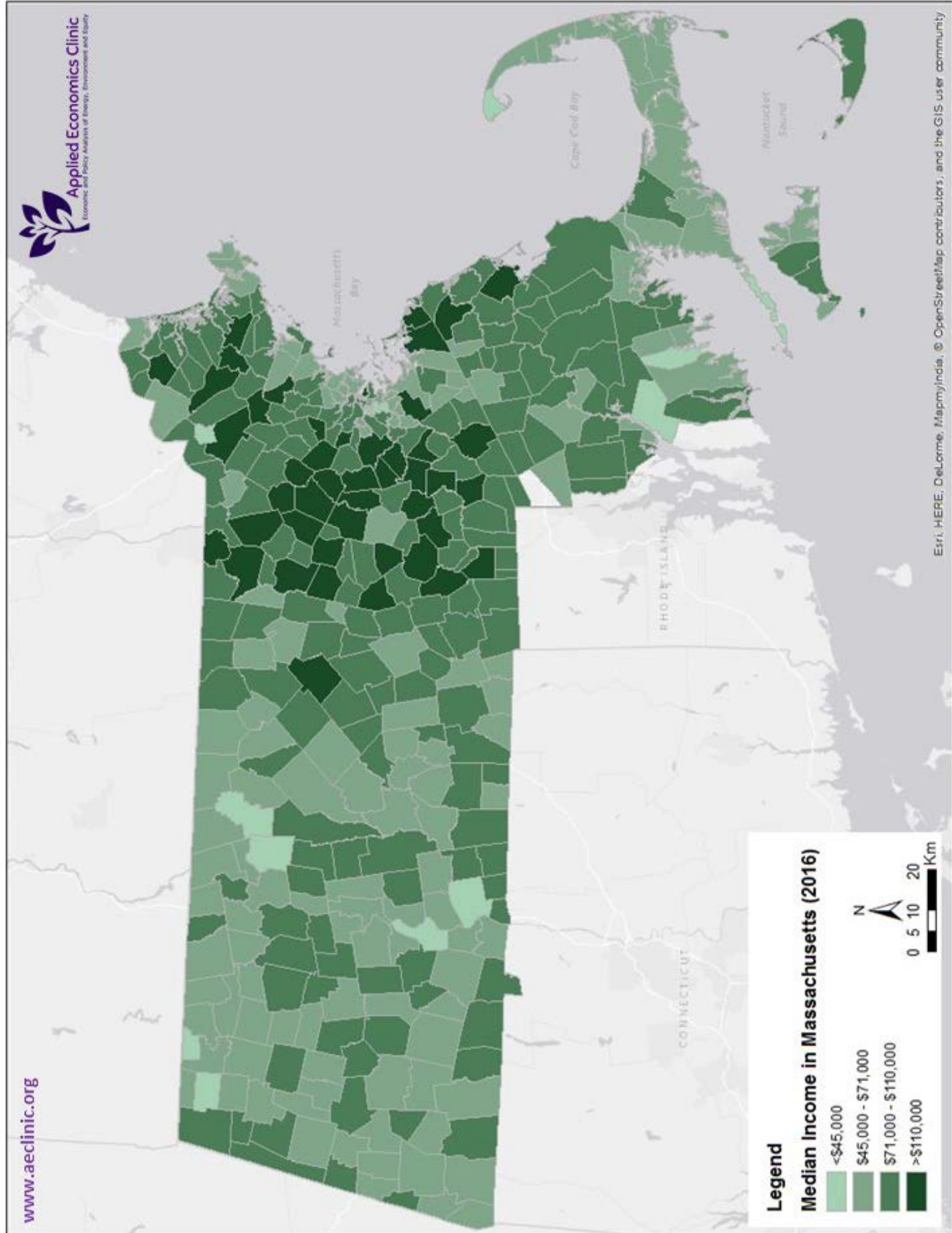




Figure 6. Median Income in Boston (2016)

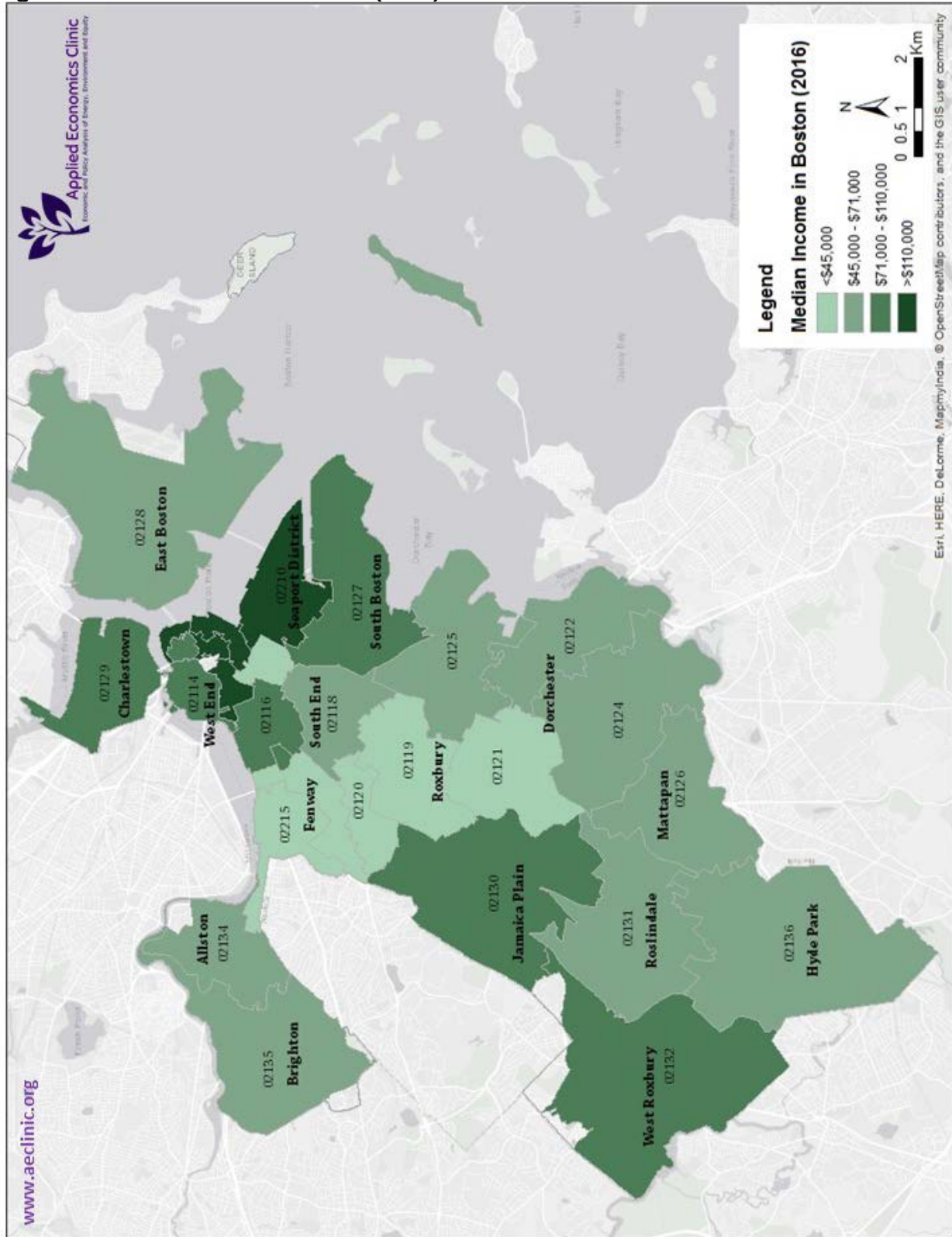




Figure 7. Percentage of Renters in Massachusetts (2016)

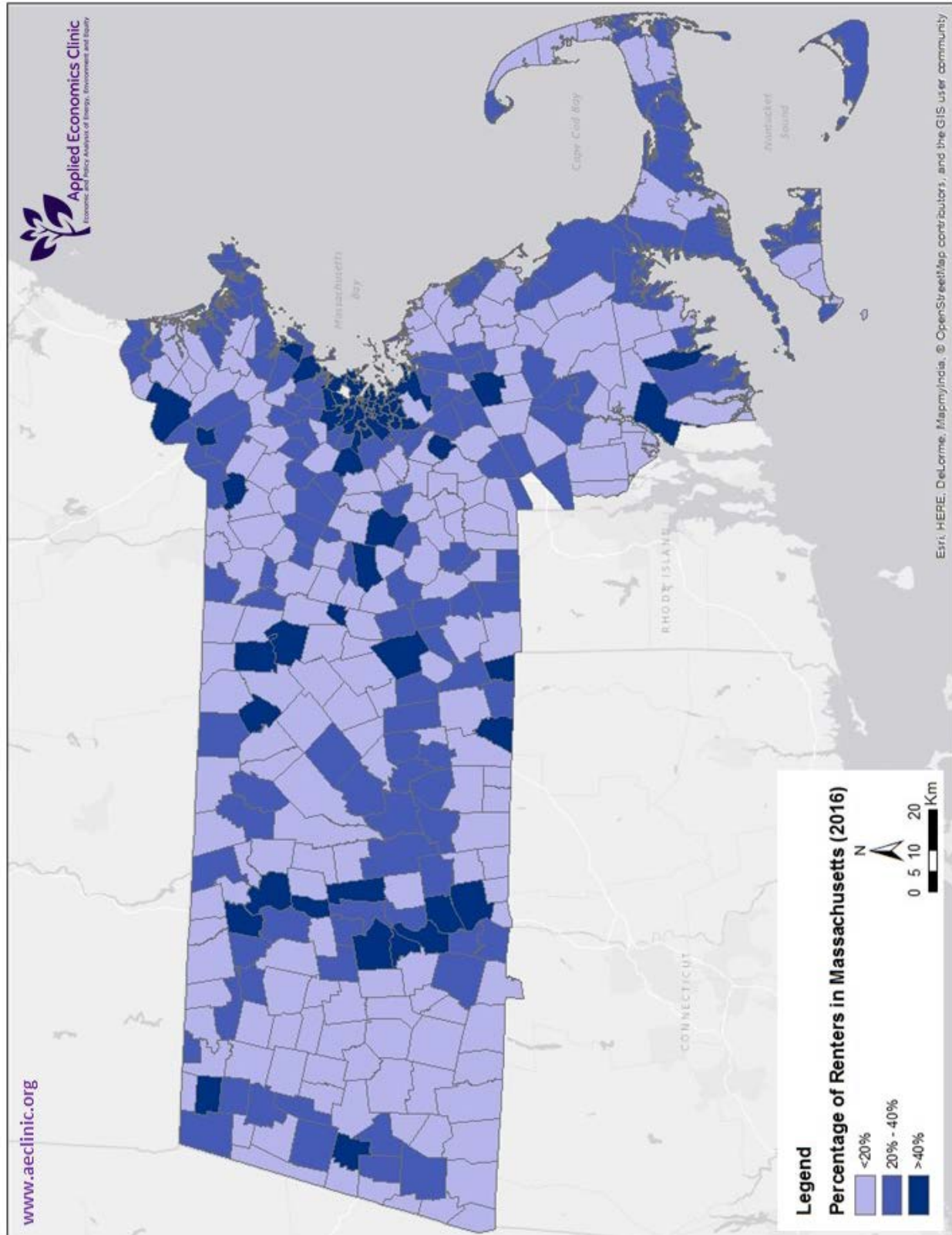




Figure 8. Percentage of Renters in Boston (2016)

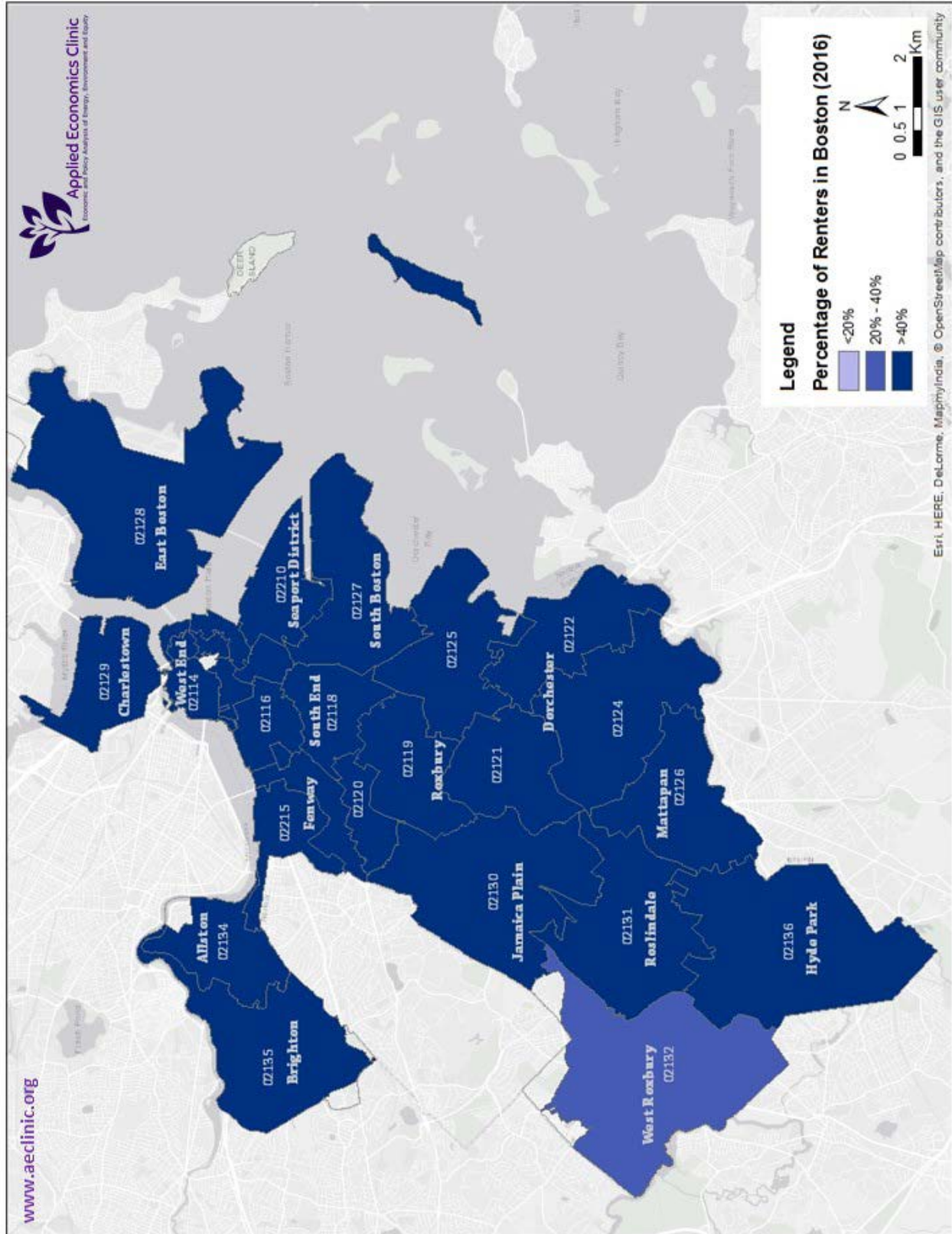




Figure 9. Percentage of Foreign Born Population in Massachusetts (2016)

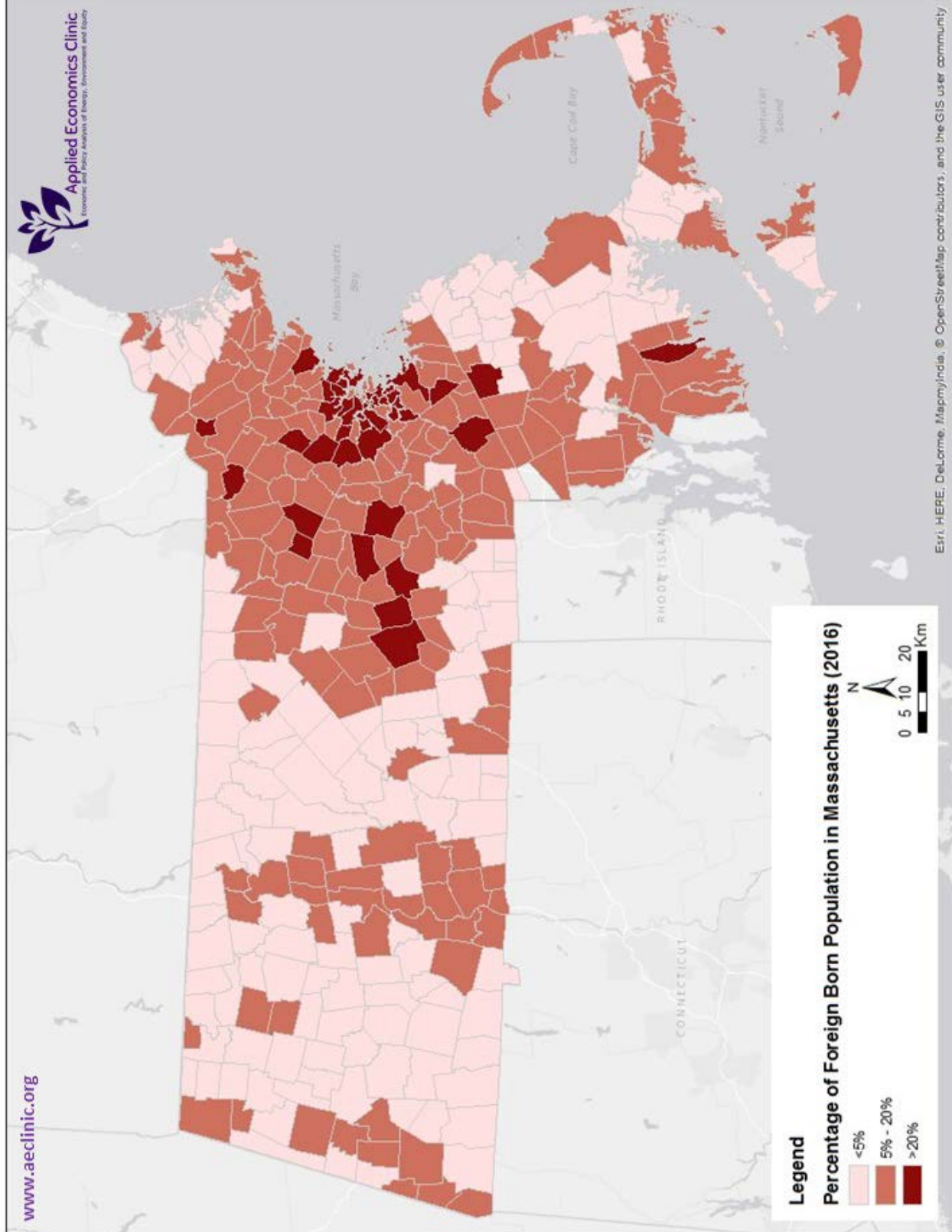




Figure 10. Percentage of Foreign Born Population in Boston (2016)

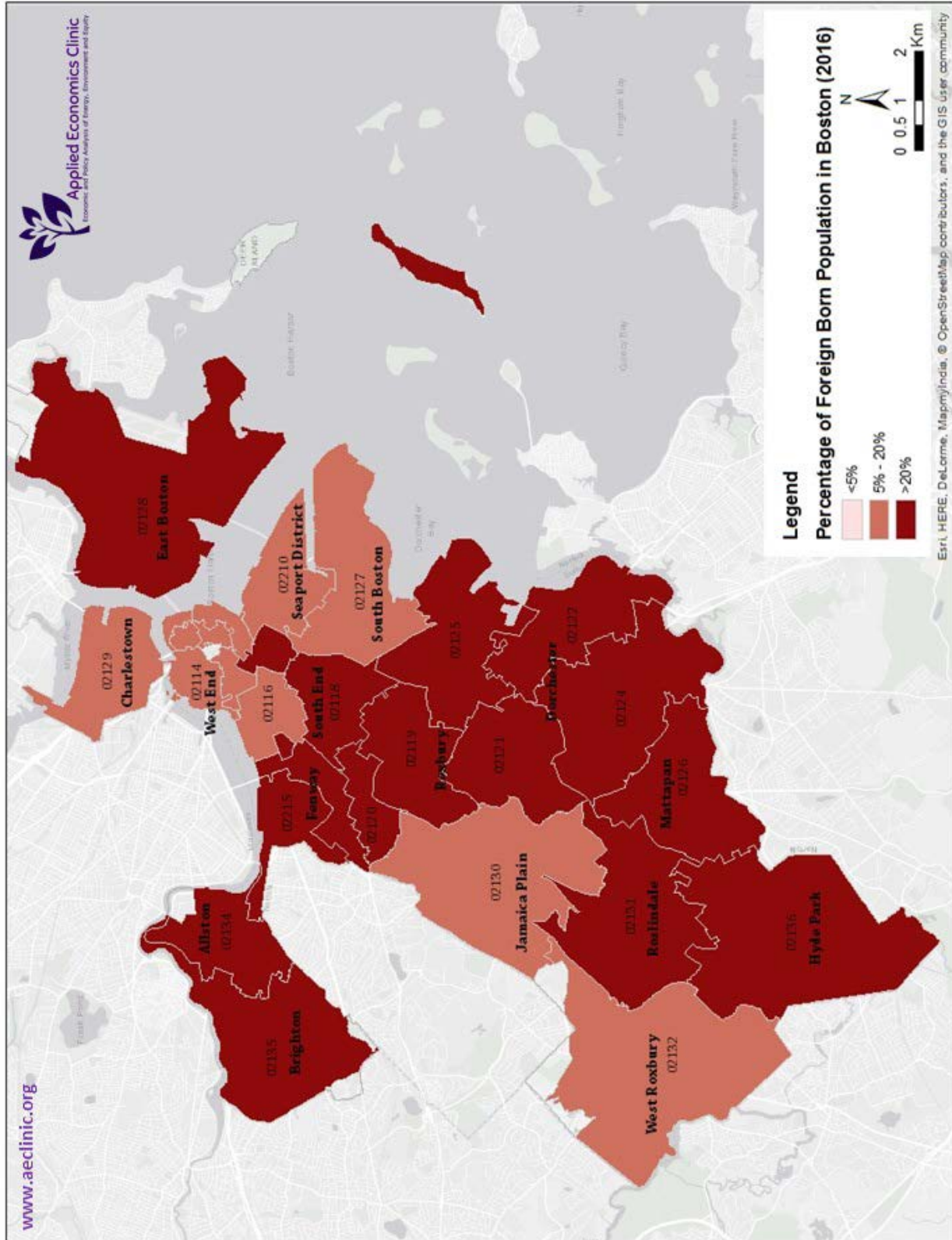




Figure 11. Percentage speaking English “less than very well” in Massachusetts (2016)

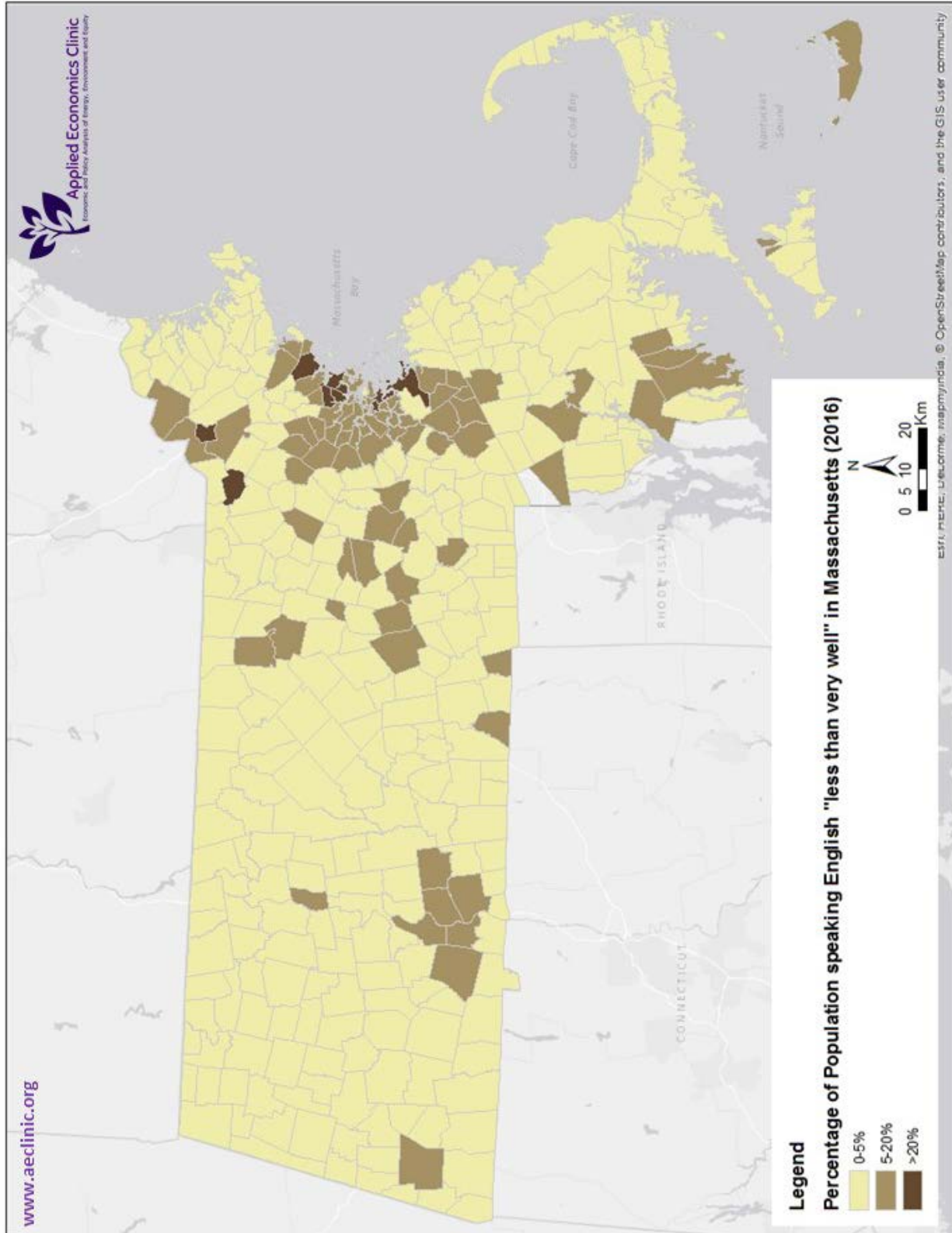




Figure 12. Percentage speaking English “less than very well” in Boston (2016)

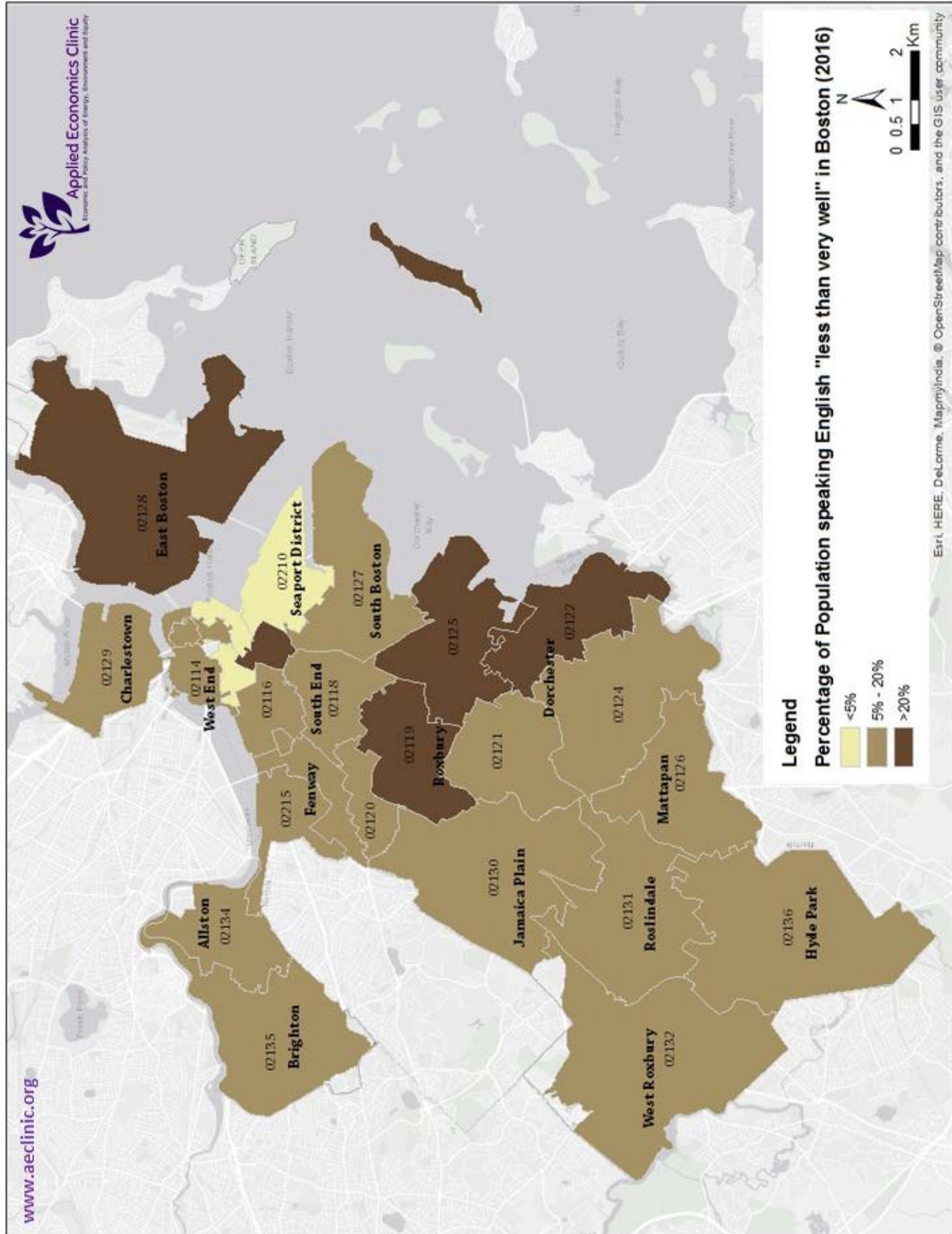




Figure 13. White, non-Hispanic as a share of population in Massachusetts (2016)

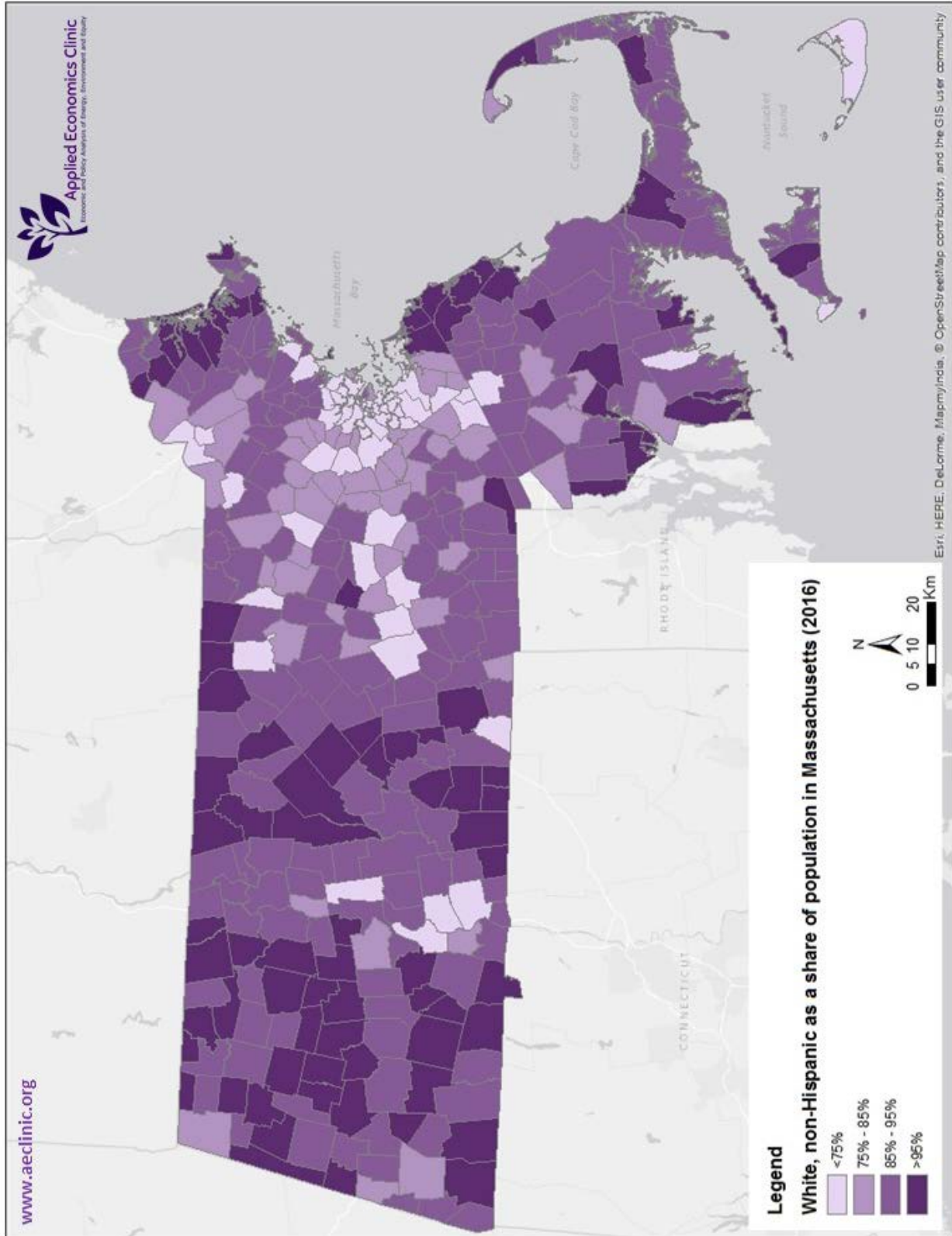




Figure 14. White, non-Hispanic as a share of population in Boston (2016)

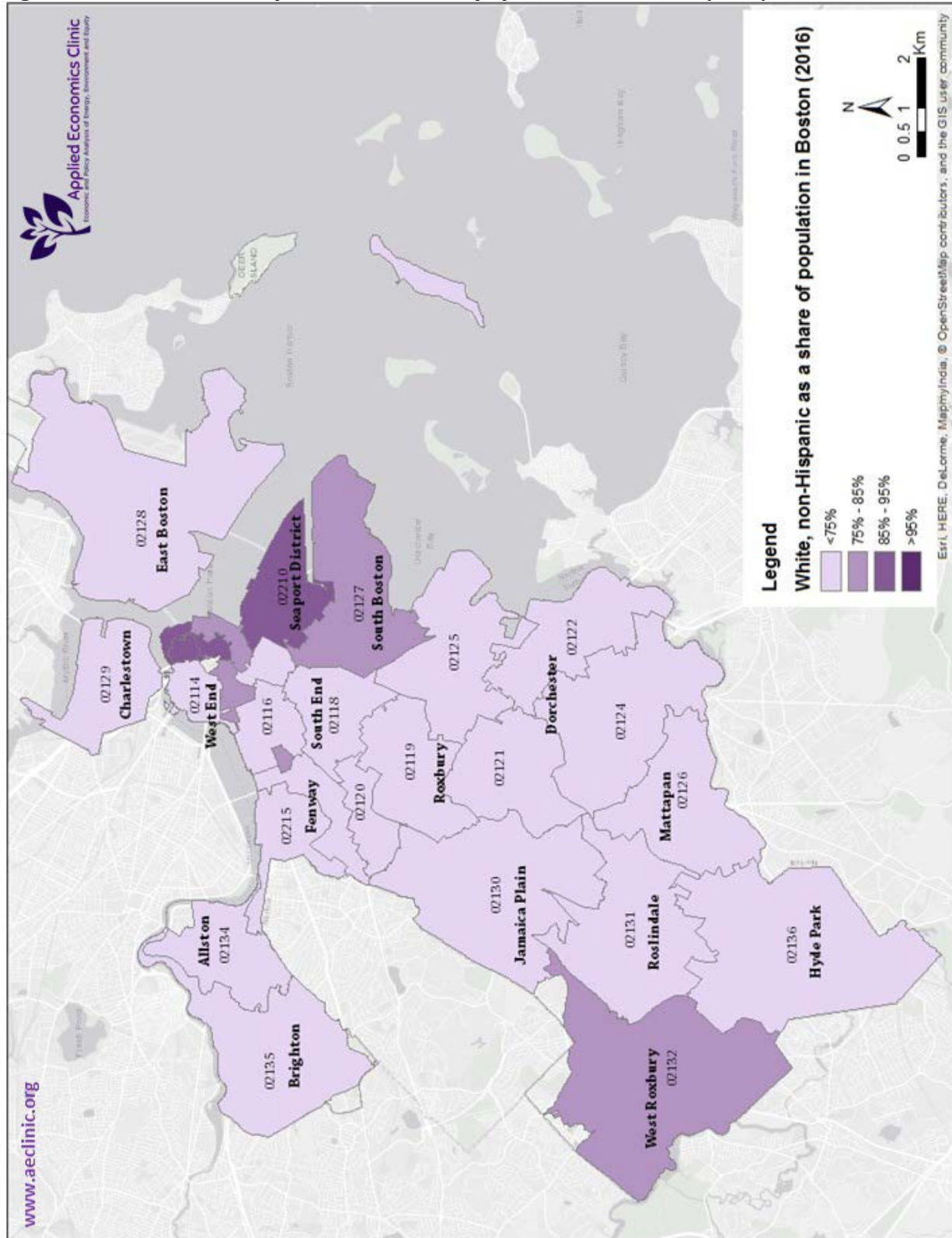


Figure 15. Race in Massachusetts by Town/Neighborhood (2016)

