

The Impact of Drug and Marijuana Arrests Within the Largest Cities of Massachusetts

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January 8, 2018

Prepared for the Massachusetts Cannabis Control Commission

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Introduction

This report is a companion to “The Impact of Drug and Marijuana Arrests on Local Communities in Massachusetts”, which argued that arrest and economic data can be used to assess the relative impact of drug law enforcement at the town or city level in Massachusetts. This report concerns the identification of areas within the largest cities of the state that have had the greatest impact of drug law enforcement *given limitations on readily available data on the locations of arrests within these cities*.

These limitations include the nature of arrest data maintained by local police agencies and the time frame in which this report was prepared. The data issue concerns levels of aggregation, such as whether the location of an arrest is categorized by local area (e.g. police precinct or patrol route) and/or by the address of the arrest (or the arrestee.) The aggregation issue also concerns cross-referencing data on arrests with data on economic conditions in local areas within a city, which are organized by census tract. Collecting appropriately localized arrest data and cross-referencing it with census tract economic data is beyond the scope of this report (in terms of budgetary and time constraints.) However, such analysis is not the only way to identify intra-city areas that have experienced the greatest impact of drug law enforcement.

While the prior report recommends that arrest and economic data be used to identify towns and cities that have experienced the greatest impact of drug laws, this report recommends that within the largest cities in the state, unemployment at the census tract level can be used alone to identify areas in which a) arrests have had the greatest impact and b) priority for awarding licenses for legal sales will thus contribute to restorative justice.

This assertion that economic development is an appropriate and effective response to unemployment is widely recognized and accepted. This report seeks to demonstrate that within the largest cities of Massachusetts unemployment at the census tract is a valid proxy for data on arrest impacts. This finding is the result of three examinations. First, the report will review the statistical correlation between unemployment levels and arrest rates in the 25 largest cities in the state. Second, the report will review the distribution of marijuana arrests and unemployment in Boston. Third, a similar review of marijuana arrests and unemployment in Worcester will also be conducted.

Part One. Unemployment and Drug Arrest Rates in Massachusetts

Correlation is a statistical term that measure the level of dependence between two variables, essential the extent to which they vary in common. A correlation indicates the extent in which a change in one variable is related to a change in another. Correlation establishes and quantifies a relationship between variables, but it does not establish a causal relationship. A strong positive correlation between variables indicates that when one increases, so does the other (and, conversely, when one decreases, the other ones does as well.)

The prior report indicated that there was a relationship between two economic variable, poverty and unemployment levels, and arrest rates for marijuana and drug arrests at the town level in Massachusetts – a sufficiently sufficient relationship to justify using theses variables along with arrests in an index with which to rank drug enforcement impacts. This relationship was qualified in that it applied mostly to the arrest rate for sales offenses and was relatively weak with respect marijuana arrests in general:

“There is a statistical relationship between drug and marijuana sales arrest rates and these indicators of poor economic conditions, however the same cannot be said in relation to the overall marijuana arrest rate or possession arrest rates.”

This report, however, is based in part on the correlation between unemployment levels and marijuana arrest rates. The reason for this is simple. The prior report looked at the correlation between arrest rates and unemployment in 148 to 160 towns (for marijuana and all drug arrests respectively.) This report looks at the same correlation in only the 25 largest cities. The relationship between these variables is different in the largest cities than it is in all cities in the state. It is this characteristic that make unemployment a suitable proxy for arrest impacts in these larger cities.

This look at unemployment and arrests rates is based on arrest data from 2006 to 2010¹ (as in the prior report) and unemployment data from 2012 to 2016² (unlike the prior report, which used unemployment data from the same period as arrests.) The reason for this is to provide findings that supports using contemporary unemployment data along with historical arrest data for setting policy regarding licensure decisions – with contemporary unemployment data being used to underscore the prospective nature of targeting current areas with high unemployment for economic development.

Figure 1 is a map of unemployment levels in Massachusetts at the census tract level. The important feature of this map is that the highest level of unemployment (noted by the red colorization) often characterizes the largest town, specifically the largest cities in the state. While some knowledge of the state’s geography will aid this observation, the cities of Boston, Worcester, Springfield, Lowell, Haverhill, Lawrence, and the combined area of Somerset/Fall River are highlighted to clarify this observation. While this map is illustrative, it is the statistical relationship between drug arrest rates and unemployment rates that clarifies this finding.

Table 1 provides the population, arrest rates, and unemployment rates for the 25 largest cities in the state. The correlation between the marijuana arrest rate and the unemployment level is .49. The correlation between the drug arrest rate and the unemployment level is .65. These correlations indicate a very strong relationship between these variables. Figures 2 and 3 illustrate this relationship – in each one when arrest rates are high, unemployment levels are high; when arrest rates are low, unemployment levels are also low. (In these exhibits, the numbers refer to the listing in Table 1 – Boston is #1 and Barnstable is #25. The figures are intended to report the relationship between the two sets of variables rather than report data and/or compare data from these cities.)

Cities with high unemployment rates tend to have high levels of drug arrests. This does not necessarily mean, or prove, that communities within these cities with the highest unemployment also have the highest drug arrest rates. But it provides sufficient evidence such a relationship to support, along with the economic development objectives, using unemployment levels as an indicator of areas within the largest cities most deserving of licenses. These areas are likely areas that experienced high arrest rates, and are also those most in need of economic development regardless of prior drug enforcement trends.

¹ United States Department of Justice. Federal Bureau of Investigation. Uniform Crime Reporting Program Data: Arrests by Age, Sex, and Race, 2006 - 2010. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor]

² The source for local level population data is U.S. Census Bureau, American Fact Finder data system, 2012-2016 American Community Survey 5-Year Estimates. Unemployment level data was obtained from Data Set S2301.

Table 1. Arrest Rates (2006–2010) and Unemployment (2012-2016) in Largest Massachusetts Cities

City	Population	Marijuana Arrest Rate	Drug Arrest Rate	Unemployment Level
Boston	600,106	207.86	663.35	8.0%
Worcester	177,890	130.53	507.28	8.8%
Springfield	152,312	124.09	555.44	12.4%
Lowell	107,836	50.08	180.60	9.6%
Cambridge	102,638	38.48	100.60	5.4%
Brockton	95,062	103.93	362.29	10.7%
Quincy	93,217	55.78	287.93	6.8%
New Bedford	93,040	379.62	945.83	10.3%
Fall River	91,057	104.77	360.65	12.3%
Lynn	89,834	66.51	218.18	7.8%
Newton	83,831	16.76	24.33	4.4%
Somerville	74,889	33.92	131.66	5.1%
Framingham	65,650	93.53	222.39	5.5%
Haverhill	60,506	91.56	241.30	7.5%
Waltham	60,357	33.30	61.96	5.3%
Malden	56,656	31.77	113.67	7.6%
Taunton	56,149	73.02	282.82	7.4%
Brookline	55,912	54.73	84.06	4.7%
Plymouth	55,887	71.04	132.05	4.6%
Medford	55,532	33.85	83.20	5.5%
Chicopee	54,617	48.70	114.62	8.4%
Weymouth	53,724	87.02	264.32	7.7%
Peabody	51,864	42.42	115.30	5.5%
Revere	51,846	60.56	201.37	8.1%
Barnstable	47,304	106.97	276.93	6.5%

Figure 1. Massachusetts Unemployment (2012–2016)

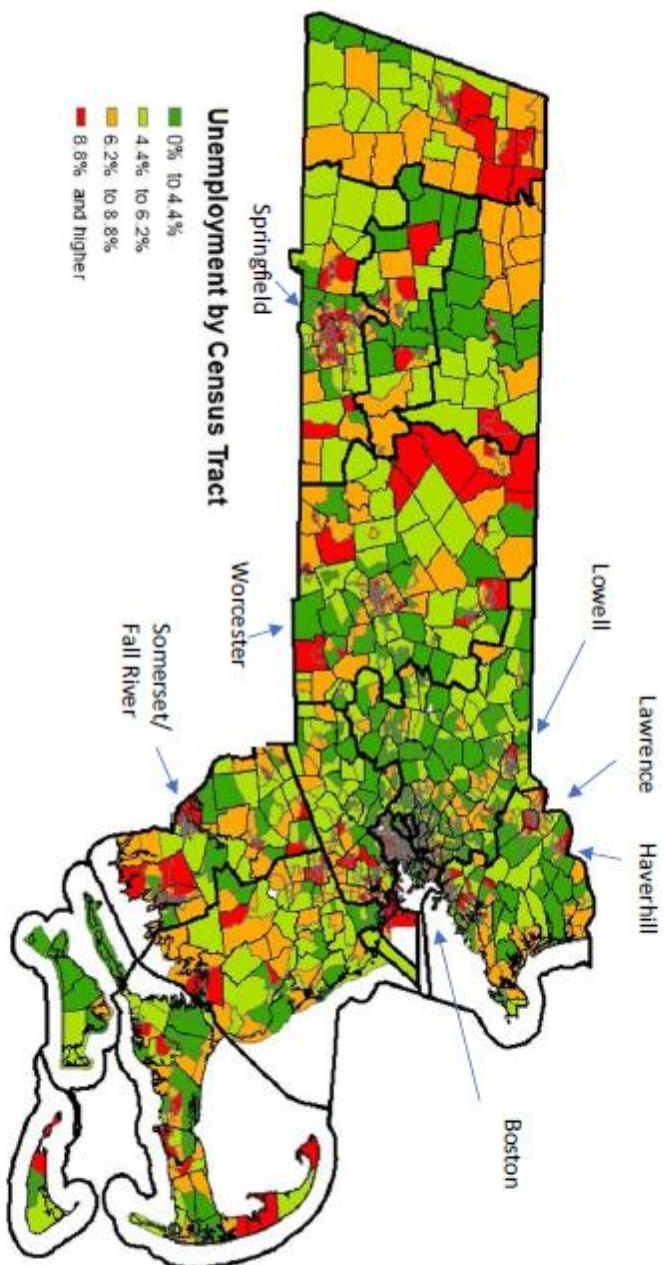


Figure 2. Marijuana Arrest Rates and Unemployment in Largest 25 Massachusetts Cities

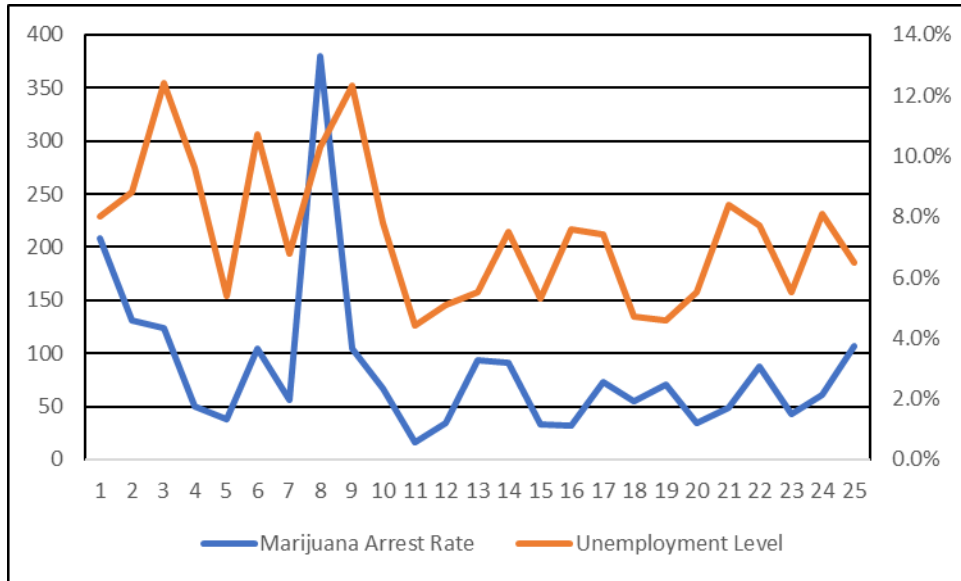
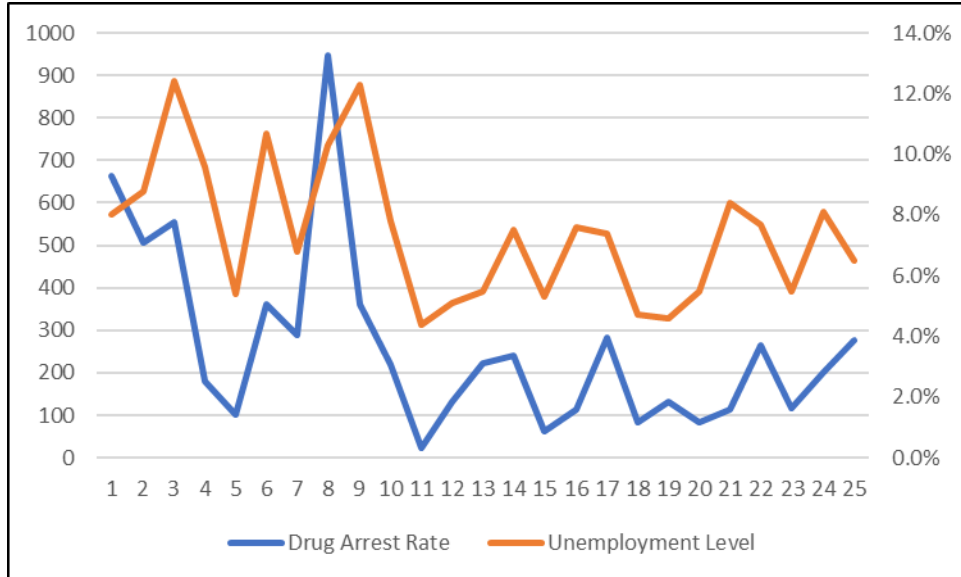


Figure 3. Drug Arrest Rates and Unemployment in Largest 25 Massachusetts Cities



Part Two. Marijuana Arrests in Boston

Recent marijuana arrests in Boston³ are presented in Table 2, categorized by police precinct. Arrests are concentrated in precincts A1/A15 (Downtown and Charlestown), C11 (Dorchester), B3 (Mattapan), and B2 (Roxbury). These four precincts account for two-thirds of the marijuana arrests for Boston in this time-period.

Table 2. Class D Marijuana Arrests, Boston (June, 2015 to September, 2017) by Precinct

Precinct	Area	Arrests	Pct.
A1 & A15	Downtown & Charlestown	225	24.5%
A7	East Boston	40	4.4%
B2	Roxbury	108	11.8%
B3	Mattapan	110	12.0%
C6	South Boston	23	2.5%
C11	Dorchester	174	19.0%
D14	Brighton	33	3.6%
D4	South End	74	8.1%
E13	Jamaica Plain	69	7.5%
E18	Hyde Park	32	3.5%
E5	West Roxbury	29	3.2%
	Total	917	

Downtown and Charlestown have the greatest concentration of marijuana arrests. However, these areas likely have high volumes of transient traffic – both tourists and regional visitors to the downtown area. Setting aside the city center the areas of Roxbury (B2), Mattapan (B3), and Dorchester (C11) have the both large concentrations of marijuana arrests and, as evident from Figure 4, areas with the highest unemployment levels in the city. Unemployment is especially pronounced in Roxbury (indicated by the red coded areas of the map). Roxbury and Mattapan have the highest levels of unemployment in the city and account for nearly one-fourth of the city’s marijuana arrests and nearly one-third of the arrests outside the city center.

Part Three. Marijuana Arrests in Worcester

Marijuana Arrest data for Worcester was obtained for 2000 to 2016⁴ and categorized according to 20 police routes (plus one category for arrests non-attributed to a specific route. There were 5,407 total arrests for this time-period. Nearly half (48.8%) of the arrests occurred in six route areas (Routes 2, 5, 10, 11, 12, and 16). Figure 5 contains a table with the arrest data, a map of the routes areas, and a map of unemployment for the period 2012 – 2016. (See Appendix 1 & Appendix 2 for larger versions of the two maps.) Consistent with the prior maps of unemployment at the census tract level, the highest levels of unemployment are red. Roads are included in both maps to facilitate comparison of census tract areas and police route areas. Each of the six areas with the greatest concentration of marijuana arrests contains census tracts with the highest levels of unemployment. In other words, areas with the highest unemployment can be used to locate the police routes with the highest concentration of marijuana arrests. The red coded tract along the eastern boundary of the city, in the upper right area of the census,

³ Personal communication, Boston Police Department, December 1, 2017 (Data provided to the Massachusetts Cannabis Control Commission.)

⁴ Personal communication, Worcester Police Department, Bureau of Investigative Services, November 13, 2017 (Data provided to the Massachusetts Cannabis Control Commission.)

Figure 4. Boston, Unemployment Levels by Census Tract and Police District (2012-2016)

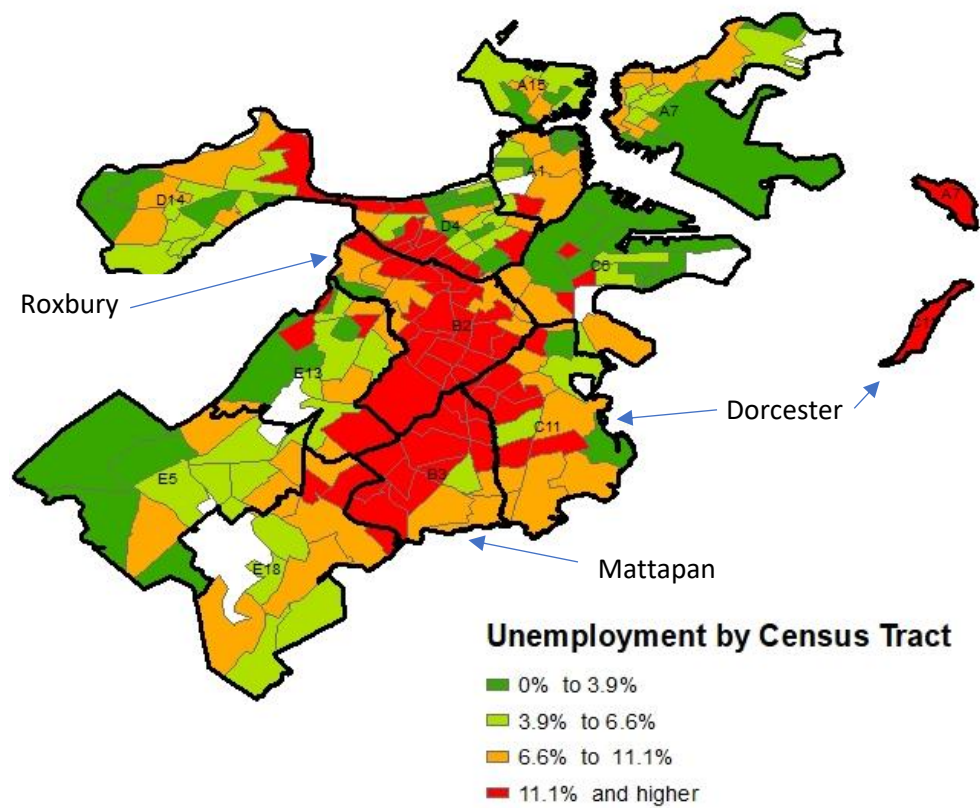
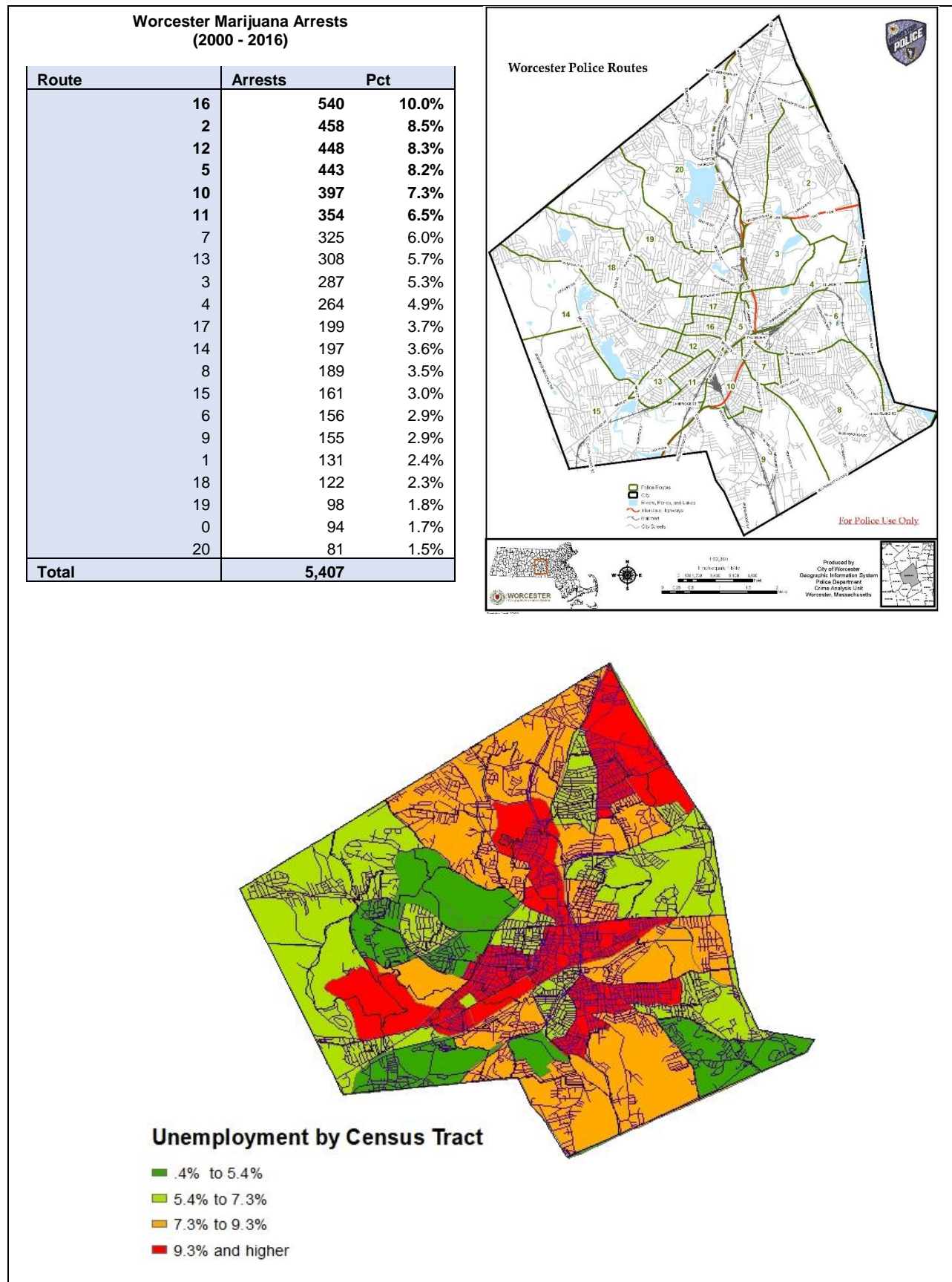


Figure 5. Marijuana Arrests (2000–2016) and Unemployment in Worcester (2012–2016)



is in police route 2. The area distinguished by the other three red coded areas indicates the inner-city concentration of the remaining 5 police routes (Routes 5, 10, 11,12 and 16). While this visual assessment is imprecise, as with in Boston, Worcester's concentration of marijuana arrests is associated with its areas with high unemployment.

Discussion

Boston and Worcester have two of the four highest arrests rates for drug offenses in the period 2006 to 2010 reviewed in the prior report on town and city impacts, and two of the three highest arrest rates for marijuana offenses. Both exhibit the same general characteristics of the association between high arrest rates and unemployment levels in the 25 largest cities in the state. Generally, it is not appropriate to associate characterizations of a group to its individual components. This is referred to as an ecological fallacy. In this case, though, there is evidence presented in the reviews of Boston and Worcester marijuana arrest to provide general support for the assertion that unemployment and high levels of marijuana arrests characterize both cities and the areas within cities.

The designation of census-tract level unemployment level would be a clear and easily evaluated characteristic to qualify an area within a major city for enhanced consideration of a licensing application. The United States Census Bureau, for example, provides a web server that will produce the unemployment data for the census block containing any street address.⁵ A state agency, as well, can provide reference exhibits in table, list, and/or map form indicating qualifying areas. The key issue for policy formulation is the designation of a threshold over which an area would be designated as qualifying for enhanced consideration.

The categories used for the color coding of the three maps in this presentation (Figures 1, 4, &5) were based on quantiles, a separation of the data for each map into four equal groups⁶. Thus, the red coded areas in each map identify the 25% of the entries with the highest levels of unemployment and the dark green coded entries identify the 25% of the entries with the lowest levels of unemployment.

Quantile designation provides an equitable standard applicable to all jurisdictions. The prior report, in effect, argues that both arrest and economic data be used to define town and cities which experienced the greatest impact from marijuana and other drug arrests during the final years when marijuana was criminalized. This report addresses the issue of prioritizing areas within larger cities for enhanced

⁵ Go to this web page:

<https://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?ref=addr&refresh=t#none>

1. Enter a street address
2. On next selection table, choose Census Tract
3. Close this dialog box
4. On the selection table that follows, choose Table S2301 Employment Status. Make sure the far - right column indicates 2016. Click on View.
5. On the resulting table, the unemployment rate for the population 16 and above will be in the upper right hand corner.

⁶ Quantile grouping creates groups with equal numbers of entries based on the number of desired groups. While the quantiles used for these maps have 4 categories, they could also have been based on 5, 6, or any other number of categories.

consideration of licensing applications, and argues that recent unemployment levels be used for this purpose. In other words, given the city experienced a greater impact of drug law enforcement based on standards applied to all cities, the areas within such a city with the highest levels of unemployment should be given preference in licensure decisions. This recommendation is based on both economic development objectives and an understanding that these areas are often the ones most affected by drug law enforcement. Designation of a specified percentage of the census tracts in a city as eligible for this preference provides a standard that is easily defined and able to be consistently applied to qualifying cities.

In this report 25% has been used as the specified percentage; however, this figure was set for demonstration purposes. If this approach is adopted the choice of a such a threshold percentage is a policy decision for the Commission.

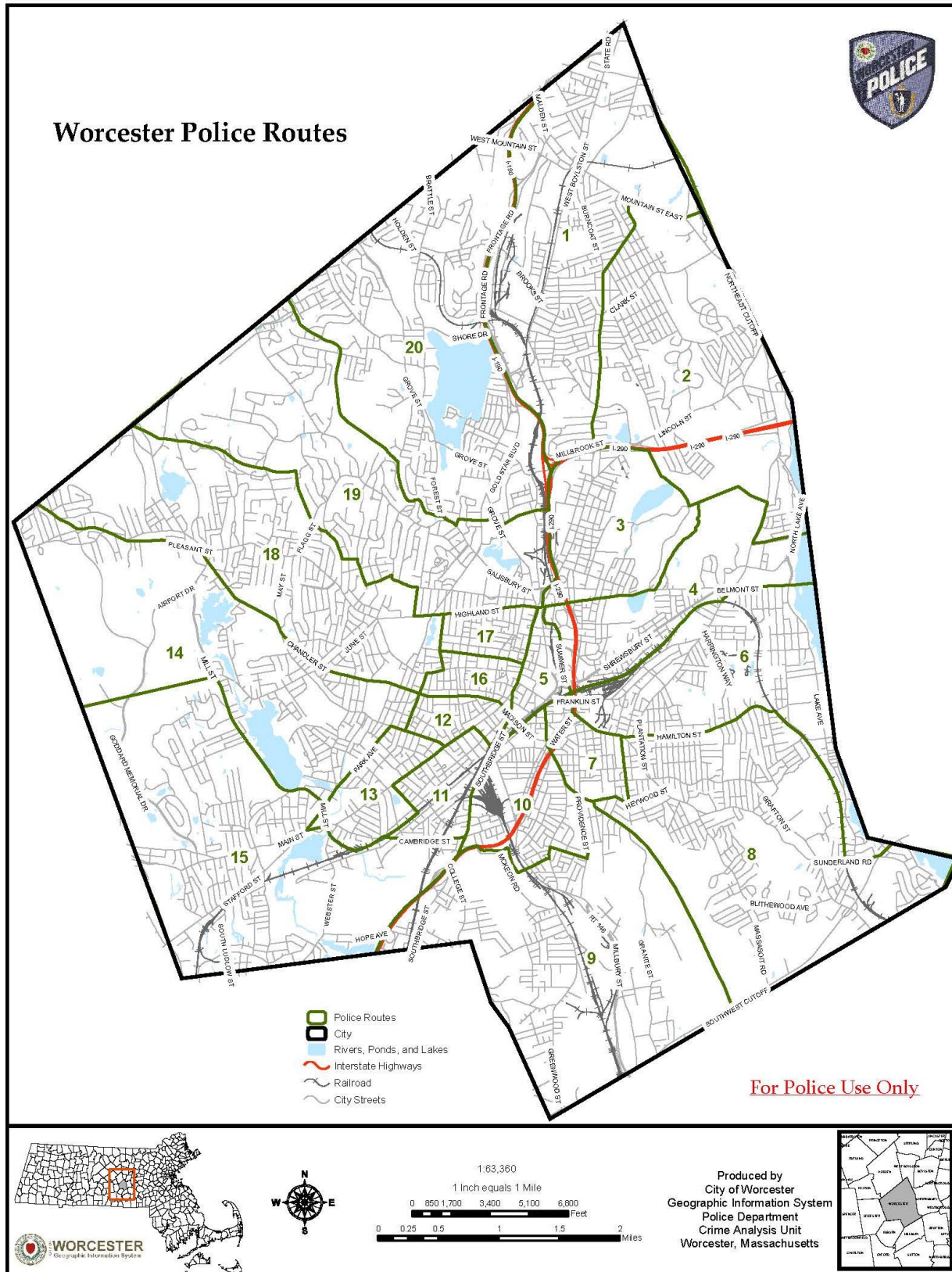
Some statistical metrics from census data used for the Boston and Worcester examples will further explain the advantage of the quantile approach. In Boston the unemployment level for the city for this time-period (2012 – 2016) was 8%. The average unemployment level for the 210 census tracts used for Figure 2 was 8.1%, with a standard deviation of 6.236. The cutoff or minimum value for the census tracts comprising the highest 25% of entries in the top category was 11.1%. In comparison, in Worcester the unemployment level for the city was 8.8%. The average unemployment level for the 58 census tracts used for Figure 3 was 7.8%, with a standard deviation of 4.207. The cutoff value for the top quantile was 9.3%.

In Boston the quantile approach produced a cutoff level that was 3.1% over the city rate of 8%. In Worcester the quantile approach produced a cutoff level that was .5% over the city rate of 8.8%. The result in both cases, though, is that 25% of the census tracts in the city were in the highest category. The quantile approach provides a consistent standard based on the number of census tracts in the city. An alternative approach based on the unemployment level, determined with reference to the city-wide unemployment level by way of a designated number percentage points or standard deviations, would produce inconsistent numbers of designated census tracts from city to city.

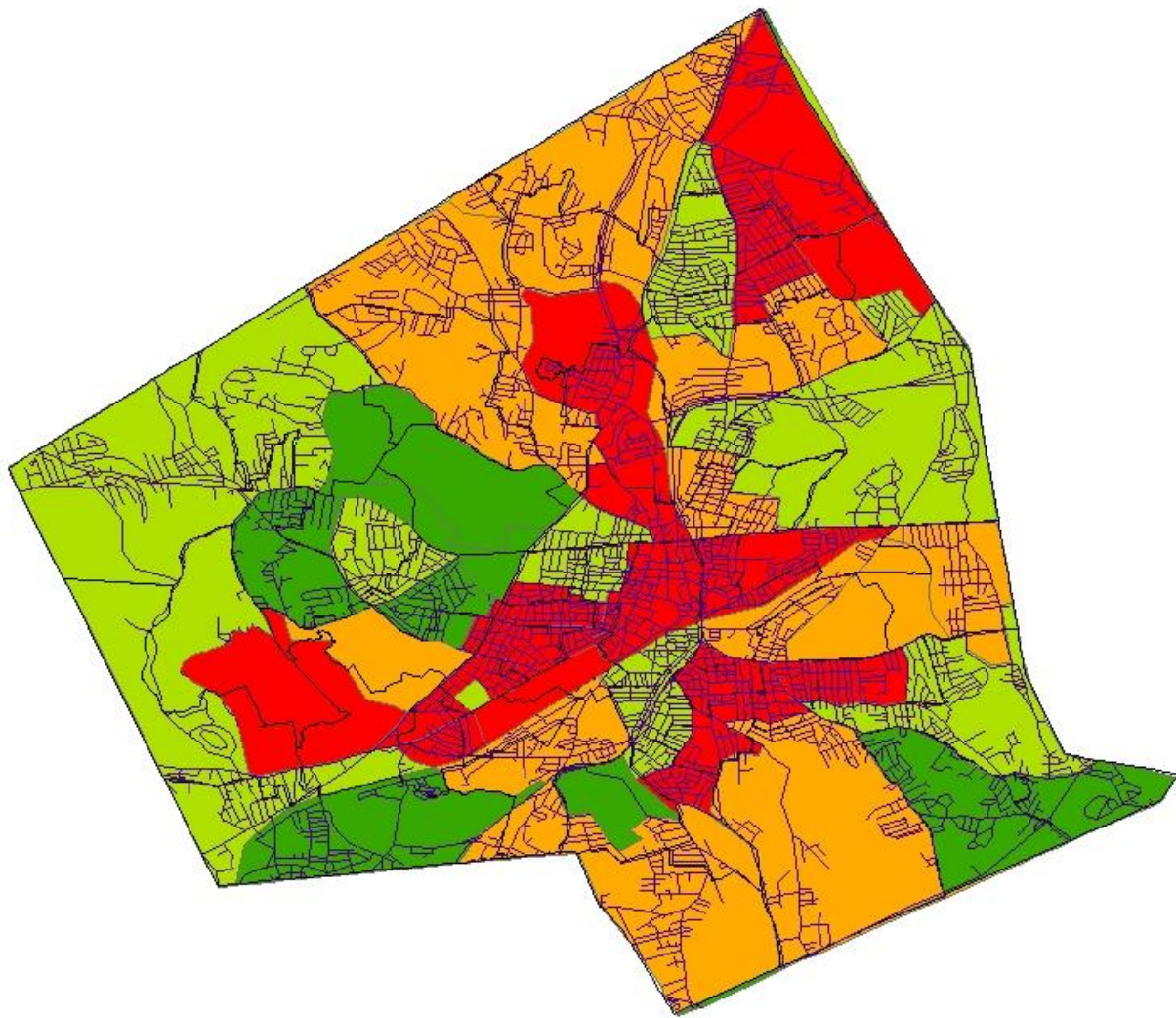
Were the Commission to adopt such a policy and designate qualifying cities and a applicable threshold level, this policy could be implemented by way of the following actions by appropriate state agencies:

- a) Preparation of a list of Census tracts and their unemployment level for a designated time-period for each city.
- b) Determination of the minimum unemployment level defining the top quantile of census tracts in each city.
- c) Preparation of maps of each city highlighting the locations of these qualifying census tracts areas.
- d) Dissemination of instructions for identifying the Census Tract and/or unemployment level for any address in these qualifying cities as well as other resources to aid in application submission and review.

Appendix 1. Worcester Police Routes



Appendix 2. Unemployment in Worcester (2012–2016)



Unemployment by Census Tract

- 4% to 5.4%
- 5.4% to 7.3%
- 7.3% to 9.3%
- 9.3% and higher