CITY OF OAKLAND

AGENDA REPORT

TO:	Sabrina B. Landreth City Administrator	**FROM:**	Katano Kasaine Finance Director
SUBJECT:	Cannabis Business Tax Policy Analysis	**DATE:**	February 1, 2018

City Administrator Approval Date: 2/15/18

RECOMMENDATIONS

Staff Recommends That The City Council Receive An Informational Report On Cannabis Tax Policy To Maximize City Tax Revenue, Economic Growth, And Jobs.

EXECUTIVE SUMMARY

This Cannabis Business Tax Policy Analysis, requested by Council President Larry Reid and directed by the Rules and Legislation Committee on November 2, 2017, is to provide the City Council an in-depth look at the application of the business tax on cannabis businesses, the challenges associated with the tax policy for the administration and for the businesses, and the options in addressing these challenges, with an eye kept on the overall mission of any tax policy, which is generating revenue to support the community's needs and helping in the formation and the growth of entrepreneurship.

This tax policy analysis is drawn upon the work done 1) by Marijuana Policy Group ("MPG"), whose July 13, 2017 tax policy paper titled Oakland Cannabis Cultivation and Manufacturing Market Share (Attachment A), was prepared for the organization called Oakland Citizens for Equity and Prosperity[1]; 2) by the University of the Pacific ("UOP"), Center for Business & Policy Research, whose October 17,2016 Economic Impact Study of the Cannabis Sector in the Greater Sacramento (Attachment B), was prepared for the Truth Enterprises, Inc.[2]; and 3) from the City Finance Department, Revenue Management Bureau ("RMB") staff's experience in working with the local cannabis businesses, perhaps the most experienced and the most successful group of cannabis businesses in the state, collectively.

The City of Oakland has always been on the cutting edge of cannabis policy. The Cannabis Business Tax Policy Analysis is intended to establish a decision-making framework for the Oakland City Council to evaluate and decide the appropriate tax policy related to the Cannabis Business Tax authorized under the Oakland Municipal Code Chapter 5.04. Based on analysis, the following are possible policy options for the City Council's consideration:

1. Option 1: Keep existing tax rates as they currently are at 5% and 10% of gross receipts on cannabis businesses, including specialized segments of the industry, such as cultivators,

[1] RMB could not verify the existence of this organization through official records, such as the office of the California Secretary of State and the Alameda County Clerk's Recorder Office.
[2] Corporate Status: Suspended

manufacturers, and transportation paying both rates. Administratively, staff has already identified a reasonable approach as to which tax rates specialized cannabis businesses, such as cannabis cultivators and manufacturers need to pay annually (*see page 9, Application of Oakland Cannabis Business Tax on Cannabis Businesses Other Than Dispensaries*).

2. Option 2: Return to voters seeking approval to authorize the City Council the flexibility in setting the tax rates, as they are currently set at 5% and 10%, and the ability to promulgate and adopt tax rules and regulations, such as the frequency of tax reporting and tax payment requirements, that are intended to apply to the cannabis industry without impacting other industries.

3. Option 3: Return to voters seeking approval to authorize the City to repeal and replace the existing tax rates with the new set of tax rates as follows:

   a. A tax rate up to a maximum of 5% applicable to medical cannabis businesses dispensing cannabis to medically-needed patients with proper state identifications
   b. A tax rate up to a maximum of 10% applicable to non-medical cannabis businesses dispensing cannabis to adults 21 and older for non-medically needed purposes
   c. A tax rate of minimum two dollars ($2) to a maximum of five dollars ($5) per ounce of cannabis produced, weighed and distributed to the cannabis retailer/dispensary applicable to cannabis cultivators
   d. A tax rate of a minimum 3% to a maximum of 7% of gross receipts applicable to cannabis manufacturers and for cannabis transport businesses.

BACKGROUND / LEGISLATIVE HISTORY

In July 2009, Oakland voters approved Measure F making Oakland the first City in the nation to impose a tax on medical cannabis businesses. The tax rate was at $18 per $1,000, or 1.8 percent, of gross receipts. The City had four approved medical cannabis dispensary businesses at the time.

In November 2010, Oakland voters approved Measure V increasing the tax rate on medical cannabis businesses from 1.8% to five percent (5%) and creating a new tax rate of 10 percent (10%) of gross receipts on non-medical cannabis businesses, referred to as adult-use or recreational. The additional 10 percent adult-use tax rate was put forth in anticipation of Proposition 19 being passed in the same election. Proposition 19 failed at the ballot box. As a result, Oakland never implemented the adult-use tax rate. Oakland's adult-use tax rate became effective for the first-time January 1, 2018 following the passage of Proposition 64 statewide in November 2016. In 2010, the City also approved four additional dispensaries, making the total of eight approved dispensaries in the city since. This year, the City is slated to approve eight additional dispensaries and unlimited number of cultivation, manufacturing, distribution, delivery or lab-testing operations, as long as certain requirements are met. On January 31, 2018, the City selected the winners of the eight additional dispensaries. Currently less than 30 percent of cities and counties in California are allowing cannabis business and, of those who are, not all are allowing all aspects of the supply chain. Always on the forefront of the cannabis industry, Oakland is one of the few cities that allows the industry to operate from seed to sale.

The passage of Proposition 64 created two new State cannabis taxes[3]:

1. A 15 percent excise tax imposed upon the purchasers of cannabis and cannabis products.
2. A cultivation tax imposed upon cannabis cultivators on all harvested cannabis that enters the commercial market. The cultivation tax is:
    - $9.25 per dry-weight ounce of cannabis flowers that enter the commercial market,
    - $2.75 per dry-weight ounce of cannabis leaves that enter the commercial market, and
    - $1.29 per ounce of fresh cannabis plant[4].

Under Proposition 64 and other legislation, a current system of dual licensure became effective this year. The entire supply chain must be licensed, including cultivation, manufacturing, distribution and transportation, laboratory testing, and retail. State law requires businesses to obtain authorization from the local authority where the business is located prior to obtaining a license from the state. There are three different licensing authorities at the State level:

1. Department of Food and Agriculture, licensing nurseries, cultivation and processing.
2. Department of Public Health- Office of Manufactured Cannabis Safety, including extraction, infusion, packaging or repackaging of cannabis products, and labeling or relabeling of the packages of cannabis products.
3. Department of Consumer Affairs, Bureau of Cannabis Control, covering retailers, distributors, distributor transport, testing laboratories and micro businesses.

The California Department of Taxes and Fee Administration ("CDFTA"), formerly the Board of Equalization, is responsible for collecting the excise taxes from businesses that cultivate, manufacture, distribute, and sell cannabis in California. In the City of Oakland, the City Administrator's office handles the City's cannabis regulatory program and all related application, licensing, permitting and renewal processes. The City Finance Department's Revenue Management Bureau handles the rules, regulations and collection of cannabis business tax annually.

MPG Tax Policy Paper[5]

As the title indicates, the MPG's Oakland Cannabis Cultivation and Manufacturing Market Share Tax Policy Paper focused on the cultivation and manufacturing segments of the cannabis industry because these segments "are the foundation of the industry." MPG estimated that these segments in California "could produce $4.2 billion in total direct and indirect economic activity and 36,000 jobs, retail not included." Because these segments are the foundation of the industry, MPG concluded that 1) "if Oakland hopes to capture a significant portion of the local and regional market - and the associated benefits - the City will need to adopt policies that are more attractive to cultivation and manufacturing businesses than those in competing jurisdictions," and 2) "lower tax rates provide a significant incentive to businesses that hope to compete on price in a large and competitive market for wholesale cannabis products."

[3] Taxes will be adjusted for inflation starting in 2020
[4] To qualify for the "fresh plant" category, the unprocessed cannabis must be weighed within two hours of harvesting
[5] Prepared for the Oakland Citizens for Equity and Prosperity

UOP Economic Impact Study[6]

The UOP Economic Impact Study, completed prior to the passage of Proposition 64, focused on the potential economic impact of the legal cannabis sector in the Greater Sacramento Area[7]. The study laid out three scenarios: 1) the cannabis industry is limited and tightly controlled ("Limited scenario"), 2) the cannabis industry primarily serves regional demand ("Local scenario"), and 3) the cannabis industry exports a significant amount of cannabis products to other areas in the state ("Cluster scenario").

Under the Limited scenario where cannabis is mostly imported from other parts of the state, the study estimated that the cannabis industry in the Greater Sacramento Area under the Limited scenario would produce about 1,600 up to 1,900 local jobs and have an output between $322 and $386 million.

Under the Local scenario where cannabis is produced enough to support the local demand, the study estimated that the cannabis industry in the Greater Sacramento Area would produce about 8,000 to 9,200 local jobs and have an output of $1.6 to $1.9 billion.

Under the Cluster scenario where cannabis is not only produced enough to support the local demand but also exported to other parts of the state, the study estimated that the cannabis industry in the Greater Sacramento Area would produce about 17,000 to nearly 20,000 jobs and have an output of $3.5 to $4.2 billion.

ANALYSIS

What Do These Studies Mean For Cannabis Businesses In Oakland?

A basic principle of economies that lowering taxes and having less regulatory restriction will attract businesses, jobs and therefore will increase output (as in the income for the businesses, citizenry and additional revenue for the government), could accurately apply to all cities, states and countries around the world. For the cannabis industry, as Federally uncertain as the cannabis industry, it is the level of tolerance and acceptance by the residents and, by extension, their elected officials that is the cornerstone of either helping the industry thrive, or making it too restrictive or expensive for the industry to make a profit, thereby preventing it from flourishing. Oakland residents and elected officials have consistently and wholeheartedly supported the cannabis industry ever since the passage of Compassionate Use Act in 1996.

Furthermore, the cannabis market, particularly regarding adult-use of cannabis, is still very much in its infancy. In fact, in California, it is one month old. As such, it limits the confidence in relying on the data assumed and compiled for another area and applied to a larger area, such as the Bay Area with a combined population that is three times (~7.5 million vs. ~2.5 million) the size of the Greater Sacramento Area. In addition, the composition of these areas is very much different. Bay Area is densely populated with little open space to allow a concentrated area for cannabis cultivation and manufacturing while the Greater Sacramento is still growing.

[6] Prepared for Truth Enterprise Inc.
[7] Greater Sacramento area is composed of eight counties (Douglas, El Dorado, Nevada, Placer, Sacramento, Sutter, Yolo & Yuba). The area has a population of about 2.5 million.

The implementation and the application of Oakland's adult-use tax rate of 10% has already generated a good share of inquiries from residents, business owners, attorneys representing business owners and the members of the Oakland City Council. The addition of State's excise tax and the latest directive from the CDFTA regarding the computation of State's sales tax have also contributed to these inquiries.

What Is The Main Objective Of Oakland Cannabis Business Tax Policy?

As with any tax program, whether the basis for the tax is on the physical goods, in-person services, gross receipts, income, or otherwise, the main objective is to fund the government to address the highest priorities that the community needs, whether ensuring the safety of the public, educating children and adults about diseases, healthy food or drink choices, improving streets, upgrading public facilities, etc. The Oakland's Cannabis Business Tax is to support all those priorities but also address the impacts of cannabis industry and to encourage the industry to operate legally and not in the unregulated market.

Who Are Oakland's Competitors?

Currently, less than 30 percent of cities and counties in California are allowing cannabis business (not limited to personal indoor grow). The listing below consists of jurisdictions that authorized cannabis business-related activities as of January 1, 2018. If a jurisdiction is not listed, cannabis business-related activity is not authorized. Jurisdictions, marked with an asterisk (*) in the list, are either in the process of evaluating and creating a regulatory or tax program for cannabis business-related activity.

JURIDICTIONS WITH APPROVED CANNABIS BUSINESS-RELATED ACTIVITIES[8]																
Jurisdiction	Medical-Use (as of January 1, 2018)								Adult-Use (as of January 1, 2018)							
	Home Grown		Commercial Grown		Testing	Sales	Manufacturing	Distribution	Home Grown		Commercial Grown		Testing	Sales	Manufacturing	Distribution
	Indoor	Outdoor	Indoor	Outdoor					Indoor	Outdoor	Indoor	Outdoor				
ALAMEDA COUNTY																
Alameda (*)	X				X	X	X	X								
Berkeley	X				X	X	X		X				X	X	X	
Hayward	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Oakland	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
San Leandro	X	X			X	X	X	X					X		X	
CONTRA COSTA COUNTY																
Richmond	X		X		X	X	X		X					X		
SAN FRANCISCO COUNTY																
San Francisco (*)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SANTA CLARA COUNTY																
Palo Alto[9]	X	X														X
San Jose	X		X	X	X	X	X	X	X		X	X		X	X	X
SAN MATEO COUNTY																
Brisbane	X	X			X		X	X					X		X	X
Pacifica	X	X			X	X	X						X	X	X	
Portola Valley	X	X	X	X		X		X						X		X
San Carlos	X	X	X	X	X		X	X	X	X	X	X	X		X	X
NOTABLE JURDISDICTIONS																
Los Angeles	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sacramento	X		X	X	X	X	X	X	X		X		X	X	X	X

[8] For the purpose of showing cannabis business-related activities, jurisdictions with laws authorizing home-grow of cannabis for personal use are purposely left out
[9] City of Palo Alto's Ordinance No. 5419 adopted in November 2017 authorized only the delivery of cannabis from a business located outside of the city of Palo Alto.

JURIDICTIONS WITH APPROVED CANNABIS BUSINESS-RELATED ACTIVITIES[3]																
Jurisdiction	Medical-Use (as of January 1, 2018)								Adult-Use (as of January 1, 2018)							
	Home Grown		Commercial Grown		Testing	Sales	Manufacturing	Distribution	Home Grown		Commercial Grown		Testing	Sales	Manufacturing	Distribution
	Indoor	Outdoor	Indoor	Outdoor					Indoor	Outdoor	Indoor	Outdoor				
Santa Rosa	X		X		X	X	X	X	X		X		X	X	X	X
San Diego	X		X		X	X	X	X	X		X		X	X	X	X

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Finance and Management Committe
February 27, 201

What Are The Tax Rates In Jurisdictions That Allow Sales Of Cannabis?

Jurisdiction	No. of Authorized Dispensaries	Retail Medical	Retail Adult-Use	Cultivation	Manufacturing	Delivery	Testing
Berkeley	6	2.5%	10%	N/A	N/A	N/A	N/A
Hayward[10]	3	Up to 15%	Up to 15%	Up to 15%	Up to 15%	Up to 15%	Up to 15%
Los Angeles[11]	98[12]	5%	10%	2%	2%	1%	1%
Oakland	8	5%	10%	5% & 10%	5% & 10%	5% & 10%	5% & 10%
Richmond	3	5%	5%	5%	5%	5%	5%
Sacramento	30[13]	4%	4%	4%	4%	4%	4%
San Diego[14]	36	5%	5%	5%	5%	5%	5%
San Jose	16	10%	10%	10%	10%	10%	10%
San Leandro[15]	3	Up to 10%	Up to 10%	Up to 10%	Up to 10%	Up to 10%	Up to 10%
Santa Rosa[16]	32[17]	0%	3%	2%	1%	N/A	N/A

While the City and County San Francisco authorizes the operating of cannabis business, it "does not currently tax cannabis beyond the standard sales tax. Local officials and members of the public are beginning to convene to decide on a tax measure to put before voters in an upcoming election[18]."

How Are Existing Oakland's Cannabis Dispensaries Doing In Relation to San Jose's?

From the financial perspective and for the purpose of comparison based on public information, the average Oakland dispensary outperformed the average for a dispensary (16 approved dispensaries total) located in the city of San Jose by a margin of about 40 percent during the last two fiscal years (FY 2015-16 & FY 2016-17) where regulations and the efforts in reducing illegal operations in both cities are beginning to have an effect. This is supported by taking the average

[10] City of Hayward's Measure EE authorized the City to impose a tax rate up to 15%. The City is in the process of finalizing the regulatory framework and approval of the tax rate to be imposed on approved businesses.
[11] City of Los Angeles' Measure M (March 2017)
[12] City of Los Angeles does not place the limit on the number of authorized dispensaries. The limit will be the number of approved businesses by a yet-to-be-determined date. As of January 2018, 98 are approved.
[13] City of Sacramento's maximum number of authorized dispensaries was based on the number of applicants approved by the deadline of May 31, 2015. 30 dispensaries were approved then and remain in place since
[14] City of San Diego's current Tax Rate is 5%, going up 8% in July 2019. The maximum tax rate is 15%.
[15] City of San Leandro's Measure NN authorized the City to impose a tax rate up to 10%. On March 20, 2017, the San Leandro City Council set the tax of 6%, 7% beginning July 2019 and 8% beginning July 2021.
[16] City of Santa Rosa's Measure D authorized the City to impose a tax rate up to $25 per square foot or 8% of gross receipts. Any tax rates set by the Council is for a minimum term of two years, but the Council may establish longer terms if desired. The initial tax rates are current set as outlined in the table, including 0% for retail of medical-use.
[17] City of Santa Rosa approved 32 cannabis businesses as of January 12, 2018. 18 more are pending.
[18] http://sf-hrc.org/sites/default/files/11.19.2017_Cannabis_Equity_Report.pdf

tax payment of about $450,000 per Oakland dispensary paying at the five percent (5%) medical-use tax rate and compared against the average tax payment of about $544,000 per San Jose dispensary paying at the 10 percent medical-use tax rate. If Oakland's medical-use rate were at 10 percent, the average tax payment per Oakland's dispensary would be at about $900,000 per dispensary.

One could argue that Oakland's medical-use tax rate, at one-half of San Jose's, is a contributing factor to the amount of businesses generated in Oakland. From appearance, the argument seems to have merit, but the underlying factor is in the demand of cannabis. Staff, through reviewing and analyzing data obtained from a variety of sources, including the comparison of cannabis retail prices readily available online, estimated that Oakland has a much larger customer-base than San Jose. Having a larger customer-base means the demand for cannabis is higher in Oakland than that of San Jose, even though Oakland faces more competition than San Jose where it is the only City authorizing the sale of cannabis in Santa Clara County. The high demand does not necessarily drive down the prices because the supply, with the legalization of adult-use, is very much in demand statewide.

Year	City of Oakland				City of San Jose			
	BT Revenue	No. of Dispensaries	Tax Rate	Average	BT Revenue	No. of Dispensaries[19]	Tax Rate	Average
FY 11-12	$1,480,424	4	5%	$370,106	$4,000,000	107	7%	$37,383
FY 12-13	$2,421,721	6	5%	$403,620	$4,200,000	87	7%	$48,276
FY 13-14	$2,648,371	7	5%	$378,339	$6,100,000	73	10%	$82,192
FY 14-15	$2,733,706	8	5%	$442,717	$5,600,000	44	10%	$88,636
FY 15-16	$3,533,044	8	5%	$441,631	$8,100,000	16	10%	$506,250
FY 16-17	$3,639,035	8	5%	$454,879	$9,300,000	16	10%	$581,250
Average	$3,586,040	8	5%	$448,255	$8,700,000	16	10%	$543,750

What Are The Challenges And Options To Address The Challenges Related To Oakland Cannabis Business Tax?

Under Oakland's municipal code, the current tax structure for cannabis business is all inclusive regardless of where a business operates within the supply chain. The tax of either 5 or 10 percent is assessed each step of the way along the supply chain, from seed to retail sale.

1. Application of Oakland Cannabis Business Tax on Cannabis Businesses Other Than Dispensaries:

   At the dispensary level, the application of the 5 percent medical and 10 percent recreational gross receipts tax is simple. However, there is difficulty when these taxes are applied on the downstream supply chain. The issue is which tax rate, 5 percent or 10 percent, the cannabis cultivators and manufacturers will need to remit as they are not the ones selling or distributing

[19] The number of dispensaries for the City of San Jose is approximate due to the City's continued enforcement activities that resulted in the fluctuation in the number of dispensaries paying the Marijuana Business Tax throughout the year.

cannabis directly to the consumers, and therefore do not have the ability to differentiate the type of clientele.

If the current all-inclusive tax structure remains, and as authorized under the Oakland Municipal Code Section 5.04.090, the Finance Department is considering one of the following:

a. Authorize cannabis cultivators and manufacturers to delay the filing and the payment of cannabis business tax up to 45 days beyond the annual March 1 deadline; or,
b. Require cannabis cultivators and manufacturers to declare the amount gross receipts generated in the prior year by the March 1 deadline but authorize an extension of payment of cannabis business tax up to 45 days beyond the annual March 1 deadline.

In either case, the objective is to allow RMB staff time from the annual deadline of March 1 to compile statistical information related to the gross receipts generated and reported by the cannabis dispensaries for the medical-use and for the adult-use. Once statistical information is compiled and analyzed, RMB would inform cannabis cultivators and manufacturers the fixed percentage of their gross receipts that are to be taxed at either 5% or 10%.

The rationale for both approaches is to provide a reasonable basis upon which the percentage of which tax rate cultivators and manufacturers must pay. After all, they are the ones supplying cannabis to the dispensaries. The taxes owed are ultimately based on the gross receipts they generated from their sale and distribution of cannabis to local dispensaries.

2. Apportionment of Gross Receipts

The apportionment of Gross Receipts, as outlined by the City Finance Director's Ruling No. 10 (Attachment C) is not a challenge facing RMB. However, it is included herein for the purpose of answering Council President Reid's request.

To determine whether an individual or a business could apportion the gross receipts, one must establish that the business activities occur inside and outside of the city of Oakland. If it does, the Director of Financing Ruling No 10 would be applicable for which one can use as a basis to calculate the amount to apportion the gross receipts. The following questions are designed to use as a basis to determine whether an apportionment could be granted:

1. Where is the sales office? This would be the place where the sale activities are negotiated, solicited, directed or controlled by the company's employees.
2. Where are the orders accepted or approved? The acceptance or approval shall be deemed to take place at the location of the sales office, as specified in item #1 above, unless there is clear and conclusive evidence that a binding acceptance or approval occurs elsewhere.
3. Where is the merchandise stored immediately prior to shipment or delivery?
4. Where are the billing/invoicing procedures performed?
5. Where is the collecting of receipts and account maintenance performed?
6. Where are the places where merchandise is delivered to, either by vehicles operated by the company or by third-party transportation carriers? A listing of businesses/clients and their respective locations could help. In addition, if merchandise is physically delivered to places outside of the city of Oakland by the company's employees, a copy of the Business

License Tax Certificate number or the Business Tax Certificate number for the city in which the company, through physical presence, carries out the business is requested.

3. Tax Payment Cycle

Currently, all newly established business taxpayers are required to pay the mandated fees associated with the registration of the business. Taxpayers, as authorized by the Oakland Municipal Code Section 5.04.110, have the option to either elect to pay the full estimated tax at the time of registration or pay the first-year tax on or before March 1 of the second year. Most taxpayers elect to pay the first-year tax in the second year.

When the business taxpayer returns the following March 1 to pay retroactively for the first-year tax using the actual gross receipts generated in the first year, the taxpayer is also required to pay the second year using the same amount of gross receipts generated during the first year. The cycle continues to the future tax years where taxpayer continues to pay the tax using the gross receipts generated in the prior year.

The inherent issue associated with allowing taxpayers making the first and second year tax payment at the same time creates a cash-flow issue for certain businesses, but more so for cannabis businesses due to higher tax payments that must be paid at once, and the inability for the cannabis industry to access traditional banking options. This resulted in RMB having to continuously provide payment plans to facilitate the payments of cannabis business tax. Generally, the payment plan spreads over a 10-month period with equal monthly installments. Once a payment plan is satisfied, the subsequent tax year is due, and the cycle of providing payment plan continues.

Given the option to elect making payment for the first tax year resides with the business taxpayer, as authorized in the Oakland Municipal Code, RMB does not have the mandate to require businesses to make an estimated tax payment.

4. Tax Reporting Cycle

Cannabis Business Tax is included as part of the Oakland Municipal Code Chapter 5.04, which covers many different types of businesses and industries that are common and general in nature. The cannabis industry, on the other hand, is regulated and being taxed at rates that are unique. The rules and regulations related to taxation will need to be kept up as the industry evolves and matures, and making changes to the current Oakland Municipal Code Chapter 5.04 intended for cannabis industry may inadvertently result in unintended consequences that will affect other industries unless the City Council could return to the voters seeking approval for the flexibility in adopting rules and regulations specifically for the cannabis industry. In addition, the tax payment cycle, as discussed in question 4 above, would also be minimized if the tax reporting cycle and payment requirement change from once a year to quarterly reporting and payment structure.

What Are Other Challenges That Affect Oakland Cannabis Businesses?

1. Deduction for Business Expenses:

   In 1982, Congress enacted Section 280E in the Internal Revenue Code, which disallowed businesses from deducting ordinary and necessary business expenses if such business or trade or the activities which comprise such trade or business consists of trafficking in controlled substances within the meaning of Schedule 1 and 2 of the Controlled Substances Act. Cannabis is listed as a Schedule 1 in the Controlled Substances Act. This results in cannabis businesses facing much higher federal tax rates than similar businesses operating in other industries.

2. Application of Sales Tax at State Level:

   As part of its overall responsibility in the administration of the Cannabis Tax Law, the CDTFA published a Tax Guide[20] for Cannabis Businesses on its website. One of the topics involves the application of Sales Tax as it relates to Local Government Cannabis Business Taxes.

   In this topic, the CDTFA states, "Generally, whenever an expense of the retailer is separately added to any taxable sale, the expense is also subject to sales tax." The CDTFA illustrates the application of the tax by providing an example of the Sales Tax calculation as follows:

Selling price of cannabis, including excise tax	$35.00
Cannabis 10% business tax	$3.50
Subtotal ($35.00 + $3.50)	$38.50
Sales tax ($38.50 × 9.25%)	$3.56
Total due ($38.50 + $3.27)	$42.06

   As the example illustrated, Sales Tax is being applied to the Cannabis Business Tax, making the total due higher than a typical sale transaction that customers and business owners are accustomed to.

What Are The Decision-Making Criteria For The City Council?

1. Can the City Council vote to increase, decrease, extend or expand existing taxes?

   State law requires that any increase, extension or expansion of a tax requires voter approval. The decreasing of the Oakland's fixed Cannabis Business Tax rates of 5% and 10% would have been acceptable had the language in Measure V, passed by the voters in 2010, provided the flexibility. Unfortunately, the Measure V language did not include such language.

2. Is a City interest served by lowering the cannabis tax rates or creating different tax rates for different parts of the industry?

   As mentioned above, the cannabis market, particularly the consumption side of the equation on the part of adults using cannabis for recreational purpose, is still very much in its infancy. In fact, in California, it is one month old. From the competitive side of the equation, it is one of

[20] https://www.cdtfa.ca.gov/industry/cannabis.htm#Retailers

the main criteria in which businesses make decision to relocate to a jurisdiction. However, and as also mentioned above, cannabis industry requires tolerance and acceptance by the electorates, and not many jurisdictions have thus far.

3. What are the risks to the City to keep the existing tax rates as they currently are?

   The risks of keeping the existing tax rates could result in businesses moving to a jurisdiction where the taxes are lower. There is also a risk that cannabis business already operating within Oakland will remain on the unregulated market due to the City's current tax rate coupled with the State's tax rates.

4. Are there other tax methods to consider beside gross receipts tax?

   The Council could, and perhaps should, consider adopting different cannabis business tax rates for various parts of the supply chain.

   - Per-Unit Taxation:

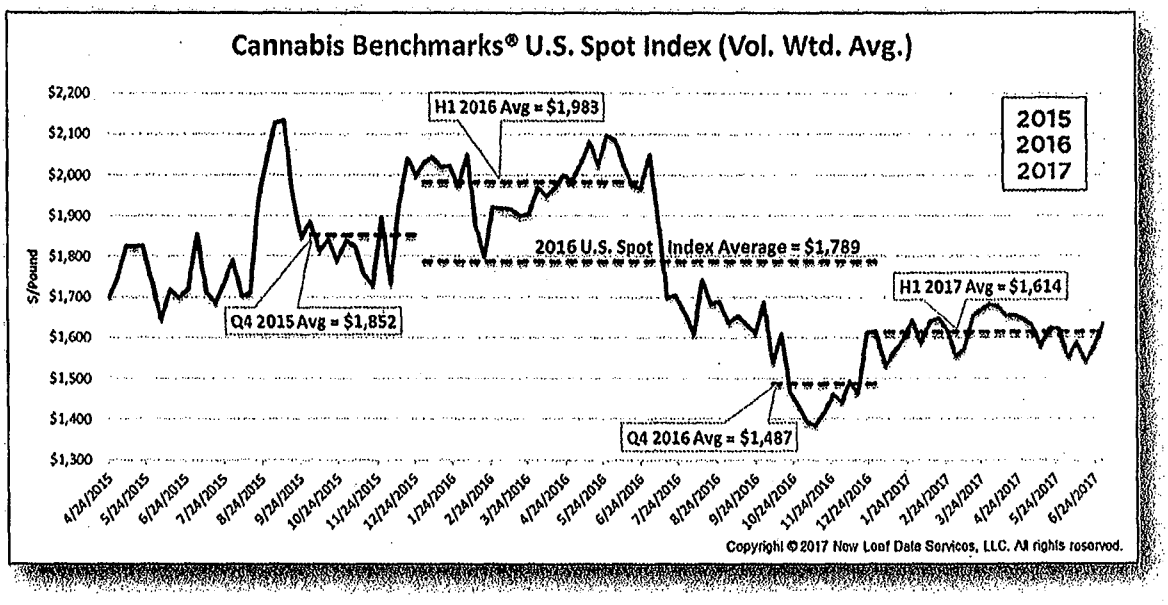
     The state's taxing of cultivators based on the weight of harvested cannabis that enters the commercial market is a form of per-unit taxation. This taxing scheme should provide a stable stream of revenue because prices tend to drop, especially during the fall when outdoor cultivators harvest their annual crop.

     On the other hand, taxing cannabis cultivators on its weight may inadvertently incentivize producers to cultivate stronger cannabis, as in the way cannabis is grown to produce a higher level of THC[21] content. The higher the level of THC content, the higher the sale price. Yet, it would be subject to the same tax rate as cannabis with lower level of THC content.

     In order to set the tax rates, similar to that of the State, the production or the yield of cannabis will need to be calculated. In general, an indoor space consists of 4 feet by 4 feet, which equates to a 16-square feet space, and equipped with a 1,200 watts lighting, would yield approximately two pounds of cannabis. At two pounds for every 16 square feet, a 10,000 square feet space would yield approximately 1,250 pounds of cannabis (10,000 / 16 x 2)

     According to Cannabis Benchmarks, a leading provider of financial, business and industry data for the North American cannabis markets, the price of cannabis is at $1,350 per pound for the month of February 2018. At this price, 1,250 pounds would generate approximately $1.7 million ($1,350 x $1,250 per pound). Historically, cannabis prices range from approximately $1,300 to over $2,100 per pound according the following chart compiled by Cannabis Benchmarks and published in the Forbes magazine in September 2017 (Attachment D).

[21] Tetrahydrocannabinol (THC) is a cannabinol found in cannabis with powerful psychotropic and therapeutic properties



Based on the foregoing where yield and revenue for the cultivators can be estimated, the rates could be set as follows:

Tax Payment by Percentage of Gross Receipts

Space Size	Yield Rate (2 Lbs./16 Sq.ft.)	Price per Pound	Revenue for Cultivators	Tax Payment Using Gross Receipts				
				2%	3%	4%	5%	10%
10,000 Sq. Ft.	1,250	$1,500	$1,875,000	$37,500	$56,250	$75,000	$93,750	$187,500
10,000 Sq. Ft.	1,250	$1,350	$1,687,500	$33,750	$50,625	$67,500	$84,375	$168,750
10,000 Sq. Ft.	1,250	$1,200	$1,500,000	$30,000	$45,000	$60,000	$75,000	$150,000
10,000 Sq. Ft.	1,250	$800	$1,000,000	$20,000	$30,000	$40,000	$50,000	$100,000

Tax Payment by Per-Pound of Cannabis

Yield Rate in Pounds	10,000 Square Feet of Growing	Tax Rate by Per-Pound of Cannabis					
		$25	$30	$40	$50	$100	$120
1 Lb. / 16 Sq.ft.	625 Lbs.	$15,625	$18,750	$25,000	$31,250	$62,500	$75,000
2 Lbs./ 16 Sq.ft.	1,250 Lbs.	$31,250	$37,500	$50,000	$62,500	$125,000	$150,000

Tax Payment by Per-Ounce of Cannabis

Yield Rate In Ounce	10,000 Square Feet of Growing	Tax Payment by Per-Ounce of Cannabis					
		$1	$2	$3	$4	$5	$9
16 Oz. / 16 Sq.ft.,	10,000 Oz.	$10,000	$20,000	$30,000	$40,000	$50,000	$92,500
32 Oz / 16 Sq.ft.	20,000 Oz.	$20,000	$40,000	$60,000	$80,000	$100,000	$185,000

Administratively, if Oakland were to seek voter approval to adopt this type of taxation to align with the state and make it applicable only to cultivators and manufacturers, it would make it easier for the cultivators and manufacturers to pay the tax, as opposed to waiting

for the City to determine the percentage of gross receipts subject to each of the two tax rates they will need to pay.

The taxing of cannabis via the level of THC content would be adaptable for the manufacturing segment of the cannabis industry, but it would have to wait until the California Department of Public Health ("CDPH") finalized its regulations with respect to labeling, the amount of THC per serving and the maximum of THC per package. CDPH published a summary of public comments on September 28, 2017[22], but it has yet to announce the date when the final regulation is to be expected.

The other form of Per-Unit Taxation is on the number of plants. Each plant is taxed at a certain rate.

- Value-Base Taxation

  Gross receipts tax and sales tax are this form of taxation. They are measured by sales.

- Square Footage of Business or Grow Space

  The taxing using the square footage of a cannabis business or the grow space in a cannabis business is a common among local jurisdictions, such as the City of Long Beach that imposes a tax of up to $15.00 per square foot under cultivation, the City of Rancho Cordova imposes a tax of $100 per square foot on all business improvements occupied by the cannabis business.

  This taxing structure also provides a stable revenue stream because the tax is fixed. Any consideration of taxing cannabis based on grow or occupied space will need to take into account that businesses maximizing the space by possibly creating a multi-level of shelving system. Counting the space by each level of shelving for taxing purpose is an option. The taxing of cannabis based on grow or occupied space could also lead to the increase in consumption of California's most precious resource - water.

POSSIBLE POLICY OPTIONS FOR CITY COUNCIL'S CONSIDERATION

The outcome of any City Council's deliberations and subsequent decision should include, but are not limited to, the following policy options:

1. Option 1: Keep existing tax rates as they currently are at 5% and 10% of gross receipts on cannabis businesses, including specialized segments of the industry, such as cultivators, manufacturers, transportation, paying both rates. Administratively, staff has already identified a reasonable approach as to which tax rates specialized cannabis businesses, such as cannabis cultivators and manufacturers need to pay annually (see page 9, *Application of Oakland Cannabis Business Tax on Cannabis Businesses Other Than Dispensaries*).

2. Option 2: Return to voters seeking approval to authorize the City Council the flexibility in

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22 https://www.cdph.ca.gov/Programs/CEH/DFDCS/CDPH%20Document%20Library/Cannabis%20Comments%20(Final%20on%20CDPH%20Letterhead).pdf

setting the tax rates, as they are currently set at 5% and 10%, and the ability to promulgate and adopt tax rules and regulations, such as the frequency of tax reporting and tax payment requirements, that are intended to apply to the cannabis industry without impacting other industries.

3. Option 3: Return to voters seeking approval to authorize the City to repeal and replace the existing tax rates with the new set of tax rates as follows:

   a. A tax rate up to a maximum of 5% applicable to medical cannabis businesses dispensing cannabis to medically-needed patients with proper state identifications. This rate stays the same as it is currently set. The change is in the City Council ability to reduce or increase the tax rate to a maximum tax rate without returning to the voters.

   b. A tax rate up to a maximum of 10% applicable to non-medical cannabis businesses dispensing cannabis to adults 21 and older for non-medically needed purposes. This rate stays the same as it is currently set. The change is in the City Council ability to reduce or increase the tax rate to a maximum tax rate without returning to the voters.

   c. A tax rate of minimum two dollars ($2) to a maximum of five dollars ($5) per ounce of cannabis produced, weighed and distributed to the cannabis retailer/dispensary applicable to cannabis cultivators. Whichever the actual tax rate set by the Council would afford the cannabis cultivators the ability to know ahead of time, as opposed to waiting for RMB to set the tax rates between 5% and 10% following the analyzing of the data each year.

      As illustrated in Section 4 of the Decision-Making Criteria above, a 10,000 square feet space under normal conditions could produce 20,000 ounces of cannabis. The tax payment could be from $40,000 to $100,000 annually.

Yield Rate In Ounce	10,000 Square Feet of Growing	Tax Payment by Per-Ounce of Cannabis			
		$2	$3	$4	$5
32 Oz / 16 Sq.ft.	20,000 Oz.	$40,000	$60,000	$80,000	$100,000

   d. A tax rate of a minimum 3% to a maximum of 7% of gross receipts applicable to cannabis manufacturers and for cannabis transport businesses. Similar to the tax rates for cannabis cultivators, cannabis infused products manufacturers and cannabis transportation-related businesses would know the fixed that rate that they would need to pay, as opposed to waiting for RMB to set the tax rates between 5% and 10% following the analyzing of the data each year

      Based on the average of Colorado's 215 licensed cannabis-infused products manufacturers that generated $1.6 million in sales in 2015[23], the tax payment could be from $48,000 to $112,000 annually.

Average Annual Gross Receipts	Tax Payment by Per-Ounce of Cannabis				
	3%	4%	5%	6%	7%
$1,600,000	$48,000	$64,000	$80,000	$96,000	$112,000

[23] Consultant's report prepared for the Contra Costa County Board of Supervisors Meeting October 24, 2017

If the City Council decided to pursue this option, two key elements must be part of the ballot measure, and they are:

- The ballot language should clearly carry a provision that would allow the City Council the flexibility to adjust the tax rates up to the maximum for each segment of the cannabis once every two years. The purpose is to provide cannabis businesses the stability and the knowledge for business planning.

- The ballot language should be structured as a repeal and replace ballot measure. By using repeal and replace language in the ballot, the existing tax rates, fixed at 5% and 10%, would remain intact if the ballot measure failed at the election.

FISCAL IMPACT

This is an informational report; there are no budget implications associated with the report.

PUBLIC OUTREACH / INTEREST

No outreach was deemed necessary for this informational report beyond the standard City Council agenda noticing procedures.

COORDINATION

This report has been coordinated with the City Attorney's Office.

ACTION REQUESTED OF THE CITY COUNCIL

Staff recommends that the City Council receive an Informational Report on Cannabis Tax Policy to maximize City Tax Revenue, Economic Growth, And Jobs.

For questions regarding this report, please contact Margaret O'Brien, Revenue and Tax Administrator, at (510) 238-7480.

Respectfully submitted,

Katano Kasaine
Director of Finance
Finance Department

Reviewed by:
Margaret O'Brien
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Prepared by:
Andy Best
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Revenue Management Bureau

Prepared by:
Huey Dang
Tax Auditor II
Revenue Management Bureau

Attachments (4):

A: Oakland Cannabis Cultivation and Manufacturing Market Share
B: Economic Impact Study of the Cannabis Sector in the Greater Sacramento Area
C: Office of Finance Revenue Division, Director of Finance Ruling No.10
D: Cannabis Wholesale Prices Have Dropped, but Markets Are Stable

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Oakland Cannabis Cultivation and Manufacturing Market Share

Tax Policy Paper

July 13, 2017

ATTACHMENT A

July 13, 2017

Oakland Cannabis Cultivation and Manufacturing Market Share

Prepared for:
Oakland Citizens for Equity and Prosperity (OCEP)

Prepared by:
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Table of Contents

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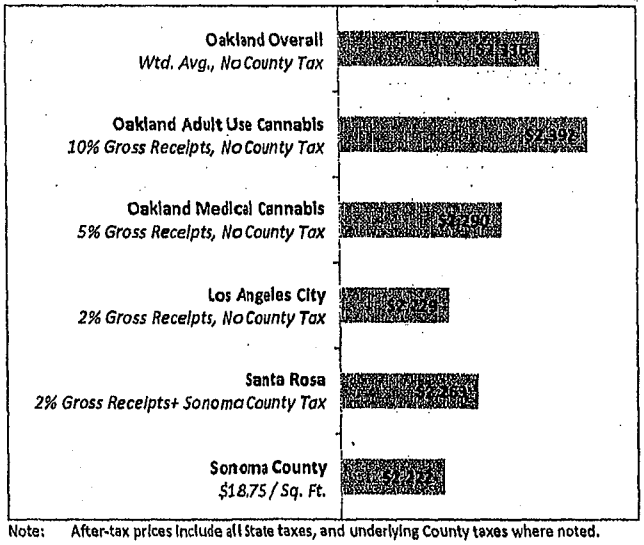
Executive Summary

In May 2017, the Oakland Citizens for Equity and Prosperity (OCEP) retained the Marijuana Policy Group (MPG) to provide an overview of tax policy considerations for Oakland policymakers, and to estimate the economic impacts of cannabis cultivation and manufacturing for the City under various policy postures. Several **key findings** of the report are summarized below:

- California's legal cannabis market will be the largest in North America, and **cultivation and manufacturing are the foundation of the industry.**
- The statewide **cultivation and manufacturing tiers of the supply chain could produce $4.2 billion in total direct and indirect economic activity and 36,000 jobs, retail not included.** These statewide businesses can locate anywhere in the state.
- Cultivation and manufacturing operations—like businesses in any other industry—**will seek out locations that provide favorable conditions for business.**
- **A large share of California cities and counties are competing for market share** by attracting cultivators and manufacturers to generate tax revenue, employment, and economic activity.

Figure ES-1.
Tax Rates and After-Tax Wholesale Prices of Local Indoor-Cultivated Cannabis

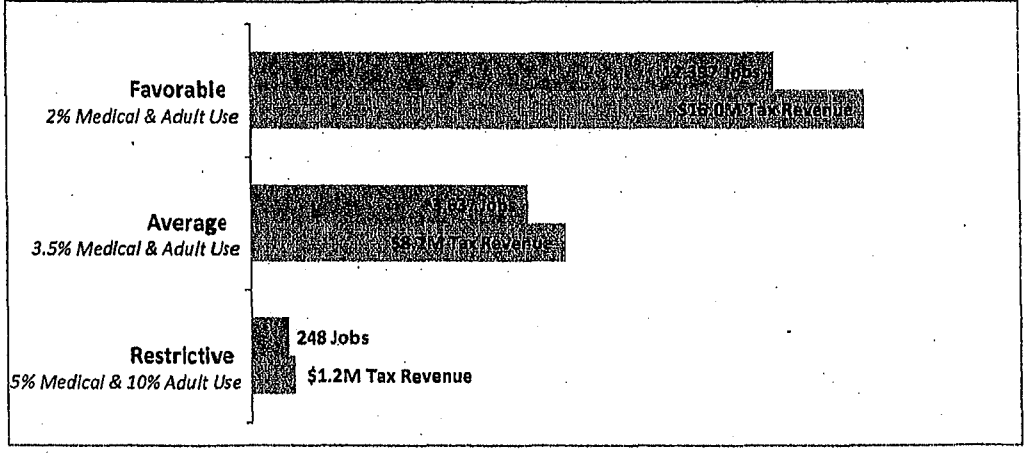


Note: After-tax prices include all State taxes, and underlying County taxes where noted.

- **Oakland currently imposes high wholesale cannabis taxes** compared to the other jurisdictions, based on a uniform price of $2,040 per wholesale pound of indoor-cultivated flower.

- If Oakland hopes to capture a significant portion of the market, the City will need to adopt policies that are more **attractive to cultivation and manufacturing businesses** than those in competing jurisdictions.
- **City tax and zoning policy will influence the presence, market share, and competitiveness** of cannabis cultivation and manufacturing businesses in Oakland.
- **A larger market share will increase tax revenue benefits,** even if competitive tax rates are needed to attract businesses.
- **Lower taxes on wholesale transactions will provide an important incentive** to businesses that hope to compete on price in a large and competitive market for wholesale cannabis products.
- Retailers and consumption, however, are much more constrained by local demand. Higher taxes are less likely to affect where dispensaries locate or where consumers choose to purchase their cannabis, since **these decisions are much more local in nature.**
- Retailers and processors buy their cannabis inputs in large quantities and are price sensitive. They will **search for the lowest prices across regions when purchasing wholesale,** after accounting for quality and transportation costs.

Figure ES-2
Oakland Employment Effects and Tax Revenues by Scenario



- Figure ES-2 provides a summary of the estimated **tax revenue and employment impacts** of Oakland cultivation and manufacturing under three policy and market environment scenarios.
- If Oakland wholesale cannabis is priced too high, **the city could potentially lose cultivation and manufacturing market share** to other jurisdictions.
- Oakland could capture **$8.2 to $16.0 million in tax revenue and generate 3,600 to 12,400 jobs** if it can capture a large share of the regional and statewide supply chain.

- Businesses also consider **city zoning rules, licensing cost and availability, building requirements, setback requirements** and other factors when choosing a jurisdiction.

Other factors that affect virtually all industrial location decisions will undoubtedly impact cannabis producers in California, including the local availability and cost of suitable cultivation and manufacturing sites, water and electricity costs, and labor costs.

Introduction

On November 8, 2016, California voters approved Proposition 64, legalizing the cultivation, manufacturing, distribution, and consumption of cannabis for adult use. On June 28, 2017, Governor Brown signed Senate Bill 94 into law, also known as the Medicinal and Adult-Use Cannabis Regulation and Safety Act (MAUCRSA). Under these new State rules, the City of Oakland will face a number of regulatory decisions, including decisions regarding taxation policies for legal cannabis cultivation.

In June 2017, the Oakland Citizens for Equity and Prosperity (OCEP) retained Marijuana Policy Group (MPG) to provide an informative overview of the potential impacts of tax policy decisions for Oakland policymakers, and to estimate the economic impacts of cannabis cultivation and manufacturing under various City policy postures.

This policy paper provides 1) a discussion of tax policy and business site selection; 2) a review of cultivation tax policy in four comparable jurisdictions; 3) an analysis of state and regional demand for cannabis with a focus on Oakland cultivation and manufacturing, and 4) a quantification of potential economic and employment impacts on the local Oakland economy.

Tax Policy and Market Share Implications

Oakland's choice of tax policy, along with several other local factors, will ultimately influence the presence, market share, and competitiveness of its cannabis production businesses.

State Taxation. The State imposes a cultivation tax of $9.25 per ounce of dry-weight flower, and $2.75 per ounce of dry-weight trim under new tax rules defined by Proposition 64. At estimated market prices of $2,040 per pound of high-quality indoor flower and $100 per pound of trim[1], MPG estimates that wholesale prices will be $2,188 for flower and $144 for trim, after state taxes are applied. These state taxes apply to all medical and adult use transactions.[2]

Local Taxation. Under the MAUCRSA, each municipality has the authority to impose its own tax structure. While some jurisdictions may aim to entice cannabis vendors and producers with accommodating taxation and regulatory policies, others may deter their presence by imposing high taxes, restrictive regulations, or prohibiting adult use and medical business altogether. All

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[1] An average indoor-cultivated flower price of $2,040 per pound is based on the recent University of the Pacific study of the Sacramento cannabis market. The price of trim can range from $100 to $500 depending on quality, according to conversations with local market participants. However, cannabis prices fluctuate and are subject to overall market conditions, similar to any other commoditized consumer product.

[2] Under the MAUCRSA, medical and adult use cannabis businesses will be able to vertically integrate their operations, with some exceptions for testing lab and distribution licenses. Tax considerations for vertically integrated businesses are notable since transfers within a single business are not likely to involve the same wholesale price as used in the open market arms-length transactions. Without proper accounting and valuation mechanisms, vertically integrated businesses can potentially avoid paying taxes by declaring their cultivation-to-processor transfer prices lower than those in the open market. In Colorado, for example, the State calculates an Average Market Rate for wholesale transactions and applies this to all vertically integrated businesses in order to calculate cultivation excise taxes.

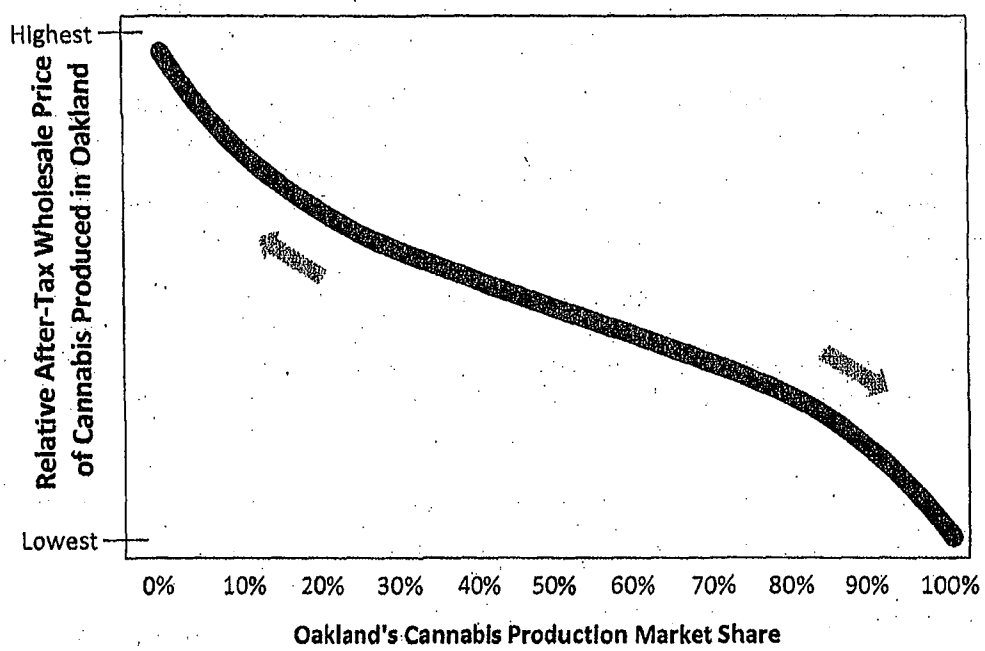
else being equal, cannabis producers will prefer to locate in lower-tax jurisdictions in order to compete in the state and regional markets on final after-tax wholesale prices.

Purchasing wholesale cannabis flower and trim is the primary input and largest cost of processors and retailers. These downstream businesses typically buy in large quantities and are highly price sensitive. Manufacturers and retailers are likely to search for the lowest prices across jurisdictions after accounting for quality and transportation costs. Suppliers with the lowest cost will likely capture a larger market share.

Manufacturers and retailers will prefer to obtain as much of their cannabis supply from Oakland as possible, if their prices are among the lowest in the state or region. Conversely, if Oakland prices are higher than other regions or clusters across the state, these businesses will prefer to purchase their cannabis inputs from other, cheaper sources.

Figure 1 below is a conceptual graph that illustrates this effect. The horizontal axis of the graph represents the portion of the overall market supplied by Oakland producers, while the vertical axis illustrates the relative price that downstream businesses would pay for Oakland cannabis products compared to that of cannabis products from competing jurisdictions.

Figure 1.
Relationship between Oakland's Relative After-Tax Wholesale Prices and Regional Market Share



Source: MPG.

This curve represents the price elasticity of demand, or price sensitivity, among the businesses that purchase wholesale cannabis products from Oakland. A steep curve suggests that downstream businesses are less responsive to price changes than to other factors, and that a higher tax rate will not significantly impact Oakland market share, likely yielding higher tax revenues. A flatter curve suggests that those businesses are more sensitive to price than to other factors, so that an increase in the tax rate is more likely to reduce the market share for Oakland-produced cannabis, potentially resulting in reduced tax revenue collections if the demand reduction is sufficiently large.

Comparative Local Tax Policy Analysis

MPG examines the tax policy implications on wholesale flower prices in three potentially large production centers (Sonoma County, Santa Rosa, and Los Angeles), providing a comparative analysis with Oakland. This section focuses only on indoor cultivation, due to the urban environment in Oakland. We assume a uniform pre-tax price of $2,040 per pound of indoor flower, similar to the University of the Pacific study of the Sacramento cannabis industry.[3] For cities, we also consider the additional layer of taxation that will be imposed by the county.

Sonoma County. In March 2017, 72.4 percent of voters in Sonoma County approved Measure A, which allows the County to impose cultivation taxes of (1) up to $38 per square foot (SF) for indoor growers[4], or (2) up to ten percent of gross receipts for any cultivation business.[5] The initial cultivation tax rate for "Medium" type cultivation permit holders (the largest and highest-taxed cultivation license available) is defined as $18.75/SF for indoor grows.[6] Based on an average annual production of 0.55 pounds of flower per square foot of indoor cultivation, MPG estimates an after-tax price of $2,222 per pound for cannabis cultivated in the unincorporated areas of the County, which is equivalent to a 1.7 percent tax on gross receipts.

Santa Rosa. Voters in the City of Santa Rosa approved two taxation mechanisms under Measure D in the June 6, 2017 election, with 77 percent voter support. All indoor commercial cannabis cultivation businesses will be taxed at a rate "not to exceed either $25 per square foot of cannabis cultivation area or eight percent (8%) of annual gross receipts." For the first two years, the City will impose a low initial tax rate of only two percent (2%) of gross receipts or $5 per square foot, with the option to raise the rate thereafter.[7,8] Combining the gross receipts tax with MAUCRSA and Sonoma County taxes,[9] MPG estimates the initial wholesale price of Santa Rosa flower will be $2,263.

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[3] "Economic Impact Study of the Cannabis Sector in the Greater Sacramento Area." Prepared by the Center for Business and Policy Research, Eberhardt School of Business, and McGeorge School of Law. October 17, 2016.

[4] Sonoma defines per-square-foot taxes separately for mixed-light and outdoor cultivation businesses, however we only describe indoor cultivation as that is the most likely form to occur in Oakland's urban environment.

[5] http://www.northbaybusinessjournal.com/opinion/6753820-181/sonoma-pot-cannabis-marijuana-tax?artslide=0

[6] http://sonomacounty.ca.gov/WorkArea/DownloadAsset.aspx?id=2147528876

[7] http://srcity.org/DocumentCenter/View/13996

[8] http://www.pressdemocrat.com/news/6734029-181/santa-rosa-council-to-weigh

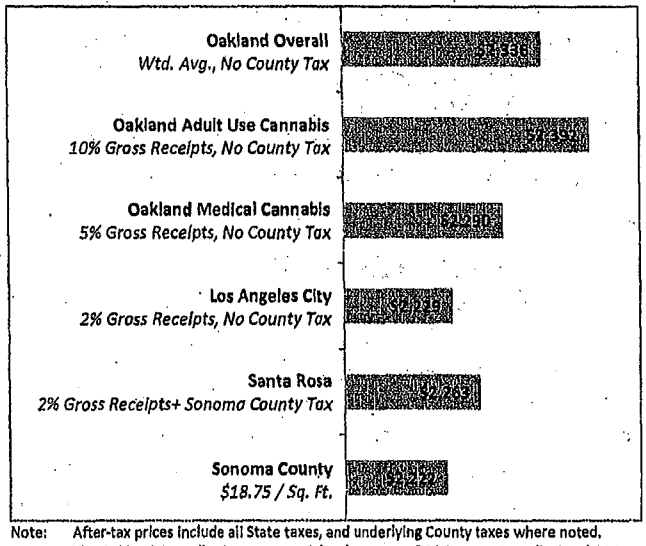
[9] Cultivation businesses within Santa Rosa will be subject to both City and Sonoma County taxation.

Los Angeles. Voters in the City of Los Angeles approved Measure M in March 2017, authorizing a cannabis cultivation tax of two percent (2%) on gross receipts effective January 2018.[10] Los Angeles County has not yet proposed or approved any form of cultivation tax. MPG estimates that in the absence of LA County taxation, growers in the City of Los Angeles will have an average wholesale price of $2,229.

Oakland. The current cannabis taxes for Oakland cultivation were established by Measure V and approved by voters in November 2010. The measure imposes a five percent (5%) tax on the gross receipts of medical cannabis businesses, and a "Non-Medical Cannabis Business Tax" of ten percent (10%). At the time of this writing, there are no initiatives or measures to change these rates. Alameda County has not yet defined a cannabis cultivation tax. Based on State and City taxes only, MPG estimates that the 2018 after-tax price of one pound of medical flower cultivated in Oakland will be $2,290, adult use flower will be $2,392, and the overall weighted average price will be $2,336.[11]

After-Tax Prices. Figure 2 illustrates the different tax rates and mechanisms for each jurisdiction above, as well as the estimated after-tax wholesale price per pound of indoor cannabis.

Figure 2.
Tax Rates and After-Tax Wholesale Price per Pound of Locally-Cultivated Cannabis



Note: After-tax prices include all State taxes, and underlying County taxes where noted.
The Oakland Overall price uses a weighted average of 55.2 percent medical and 44.8 percent adult use cannabis cultivation.
Source: MPG.

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10 https://ballotpedia.org/Los_Angeles,_California,_Marijuana_Regulation_and_Taxation_Referred_Ordinance,_Measure_M_(March_2017)

11 We assume a distribution of 55.2 percent medical and 44.8 percent adult use for all cultivated cannabis in order to estimate the after-tax wholesale price of cannabis cultivated in Oakland, based on data from the first year of legalization in Colorado.

Based on current State and local tax schemes and an average wholesale price of $2,040 per pound of indoor flower, the table above illustrates that Oakland's tax scheme will result in the highest after-tax prices compared to the three other jurisdictions described in this report, *without considering a potential Alameda County tax.* Compared to Sonoma County, one pound of indoor flower grown in Oakland is estimated to be $114 more expensive (5.1 percent), $73 more expensive than Santa Rosa (3.2 percent), and $107 more expensive than Los Angeles (4.8 percent).

Depending on the price sensitivity of downstream businesses, Oakland could lose market share to cultivators in other jurisdictions that produce similar quality cannabis and have similar transportation costs, as illustrated previously in Figure 1. As an example, consider the demand for regionally-cultivated cannabis flower by price-sensitive retailers in Sacramento. The distance and transportation costs to Oakland and unincorporated Sonoma County are likely to be similar. If the quality of cultivated cannabis flower is also similar between both jurisdictions, then Sacramento businesses would purchase a larger share of their supply from Sonoma County growers, given the higher after-tax wholesale flower price in Oakland ($2,222 versus $2,336 per pound).

As cannabis producers decide where to locate and the market responds to pricing and other factors, a decrease in Oakland's market share will also cause a proportionate reduction in the potential for associated tax revenues and economic activity.

Total State and Regional Demand for Cannabis

To provide a basis for the potential share of state and regional cannabis supplied by Oakland producers, MPG estimates the total demand for cannabis in California, the Northern and Southern California Regions, and the Oakland metro area.

Methodology: MPG combines proprietary demand models with regional demographic data and use prevalence survey data in order to calculate total demand in terms of flower equivalent (FE) cannabis product.[12] Only the combination of these three components can yield an accurate and defensible point estimate of cannabis demand.

Results: MPG calculates the number of past-year and past-month cannabis users aged 21 and over for 2018 using cannabis use prevalence data from the most recent 2014-15 National Survey on Drug Use and Health (NSDUH) and 2018 population projections from the CA Department of Finance. Since the California medical cannabis registry for patients is voluntary,

[12] In light of recent studies and analyses of market data and trends, it is no longer appropriate to simply calculate demand in terms of "flower weight" or "buds". Instead, best practices suggest that demand should be calculated in terms of Flower Equivalent (FE) in order to account for the growing range and popularity of cannabis products such as edibles and concentrates. These products require differing levels of cannabis input in their production, and the different modes of consumption have differing pharmacological and psychoactive implications. As alternative consumption methods gain in popularity (in Colorado, more than 30 percent of spending on cannabis is for non-flower products), the FE approach to demand calculation takes into consideration the total amount of cannabis flower needed for demand that spans all product categories.

we combine estimates from the Marijuana Policy Project with MPG calculations to estimate the number of individuals with physician recommendations for medical cannabis. Figure 3 presents these estimates.

Figure 3.
Adult California Resident Cannabis User Estimates

Source:
CA Dept. of Finance; NSDUH; MPP; MPG.

2018 Estimates	
Past-Month Medical Cannabis Patients	868,718
Past-Month Adult Cannabis Users, 21+	1,993,002
Past-Year Adult Cannabis Users, 21+	1,618,934
Total Past-Year Cannabis Users, 21+	**4,480,654**

MPG combines the user estimates above with detailed NSDUH data on California consumers' frequency of use and recent survey data on average daily consumption quantities to estimate the total demand for cannabis flower equivalent by adult Californians. We repeat this process to estimate the demand of out-of-state adult visitors, using 2016 domestic and international annual visitation data from Visit California[13].

According to the estimates in Figure 1, medical cannabis patients account for approximately 30 percent of all past month users in California. However, survey data suggests that their typical consumption is twice that of the average adult user. Based on post-legalization patterns observed in Colorado, the relative ease of becoming a medical patient in California, and the large well-established state medical cannabis market, we estimate that small majority of the overall resident cannabis demand will be supplied by medical cannabis businesses during the first year of adult use sales. We estimate 55.2 percent of all demand for legal and regulated cannabis supplied by the medical market and 44.8 percent supplied by the new adult use market. This pattern was observed during the first year of Colorado legalization, but it has slowly shifted towards the adult use market in subsequent years.

While businesses licensed under MAUCRSA will provide the only legal sources of adult use and medical cannabis, the underground market is likely to persist in the early years, as observed in states that have legalized like Colorado and Washington. Given the uncertainties surrounding relative prices, quality, and availability of regulated cannabis businesses compared to the underground market, as well as the historical presence of a large and deep-rooted network of underground market growers, MPG estimates that 59.1 percent of all cannabis demand will be supplied by regulated businesses, while 40.9 percent will remain in the underground market. This split between the regulated and underground markets is based on data observed during the first year of legalization in Colorado. Since visitors are much less likely to have access to underground market supply channels, we assume that 95 percent of visitor demand will be supplied by regulated businesses.

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[13] http://industry.visitcalifornia.com/Find-Research/California-Statistics-Trends/

Figure 4 shows the estimated 2018 consumer demand for regulated cannabis flower equivalent by each California market segment, with a statewide annual total of 1.04 million pounds.

Figure 4.
Annual Consumer Demand for Cannabis Flower Equivalent

User Group	Share of Demand	Total Demand (000's of Lbs)	Regulated Market Share	Regulated Demand (000's of Lbs)[+]
CA Residents	-	**1,638.0**	-	**968.1**
CA Medical Cannabis Patients	*55.2%*	*904.2*	*59.1%*	*534.4*
CA Adult Users	*44.8%*	*733.8*	*59.1%*	*433.7*
Out-of-State Visitors (Recreational Only)	-	80.7	95.0%	76.6
Total 2018 Demand for CA Cannabis FE		**1,718.7**		**1044.7**

Source: MPG.

Oakland Cannabis Market Share

We utilize the regional share of the total California population in order to estimate the share of statewide demand for regulated cannabis in the Oakland area, Northern California (NorCal), and Southern California (SoCal).

In order to be more competitive in the large supplier market, California producers will choose to establish their businesses in locations that offer the most compelling environment for their operations. Several local and regional factors will ultimately influence the size and shape of the cannabis production market in Oakland once MAUCRSA takes effect in 2018, including local taxes, real estate availability and prices, local business demand and wholesale opportunities, energy and water costs, and many others, as discussed in detail in later sections of this report.

We examine three policy and market scenarios for market share capture by Oakland producers, similar to the framework used in the 2016 University of the Pacific Sacramento study[14]. In the *Restrictive scenario*, Oakland would maintain the current 5 percent medical and 10 percent adult use gross receipts taxes (some of the highest taxes in the state), impose very restrictive operational regulations, and present limited local business opportunities that would encourage producers to locate in other jurisdictions and reduce the City's market share of total regional production. The Restrictive scenario describes the potential outcome if Oakland does not adjust the current tax rates to compete with other jurisdictions, resulting in businesses leaving for a more favorable locale. Figure 5 shows the potential tax rates for each scenario, as used in our analysis.

[14] "Economic Impact Study of the Cannabis Sector in the Greater Sacramento Area." Prepared by the Center for Business and Policy Research, Eberhardt School of Business, and McGeorge School of Law. October 17, 2016.

Figure 5.
Oakland Cannabis Policy Scenarios

Scenario	Restrictive	Average	Favorable
Tax Rates	5% Medical; 10% Adult Use	3.5% Medical & Adult Use	2% Medical & Adult Use
Business Opportunities	Limited	Local	Broad
Regulations	Strict	Robust	Relaxed

Source: MPG.

Figure 6 describes the adult demand for regulated cannabis in each geographic area, the Oakland market share capture rate, and the resulting demand for raw and processed cannabis flower equivalent (FE) produced in Oakland, under each of the three scenarios.

Figure 6.
Regional Demand for Wholesale Pounds of Flower Equivalent Cannabis Products Cultivated and Processed in Oakland, by Scenario

	Oakland Area	NorCal	SoCal	Total
Share of 2018 Adult CA Population	1.1%	38.1%	60.9%	100.0%
Total Demand (thousand pounds of FE)	11.0	397.7	636.0	1,044.7
Regional Market Share Supplied by Oakland Cultivation				
Restrictive	30%	1%	0%	-
Average	65%	25%	0%	-
Favorable	85%	65%	15%	-
Total Demand Supplied by Oakland Supply Chain (thousand pounds of raw & processed FE)				
Restrictive	3.3	4.0	0.0	7.3
Average	7.1	99.4	0.0	106.6
Favorable	9.3	258.5	95.4	363.2

Source: MPG.

MPG estimates that Oakland cultivators and processors will supply just 7,300 pounds of cannabis flower equivalent products to the wholesale market in the Restrictive scenario, 106,600 pounds in the Average scenario, and 363,200 pounds in the Favorable scenario.

Oakland Cultivation and Manufacturing Market Size and Tax Revenues

This section examines the potential market size and tax revenue for cannabis cultivation and manufacturing. Retail sales are not a part of this study, because consumers are generally less sensitive to tax policy than producers. For example, an individual from Oakland is less likely to drive to Los Angeles to save ten percent on their small personal purchase than a processor, who may buy tens of thousands of dollars of product per month.

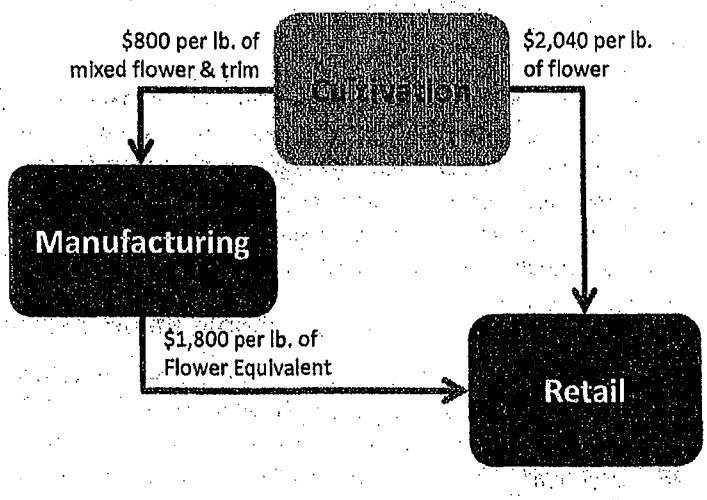
In order to estimate the wholesale market size for raw cultivated cannabis and infused products manufactured in Oakland under each scenario, MPG uses a wholesale price of $2,040 per pound of high-quality indoor flower sold from cultivators directly to retailers.

Processors are typically willing to purchase relatively inferior raw cannabis material since their focus is on THC content for extraction. They often purchase large amounts of trim and lower-quality flower for manufacturing, which generally have much lower wholesale prices than the high-quality flower sold to retailers for smoking or vaporization. MPG applies a discounted price for cultivated materials sold to processors and estimates the share of raw material sold from cultivators to processors and retailers based on observed wholesale and product transfer data from the Colorado supply chain.

Based on Colorado production and sales data, MPG also estimates the wholesale price markup on manufactured goods, relative to the cost of the inputs. Figure 7 illustrates the prices and product flow of cannabis through the supply chain. Raw cannabis is first produced by cultivators, with a portion sold directly to retailers at $2,040 per pound of flower. The remainder is sold to processors for manufacturing at $800 per pound of combined flower and trim. Processors then extract and manufacture infused products, which are sold to retailers at a 200 to 300 percent markup over the input prices.[15]

Figure 7.
Cultivated Cannabis Supply Chain Flow Diagram

Source:
MPG.



All wholesale transactions from cultivators and processors in the model are taxed based on the market share split between the medical and adult use markets described above. Figure 8 shows the total estimated market value and the tax revenues for Oakland cultivation and manufacturing under each scenario.

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[15] Based on interviews with local market participants, manufacturers purchase a mix of lower-quality flower and trim for their cannabis material inputs, and mark up the manufactured product by 200 to 300 percent over the cost of the inputs.

Figure 8.
Oakland Cultivated Cannabis Market Value and Tax Revenues, by Scenario

Scenario	Total Wholesale Demand (000's Lbs of FE)	Wholesale Market Value	Wholesale Tax Revenues*
Cultivation Wholesale			
Restrictive	7.3	$12,130,308	$878,234
Average	106.6	$177,750,378	$6,221,263
Favorable	363.2	$605,886,497	$12,117,730
Manufacturing Wholesale			
Restrictive	2.2	$3,927,078	$284,320
Average	32.0	$57,545,086	$2,014,078
Favorable	109.0	$196,150,305	$3,923,006
TOTAL			
Restrictive		$16,057,386	$1,162,555
Average		$235,295,464	$8,235,341
Favorable		$802,036,802	$16,040,736

Note: Assumes 55.2 percent of all cultivation is medical and taxed at five percent of gross receipts, and 44.8 percent is adult use cultivation at ten percent of gross receipts.
The Restrictive scenario utilizes Oakland's current 5 percent gross receipts tax on medical businesses and 10 percent tax on adult use businesses; the Average scenario assumes a 3.5 percent tax for all cannabis businesses; the Favorable scenario utilizes a two percent gross receipts tax on all cannabis businesses.
Source: MPG.

At current Oakland tax rates, very little cultivation or manufacturing is expected to take place in the City, generating a total estimated potential tax revenue of just $1.2 million (not including tax revenue from retail sales). In the Average scenario where Oakland producers serve most of the local demand and a small portion of regional demand, the City would collect an estimated $8.2 million. The presence of Favorable policy and market conditions in the City could generate wholesale cannabis tax revenues of $16.0 million.

Oakland Economic Output and Employment Impacts

In this section, MPG computes the economic impacts of the cultivation and manufacturing sectors under each of the production market share scenarios. MPG is the only entity, worldwide, that can accurately calculate economic effects from cannabis production as we are the only firm with access to official transaction-level data for an entire state industry.[16] In order to accurately assess the economic impact, the model needs *all* production and sales data for an entire state. For these reasons, MPG's "Marijuana Impact Model" is the only accurate and reliable model of the economic impacts associated with the legal cannabis industry.

[16] MPG is the first and only entity with official, transaction-based data for an entire state. Economic studies by other entities (universities, consultancies, private firms) can only use "hypothetical" types of data inputs to characterize the size of each cannabis segment. This is because other entities do not know the system-wide shares for each product type sold, for manufacturing, and for cultivation shares between flower and trim.

The Marijuana Impact Model was used to compute the employment and output effects related to each of the three scenarios,[17] using the total wholesale values of cultivation and manufacturing inputs to the model. Figure 9 shows the results for these sectors.

Figure 9.
Oakland Economic Impacts of Cannabis Cultivation and Manufacturing, by Scenario

	Restrictive	Average	Favorable
Economic Impacts ($ millions)			
Total Change in Oakland's Economic Output	**$29.4**	**$431.3**	**$1,470.3**
Cultivation Economic Impact	$21.7	$318.2	$1,084.5
Manufacturing Economic Impact	$7.7	$113.2	$385.7
Number of Jobs Created			
Total Oakland Jobs Created (FTE):	**248**	**3,637**	**12,397**
Cultivation	192	2,819	9,608
Manufacturing	56	818	2,789

Source: MPG calculations using our "Marijuana Impact Model".

Under the Restrictive scenario, Oakland producers will generate a combined $29.4 million in new additional economic output, with a total of 248 jobs created by cultivation and manufacturing businesses. The Average scenario features a much more robust Oakland production presence, generating an estimated total economic impact of $431.3 million and 3,637 jobs. In the Favorable scenario, the overall economic impact is estimated at $1.5 billion, with 12,397 total jobs.

Other Local Factors for Market Share

Local tax policy and relative after-tax wholesale prices are important factors in the state and regional market share captured by Oakland producers. However, there are other important local policy and business environment considerations that will influence whether cultivation and manufacturing businesses decide to locate in Oakland. This chain reaction will ultimately determine the market share captured by these Oakland producers and the potential tax revenues and economic impacts associated with the wholesale of Oakland cannabis products.

Cannabis Application & Licensing Fees

Some of the greatest barriers to entry for cannabis businesses are the required local licenses and permits needed to legally establish and operate their enterprise. Cannabis businesses must often acquire cannabis-specific licenses in addition to any other necessary local zoning or building

[17] MPG estimates the total impact of cultivation and manufacturing on Oakland economic activity using our proprietary Marijuana Impact Model. The economic output methodology accounts for the direct effect of dollars spent on wholesale cannabis purchases, the indirect effect of business spending on intermediate inputs and professional services, and the induced effect of employee expenditures. The employment model includes direct and indirect job creation that results in employee expenditures in the local market.

permits. There can be significant monetary and time costs associated with these licenses, such as application and annual fees, as well as burdensome paperwork.

Licensing and application fees for cannabis licenses are designed to recoup the administrative costs of reviewing and issuing licenses. These fees could decrease as a City's capacity to efficiently process licenses evolves, or they could potentially increase if the City imposes more demanding licensing requirements. In Oakland, it may be possible to leverage the City's experience with medical cannabis to more efficiently process new MAUCRSA licenses. This could allow lower fees than jurisdictions that do not have experience with cannabis businesses.

Local licensing entails substantial (and often non-refundable) monetary costs, so jurisdictions with lower fees are likely to attract more business applications since businesses have less at risk with lower non-refundable application fees. Lower annual licensing fees are attractive because, as an overhead cost, lower fees can improve the bottom line profitability of a cannabis business.

The State and many local municipalities are currently in the process of developing new licensing processes and fees under MAUCRSA. MPG provides an overview of existing cannabis cultivation fees in each of the jurisdictions discussed above in order to describe the relative attractiveness of each location in terms of application and licensing costs.

It is important to note that other types of fees are applicable to all businesses, such as zoning and building permit fees. This study does not examine detailed standard building or zoning fees in each jurisdiction, but it should be noted that more restrictive general permitting requirements may be less attractive to prospective businesses.

Oakland. The Oakland Municipal Code establishes fees payable to the City Administrator's Office for all medical cannabis businesses. All applicants must pay an application fee of $2,474 for each Medical Cannabis Permit Application, regardless of business type (i.e. cultivation, manufacturing, retail).[18] Annual licensing fees for Oakland medical cannabis cultivators are based on the volume of the business' gross sales, as shown in Figure 10 below.[19]

Figure 10.
Annual Oakland Cannabis Licensing Fees

Source:
City of Oakland.

Annual Gross Sales	Annual Licensing Fee
> $150,000	$11,173
$50,000 - $150,000	$5,586
< $50,000	$2,790

The City has appointed a Cannabis Regulatory Commission[20] to further develop Oakland cannabis policy under MAUCRSA, however the application process and fees for adult use

[18] http://www2.oaklandnet.com/government/o/CityAdministration/OAK064043
[19] http://cannabusinesslaw.com/2017/01/commercial-cannabis-latest-update-oakland-permitting-and-regulations/
[20] http://www2.oaklandnet.com/government/o/CityAdministration/d/CannabisRegulatoryCommissionformerlyknownasMeasureZCommittee/index.htm

cultivation businesses have not yet been determined. As the City explores licensing fee options, they should carefully review the processes and fees of other jurisdictions to design and implement fees that are attractive to cultivation businesses.

Sonoma County. Sonoma County does not currently define cannabis-specific fees in the unincorporated area. However, the Sonoma County Cannabis Regulatory Commission currently meets once a month, and is in the process of developing regulations for medical and adult use cannabis activities. The Commission plans to begin issuing cultivation permits by July 1, 2017.[21] As these regulations are developed and finalized, application and licensing fees are likely to be adopted.

Ordinance 6189, passed in December 2016, defines the allowed zones in the County's unincorporated area for medical cannabis cultivation businesses. The largest permissible indoor cultivation businesses (10,001 - 22,000 sq. ft.) are restricted to industrial zones,[22] and are required to secure a Minor Use Permit (MUP), the fee for which depends on the site's zoning classification. A Summary Report the County Board of Commissioners estimates that Minor Use Permits for cannabis businesses will cost between $2,000 and $6,000.[23]

Santa Rosa. Measure D was approved by Santa Rosa voters in June 2017 and imposes an annual business registration fee of $100 for all cannabis businesses. The measure allows the City Council to adjust this fee by resolution. Additional licensing and application fees have not yet been adopted or proposed for MAUCRSA licenses.

Santa Rosa City Code 20-46 defines land use permit requirements for medical cannabis cultivation businesses. Indoor cultivations with more than 10,000 sq. ft. are restricted to industrial zones and require a Major Conditional Use Permit (CUP), which entails a public hearing and action by the Planning Commission.[24]

Los Angeles City. Voters approved Measure M in March 2017, authorizing the City Council to establish new regulations and enforcement measures for commercial cannabis activity. The Measure does not explicitly address licensing fees, however the City Council is likely to develop fees under the Measure. To date, the City has not yet established new regulations for commercial cannabis businesses under MAUCRSA, aside from the taxes described in the previous section.

Denver Example. Since many of the California jurisdictions above have not yet adopted licensing fees, MPG use the City of Denver as an example of licensing and application fees. The City of Denver sets its annual license fees to recover the cost of regulation and enforcement. New medical cultivation licenses require a $2,000 non-refundable application fee, plus an annual

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[21] http://sonomacounty.ca.gov/CAO/Cannabis/Adopted-Medical-Cannabis-Program-Ordinances-and-Policies/
[22] http://sonomacounty.ca.gov/WorkArea/DownloadAsset.aspx?id=2147528869
[23] http://sonomacounty.ca.gov/WorkArea/DownloadAsset.aspx?id=2147528348
[24] http://srcity.org/DocumentCenter/Home/View/3106

$3,000 licensing fee. New adult use licenses require a $2,500 application fee and a $5,000 annual licensing fee.[25,26] These local fees are in addition to State licensing fees.

Locational Factors

There are a host of other factors that impact virtually all industrial location decisions and that undoubtedly will impact cannabis cultivators in California. Corporate siting choices generally involve cost minimization related to the following factors or, in the case of labor and water quality, demonstration of an acceptable standard for cannabis production and manufacturing. The cannabis industry will be no different than other industries as companies attempt to optimize physical, market and economic factors to provide the most benefit for employees, shareholders and customers. The following factors warrant discussion:

- **Suitable cultivation sites.** There will likely be some degree of increased demand in all cities that have suitable, appropriately zoned indoor and outdoor cultivation sites. Cities and counties will have some control over inventories through their zoning powers or through moratoria. Cultivators will require sites that are large enough, in the appropriate industrial zone, with appropriate utilities, and in the closest proximity to market.

- **Leasing or purchase cost.** Regional commercial lease and/or purchase rates are another important factor for cultivators when considering where to locate. Prices are currently volatile because state and local regulations are not yet in final form. Until regulations are finalized and the current supply of cultivation sites is known, volatility will continue. Another complexity further restricting supply is that some owners will not be able to access traditional capital markets for financing if their tenants cultivate cannabis. Industrial space suitable for indoor cannabis cultivation is often 2-3 times more expensive than average due to the additional scarcity.[27] Depending on preferences for outdoor and greenhouse cultivations, urban areas may be at a disadvantage as prices are comparatively higher than their more rural neighbors.

- **Input prices.** Indoor cultivation is most likely to occur in Oakland, and electricity and water rates are significant production costs. Large scale indoor cultivators will look to minimize production costs by choosing locales with favorable utility rates. Outdoor and greenhouse cultivation sites located around the state will allow for significantly lower production costs, although with a lesser quality product and arguably a different market segment.

- **Labor.** Access to a quality, licensed workforce is a critical factor in deciding where to locate a cultivation facility. The state of California will likely require additional vetting procedures for employee licensing. Oakland has a comparative advantage over competing cities due to its location in a densely populated urban area and its progressive equity licensing

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[25] https://www.denvergov.org/content/denvergov/en/denver-business-licensing-center/marijuana-licenses/medical-marijuana.html

[26] https://www.denvergov.org/content/denvergov/en/denver-business-licensing-center/marijuana-licenses/retail-marijuana.html

[27] http://www.businessden.com/wp-content/uploads/2015/10/CBRE-marijuana-report.pdf

programs. However, Oakland like the rest of the immediate San Francisco Bay Area also has a markedly high labor cost and cost of living compared to the rest of California and consequently starts with a commensurate competitive disadvantage. A steady labor pool is imperative to cultivator and manufacturer development efforts.

- **Water quality.** Water quality is specific to each region and is a significant consideration in cannabis cultivation. Good water quality can eliminate the need for costly additional filtration systems. Capable water treatment is also required, although cannabis cultivation does not create demands on wastewater treatment beyond comparable industries.

Locational factors are often as important as economic factors when deciding where to site cannabis cultivation facilities. Local governments cannot control all the variables discussed above, but should consider whether they have a competitive advantage or disadvantage in the above factors when deciding how to set zoning and tax policy.

Summary

Some California municipalities and counties are competing for a larger share of the world's largest cannabis market by adopting and implementing policies to attract cultivators and processors. A larger local cannabis business presence will generate higher tax revenues, employment, and economic activity. Cultivators and processors are the foundation for all retail and distribution activity in the industry. Jobs in these sectors are usually higher paying, compared to other industry jobs.

If Oakland hopes to capture a significant portion of the local and regional market – and the associated benefits – the City will need to adopt policies that are more attractive to cultivation and manufacturing businesses than those in competing jurisdictions. In response to these policy choices, cultivation and manufacturing businesses will – like businesses in any other industry – seek out a jurisdiction that provides the most favorable conditions for business.

Lower tax rates provide a significant incentive to businesses that hope to compete on price in a large and competitive market for wholesale cannabis products. It will ultimately be up to the City to decide if it will welcome a new agriculture and manufacturing industry through its policies and regulations. These choices will have significant impacts on cultivation and manufacturing industry size, employment, and tax revenue.

Economic Impact Study of the Cannabis Sector in the Greater Sacramento area

October 17, 2016

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ATTACHMENT B

Executive Summary

Legal cannabis would create new industries and economic activity in California. This report estimates the potential economic impacts with a legal (recreational and medical) cannabis sector in the Sacramento area. In this study, we assume legalization is only statewide and would occur through the passage of Proposition 64, entitled: "Control, Regulate and Tax Adult Use of Marijuana Act" also known as AUMA, in the November 2016 election. The study assumes the full legal transition of all medical and recreational sales occurs in 2018 for simplicity, although in reality the transition to a completely legal industry could take several years.

If AUMA passes, it is likely that the legal industry will develop clusters in certain regions of the state. Factors that influence industry clustering include local government policies, production costs, proximity to market, and the availability of investment capital and skilled workers. Because AUMA allows local governments to regulate the cultivation, production of products, and retail sales of cannabis local government decisions will have a major impact on clustering. Sacramento has several attributes that could facilitate the development of the legal cannabis industry, including relatively low costs for California, good access to urban markets, and available workers and investors with knowledge of the industry. Many local governments in the Sacramento area are already considering policies regarding cannabis cultivation, production, and sales but there is still considerable uncertainty about whether the regulatory climate in the region will support the development of an industry cluster. Given this uncertainty, the study includes three over-arching scenarios for the Sacramento area cannabis industry if AUMA passes: a) a limited scenario with tight local regulation, b) a local scenario where the industry primarily serves regional demand, and c) a cluster scenario in which the Sacramento area exports a significant amount of cannabis and cannabis products to other areas in the state. As these scenarios define a market in which recreational cannabis sales are legal at a state level, they define a new market environment. However, not all of the economic impact we calculate represents new economic activity as this total would include economic activity currently associated with the medical market and illegal consumption. The table below summarizes the assumptions that describe the three scenarios we utilize to describe the potential impact on the Sacramento area economy.

Overview of the Sacramento Area Cannabis Sector and Consumers

Market Scenario	Regional Shares Supplied by Sacramento:		
	Sac Area	Other NorCal	SoCal
Limited Scenario	20%	0%	0%
Local Scenario	80%	10%	0%
Cluster Scenario	90%	50%	10%

An estimate of baseline statewide and Sacramento area demand for cannabis is necessary to determine the potential market for the Sacramento area's cannabis sector under legalization. Since the amount of cannabis consumption varies considerably by the frequency of use, we establish 'typical' quantities across several levels of use and associate them with projected cannabis consumers to create an estimate of baseline demand for cannabis in California. The table that follows shows that after accounting for rising prevalence of consumption independent of legal status as well as under-reporting

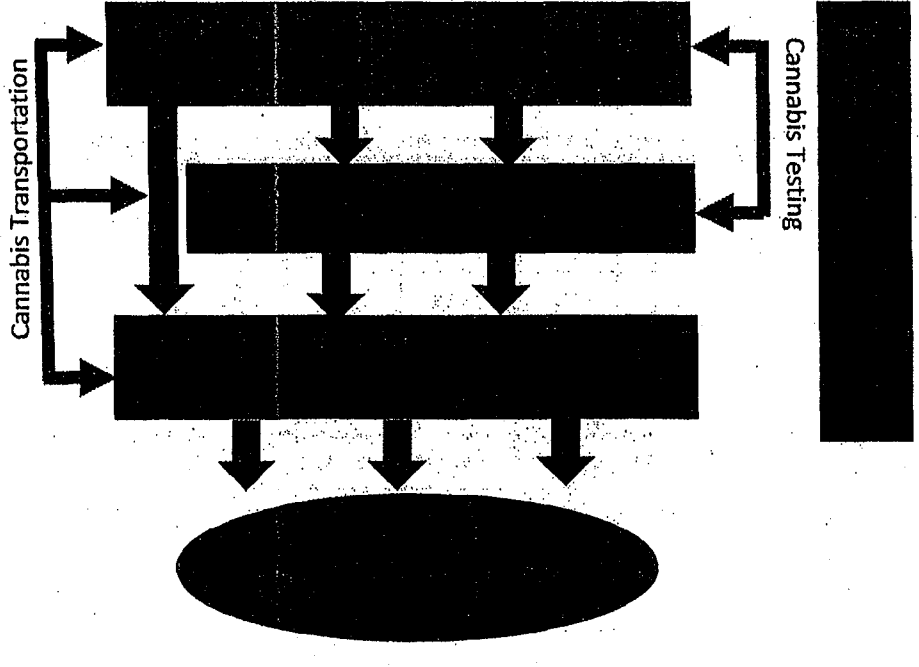
of use because of legal and social concerns, baseline demand across California for the population 21-years and older is estimated to be 640 metric tons (tonnes) in the year 2018. Demand from Sacramento area cannabis users is estimated to be 41.6 tonnes, or about 6.5% of total statewide demand.

Total estimated California resident consumers' baseline demand for cannabis in 2018

Frequency of use (days per month):	Number of Users 21+ years-old	Usage Amounts (Grams)	Share of...	
		Typical	Users	Demand
<1	1,132,355	1,275,858	29.7%	0.2%
1-5	947,980	21,848,340	24.9%	3.8%
6-10	333,669	22,315,134	8.8%	3.8%
11-15	281,049	29,915,579	7.4%	5.1%
16-20	192,533	27,502,622	5.1%	4.7%
21-25	267,588	113,676,709	7.0%	19.5%
26-31	655,102	365,701,112	17.2%	62.8%
Total Users/Use:	*3,810,277*	*582,235,354*	*100%*	*100%*
Assume 10% under-reporting/prevalence		58,223,535		
Grand Total Baseline Statewide Demand		**Grams:**	**Kilograms:**	**Tonnes:**
		640,458,889	**640,459**	**640**

Production characteristics and market scenarios are analyzed in terms of their economic impacts using the IMPLAN model, which allows us to develop a model of the Sacramento area economy. Because a legal cannabis sector does not currently exist, we built several custom industries in IMPLAN to incorporate the cannabis sector into the economic model. The figure below represents the sector's industries across which we examine in-depth impacts from several hypothetical demand and supply-side environments.

Overview of the Sacramento Area Cannabis Sector and Consumers



In terms of regional supply, local government policies are assumed to be a primary determinant of whether the Sacramento area industry develops in a limited constrained environment; an intermediate locally focused industry, or a more dynamic cluster with substantial sales outside the region. We also examine three demand alternatives ranging from the baseline demand scenario, described above, to a moderate growth scenario with a 10% increase above the baseline, and concluding with high growth scenario in which demand increases 20% above the baseline. Thus, a total of nine distinct scenarios are created by the three demand-side and three supply-side alternatives.

The economic impacts on the Sacramento area from the sector as a whole is reported in the first table below, while subsequent tables show detailed results for the cultivation, processing, and retail industries. While the economic impacts in these tables represent a new market environment they are not completely new to the economy as they include the existing medical market and existing recreational sales that are currently illegal at the state level.

Total Economic Impact: Sacramento Area Cannabis Sector by Supply and Demand Scenarios

Impact:	Supply:	Limited			Local			Cluster		
	Demand:	Base	Medium	High	Base	Medium	High	Base	Medium	High
Employment	Direct Effect	602	662	722	2,793	3,072	3,351	5,535	6,089	6,642
	Total Effect	1,578	1,736	1,893	7,657	8,423	9,189	16,497	18,147	19,797
Labor Income ($'000s)	Direct Effect	$33,861	$37,247	$40,633	$184,077	$202,485	$220,893	$510,533	$561,587	$612,640
	Total Effect	$96,598	$106,258	$115,918	$488,461	$537,307	$586,154	$1,155,270	$1,270,797	$1,386,324
Output ($'000s)	Direct Effect	$150,650	$165,715	$180,780	$753,621	$828,983	$904,345	$1,708,467	$1,879,314	$2,050,161
	Total Effect	$321,594	$353,753	$385,912	$1,583,375	$1,741,712	$1,900,050	$3,466,058	$3,812,664	$4,159,269

Cannabis Cultivation Economic Impact: Sacramento Area Supply and Demand Scenarios

Impact:	Supply:	Limited			Local			Cluster		
	Demand:	Base	Medium	High	Base	Medium	High	Base	Medium	High
Employment	Direct Effect	103	113	123	672	739	806	2,246	2,470	2,695
	Total Effect	260	286	312	1,699	1,869	2,039	5,680	6,248	6,815
Labor Income ($'000s)	Direct Effect	$16,360	$17,996	$19,632	$107,110	$117,821	$128,532	$357,964	$393,760	$429,557
	Total Effect	$23,449	$25,793	$28,138	$153,516	$168,867	$184,219	$513,052	$564,357	$615,663
Output ($'000s)	Direct Effect	$26,010	$28,611	$31,212	$170,287	$187,316	$204,345	$569,102	$626,013	$682,923
	Total Effect	$45,626	$50,189	$54,751	$298,711	$328,583	$358,454	$998,297	$1,098,127	$1,197,957

Cannabis Processing Economic Impact: Sacramento Area by Supply and Demand Scenarios

Impact:	Supply:	Limited			Local			Cluster		
	Demand:	Base	Medium	High	Base	Medium	High	Base	Medium	High
Employment	Direct Effect	93	103	112	610	671	732	2,040	2,244	2,448
	Total Effect	362	398	434	2,370	2,607	2,844	7,921	8,713	9,505
Labor Income ($'000s)	Direct Effect	$9,188	$10,106	$11,025	$60,151	$66,167	$72,182	$201,027	$221,129	$241,232
	Total Effect	$24,969	$27,466	$29,963	$163,469	$179,816	$196,163	$546,316	$600,947	$655,579
Output ($'000s)	Direct Effect	$41,399	$45,539	$49,679	$271,036	$298,139	$325,243	$905,805	$996,385	$1,086,966
	Total Effect	$83,866	$92,252	$100,639	$549,064	$603,970	$658,876	$1,834,977	$2,018,475	$2,201,973

Cannabis Retailing Economic Impact: Sacramento Area by Supply and Demand Scenarios

Impact:	Supply:	Limited			Local			Cluster		
	Demand:	Base	Medium	High	Base	Medium	High	Base	Medium	High
Employment	Direct Effect	602	662	722	2,424	2,666	2,909	3,020	3,322	3,624
	Total Effect	1,578	1,736	1,893	6,331	6,964	7,598	7,448	8,192	8,937
Labor Income ($'000s)	Direct Effect	$33,861	$37,247	$40,633	$130,953	$144,048	$157,143	$148,021	$162,823	$177,625
	Total Effect	$96,598	$106,258	$115,918	$382,765	$421,042	$459,318	$434,011	$477,413	$520,814
Output ($'000s)	Direct Effect	$150,650	$165,715	$180,780	$602,601	$662,861	$723,121	$677,926	$745,718	$813,511
	Total Effect	$321,594	$353,753	$385,912	$1,289,574	$1,418,532	$1,547,489	$1,461,201	$1,607,321	$1,753,441

The results show a large difference between the cluster and the limited scenario, illustrating a distinct opportunity for the Sacramento area economy. A supportive local policy environment with a community of strong cannabis entrepreneurs in the Sacramento area could potentially develop a cannabis cluster industry that would support a total of nearly 20,000 jobs, $4.2 billion in annual output, and $1.4 billion in labor income per year; these numbers represent nearly 2% of the region's current gross economic output. In contrast, the limited scenario where the industry clusters in other areas and most local Sacramento demand is imported from other parts of the state would support about 1,600 local jobs and $322 million in total output with most activity in retail and local distribution. Thus, the Sacramento area would lose the opportunity for over 18,000 jobs if weak investment and restrictive local policies cause the cannabis industry to locate outside the region.

Key Findings

The Overall Economic Impact of the Sacramento Area Cannabis Sector:

- Direct employment by the cannabis sector is between 602 in the limited-baseline scenario and 6,642 jobs in the cluster-high growth scenario.
- Total employment impacts are between 1,578 in the limited-baseline scenario and 19,797 jobs in the cluster-high growth scenario.
- Direct output by the cannabis sector is between $151 million in the limited-baseline scenario and $2.1 billion in the cluster-high growth scenario.
- Total output impacts from the sector are between $322 million in the limited-baseline scenario and $4.2 billion in the cluster-high growth scenario.

➢ The sector's total impacts could represent as much as 1.6% of gross regional product under the cluster-high growth scenario, or as little as 0.1% under the most restrictive scenario.

The Economic Impact of Cannabis Cultivation in the Sacramento Area:

- Direct employment by cannabis cultivators is between 103 in the limited-baseline scenario and 2,695 jobs in the cluster-high growth scenario.
- Total employment impacts are between 260 in the limited-baseline scenario and 6,815 jobs in the cluster-high growth scenario.
- Direct output by cannabis cultivators is between $26 million in the limited-baseline scenario and $683 million in the cluster-high growth scenario.
- Total output impacts from the industry are between $46 million in the limited-baseline scenario and $1.2 billion in the cluster-high growth scenario.

➢ Under the local/proportional scenario, the value of cannabis cultivation would be similar to the existing value of wine grape cultivation in the Sacramento area, around $200 million.

➢ However, under the cluster-high growth scenario, cannabis cultivation in the Sacramento area could be similar in value to wine grape cultivation in Sonoma County, around $600 million.

Key Findings (continued)

The Economic Impact of Cannabis Processing in the Sacramento Area:

- Direct employment by cannabis processors is between 93 in the limited-baseline scenario and 2,448 jobs in the cluster-high growth scenario.
- Total employment impacts are between 362 in the limited-baseline scenario and 9,505 jobs in the cluster-high growth scenario.
- Direct output by cannabis processors is between $41 million in the limited-baseline scenario and $1.1 billion in the cluster-high growth scenario.
- Total output impacts from the industry are between $84 million in the limited-baseline scenario and $2.2 billion in the cluster-high growth scenario.

➢ Under the cluster-high growth scenario, the value of cannabis processing would be approximately $1 billion, which would be larger than roasted nuts and peanut butter manufacturing, which is around $700 million, but less than soft drink and water manufacturing, which is about $1.4 billion in the Sacramento area.

The Economic Impact of Cannabis Retailing in the Sacramento Area:

- Direct employment by cannabis retailing is between 602 in the limited-baseline scenario and 3,624 jobs in the cluster-high growth scenario.
- Total employment impacts are between 1,578 in the limited-baseline scenario and 8,937 jobs in the cluster-high growth scenario.
- Direct output by cannabis retailing is between $151 million in the limited-baseline scenario and $814 million in the cluster-high growth scenario.
- Total output impacts from the industry are between $322 million in the limited-baseline scenario and $1.8 billion in the cluster-high growth scenario.

➢ Under the local/proportional scenario, the approximately 2,700 jobs in cannabis retailing would similar in size to Sacramento area employment in retail automotive parts and accessory stores.

Key Findings (continued)

Cannabis Consumption in the Sacramento Area:

- Under our 'baseline' scenario in 2018, California's adults will demand 640 metric tons of marijuana (1.41 million pounds)
- Under a 'high-growth' scenario demand by California's adults may equal 768 metric tons
- Demand from Sacramento Area adults is estimated to be between 42 and 50 metric tons
- Heavy consumers (those who consume nearly daily) account for over 80% of cannabis demand but form just 24% of all users

The Economic Impact of Other Cannabis Industries in the Sacramento Area:

- Direct sales in the cannabis transportation industry is between $3.5 million in the limited-baseline scenario and $50 million in the cluster-high growth scenario.
    - This would be from about 1% to 7% of existing sales in the area's courier and messenger industry.

- Direct sales in the cannabis testing industry is between $0.2 million in the limited-baseline scenario and $20 million in the cluster-high growth scenario.
    - That equates to between 0.01% and 1.1% of existing sales in the area's testing and laboratory services industry.

Contents

Tables

Figures

Glossary

Absolutes	The dewaxed essence of a botanical extraction. These are concentrates that are treated with another solvent to remove their waxes and leave just the fragrant oil. These are usually highly concentrated viscous liquids but can be solid or semisolid. Absolutes are the most refined level of plant extracts. See also: Concretes and Essential Oil.
AUMA	Adult Use of Marijuana Act – The future legalization of cannabis initiative on the November 2016 statewide ballot that forms the basis for this report's analysis. Its full title is: Control, Regulate and Tax Adult Use of Marijuana Act, No. 15-0103 (Michael Sutton and Donald Lyman).
BHO	Abbreviation for "butane hash oil" which can be a number of concentrates derived from butane extraction as well as referring to the raw, unpurged, liquid solution of butane and extract.
Budder	A type of BHO that is opaque and malleable.
Cannabinoid	Any tricyclic compound or class of cellular receptors; those associated with the marijuana plant (as opposed to those naturally occurring in humans and animals) are also known as phytocannabinoids.
CBD	Cannabidiol (CBD) is not psychoactive in the same manner as THC, but can be mood-altering and modulate the psychoactive effects of THC.
Concretes	A botanical extraction that includes the plant's essential oils, as well as its waxes, lipids, resins and other oil-soluble plant material like cannabinoids. These can be hard, malleable, or viscous depending on wax content. Concretes are an intermediate level of refinement of plant extracts. See also: Absolutes and Essential Oil.
Direct Effects	These are the changes in jobs, sales, and income related exclusively to initial expenditures.
Dry Sift	See: Kief.
Essential oils	A concentrate of hydrophobic liquid containing volatile aroma compounds from plants, it includes its lipids and cannabinoids in the case of marijuana. Essential oil is the least refined level of plant extracts. See also: Concretes and Absolutes.
Employment	This is the number of full- and part-time jobs based on an annual average of monthly jobs. That is, one job lasting 12 months is equal to two jobs lasting six months each and is equal to three jobs lasting four months each.
Gram	A metric unit of mass equal to 1/1,000th of a kilogram. There are approximately 453.592 grams in a pound and 28.3495 grams in an ounce.
GRP	Gross Regional Product – is conceptually equivalent to gross domestic product (GDP); while GDP measures newly created value through production by residents in the domestic economy, GRP measures newly created value through production by residents in the regional economy, be it a state, county, or district.

Hash This is an extracted product composed of compressed kief. Hash is also called *hashish* and may be solid or resinous depending on the preparation.

Indirect Effects These represent the iterative impacts of inter-industry transactions as supplying industries respond to demand from the sector(s) where the initial expenditures occurred.

Induced Effects These reflect the contribution benefit payments make to household expenditures by direct and indirect sector employees.

Kief This is a very basic cannabis product composed of the unpressed glands (trichomes) scrapped from dried mature flowers and leaves. Kief, can be consumed directly or more frequently it is pressed to make hash. Kief is also spelled as *kif, kef, or kiff* and is sometimes called *pollen or polm*. It is one of the oldest cannabis products.

Kilogram A metric unit of mass equivalent to 2.20462 pounds or 35.274 ounces.

Labor Income This is the sum of employee compensation and proprietor income. Employee compensation includes wages, salaries, benefits, and all other employer contributions, while proprietor income consists of payments received by self-employed individuals and unincorporated business owners.

Metric Tonne See Tonne below for a definition.

Oil A general term referring to a number of concentrates of different consistencies, as well as raw, unpurged BHO or CO_2.

Output This represents the value of industry production. It accounts for the total change in the value of production in an industry for a given time period. Output varies as a measure across industries. For manufacturers, the value of production is sales plus or minus any change in inventories. For service sectors, the value of production equals their sales. While for retail and wholesale trade, the value of production equals their gross margin and not their gross sales.

Shatter A highly regarded type of BHO characterized by its translucence and it brittleness at room temperature.

THC Tetrahydrocannabinol (THC) a cannabinoid found in cannabis with powerful psychotropic and therapeutic properties.

Tonne A metric unit of mass equal to 1,000 kilograms or approximately 2,204.6 pounds.

Total Effects These are the combined impacts of the Direct, Indirect, and Induced Effects.

Wax A type of BHO; also a substance excreted by cannabis plants to protect themselves from extreme drying.

1 Introduction

Legal cannabis would create new industries and economic activity in California. This report estimates the potential economic impacts with a legal (recreational and medical) cannabis sector in the Sacramento area. In this study we assume recreational legalization is only statewide and occurs through the passage of Proposition 64, a statewide ballot initiative, in the November 2016 election. The title of Proposition 64 is "Control, Regulate and Tax Adult Use of Marijuana Act" or as we will refer to it throughout the remainder of this report, AUMA. Although national legalization may occur in the future, this analysis assumes that medical and recreational marijuana remains illegal on the federal level.

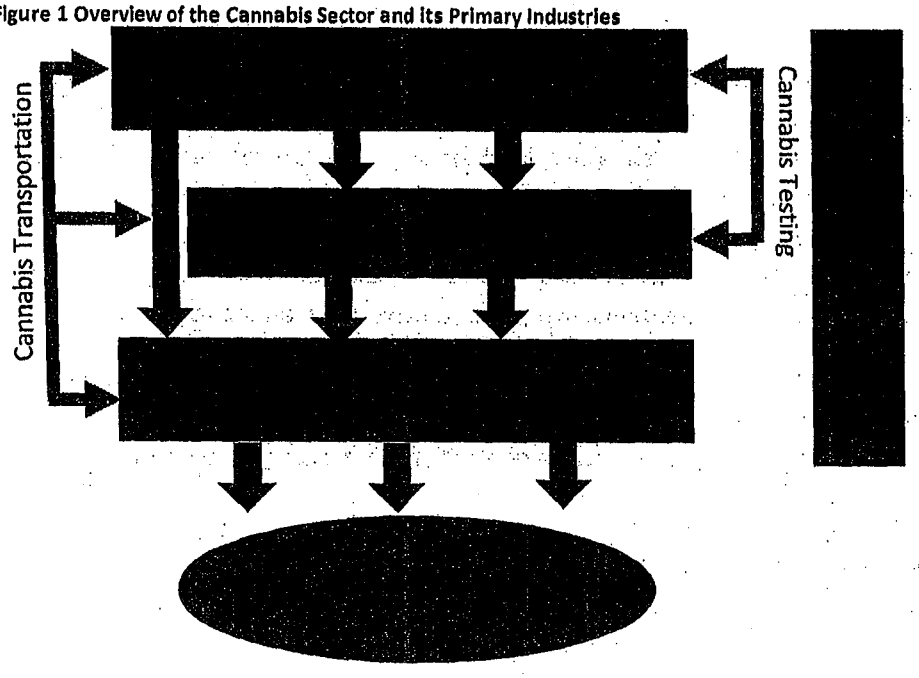
Although it is likely that the transition to a completely legal industry will take several years and may never be fully complete, we assume that a full legal transition of all medical and recreational sales occurs in 2018. This is done for simplicity, but several factors will affect the actual transition, including:

- Extent to which illegal suppliers persist
- Extent to which local autonomy supports or hinders transition
- Speed with which statewide regulatory and enforcement mechanisms implemented
- Federal tolerance, or lack thereof, for state and local legalization

Despite the large medical marijuana industry currently established in California, the illegal market is large and well established. The regulatory requirements of legal (medical and recreational) cannabis will preclude many existing illegal producers from participating in the legal market. Some of those illegal suppliers will remain cost competitive in a legal market, particularly as initial regulatory compliance costs are borne by the legal market. Enforcement of regulations in California and growing support in other states and federally for legalization will reduce the illegal market, but the extent of those impacts may take some time. While medical and recreational use of cannabis may become legal statewide, in California there will remain substantial local authority to prohibit or severely limit cultivation, processing, and retail sales. Therefore, county and city governments will also influence the speed and scope with which legal cannabis replaces illegal cannabis. Lastly, there has been an evolution in federal enforcement policies against cannabis since the mid-2010s. These have allowed increased investment in the medical sector and facilitated statewide legalization of recreational use in several states including Colorado, Oregon, and Washington. The direction of federal enforcement policies in the future will therefore have a significant influence over the extent of the Californian legal market.

As an initial study, the focus of this report is to provide a credible estimate of the cannabis sector and its principal industries. These industries and their associated consumer markets are represented in Figure 1. We hope that this report, and others like it, will inform discussion of costs and benefits of a legalized cannabis sector on the Sacramento area economy.

Figure 1 Overview of the Cannabis Sector and its Primary Industries



Given the importance of the context with which legalization of marijuana occurs, the remainder of this introduction reviews AUMA with an emphasis on key features within it that may determine the eventual structure of a legal cannabis sector. In Part Two, we estimate the baseline statewide demand for cannabis that could be filled by the Sacramento area's cannabis sector under legalization through AUMA. Typical cannabis cultivation, processing, and retail facilities in a legal market environment are then described in Part Three. Additional key components in the cannabis sector: testing, transportation, and microbusiness are also reviewed in that part of the analysis. In Part Four, a range of demand and supply-side environments are described to define the cannabis market in the Sacramento area. The economic impacts of those scenarios are then analyzed in Part Five across the cannabis sector as a whole as well as the principal industry groups.

Key Features of the Adult Use of Marijuana Act

Medical marijuana has been legal in California for approximately two decades, and if AUMA is passed, the Bureau of Marijuana Control within the Department of Consumer Affairs will be established to regulate and license both the medical and recreational marijuana industry. While AUMA will set up a comprehensive system governing marijuana businesses at the state level, it will safeguard local control, allowing local governments to regulate marijuana-related activities, subject marijuana businesses to zoning and permitting requirements, and ban marijuana businesses by a vote of the people within a locality. However, AUMA will not allow local governments to prevent personal cultivation or possession of cannabis and products containing cannabis to their residents 21-years of age and older.

Several departments within government at the state level will work with the Bureau of Marijuana Control to regulate and license the sector. These departments are listed in Table 1 across the various

industries they have been assigned responsibility under AUMA. Each regulatory authority will be responsible for licensing businesses under their respective authority. These licenses will be issued in advance of 1 January 2018 when cannabis' legalization is envisioned under AUMA.

Table 1 Overview of Sub-Industries within the Cannabis Sector under AUMA

Industry	What	Regulatory Authority
Cultivation	Planting, growing, harvesting, drying, curing, grading, or trimming of marijuana. Cultivation can occur indoors, in greenhouses and/or outdoors	Department of Food and Agriculture
Processing	Compounding, blending, extracting, infusing, or otherwise making or preparing a marijuana product	Department of Public Health
Testing	Testing of marijuana products and accessories, necessary after cultivation and processing before retailing	Department of Public Health
Distribution	Procurement, sale, and transport of marijuana and marijuana products between entities	Bureau of Marijuana Control
Retailing	Retail sale and delivery of marijuana or marijuana products to customers	Bureau of Marijuana Control
Microbusiness	Special vertically integrated industry within the sector that is allowed to engage in cultivation, processing, testing, distribution, and retailing on a small scale basis	Bureau of Marijuana Control

AUMA will ensure the nonmedical marijuana industry in California will be built around small and medium sized businesses by prohibiting large-scale cultivation licenses for the first five years. AUMA also protects consumers and small businesses by imposing strict anti-monopoly restrictions for businesses that participate in the nonmedical marijuana industry. In addition, AUMA will prohibit the sale of nonmedical marijuana by businesses that also sell alcohol or tobacco. Licenses must be renewed annually and multiple factors will be taken into consideration related to the issuing of licenses, such as not concentrating licenses in a specific area and potential for violation of any laws.

Other key features of AUMA include the following:

- Marijuana Cultivation and Possession for Personal Use.
    - Individuals over the age of 21 could lawfully:
        (1) possess, process, transport, purchase, obtain, or give away to individuals over the age of 21, up to 28.5 grams of marijuana and up to eight grams of concentrated cannabis and
        (2) cultivate up to six living marijuana plants and possess the marijuana produced by the plants within a private residence if in a locked area on private property that is not visible from a public place.

- Cities and counties could place "reasonable" restrictions on the cultivation of marijuana for personal use but could not prohibit cultivation within a fully enclosed and secure private residence.

- Local Regulation of Marijuana Businesses
  Cities and counties would continue to have the authority to regulate commercial marijuana businesses in their jurisdiction. Cities and counties could:
  - require marijuana businesses to obtain local licenses
  - set rules for such businesses (such as those related to hours of operation and minimum security levels) and establish restrictions on where they could be located
  - completely ban marijuana-related businesses in their jurisdiction
  - not ban the transportation of marijuana through their jurisdictions

- Industry Regulation
  - Large scale cultivation is prohibited for the first five years (until 1/1/2023)
    - Defined as 1 acre outdoor or 22,000 sq. ft. indoor
  - Anti-monopoly restrictions for business in the marijuana industry including
    - Selling marijuana or marijuana products at less than cost to purposely injure competitors is not allowed
    - No geographic price discrimination permitted
  - Requires tracking and tracing of all nonmedical marijuana from cultivation to sale
  - Prohibits marketing to persons under the age of 21
  - Allows tax policy to be adjusted to limit illicit market
  - Allows industrial hemp to be grown as an agricultural product and allows research in growing as long as the hemp is low-THC, but does not have a provision for marijuana research funding
  - Requires all marijuana to be sold in child resistant containers
  - Allows licenses to be restricted in high ratio areas (licensee to population ratio)
  - Until 1 January 2020, it requires the licensee to be have been a California resident continuously since 1 January 2015
  - Until 1 January 2020, priority licensing will be given to businesses that demonstrated compliance with the Compassionate Use Act
  - Large scale cultivators are indefinitely restricted from operating testing, distribution, and microbusiness
  - Marijuana appellations and organic certification will be established
  - Warning labels are mandatory
  - No minors on premises

- Taxation
  - Existing state and local sales taxes applicable to the sale of recreational marijuana products
  - Additional excise tax of 15 percent on the retail sale of marijuana products
  - Additional excise tax on the cultivation of marijuana at $9.25 per ounce of dried marijuana flowers
  - Additional excise tax on the cultivation of marijuana at $2.75 per ounce of dried marijuana leaves

- Board of Equalization may annually adjust the tax rate for leaves to reflect fluctuations in the relative price of marijuana flowers to marijuana leaves.
- Board of Equalization may establish other categories of marijuana (such as frozen marijuana) and these categories would be taxed at their value relative to marijuana flowers
- Beginning in 2020, the cultivation tax would be adjusted annually for inflation
- Medical cannabis and related products are exempt from the sales and use tax if the consumer possesses a valid government issued identification card
- Revenues collected from excise tax, as well as certain fines imposed on businesses or individuals who violate regulations established under the measure, would be deposited in a new special fund called the California Marijuana Tax Fund
- Monies from the Marijuana Tax Fund would be used to reimburse state agencies, such as the Bureau of Marijuana Control, for the costs of regulating the commercial marijuana industry not covered by license fees. After reimbursing state agencies for implementation costs, the measure would allocate a portion of the remaining revenues for the following purposes (in order of priority):
    - Any funds remaining after the above allocations would be annually allocated as follows:
        - (1) 60 percent to the state Department of Health Care Services for substance use disorder education and prevention programs for youth;
        - (2) 20 percent to the state Department of Fish and Wildlife (DFW) and the state Department of Parks and Recreation (DPR) for environmental programs designed to clean up and prevent environmental damage resulting from the illegal cultivation of marijuana
        - (3) 20 percent to the California Highway Patrol for programs designed to reduce driving under the influence of alcohol, marijuana, and other drugs as well as to the Board of State and Community Corrections for a grant program designed to mitigate any potential negative impacts on public health or safety resulting from the implementation of the measure.
- Under the measure, beginning July 2028, the Legislature could change the above allocations to further the purpose of the measure, subject to certain limitations.
- The measure also requires that funding provided to the DFW and DPR from the Marijuana Tax Fund not be used to replace other funds currently used by the departments for the purposes described above. As such, the measure requires that General Fund appropriations to the DFW and DPR not be reduced below the levels provided in the 2014-15 Budget Act.

2 Baseline Projected Cannabis Consumption

This section provides an estimate of the demand for cannabis for individuals age 21 and over. Under AUMA, consumption of cannabis will be legal for individuals 21-years of age and older across California beginning in 2018. We estimate demand in four sub-sections. In Section 2.1 we calculate the number of Californians over 21 who would likely consume some cannabis in 2018. The amount of cannabis consumed varies considerably by the frequency of use, therefore Section 2.2 reviews the extent that the quantity of cannabis consumed per use varies and establishes a 'typical' quantity consumed by frequency. The annual frequency of use for all cannabis consumers is then estimated in Section 2.3. Combining the frequency, quantity, and number of users from the previous sub-sections, Section 2.4 then estimates the total statewide quantity of cannabis demand in 2018.

2.1 Estimated Cannabis Users

In order to estimate future cannabis demand, we begin by estimating current users in California. The best source of information on the incidence of cannabis use we identified is the National Survey on Drug Use and Health (NSDUH).[1] We obtained an estimate from NSDUH of the number of Californians 21-years and older who consumed cannabis at least once during the past year. Since the latest available NSDUH data is from 2013-2014, we inflated those values to reflect the estimated growth in California's 21-years of age and older population in 2016 and 2018.[2] The 2016 population estimate is used to calibrate our cultivation and processing industries, while the 2018 projection is used to generate the baseline population of the 21-years of age and older population when AUMA would legalize cannabis.

Table 2 California's Total and Cannabis User Populations by Age

California's Population			
Year:	2013/14	2016	2018
Total	38,375,205	39,242,698	39,933,359
12-years & Older	32,338,284	33,180,165	33,839,069
21-years & Older	27,573,227	28,472,833	29,141,290
Cannabis Users in California			
Year:	2013/14	2016	2018
12-years & Older	4,633,000	4,753,614	4,848,013
21-years & Older	3,605,250	3,722,875	3,810,277
Compiled by CBPR based on DOF and NSDUH data			

The 2013-2014 NSDUH estimates that there were 3.6 million Californians who were 21-years and older and 4.6 million Californians 12-years and older who consumed cannabis at least once during the past year. Hence, Table 2 shows that in 2013-2014 13.1% of Californians 21-years of age and older, 3.6 million out of 27.6 million, reported themselves as cannabis users in the past year. That figure is slightly lower than the 14.3% share, 4.6 million out of 32.3 million, that was reported by those 12-years of age and older. Applying those shares to the projected 2016 and 2018 populations, we estimate that in 2016

[1] For details about the survey see it website at: https://nsduhweb.rti.org/respweb/homepage.cfm

[2] The estimated 2016 and 2018 populations were taken from the California Department of Finance's annual population estimates and projections. These estimates are available at the DOF website: http://www.dof.ca.gov/research/demographic/dru/index.php

there are 3.7 million Californians 21-years of age and older who will consume cannabis at least once during the year and by 2018 that number will increase to 3.8 million. Since sales to anyone under 21-years of age are not allowed under AUMA, Table 2 shows that there will remain approximately one million cannabis consumers less than 21-years of age for whom cannabis consumption continues to be illegal.

2.2 Estimated Quantity of Cannabis per Day of Use

The amount of cannabis consumed by users identified in Section 2.1 will vary. Following a review of several studies, we concluded that it is reasonable to relate the intensity of cannabis use (grams consumed per day) and an individuals' frequency of use (days of consumption per year).[3] Therefore, we use the estimates from Light et al. (2014) to differentiate intensity and frequency of use. These quantities are reported in Table 3.

Table 3 Quantity of Cannabis Used per Day by Frequency of Use

Type of Consumer	Use Days per Year	Use Days per Month	Usage Amounts (Grams per day of use):		
			Low	"Typical"	High
Infrequent	1-11	<1	0.2	**0.3**	0.6
Regular	12-246	1-20	0.43	**0.67**	0.95
Heavy	247+	21+	1.3	**1.6**	1.9
Source: Light et al. 2014					

Table 3 is based on several datasets and studies to measure quantity of use, which shows that heavy use forms the majority of cannabis demand in all markets.[4] The table adopts a three-tiered approach to estimate the quantity of cannabis consumed relative to the frequency of use. Based on the analysis of Kilmer et al. (2013), the heaviest tier of users, defined as those using cannabis 21 or more days per month, consume between 1.3 to 1.9 grams per day. Assuming an equal distribution across this tier of consumers, 1.6 grams per day of use is assumed for these heavy users. The next tier is composed of regular users, defined as those using cannabis 1 to 20 days per month, who consume between 0.43 to 0.95 grams per day. An equal distribution of use is also assumed across these regular consumers, equating to 0.67 grams per day of use. In addition to these tiers for regular and heavy users, Light et al. (2013) use a third tier for individuals who use cannabis less than once per month. Using their definitions, which account for a disproportionate number of very low consumption, this infrequent tier of consumers is assumed to use 0.3 grams per day of use.

2.3 Estimated Frequency of Cannabis Use

This sub-section estimates the frequency of consumption during the past year. Because of confidentiality, state specific data for California is not available and national frequency of use had to be relied on to estimate this distribution.[5] Table 4 suggests that this is likely to lead to a conservative estimate of cannabis demand in California because Californian's have a higher overall rate of use than

[3] Burns et al. (2013), and Zeisser et al. (2011).

[4] Asbridge et al. (2014), Kilmer et al. (2013), and Burns et al. (2013).

[5] California specific data from the NSDUH on the frequency of use is typically available on the Substance Abuse and Mental Health Data Archive (SAMHDA) website, but that website has been unavailable during the duration of this study as it transitions to a new software platform.

the nation as a whole across every age group. Nonetheless, California's cannabis consumption is lower than in states where recreational cannabis is legal. Using the national frequency distribution is therefore assumed to be a conservative proxy for the distribution of California users. Refining this distribution when the state specific data is again available will be important since it will facilitate a more accurate indication of demand from heavy users, which is a very important influence on the state's demand.

Table 4 Percentage of Population by Age Group Reporting Cannabis Use in the Past Year

State	12 or Older	12-17	18-25	26 or Older	18 or Older
Total U.S.	12.90%	13.28%	31.78%	9.63%	12.87%
California	***14.49%***	***15.03%***	***33.69%***	***10.91%***	***14.44%***
Washington	18.92%	17.53%	36.50%	16.23%	19.06%
Oregon	19.39%	18.32%	38.05%	16.60%	19.50%
Alaska	19.60%	17.30%	36.47%	16.70%	19.86%
Colorado	20.74%	20.81%	43.95%	16.80%	20.74%
Source: 2013-2014 NSDUH					

Table 5 is a summary of cannabis frequency of use distribution nationally across seven intervals. The SAMHDA public-use national files allow us to detail an annual daily frequency distribution for each number of days used per year, from 1 to 365. The table shows that about 30% of cannabis consumers use less than one day per month (11 days per year). The largest share, 46% of cannabis consumers, are regular users who use between 1 to 20 days per month (12-246 days per year). Heavy cannabis consumers, who use cannabis more than 21 days per month (247 or more days per year), compose the smallest share of users: 24%.

Table 5 Distribution of Users' Frequency of Use

Type of Consumer	Use Days per Year	Use Days per Month	Share of Users	Typical Grams per Day of Use
Infrequent	1-11	<1	29.7%	0.3
Regular	12-66	1-5	24.9%	0.67
Regular	67-126	6-10	8.8%	0.67
Regular	127-186	11-15	7.4%	0.67
Regular	187-246	16-20	5.1%	0.67
Heavy	247-306	21-25	7.0%	1.6
Heavy	307-365	26-31	17.2%	1.6
			100%	

2.4 Projected Demand for Cannabis

Having established the population, frequency, and intensity of cannabis consumers in California, we are able to estimate the total base-line demand for cannabis in the year 2018. This is calculated by taking the total number of cannabis consumers, discussed in Section 2.1, then distributing them across the daily frequency of use, discussed in Section 2.3, and finally multiplying that distribution of consumers by their 'typical' daily consumption, found in Section 2.2. As summarized in Table 6, when this calculation is completed it generates an estimated demand of 582 metric tons (tonnes) of cannabis. However, there are two additional issues that need to be accounted for in estimating baseline demand for cannabis: 1)

rising prevalence of consumption independent of legal status, and 2) under-reporting of use because of legal and social concerns.[6] In order to account for these factors, we follow estimates of recent growth in prevalence from Washington State as well as Colorado and assume an additional 10% increase in consumption.[7] This adjustment equates to a further 58 tonnes of cannabis. With this adjustment and our initial calculation, we find that the 2018 baseline demand for cannabis across California will be a grand total of 640 tonnes for the population 21-years and older.

Table 6 Total estimated California resident consumers baseline demand for cannabis in 2018

Frequency of use:	Number of Users 21+ years-old	Usage Amounts (Grams)	Share of...	
Monthly		Typical	Users	Demand
<1	1,132,355	1,275,858	29.7%	0.2%
1-5	947,980	21,848,340	24.9%	3.8%
6-10	333,669	22,315,134	8.8%	3.8%
11-15	281,049	29,915,579	7.4%	5.1%
16-20	192,533	27,502,622	5.1%	4.7%
21-25	267,588	113,676,709	7.0%	19.5%
26-31	655,102	365,701,112	17.2%	62.8%
Total Users/Use:	*3,810,277*	*582,235,354*	*100%*	*100%*
Assume 10% under-reporting/prevalence		58,223,535		
Grand Total Baseline Statewide Demand		**Grams:**	**Kilograms:**	**Tonnes:**
		640,458,889	**640,459**	**640**

In addition to total baseline demand, Table 6 shows the importance of accounting for differences in the intensity and frequency of cannabis use. Because of their much larger intensity and frequency of use, heavy consumers account for over 80% of cannabis demand, despite accounting for 24% of all users. Similarly, while infrequent consumers account for nearly 30% of all users, their low frequency and intensity of use results in their accounting for less than one percent of demand or 0.2%. While not a focus of this analysis, the marked difference in the type of cannabis user suggests distinct demand structures that should be considered in policy analyses.

3 The Legal Cannabis Sector

Typical cannabis cultivation, processing, and retail industries are developed in this part of the report so that they can be applied to generate an estimate of their economic impacts. AUMA's framework guides assumptions around the characteristics of these industries. We assume that these businesses are legal at a statewide level and are operating within the parameters of their licenses. Section 3.1 examines the cannabis cultivation industry, distinguishing across three types of operations: 1) Indoor grows, 2) Outdoor grows, and 3) Greenhouse grows. Section 3.2 is a preliminary profile of the cannabis processing industry and examines the cannabis processing industry across two stages of production: 1) Extraction of Concentrates, and 2) Manufacture of Cannabis-based Products. Section 3.3 then examines three types

[6] For further discussion of these trends see: Reed (2016).

[7] Light et al (2015) estimate the average users under-report by about 22% and heavy users by 11% in their review of use in Colorado. Kleiman et al (2015) in their study of the Washington State market estimate a range of between a 3% decline to a 27% increase in demand, with a best estimate growth factor of 10%.

of cannabis retailing to consumers: 1) In-Store Sales, 2) On-line/On-demand Delivery Sales, and 3) Food and Accommodation Based Sales. Lastly, Section 3.4 describes three industries in the cannabis sector that require licensing under AUMA but are smaller: 1) Microbusinesses, 2) Cannabis Transit, and 3) Cannabis Testing.

3.1 The Cannabis Cultivation Industry

Three distinct types of cannabis cultivation are assumed to supply all cannabis in our analysis: 1) Indoor farming operations, 2) Greenhouse farming operations, and 3) Outdoor farming operations.[8] For each type of facility, we fix their typical physical size, employment, and cannabis production. Assuming fixed characteristics, we impose constant returns to scale in the facilities' operations. That assumption is justified because, as we explained in the introduction, AUMA will restrict cultivation to small and medium size operations between 2018 and 2023. In addition, analyses of the industry show constant returns to scale are a reasonable assumption for this range of facilities.[9] The characteristics of the facilities are based on interviews by our project team with industry experts and available literature.[10]

As such our typical indoor grow is assumed to be in a 10,000 square feet (sq. ft.) facility with 4,900 sq. ft. of canopy and five harvests annually which results in an annual yield of 980 kilograms of cannabis. Greenhouse cannabis grows are assumed to be in 21,000 sq. ft. facilities with 14,700 sq. ft. of canopy and four annual harvests which yield a total of 2,352 kilograms of cannabis annually. The typical outdoor grow is assumed be in a 10,000 sq. ft. facility with a 7,000 sq. ft. canopy and a single annual harvest that yields 280 kilograms. Based on interviews with Northern California market experts and information from available industry databases,[11] the wholesale value of the facilities' cannabis is assumed to be as follows:

- Indoor grown cannabis is assumed to be worth $4.50/gram ($2,040/lbs.).
- Greenhouse grown cannabis is assumed to be worth $3.50/gram ($1,588/lbs.).
- Outdoor grown cannabis is assumed to be worth of $2.25/gram ($1,020/lbs.).

In terms of output shares and based on the interviews with Northern California market experts we assume that 50% of all cannabis is produced at outdoor grows and the remainder is split equally between indoor and greenhouse grows (25% each).

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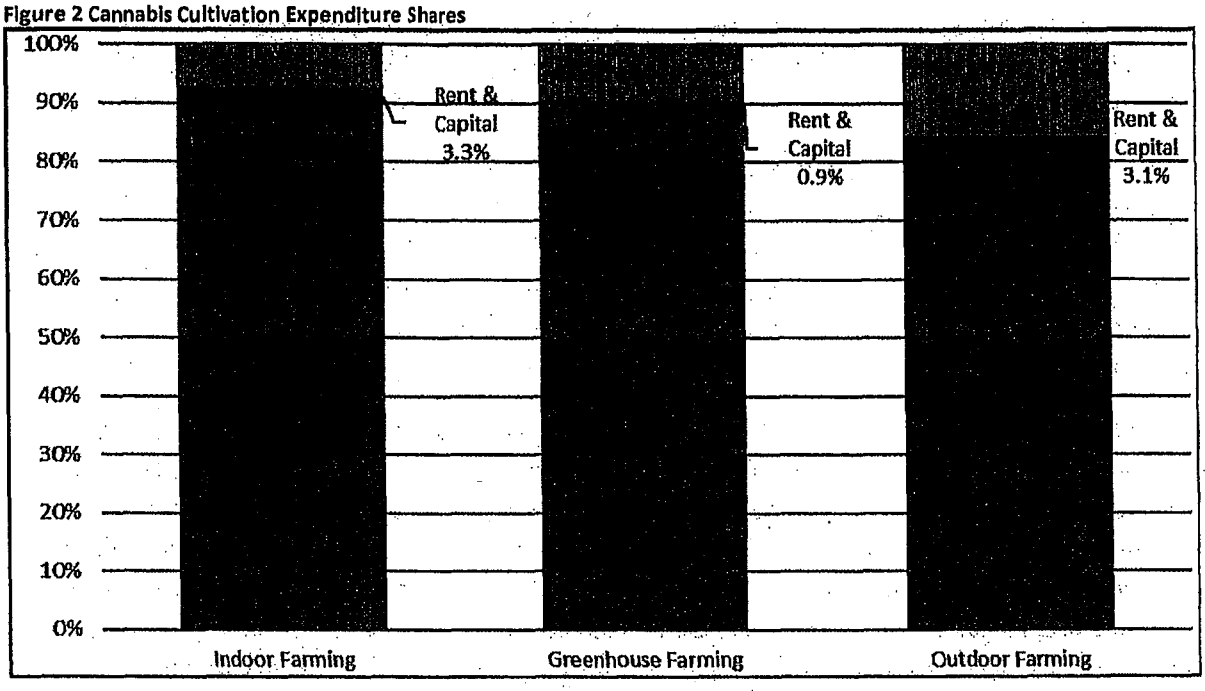
[8] While home-growing is another cultivation option these were not identified as a separate type of producer.
[9] See for example: Hawken (2013); Caulkins (2010). There is clearer evidence for economies of scale in large greenhouse grows as described in Schumacher et al (2003), but these are most significant well beyond the initial 22,000 square foot capacity imposed by AUMA during the first five years of legalization.
[10] See for example: Zamarra (2013), Hawken (2013), and Caulkins et al. (2014).
[11] Reference product pricing was sourced from the following industry data providers: Cannabis Benchmarks http://www.cannabisbenchmarks.com/ ; Price of Weed http://www.priceofweed.com/ ; Arcview Market Research http://www.arcviewmarketresearch.com/ .

Figure 2 Cannabis Cultivation Expenditure Shares



The division of expenditures across the three types of cultivators are reported in Figure 2 and Table 7 provides a more detailed summary of the goods and services expenditures across each type of operation.[12]

Table 7 Goods and Services Expenditures in Cannabis Cultivation by Type of Farm

	Cannabis Farming		
Sector of Expenditure:	Indoor	Greenhouse	Outdoor
Cannabis Sector Inputs	0.2%	0.4%	1.7%
Costs of Premises	1.5%	1.1%	3.7%
Equipment	4.4%	1.6%	1.2%
Growing Material	13.2%	20.2%	46.8%
Insurance Services	0.4%	0.5%	1.2%
Other Operational Expenses	1.2%	1.5%	0.6%
Packaging	0.1%	0.2%	0.1%
Professional Services	36.9%	45.7%	35.3%
Security	2.0%	2.8%	6.7%
Utilities	40.2%	26.0%	2.6%
	100%	***100%***	***100%***

3.2 The Cannabis Processing Industry

Measuring the economic impacts of processing is challenging because cannabis processing is highly dynamic and one of the fastest growing parts of the cannabis sector. In this initial analysis, we differentiate between two parts of the industry: extraction and manufacturing of cannabis based products. Given that deriving cannabis extracts is necessary before products can be manufactured, we

[12] See Appendix 1 to 3 for further details of the goods and expenditures by the three types of cultivators.

assume that all inputs from the cultivation industry enters into the processing industry through extraction operations. The vast majority of output from extractors (90%) is sold to retailing operations.[13] The remaining 10% of extractors' output is assumed to be sold to product manufacturers.[14]

In developing the production characteristics of extractors, a range of contemporary studies and discussions with knowledgeable Northern California market experts were utilized.[15] While THC, CBD, and other cannabinoids can be extracted from several parts of the cannabis plant besides the flowers (buds),[16] we focus on the flow of output from the cultivation industry. We assume that 70% of all outdoor cannabis, 15% of all greenhouse cannabis, and 5% of indoor cannabis goes to the processing industry.

In analyzing manufacturers of cannabis based products, we developed a highly stylized (aggregated) model of their operations that includes everything from the manufacturing of cannabis based food and drink products to cannabis based salves, ointments, tinctures, and pills. Building this industry began by identifying costs and input purchases from comparable edible (e.g. brownies, oil, candy) and non-edible (e.g. creams, lotions) products already being manufactured in the area. In the non-edibles industries manufacturers of lotions, salves, massage oils and other health and beauty products were used while industries manufacturing a range of food products were similarly used for the edible products.[17] Based on the existing scale of these industries in the Sacramento area, these producers were aggregated across edible and non-edible products respectively then combined into a single aggregated product manufacturing operation. The share of cannabis concentrates' input costs was then estimated through a review of existing medical marijuana dispensaries in the Sacramento area as well as contemporary studies to complete the development of the industry.[18]

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[13] Cannabis extractors produce a range of products. Some of the simplest are keif and hash, but they also include a range of products derived through a process of BHO extraction (budder, shatter, and wax) as well as carbon dioxide (CO_2) based extracts (essential oils, concrete, and absolutes).

[14] See Figure 6 and Figure 7 for a representation of these flows.

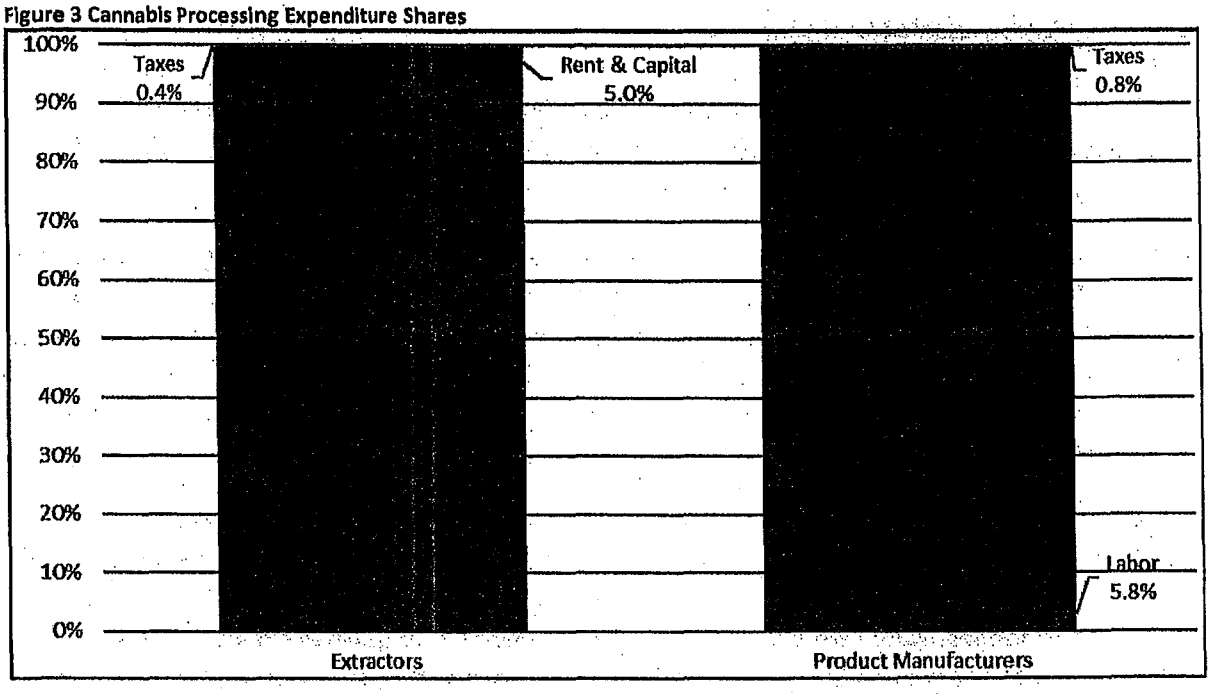
[15] See for example: Rosenthal (2014), and Zamarra (2013).

[16] According to Rosenthal (2014) a cannabis plant will have 5-20% THC in its flowers, but THC-containing resin glands are also found in trim, small leaves near the flowers (2-6% THC), fan leaves, large sun leaves (1-3% THC), and other parts of the plant. In fact, these parts of the plant are estimated to contain 10-20% of a cannabis plant's total THC.

[17] These industries included confectionary, dehydrated food, and flavoring/concentrate manufacturing, as well as soda, milk, and other drink manufacturing.

[18] Rosenthal (2014) and Zamarra (2013).

Figure 3 Cannabis Processing Expenditure Shares



The division of expenditures across the two types of processors are reported in Figure 3 and Table 8 provides a more detailed summary of the goods and services expenditures by the extractors and product manufacturers. [19]

Table 8 Goods and Services Expenditures in Cannabis Processing

	Cannabis Processing	
Sector of Expenditure:	Extractors	Products Mfc.
Cannabis Sector Inputs	53.4%	18.2%
Cannabis Sector Services	9.9%	7.9%
Advertising/Promotion	4.5%	1.9%
Costs of Premises	1.6%	1.0%
Equipment	3.7%	1.0%
Insurance Services	0.9%	0.6%
Other Operational Expenses	5.3%	52.3%
Packaging	14.8%	9.0%
Professional Services	3.4%	6.2%
Security	0.9%	0.5%
Utilities	1.6%	1.4%
	100%	***100%***

[19] See Appendix 4 and 5 for further details of the goods and expenditures by the extractors and product manufacturers.

3.3 The Cannabis Retailing Industry

Cannabis sales to consumers occur through three types of retailers in our analysis: in-store retailers, direct to home (delivery) retail, and retail sales through dedicated restaurants, entertainment venues, and hotels/B&Bs (food and accommodation). The division of sales to consumers across these three channels varies among the various scenarios, which we detail in Part Four.

Based on our review of AUMA, we assume that in-store delivery will consist of dedicated cannabis store sales similar to existing medical marijuana dispensaries. Hence, we used studies of existing stores and dispensaries to estimate these operations' expenditures.[20] The other two channels of cannabis retailing involved fewer precedents from which to draw. Therefore, the retail delivery model is based on e-commerce and non-store retail operations where consumers can go online or call-in orders followed by delivery of their purchases.

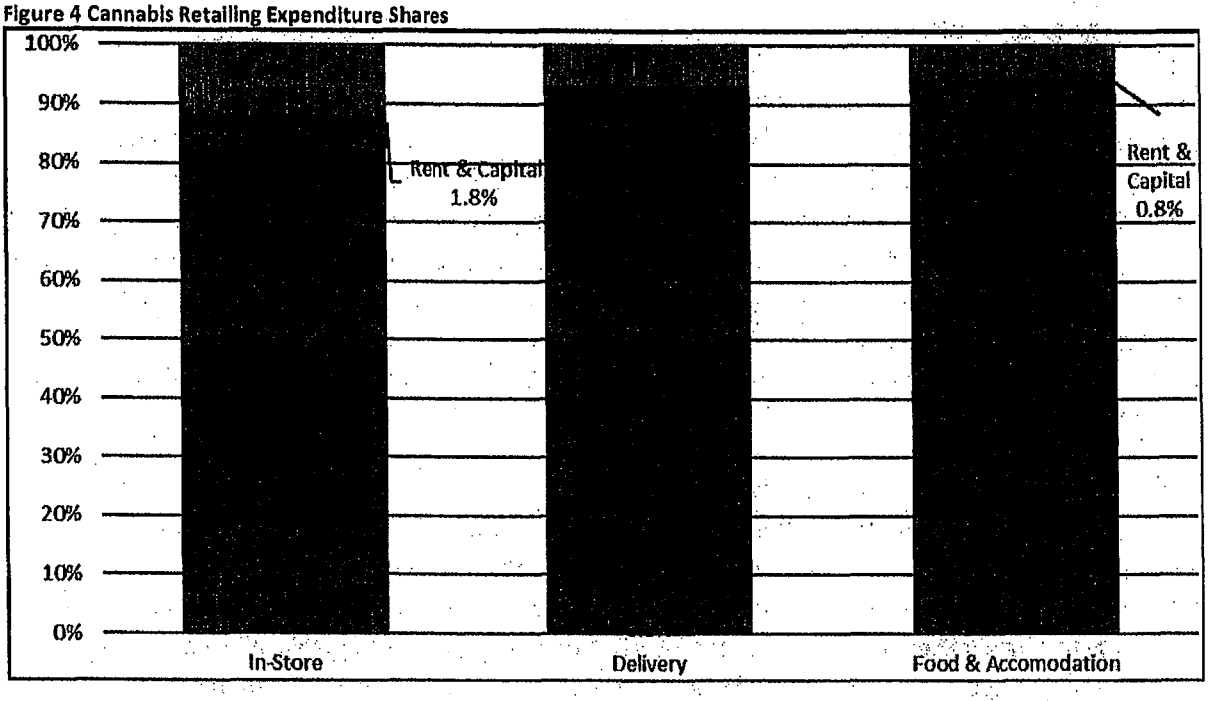
While existing non-store retail operations can form a foundation for retail delivery operations, it was necessary to modify the non-store operations to reflect cannabis product costs and transportation restrictions. The cost of cannabis was captured by drawing on the in-store operations, but adjustments for transportation restrictions were slightly more complicated. Because cannabis remains illegal nationally, it is not possible to use existing delivery services such as the US Post Office, Federal Express (FedEx), or United Parcel Service (UPS) to ship purchases to consumers. Therefore, these operations must deliver the purchases directly to consumers themselves or hire a licensed cannabis transportation provider. While it is possible that the cannabis transportation providers will undertake physical delivery, for this analysis we have assumed delivery is provided by these retail operations, hence they incur relatively high capital expenditures that reflect vehicle purchases for delivery.

In analyzing food and accommodation retailing, our approach is similar to the one followed in analyzing product manufacturers, namely developing a highly stylized (aggregated) operation that reflects a variety of distinct industries. In this case we combined a range of restaurants and accommodation operations to identify cost and input purchase structures.[21] Using weights to reflect the existing scale of these industries in the Sacramento area, these retailers were then used to define a single food and accommodation operation.

[20] Caulkin et al. (2013a), Caulkin et al. (2013b), Caulkin and Dahlkemper (2013).

[21] These industries included hotels, motels, and bed and breakfasts, as well as full-service restaurants, limited service restaurants, and drinking establishments.

Figure 4 Cannabis Retailing Expenditure Shares



The division of expenditures across the various types of retailers is reported in Figure 4, and Table 9 provides a more detailed summary of their expenditures on goods and services. [22]

Table 9 Goods and Services Expenditures in Cannabis Retailing

	Cannabis Retailing		
Sector of Expenditure:	In-Store	Delivery	Food & Acc.
Cannabis Sector Inputs	65.9%	59.6%	60.2%
Cannabis Sector Services	3.6%	3.6%	0.9%
Advertising/Promotion	5.5%	6.1%	3.0%
Costs of Premises	9.8%	6.5%	6.3%
Equipment	1.2%	8.2%	0.9%
Insurance Services	0.8%	0.9%	1.0%
Other Operational Expenses	3.4%	4.6%	16.6%
Professional Services	4.7%	4.6%	7.0%
Security	3.3%	3.5%	0.7%
Utilities	1.9%	2.3%	3.2%
	100%	***100%***	***100%***

[22] See Appendix 6 to 8 for further details of the goods and expenditures by the in-store, delivery, and food/accommodation retail.

3.4 Other Cannabis Industries

3.4.1 The Cannabis Transportation Industry

AUMA requires that any cannabis transported between premises takes place under a licensed cannabis transportation provider. This means that all shipments between industries and among operations within industries in the cannabis sector must be made by a licensed cannabis transportation service provider. These operations are essentially similar to other transit service providers like FedEx and UPS, but federal law prevents these carriers from transporting cannabis. Therefore, we separate these expenditures for transportation within the sector. However, we have in this analysis limited industry scope to intra-sectoral transportation and assume that, in-line with AUMA, sales to consumers are provided by retail delivery operations.

3.4.2 The Cannabis Testing Industry

Testing of all cannabis sold to consumers for its potency and cannabinoid composition is another requirement of AUMA. This requires laboratory analysis of the product similar to nutritional labeling on food products. As such, we assume that cannabis testing occurs through the existing laboratory and analytical testing services sector. Because these services are part of the cannabis production process, we separate these expenditures and identify them as the additional distinct component of production costs which they form.

3.4.3 The Cannabis Microbusiness Industry

AUMA is structured to limit the extent to which large corporate operations can dominate the sector. An important part of these restrictions is in general limiting a license holder to a single operation. That is, under AUMA you could not get a license to cultivate and process cannabis. However, AUMA allows for a number of licenses across stages under the Microbusiness Industry. A business operating with a microbusiness license cannot cultivate an area of 10,000 square feet or more but may engage in all other aspects of the sector as long as those operations involve the product it's cultivated and they do not source product from other cultivators or processors.

4 Cannabis Sector Market Scenarios

Alternative supply-side and demand-side influences defining the structures of a legal cannabis sector in the Sacramento area are described in this part of the analysis. In Section 4.1 three alternative policy environments influencing cannabis supplies in the Sacramento area are described. A range of three alternative forecasts regarding statewide demand for cannabis are then detailed in Section 4.2. The nine distinct market structures formed from this combination of supply and demand alternatives are then set out in Section 4.3 along with their associated direct employment and output values. Those values are then used in Part Five to analyze the economic impact of a legal cannabis sector in 2018 on the Sacramento area economy.

4.1 Sacramento Area Cannabis Supply Scenarios

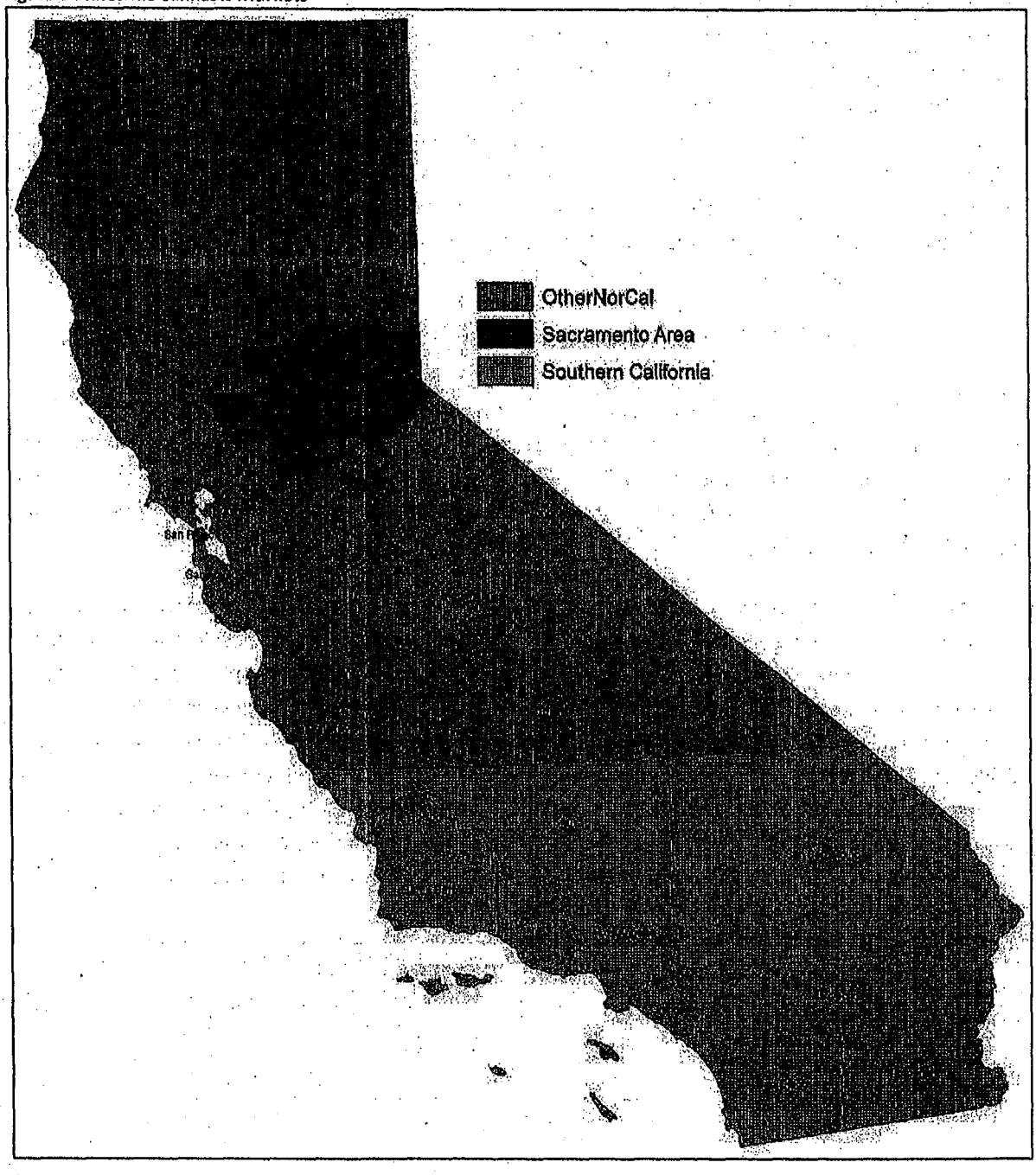
The statewide supply provided by Sacramento area cultivators and processors depends on their comparative advantage. There are three distinct geographically defined California markets available to the Sacramento area cannabis sector in this analysis: 1) The Sacramento area, 2) Other Norther California, and 3) Southern California. These markets and their constituent counties are represented in Figure 5 on the next page.

We propose three alternative cannabis market supply scenarios. In the first scenario, local and county governments are assumed to take a hostile anti-cannabis industry stance. As a result, the Sacramento area has a very limited cannabis sector that supplies only a minority of the region's demand and does not export to other parts of the state. In the second scenario, we assume local governments have a more moderate attitude towards the sector and has some capacity to supply other parts of Northern California. The last scenario assumes local governments seek to maximize the economic potential of the sector and existing capabilities in cannabis across the region are leveraged in a recreationally legal cannabis market to create a cannabis cluster that supplies a significant share of demand across the state. These market scenarios and their supply shares are summarized in Table 10 below.

Table 10 Sacramento Area Regional Cannabis Supply in 2018

Market Scenario	Regional Shares Supplied by Sacramento:		
	GSA	Other NorCal	SoCal
Limited Scenario	20%	0%	0%
Local Scenario	80%	10%	0%
Cluster Scenario	90%	50%	10%

Figure 5 Statewide Cannabis Markets



4.2 Sacramento Area Cannabis Demand Scenarios

In Part Two, a 'baseline' statewide demand for cannabis in 2018 by those age 21 and over was estimated to be 640 tonnes. In order to find the geographic distribution, we assume that demand is proportional to projected 2018 statewide population shares.[23] Table 11 reports these projected shares of the 21-years of age and older population across our three California markets.

Table 11 Geographic distribution of cannabis demand in 2018

Region	% of 2018 CA Demand	Baseline demand (kg)
Greater Sacramento Area	**6.5%**	**41,630**
Other NorCal	**33.1%**	**211,992**
SoCal	**60.4%**	**386,837**
Grand Total	**100%**	**640,459**

Next, statewide and regional shares of demand for cannabis in a recreationally legal market environment need to be estimated. In addition to 'baseline' demand determined in Section Two, we develop two additional demand scenarios. Both cases reflect very general statewide changes in demand and incorporate initial experience with legalization in the states of Colorado and Washington.[24] Under our moderate "low-growth" scenario, baseline demand increases by an additional 10% or 64 tonnes, which equates to total demand of 704.5 tonnes. In the second case, we propose a more aggressive "high-growth" scenario where baseline demand increases by 20% or 121.1 tonnes, bringing total demand to 768.6 tonnes. These three demand scenarios are summarized in Table 12 below according to their associated statewide and regional shares of demand.

Table 12 Statewide & Regional Cannabis Demand in 2018

2018 Demand by Region:	Tonnes:		
	Baseline	**Low-Growth**	**High-Growth**
Greater Sacramento Area	41.6	45.8	50.0
Other NorCal	212.0	233.2	254.4
SoCal	386.8	425.5	464.2
Statewide Grand Total	**640.5**	**704.5**	**768.6**

4.3 Sacramento Area Cannabis Market Scenarios

The supply scenarios from Table 10 are combined with the demand scenarios in Table 12 to estimate Sacramento area market output for each scenario. For example, under baseline demand and the limited supply scenario, Sacramento area demand is 41.6 tonnes of which 20% is supplied by the local industry.[25] Similarly, under that market scenario, Other Northern California demand is 212 tonnes and

[23] As noted in Part Two, NSDUH data from the SAMHDA website should be able to provide some regional information about the regional incidence of cannabis consumption in California, but that data is currently unavailable and so it is necessary to assume similar statewide frequency and intensity of cannabis consumption. Some details of statewide variation in cannabis consumption is available in Kilmer et al. (2010).

[24] See for example Kleiman et al (2015) and Reed (2016).

[25] See Row One, Column One of Table 10 and Row One, Column One of Table 12.

Southern California demand is 386.8 tonnes; these markets are not supplied by the Sacramento industry.[26] Therefore, Sacramento area output under this market scenario is 8.3 tonnes, which can be expressed by the following equation: 41.6*(20%)+212*(0%)+386.8*(0%)=8.3 tonnes. Following similar calculations, Table 13 reports cultivator and, by assumption, sector-wide output for each market scenario.

Table 13 Sacramento Area Cannabis Output by Market Scenario

Market Scenario:		Tonnes of SAC Output:
Limited Scenario	Baseline	8.3
	Low-Growth	9.2
	High-Growth	10.0
Local Scenario	Baseline	54.5
	Low-Growth	60.0
	High-Growth	65.4
Cluster Scenario	Baseline	182.2
	Low-Growth	200.4
	High-Growth	218.6

The considerable range in the scale of local market impacts that are reported in Table 13 are important to highlight. Table 13 shows that local market output is heavily dependent on the assumed supply-side conditions. While we assume demand varies between the baseline and high-growth environments by up to 20%, under similar demand conditions the cluster supply-side environment is over 20 times the size of the limited conditions. Refining the likely supply-side conditions is therefore important to narrowing the range of potential impacts.

Table 14 Sacramento Area Cannabis Sector Output ($millions) by Industry and Supply/Demand Scenario

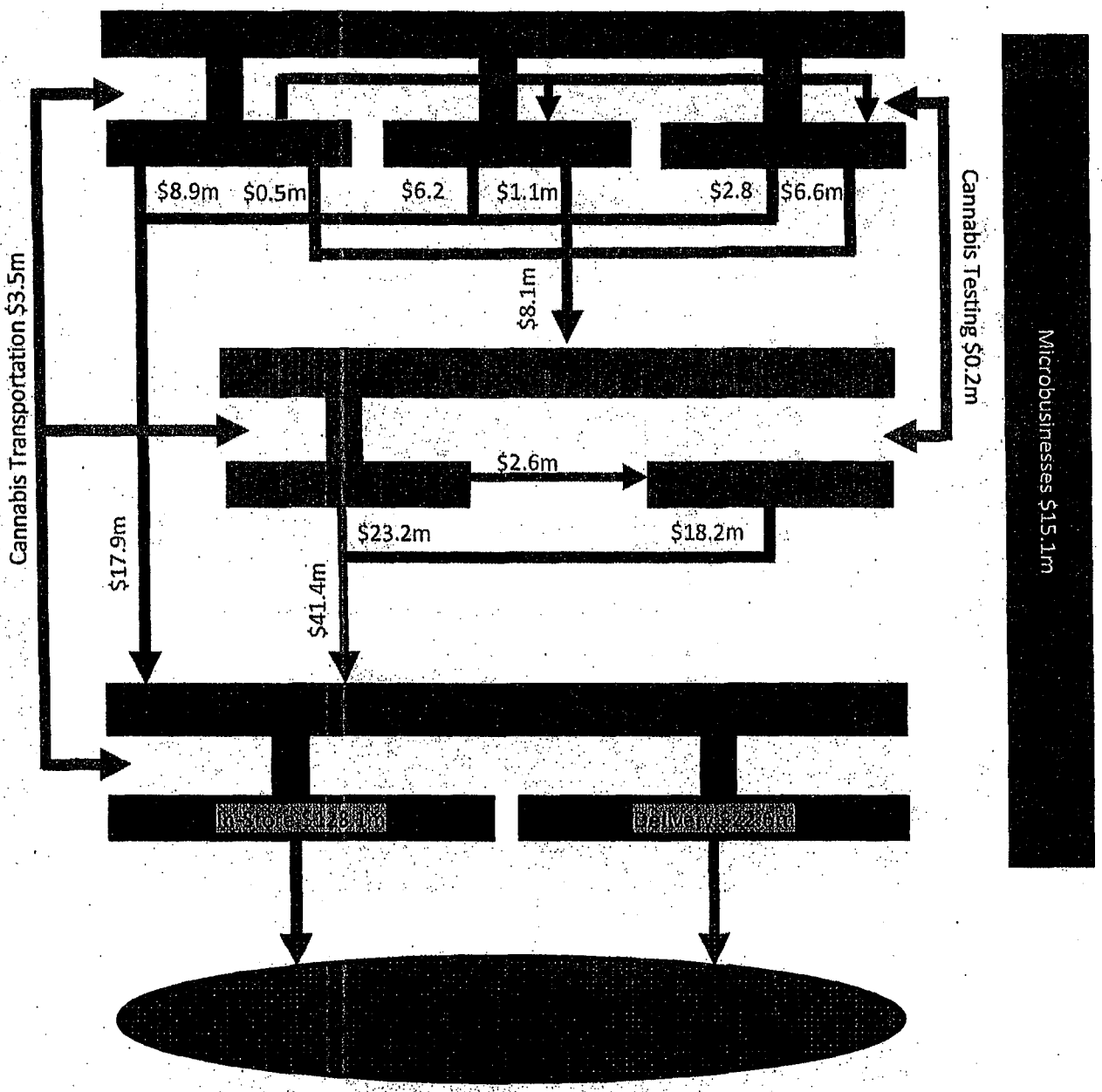
		Total Cannabis Industry Employment					
Supply/Demand Scenario:		Cultivators	Processors	Retail	Transport	Testing	Micro
Limited Scenario	Baseline	26.0	41.4	150.7	3.5	0.2	15.1
	Low-Growth	28.6	45.5	165.7	3.8	0.2	16.6
	High-Growth	31.2	49.7	180.8	4.2	0.3	18.1
Local Scenario	Baseline	170.3	271.0	602.6	17.5	3.2	75.4
	Low-Growth	187.3	298.1	662.9	19.2	3.5	82.9
	High-Growth	204.3	325.2	723.1	21.0	3.8	90.4
Cluster Scenario	Baseline	569.1	905.8	677.9	42.0	16.6	170.9
	Low-Growth	626.0	996.4	745.7	46.2	18.2	187.9
	High-Growth	682.9	1,087.0	813.5	50.4	19.9	205.0

Using the assumption of constant returns to scale, the amount supplied by each grow facility (Section 3.1), can be divided by the Sacramento area market demand in Table 13 to establish the associated direct sales (output) from the cultivation industry. Similarly, the cannabis flows from the cultivation industry down the value chain create impacts through the rest of the sector. Applying the assumptions

[26] See Row One, Column Two of Table 10 and Row Two, Column One of Table 12 as well as Row One, Column Three of Table 10 and Row Three, Column One of Table 12 .

of the flows detailed in Part Three, Table 14 summarizes the direct output effects associated with each scenario. As these scenarios define a market in which recreational cannabis sales are legal at a state level, they define a new market environment. However, the economic impact of that market is only new in that it is not part of the existing medical market nor part of the existing illegal market.

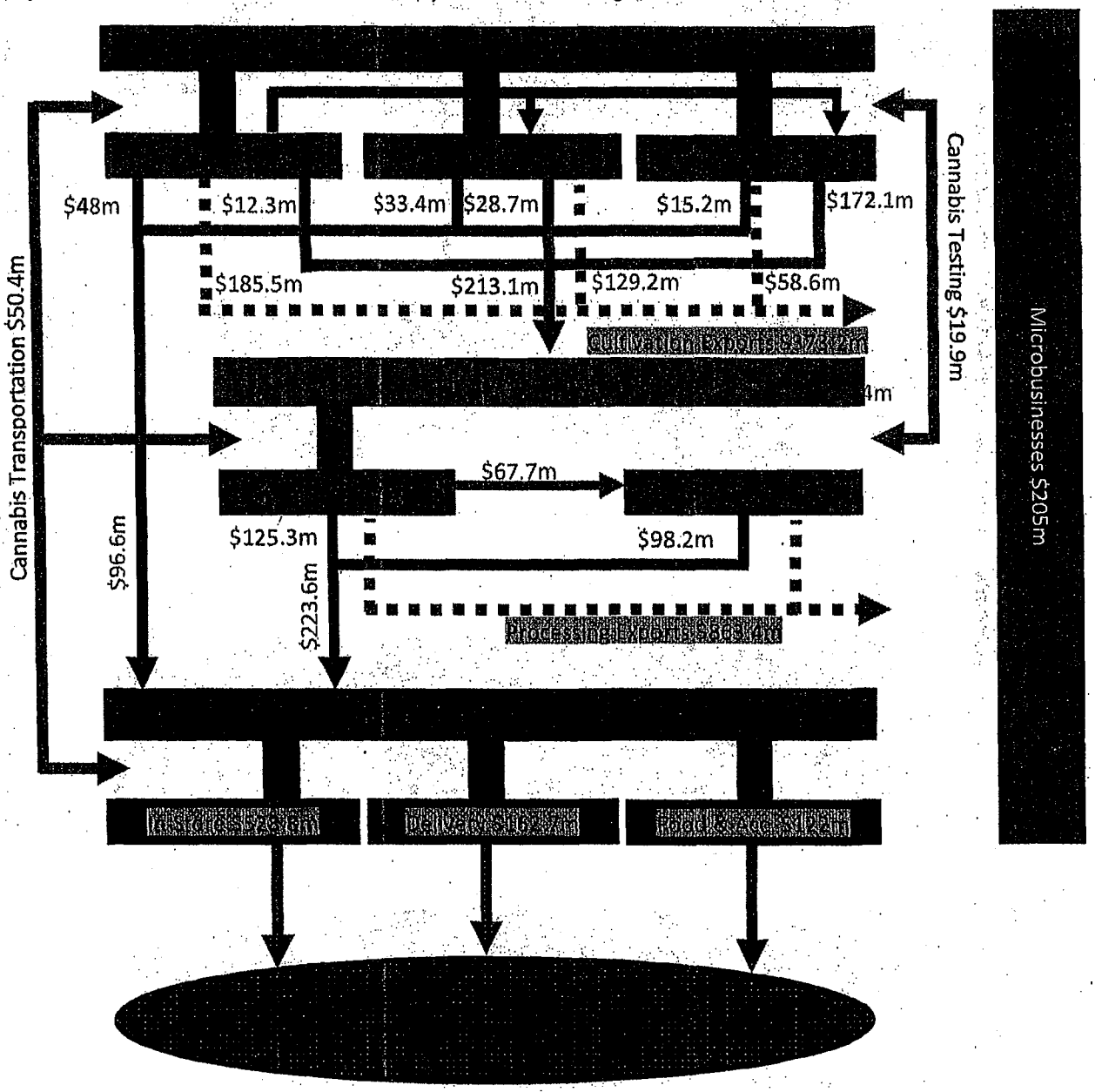
Figure 6 Overview of the Cannabis Sector Impacts under Limited Baseline Scenario



The flow of sales and the value addition associated with each stage in the cannabis sector under the limited baseline scenario are illustrated in Figure 6. Under this scenario there are no supplies of cannabis to other regions. Sales (highlighted in yellow) to Sacramento area consumers represent the total direct

impact of the sector.[27] However, if sales to other California regions are occurring, these exports must be added to the sales to Sacramento area consumers in order to derive the total direct impact of the cannabis sector. These additional flows are illustrated in Figure 7 below.[28] The component industry totals in Table 14 and the overall total direct output impacts from each scenario, such as those described in Figure 6 and Figure 7, form the basis with which we can analyze the associated economic impacts in Part Five.

Figure 7 Overview of the Cannabis Sector Direct Impacts under Cluster High-Growth Scenario



[27] As described in Part 5, the total direct output impact under the limited baseline scenario is $150.7 million.
[28] As described in Part 5, the total direct output impact under the cluster high-growth scenario is $2,050.2 million.

5 Economic Impact Analysis

In order to analyze the economic impacts of the sector and its industries, we utilize economic modelling software called IMPLAN, which allows us to develop a model of the Sacramento area economy.[29] This model is in a sense a general accounting system of transactions between industries, businesses, and consumers that estimates the range of economic impacts. We thereby create a complete, extremely detailed Social Accounting Matrices and Multiplier Models of the Sacramento Area economy that enables in-depth examination of the impacts of a legal cannabis industry in 2018.

IMPLAN was developed in the late-1970s by the United States Forest Service and researchers at the University of Minnesota. The software was initially based on input-output accounts whose analysis was pioneered in the Nobel Prize winning work of Wassily Leontief. As the software evolved, it began using Social Accounting Matrices to incorporate transactions among institutional agents in its analysis. Currently, IMPLAN is among the most widely used economic impact modeling systems. It provides a transparent and detailed approximation of economic impacts that is widely utilized by businesses and government agencies.

The full range of economic impacts that result from the sector's employment, known as the Total Effect, is the sum of the direct, indirect, and induced effects:

- **Direct Effects** are the changes in jobs and income directly supported by the industry such as the jobs held by a greenhouse cannabis farm's employees.
- **Indirect Effects** represent the iterative impacts of inter-industry transactions as supplying industries respond to demand from the sector(s) where the initial expenditures occurred. An example of an indirect impact would be employees of a plant nutrient supplier to an indoor cannabis farm.
- **Induced Effects** reflect the expenditures made by recipients of wages in the direct and indirect industries. Examples of induced impacts include employees' expenditures on items such as retail purchases, housing, food, medical services, banking, and insurance.

In these analyses, the total, direct, indirect, and induced effects are reported by employment, output, and labor income:

- **Employment** is the number of full- and part-time jobs based on an annual average of monthly jobs. In other words, employment is measured as a full year of employment. Thus, 3 temporary jobs that lasted for 4 months are reported as 1 job.
- **Output** represents the value of industry production. It accounts for the total change in the value of production in an industry for a given time period. Output varies as a measure across industries. For manufacturers, the value of production is sales plus or minus any change in inventories. For

[29] Specifically, in this analysis we use IMPLAN Version 3.1 with calendar year 2013 data and results adjusted to 2016 values.

service sectors, the value of production equals their sales. While for retail and wholesale trade, the value of production equals their gross margin and not their gross sales.

- **Labor Income** is the sum of employee compensation and proprietor income. Employee compensation includes wages, salaries, benefits, and all other employer contributions, while proprietor income consists of payments received by self-employed individuals, and unincorporated business owners.

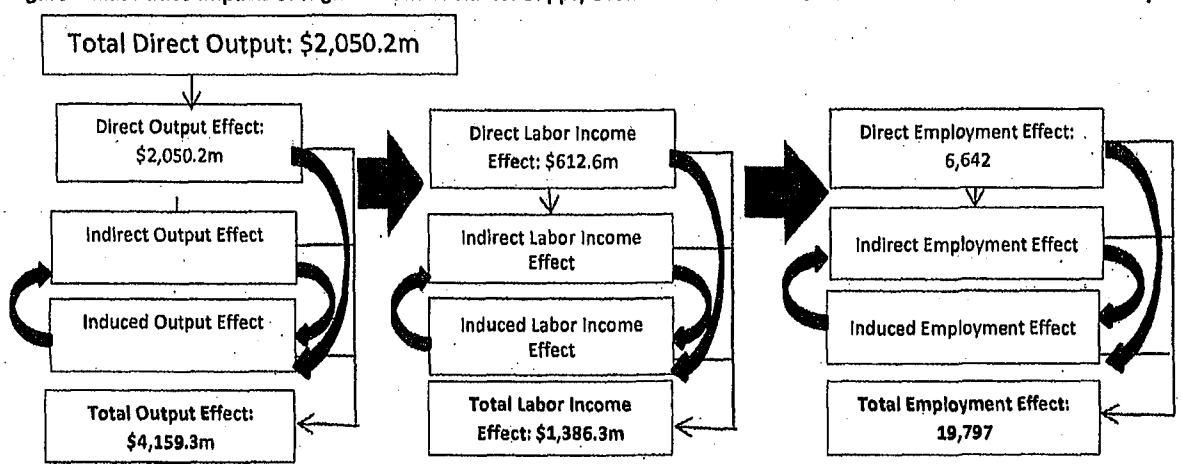
The economic model is defined for a specific geographic area, and economic impacts are calculated for that area. Indirect and induced effects are calculated using regional purchase coefficients calculated by IMPLAN, and thus economic impacts do not include spending outside the region of analysis even if the purchases are made by individuals or businesses located within that region.

5.1 Economic Impacts of the Cannabis Sector

In Section 4.3, the Sacramento area's 2018 total direct output impacts were calculated and illustrated for the limited baseline scenario and the cluster high-growth scenario. Analyzing each of the other 25 scenarios in this analysis we confirmed that those two scenarios had the smallest and largest direct impacts respectively. As such we find that the sector's direct output impacts range from $150.7 million to $2,050 million. Our analysis equates that level of output to direct employment between 602 and 6,642 jobs. Similarly, the direct effect on labor income is estimated from $33.9 million to $612.6 million.

In order to estimate the sector's total effects indirect and induced impacts need to be estimated and combined with the direct effects. Figure 8 illustrates the generation of these total effects under the scenario of high demand growth and a strong comparative advantage in the market under the cluster scenario. Therefore, we see how the $2.1 billion in cannabis sector output generates a total of $4.2 billion of output in the Sacramento area economy. Likewise, the figure shows how the direct labor income of $0.6 billion under that scenario leads to a total labor income effect of $1.4 billion and the 6,642 in direct jobs leads to 19,797 in total employment.

Figure 8 Illustrative Impacts of High Demand & Cluster Supply Scenario Cannabis Sector on the Sacramento Area Economy



Estimating the total effects for each scenario requires a similar process to the one illustrated in Figure 8. Those calculations were made within our impact analysis model and the results for each supply/demand scenario are reported in Table 15 below. Our analysis suggests that in 2018 the cannabis sector may support output between $322 million and $4.2 billion in the Sacramento area's economy through its total effects. Those levels of output equal total labor income effects from $97 million to $1.4 billion. Similarly, the total effects on employment are estimated to range between 1,578 and 19,797 jobs.

Table 15 Sacramento Area Cannabis Sector Economic Impacts by Supply and Demand Scenarios

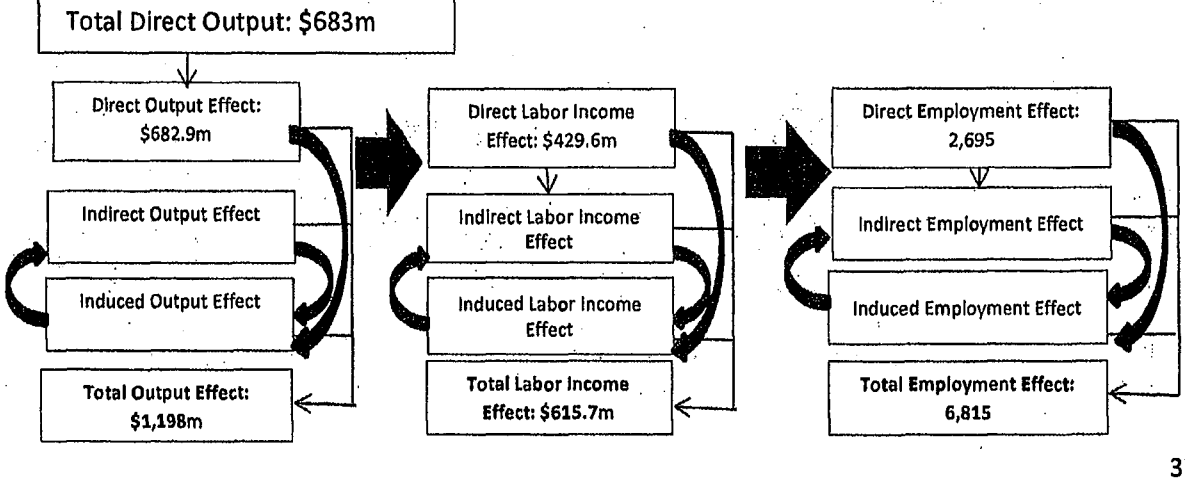
Impact:	Supply:	Limited			Local			Cluster		
	Demand:	Base	Medium	High	Base	Medium	High	Base	Medium	High
Employment	Direct Effect	602	662	722	2,793	3,072	3,351	5,535	6,089	6,642
	Total Effect	1,578	1,736	1,893	7,657	8,423	9,189	16,497	18,147	19,797
Labor Income ($'000s)	Direct Effect	$33,861	$37,247	$40,633	$184,077	$202,485	$220,893	$510,533	$561,587	$612,640
	Total Effect	$96,598	$106,258	$115,918	$488,461	$537,307	$586,154	$1,155,270	$1,270,797	$1,386,324
Output ($'000s)	Direct Effect	$150,650	$165,715	$180,780	$753,621	$828,983	$904,345	$1,708,467	$1,879,314	$2,050,161
	Total Effect	$321,594	$353,753	$385,912	$1,583,375	$1,741,712	$1,900,050	$3,466,058	$3,812,664	$4,159,269

5.2 Economic Impacts of Cannabis Industries

5.2.1 Economic Impacts of Cultivation

The Sacramento Area's 2018 total direct output impacts from cannabis cultivation were reported in Table 14 in Section 4.3. These showed that cultivation operations' direct output impacts range from $45.6 million to $1,198 million. That level of output equates to a direct effect on labor income between $16.3 million and $429.6 million. Similarly, the direct employment effect is estimated between 103 and 2,695 jobs. Estimating the industry's total effects requires indirect and induced impacts to be estimated and combined with the direct effects. In similar fashion to the analysis of the sector as a whole, Figure 9 illustrates the generation of these total effects under the scenario of high demand growth and a strong comparative advantage in the market under the cluster scenario.

Figure 9 Illustrative Impacts of High Demand & Cluster Supply Scenario in Cultivation on the Sacramento Area Economy



Estimating the total effects for each scenario requires a similar process to the one illustrated in Figure 9. Those calculations were made within our impact analysis model and the results for each supply/demand scenario are reported in Table 16 below. Our analysis suggests that in 2018 the cannabis cultivation industry support output between $45.6 million and $1.2 billion in the Sacramento Area's economy through its total effects. Those levels of output equal total labor income effects from $23.5 million to $616 million. The total effects on employment are estimated to range between 260 and 6,815 jobs.

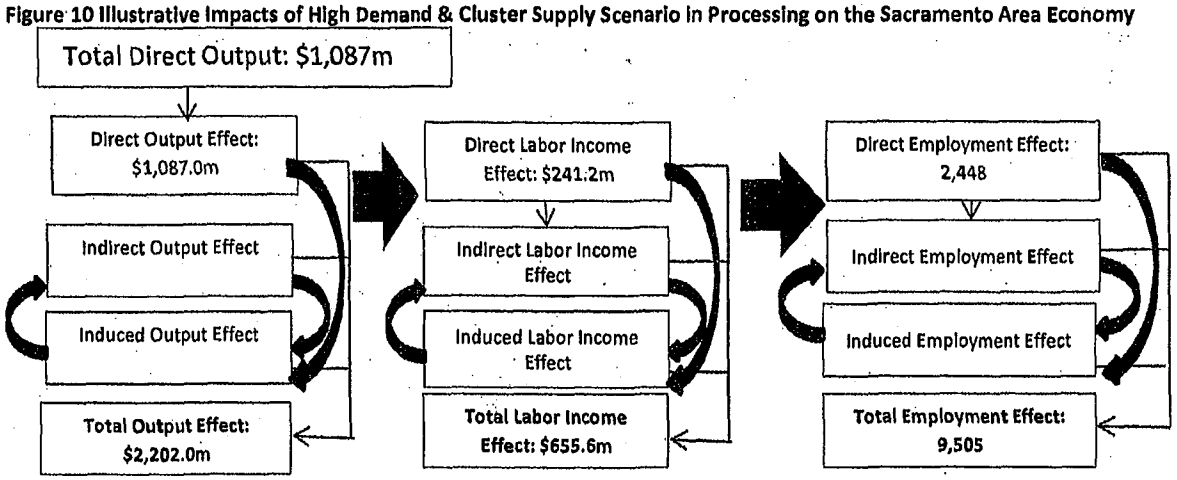
Table 16 Sacramento Area Cannabis Cultivation Economic Impacts by Supply and Demand Scenarios

Impact:	Supply:	Limited			Local			Cluster		
	Demand:	Base	Medium	High	Base	Medium	High	Base	Medium	High
Employment	Direct Effect	103	113	123	672	739	806	2,246	2,470	2,695
	Total Effect	260	286	312	1,699	1,869	2,039	5,680	6,248	6,815
Labor Income ($'000s)	Direct Effect	$16,360	$17,996	$19,632	$107,110	$117,821	$128,532	$357,964	$393,760	$429,557
	Total Effect	$23,449	$25,793	$28,138	$153,516	$168,867	$184,219	$513,052	$564,357	$615,663
Output ($'000s)	Direct Effect	$26,010	$28,611	$31,212	$170,287	$187,316	$204,345	$569,102	$626,013	$682,923
	Total Effect	$45,626	$50,189	$54,751	$298,711	$328,583	$358,454	$998,297	$1,098,127	$1,197,957

5.2.2 Economic Impacts of Processing

The Sacramento Area's 2018 total direct output impacts from cannabis processing were reported in Table 14 in Section 4.3. These showed that processing operations' direct output impacts range from $41.4 million to $1,087 million. That level of output equates to a direct effect on labor income between $9.2 million and $241.2 million. Similarly, the direct employment effect is estimated between 93 and 2,448 jobs. Estimating the industry's total effects requires indirect and induced impacts to be estimated and combined with the direct effects. In similar fashion to the analysis of the sector as a whole and cultivation, Figure 10 illustrates the generation of these total effects under the scenario of high demand growth and a strong comparative advantage in the market under the cluster scenario.

Figure 10 Illustrative Impacts of High Demand & Cluster Supply Scenario in Processing on the Sacramento Area Economy



Estimating the total effects for each scenario within our impact analysis model results in the direct and total effects reported in Table 17 below. Our analysis suggests that in 2018 the cannabis processing industry may support output between $83.9 million and $2.2 billion in the Sacramento Area's economy through its total effects. Those levels of output equal total labor income effects from $25 million to $656 million. Similarly, the total effects on employment are estimated to range between 362 and 9,505 jobs.

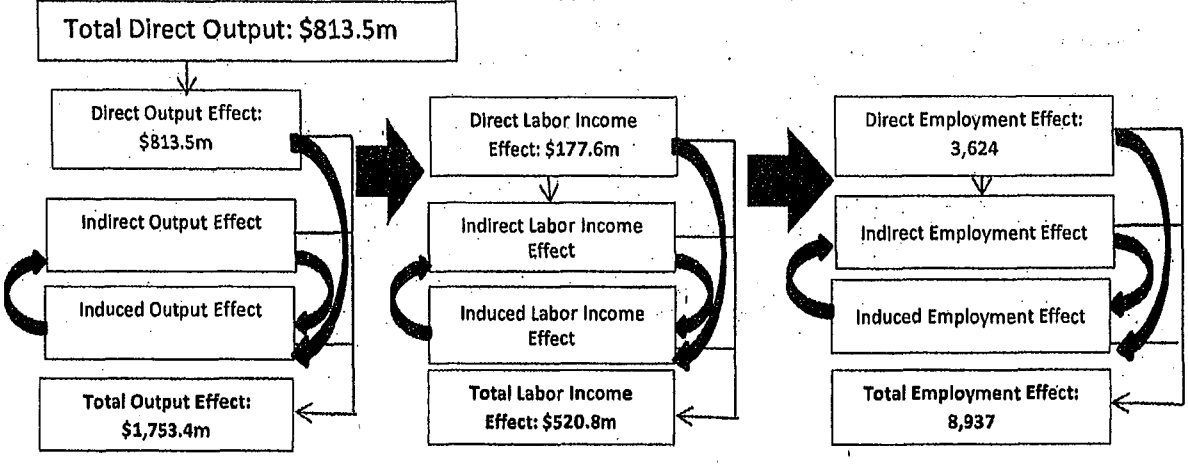
Table 17 Sacramento Area Cannabis Processing Economic Impacts by Supply and Demand Scenarios

Impact:	Supply:	Limited			Local			Cluster		
	Demand:	Base	Medium	High	Base	Medium	High	Base	Medium	High
Employment	Direct Effect	93	103	112	610	671	732	2,040	2,244	2,448
	Total Effect	362	398	434	2,370	2,607	2,844	7,921	8,713	9,505
Labor Income ($'000s)	Direct Effect	$9,188	$10,106	$11,025	$60,151	$66,167	$72,182	$201,027	$221,129	$241,232
	Total Effect	$24,969	$27,466	$29,963	$163,469	$179,816	$196,163	$546,316	$600,947	$655,579
Output ($'000s)	Direct Effect	$41,399	$45,539	$49,679	$271,036	$298,139	$325,243	$905,805	$996,385	$1,086,966
	Total Effect	$83,866	$92,252	$100,639	$549,064	$603,970	$658,876	$1,834,977	$2,018,475	$2,201,973

5.2.3 Economic Impacts of Retailing

The Sacramento Area's 2018 total direct output impacts from cannabis retailing were reported in Table 14 in Section 4.3. These showed that retailing operations' direct output impacts range from $150.7 million to $813.5 million. That level of output equates to a direct effect on labor income between $33.9 million and $117.6 million. Similarly, the direct employment effect is estimated between 602 and 3,624 jobs. Estimating the industry's total effects requires indirect and induced impacts to be estimated and combined with the direct effects. In similar fashion to the analysis of the sector as a whole and the other industries, Figure 11 illustrates the generation of these total effects under the scenario of high demand growth and a strong comparative advantage in the market under the cluster scenario.

Figure 11 Illustrative Impacts of High Demand & Cluster Supply Scenario in Retailing on the Sacramento Area Economy



Estimating the total effects for each scenario within our impact analysis model results in the direct and total effects reported in Table 18 below. Our analysis suggests that in 2018 the cannabis retailing industry may support output between $321.6 million and $1.8 billion in the Sacramento area's economy through its total effects. Those levels of output equal total labor income effects from $97.6 million to $520.8 million. Similarly, the total effects on employment are estimated to range between 1,578 and 8,937 jobs.

Table 18 Sacramento Area Cannabis Retailing Economic Impacts by Supply and Demand Scenarios

Impact:	Supply:	Limited			Local			Cluster		
	Demand:	Base	Medium	High	Base	Medium	High	Base	Medium	High
Employment	Direct Effect	602	662	722	2,424	2,666	2,909	3,020	3,322	3,624
	Total Effect	1,578	1,736	1,893	6,331	6,964	7,598	7,448	8,192	8,937
Labor Income ($'000s)	Direct Effect	$33,861	$37,247	$40,633	$130,953	$144,048	$157,143	$148,021	$162,823	$177,625
	Total Effect	$96,598	$106,258	$115,918	$382,765	$421,042	$459,318	$434,011	$477,413	$520,814
Output ($'000s)	Direct Effect	$150,650	$165,715	$180,780	$602,601	$662,861	$723,121	$677,926	$745,718	$813,511
	Total Effect	$321,594	$353,753	$385,912	$1,289,574	$1,418,532	$1,547,489	$1,461,201	$1,607,321	$1,753,441

5.2.4 Economic Impacts of Other Cannabis Industries

Cannabis Transportation

The cannabis transportation industry's total direct output impacts in the Sacramento area were reported in Table 14 in Section 4.3. Following a similar methodology to the other sectors the total effects for each scenario within our impact analysis model are reported in Table 19 below.

Table 19 Sacramento Area Cannabis Transportation Economic Impacts by Supply and Demand Scenarios

Impact:	Supply:	Limited			Local			Cluster		
	Demand:	Base	Medium	High	Base	Medium	High	Base	Medium	High
Employment	Direct Effect	31	34	38	158	174	190	380	418	456
	Total Effect	48	52	57	241	265	289	579	636	694
Labor Income ($'000s)	Direct Effect	$1,197	$1,317	$1,436	$6,045	$6,649	$7,254	$14,533	$15,986	$17,440
	Total Effect	$2,088	$2,296	$2,505	$10,542	$11,596	$12,651	$25,346	$27,881	$30,416
Output ($'000s)	Direct Effect	$3,460	$3,807	$4,153	$17,475	$19,222	$20,969	$42,014	$46,215	$50,416
	Total Effect	$5,898	$6,488	$7,077	$29,782	$32,760	$35,739	$71,605	$78,765	$85,926

Cannabis Testing

The cannabis transportation industry's total direct output impacts in the Sacramento Area were reported in Table 14 in Section 4.3. Following a similar methodology to the other sectors the total effects for each scenario within our impact analysis model are reported in Table 20 below.

Table 20 Sacramento Area Cannabis Testing Economic Impacts by Supply and Demand Scenarios

Impact:	Supply:	Limited			Local			Cluster		
	Demand:	Base	Medium	High	Base	Medium	High	Base	Medium	High
Employment	Direct Effect	2	2	2	25	28	30	131	144	158
	Total Effect	4	4	4	51	56	61	266	292	319
Labor Income ($'000s)	Direct Effect	$133	$147	$160	$1,898	$2,087	$2,277	$9,945	$10,940	$11,934
	Total Effect	$221	$243	$265	$3,146	$3,461	$3,776	$16,488	$18,137	$19,786
Output ($'000s)	Direct Effect	$222	$244	$266	$3,160	$3,476	$3,792	$16,561	$18,217	$19,873
	Total Effect	$464	$510	$557	$6,611	$7,272	$7,933	$34,643	$38,107	$41,571

Cannabis Microbusinesses

Given that the microbusinesses are assumed to form a portion of the sector as a whole, the direct, indirect and induced impacts are a corresponding portion of the sector-wide impacts.[30] These total effects for each scenario within our impact analysis model are reported in Table 21 below.

Table 21 Sacramento Area Cannabis Microbusiness Economic Impacts by Supply and Demand Scenarios

Impact:	Supply:	Limited			Local			Cluster		
	Demand:	Base	Medium	High	Base	Medium	High	Base	Medium	High
Employment	Direct Effect	60	66	72	279	307	335	554	609	664
	Total Effect	158	174	189	766	842	919	1,650	1,815	1,980
Labor Income ($'000s)	Direct Effect	$3,386	$3,725	$4,063	$18,408	$20,248	$22,089	$51,053	$56,159	$61,264
	Total Effect	$9,660	$10,626	$11,592	$48,846	$53,731	$58,615	$115,527	$127,080	$138,632
Output ($'000s)	Direct Effect	$15,065	$16,572	$18,078	$75,362	$82,898	$90,434	$170,847	$187,931	$205,016
	Total Effect	$32,159	$35,375	$38,591	$158,337	$174,171	$190,005	$346,606	$381,266	$415,927

[30] See Section 3.4.3 for a further discussion of the Microbusiness industry's structure in our analysis.

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Appendices

Appendix One Indoor Farming Goods and Services Expenditure Shares

Cannabis Sector Inputs	
Indoor Cannabis Farming	0.23%
Costs of Premises	
Newly constructed commercial structures, including farm structures	0.88%
Maintained and repaired nonresidential structures	0.34%
Real estate buying and selling, leasing, managing, and related services	0.20%
Landscape and horticultural services	0.06%
Services to buildings	0.01%
Equipment	
Lighting fixtures	1.655%
Air conditioning, refrigeration, and warm air heating equipment	1.317%
Farm machinery and equipment	0.640%
Handtools	0.181%
Lawn and garden equipment	0.131%
Motor vehicle electrical and electronic equipment	0.096%
Leasing of nonfinancial intangible assets	0.095%
Power-driven handtools	0.058%
Commercial and industrial machinery and equipment rental and leasing services	0.047%
Storage batteries	0.035%
All other miscellaneous manufactured products	0.027%
Rubber and plastics hoses and belts	0.022%
Scales, balances, and miscellaneous general purpose machinery	0.022%
Steel wire	0.009%
Motors and generators	0.009%
Rope, cordage, twine, tire cord and tire fabric	0.008%
All other miscellaneous wood products	0.008%
Growing Material	
Retail services - Building material and garden equipment and supplies stores	6.30%
Other basic inorganic chemicals	1.75%
Pesticides and other agricultural chemicals	1.74%
Phosphatic fertilizer	1.73%
Nitrogenous fertilizer	1.58%
Other miscellaneous chemical products	0.05%
Insurance Services	
Insurance	0.34%
Insurance agencies, brokerages, and related services	0.04%
Other Operational Expenses	
Commercial and industrial machinery and equipment repair and maintenance	0.10%
Monetary authorities and depository credit intermediation	0.70%
Other financial investment services	0.09%
Electronic and precision equipment repair and maintenance	0.02%
Retail services - Nonstore retailers	0.08%
Nondepository credit intermediation and related activities	0.08%
Retail services- Clothing and clothing accessories stores	0.06%
Software publishers	0.03%
Securities and commodity contracts intermediation and brokerage	0.02%
Retail services - Miscellaneous store retailers	0.02%
Retail services - Gasoline stores	0.02%
Packaging	
Plastics packaging materials and unlaminated films and sheets	0.13%
Textile bags and canvas	0.003%
Professional Services	
Support activities for agriculture and forestry	36.07%
Accounting, tax preparation, bookkeeping, and payroll services	0.41%
Other computer related services, including facilities management services	0.16%
Computer systems design services	0.08%
Business and professional services	0.08%
Legal services	0.06%
Business support services	0.01%
Security	
Investigation and security services	1.99%
Utilities	
Electricity transmission and distribution	39.09%
Natural gas distribution	0.47%
Water, sewage and other systems	0.47%
Wired telecommunications	0.06%
Wireless telecommunications (except satellite)	0.10%
Satellite, telecommunications resellers, and all other telecommunications	0.01%

Appendix Two Greenhouse Farming Goods and Services Expenditure Shares

Cannabis Sector Inputs	
Indoor Cannabis Farming	0.36%
Costs of Premises	
Newly constructed commercial structures, including farm structures	1.12%
Equipment	
Lighting fixtures	0.40%
Air conditioning, refrigeration, and warm air heating equipment	0.32%
Handtools	0.22%
Farm machinery and equipment	0.15%
Motor vehicle electrical and electronic equipment	0.12%
Leasing of nonfinancial intangible assets	0.12%
Power-driven handtools	0.07%
Storage batteries	0.04%
All other miscellaneous manufactured products	0.03%
Lawn and garden equipment	0.03%
Rubber and plastics hoses and belts	0.03%
Scales, balances, and miscellaneous general purpose machinery	0.03%
Commercial and industrial machinery and equipment rental and leasing services	0.01%
Steel wire	0.01%
Motors and generators	0.01%
Rope, cordage, twine, tire cord and tire fabric	0.01%
All other miscellaneous wood products	0.01%
Overhead cranes, hoists, and monorail systems	0.001%
Growing Material	
Retail services - Building material and garden equipment and supplies stores	12.55%
Other basic inorganic chemicals	1.96%
Pesticides and other agricultural chemicals	1.95%
Phosphatic fertilizer	1.94%
Nitrogenous fertilizer	1.77%
Other miscellaneous chemical products	0.06%
Insurance Services	
Insurance	0.45%
Insurance agencies, brokerages, and related services	0.05%
Other Operational Expenses	
Monetary authorities and depository credit intermediation	0.86%
Commercial and industrial machinery and equipment repair and maintenance	0.12%
Other financial investment services	0.12%
Retail services - Nonstore retailers	0.10%
Nondepository credit intermediation and related activities	0.09%
Retail services- Clothing and clothing accessories stores	0.07%
Retail services - General merchandise stores	0.07%
Software publishers	0.03%
Securities and commodity contracts intermediation and brokerage	0.03%
Electronic and precision equipment repair and maintenance	0.02%
Retail services - Gasoline stores	0.02%
Packaging	
Textile bags and canvas	0.00%
Plastics packaging materials and unlaminated films and sheets	0.15%
Professional Services	
Support activities for agriculture and forestry	44.77%
Accounting, tax preparation, bookkeeping, and payroll services	0.50%
Other computer related services, including facilities management services	0.20%
Computer systems design services	0.10%
Business and professional services	0.09%
Legal services	0.08%
Business support services	0.01%
Security	
Investigation and security services	2.77%
Utilities	
Electricity transmission and distribution	24.71%
Natural gas distribution	0.52%
Water, sewage and other systems	0.52%
Wireless telecommunications (except satellite)	0.13%
Satellite, telecommunications resellers, and all other telecommunications	0.01%
Wired telecommunications	0.08%

Appendix Three Outdoor Farming Goods and Services Expenditure Shares

Cannabis Sector Inputs	
Indoor Cannabis Farming	1.7%
Costs of Premises	
Newly constructed commercial structures, including farm structures	3.7%
Equipment	
Farm machinery and equipment	0.771%
Lawn and garden equipment	0.168%
Handtools	0.099%
Commercial and industrial machinery and equipment rental and leasing services	0.057%
Leasing of nonfinancial intangible assets	0.052%
Storage batteries	0.019%
All other miscellaneous manufactured products	0.015%
Rubber and plastics hoses and belts	0.012%
Scales, balances, and miscellaneous general purpose machinery	0.012%
Steel wire	0.005%
Motors and generators	0.005%
Rope, cordage, twine, tire cord and tire fabric	0.004%
All other miscellaneous wood products	0.004%
Growing Material	
Retail services - Building material and garden equipment and supplies stores	19.0%
Pesticides and other agricultural chemicals	9.5%
Phosphatic fertilizer	9.4%
Nitrogenous fertilizer	8.6%
Other miscellaneous chemical products	0.3%
Insurance Services	
Insurance	1.1%
Insurance agencies, brokerages, and related services	0.1%
Other Operational Expenses	
Monetary authorities and depository credit intermediation	0.38%
Commercial and industrial machinery and equipment repair and maintenance	0.05%
Other financial investment services	0.05%
Nondepository credit intermediation and related activities	0.04%
Retail services- Clothing and clothing accessories stores	0.03%
Retail services - General merchandise stores	0.03%
Software publishers	0.02%
Securities and commodity contracts intermediation and brokerage	0.01%
Electronic and precision equipment repair and maintenance	0.01%
Retail services - Miscellaneous store retailers	0.01%
Retail services - Gasoline stores	0.01%
Packaging	
Plastics packaging materials and unlaminated films and sheets	0.1%
Professional Services	
Support activities for agriculture and forestry	34.89%
Accounting, tax preparation, bookkeeping, and payroll services	0.22%
Other computer related services, including facilities management services	0.09%
Business and professional services	0.04%
Legal services	0.04%
Business support services	0.004%
Security	
Investigation and security services	6.7%
Utilities	
Water, sewage and other systems	2.5%
Wireless telecommunications (except satellite)	0.1%
Satellite, telecommunications resellers, and all other telecommunications	0.01%

Appendix Four Extractors Goods and Services Expenditure Shares

Cannabis Sector Inputs	
Outdoor Cannabis Farming	46.69%
Greenhouse Cannabis Farming	5.00%
Indoor Cannabis Farming	1.67%
Cannabis Sector Services	
Cannabis Transportation	6.02%
Cannabis Testing	3.91%
Advertising/Promotion	
Advertising, public relations, and related services	4.51%
Costs of Premises	
Newly constructed commercial structures, including farm structures	0.83%
Maintained and repaired nonresidential structures	0.30%
Services to buildings	0.30%
Real estate buying and selling, leasing, managing, and related services	0.20%
Equipment	
Air conditioning, refrigeration, and warm air heating equipment	0.90%
Valve and fittings, other than plumbing	0.89%
Metal cans	0.46%
Other fabricated metals	0.41%
Machined products	0.36%
Commercial and industrial machinery and equipment rental and leasing services	0.29%
Air purification and ventilation equipment	0.22%
Air and gas compressors	0.17%
Insurance Services	
Insurance	0.87%
Other Operational Expenses	
Other basic inorganic chemicals	2.01%
Other basic organic chemicals	1.64%
Other miscellaneous chemical products	0.517%
Plastics materials and resins	0.384%
Industrial gases	0.234%
Retail services - General merchandise stores	0.200%
Commercial and industrial machinery and equipment repair and maintenance	0.179%
Monetary authorities and depository credit intermediation	0.083%
Waste management and remediation services	0.063%
Packaging	
Other plastics products	11.14%
Plastics packaging materials and unlaminated films and sheets	1.55%
Other pressed and blown glass and glassware	1.52%
Synthetic rubbers	0.63%
Professional Services	
Management consulting services	1.45%
Legal services	1.02%
Accounting, tax preparation, bookkeeping, and payroll services	0.69%
Computer systems design services	0.19%
Security	
Investigation and security services	0.86%
Utilities	
Electricity transmission and distribution	0.85%
Natural gas distribution	0.36%
Water, sewage and other systems	0.23%
Wired telecommunications	0.20%

Appendix Five Product Manufacturers Goods and Services Expenditure Shares

Cannabis Sector Inputs	
Cannabis Extracts	17.56%
Other Cannabis Products	0.62%
Cannabis Sector Services	
Cannabis Testing	0.48%
Cannabis Transportation	7.41%
Advertising/Promotion	
Advertising, public relations, and related services	1.90%
Costs of Premises	
Newly constructed commercial structures, including farm structures	0.49%
Maintained and repaired nonresidential structures	0.50%
Equipment	
Valve and fittings, other than plumbing	0.73%
Air conditioning, refrigeration, and warm air heating equipment	0.26%
Insurance Services	
Insurance	0.58%
Other Operational Expenses	
Soybean and other oilseed processing	9.10%
Oilseeds	6.81%
Flavoring syrup and concentrate	4.33%
Dairy cattle and milk products	3.64%
Flour	3.17%
Fruit	3.08%
Industrial gases	2.79%
Other basic organic chemicals	2.35%
Sugar cane	2.30%
Fluid milk	2.27%
Wet corn	1.91%
Dehydrated food products	1.82%
Chocolate and confectioneries from cacao beans	1.51%
All other crops	1.43%
Coffee and tea	1.35%
Medicines and botanicals	1.08%
Toilet preparations	0.81%
Poultry and egg products	0.75%
Tree nuts	0.66%
Grains	0.63%
Monetary authorities and depository credit intermediation	0.41%
Plastics materials and resins	0.16%
Packaging	
Paperboard containers	4.95%
Other plastics products	2.74%
Plastics packaging materials and unlaminated films and sheets	1.29%
Professional Services	
Management consulting services	6.07%
Legal services	0.14%
Security	
Investigation and security services	0.54%
Utilities	
Electricity transmission and distribution	0.90%
Natural gas distribution	0.50%

Appendix Six In-Store Retail Goods and Services Expenditure Shares

Cannabis Sector Inputs	
Cannabis Extracts	18.97%
Indoor Cannabis Farming	16.61%
Cannabis Products	13.55%
Greenhouse Cannabis Farming	11.57%
Outdoor Cannabis Farming	5.25%
Cannabis Sector Services	
Cannabis Laboratory Fees & Testing	0.23%
Cannabis Transportation Services	3.37%
Advertising/Promotion	
Advertising, public relations, and related services	5.45%
Costs of Premises	
Maintained and repaired nonresidential structures	0.51%
Real estate buying and selling, leasing, managing, and related services	8.93%
Landscape and horticultural services	0.11%
Services to buildings	0.25%
Equipment	
Hardware	0.13%
Commercial and industrial machinery and equipment repair and maintenance	0.51%
Leasing of nonfinancial intangible assets	0.56%
Insurance Services	
Insurance	0.77%
Other Operational Expenses	
Monetary authorities and depository credit intermediation	1.72%
Data processing, hosting, and related services	0.40%
Printed materials	0.30%
Waste management and remediation services	0.24%
Other plastics products	0.21%
Retail services - Nonstore retailers	0.13%
Retail services- Clothing and clothing accessories stores	0.09%
Finished textiles and fabrics	0.09%
Plastics packaging materials and unlaminated films and sheets	0.09%
Paper bags and coated and treated paper	0.09%
Professional Services	
Management of companies and enterprises	2.41%
Accounting, tax preparation, bookkeeping, and payroll services	0.59%
Employment services	0.57%
Business support services	0.53%
Legal services	0.27%
Other computer related services, including facilities management services	0.16%
Computer systems design services	0.14%
Security	
Investigation and security services	3.32%
Utilities	
Electricity transmission and distribution	1.14%
Wired telecommunications	0.51%
Wireless telecommunications (except satellite)	0.24%

Appendix Seven Delivery Retail Goods and Services Expenditure Shares

Cannabis Sector Inputs	
Indoor Cannabis Farming	16.45%
Cannabis Extracts	15.49%
Greenhouse Cannabis Farming	11.46%
Cannabis Products	11.06%
Outdoor Cannabis Farming	5.19%
Cannabis Sector Services	
Cannabis Laboratory Fees & Testing	0.16%
Cannabis Transportation Services	3.42%
Advertising/Promotion	
Advertising, public relations, and related services	6.09%
Costs of Premises	
Maintained and repaired nonresidential structures	0.62%
Real estate buying and selling, leasing, managing, and related services	5.60%
Services to buildings	0.30%
Equipment	
Automotive equipment rental and leasing services	6.91%
Scenic and sightseeing transportation services and support activities for transportation	1.04%
Hardware	0.15%
Other motor vehicle parts	0.13%
Insurance Services	
Insurance	0.79%
Insurance agencies, brokerages, and related services	0.15%
Other Operational Expenses	
Monetary authorities and depository credit intermediation	2.09%
Commercial and industrial machinery and equipment repair and maintenance	0.50%
Data processing, hosting, and related services	0.49%
Printed materials	0.37%
Refined petroleum products	0.30%
Waste management and remediation services	0.29%
Other plastics products	0.25%
Automotive repair and maintenance, except car washes	0.19%
Retail services - Motor vehicle and parts dealers	0.12%
Professional Services	
Management of companies and enterprises	2.82%
Employment services	0.57%
Accounting, tax preparation, bookkeeping, and payroll services	0.51%
Computer systems design services	0.37%
Legal services	0.32%
Security	
Investigation and security services	3.46%
Utilities	
Electricity transmission and distribution	1.39%
Wired telecommunications	0.62%
Wireless telecommunications (except satellite)	0.30%

Appendix Eight Food and Accommodation Retail Goods and Services Expenditure Share

Cannabis Sector Inputs	
Cannabis Extracts	3.44%
Indoor Cannabis Farming	16.79%
Cannabis Products	17.01%
Greenhouse Cannabis Farming	11.69%
Cannabis Retail Food and Accommodation	6.01%
Outdoor Cannabis Farming	5.30%
Cannabis Sector Services	
Cannabis Laboratory Fees & Testing	0.23%
Cannabis Transportation Services	0.67%
Advertising/Promotion	
Internet publishing and broadcasting and web search portals	0.29%
Advertising, public relations, and related services	2.74%
Costs of Premises	
Real estate buying and selling, leasing, managing, and related services	5.13%
Maintained and repaired nonresidential structures	1.16%
Equipment	
Leasing of nonfinancial intangible assets	0.94%
Insurance Services	
Insurance	1.00%
Other Operational Expenses	
Soybean and other oilseed processing	1.68%
Canned specialties	1.72%
Meat (except poultry) produced in slaughtering plant	0.95%
Processed poultry meat products	0.91%
Seafood products	0.93%
Bread and bakery products, except frozen	0.54%
Coffee and tea	0.22%
Flavoring syrup and concentrate	0.69%
Bottled and canned soft drinks and water	0.98%
Paper bags and coated and treated paper	0.50%
Printed materials	0.42%
Other plastics products	1.15%
Curtains and linens	0.19%
Other fabricated metals	0.40%
Retail services - Health and personal care stores	0.25%
Retail services- Clothing and clothing accessories stores	0.40%
Retail services - General merchandise stores	0.55%
Retail services - Nonstore retailers	0.51%
Monetary authorities and depository credit intermediation	1.08%
Waste management and remediation services	0.59%
Commercial and industrial machinery and equipment repair and maintenance	0.68%
Limited-service restaurants	0.87%
Dry-cleaning and laundry services	0.35%
Professional Services	
Legal services	0.42%
Accounting, tax preparation, bookkeeping, and payroll services	0.83%
Computer systems design services	0.24%
Management of companies and enterprises	4.73%
Employment services	0.82%
Security	
Investigation and security services	0.74%
Utilities	
Electricity transmission and distribution	2.20%
Wired telecommunications	0.63%
Natural gas distribution	0.24%
Water, sewage and other systems	0.18%

CITY OF OAKLAND
OFFICE OF FINANCE
REVENUE DIVISION
DIRECTOR OF FINANCE RULING NO. 10

APPORTIONMENT OF GROSS RECEIPTS FOR CLASSIFICATION OF RETAILERS, GROCERS, AUTO DEALERS, WHOLESALERS, MANUFACTURERS, CANNABIS RELATED BUSINESSES

Reference: Section 5.04.290, 5.04.300, 5.04.310, 5.04.320, 5.04.390, 5.04.480, 5.04.81, and 5.04.570 of the Oakland Municipal Code (OMC).

PURPOSE

This amendment clarifies application of the established apportionment guidelines set forth in Finance Ruling No. 10 to cannabis businesses. These apportionment guidelines may be used to adjust your tax base for persons engaged in business activity within the City of Oakland as a retailer, grocer, auto dealer, wholesaler, manufacturer, and cannabis business.

BACKGROUND

The Business Tax provisions of the Oakland Municipal Code address the issue of apportionment of the measure of the tax in broad (general) terms as it relates to taxpayer's selling and related processing activities that occur within the City. The ruling herein promulgated provides specific apportionment criteria to be used by the City of Oakland staff and the taxpayer in determining the percentage of gross receipts to be used as a tax base.

RULING OF THE DIRECTOR OF FINANCE

All persons, whether or not they own, lease, occupy or otherwise maintain within or outside the City of Oakland a place or premise upon or from which they engage in business, shall nevertheless be deemed to be engaged in business within the City of Oakland when through the physical or virtual presence of themselves, their employees, representative, agents, equipment, or through use of electronic devices, including but not limited to, telephone, teletype, computer online internet or other forms of virtual or electronic transmission, and or by any other means at their disposal, carries on activities within the City of Oakland which are designed to negotiate, solicit, initiate, promote, activate, stimulate or otherwise encourage the sale of goods, wares or merchandise.

The following guidelines shall be used to determine the percentage of gross receipts to be used for the tax base:

1. Up to 15% of those gross receipts negotiated, solicited, initiated, promoted, activated or stimulated when the buyer is within the City of Oakland for the benefit of the parties or location within the City of Oakland.

2. Up to 15% of those gross receipts negotiated, solicited, initiated, promoted or activated when the seller is within the City of Oakland for the benefit of either

ATTACHMENT C

party or location within the City of Oakland.

3. Up to 30% of those gross receipts if deliveries are to customers located within the City of Oakland whether delivery, shipment or pickup is made to points within or outside the City of Oakland, regardless of f.o.b. point, other conditions of sale, or method of delivery.

4. Up to 20% of those gross receipts if merchandise is shipped from within the City of Oakland.

5. Up to 5% of those gross receipts if billing data is generated within the City of Oakland.

6. Up to 5% of those gross receipts if billing invoice or statement is processed within the City of Oakland.

7. Up to 5% of those gross receipts if funds are collected or received within the City of Oakland.

8. Up to 5% of those gross receipts if updating or posting to account is performed within the City of Oakland.

APPORTIONMENT TABLE

REF	Rate	Description
		SALES
1	Up to 15%	When the Buyer is located in Oakland
2	Up to 15%	When the Seller is located in Oakland
		PRODUCT DELIVERY
3	Up to 30%	If product is delivered in Oakland
4	Up to 20%	If product is shipped from Oakland
		ACCOUNT PROCESSING
5	Up to 5%	Billing data is generated from Oakland
6	Up to 5%	Billing invoice or statement is printed or processed in Oakland
7	Up to 5%	Funds are collected or deposited in Oakland
8	Up to 5%	Accounts are updated or posted in Oakland
Total not to exceed 100%		

PROVISION FOR MODIFICATION OF APPORTIONMENT FORMULA

Any person, who believes that the percentage of gross receipts determined to be subject to tax under the foregoing provisions of this ruling is greater than the facts justify, may apply to the Director of Finance for modification of the percentage. Such application shall be made in writing to the Director of Finance and shall be accompanied by a statement of facts supporting the basis for such modification. The Director of Finance shall make his determination on the basis of evidence presented to him and select other evidence as he may have, may request from the taxpayer, or may discover from other sources. The Director of Finance shall increase, reduce, or allow to stand the percentage originally determined, depending on the facts.

According to OMC Section 5.04.570 (B) it is your obligation to request in writing for an adjustment of the tax base. Failure to do so within one year of payment shall be deemed to have waived your right to an adjustment. Therefore if you check the apportionment box on the declaration form you will have met the requirement. If material differences are found between your adjusted gross receipts and the results of an audit, penalty and interest will apply. Prepare and attach your apportionment worksheet to your annual Business Tax Declaration.

Should the Director of Finance be of the opinion that the percentage of gross receipts determined to be subject to tax under the foregoing provisions of this ruling is less than the facts justify in any particular case, he shall make such investigation as is necessary to ascertain the facts and revise the percentage, if required.

Any variation from the percentages provided for under this ruling shall be approved in writing by the Director of Finance.

Katano Kasaine
Director, Finance Department

November 2, 2017

Forbes / Retail / #MarketMoves
SEP 25, 2017 @ 08:30 AM 14,384

Cannabis Wholesale Prices Have Dropped, But Markets Are More Stable

Debra Borchardt, CONTRIBUTOR
FULL BIO
Opinions expressed by Forbes Contributors are their own.

As prices fall for wholesale marijuana, California growers will find it expensive to comply with new rules and [+]

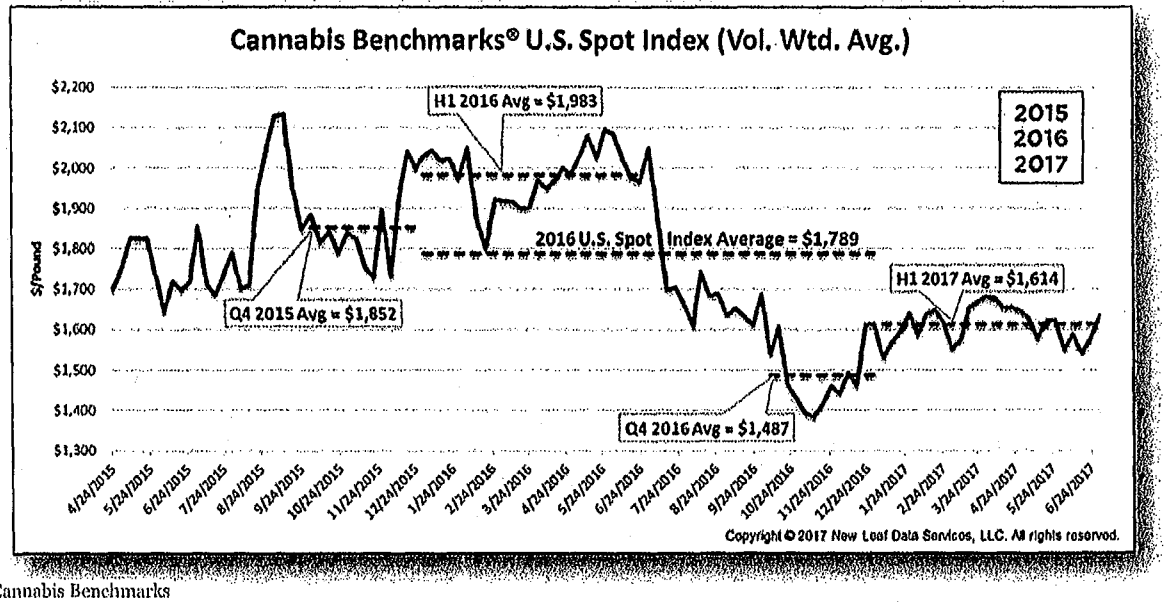
Cannabis Benchmarks has released a new Mid-2017 Wholesale Market report on the spot prices for cannabis in legal markets. Cannabis Benchmarks is a division of New Leaf Data Services and gathers its pricing information from in-the-field reporters who contact cultivators and dispensaries, transaction data from market participants and data from vendors and associations.

ATTACHMENT D

For the first half of 2017, prices for cannabis were down significantly from 2016, but the market hasn't experienced the big swings that characterized the 2016 market.

Prices have been mostly stable, but California markets could become destabilized as growers shift to a regulated landscape and the black market fights back with cheaper prices.

According to the report, the U.S. Spot Index opened this year at $1,532 per pound, which was a nice recovery from 2016's low price of $1,386 per pound. Prices peaked at $1,682 per pound in the last week of March as buyers sought to build up inventory for the 420 holiday. However, this is still lower than 2016's peak price of $2,096 per pound. The big difference can be attributed to 2017's marked level of stability. There has only been a spread of $150 between the half year's lows and highs. The first half of 2016 experienced a spread of $296 between the highs and lows.



Cannabis Benchmarks

U.S. Spot index prices for cannabis for the first half of 2017.

That consistency and stability are a welcome change to the industry buyers even though the prices are down 18.6% year over year for the first half. Last year, prices plunged in the summer when an oversupply from greenhouse growers flooded the market. This year it seems growers are selling in a fairly consistent manner and managing their inventory and cash flow more effectively. The buyers are also able to make purchases more consistently and a trend of smaller average deal sizes seems to have taken place.

The report said, "Last year, through the first six months of 2016, the average deal sizes of outdoor, greenhouse and indoor-grown flower were observed to be 29, 21, and 7 pounds, respectively. In 2017, individual transactions for outdoor, greenhouse and indoor product averaged volumes of 21, 11, and 6 pounds, respectively, between January and June." Cannabis Benchmarks also believes that even though market outsiders believe there are lots of marijuana millionaires, the reality is that few

operators are willing or able to do big deals since they mostly continue to operate in cash. Unfortunately, they end up paying higher prices since they can't buy in bigger bulk. The Cannabis Benchmarks report found that buyers on average got a 24.8% discount when buying 25 pounds and a 30.1% discount for 50 pounds.

Colorado's prices have fallen the least of any of the states as drastic increases in production capacity caused average prices to fall 33.5% for the first quarter as compared to last year. Washington state's prices are down 15.4% for the same period. California, on the other hand, saw its spot index trend upwards through the first six months of the year. Prices opened at $1,413 per pound and hit a six-month high of $1,724. Outdoor grown marijuana though has slipped in price from an average of $1,542 per pound in the first six months of 2016 to $1,133 for 2017. "This trend is troubling for existing outdoor farmers hoping to enter California's imminent licensed system. Such operations can require significant capital to come into compliance with the state's extensive water and environmental quality regulations," said Jonathan Rubin, Chief Executive Officer of Cannabis Benchmarks.