An Economic Analysis of the Current Medical and Future Adult-Use Cannabis Market in Hawai‘i

December 19, 2025

Prepared For:
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Report Citation: Cunningham, G., Slade, M., & Fox, S. (2025, December 19). An economic analysis of the current medical and future adult-use cannabis market in Hawai‘i. Cannabis Public Policy Consulting.

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Acronyms

Acronym	Definition
BRFSS	Behavioral Risk Factor Surveillance System
CBD	Cannabidiol
CDC	Centers for Disease Control and Prevention
CI	Confidence Interval
CPPC	Cannabis Public Policy Consulting LLC
DOH	Hawai‘i Department of Health
DUIC	Driving Under the Use of Cannabis
GET	General Excise Tax (Hawai‘i)
IRB	Institutional Review Board
NSDUH	National Survey on Drug Use and Health
OMCCR	Office of Medical Cannabis Control and Regulation
RDCOS	Regulatory Determinants of Cannabis Outcomes Survey
SAMHSA	Substance Abuse and Mental Health Services Administration
TAXT	Transient Accommodations Tax (Hotel tax)
THC	Tetrahydrocannabinol
VOC	Volatile Organic Compound
WTP	Willingness-to-Pay

Executive Summary

This report, developed by Cannabis Public Policy Consulting, presents an evaluation of Hawai‘i’s medical cannabis program and assessment of the current dispensary licensing framework, with an emphasis on patient access, along with an economic and policy analysis of Hawai‘i’s potential adult-use cannabis market and its impacts. The research was commissioned to provide an external evaluation of current cannabis demand (including medical, gray, and illicit markets), forecast future market dynamics under adult-use legalization, and explore associated policy implications including taxation, licensing, and broader cannabis economic development.

The research involved conducting multiple surveys among Hawai‘i’s adult population aged 21 and older, tourists, medical cannabis patients aged 18 and older, and legacy farmers. Results of these surveys were applied to statistical models to estimate demand and supply needs. Aggregated data from the medical cannabis licensed dispensary sales were used to inform modeled estimates. The following are the key findings from the research.

Current Market Demand and Revenue Potential

- The current total monthly (past 30-days) cannabis market in Hawai‘i across all sources, including medical, gray, and illicit sources, is estimated to range between $16.5 million and $32 million.
- Within this total, the legal medical cannabis market currently generates approximately $5.3 million per month, representing roughly 33% of the initial total market share. Notably, the medical cannabis population in the state represents roughly 25% of all past-month cannabis consumers in the state, lending further confidence to these conservative estimates.
- The Hawai‘i medical dispensary seed-to-sale information system, BioTrack, recorded $5,336,700 in medical cannabis sales in a month, while our survey-based estimate totaled $5,409,500, a 98.6% match. Based on these estimates, Hawai‘i’s medical dispensary system captures 86-87% of all dollars spent by medical cannabis patients. In other words, the regulated medical market accounts for the vast majority of patient spending and functions as the primary channel through which patients obtain cannabis products.

- Should Hawaii choose to legalize adult-use cannabis, by year 5 the total cannabis market across all sources is projected to reach $59-95 million per month, or $46-90 million per month when adjusting for expected consumer participation under a 15% total tax rate.

Tourism as a Driver of Future Adult-use Demand

- Tourists are projected to contribute an additional $11.5 million per month at minimum to Hawai‘i’s total cannabis demand under an adult-use market. This figure is considered a constant minimum in this analysis but is likely to vary based on seasonality.
- Domestic tourists will be the main drivers of the tourist market. Based on survey responses, domestic tourists are willing to spend an average of $124.65 per trip on cannabis products, while international tourists are much more conservative in their reported willingness to spend, at an estimated $12.46 per trip.
- There is anticipated to be minimal loss from Japanese tourists, and gains from Canadian tourists that indicated they would are likely to visit Hawai‘i in the future. Perception data from both surveys show that the majority of respondents (57.5% in Japan and 64.5% in Canada) reported that adult-use legalization would have no influence on their decision to visit Hawai‘i. After balancing the small share who say legalization would make them more likely to visit against those who say it would deter them, the projected net effect is expected to be modest among those anticipating a future visit. In other words, cannabis policy is not a decisive factor in travel decisions for most respondents in either Japan or Canada.
- A separate analysis using Guam tourism data suggested that adult-use legalization did not lead to a decline in visits from Japanese or South Korean travelers. For each group, Guam tourism data before and after legalization in April 2019 was used to statistically test the association of adult-use legalization.

Adult-Use Retail Infrastructure Needs

- Hawai‘i is estimated to require approximately 65 retail outlets statewide at minimum in the first year of adult-use sales to meet expected demand from adult-use consumers, medical patients, and tourists. This estimate is derived by calculating total projected Year 1 demand in dollars and dividing it by the historical average annual sales per medical cannabis retail outlet (2019-2024), thereby preserving existing levels of market competition while scaling capacity to match aggregate demand.
- The analysis assumes Hawai‘i will follow best practices from other states by allowing both medical and adult-use sales through the same retail locations.

Adult-Use Cultivation Infrastructure Needs

- Hawai‘i will require a substantial expansion of cultivation capacity to meet adult-use, medical, and tourism demand. The total production needs modeled using BioTrack plant efficiency data from the medical market averages approximately 117,500 plants harvested and cured annually, or 9,700 plants harvested and cured every month.
- Hawai‘i will need between 17 and 67 indoor cultivation facilities (assuming 0.5–2 sq ft per plant) or between 47 and 376 outdoor facilities (assuming 4–8 sq ft per plant). The final mix will be determined by regulatory decisions on indoor vs. outdoor canopy allowances.
- Robust production management authority will be essential, including the ability to scale canopy sizes, issue or reserve cultivation licenses, and deploy moratoriums to prevent oversupply, market destabilization, or illicit market diversion.

Adult-Use Taxation Sensitivity and Policy Implications

- Holding all else constant, a 15% tax rate as a function of total price (i.e., GET included) would be taxation revenue maximizing.
- A 10% tax rate is optimal for jurisdictions that wish to retain a larger portion of the legal market, while still maintaining larger comparable taxation revenues as 15%.
- For jurisdictions wishing to maximize taxation revenue, a 20% taxation rate can be applied.

Adult-Use Licensing and Equity Considerations

- Survey respondents, particularly legacy farmers and small business applicants, demonstrated low willingness-to-pay (WTP) for cannabis business licenses, indicating a strong need for affordable or waived licensing fees if diverse participation is desired.
- Related to this data point as well as other best practices and standard macroeconomic theory, jurisdictions with an interest in supporting small businesses can consider implementing flexible licensing structures, scaling opportunities, and transfer allowances to support small business longevity and exit strategies.

Medical Competition from Hemp-Derived Cannabinoids

- Medical cannabis patients spend roughly $661,000 on hemp-derived products from all sources monthly. In total, hemp-derived products make up approximately 9.5% of the total market size for cannabis and hemp-derived products every month.
- Non-patient adult cannabis consumers older than 21 spend approximately $6.17M monthly on hemp-derived products. In total, hemp-derived products make up approximately 30.9% of the total market size for cannabis and hemp-derived products every month.

Homegrown Cannabis

- At any given time, medical cannabis patients altogether are cultivating between 990-4,500 pounds of cannabis. Adult-use cannabis consumers cultivate an additional 2,200-42,000 pounds of cannabis. Given this, homegrown cannabis is a non-trivial source. However, these estimates should be approached with caution given the mostly obscure nature of homegrown cannabis. Survey responses on home grown cannabis are less reliable, and the margin of error is large.

Introduction

The following research was conducted by Cannabis Public Policy Consulting (CPPC) and procured under solicitation #P25000681, titled “Medical Cannabis Licensing & Adult-Use Market Demand Assessment”. The goals of this research are as follows:

- Assess the current demand of all cannabis markets in Hawai‘i, including that of illicit, gray, and medical
- Estimate the future demand of these markets in the context of an available adult-use marketplace, as well as the necessary supply to meet demand should cultivation licenses be limited
- Identify the barriers of access in the current medical cannabis program, and provide context into what impact legalization may have on medical cannabis patients

To conduct a comprehensive study inclusive of all necessary data points, the research team collected multiple data sets. The data sets collected, analyzed and used in this report are as follows:

1. A sample of adult cannabis consumers across Hawai‘i* (n= 233)
2. A sample of registered medical cannabis patients* (n= 805)
3. A sample of past and potential tourists of Hawai‘i across Japan (n=1,009)
4. A sample of past and potential tourists of Hawai‘i across Canada (n=1,004)
5. A sample of past and potential tourists of Hawai‘i across the United States* (n=489)
6. A sample of cannabis consumers across Hawai‘i with an experiment regarding tax sensitivity* (n=255)
7. A sample of Hawai‘i legacy farmers (n=15)
8. Hawai‘i Department of Business, Economic Development, and Tourism visitor data
9. Guam Visitors Bureau visitor data
10. Seed-to-sale retail data from BioTrack for years 2019 to 2024 (n=6,881,020)
11. Seed-to-sale cultivation data from BioTrack for years 2019 to 2024 (n=664)

**Indicates the survey is an augmented or tailored version of CPPC’s Regulatory Determinants of Cannabis Outcomes Survey.*

Data collection for all surveys began approximately on January 19, 2025. Final data collection across all survey samples was March 2025. Japan and Canada population samples were obtained in October 2025.

Summary of Methodology

CPPC administers the Regulatory Determinants of Cannabis Outcomes Survey (RDCOS)[1], one of the largest and most frequently issued cannabis surveys in the nation. Using applied behavioral methodology within the proprietary survey logic to quantify consumer behavior, we capture demand and evaluate the impacts of policies across over 200 market, public health, and economic outcomes. The RDCOS is one of the only surveys available on the market with real-time data collection that:

- Uses a behavioral science approach to understand cannabis consumption behaviors and patterns
- Evaluates the efficacy of individual policies
- Identifies and tailors key performance indicators for state-specific markets
- Measures outcomes at the local, state, and national level for appropriate benchmarking, trend analysis, and predictions.

To accomplish this research, CPPC collaborated with the Hawai‘i Department of Health (DOH) Office of Medical Cannabis Control and Regulation (OMCCR) to tailor the standard RDCOS format to include the state’s research goals and unique policy environment. The RDCOS, and its many iterations for populations of interest, is hosted on Qualtrics[2], a leading online survey platform with customizable logic to ensure validity and accuracy in participant reporting.

The RDCOS was determined exempt by the Institutional Review Board, BRANY IRB.[3] BRANY is registered per 45 CFR 46 Subpart E and 21 CFR 56.106 (Registration #IRB00000080 and #IRB00010793). The Hawai‘i legacy farmer survey and the tourism surveys, distinct from the RDCOS, was determined not to require IRB review, as the purpose of this data collection is not to contribute to generalizable knowledge and did not collect any potentially identifying information. The medical cannabis patient survey was approved by Hawai‘i Department of Health’s IRB, as it was administered through the Department of Health’s patient registration list.

Recruitment for the population surveys, which use an augmented or tailored version of the RDCOS, is conducted through Cint’s Lucid Community Research Panels to recruit in Hawai‘i, nationwide, and within Canada and Japan.

Cint[4], a reputable vendor whom our researchers have historically worked with, facilitate diverse, large-scale, and rapid recruitment of participants by offering incentives provided by participating panel vendors, confirming samples mirroring representative population frames and quick response turnaround times.

All surveys are hosted in Qualtrics, which allows the CPPC research team to maintain respondent anonymity and adhere to IRB protocols and National Institute of Standards and Technology standards. Cint staff receive only a secure Qualtrics survey link, which is distributed through their vendor portals. As some surveys contain questions that prompt responses of sensitive information, CPPC ensures compliance with all confidentiality protocols, data security and management procedures, and requires that all staff analyzing data hold valid certifications in confidentiality and human subject research from the U.S. Department of Health and Human Services.

Limitations

This research has several limitations, including a four-month performance period constraining recruitment procedures and data collection efforts. Given the short timeframe and robust research scope requiring multiple samples, probability-based address or SMS sampling was not feasible. Instead, the CPPC research team used convenience sampling procedures, which is a common practice used in similar market research. Convenience samples are not organically representative of the population, often reflect a self-selection bias, and can over or underrepresent demographic subgroups resulting in biased estimates when compared to probability-based sampling. To accommodate for this, CPPC researchers weighted the sample using weights derived from iterative proportional fitting, commonly referred to as “raking”, to reflect the population of past month cannabis consumers in Hawai‘i for the population surveys, as well as other states population data wherein necessary.

CPPC applied demographic and behavioral estimates from the 2020 and 2021 Behavioral Risk Factor Surveillance System (BRFSS) survey conducted by the Centers for Disease Control and Prevention (CDC) and the Hawai‘i Department of Health for this raking procedure. To derive marginal proportions for use in raking from these surveys, five variables were used: age group, race, sex, income group, and number of days cannabis was consumed in the past month. Total population estimates for the total size of the target population of past-month cannabis consumers in Hawai‘i were derived from 2023 state estimates from the National Survey on Drug Use and Health (NSDUH) directed by the Substance Abuse and Mental Health Services (SAMHSA). A notable limitation is that these data are from multiple years prior to our collection of survey data (2023). If underlying demographic subgroups or consumption of cannabis days have shifted significantly in either direction, our estimates will contain biases.

However, it is very unlikely that there has been a drastic shift in only 2 years, as BRFSS trends show stable estimates year over year. It should be noted that BRFSS and NSDUH show different population level estimates provided their different sampling methodologies.

A second limitation is that, because Hawai‘i’s demographic representation is incomparable to any other state in the U.S., recruiting a large sample of past-month cannabis consumers proved to be a unique challenge in our brief recruitment period. According to the U.S. Census Bureau Vintage 2023 State and County population characteristics report[5], Hawai‘i’s population has an older median age and a larger share of residents above 65 years old compared to the United States average. Prevalence of cannabis consumption among older populations is lower on average compared to younger generations. Relatedly, cannabis consumption volume is also likely to be less for older populations.[6] Additionally, nearly 18% of Hawai‘i’s population are immigrants, serving as a prominent gateway for immigration from Asia and the pacific.[7] Approximately 37.8% of Hawai‘i’s population identifies as Asian alone. The largest Asian ethnicities in Hawai‘i are Japanese, Filipino, and Chinese. Other prominent Asian ethnicities in Hawai‘i include Hmong, Cambodian, Vietnamese, Asian Indian, and Indonesian. Asian ethnicities are less likely to consume cannabis, which may be attributed to cultural values.[8]

CPPC offered translation for nearly 40 languages in our survey to increase recruitment. To accommodate the slower response rate, we increased incentive costs for samples that required more responses for statistical power to up to $15, nearly 3 times the standard rate for a 15-minute survey. To remove potential responses by bots, we utilized multiple bot-check features including but not limited to validated attention check questions in the survey and removal of respondents with low RE-CAPTCHA scores. We also performed distance formulas to remove suspicious outliers in our data cleaning efforts.

As with any economic and statistical modeling in an underdeveloped field, the models deployed for predictions use justifiable assumptions based on sample data or auxiliary data sets. For example, predicting sales in a state that does not yet have an adult-use market and is geographically isolated from neighboring states with cannabis markets requires assumptions related to future behaviors of consumers and businesses. Moreover, predicting necessary retail outlets or supply based on predictive sales information requires assumptions. All assumptions used in this analysis are documented in this report.

Finally, many of the research questions posed in the RFP are not quantifiable by traditional economic models without more information or data that do not yet exist and are instead treated as policy-oriented questions. These include “impact” questions related to licensing fees and licensing classes. For questions that could not be identified by quantitative modeling at this time, the CPPC research team prepared qualitative reasoning based on their expertise implementing cannabis laws around the country.

Results

Evaluating the Impact of Hawai‘i’s Current Medical Cannabis Regulatory Framework

CPPC conducted an evaluation of Hawai‘i’s existing medical cannabis program framework, focusing on two key areas: 1) assessing how effectively the current system supports patients’ access to medical cannabis and 2) examining the impact of the regulatory framework on the operational and financial viability of licensed medical cannabis dispensaries. Leveraging data from the RDCOS and patient survey and qualitative policy analysis, this section offers evidence-based insights into the strengths and shortcomings of Hawai‘i’s medical cannabis program. The goal is to inform thoughtful policy and programmatic improvements that enhance patient access and support dispensary viability.

Access to Dispensaries and Perceptions About Supplies

Table 1. Patient Perception of Medical Cannabis Supply

Access to Medical Cannabis Supply	Proportion	Confidence Intervals (95%)
Plenty of Supply	68.19%	52.49% - 83.89%
Limited Supply	27.61%	12.44% - 42.77%
Little Supply to No Supply	4.20%	0.00% - 10.98%

Table 2. Distance to Dispensaries and Average Travel Time

Island	Time to Medical Dispensary (in minutes, by car or airplane)	Confidence Intervals (95%)
Hawai'i	29.64	24.98 – 34.31
Maui	23.09	15.01 – 31.17
Kauai	25.16	19.19 – 31.13
Oʻahu	22.98	17.04 – 28.92
Molokaʻi	69.94	*
Lanai	90	*

**indicates not enough data was collected for a confidence interval.*

Patients (n=89, n=727) were asked about their access to medical cannabis and the average time they spend traveling to their nearest dispensary. The majority of patients (68%) reported that there is “plenty of supply,” while fewer than 5% indicated experiencing “little supply to no supply.” However, over a quarter of patients (27.6%) noted that supply is “limited,” suggesting that while access is generally adequate, there may be gaps in supply, product variety, or regional availability.

Patients from Hawaiʻi, Maui, Kauaʻi, and Oʻahu reported average travel times to their nearest dispensary ranging from approximately 23 to 30 minutes, suggesting generally reasonable geographic access on the most populated islands. In contrast, patients on Molokaʻi and Lānaʻi report substantially longer travel times, averaging nearly 70 minutes and 90 minutes, respectively. Responses for Molokaʻi and Lānaʻi were limited in comparison to the overall observations for other islands. Confidence intervals were not produced for these two islands(*). These disparities highlight potential access challenges for patients on smaller, more remote islands. The burden of travel in these areas may deter consistent medical cannabis use and lead to patients obtaining cannabis from alternative sources.

Regulatory Considerations to Support License Medical Cannabis Operators

Hawai‘i’s medical cannabis program is highly regulated to protect patient safety and public health. While several elements of the program are essential to any well-regulated medical cannabis program, such as laboratory testing, track-and-trace requirements, and patient registration mandates, there are several regulatory and economic factors that may serve as a constraint to the viability of licensed operators. While many of these factors are imperative for any regulated cannabis program, they can be refined through policy reform to ease the burden on operators without compromising public health or patient access.

License Fees. Licensed operators must pay an annual renewal fee calculated based on factors such as plant count, number of facilities, and market conditions. For some businesses, this fee can exceed $100,000 annually, a substantial cost that applies regardless of patient volume or yearly sales. To support sustainability in the medical market, Hawai‘i could consider lowering license fees. Additionally, simplifying and streamlining the fee structure could reduce administrative burdens for both licensees and the state. However, the current medical cannabis license fee structure is designed to recover the operating costs of the Office of Medical Cannabis Control and Regulation (OMCCR), which administers and enforces Hawai‘i’s medical cannabis program. To the extent license fees are reduced, the program would no longer be self-funded and would require partial or full support from state general funds or other tax revenues to maintain regulatory oversight, patient protections, and program operations.

Mandatory Audits. Current regulation requires dispensary licensees to annually obtain an independent financial audit from a licensed certified public accountant. This may impose a financial and administrative burden, particularly on smaller operators. The cost of hiring an external CPA each year can be substantial, and the requirement applies regardless of the scale or complexity of a licensee’s operations. As an alternative, Hawai‘i could shift to a system of random or risk-based audits, conducted at the department’s discretion. This would reduce unnecessary costs for compliant businesses while still ensuring regulatory oversight. Alternatively, the state could consider covering the cost of required audits to alleviate the financial pressure on licensees.

Impact of Other Markets on the Viability of Licensed Medical Cannabis Operators

Hemp Retailers

Even though there is no regulated adult-use cannabis in the state of Hawai‘i, consumers can purchase legal hemp-derived cannabis and alternative cannabinoid products. There is reason to believe that hemp markets, both legal and illicit, are competing with regulated cannabis markets across the country, as hemp-derived Delta-9 THC and other cannabinoids offer similar intoxicating effects at a lower cost and easier access.[9] However, to understand how consumers may use the hemp market as a substitute for a cannabis market, creating true economic competition, requires additional research.

Adults aged 21 and older who reported past-month cannabis use also reported rates of using hemp-derived products compared with registered medical patients.

These hemp-derived products contained any of the following cannabinoids: CBD, THCV, THCP, THCO, CBG, CBN, THCA, Delta 10 THC, and Delta 8 THC. Medical cannabis patients consumed , but comparable, rates of past-month consumption of products with CBD as the major active cannabinoid. A key limitation in these estimates is the relatively lower number of observations among adults 21 and older that consumed cannabis within the past month. Moreover, the survey did not inquire about hemp-derived Delta-9 THC products. Estimated market sizes by month are listed below.

Table 3. Estimated Hemp-Derived Market Size by Month among Medical Cannabis Patients vs. Non-medical Cannabis Consumers

Target Population	Estimated CBD Market Size by Month	All Other (Outside of CBD) Hemp-Derived Products Market Size by Month	Population Size	Observations
Past Month Medical Patients (Ages 18+)	$387,318.70	$274,422.70	29,780	633
Past Month Adult-Use Cannabis Consumers (Ages 21+)	$1,604,836	$4,567,636	110,456	110

Home Cultivation

On average, medical cannabis patients grew fewer cannabis plants compared to adult-use cannabis consumers and had a lower yield from growing cannabis at home. The following estimates were calculated based on reports on how much flower they yielded from one plant on average, with no assumptions over what timeframe these yields occurred. Estimates should be approached with caution for adult-use cannabis consumers, as a low number of observations reported growing cannabis at home.

Table 4. Estimated Home Cultivation Market Size among Medical Cannabis Patients vs. Non-medical Cannabis Consumers

Target Population	Average Plant Yield [95% CI]	Average Number of Plants [95% CI]	Population Size	Total Size of Homegrown Cannabis at Any Given Time [95% CI]
Past Month Cannabis Consumers (Medical Cannabis Patients)	3.88 oz [3.14 – 4.61]	0.35 [0.17 – 0.53]	29,780	2,527.58 pounds of cannabis [993.53 – 4,547.59]
Past Month Cannabis Consumers (Adults 21+)	5.91 oz [3.02 – 8.79]	0.44 [0.12 – 0.78]	110,456	17,951.86 pounds of cannabis [2,222.64 – 42,049.93]

Market Share Among All Sources

Table 5. Percent of Average Past-Month Expenditures Across All Sources of Cannabis among Medical Cannabis Patients

	Medical Cannabis Dispensaries	Free or gifted	Purchased From Friends and Family	Dealer	Online Delivery (Not Medical Dispensary)	Home grow	Co-Operatives	Other
Average Monthly Expenditures	$183.58	$2.31	$8.95	$6.69	$2.33	$4.06	$1.72	$2.44
Percent Past-Month Average Market Capture	87%	1%	4%	3%	1%	2%	1%	1%

The impact of other sources and markets on the medical cannabis dispensary system is minimal from an expenditures perspective among registered medical patients. The average monthly expenditure of a medical patient is approximately $210.13 (see Table 7). Provided this, roughly 87% of cannabis purchases in dollars are absorbed through existing licensed medical cannabis dispensaries. The second largest share of purchases come from friends or family, followed by dealer. Taken together, these findings suggest that there is little impact of other markets affecting the viability of the medical cannabis dispensary system and the medical program appears to serve patients' needs through reliable access to regulated products. Sources that are utilized less often, or only by a well-defined, smaller subpopulation (cooperatives) will appear as lower averages for the total population, even if some segments of the population utilize a given source exclusively.

Estimating Demand for Adult-Use Retail Outlets

Most states transitioning to adult-use sales leverage their existing medical cannabis infrastructure, allowing medical licensees to cultivate, manufacture, and sell adult-use products. This model assumes Hawai‘i will follow a similar pathway and therefore does not differentiate between medical and adult-use retail outlets, since the same operators are expected to serve both medical patients and adult-use consumers.

Demand is dynamic and shaped by both supply and market competition, and retail outlets function as a primary access point for consumers to obtain cannabis. As a result, the estimates in Table 6 do not reflect an “ideal” number of outlets, but rather the number needed to serve the adult-use, medical and tourism population based on projected demand and the existing retail sale distribution in the medical cannabis market. Given this fluidity, embedding regulatory flexibility into license issuance and production management will allow regulators to respond to changing market conditions and better support a stable, well-functioning regulated market.

The total number of retail outlets needed in Hawai‘i is estimated by calculating total expected demand in dollars at the end of year one across all consumer types (adult-use, medical, tourist) and dividing by the average sales in dollars per retail outlet, per year in the Hawai‘i medical cannabis market from 2019 to 2024. This estimation preserves existing levels of market competition while scaling the necessary number of outlets to meet expected aggregate demand upon the integration of adult-use cannabis consumers and tourist cannabis consumers. Once a total number of retail outlets were estimated (65), the distribution of retail outlets across islands is calculated using distributional percentages of adult-use consumers (past-month cannabis consumer distribution, BRFSS 2020-2021; lower-bound target population of past-month cannabis consumers, NSDUH 2023), medical patient consumers (Internal Hawai‘i DOH patient distribution by island), and tourism expenditures by island (Department of Business, Economic Development, and Tourism, 2023). Tourism expenditure distributions were chosen over the distribution of people visiting each island because it is assumed that tourism expenditures will better correlate with cannabis sales over the distribution of islands tourists visit. A weighted percentage (size of consuming population by consumer type) by island was calculated to give a final percentage that distributed the total number of retail outlets down to the island level. The following table lists the number of retail outlets necessary based on the unweighted estimate at the end of year one.

Table 6. Estimated Dispensaries Per Island to Meet Adult-use Consumption Demand

Island	Minimum Estimate Per Island
Lanai	1
Hawai‘i	13
Maui	12
Molokai	1
Oahu	33
Kauai	5
Total Retail Licenses Across Hawai‘i to Meet Total Demand	65

Current Monthly Expenditures of Cannabis Across All Sources of Cannabis Medical Patients and Adult Consumers

Participants were asked to report their purchasing behaviors in the past month on nine cannabis product types. For each product type, participants indicated how many units they purchased and what they paid in total for the month. Products are reported in category-specific units: grams for flower, pre-rolls, concentrates, and vapes; packages for edibles and capsules; beverages for drinks; bottles for tinctures, and units for topicals.

Medical Cannabis Patients

The following tables are the mean units (e.g., grams) followed by the mean expenditures (USD) for their current consumption patterns by each identified source for the medical cannabis patient population. The confidence intervals (CI) for these tables are 95%. As these tables demonstrate the mean (i.e., average) units and costs, it is important to note that medical cannabis patients may be spending more, or less, than what is presented here. What is shown is the combined average across the representative sample of medical cannabis patients using the direct sampling procedure for registered medical cannabis patients.

We cross validated our total market estimate for the medical dispensary data from March Biotrack seed-to-sale data. For March, Biotrack recorded $5,336,706.18 in medical cannabis sales in Hawai‘i. Our survey estimate, based on survey reported prices for the medical cannabis dispensary market estimated the market is valued at $5,409,537. Our survey estimate for the medical cannabis dispensary market is 98.64% accurate with respect to seed-to-sale figures. Based on our survey estimates in dollars, the medical cannabis dispensary market captures between 86%-87% of total dollars spent on all cannabis products by medical patients. ***In other words, the survey results closely mirror official sales records and confirm that the regulated medical market accounts for the vast majority of patient spending.***

Table 7. Total Average Units and Expenditures Procured by Medical Cannabis Patients, By Product Type Across All Sources (95% CI)

Products	Flower	Pre-Rolls	Edibles	Beverages	Concentrates	Vapes	Tinctures	Topicals	Capsules
Average Units	21.04 (15.46–26.61)	1.63 (0.57–2.68)	1.95 (1.34–2.56)	0.19 (0.08–0.30)	0.66 (0.33–1.00)	2.75 (1.52–3.99)	0.13 (0.08–0.17)	0.25 (0.00–0.50)	0.03 (0.01–0.05)
Average Expenditures	$210.13 ($179.95 – $240.31)	$113.55 ($95.14–$131.96)	$10.52 ($7.13–$13.91)	$35.68 ($28.83–$42.53)	$0.88 ($0.44–$1.32)	$9.01 ($5.72–$12.30)	$32.08 ($23.74–$40.42)	$4.31 ($2.80–$5.82)	$3.20 ($1.91–$4.48)

Medical cannabis patients predominantly spend their money on products from the medical cannabis dispensary system, resulting in the majority of total dollars being captured by the medical cannabis market. However, this does not tell the entire story. While the majority of patients obtain their cannabis products from the medical cannabis market, smaller sources (homegrown, purchasing/gifted from friends and family, dealer) make up a sizeable proportion when combined. This results in cannabis products being obtained by patients from alternative sources for a very low cost relative to the prices found in the medical cannabis market. Patients are likely using these other sources to “fill the gap” in consumption, rather than using them as a primary source. Consumers have a range from which they spend on cannabis every month. When the medical cannabis market prices for products desired reach near the edge of these boundaries, patients are likely turning to cheaper or free sources to obtain the rest of the products needed. Although the medical market captures the vast majority of patient spending, reducing per-unit prices would likely draw an even greater share of total purchases into the regulated system.

Table 8. Total Monthly Average Units and Expenditures from Medical Cannabis Patients By Product Type and Source

	Medical Cannabis Dispensaries		Free or Gifted		Purchased From Friends and Family		Dealer	
	Average Monthly Units (g)	Average Monthly Expenditures	Average Monthly Units (g)	Average Monthly Expenditures	Average Monthly Units (g)	Average Monthly Expenditures	Average Monthly Units (g)	Average Monthly Expenditures
Flower	10.06	$92.61	2.06	$1.38	2.58	$7.44	0.88	$5.40
Pre-Rolls	1.03	$9.72	0.08	$0.26	0.07	$0.05	0.16	$0.16
Edibles	1.61	$35.54	0.12	$0.55	0.01	$0.48	0.01	$0.18
Beverages	0.19	$0.89	0	$0.00	0	$0.00	0	$0.00
Concentrates	0.42	$7.58	0.02	$0.00	0.06	$0.37	0.02	$0.11
Vapes	2.29	$28.38	0.07	$0.12	0.05	$0.61	0.02	$0.84
Tinctures	0.12	$4.30	0	$0.00	0	$0.00	0	$0.00
Topicals	0.2	$3.49	0.03	$0.00	0	$0.00	0	$0.00
Capsules	0.03	$1.07	0	$0.00	0	$0.00	0	$0.00

Table 8 (Cont.). Total Monthly Average Units and Expenditures from Medical Cannabis Patients By Product Type and Source

	Online Delivery (Not Medical Dispensary)		Homegrow		Co-Operatives		Other	
	Average Monthly Units (g)	Average Monthly Expenditures	Average Monthly Units (g)	Average Monthly Expenditures	Average Monthly Units (g)	Average Monthly Expenditures	Average Monthly Units (g)	Average Monthly Expenditures
Flower	0.04	$0.96	4.6	$2.65	0.62	$1.48	0.2	$1.63
Pre-Rolls	0	$0.00	0.28	$0.29	0	$0.01	0	$0.03
Edibles	0.15	$0.07	0.04	$0.28	0.01	$0.00	0.01	$0.25
Beverages	0	$0.00	0.13	$0.00	0	$0.00	0	$0.00
Concentrates	0	$0.10	0.07	$0.09	0	$0.12	0	$0.00
Vapes	0.11	$1.13	0.01	$0.49	0	$0.06	0.12	$0.51
Tinctures	0	$0.03	0.01	$0.22	0	$0.00	0	$0.00
Topicals	0	$0.04	0.01	$0.04	0	$0.05	0	$0.02
Capsules	0	$0.00	0	$0.00	0	$0.00	0	$0.00

Adult-Use Consumers

Non-patient residents of Hawai‘i 21 years and older (n=118) were asked to report their cannabis product sources and which cannabis products they purchased within the past month. Average monthly units and monthly expenditures are reported in each table along with 95% confidence intervals. Adult cannabis consumers overwhelmingly source their cannabis products from the “other market” and the illicit market. Just a small proportion comes from the legal medical cannabis market. Upon further inspection, these small numbers are driven by former patients who source cannabis products from caregivers and cooperatives. It is possible that these cannabis products were obtained legally prior to the participant no longer being a medical patient. For purposes of these tables, former patients are included with those who have never been medical cannabis patients. Adult cannabis consumers were not asked about where family and friends obtained their cannabis products.

The medical cannabis market is grouped together for calculations involving adult-use consumers only. This includes purchases from medical dispensaries, caregivers, and co-operatives. Next, dealer as a source is grouped separately. Finally, homegrown, gifted or purchased from friends or family, non-medical delivery, and others are grouped together.

Table 9. Total Monthly Average Units and Expenditures Procured by Adult-use Consumers by Market

		Total (Mean)	Medical Dispensary	Other Markets (Mean)	Dealer (Mean)
Flower	Units (g)	25.26	1.87	14.52	8.86
	Price ($)	$77.67	$10.55	$33.22	$33.90
Pre-Roll	Units (g)	1.97	0.38	1.22	0.37
	Price ($)	$6.60	$1.46	$4.41	$0.73
Edibles	Units (g)	2.49	0.17	1.66	0.66
	Price ($)	$20.52	$2.26	$13.87	$4.39
Beverages	Units (g)	0.1	0.04	0.06	0
	Price ($)	$1.00	$0.46	$0.55	$0
Concentrates	Units (g)	1.03	0.24	0.45	0.34
	Price ($)	$5.87	$2.50	$0.70	$2.66
Vapes	Units (g)	1.32	0.38	0.84	0.1
	Price ($)	$12.35	$4.70	$6.70	$0.95
Tinctures	Units (g)	0.04	0.01	0.03	0
	Price ($)	$0.21	$0.21	$0	$0
Topicals	Units (g)	0.05	0	0.04	0.01
	Price ($)	$0.18	$0	$0.02	$0.16
Capsules	Units (g)	0.01	0	0.01	0
	Price ($)	$0.10	$0	$0.10	$0

Future Cannabis Market Sizes Across All Sources

The tables below represent the estimated current demand for Hawai‘i’s total addressable cannabis market across all consumer types and across all sources, including illicit, medical, and gray. Tourist demand numbers represent potential future demand, not past demand. Additionally, tourism surveys did not inquire about medical cannabis consumption. Tourism demand in the following estimates utilizes the lower-bound expected dollars spent as a constant. It is likely that this number will vary by month as the demographic composition of the tourism population varies by month. ***In other words, these estimates provide a conservative baseline, but actual spending will shift based on who is visiting Hawai‘i in any given month.***

The second set of estimates is weighted to reflect the expected decline in sales due to the implementation of a retail sales tax for adult-use and tourist cannabis consumers. Total market demand for medical cannabis patients is left unchanged under the assumption that patients will remain in the program and not experience a tax increase. Each estimate represents the total market size estimate multiplied by the estimated probability of participating in the market under a 15% total tax rate. The upper bound and lower bound of the estimated probability of participating in the market are applied to their respective upper bound and lower bound in market sizes (i.e. upper bound total market size multiplied by upper bound probability of participating in the market).

Market sizes post-legalization are estimated using the average growth rate in dollars across 11 U.S. states with adult-use cannabis markets. This allows us to estimate the average growth by month in dollars to sixty months.

Table 10. Total Current Cannabis Demand in Hawai‘i, Past 30-Days

Estimates	Estimated Current Total Monthly Cannabis Demand in USD for Hawai‘i Residents Age 21+ & Med Patients 18+	Estimated Tourism in USD – Constant	Total Current Monthly Cannabis Market Estimate Across all Sources in USD
Unweighted			
Lower Bound	$13,542,775.99	$7,611,099.18	$21,153,875.17
Estimate	$20,009,653.53	$7,611,099.18	$27,620,753
Upper Bound	$26,474,321.84	$7,611,099.18	$34,085,421.02
Weighted for Tax			
Lower Bound	$11,212,062.49	$5,443,458.13	$16,655,520.62
Estimate	$17,913,883.48	$6,451,167.66	$24,365,051.14
Upper Bound	$25,137,540.47	$7,084,411.12	$32,221,951.58

Table 11. Hawai‘i Adult-use Market - Sales Predictions at Market Launch and Year 5 (Month 60)

Estimates	Month 1 Sales (February 2025 - Estimated Starting Point Post Adult-Use Cannabis Legalization)	Month 60 Sales
Unweighted		
Lower Bound	$4,995,926.08	$58,920,588.02
Estimate	$6,523,213.31	$76,932,996.69
Upper Bound	$8,049,978.66	$94,939,250.30
Weighted for Tax		
Lower Bound	$3,933,546.41	$46,391,172.34
Estimate	$5,754,311.84	$67,864,782.64
Upper Bound	$7,609,881.73	$89,748,867.27

Note: Applying a uniform tax rate directly to the estimated adult-use market projections above would oversimplify underlying tax dynamics and could yield inaccurate revenue estimates. As such, this report intentionally does not produce tax revenue estimates, and any external application of a flat tax rate to these projections should be interpreted with caution.

Shifting Consumption to the Legal Market

Cannabis Cultivation and Canopy

Modeling cannabis production to meet demand is a challenging task, as supply and demand are dynamic in nature and endogenous. Because of this, traditional economic principles suggest that there is no such thing as “optimal” production/supply. Instead, supply and demand are determined in relation to one another under a given level of market competitiveness. In the case of cannabis, however, production management is an important policy given the illicit status of cannabis and the need to ensure that high competition across the industry does not inadvertently lead to regulated businesses merging their supply with illicit operations to stay financially viable.

As such, dispensary seed-to-sale data was used to model out efficiencies of current medical suppliers. In theory, the efficiency of adult-use cannabis suppliers (i.e., plants harvested, plants cured, volume of cannabis produced, manufactured and made to final sale) is likely to match that of the current medical cannabis suppliers. Notably, there is likely to be overlap between these two markets, as many medical cannabis suppliers will likely be ushered into the adult-use market.

To estimate the amount of cultivation licenses necessary for an effective market, considerations around maximum square feet and plants per square feet are necessary. Using the average plants that had been harvested and cured per year for the medical market in the BioTrack data, we created a ratio of average harvested and cured plants per enrolled medical patient across five years (2019-2024). That figure was then scaled to the entire adult-use, medical and tourism population using the demand data captured in our purchasing behavior surveys and distributional percentages by island detailed in the retail outlet section. We then examined this figure by monthly purchases.

Table 12. Seed-to-sale Average Plant Count from Current Cultivators

Medical Market Grow Efficiency from BioTrack	Number of Plants
Plant Average Year (Harvest and Cured)	117,527.40
Plant Average Month (Harvest and Cured)	9,793.95

It is currently unknown how many square feet of cultivation space the existing medical cannabis market uses to produce the reported number of plants. Such information is necessary to be able to understand how indoor and outdoor licenses may vary, as prior adult-use cannabis legislation in Hawai‘i contemplated licenses be capped at 3,500 sq ft of plant canopy for indoor cultivations, and 5,000 sq feet of plant canopy for outdoor cultivations.

If we were to use existing understanding of cultivation practices for indoor facilities, this would likely range between 0.5-2 square feet per plant. The table below represents the necessary amount of indoor cultivation facilities necessary based on these assumptions. Estimates are rounded to give exact numbers.

Table 13. Indoor Cultivation Facilities based on Square Footage per Indoor Plant

	Indoor Sq Ft Needed	Minimum Indoor Cultivation Facilities Needed
0.5 Square Ft Per Indoor Plant	**58,763.70**	17
1 Square Ft Per Indoor Plant	**117,527.40**	34
2 Square Ft Per Indor Plant	**235,054.80**	67

Currently, medical cultivators are not permitted to cultivate outdoors. Outdoor cultivation requires more square footage for a successful yield, likely to range between 4-8 square feet per plant equivalent to what is being grown indoors.

Table 14. Outdoor Cultivation Facilities based on Square Footage per Indoor Plant

Indoor Sq Ft Needed	Outdoor Sq Ft Equivalency (4, 6, 8 sq. ft)	Outdoor Cultivation Facilities Needed
	235,054.80	47
58,763.70	**352,582.20**	71
	470,109.60	94
	470,109.60	94
117,527.40	**705,164.40**	141
	940,219.20	188
	940,219.20	188
235,054.80	**1,410,329**	282
	1,880,438	376

The estimates above do not assume an optimal mix of outdoor and indoor cultivation facilities or square footage, but instead present the maximum for one category (indoor vs. outdoor) or the other. Under a production possibilities frontier framework (PPF) in microeconomics, we calculated a sliding scale that should yield the same production while maintaining a different bundle of indoor cultivators and outdoor cultivators. For example, in the above tables, for one square foot per indoor plant and an equivalence of one square foot of indoor cultivation to four square feet of outdoor cultivation, Hawai‘i can maintain 34 indoor cultivation facilities and 0 outdoor cultivation facilities or 0 indoor cultivation facilities and 94 outdoor facilities and yield a similar production quantity. Using conversion ratios below, Hawai‘i can model the optimal mix based on these estimates.

Table 15. Possibility Frontiers Framework of Cultivation Licenses

Indoor Sq Ft Needed For 1 plant per 1 sq ft	Indoor Cultivation Facilities	Outdoor Sq Ft Equivalency (1 sq ft indoor = 4 sq ft outdoor)	Outdoor Cultivation Facilities	1 Outdoor Cultivation Facility is equal to	1 Indoor Cultivation Facility is equal to
117,527.40	33.57926	470,109.60	94.02192	0.35714289	2.79999976

Production Management Policies

Production management policies refer to the authority granted to the regulatory agency to adjust total industry production, either increasing or decreasing production if market conditions warrant, to respond to shifts in supply and demand. These policies may be as simple as a scaled approach to licensing, wherein the agency may reserve a number of licenses from their total market licenses for future allocation. This is commonly used in cannabis, as it allows for competition to evolve upon new entrants. Additionally, it allows for the ability to more strategically place licenses in areas where "cannabis desserts" emerge.

Another production management policy is the ability to scale up cultivation volume for licenses. Scalability is vital for cultivators to maximize efficiency and operate viable businesses. As cannabis is an agricultural commodity, returns on investment often benefit from economies of scale. Given the cost intensive nature of starting a cultivation facility, production is typically increased over time. Many smaller cultivators may choose to start with a smaller license with limited canopy and increase to a larger license alongside total market growth. Similarly, cultivators with financial means may select a license with a large canopy and only operate at a limited capacity. Policies that give regulators the ability to permit canopy growth are an important element of production management. One model of this requires that the cultivator be able to provide proof of a certain percentage (e.g., 80%) of their total canopy as successfully sold.

The most common production management policy is the ability to readily issue a moratorium on licensing. Moratoriums, the suspension of licensing for a defined period of time, are protective measures for existing operators, limiting market saturation and helping stabilize elements such as pricing or business sustainability. This is especially relevant in states with low population density and consumption rates, like Hawai‘i.

Environmental Impact of Cannabis Cultivation and Manufacturing

Cannabis cultivation and manufacturing pose a range of environmental challenges in Hawai‘i, where unique ecological and infrastructure constraints amplify typical impacts observed in other states. For example, cannabis is a water-intensive crop. Estimates indicate that a single outdoor cannabis plant can use approximately 5–6 gallons of water per day during the growing season.[10] In Hawai‘i, where water resources are increasingly stressed due to climate variability, this demand for water may pose risks to native ecosystems. For indoor grows, plants can consume more than 2,000 liters of water per 2.2lbs of cannabis produced, depending on systems and humidification approaches.[11] As the number of licensed cultivators increases, cumulative water draw from municipal or other water sources may affect stream flow and availability for other crops or households.

Indoor cannabis cultivation is extremely energy-intensive due to high demands for lighting, HVAC systems, and dehumidification. According to a study published in Nature Sustainability, cannabis production in the U.S. can emit up to 5,200 kg of CO_2-equivalent per kilogram of final product, depending on climate and production methods.[12] Given that Hawai‘i’s energy grid is heavily reliant on imported fossil fuels, cannabis grown indoors may contribute to higher greenhouse gas emissions. As more licenses are issued and indoor grows expand, the cumulative energy burden could be significant and increase carbon emissions. Proper regulations and lessons learned from states like California may be vital in protecting Hawai‘i’s environment.

Cannabis cultivation releases terpenes, which can contribute to ozone formation. Studies in Colorado and California have shown that volatile organic compounds (VOCs) from large-scale operations can meaningfully affect regional air quality.[13] Additionally, indoor cultivation and manufacturing operations that rely on high-energy lighting and CO_2 enrichment may generate combustion-related emissions when their energy is sourced from fossil fuels. In Hawai‘i’s sensitive regions, air quality management regulations may be useful for extraction labs, more specifically.

Cannabis cultivation and processing generate substantial and often hazardous waste, including plant waste, solvent waste from extraction processes, and packaging waste. Notably, plant waste will likely be rendered useless for operators, and solvent waste is considered hazardous. Both require regulations to ensure safety in their disposal. Packaging waste may increase plastic waste in the state, as packaging is typically required to be child-sensitive and single-use. This may be a concern for landfill capacity, dependent on the current state of Hawai‘i’s landfills. However, this has not been a significant issue attributed to the cannabis industry in other states.

As the number of licenses increases, the cumulative environmental impacts become more pronounced. Higher electricity demands in isolated grid regions are very likely to happen and should be considered thoughtfully when planning for a robust adult-use program. Requesting that licenses prepare valid energy and water mitigation plans may help Hawai‘i align cannabis market growth with its environmental goals.

Cannabis Taxation Experiment

The type of taxation (i.e., excise tax, cultivation tax, sales tax) and where along the supply chain the tax is levied is an important element of cannabis policy. However, the central question is determining the total tax rate that minimizes negative externalities, such as shifting demand away from the regulated market, and maximizing positive externalities, such as discouraging adverse consumption. Balancing these policy tradeoffs is key to establishing a well-regulated, social welfare-maximizing cannabis policy.

Tax is a function of total price, and cannabis consumers are particularly price sensitive. As such, to identify a final tax rate (i.e., a tax that, should it be broken up across the supply chain, is the compounded total) that consumers are willing to pay as a function of overall price for a unit of cannabis, we conducted an experiment for in-state residents. Approximately 255 individuals participated in this experiment. First, participants assessed a cannabis product and responded with how much they were willing to pay for the product from a dispensary. Second, participants were randomized into one of five tax conditions: 0%, 5%, 10%, 15%, or 20%. Finally, participants were asked if they would purchase that cannabis product from a dispensary with an updated price that included the tax portion they were randomized into. For example, a participant who indicated they would pay $10.00 for the shown cannabis product would then see a final sale price reflecting their assigned tax rate (e.g., $12.00 at a 20% tax rate). They were then asked if they would purchase this product from the adult-use cannabis market or purchase different cannabis products elsewhere.

Multivariate logistic regression models were employed to observe the likelihood of purchasing cannabis from the regulated adult-use market at different tax rates, on average. Models included controls such as frequency of cannabis use (past two years, past year, past month, etc.), log household income, and willingness to pay for one gram of cannabis. All participants were shown the same picture of cannabis flower with the same description about its product characteristics. Participants were asked to report how much they would be willing to pay for a cannabis product they were shown. Once the treatment was administered, the participants' reported amount in dollars was multiplied by the treatment tax rate condition a participant was randomly assigned to. A continuous indicator variable was created by grouping the treatment conditions together to investigate the average tax slope for the model over the range of assignments. ***Holding all else constant, the tax rate indicator was statistically significant and inversely related to the likelihood of purchasing cannabis in the regulated market on average ($p < .05$).*** In other words, as tax rates increase, consumers are less likely to purchase cannabis from the regulated market. No other variables reached significance.

An expected tax revenue variable was generated that indicated the multiplication of the willingness to pay by the tax rate for each observation (a $10.00 willingness to pay, a 20% tax rate, and a $12.00 final sale price would generate $2.00 in tax revenue). To estimate uncertainty in our estimates, Monte Carlo simulations were employed to generate the likelihood each observation would participate in the market and the expected tax revenue for each observation, as well as upper and lower bound confidence intervals for both variables, based on simulations of model covariates. Expected tax revenue was then multiplied by the probability of participating in the market to create a Laffer curve. In our scenario, a cannabis market, the most efficient (optimal) tax rate will be indicated by the point that reaches closest to the top right-hand corner of the graph (maximum expected tax revenue and 100% market participation). Below is a graphical representation of the model with the expected tax revenue per cannabis product purchase on the y-axis and the predicted probability of purchasing the product in an adult-use cannabis market in Hawai‘i. ***The optimal total tax rate in our experiment is 15%.*** While unlikely, it is possible to garner the same expected tax revenue at a 15% total tax rate as a 20% total tax rate, while likely maintaining a much higher level of market participation.

These results are constrained by important limitations. There were limited conditions (only five tax rates) and one cannabis product, rather than a variety of different cannabis products. Final assessments and practical effects of the tradeoff between tax rate and purchases outside of the regulated adult-use market will be subject to empirical and causal assessment of the reported, in practice, purchasing behaviors of an active adult-use cannabis market rather than hypothetical pre-market experiments.

Figure 1. Expected Tax Revenue and Predicted Probability of Market Participation

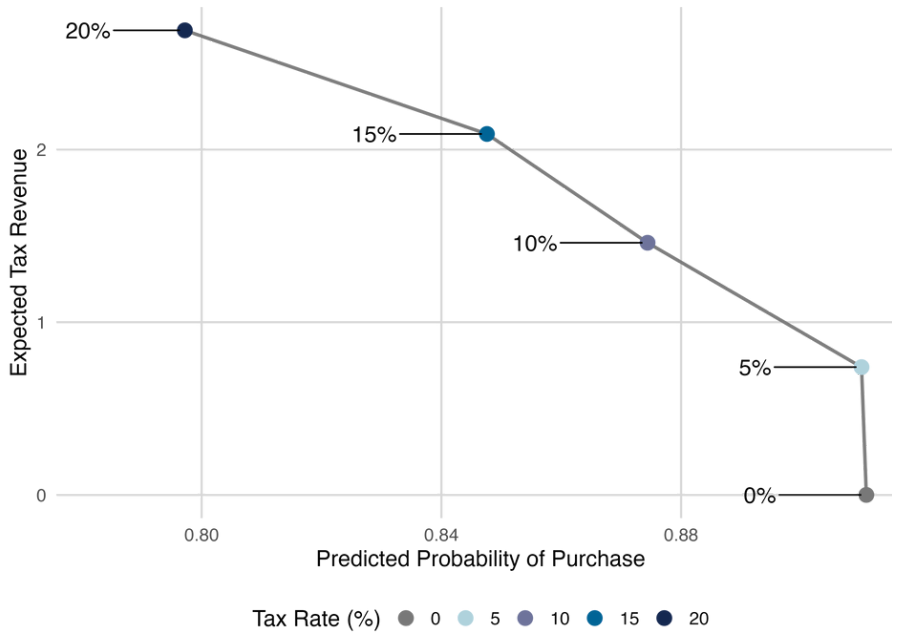
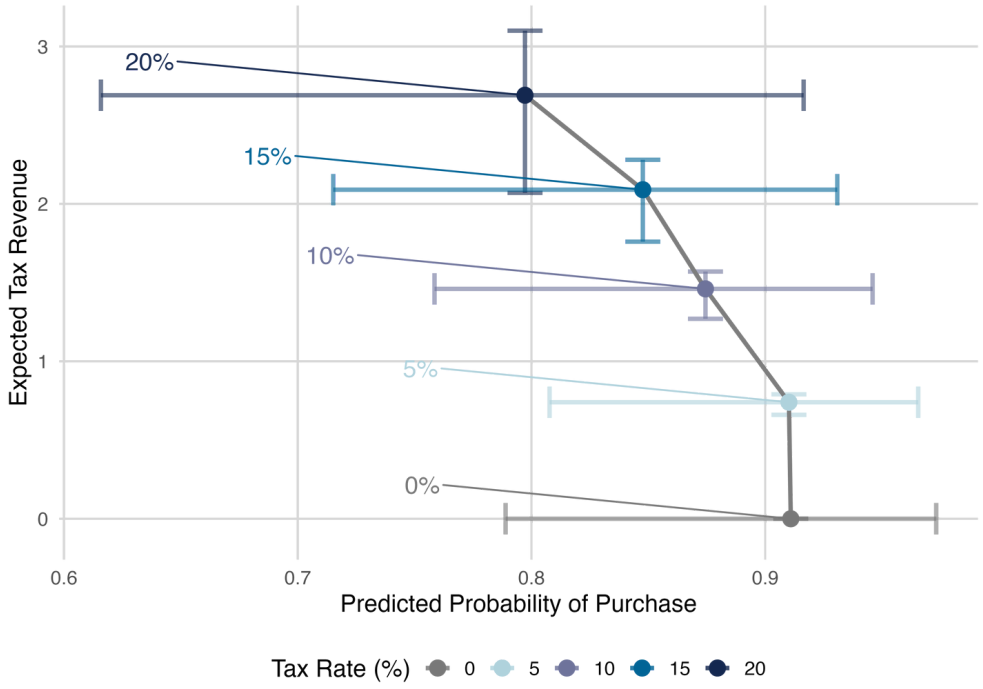


Figure 2. Expected Tax Revenue and Predicted Probability of Purchase



Cannabis Taxes in Other Adult-Use States

While the preceding section explored consumer sensitivity to various tax rates through experimental design, understanding where taxes are levied within the cannabis supply chain is also important to consider in the broader policy conversation. Retail-level and wholesale/excise-level taxes are the two primary forms of cannabis taxation, each with distinct structures, administrative burdens, and market effects. The placement of taxes within the supply chain can influence price transparency, compliance costs, revenue volatility, and the distribution of tax burdens across producers, retailers, and consumers. In practice, many states adopt a layered approach, applying taxes at multiple points along the supply chain to balance fiscal and regulatory objectives. The following sections outline the structure and implications of retail-level and wholesale/excise taxes, including how they function in different states and the tradeoffs they present for states seeking to maximize revenue, reduce diversion to illicit markets, and align tax policy with broader public health goals.

Retail-level taxes, most commonly structured as ad valorem taxes on the final sale price, are the most visible form of cannabis taxation for consumers and are frequently used across adult-use states. These taxes are typically levied at the point of purchase and are often applied in conjunction with general state and local sales taxes. For example, the state of Massachusetts imposes a 10.75% cannabis excise tax on retail sales, which is layered on top of the state's 6.25% sales tax and an optional local tax of up to 3%, resulting in a potential combined retail-level tax burden exceeding 20%. Similarly, Michigan levies a 10% cannabis excise tax, which is applied alongside the state's 6% sales tax, producing a relatively straightforward dual-tax structure. Retail-level taxes have the administrative benefit of being collected through existing sales tax systems, are straightforward to calculate using retail price data, and can provide transparency in revenue collection, an advantage to both regulators and consumers.

Despite these advantages, retail-level taxation introduces policy tradeoffs that must be considered. Because these taxes are tied directly to retail prices, they can create incentives for businesses to manipulate transaction values aimed at lowering the taxable base. More importantly, these taxes contribute directly to the final price faced by consumers—an important consideration given the high degree of price sensitivity demonstrated in the prior section. In states where taxes at the point of sale are high, the higher retail prices can push consumers to buy from untaxed and unregulated sources. Additionally, retail-level taxes are typically uniform across product categories and do not vary based on product potency, limiting their utility as a public health tool. Another constraint is their sensitivity to product price compression, the decline in overall sales prices ultimately decreases taxation revenue if volume sold does not keep pace. Nevertheless, due to their simplicity and easy implementation with existing tax infrastructure, retail-level taxes remain a core component of many state cannabis tax frameworks.

In contrast to retail-level taxes, wholesale and excise taxes are levied earlier in the supply chain, most often when product is transferred between cultivators, manufacturers, and retailers. These taxes take a variety of forms, including percentage-based taxes on wholesale value, weight-based taxes, and more recently, potency-based taxes calibrated to the concentration of THC. Alaska, for example, applies a weight-based tax of $50 per ounce of flower and $15 per ounce of trim, creating a fixed and predictable tax obligation on cultivators regardless of downstream pricing. New York initially had a potency-based excise tax, charging $0.005 per milligram of THC in flower, $0.008 per milligram in concentrates, and $0.03 per milligram in edibles. The intent of this tax framework was to align tax obligations with the public health risk of higher potency cannabis products.

However, given the difficulties of calculating and enforcing a potency-based tax for both operators and government officials, New York replaced its potency tax with a 9% wholesale excise tax to “ease tax compliance for distributors” and “promote and support the expansion of the legal adult-use cannabis market.”[14] California, which previously used a tax on the "average market price" at wholesale, abandoned this approach in 2022 due to widespread concerns about administrative complexity.

Wholesale and excise taxes offer several policy advantages. By capturing revenue earlier in the supply chain, these taxes reduce reliance on retailers as the primary tax collectors. Potency- and weight-based tax structures also provide policymakers with tools to influence product development, discourage the production of high-THC products, and stabilize revenue streams regardless of fluctuations in retail prices. However, implementing these types of taxes may presents challenges. In markets that allow for vertical integration, it can be difficult to establish reliable transfer pricing for tax purposes, often necessitating the use of administrative proxies or enforcement mechanisms to prevent manipulation.

Potency-based taxes, while theoretically aligned with harm-reduction goals, require a consistent and trustworthy testing infrastructure and labeling standards—both of which remain underdeveloped in many states. These systems are critical, as potency-based tax models create financial incentives for producers to underreport THC levels to lower their tax liability. In the absence of strong oversight and inter-laboratory consistency, this can lead to lab shopping (i.e., seeking testing services that would provide desired rather than objective results) or the manipulation of test results. Without rigorous enforcement and auditing capacity, such practices risk undermining the integrity of the regulated market and distorting consumer information. Finally, any taxes levied upstream are ultimately passed on to consumers through higher retail prices, raising similar concerns about diversion to the illicit market if the overall tax burdens become too high.

Ultimately, wholesale and excise taxes offer policymakers greater flexibility in targeting specific segments of the supply chain, and when carefully calibrated, can serve as a dual-purpose tool for revenue generation and predictability and better health outcomes. However, these benefits must be weighed against administrative complexity and enforcement requirements that accompany each approach. When layered with retail-level taxes, it is important to consider that the compounded tax burden may push final prices beyond consumers’ willingness to pay for products sold in the regulated market. Generally, weight and potency-based taxation should be less vulnerable to product price compression and more robust to stable taxation revenue if the overall volume remains constant, but as is mentioned above, they are subject to other constraints.

Retail-level and wholesale or excise taxes form the foundation of state cannabis tax policy, each offering unique advantages and tradeoffs. The effectiveness of either approach depends not only on how taxes are structured, but also on how they interact within the broader supply chain. As states continue to refine cannabis taxation frameworks, striking the right balance between administrative feasibility, market stability, public health objectives, and consumer behavior will remain central to achieving long-term policy success.

Table 16. Cannabis Taxation Models Across U.S. States

Cannabis Taxes in Other Adult-Use States		
State	**Type of Tax**	**Tax Rate***
Alaska	Wholesale; Weight-Based	• $50 per ounce of flower • $15 per ounce of trim • $25 per ounce of immature flower and abnormal buds • $1 per clone
Delaware	Retail-Level; Ad Valorem	• 15% of retail price
California	Retail-Level; Ad Valorem	• 15% of retail price
Massachusetts	Retail-Level; Ad Valorem	• 10.75% of retail price
Maine	Retail-Level; Ad Valorem Wholesale; Weight-Based	• 10% of retail price • $335 per pound of flower • $94 per pound of trim • $35 per mature plant • $1.5 per immature plant or seedling • $0.3 per seed
Michigan	Retail-Level; Ad Valorem	• 10% of retail price
Missouri	Retail-Level; Ad Valorem	• 6% of retail price
Montana	Retail-Level; Ad Valorem	• 20% of retail price
New York	Retail-Level; Ad Valorem Wholesale; Ad Valorem	• 9% of retail price • 9% wholesale excise tax
Rhode Island	Retail-Level; Ad Valorem	• 10% of retail price
Washington	Retail-Level; Ad Valorem	• 37% of retail price

** Does not include local cannabis tax rates.*

Tourism Taxes

We did not conduct the tax experiment with tourists, as it is likely that tourists will be a less vital market population than that of in-state residents. Additionally, tourists are typically less price sensitive, particularly if they have no alternative source available for their desired goods. We also realize that, because of this, there may be an opportunity to use Hawai‘i’s tourism market for more revenue collections without burdening residents. Given that a tourist specific tax would likely be discriminatory, we considered how the cannabis program may benefit from high tourism zones outside of general sales.

Hawai‘i uses Transient Accommodations Tax (TAT), also known as a hotel tax. At a 10.25% base rate, these taxes on hotels, short-term rentals and lodging are significantly higher than general excise or sales taxes and are commonly referred to as a visible tourism tax. These taxes set a precedent for Hawai‘i to consider exploring a specific fee for high-tourism zones. For example, dispensary licenses located within high impact tourism zones, such as a specific proximity to a hotel or airport, may be placed at a higher fee. These zones could be established in advance of legislation in partnership with the Hawai‘i Tourism Authority.

Local Taxes

When evaluating different taxation models for an adult-use cannabis market, one critical consideration is whether to allow local taxation of cannabis businesses and to what extent. Allowing municipalities to impose their own cannabis taxes can help ensure they benefit from a new industry by collecting revenue to help fund important local services and community programs. This gives local governments a direct fiscal stake in the success of the legal cannabis industry. However, local taxation must be carefully balanced against the risk of increasing the price of cannabis beyond the point at which consumers are willing to pay for legal products. Excessive taxation, especially from layered state and local taxes, can create a large enough price disparity between legal and unregulated products. Given that cannabis consumers are relatively price sensitive, if the cost of legal cannabis is too high, they will continue purchasing from unregulated sources, thereby undermining one of legalization’s key goals of minimizing the illicit market.

There are several local taxation models that Hawai‘i can consider. One approach is to prohibit local taxation and to instead offer a distribution of state tax revenue to municipalities based on different criteria. For example, Michigan follows a model where local taxation is prohibited, but cities and counties receive revenue from the state based on how many licensed retailers operate within their jurisdiction.[15] This incentivizes local governments to allow retailers within their jurisdiction but restricts the extent to which they can benefit monetarily from the adult-use cannabis industry.

Hawai‘i could follow a similar model and allocate the tax redistribution based on similar or different criteria, such as the number of total cannabis businesses in the jurisdiction (not just retailers) or by population.

Another local taxation approach Hawai‘i could consider is to allow local governments to levy their own taxes on cannabis businesses with a reasonable cap. For example, cities and towns in Massachusetts may impose up to a 3% tax on adult-use cannabis sales at the retail level. This approach grants localities flexibility with taxation but puts guardrails up to prevent excessive taxation. A third option for local taxation would be allowing localities to tax cannabis at their discretion without state-imposed limits. This approach grants localities the most flexibility and freedom with respect to taxation but carries the greatest risk of over taxation, inadvertently leading to the continued purchasing of unregulated cannabis products.

To encourage consistent consumer participation in the regulated market, it is essential to account for how state and local taxes, alongside other regulatory costs, will ultimately affect the retail price of cannabis products. Hawai‘i’s approach to local taxation will involve inherent trade-offs between maximizing revenue, incentivizing municipal engagement in the legal market, and minimizing the persistence of illicit sales. Striking the right balance is critical to ensuring the long-term health and accessibility of the adult-use cannabis industry in Hawai‘i.

Licensing Volume and Associated Fees to Encourage Diverse and Small Businesses

The following table is the mean Willingness-to-Pay (WTP) reported by interested legacy farmers and general applicants for each license type. As the WTP are low comparative to other state license fees across the United States, reducing fees or offering fee waivers would likely have a positive impact on legacy farmers, presumably communities adversely impacted by cannabis criminalization, and smaller businesses generally.

Table 17. License Types and Mean Reported Willingness-to-Pay by All Applicants vs. Legacy Farmers

License Type	Mean Willingness-to-Pay by License Type for All Interested Applicants	Mean Willingness-to-Pay by License Type (Legacy Farmers)
Dispensary	$5,617	$16,029
Cultivation	$4,316	$3,875
Processing	$7,316	$3,025

Because there is a very limited legal avenue to provide fee reductions on race-based criteria, we did not look at the impact on what may be considered “diverse” applicants. For now, the legacy farmers are our primary area of interest for consideration as Hawai‘i aims to usher legacy farmers into a regulated environment.

Notably, legacy farmers that completed the survey (albeit very low at 15 total) responded with a far higher mean WTP for a dispensary license compared to all interested applicants at $16,029. This is nearly three times that of what all interested applicants provided in a separate survey of $5,617. At face value, this may be because it is the only area of the supply chain that they currently do not have operations for (i.e., storefront).

While WTP tasks are used as analogs for real-world purchasing behaviors, there are a series of considerations that will likely be included in the real-world purchasing of these licenses that are not reflected in this table. For example, the ability to gather funding from outside investors was likely not considered by respondents as WTP tasks implicitly assume the individual is responsible for payment alone.

This analysis is quantitively weak due to the low number of survey respondents and only serves to provide contextual information that can be considered for policy development based on the priorities of the state. Dependent on the goals of the state, adult-use regulations may consider lower licensing fees overall, with higher fee reductions based on social equity eligibility if the market will include capped licenses as it did in past legalization efforts. However, licensing fees typically cover the cost of regulatory administration (e.g. staff). Minimizing license fees likely comes at the expense of a well-staffed and efficient agency. To accommodate for this trade-off, the state may explore higher fees for new entrants, and higher waivers for those who meet the criteria of social equity with an eye toward the inclusion of legacy farmers.

Impact of Establishing Licensing Classes and Ownership Allowances

Licensing Classes. Establishing licensing classes based on the size of the business has traditionally been observed as encouraging for small businesses and diverse business participation. This is particularly true when licensing fees are reduced based on classification size, as diverse business owners traditionally experience more challenges in securing funding. The most common and impactful license type for size classification is for cultivation licenses.

Cultivation licenses based on the size of mature canopy and method of growing (i.e. indoor, outdoor, greenhouse) are commonly deployed across states with adult-use cannabis legalization to better differentiate between small, craft cultivators vs. large operators. For example, Illinois utilizes a Craft Cultivator license with 5,000 sq ft of canopy.

This license type is specifically for Social Equity applicants, which ensures the classification is being utilized by applicants who meet certain equity criteria, inherently promoting diverse participation. Importantly, Illinois, along with other states that deploy similar licensing classes, authorizes the increase in canopy up to a certain volume for these craft license types.

The ability to scale is vital for any small business, but it is particularly important for agricultural commodities. While it is important to encourage small business participation in cannabis economies, it is also vital to recognize that cannabis is an agricultural commodity with a demand ceiling and price elasticity. Small, craft cultivators may find smaller licensing classes an easier and more cost-effective entry into the cannabis sector but must have the ability to scale their production if larger cultivators are permitted to operate at scale and achieve lower costs through higher production volumes. The longevity of these smaller operators depends on several factors such as the ability to secure capital, but it fundamentally depends on the ability to compete for a price-sensitive consumer base, a factor contingent on scalability. It is because of this that, in addition to the ability to scale up from small business class licenses, there are benefits to the allowance for the transfer of licenses for diverse and small businesses.

Transfer of licenses. While most states create cannabis economies with a goal of promoting small, diverse businesses, the sustainability of small businesses in cannabis markets is extremely limited due to immense competition and demand ceilings. It has been reported that only 23% of all cannabis businesses were profitable in the last year, requiring the vast majority of businesses to run at a loss or break even.[16] Because of this landscape, as well as challenges in securing ongoing capital where traditional banking is not an option, small businesses have a higher fail rate in cannabis than large, multi-state operators. While the goal of promoting smaller businesses should always be central to any cannabis economy, allowing the transfer of license types allows for an exit plan for businesses that would otherwise close and potentially lose a significant amount of money. Importantly, cannabis companies do not have the ability to file for bankruptcy. Transfer of licenses that are specifically designed for small and diverse businesses allows larger companies to purchase their facility, and maintain their employees and operations in many cases, providing a relief valve for economically distressed business owners. Not providing this option could be devastating for the many small business owners who have self-funded their operations.

In order to authorize the transfer of licenses, it is inherent that single entities may own more than one license as it is unlikely that new entrants will be interested in a market at point of maturity and high competition.

Ownership Restrictions. Many states seek to restrict the number of licenses owned by a single entity to ensure businesses with access to capital do not create monopolies, effectively forcing out small businesses overtime. Providing ownership restrictions for licenses across the supply chain may help deter this, particularly in the launch of the system. For example, restricting vertical ownership (i.e. ownership of licenses to produce cannabis from cultivation to production, and sale) may help facilitate a more equitable participation of businesses across the supply chain. Similarly, horizontal integration (i.e. ownership of multiple licenses across one area of the supply chain) may also allow for small businesses in that area to compete in the immediate launch of the market.

However, Hawai‘i is a small state, with a small in-resident cannabis consuming population. Competition will already be substantial if there are classifications of smaller licenses vs. larger ones. As noted, having a relief valve that allows a transfer of license to an existing establishment may be of importance. To accommodate to this, the following options may be considered to promote small and diverse business participation, though **no strategy is without its flaws:**

- Instead of creating license classes based on size, consider a single class for cultivators with a small canopy for all cultivator licenses. Authorizations to increase canopy may be pursued with an annual ceiling not to exceed, based on evidence of being able to sell a certain threshold of total canopy (e.g. 80%). This could enable all entry license points to begin at a level playing field. It will, however, influence the total price of cannabis and make it more expensive in the short and medium term, which may negatively influence consumer attendance in the regulated market. However, cultivators with higher capitalization or more efficient production practices may be able to quickly lower their prices with the intent to push out the small businesses and establish consumer bases. There may be policies that could protect against this, as seen in other markets. Enforcement of this may prove a challenge.
- Establish allowances for transfer of licenses and additional horizontal integration upon market maturity (e.g. year 3 of active sales). This will allow smaller businesses experiencing trouble competing to exit. However, this may effectively allow for well-funded companies to pursue buyouts of diverse or small businesses with the intention of creating a monopoly. Transfers and ownership allowances may include parameters to protect against this.
- Establish a threshold of horizontal allowances per license type for a single entity. There may be an allowance for multiple cultivation licenses as the fail rate and financial risk is much higher for at the top of the supply chain than the bottom. Dispensaries, which have much lower operating and start-up costs, are a less-risky license type for smaller businesses, and therefore ownership may be limited more stringently for a single entity.

- Establish a threshold of vertical allowances for a single entity. While permitting a social equity license to be vertically integrated as described as a craft license type in the adult-use cannabis bills considered in Hawai‘i in 2025, conducting all activities across the supply chain requires a significant amount of capital, and is only beneficial if the canopy size of that license is large enough. If pursuing an even playing field in small canopy licenses with permissions to increase, it could be that craft licenses scale up enough to build out their own activities among the supply chain, but it is more likely they will use the existing infrastructure of other licensees, dependent on their perceived efficiency gains in either option. However, the same concept of scaling up also applies to scaling down. It may be perceived as more efficient to allow businesses to shed *future* unproductive portions of their businesses (i.e. portions of their vertical licenses) to maximize gains from trade early in the market. Additionally, the integration of the current medical operators that are all vertically integrated requires allowances for ownership of multiple license types. Limitations of this vertical ownership should not be more limited than the current medical infrastructure as that would be unequal treatment across operators of the same business nature.

Agricultural markets are extremely competitive. In the case of cannabis, they are also confined to a single state consuming population. While Hawai‘i has a promising tourism population, the market design enabling diverse and small businesses should consider the realities of this particularly limited economy. This area of policy would be best informed through stakeholder outreach paired with education on the economics of agricultural markets.

Impact of a Potential Adult-Use Market on Hawai‘i’s Medical Cannabis Program

Potential Shifts in Patient Numbers

Medical marijuana programs across the United States have seen large portions of their medical patient population dimmish with the maturity of adult-use cannabis markets. Medical patients, not unlike consumers of other commodities, need to be incentivized to remain in the medical cannabis program upon legalization of adult-use cannabis. Programs that retained medical cannabis patients did so in three ways. Ensuring that patients were given access to the products they need, providing greater or comparable access to cannabis products, or providing a lower price to obtain their medicine.

Impact on Accessibility of Medical Cannabis

When an adult-use market initiates sales, the existing cannabis supply chain that used to cater to the medical market tends to reorient toward where revenues are highest. Most states have seen a decline in registered medical patients following adult-use legalization, particularly where adult-use access is more convenient and less administratively burdensome. If Hawai‘i follows this pattern, demand for medical cannabis products could decline over time, weakening the economic incentive for operators to prioritize medical-only products. Without deliberate policy interventions, this shift could result in reduced availability of certain medical products or narrower product variety.

It is important to note that adult-use legalization does not inherently eliminate access to medical cannabis. In most markets, a subset of operators adapts by focusing on patient-only products, including higher-potency formulations, condition-specific products, inhalers, tinctures, and capsules that are less commonly offered in adult-use retail settings. These specialized operators can play an important role in maintaining access for patients with more complex clinical needs. However, the sustainability of this model depends on whether a sufficient patient population remains in the program and whether the regulatory framework includes incentives or safeguards to support continued availability of medical-only products.

Integrating the Medical and Adult-Use Cannabis Supply Chains

Should Hawai‘i legalize adult-use cannabis, a key policy decision will involve determining whether to maintain separate medical and adult-use supply chains or to integrate them. Some states, like Michigan, operate parallel systems in which cannabis is designated as medical or adult-use from the point of cultivation until final retail sale. Each pathway carries its own set of slightly different regulatory requirements, including differences in plant count limits for licensees, licensing fees, taxation, labeling standards, patient verification procedures, and more. Dispensaries can sell to both medical and adult-use cannabis products, but they must manage separate inventories and comply with differing regulatory protocols. Other states, like California, have opted for an integrated supply chain following the legalization of adult-use cannabis. In this model, cannabis remains undifferentiated throughout production, manufacturing, and distribution and is only classified as medical or adult-use at the point of sale, where it is subject to different retail taxation requirements.

Integrating the medical and adult-use supply chains offers several potential advantages, including streamlining operations for licensees, reducing redundant compliance costs, and allowing greater inventory flexibility. Patients may benefit from increased product availability and lower prices due to economies of scale. From a regulatory standpoint, integrated supply chains can simplify oversight and enforcement efforts.

One potential risk of an integrated supply chain, however, is that specialized patient-centric medical cannabis products may become deprioritized in favor of higher profit adult-use products that serve a wider customer base. This can be potentially mitigated by offering incentivizes to operators that produce specialized medical-only products or reserve a portion of their in-store inventory for these products.

Incentives for Businesses to Manufacture and Dispense Medical Cannabis Products

Under an adult-use legalization framework in Hawai‘i, there are several regulatory options the state can consider to ensure the cannabis program continues to prioritize the needs of qualifying patients. Without incentive, cannabis operators may deprioritize medical patients and medical cannabis products to serve the larger adult-use consumer base. Below are some policy tools Hawai‘i can consider to incentivize manufacturers and dispensaries to continue developing and stocking medical cannabis products.

Tax Incentives for Medical Products. To encourage the production and development of medical-specific cannabis products, Hawai‘i could offer tax exemptions or rebates for products designated as medical at the point of manufacturing. For example, if a manufacturing tax is adopted, medical-designated products could be exempt from the tax or eligible for a rebate. To prevent abuse of this tax incentive, the rebate should be capped or subject to frequent audits to verify reported sales volumes.

Reduced Licensing Fees. Operators that commit to designating a minimum percentage of their inventory for medical patients could qualify for a reduction in their annual license fee. Regulators should be granted flexibility to adjust the minimum inventory threshold as needed, in order to allow the program to evolve with changes in market dynamics and patient needs.

Streamlined Approvals for Medical Products. Depending on how Hawai‘i decides to structure the approval process for manufactured cannabis products, products sold exclusively to medical patients could be made eligible for expedited product and labeling review. This could incentivize the development of products specific to the medical patient population and encourage innovation among manufacturers.

Regulatory Benefits for Medical-Only Products and Patients. Like other states with both an adult-use and medical program, Hawai‘i could consider implementing certain regulatory benefits or allowances for medical cannabis products and patients. For example, cannabis products for medical patients, particularly edibles, tinctures, inhalers, and transdermal patches, could be given a higher potency limit than adult-use products, as some medical patients may require higher potency products to address their specific condition.

Additionally, patients purchasing medical-only products could be allowed to exceed the standard adult-use daily purchase limits to adhere to the needs of patients who require more products. These regulatory benefits could encourage dispensaries to sell medical products, as they would be allowed to stock specific high potency products in demand by patients and to sell more by volume to certain customers.

Recognition for Patient-Friendly Practices. Operators who adhere to certain patient-centric practices, such as reserving a certain percentage of their inventory for medical patients, manufacturing medical-specific products, hosting patient-only service hours, or maintaining patient-only cashier lines, could receive some form of public recognition by the regulatory agency to encourage their operations. This could be a seal of distinction, a certification, or a feature on the regulatory website. This could allow dispensaries to differentiate themselves in the marketplace while prioritizing the medical cannabis program.

Public Health and Safety Considerations in Retail Density

There is a growing body of literature related to the public health and safety considerations in retail density. While no study is without its flaws, there is evidence to suggest that jurisdictions where cannabis retailers were not in operation have lower cannabis consumption among youth specifically. A recent study published in the American Journal of Public Health analyzed data from over 100,000 adolescents in California. The findings indicated that adolescents living in jurisdictions that banned storefront cannabis retailers had a lower prevalence of cannabis use compared to those in areas where such retailers were permitted. However, the differences in adjusted prevalence were rather small. The study also found that greater distances to the nearest retailer and lower retailer density were associated with reduced adolescent cannabis use.[17]

Researchers at the University of Washington have conducted similar research, identifying the potential association between driving under the use of cannabis (DUIC) and cannabis sales.[18] The findings suggest a potential association between the availability of retail cannabis and impaired driving behaviors, but it should be noted that Hawai‘i has a vastly different demographic than that of Washington state. Importantly, our retail licensing figures did account for DUIC rates.

There is currently no definitive answer related to the density of retail establishments and changes in public health outcomes that may be associated with a specific density. The challenges for establishing such an ideal ratio are due to factors like illicit viability, unique state demographics and geographic variables. Such modeling could be done for Hawai‘i in advance of legalization but would require larger population sample sizes and analysis at a zip code level.

The Potential Impact of Legalization on Tourism

To better understand the potential impact of adult-use cannabis legalization on tourism in Hawai‘i, CPPC fielded surveys in two key visitor markets: Japan and Canada. These surveys included questions about respondents’ perceptions on cannabis legalization in Hawai‘i, their past and anticipated travel to the state, and whether legalization might influence their decision to visit. Those who responded that legalization would negatively influence their anticipated travel plans were asked to provide more information about their reasons.

Both surveys used online recruitment through Cint’s Global Marketplace in October 2025, with sample frame parameters set to the country’s census population. Those under the age of 21 and not currently residing in the country of interest were excluded from recruitment. Data does not represent the country’s population, as probability-based sample and framing question were not available to be able to weight for tourism. As such, the results below illuminate the potential impact that legalization may have on tourism for Japan and Canada. However, the following are exclusively perception data and should not be misconstrued as experimental that can be inferred as causation. In other words, these results show how people say they might respond, not how they will *actually* behave.

Japan Survey (n = 1009)

Of the respondents, roughly 39% had visited Hawai‘i in their lifetime. While there is no source that determines the prevalence of the Japan population that has visited Hawai‘i in their lifetime, Hawai‘i tourism data shows that Japanese tourism is strong, lending confidence to this finding.

Data from the Japan survey suggests that adult-use cannabis legalization in Hawai‘i is not a decisive factor for potential tourists. A majority of respondents have never visited Hawai‘i (59.7%), yet a substantial share expects to travel there in the future, with 16.5% saying they “probably will” and 8.1% saying they “definitely will.” When asked directly whether legalization would influence their decision to visit, most respondents (57.5%) reported that it would have no influence at all.

Among those who already anticipate visiting Hawai‘i, approximately 48% indicated that legalization would not change their plans. Based on this sample, there may be small decrease in visit likelihood from Japanese tourists currently anticipating a visit, although the subset of respondents was small.

For most Japanese travelers, cannabis legalization does not appear to be a primary driver of tourism decisions. For those who may be deterred from visiting, the reason for deterrence may be guided by perceived morality of cannabis use, as 16% of those who noted it would influence their decision to visit, irrespective of their anticipated travel plans, selected "Cannabis use is wrong" as their reason. Second leading reasons included "Cannabis consumption is not legal in Japan and makes me uncomfortable to travel to a location where this activity is legal" and "Legal cannabis makes the destination less safe to travel to."

Figure 3. Percentage of Japan Respondents that Have Visited Hawai'i in Their Lifetime

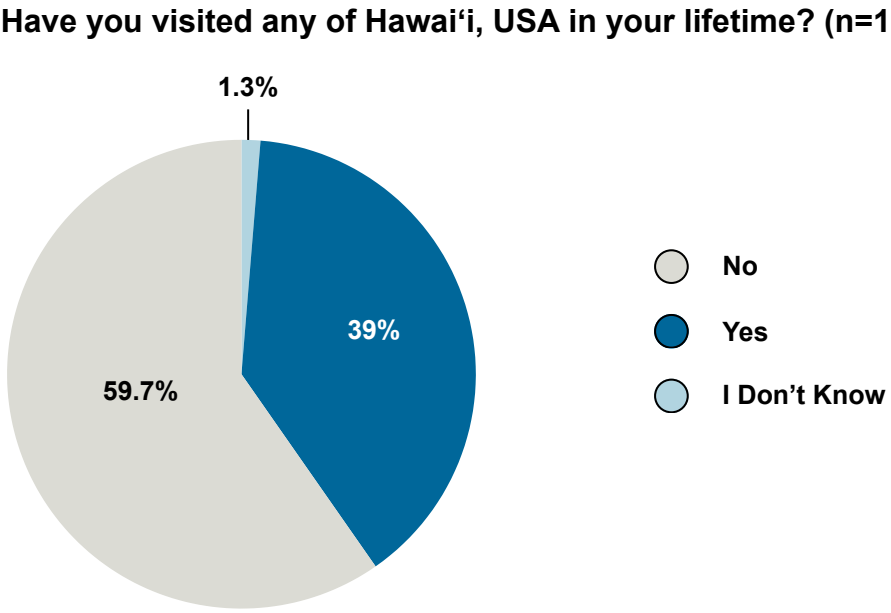


Figure 4. Percentage of Japan Respondents that Plan to Visit Hawai'i

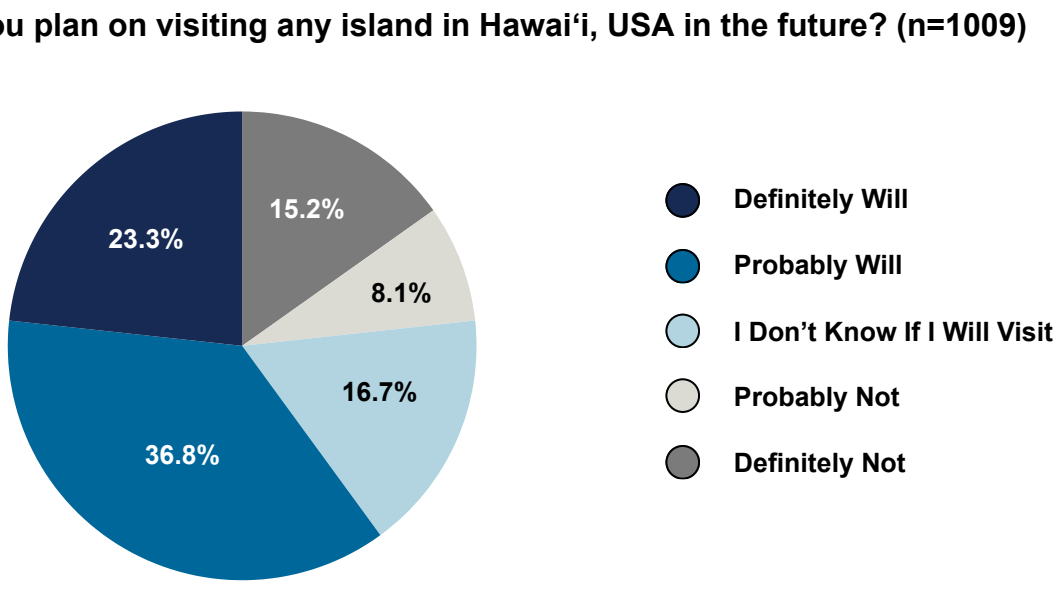


Figure 5. Japan Respondents Reporting How Cannabis Legalization Would Influence Their Decision to Visit Hawai‘i

If the government of Hawai‘i were to legalize recreational cannabis for all adults, including tourists, how would that influence your decision to visit Hawai‘i? (n = 1009)

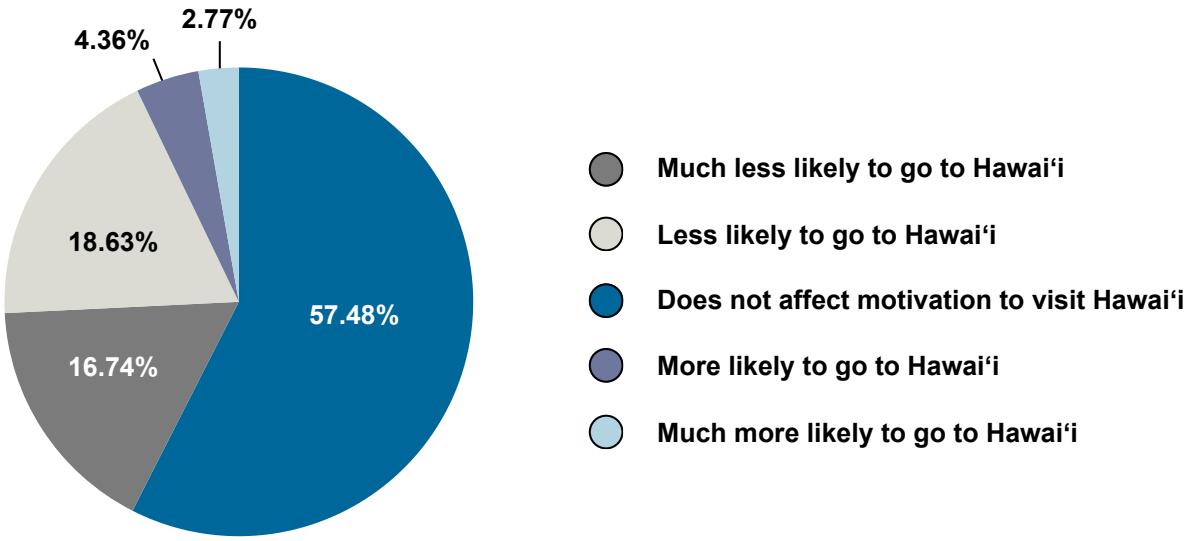


Figure 6. Japan Respondents Reporting How Cannabis Legalization Would Influence Their Decision to Visit Hawai‘i, by Reported Visit Plan

If the government of Hawai‘i were to legalize recreational cannabis for all adults, including tourists, how would that influence your decision to visit Hawai‘i? (n = 1009)

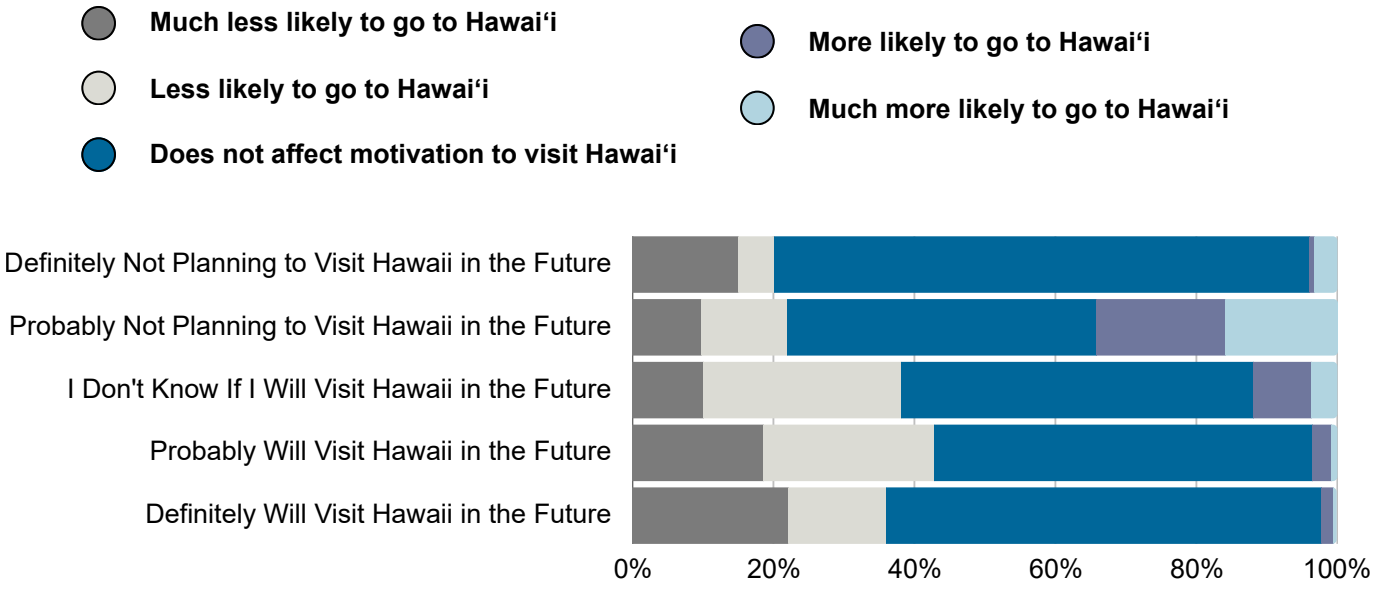


Table 18. Japan Respondents Reporting How Cannabis Legalization Would Influence Their Decision to Visit Hawai‘i for Those Who Reported Probably and Definitely Will Visit

More or Less Likely to Influence Their Decision to Visit Among Those Who Anticipate A Visit (n = 250)	%
Less likely	32.80%
More likely	19.20%
No change	48%

Table 19. Japan Respondents Reporting How Cannabis Legalization Would Influence Their Decision to Visit Hawai‘i for Those Who Reported Probably and Definitely Will Not Visit

More or Less Likely to Influence Their Decision to Visit Among Those Who Do *Not* Anticipate A Visit (n = 388)	%
Less likely	29.90%
More likely	2.80%
No change	67%

Table 20. Reasons for Reconsidering a Visit to Hawai‘i Among Those Who Reported Cannabis Legalization Would Negatively Influence Their Decision to Visit

Which of the following reasons are why you would reconsider a future visit to any island in Hawai‘i, USA? Please select all that apply (n = 357)	
Reason for Reconsidering a Visit	**Proportion Endorsed**
Using cannabis is wrong	46%
Cannabis legalization makes tourism less enjoyable	31%
People using cannabis make tourism less enjoyable	31%
Cannabis consumption is not legal in Japan and makes me uncomfortable to travel to a location where this activity is legal	39%
Legal cannabis makes the destination less safe to travel to	40%
Other	2%
I do not wish to travel to a destination where cannabis odor may be present	25%

Canada Survey (n = 1004)

Canada, another high tourism country for the state of Hawai‘i, had more favorable results in the anticipation of legal adult-use cannabis. Of the respondents, roughly 28% had visited Hawai‘i in their lifetime. Similar to Hawai‘i, data from the Canada survey suggests that adult-use cannabis legalization in Hawai‘i is largely not a decisive factor for potential tourists.

A majority of respondents have never visited Hawai‘i (68.2%), yet a substantial share expects to travel there in the future, with 26.2% saying they “probably will” and 16.5% saying they “definitely will”. When asked directly whether legalization would influence their decision to visit, the vast majority of respondents (64.5%) reported that it would have no influence.

Among those who already anticipate visiting Hawai‘i, approximately 52% indicated that legalization would not change their plans. Based a small subset of respondents, there may be a positive shift in visit likelihood from Canadian tourists currently anticipating a visit.

For most Canadian travelers, cannabis legalization does not appear to be a primary driver of tourism decisions. For those who responded that they would be less likely to visit Hawai‘i, irrespective of plans to visit, the most frequently selected reasoning was cannabis odor. Given that cannabis is federally legal in Canada, this may be informed by lived experience by residents.

Figure 9. Percentage of Canada Respondents that Have Visited Hawai‘i in Their Lifetime

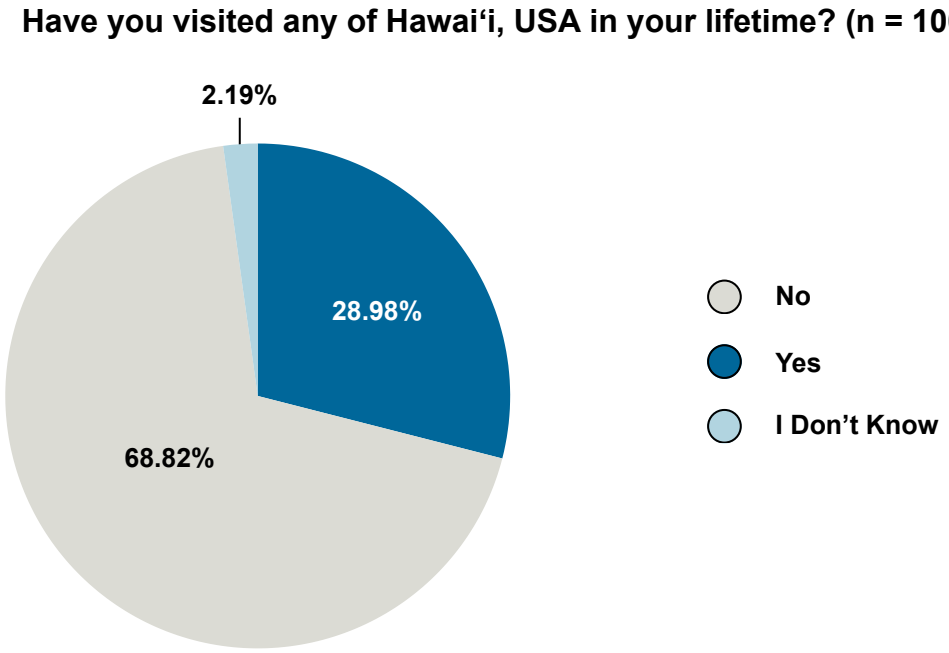


Figure 10. Percentage of Canada Respondents that Plan to Visit Hawai‘i

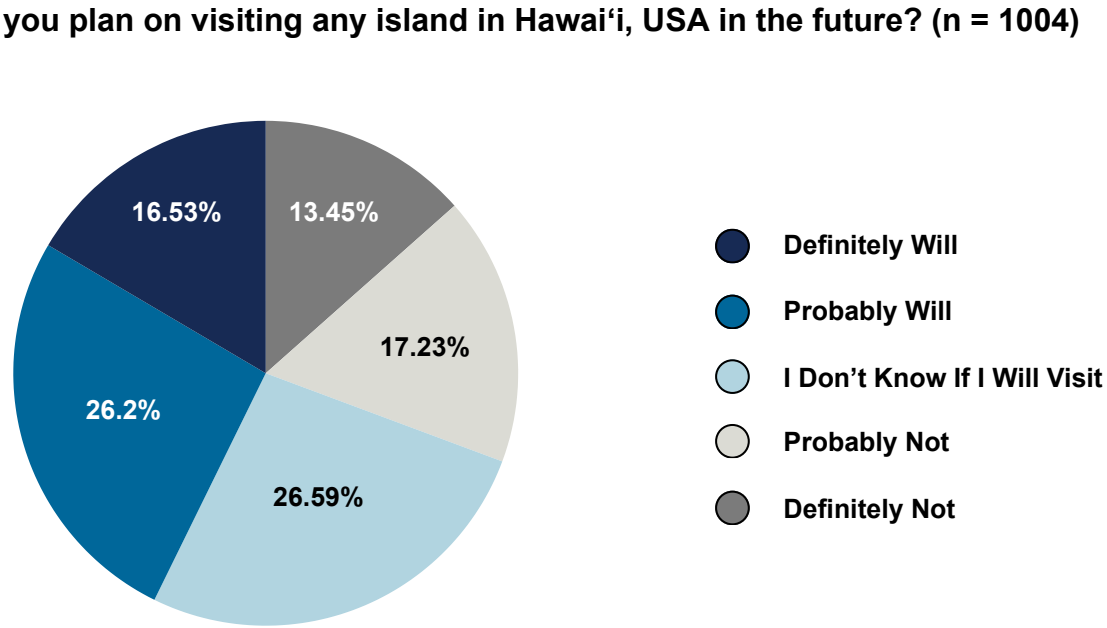


Figure 11. Canada Respondents Reporting How Cannabis Legalization Would Influence Their Decision to Visit Hawai‘i

If the government of Hawai‘i were to legalize recreational cannabis for all adults, including tourists, how would that influence your decision to visit Hawai‘i? (n = 1004)

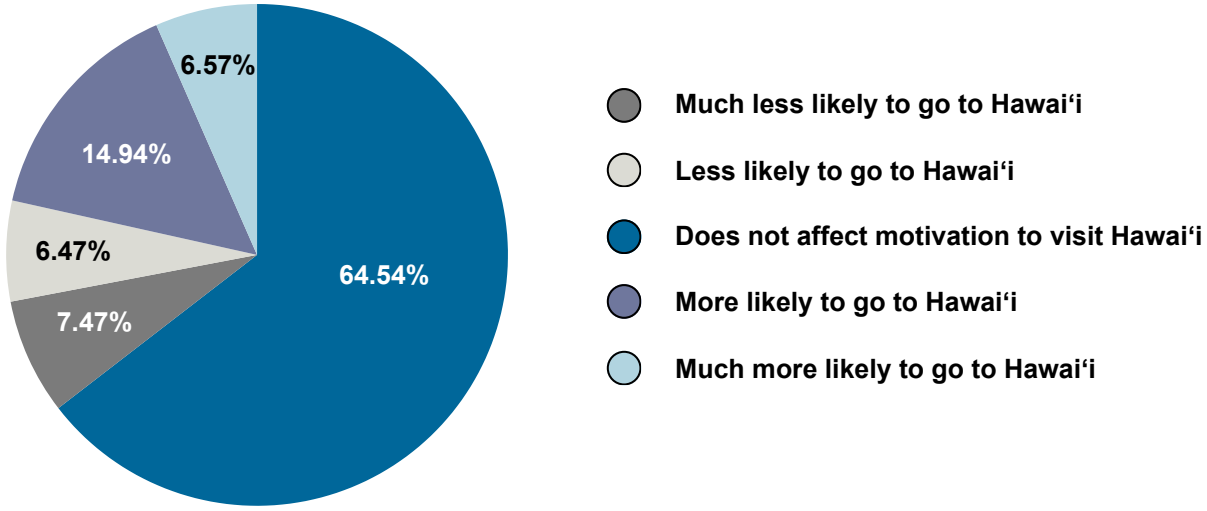


Figure 12. Canada Respondents Reporting How Cannabis Legalization Would Influence Their Decision to Visit Hawai‘i, by Reported Visit Plan

If the government of Hawai‘i were to legalize recreational cannabis for all adults, including tourists, how would that influence your decision to visit Hawai‘i? (n = 1004)

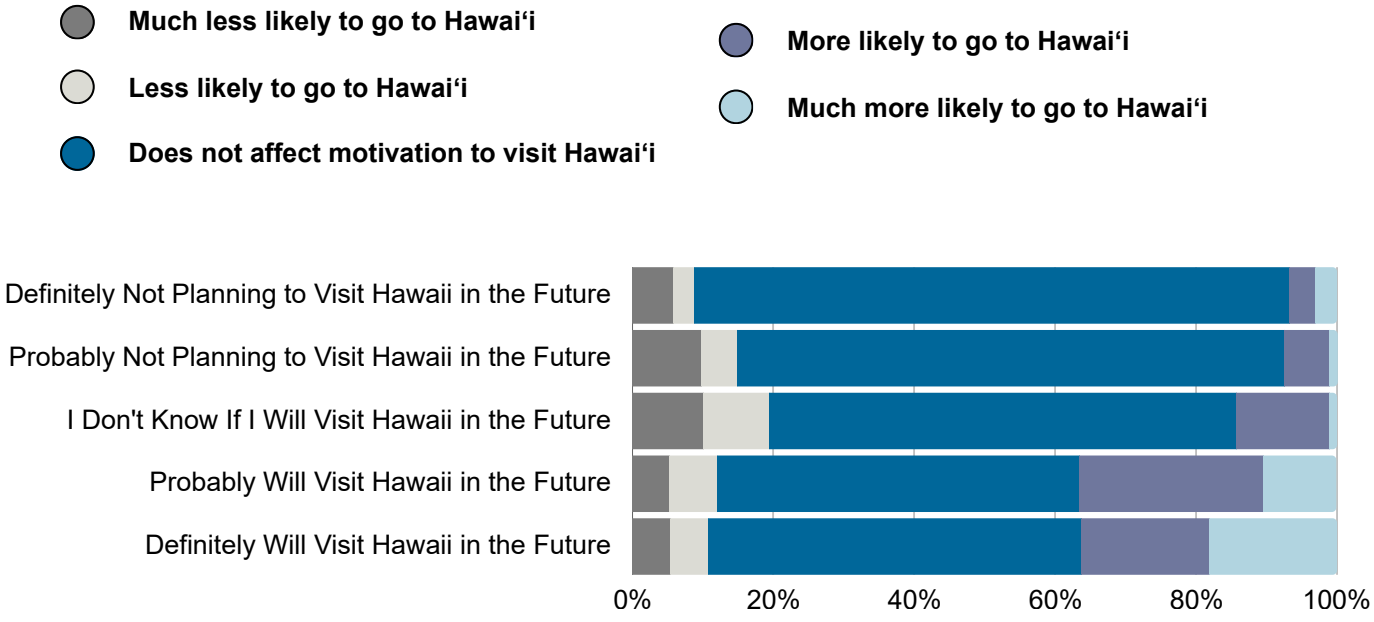


Table 21. Canada Respondents Reporting How Cannabis Legalization Would Influence Their Decision to Visit Hawai‘i for Those Who Reported Probably and Definitely Will Visit

More or Less Likely to Influence Their Decision to Visit Among Those Who Anticipate A Visit (n = 429)	%
Less likely	11.70%
More likely	36.40%
No change	52%

Table 22. Canada Respondents Reporting How Cannabis Legalization Would Influence Their Decision to Visit Hawai‘i for Those Who Reported Probably and Definitely Will Not Visit

More or Less Likely to Influence Their Decision to Visit Among Those Who Do *Not* Anticipate A Visit (n = 308)	%
Less likely	12.30%
More likely	7.10%
No change	80.50%

Table 23. Reasons for Reconsidering a Visit to Hawai‘i Among Those Who Reported Cannabis Legalization Would Negatively Influence Their Decision to Visit

Which of the following reasons are why you would reconsider a future visit to any island in Hawai‘i, USA? Please select all that apply (n = 140)	
Reason for Reconsidering a Visit	**Proportion Endorsed**
Using cannabis is wrong	35%
Cannabis legalization makes tourism less enjoyable	37%
People using cannabis make tourism less enjoyable	31%
Legal cannabis makes the destination less safe to travel to	16%
Other	50%
I do not wish to travel to a destination where cannabis odor may be present	35%

The Potential Impact of Legalization on Tourism (Examples from Guam)

Hawai‘i is unique among U.S. states. As the only state located in the Pacific Ocean, we can expect that the effect legalization of adult-use cannabis will have on tourism will be different than previous states that have legalized adult-use within the United States. While other U.S. state experiences may not be comparable, the experiences in Guam, a U.S. territory, may be indicative of the impact on tourism in Hawai‘i. Guam legalized cannabis for adult-use consumption in April 2019. Interested parties in the effect of adult-use legalization on tourism for islands in the Pacific Ocean that use U.S. currency may look to Guam’s experience to inform what the effect might be, assuming the underlying reasons for traveling to Guam and international demographic subpopulations share the same characteristics as for Hawai‘i.

We take Guam’s monthly tourism data on travelers from Japan (the second largest tourist group, 2023) and South Korea (the sixth largest tourism group, 2023) from November 2012 to December of 2020 (the first month COVID-19’s effect on tourism became worldwide) and combine it with Consumer Price Index data by month and Exchange Rates with the U.S. dollar by month data from the Federal Reserve Bank of St. Louis (FRED). We then estimated two separate ARIMA (Autoregressive Integrated Moving Average) models, one for Japan and one for South Korea, in an Interrupted Time Series design to test the association of adult-use legalization with tourism using a z-test. Despite limited data due to the COVID-19 pandemic, ***adult-use cannabis legalization was not significantly associated with a decline nor increase in tourism to Guam for neither Japan nor South Korea.***

Appendix

A. Methodology (Detailed)

Estimating Future Cannabis Market Sizes Across All Sources

Participants that reported past month demand of cannabis products in units and the prices paid for this unit demand were recruited across four separate survey waves. As of present, 233 participants met the requirements to have their observations included in demand estimation. To be included, participants passed multiple attention checks and met the criteria for their responses to be included as a non-outlier in two-stages. To ensure data quality, Mahalanobis distance and Chi-Squared tests were utilized to measure systematic correlation among price and unit reporting across variables within survey waves. Observations deemed systematic outliers were not included in final estimation.

Price and unit observations of cannabis product by source were summed to create the estimated total demand for cannabis in Hawai‘i across all sources. Total population size of past month cannabis consumers was pulled from the 2023 National Survey on Drug Use and Health deployed by the Substance Abuse and Mental Health Services Administration. The most recent publication of by state estimate, 2023, provided in-state estimation of the total past month cannabis consuming population for this estimate. For our calculations, the lower bound estimate is used in conjunction with down weighting the population size to exclude 18–20-year-olds. The lower bound estimated total population of adults that consumed cannabis in the past month in Hawai‘i was 147,000 in 2023. Using BRFSS data, we found that approximately 4.6% of these individuals were between the ages of 18-20. Our total target population estimate was then adjusted to match this to accurately represent those that can legally purchase cannabis in adult-use market (i.e., 140,238). Survey weights are used to decrease bias and increase representativeness of a non-probability sample of participants. Bias is best decreased in convenience samples when weighted on characteristics we know vary alongside our variables of interest. In our case we selected: age group, race, sex, income group, and number of days cannabis was consumed in the past month. By doing so, our sample better represents our target population of interest, past month cannabis consumers who are 21 years and older.

Once samples were weighted, past month estimates for price and units of cannabis product (flower, concentrates, vapes, edibles, infused beverages, pre-rolls, tinctures, and topicals) were calculated by weights derived during raking in the survey package in R.19 Weighted estimates were then “bootstrapped” in 1,000 iterations to provide more accurate simulated standard errors and confidence intervals. “Bootstrapping” refers to the process of resampling a dataset to create a simulated sampling distribution for calculated values. For each estimate, price and units purchased, the upper-bound (95% confidence interval), lower-bound (95% confidence interval), and mean estimate sum of products sourced were used to provide a range of demand estimates for total past month consumption. These estimates were then summed to create a total past month demand for cannabis, as the market currently exists. In total, six estimates are provided. The latter three estimates are further weighted estimates based on the likely effect of introducing taxation on cannabis as a more conservative estimate of market size.

The next stage involved pulling estimates from another survey that recruited U.S. based tourists that have been to Hawai‘i in the past five years or plan to visit Hawai‘i in the next two years. We were limited to U.S. based tourists as recruitment outside of the U.S. would compromise our IRB protocol. In total, 489 participants finished the survey. Total population estimates of visitors from major markets to Hawai‘i for 2023 were pulled from the Hawai‘i Department of Business, Economic Development, and Tourism website. For each market, the total number of tourists is divided by the average group size to conceptualize demand as based on groups rather than individuals. Next, population estimates for the percentage of adults older than 21 were pulled from the United Nations[20] for each market. If a market represented a broader region, an estimate for the region was pulled instead. The residual category of “other tourists” that did not fall into the defined major market regions utilized the world average for population percentage over 21. The new consuming population of tourists were then downweighed with the percentage of people who had used cannabis within the past year, based on the most recent data source found in the United Nations World Drug Report (2025).[21] Many markets did not have an exclusive estimate for past year consumption of those older than 18 or 21, in lieu of these, estimates that covered adults were used (generally, 15-64).

Once a final “consuming” group population was defined. We took the lower bound bootstrapped confidence interval estimate from our survey and applied this figure to the final domestic U.S. tourism group ($135.73). For all other tourists, I took the lower bound bootstrapped confidence interval estimate ($14.63) of those in our sample from other countries in the United States and applied it to our final adjusted number of groups that can be “expected” to participate in a legal market. The final estimate in dollars is divided by 12 to get an approximate floor for tourism demand calculations, based on 2023 tourism numbers.

The final stage involved pulling sales data from states with legalized adult-use cannabis markets (California, Colorado, Connecticut, Illinois, Maine, Michigan, Missouri, New Jersey, New York, Rhode Island, and Washington). Sales data by month, and if applicable, by quarter divided by four, was gathered to give by-month growth estimate percentages from one to sixty months. As not all states have reached sixty months of an adult-use cannabis market yet, percentages were calculated based on the number of observations (states in each column). To get a starting point, we take the total monthly demand in dollars for cannabis from past-month cannabis consumers in Hawai‘i and reported figures by future and past tourists and weight this value by the percentage different between month-one and month-sixty, on average for all states (24%). At month one, the dollar value spent for all these states was on average 24% of the dollar value of their most recent month in our dataset. This percentage was then applied to our above total estimated demand as a starting point in month one. A potential point of note in this is that each state’s starting point varied significantly, with Missouri capturing 62% of its current market in month one, and New York only capturing 2% of its current market in month one. It is currently unknown in which direction the starting point for Hawai‘i will be that will largely contribute to the latency period and dispensary outlets.

It is important to note that the model utilized for these predictions includes data that was influenced by the COVID-19 pandemic and inflation, wherein cannabis purchases increased significantly, and broader inflation was higher than average. Despite this, seasonal trends should be, broadly speaking, captured in growth rates by month. The key limitation to this is we are unable to accurately decipher if growth is due to inflation, seasonal trends, or distortions from COVID. Because of this, we expect that the data may be inflated when applied to Hawai‘i.

Estimating Demand for Hemp-Derived Products

Past month cannabis consumers were asked to report their purchasing behaviors of hemp-derived products from all sources. Participants were asked about nine cannabinoids that can be derived from hemp to make consumable products. These are: CBD, THCV, THCP, THCO, CBG, CBN, THCA, Delta 10, and Delta 8. Participants were asked to report what product types they consumed in the past month, how many units they purchased, and how much did they pay in total. Our research team investigated available product types in online dispensary websites to ensure coverage of available hemp derived product types throughout the United States.

Estimating Home Cultivation

Medical cannabis patients and non-medical cannabis consumers older than 21 were asked to report if they grew cannabis plants at home. After reporting if they grew cannabis, participants that responded greater than zero were asked how much flower they yielded from one plant on average. We did not ask how frequently participants yielded flower from plants, and we do not make any assumptions over what time frame these yields occurred.

B. Tables with Confidence Intervals (Detailed)

	Medical Cannabis Dispensaries				Free or Gifted			
	Average Monthly Units	Confidence Intervals (95%)	Average Monthly Expenditures	Confidence Intervals (95%)	Average Monthly Units	Confidence Intervals (95%)	Average Monthly Expenditures	Confidence Intervals (95%)
Flower	10.06	7.59, 12.52	$92.61	$76.38, $108.84	2.06	0.46, 3.66	$1.38	$0.00, $3.17
Pre-Rolls	1.03	0.65, 1.42	$9.72	$6.73, $12.71	0.08	0.00, 0.18	$0.26	$0.00, $0.55
Edibles	1.61	1.19, 2.03	$35.54	$28.61, $42.46	0.12	0.01, 0.22	$0.55	$0.00, $1.32
Beverages	0.19	0.08, .3	$0.89	$0.47, $1.30	0	0, 0.01	$0.00	$0.00, $0.00
Concentrates	0.42	0.13, .71	$7.58	$4.86,$10.30	0.02	0.00, .04	$0.00	$0.00, $0.00
Vapes	2.29	1.13, 3.46	$28.38	$20.82, $35.94	0.07	0.00, 0.13	$0.12	$0.00, $0.28
Tinctures	0.12	0.07, .16	$4.30	$2.75, $5.85	0	0.00, 0	$0.00	$0.00, $0.00
Topicals	0.2	0.00, .43	$3.49	$1.99, $4.98	0.03	0.00, .07	$0.00	$0.00, $0.00
Capsules	0.03	0.01, .05	$1.07	$0.44, $1.70	0	0.00, 0.00	$0.00	$0.00, $0.00

	Online Delivery (Not a Medical Dispensary)				Homegrow			
	Average Monthly Units	Confidence Intervals (95%)	Average Monthly Expenditures	Confidence Intervals (95%)	Average Monthly Units	Confidence Intervals (95%)	Average Monthly Expenditures	Confidence Intervals (95%)
Flower	0.04	0.00, 0.09	$0.96	$0.00, $2.62	4.6	2.84, 6.37	$2.65	$1.13, $4.18
Pre-Rolls	0	0.00, 0.00	$0.00	$0.00, $0.00	0.28	0.00, 0.71	$0.29	$0.00, $0.77
Edibles	0.15	0.00, 0.44	$0.07	$0.00, $0.17	0.04	0.01, 0.07	$0.28	$0.00, $0.61
Beverages	0	0.00, 0.00	$0.00	$0.00, $0.00	0.13	0.02, 0.25	$0.00	$0.00, $0.00
Concentrates	0	0.01, 0.11	$0.10	$0.00, $0.28	0.07	0.01,	$0.09	$0.00, $.23
Vapes	0.11	0.00, 0.27	$1.13	$0.00, $2.85	0.01	0.01, 0.02	$0.49	$0.00, $1.04
Tinctures	0	0.00, 0.00	$0.03	$0.00, $0.08	0.01	0.00, 0.03	$0.22	$0.00, $0.58
Topicals	0	0.00, 0.00	$0.04	$0.00, $0.11	0.01	0.00, 0.03	$0.04	$0.00, $0.09
Capsules	0	0.00, 0.00	$0.00	$0.00, $0.00	0	0.00,0.00	$0.00	$0.00, $0.00

	Co-Operatives				Other			
	Average Monthly Units	Confidence Intervals (95%)	Average Monthly Expenditures	Confidence Intervals (95%)	Average Monthly Units	Confidence Intervals (95%)	Average Monthly Expenditures	Confidence Intervals (95%)
Flower	0.62	0.03, 1.24	$1.48	$0.00, $3.16	0.2	0.00, 0.44	$1.63	$0.00, $3.68
Pre-Rolls	0	0.00, 0.01	$0.01	$0.00, $0.04	0	0.00, 0.01	$0.03	$0.00, $0.09
Edibles	0.01	0.00, 0.01	$0.00	$0.00, $0.00	0.01	0.00, 0.02	$0.25	$0.00, $0.53
Beverages	0	0.00, 0.01	$0.00	$0.00, $0.00	0	0.00,0.00	$0.00	$0.00, $0.00
Concentrates	0	0.00, 0.01	$0.12	$0.00, $0.34	0	0.00,0.00	$0.00	$0.00, $0.00
Vapes	0	0.00, 0.01	$0.06	$0.00, $0.14	0.12	0.00, 0.34	$0.51	$0.08, $0.94
Tinctures	0	0.00, 0.00	$0.00	$0.00, $0.00	0	0.00,0.00	$0.00	$0.00, $0.00
Topicals	0	0.00, 0.01	$0.05	$0.00, $0.14	0	0.00,0.00	$0.02	$0.00, $0.05
Capsules	0	0.00, 0.00	$0.00	$0.00, $0.00	0	0.00,0.00	$0.00	$0.00, $0.00

	Purchased From Friends and Family				Dealer			
	Average Monthly Units	Confidence Intervals (95%)	Average Monthly Expenditures	Confidence Intervals (95%)	Average Monthly Units	Confidence Intervals (95%)	Average Monthly Expenditures	Confidence Intervals (95%)
Flower	2.58	0.09, 5.25	$7.44	$4.11, $10.78	0.88	0.24, 1.52	$5.40	$1.78, $9.02
Pre-Rolls	0.07	0.00, 0.20	$0.05	$0.00, $0.14	0.16	0.00, 0.46	$0.16	$0.00, $0.46
Edibles	0.01	0.00, 0.03	$0.48	$0.00, $1.12	0.01	0.00, 0.01	$0.18	$0.00, $0.46
Beverages	0	0.00, 0.00	$0.00	$0.00, $0.00	0	0.00, 0.00	$0.00	$0.00, $0.00
Concentrates	0.06	0.00, 0.12	$0.37	$0.00, $.83	0.02	0.00, .06	$0.11	$0.00, $0.00
Vapes	0.05	0.00, 0.12	$0.61	$0.07, $1.16	0.02	0.02, 0.07	$0.84	$0.00, $2.28
Tinctures	0	0.00, 0.00	$0.00	$0.00, $0.00	0	0.00, 0.00	$0.00	$0.00, $0.00
Topicals	0	0.00, 0.00	$0.00	$0.00, $0.00	0	0.00, 0.00	$0.00	$0.00, $0.00
Capsules	0	0.00, 0.00	$0.00	$0.00, $0.00	0	0.00, 0.00	$0.00	$0.00, $0.00

End notes

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