



Cannabis Market Saturation Research Project

Identifying the Impact of Siting Several Cannabis Establishments within a Localized Area and the Potential Impact of Over-Saturation on this Emerging Market

City of Boston, Boston Cannabis Board (BCB)

February 27, 2023

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Background and Scope of Work

On January 13, 2023, the Office of Economic Opportunity & Inclusion (OEOI) for the City of Boston issued a written quote contract (WQC) for a Cannabis Market Saturation Research Project “related to the impacts of siting several cannabis establishments within a localized area and to the potential impact of over-saturation on this emerging market” (OEOI, 2023, p. 1). The following excerpt from the WQC provides an overview of the background and scope of work for the project. In 2016, the Commonwealth of Massachusetts, by ballot initiative, legalized the sale of Cannabis.

The City of Boston has adopted policies and zoning regulations to allow for the siting of at least 52 cannabis establishments with an application process overseen by the Boston Cannabis Board (BCB), a five-member panel with expertise in licensing, security, employment, diversity and community engagement. The BCB grants licenses for cannabis establishment while the City of Boston’s Zoning Board of Appeals grants relief from the “conditional” use and relief from the buffer zone ordinance.

The City of Boston has granted Host Community Agreements to 64 companies and has issued 16 licenses to cannabis retail establishments. Boston’s Downtown area has two sites that are open and operating and four pending sites that have received City approval and await final approval from the State. The Downtown area also has the highest volume of prime commercial space due to the volume of employees, visitors, and tourists that rely on this area for goods and services. As cannabis is still an emerging industry, stakeholders have raised concerns about over-saturation of an area in relation to cannabis establishments and the potential impact of over-saturation on this emerging market. The BCB is tasked with evaluating cannabis license applications and determining the appropriateness of the application based on the following criteria:

- Diversity and Inclusion Plan
- Location
- Employee Plan
- Community Feedback/Public Support
- Safety and Security

In addition to the above-mentioned criteria, applications that seek to pierce the buffer zone of an existing or pending establishment require the Board to exercise a heightened level of scrutiny to determine if locating the establishment within the buffer zone serves a uniquely justifiable purpose, and if piercing the buffer zone is likely to produce any negative economic impact. The BCB starts with a presumption that such applications are forbidden and the onus is on the applicant to provide such detail and circumstance to allow for the approval of the license.

The purpose of this project is to determine the impacts of issuing several cannabis licenses in a localized area, as documented by other municipalities, specifically pertaining to market saturation. The Scope of Work for the project was to provide data and research findings that demonstrate whether or not there is any market saturation effect on cannabis licensed premises within a six (6) square mile distance (approximately), and how the findings can inform the BCB application review process.

These data should explain if the location of several cannabis establishments in close proximity to one another is likely to have a detrimental impact on that market and to determine the economic impacts of locating multiple cannabis licenses within a half mile radius, specifically the potential for market saturation.

The Boston Cannabis Board (BCB) of the City of Boston is responsible for reviewing all applications for a cannabis license. Recently the BCB reviewed an application for a Retail Recreational Cannabis license at Faneuil Hall Marketplace. This would add a 6th cannabis establishment within a six (6) square mile radius. The Boston Zoning Code, Article 8 specifically states that “any cannabis establishment shall be sited at least one half mile or 2,640 feet from another existing cannabis establishment.” For the purposes of cannabis licensing, this regulation creates a buffer zone between cannabis establishments (the “Buffer Zone”).” The BCB’s priority is to evaluate cannabis use applications (on a one to one equity:non equity ratio) that adhere to the City’s Rules and Regulations. Applicants are granted a cannabis license within the half mile buffer zone if the applicant can provide the BCB with sufficient information that demonstrates that the site will have no detrimental impact on the existing residential and business community. (OEOI, 2023, pp. 1-4)

Goals of the Study

The focus of the project, as outlined in the OEOI WQC, was to determine the economic impacts of locating multiple cannabis licenses within a half mile radius, specifically the potential for market saturation. The goals of the project were to provide the BCB with an analysis of the impact that saturation may have on the existing markets that have been established in other states. The goals included in the scope of work included:

1. Determine what data or research is available on the impact of multiple cannabis licenses within close proximity.
2. Determine if there is a causal relationship between licensed premise locations within a half a mile proximity (as established in the Article 8 of the Boston Zoning Code) and retail marijuana market performance (specifically market saturation).
3. Provide the BCB with research findings that inform the BCB application review process for those applicants seeking to pierce the “buffer zone” (as established in the Rules and Regulations).

Methodology and Approach

A scoping review of the literature was conducted in February 2023 to map the relevant research in the field of U.S. cannabis market saturation and to meet the goals of the study specific to the impact of siting multiple cannabis licenses within close proximity. The scoping review approach is adapted from a methodological framework outlined by social policy research experts Arksey

& O'Malley, 2005 and was used because the framework is useful for mapping “relevant literature covering broader and more complex research or policy-related questions, to assimilating a broad and diverse range of interdisciplinary research and non-research sources, and to summarizing and prioritizing among important sources and types of evidence available” (Pascale, Beal, & Fitzgerald, 2016). The scoping review included the following steps:

- Identification of relevant studies (electronic databases reference lists hand-searching of key journals existing networks, relevant news articles, organizations and conferences) and speaking with key stakeholders and key subject matter experts.
- Selection of studies and materials (applying inclusion and exclusion criteria to rule out irrelevant studies and materials)
- Charting the data (technique for synthesizing and interpreting qualitative data by sifting, charting and sorting material according to key issues and themes); and
- Collating, summarizing and reporting the results (provided a comprehensive and thorough review of available literature and identified numerous gaps in the evidence base).

Results

Outreach to 20 key stakeholders and subject matter experts (SMEs) from the cannabis industry was conducted throughout February 2023 resulting in interviews over the telephone, on Zoom, and via email with a total of 12 key stakeholders and key SMEs. These informal interviews were conducted with business researchers, academics, business owners, investors, and government officials located in Canada and in several states in the U.S., including Massachusetts, Colorado, Washington, Oregon, and Virginia.

The scoping review included a search of the databases PubMed, Google, Google Scholar, and Lexis/Nexis (Nexis Uni). In addition, a hand search of the web sites of relevant industry organizations was undertaken to ensure inclusion of all possible research. The scoping review revealed very few relevant articles in the peer-reviewed literature. The lack of peer-reviewed literature on the topic of interest was confirmed by several cannabis industry experts who suggested the scoping review focus on news articles and grey literature, information produced outside of traditional commercial or academic publishing and distribution channels. Therefore, a focused search of news, business, and legal sources was undertaken using the Nexis Uni database.

Given that the field and business of cannabis retailers is rapidly changing, the Nexis Uni database search focused on the past three years. All applicable references were collected and organized in Zotero, an open-source reference management software (version 6.0.2.2). The Nexis Uni database search yielded 506 articles. A review of these articles found 62 with some relevance to the topic. However, only three articles provided information that was directly related to the goals of this study.

The scoping review of literature utilizing the Nexis Uni database and information collected from key stakeholder and key SME interviews revealed that, although there are growing concerns among community members, policymakers, and business leaders regarding the potential negative

market impact of siting multiple licensed cannabis retailers within close proximity in the U.S. and in provinces across Canada, very few published research or data have been produced on this issue that would be relevant to the goals of this project and none of the articles focused specifically on the impact proximity has on the market. The following provides an overview of three studies identified during the scoping review of the literature deemed relevant to this project.

1. Using Alcohol Retail Density to Guide a Cannabis Dispensary Footprint

A brief report published in 2023 from the cannabis research firm Pink Horse Capital Research used the U.S. retail alcohol market as a source for guiding legal cannabis dispensary density. The researchers note that, for the legal cannabis dispensary to thrive, it must have the proper density or risk having consumers turn to the illicit market for reasons of convenience and lower prices (Pink Horse Capital, 2023; Garner, 2022). The researchers compared the retail sales of alcohol to cannabis in order to determine “the optimal retail footprint by state for the appropriate number of cannabis dispensaries to satisfy the entire demand and have a well-penetrated marketplace” (Pink Horse Capital Research, 2023). From the analysis the researchers recommended a national dispensary density of 1 dispensary for every 5,937 people. Applying this ratio to the Census population for each state, **the authors determined that Massachusetts requires 1,166 retail cannabis dispensaries to satisfy demand and ensure access.**

2. Market Saturation in Massachusetts

The Massachusetts Cannabis Control Commission (MCCC) published a report in July 2020, “Feasibility of Alternative Cannabis Tax Schemes: A Legislative Report & Recommendation for Massachusetts.” The report examined market saturation as an important factor to consider when examining the state’s tax revenues from retail cannabis sales. Given the short history of legal cannabis sales in the U.S., the authors note that information on the exact number of retail stores to reach market saturation are unavailable. However, the MCCC found that by studying states with a relatively long legal cannabis sales history they could estimate the number of per capita stores that would result in market saturation in Massachusetts. Mapping the per capita number of retail cannabis stores in Oregon (13.3 stores per 100,000 residents), Colorado (9.0 stores per 100,000 residents), and Washington (1.3 stores per 100,000 residents) at the time onto the Massachusetts’s 2020 population, the MCCC **determined a possible saturation point of 627 to 921 stores in Massachusetts.**

3. Market Saturation for Provinces in Canada

Market data firm Cannabis Benchmarks examined cannabis retail market saturation in 2022. The firm found that Canada’s retail cannabis market could sustain a rate of **1 cannabis store per 7,500 people based on per-capita store counts from retail cannabis markets in Colorado and Oregon.** These findings demonstrated that all Canadian provinces could sustain more recreational cannabis stores, with the exception of the province of Alberta (Israel, 2022).

Economic Analysis of Market Saturation in Massachusetts

Given the lack of published research on this important topic, outreach to cannabis industry researchers, consultants, and associations was conducted to find unpublished data relevant to the goals of this project. One of the organizations that was contacted and responded during the project timeframe was The National Cannabis Industry Association (NCIA). According to their website the NCIA’s mission is to: **“promote the growth of a responsible, sustainable, and inclusive cannabis industry and work for a favorable social, economic, and regulatory environment for that industry throughout the United States”** (NCIA, 2023). The NCIA is focused on advocating to advance national policy reforms to “ensure small and medium sized cannabis businesses” and describes their organization as the “voice of Main Street Cannabis” (NCIA, 2023).

NCIA recommended a discussion with economist Beau Whitney, an expert on this topic, who was able to provide data and analysis for this project. Beau Whitney is the founder and Chief Economist of Whitney Economics, a cannabis and hemp business consulting and economic research firm. He also serves as the Senior Economist at NCIA and is an authority on cannabis economics and the supply chain. Please see the Appendix for Beau Whitney’s full biography.

Whitney Economics was able to provide a market saturation analysis for the Massachusetts 2022 retail cannabis industry. That analysis is described in detail in the next section of this report. Given the tight timeframe for this project (February 6 – February 27, 2023), a market saturation analysis of the Boston area could not be conducted for this project. However, data are available for Boston and Whitney Economics is available to compete a detailed supply and demand analysis and market saturation study in the near future.

Examining Supply and Demand in Detail for the Massachusetts Market

Whitney Economics (2023) has built a detailed supply and demand model in order to better understand the market opportunities that exist in the U.S. cannabis industry. By examining the market in detail, Whitney Economics was able to forecast future demand for products, and to make far more refined demand and revenue projections for Massachusetts (see Tables 1-3) (Whitney Economics, 2023).

Table 1 provides a ranking of retail licenses per capita by state. Out of the 38 states with either Medical or Adult-use legalization, Massachusetts ranks in the middle at 11th with a retail per capita rate of 1 cannabis retail store per 12,175 Massachusetts residents (Whitney Economics, 2023).

Table 1: Retail Licenses per Capita for Massachusetts Compared to Other States, 2022

State	2022 forecast	Retail Licenses	Retail per capita	Rank low to high
Oklahoma	2,859,782	2,759	1,037	1
Montana	809,215	430	1,882	2
Alaska	597,333	157	3,805	3
Oregon	3,471,527	827	4,198	4
Colorado	4,625,482	1,066	4,339	5
New Mexico	1,619,866	305	5,311	6
Maine	1,151,273	205	5,616	7
Michigan	8,408,719	1,000	8,409	8
Nevada	2,801,605	283	9,900	9
Washington	5,979,396	500	11,959	10
Massachusetts	5,539,833	455	12,175	11
West Virginia	1,481,932	100	14,819	12
California	31,113,152	1,830	17,002	13
Missouri	5,024,282	196	25,634	14
Delaware	771,391	30	25,713	15

Source: Whitney Economics (2023)

In addition, Massachusetts currently has one of the lowest cultivators to retail ranking in the U.S. at a ratio of .77 (Table 2) (Whitney Economics, 2023).

**Table 2: Cultivator to Retail License Ratio for Massachusetts
Compared to Other States, 2022**

State	Retail Licenses	Cultivation	Cultivator to Retail Ratio	Rank
Rhode Island	6	66	11.00	1
Vermont	18	113	6.28	2
New York	40	244	6.10	3
California	1,830	7,651	4.18	4
Oklahoma	2,759	7,066	2.56	5
Washington	500	1,091	2.18	6
Delaware	30	60	2.00	7
United States	11,591	22,861	1.97	
Oregon	827	1,411	1.71	8
Michigan	1,000	1,647	1.65	9
Nevada	283	456	1.61	10
Alaska	157	250	1.59	11
New Mexico	305	427	1.40	12
District of Columbia	7	8	1.14	13
Colorado	1066	1,215	1.14	14
Alabama	12	12	1.00	15
Montana	430	367	0.85	16
New Jersey	21	17	0.81	17
Maine	205	159	0.78	18
Massachusetts	455	352	0.77	19

Source: Whitney Economics (2023)

Table 3 provides an overview of the percentage of legal sales by state relative to the Total Addressable Market (TAM). Massachusetts ranks 5th nationally. This is to be expected given that Massachusetts has adult-use legalization and is considered a mature market state. The percentage is based on the sales of cannabis and compared to the consumption rates of the citizens within the state. With an adjusted percentage of 84.8%, there is an opportunity to reach an additional 15% of cannabis consumers in Massachusetts based on 2022 data (Whitney Economics, 2023).

Table 3: Total Addressable Market (TAM) for Massachusetts Compared to the U.S., 2022

		Actuals: Estimate	Adjusted for 2022	
Status	State	2021	2022	Rank
M	Oklahoma	86.6%	99.76%	1
A	Colorado	95.0%	99.75%	2
A	Montana	48.8%	97.75%	3
A	Alaska	92.0%	92.00%	4
A	Massachusetts	66.1%	84.80%	5
A	Nevada	99.3%	82.00%	6
A	Oregon	90.0%	74.75%	7
A	New Mexico	63.2%	71.20%	8
A	Michigan	55.8%	69.80%	9
A	Washington	64.8%	55.72%	10
A	Arizona	52.5%	52.10%	11
A	Illinois	34.9%	45.20%	12
A	California	43.6%	40.75%	13
M	Pennsylvania	28.7%	38.75%	14
A	Maine	18.3%	36.00%	15

Source: Whitney Economics (2023)

It is important to note that Massachusetts, Colorado and Nevada skew higher due to cannabis tourism. In fact, without cannabis tourism, Massachusetts would rank 8th or 9th. As other New England states have legalized the recreational use of cannabis, Massachusetts will likely see this ranking drop considerably (Whitney Economics, 2023). According to industry experts, typically, the more outlets and access and the lower the price, the greater likelihood of legal participation. From a public safety perspective, more access is better than less so that buyers do not turn to the illicit market for their cannabis supply (Wadsworth, Driezen, & Hammond, 2021; Leafly, 2022).

Together, Tables 1-3 provide an overview of the market saturation for Massachusetts compared to other states in the U.S. These findings show that the market is not currently saturated and there are significant growth opportunities in access, sales and revenue (Whitney Economics, 2023).

Retailers need to generate approximately \$2.0 million to \$2.5 million in order to be economically viable and sustainable. At \$4.0 million in revenue per retailer in Massachusetts, even with potential downside risks associated with demand loss to other states, there is room for more retail operators in the state without running the risk of putting operators under economic stress (Whitney Economics, 2023). See Table 4 for details.

Table 4: Average Revenue per Retailer for Massachusetts Compared to the U.S., 2022

State	2022 Revenue	Number of Retailers	Average Revenue per Retailer	Rank
New Jersey	\$536,449,185	21	\$25,545,199	1
Rhode Island	\$69,804,557	6	\$11,634,093	2
Illinois	\$1,790,298,009	183	\$9,783,049	3
Utah	\$135,520,646	14	\$9,680,046	4
Pennsylvania	\$1,509,684,260	161	\$9,376,921	5
Arkansas	\$273,474,225	33	\$8,287,098	6
Arizona	\$1,373,147,004	169	\$8,125,130	7
District of Columbia	\$56,326,675	7	\$8,046,668	8
Hawaii	\$62,946,419	8	\$7,868,302	9
New Hampshire	\$29,916,220	4	\$7,479,055	10
Connecticut	\$125,929,332	18	\$6,996,074	11
Minnesota	\$87,356,886	14	\$6,239,778	12
Maryland	\$507,975,613	102	\$4,980,153	13
Massachusetts	\$1,800,814,903	455	\$3,957,835	14
Florida	\$1,781,423,963	488	\$3,650,459	15

Source: Whitney Economics (2023)

Conclusion

While the market may appear to have significant demand, there are risks associated with the anticipated deployment of new cannabis regulatory programs in other New England states. More will need to be done to educate Massachusetts consumers to participate in the legal, regulated market, to balance the supply with the demand, and to maintain a general equilibrium so that operators can remain economically viable. Supporting business and job development and sustainability is a more important focus at this stage of the market's development than concerns over the risks of the market becoming saturated (Whitney Economics, 2023).

References

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APPENDIX



Biography for Beau Whitney, Whitney Economics

Beau Whitney, Cannabis Economics, Operations and Supply Chain Expert

Beau Whitney is the founder and Chief Economist at Whitney Economics, a global leader in cannabis and hemp business consulting, data, and economic research. Whitney Economics is based in Portland, Oregon.

Serving an international clientele, Beau is considered one of the leading cannabis economists in the U.S. and globally. His applications of economic principles to create actionable operational and policy recommendations has been recognized by governments, and throughout the economic, investment, business communities. In 2022, Beau presented data and insights about cannabis and hemp economics at the United Nations.

His white papers analyzing the adult-use, medical and industrial cannabis markets have been referenced in the Wall Street Journal, Washington Post, New York Times, USA Today, the Associated Press, as well as in leading cannabis industry publications.

Beau Whitney is a member of the American Economic Association, the Oregon chapter president of the National Association for Business Economics, is a member of multiple regulatory advisory committees throughout the U.S. and participates on the Oregon Governor's Council of Economic Advisors.

Beau has provided policy recommendations at the state, national and international levels and is considered an authority on cannabis economics and the supply chain.