

September | 16

Legalization of Cannabis for Social Use

New Mexico Market Analysis

Commissioned by:  **Ultra Health**[®]

O'Donnell Economics & Strategy

Corrales, New Mexico

Supported by:

We are
the **Drug**
Policy
Alliance.

 RIO GRANDE
FOUNDATION

Table of Contents

Introduction	2
Methodology	3
Residents	4
Estimation process overview	4
Prevalence	4
Frequency of Use	5
Dosage	6
Adjustments to Gross Consumption	7
Population Adjustment	7
Under-reporting of Cannabis Consumption	7
Demand Growth Due to Increased Access and Decreased Risk	8
Medical Cannabis	9
Licensed Non-Profit Producers	10
Personal Production Licenses	10
Home Grown Cannabis for Social Use	11
Conversion Rates	12
Price Elasticity of Demand	13
Out of State Visitors	13
5 Year Forecast	15
Social Use Cannabis in the New Mexico Economy	17
Conclusion	18

Introduction

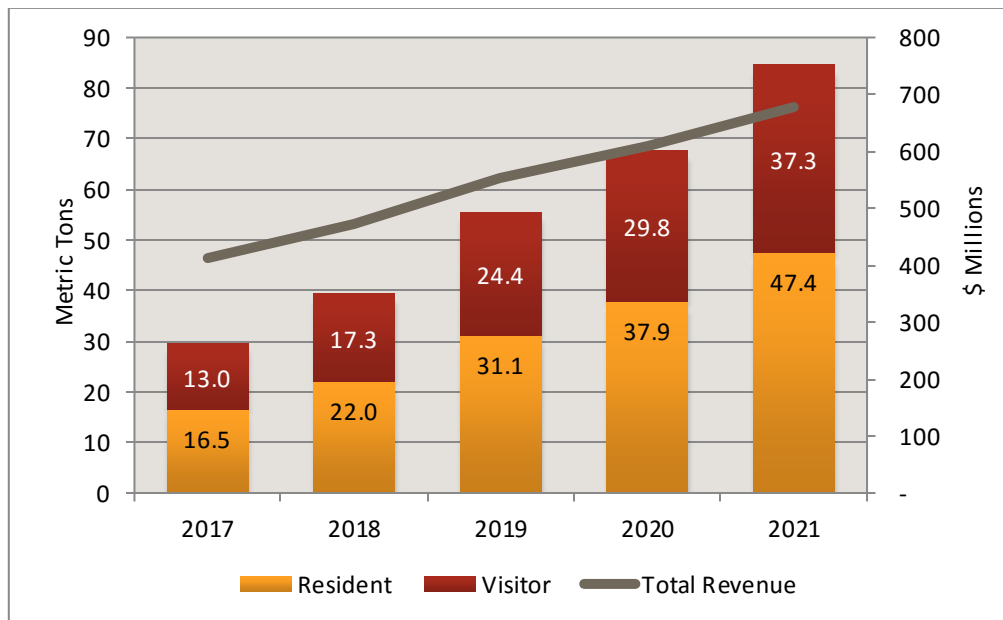
O'Donnell Economics and Strategy was retained to estimate the potential demand for state-regulated social use cannabis in New Mexico. This report presents the results of that analysis which finds that the legal market for social use cannabis would total \$412.5 million (29.5 metric tons (t)) after the first full year of implementation and \$677.7 million (84.7t) after the fifth. Total demand for legalized cannabis would have two major components: consumption by New Mexico residents and purchases by out-of-state visitors, with visitors making up over 40 percent of total cannabis sales.

Although some New Mexicans may be compelled to start or resume using cannabis as a result of legalization, the vast majority of legal sales to New Mexico residents will be made to regular or heavy users who would otherwise obtain cannabis in the black or grey markets.^a Transitions into the legal market from the illicit markets will be driven by a number of factors, among them reduced risk, higher quality, greater product variety, ease of access, marketing, and convenience; but the primary motivation for choosing one market over another will be price. As prices charged by legal providers decline relative to those charged by illicit suppliers, increasing numbers of cannabis consumers will switch to the taxed and regulated market, resulting in higher tax revenue, improvements in product quality, consistency, and safety, job creation, and market transparency while, at the same time, diminishing the size and negative impacts of the illicit cannabis market. Figure 1 depicts resident and visitor demand for legalized social use cannabis in New Mexico in both tons (right axis) and millions of dollars (left axis) over a five-year time horizon.

In its first year, the New Mexico social use cannabis industry is expected to generate over three times more revenue than the state's entire pecan crop¹ and create over 11,400 new jobs -- 6,600 jobs in cannabis production and cannabis product manufacturing and 4,780 jobs in ancillary businesses including professional services, construction, cultivation supplies, and equipment for the production and consumption of cannabis.

^a The term "grey market" refers to the sale of cannabis that is produced legally, typically by licensed medical cannabis home growers, but sold illegally to recreational users. For a detailed description of grey market dynamics in Colorado see: Colorado Office of the Governor. (2016, August). Marijuana Grey Market. <https://www.colorado.gov/pacific/sites/default/files/16Marijuana0817Marijuana%20Grey%20Market.pdf>

Figure 1. Annual Legal Social Use Cannabis Demand by New Mexico Residents and Out-of-State Visitors in Metric Tons (t) and \$ Millions, Five Year Forecast



New Mexico has much to gain from legalizing cannabis for use by adults; but the extent to which New Mexico realizes the potential benefits of a robust, regulated market for social use cannabis depends, in large part, on state policy choices about how the market is regulated and taxed. The estimates in this report assume a coherent state regulatory structure that doesn't unduly hamper the functioning of the legal cannabis market or its ability to respond to consumer demand.

Methodology

New Mexicans obtain cannabis in three primary ways. First, as of August 2016, roughly 30,000 New Mexicans participate in the state's Medical Cannabis Program (MCP), which entitles certain cardholders to grow specified amounts of cannabis for their own consumption and any cardholder to purchase it through dispensaries operated by Licensed Non-Profit Producers (LNPPs).^b A second group of New Mexicans cultivate cannabis for their own consumption but do not hold medical cannabis cards. The third and largest group of cannabis consumers obtains cannabis directly or indirectly through the black and grey markets.

This analysis estimates the extent to which a legal market for social use cannabis in New Mexico could capture the economic activity currently occurring outside legal channels and attract out-of-state customers and tourism dollars to New Mexico.

Demand for legal cannabis for social use is estimated in a multi-step process using a variety of data, each of which are discussed in detail later in this report. Demand by New Mexico residents and out-of-state visitors are estimated separately and then summed to arrive at total demand.

^b A companion report, *The Medical Cannabis Market in New Mexico*, describes the state's medical market in more detail.

RESIDENTS

This section provides a detailed description of the methodology and data used to estimate demand for legal social use cannabis by New Mexico residents.

Estimation process overview

First, survey data is used to estimate the number of current cannabis users age 21 and over and categorize them by how often they use cannabis. Next, the average quantity of cannabis consumed per instance of use is estimated for each category of user. The number of users, the frequency of use, and dosage per use are then multiplied and the product is adjusted to reflect: (1) population changes since the year in which the survey data was collected; and (2) the extent to which survey respondents are assumed to have under-reported their consumption. The resulting value is the total quantity of cannabis demanded by New Mexico residents prior to legalization. Post-legalization resident demand is estimated by adjusting pre-legalization demand to reflect the likely effects of legalization such as increased access, decreased risk, and supplier marketing on the quantity of cannabis demanded at any given price. Demand for cannabis in the legal, social use market is derived from total post-legalization demand by subtracting the quantity of cannabis already being obtained legally by medical cannabis cardholders and multiplying the difference by the percent of black and grey market purchases that are expected to shift to the regulated market post-legalization.

Post-legalization metric tons consumed =
(Number of New Mexicans 21 and over who use cannabis at least once a year
× Change in use since 2013–2014
× Average grams consumed per month
× 12 months
× Adjustment for survey under-reporting
× Adjustment for impact of legalization on demand)
÷1,000,000 grams

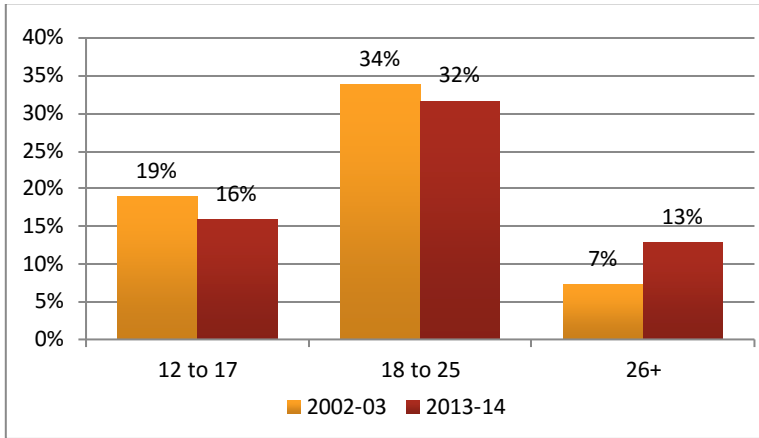
Social Use market =
Post-legalization metric tons consumed
- Medical cannabis consumption
- Social Use cannabis grown for personal consumption
- Market share retained by black and grey markets
+ Out-of-state visitor demand

Prevalence

The term prevalence refers to the number of people who have used cannabis within the previous month or year. *At least* 213,000 New Mexicans age 21 and over have used cannabis in the last year. Two-thirds of past year users have used cannabis in the past month and about 23 percent use cannabis on a near-daily basis. Data on the prevalence of cannabis use among New Mexicans was obtained from the National Survey on Drug Use and Health (NSDUH), a nationwide survey conducted annually by the Substance Abuse Mental Health Services Administration (SAMSHA) of the U.S. Department of Health and Human Services. The most recent NSDUH data available at the time of this writing (August

2016) were collected in 2013 and 2014. Figure 2 compares New Mexico cannabis use in the past month by age group as measured by the 2002-2003 and 2013-2014 NSDUHs. Over that period, cannabis consumption by youth and young adults decreased while cannabis consumption by New Mexicans age 26 and older nearly doubled.

Figure 2: Cannabis Use in the Past Month, by Age Group, New Mexico 2002-2003 and 2013-2014

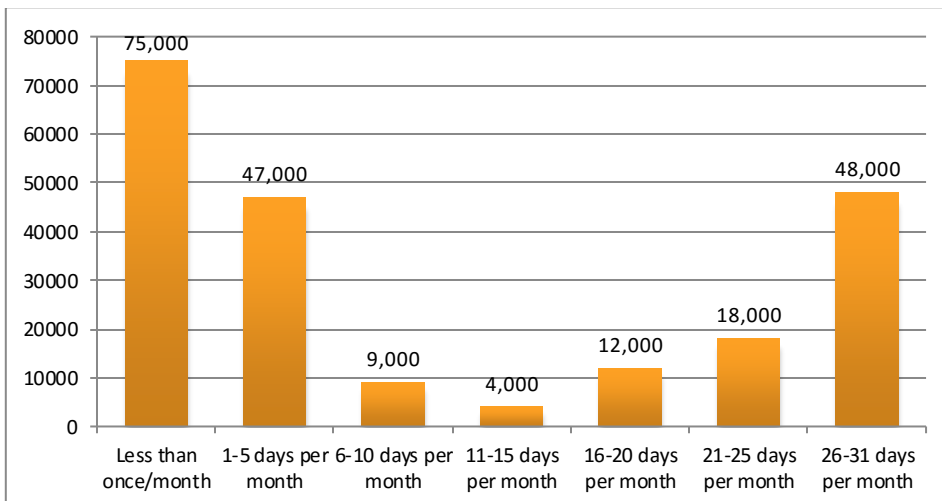


Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2002, 2003, 2013, and 2014

Frequency of Use

Data on the frequency with which New Mexicans use cannabis was obtained from the NSDUH “restricted-use data analysis system” (R-DAS). The restricted data provides two major advantages over the more readily accessible NSDUH data. First, R-DAS enables users age 21 and over, the population most likely to have access to social use cannabis should it be legalized, to be isolated from the larger sample of those age 18 and over. Second, R-DAS includes data on the frequency of cannabis use by monthly users age 21 and over. The ability to differentiate frequent users from infrequent users greatly improves the accuracy of the demand estimate due to the disproportionately large quantities of cannabis consumed by daily and near-daily users.² Figure 3 shows the number of New Mexicans 21 and over who have consumed cannabis in the past year, by the frequency with which they use it.

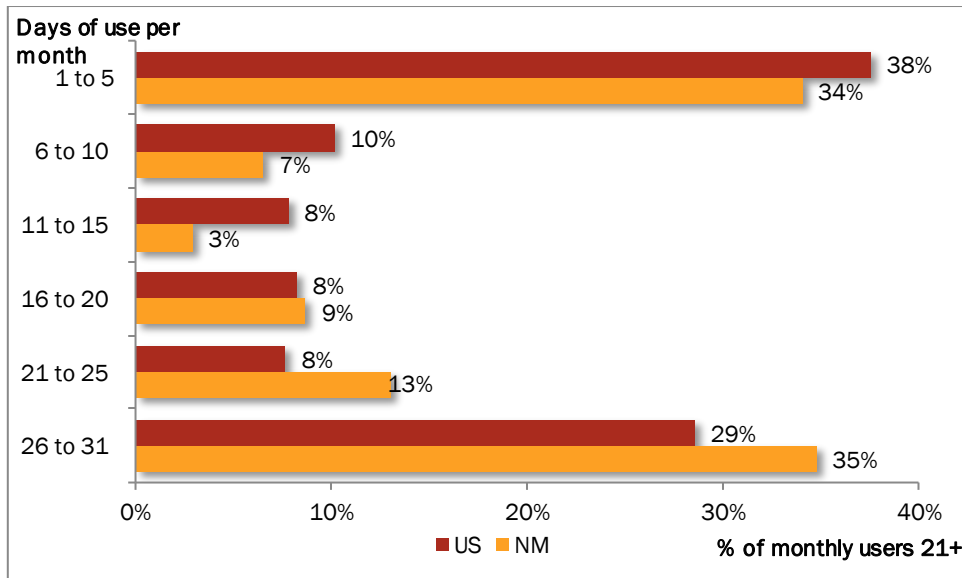
Figure 3. Yearly Cannabis Users 21 and Over by Frequency of Use, New Mexico 2013-2014



Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health R-DAS 2013 and 2014

Figure 4 contrasts the frequency of cannabis use by New Mexicans who use cannabis at least once per month to monthly cannabis users in the US overall. Over one-third of New Mexicans who use cannabis one or more times per month consume cannabis daily or near-daily (26 to 31 days per month), compared to 29 percent in the United States overall.

Figure 4. Frequency of Cannabis Use by Monthly Users Age 21 and Over, New Mexico and the United States 2013-2014



Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health R-DAS 2013 and 2014

Dosage

The NSDUH does not collect data on amounts of cannabis used per instance of use. In fact, there is currently no national survey of drug use that produces estimates of this sort. Instead, we must rely on survey data collected from cannabis users in Washington and Colorado in 2013 and 2014 respectively for data on the quantities of cannabis consumed by regular cannabis users. Fortunately, the two surveys, developed for the Washington State Liquor Control Board³ and the Colorado Department of Revenue, yielded largely comparable results. For purposes of the analysis presented here, the most important conclusion from both studies is that the amount of cannabis used per day is highly correlated with the number of days of use per month. In fact, the top 20 percent of cannabis consumers in Washington State, accounted for over 80 percent of the cannabis consumed.⁴ The correlation between dosage and frequency of use is confirmed, to a degree, by a 2013 survey of MCP cardholders conducted by the New Mexico Department of Health (NMDOH). The NMDOH survey didn't ask about frequency of use, but it did ask respondents how much cannabis they consumed in a typical week. Respondents, most of whom were presumably relatively heavy users, reported using an average of roughly 10 grams per week, or about 1.8 grams per day for a 24 day-per-month user. In Washington, survey respondents who used cannabis 21 or more days per month consumed an average of 1.6 grams per day, and those who consumed cannabis regularly, but less than 21 days per month, used an average of .67 grams per day. Table 1 provides an estimate of average grams per day by frequency of use for New Mexico social cannabis users based on data from the Washington and New Mexico surveys. Table 2 combines prevalence, frequency,

and dosage data to arrive at a *preliminary* estimate of gross demand for cannabis by New Mexicans age 21 and over.

In subsequent sections preliminary gross demand will be adjusted to arrive at the final estimate of net demand for social use cannabis in the legal market.

Table 1. Preliminary (unadjusted) calculation of gross annual cannabis consumed by New Mexico residents 21 and over prior to legalization

Days of use per month	Cannabis consumers, 21+	Grams per day of use	Days of use per year (midpoints)	Gross consumption (unadjusted), grams
Less than	75,000	0.67	6	301,500
1-5 days per month	47,000	0.67	36	1,133,640
6-10 days per month	9,000	0.67	96	578,880
11-15 days per	4,000	0.67	156	418,080
16-20 days per	12,000	0.67	216	1,736,640
21-25 days per	18,000	1.8	276	8,942,400
26-31 days per	48,000	2	348	33,408,000
Total	138,000	n/a	n/a	46,519,140

Adjustments to Gross Consumption

To improve the accuracy of the final demand forecast, the estimate of gross consumption by New Mexicans age 21 and over is adjusted to reflect changes in population since the survey data was collected and to offset under-reporting of cannabis consumption by survey respondents.

Population Adjustment

Prevalence estimates would typically be adjusted to reflect changes in population since the 2013-2014 period in which the NSDUH data were collected. However, unlike other western states, including those that have legalized social use cannabis, New Mexico's population has experienced little growth and actually declined in many places since 2013-2014. Therefore, the 2013-2014 prevalence estimates require no adjustments to accurately reflect the size of New Mexico's population in 2016.

Under-reporting of Cannabis Consumption

Gross consumption estimates are also adjusted to offset misreporting of cannabis use by survey respondents and undercounting of cannabis users by survey-takers. Several recent studies provide evidence that under-reporting of drug use is common among survey respondents and recommend that survey results be adjusted upward to more accurately gauge prevalence. Researchers also note that the NSDUH does not survey certain populations including the unsheltered homeless and active duty military, populations that have very high and relatively low rates of cannabis use respectively.⁵ Researchers who study under-reporting recommend a variety of adjustments ranging in size from 2 percent to 43 percent, depending on the study. Increasing cannabis consumption estimates by an ad hoc factor of 1.25 is also a common approach.⁶ However, the method used in a recent Colorado demand study seems most apt to the analysis at hand. The Colorado researchers adopted a 22 percent adjustment factor derived from a review of the literature on drug survey mis-reporting.⁷ Then, theorizing that infrequent users are more likely to under-report

their cannabis use than are daily or near-daily users,^c the research team increased amounts consumed by users in the four lowest frequency classes (“less than once per month” through “16 to 20 days per month”) by 22 percent and increased amounts consumed by users in the top two frequency classes (“21-25 days per month” and “26 to 31 days per month”) by half that amount (11%).⁸ The present analysis applies the same adjustment.

Table 2. Preliminary Adjusted Calculation of Gross Annual Cannabis Consumed by New Mexico Residents 21 and Over Prior to Legalization

Days of use per month	Gross consumption	Under-reporting	Adjusted pre-legalization	
			Grams	Metric tons
Less than	301,500	1.22	367,830	0.37
1-5 days per month	1,133,640	1.22	1,383,041	1.38
6-10 days per month	578,880	1.22	706,234	0.71
11-15 days per	418,080	1.22	510,058	0.51
16-20 days per	1,736,640	1.22	2,118,701	2.12
21-25 days per	8,942,400	1.11	9,926,064	9.93
26-31 days per	33,408,000	1.11	37,082,880	37.08
Total	46,519,140		52,094,807	52.09

Demand Growth Due to Increased Access and Decreased Risk

Although the bulk of demand for legal social use cannabis is expected to come from people who are already regular cannabis users, legalization itself will likely increase demand at least somewhat. Legalization may increase demand by: (1) reducing the stigma still surrounding cannabis in some segments of the community; (2) increasing access to a wider variety of cannabis products; and (3) reducing the perceived risk of obtaining and using cannabis. Marketing by dispensaries is also likely to make cannabis products appealing to a broader range of customers. Because the NSDUH data is published two to three years after it is collected (the most recent data currently available is from 2013 and 2014), it does not yet reflect the full impact of legalization on cannabis consumption by residents of Colorado and Washington where legal retail sales commenced January 1, 2014. In addition, once the published NSDUH statistics reflect the full impact of legalization, it may still be difficult to parse legalization impacts from other factors driving increased acceptance of cannabis nationwide.

There is very little research on how legalization impacts cannabis consumption. In 2014, Oregon researchers posited that improvements in access due to legalization would increase Oregon residents’ consumption of legal cannabis by 11.4 percent.⁹ Similarly, researchers in Australia estimated that legalization would increase cannabis use by 13 percent.¹⁰ Given the scant research on this topic, the present analysis makes the relatively conservative assumption that legalization will increase consumption by New Mexico residents by 10 percent, yielding post-legalization resident consumption of 57.3 metric tons.

^c Frequent users maybe more honest about the amount of cannabis they consume because heavy use is harder to conceal than infrequent use and/or because they are more likely than infrequent users to consume cannabis legally through state medical cannabis programs.

Table 3 depicts adjusted gross consumption of cannabis by New Mexico residents before and after legalization in grams and metric tons.

Table 3. Adjusted pre- and post-legalization gross consumption in grams and metric tons

Days of use per month	Adjusted pre-legalization gross consumption		Post-legalization gross consumption	
	Grams	Metric tons	Grams	Metric tons
Less than once per month	367,830	0.37	404,613	0.40
1-5 days/month	1,383,041	1.38	1,521,345	1.52
6-10 days/month	706,234	0.71	776,857	0.78
11-15 days/month	510,058	0.51	561,063	0.56
16-20 days/month	2,118,701	2.12	2,330,571	2.33
21-25 days/month	9,926,064	9.93	10,918,670	10.92
26-31 days/month	37,082,880	37.08	40,791,168	40.79
Total	52,094,807	52.09	57,304,287	57.30

In order to estimate the quantity of social use cannabis likely to be purchased from regulated retailers after legalization, we must identify those components of pre-legalization gross cannabis consumption (52.1t) that are likely to shift to the legal market in the relatively near term and those that are not. Components of gross consumption that are unlikely to shift to the legal market include medical cannabis, both purchased at retail and grown at home; a portion of social use cannabis grown for personal consumption at home; and, depending on the relative prices in the legal and illicit markets, a significant portion of black market purchases.

Medical Cannabis

New Mexico is one of 25 states that allow the use of cannabis by individuals with certain qualifying medical conditions. The Lynn and Erin Compassionate Use Act,¹¹ enacted in 2007, permits the use of cannabis by New Mexico residents with certain severe medical conditions, legalizes the production, possession, distribution, and dispensing of cannabis for use under the provisions of the Act, and establishes the broad regulatory framework for the state's Medical Cannabis Program (MCP). To qualify for the MCP, a patient must have their diagnosis and need for medical cannabis certified in writing by a health practitioner licensed to prescribe and administer controlled substances in New Mexico and they must register with the state MCP.

The market for medical cannabis in New Mexico, although well established, is not as large or diversified as those of states like Colorado and Washington, but it has grown steadily over the last nine years. Recently, New Mexico's medical cannabis market has entered a period of unprecedented expansion. Thirty thousand New Mexicans currently hold New Mexico Medical Cannabis cards compared to 9,760 in 2013. State regulations cap the number of producers at 35 and the number of plants any single producer can grow at one time at 450.¹² The caps ensure that demand will greatly outstrip supply in New Mexico's medical cannabis market.

In New Mexico, medical cannabis is produced legally by Licensed Non-profit Producers (LNPPs) and patients who hold Personal Production Licenses (PPLs). These two sources are expected to produce a total of 6.3 metric tons in calendar year 2016. Demand for medical cannabis is expected to total 16.1 metric tons during the same period. The 9.8 metric tons of cannabis demanded by medical cannabis program patients, but not supplied through MCP-regulated channels due to state-imposed production quotas, is obtained in the black market and grey markets.

Licensed Non-Profit Producers

LNPPs produce and sell approximately 83 percent of regulated cannabis in New Mexico.¹³ LNPPs operate vertically integrated grow sites and dispensaries. State regulation caps the number of LNPPs at 35, but each LNPP can operate an unlimited number of dispensaries.¹⁴ In July 2016, 23 licensed cultivators operated 41 dispensaries in 15 counties statewide.¹⁵ Twelve additional producers were licensed late in 2015.

During the first quarter of 2016, the most recent period for which data are available, LNPPs produced a total of 1.3 metric tons.¹⁶ Total LNPP production for calendar year 2016 is expected to total 5.9 metric tons. The forecasting model used for these projections is described in detail in *The Medical Cannabis Market in New Mexico*, a 2016 companion report to this one.

Personal Production Licenses

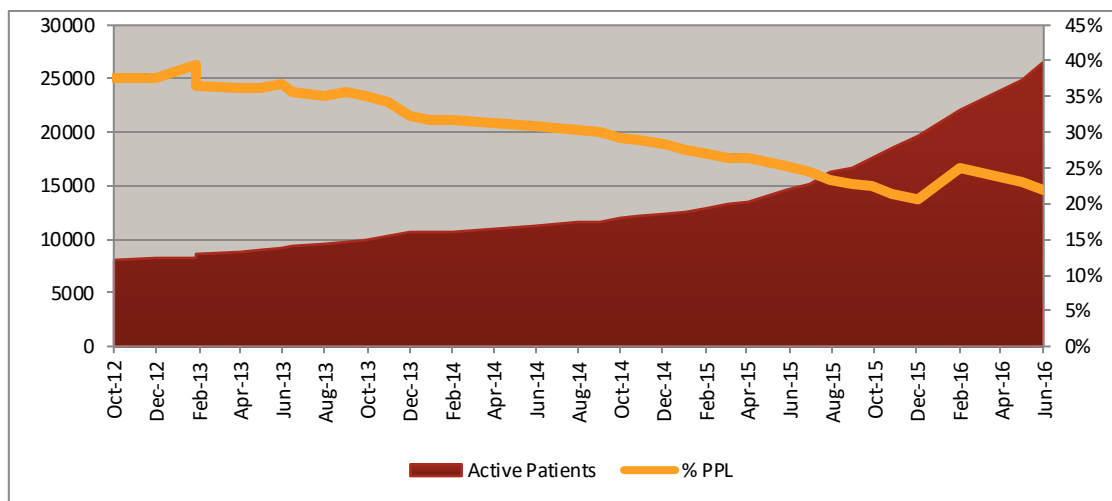
Medical cannabis patients holding Personal Production Licenses (PPLs) are expected to produce 0.384 metric tons in 2016. PPLs are available to qualified patients who wish to grow medical cannabis for their personal use only. PPL holders are authorized to possess no more than four mature female plants and a combined total of 12 seedlings and male plants, and may possess no more than an "adequate supply" of cannabis, currently defined by the New Mexico Department of Health as eight ounces of useable cannabis over a 90 day period. A PPL holder may also obtain cannabis from LNPPs.

At the end of June 2016, 5,865 (22%) of the 26,568 MCP participants held PPLs. As depicted in Figure 5, the percentage of MCP participants who hold PPLs has slowly declined as the total number of program participants has grown. Half of respondents to the 2013 DOH survey who held PPL licenses reported that they were currently utilizing the license,¹⁷ suggesting that approximately 11 percent of MCP participants are actively growing cannabis at any given time.

Respondents to the 2013 DOH survey who held and actively utilized a PPL reported harvesting an average of 108.5 grams annually. If patterns of production by PPL holders have remained constant, and there is no evidence that they have not, PPL holders will

produce .4 metric tons of medical cannabis in calendar year 2016.^d The finding that personal production constitutes a relatively small share of legal cannabis in New Mexico is supported by recently published research by the RAND Corporation comparing patterns of cannabis consumption for medicinal and social use users in Washington, Oregon, Colorado and New Mexico.¹⁸ Between 5.1 percent and 7.2 percent of medicinal cannabis users who took part in the RAND survey said they grew at least some of the cannabis they used. It is worth noting that although PPL holders produced roughly 17 percent of legal medical cannabis in 2013, the 188,415 grams they produced constituted roughly 3.7 percent of the 5.1 million annual grams DOH estimated would be needed to *fully* satisfy demand from the 9,760 patients enrolled in the MCP at the time of the survey.¹⁹

Figure 5: New Mexico Medical Cannabis Program: Total participants and percent with personal production licenses by month and year



Source: New Mexico Department of Health Medical Cannabis Program

In Colorado, two and a half years after legal retail sales began, social use sales continue to grow while sales of medical cannabis have remained fairly constant, suggesting that relatively few medical customers are switching to the retail market and indicating that out-of-state visitors and former black and grey market customers are driving social use demand. The minimal conversion of medical customers to the social use market is due, at least in part, to the additional taxes Colorado levies on social use sales.²⁰

Home Grown Cannabis for Social Use

Individuals who cultivate cannabis for their own consumption without authorization from the state medical cannabis program supply approximately 1.3t annually. Data from the NSDUH proved problematic for estimating the amount of social use cannabis produced at home for personal consumption. According to the 2014 NSDUH, 1.1 percent of past year New Mexico cannabis users said that they had grown the cannabis they used most recently themselves.²¹ Applying this percentage to New Mexico's 213,000 past year users yields 2,343 New Mexicans who grew at least a portion of the cannabis they consumed in the previous year. Even after increasing this amount by 22 percent to adjust for under-reporting, it is still less than the 2,933 PPL holders presumed to be actively cultivating cannabis at any given time.

^d Cannabis produced by PPL holders but sold (in violation of their license) to recreational users is not counted here, but is reflected in the estimated size of the black and grey markets.

An alternative approach to estimating social use home grown as a percentage of total social use cannabis consumption uses the amount of food produced at home relative to the amount purchased (approximately 3.2% nationally) as a model for at-home cannabis production.²²

Multiplying pre-legalization gross consumption by New Mexicans age 21 and over (52.1t) by 3.2 percent yields 1.7t of unauthorized home grown. Subtracting PPL production (.4t) gives non-medical home grown production of 1.3t.

$$\begin{aligned} \text{Social Use home production for personal use} &= \\ (52.1t * 3.2\%) - .4t &= 1.3t \end{aligned}$$

Trend data suggest that home production is declining relative to other methods of obtaining cannabis.²³ Based on this information and the calculations using NSDUH data presented in the previous paragraphs, we exclude only half of the 1.3t (.63t) from the potential legal retail market.

Conversion Rates

The term “conversion rate” refers to the rate at which cannabis sales shift from the black and grey markets to the regulated market post-legalization. Several factors will induce black and grey market customers to switch to the legal market. Better and more consistent quality, wider varieties of products and strains, greater convenience, more reliable supply, reduced risk, and diminished stigma will all play a part in increasing legal sales; but the primary driver of movement out of the illicit market and into the legal one will likely be price.

Legalization has the potential to reduce price in a variety of ways. First, the price of illicit commodities reflects, to some degree, the risk suppliers assume in producing, transporting, and marketing them. All else being equal, greatly reducing suppliers’ risk of criminal prosecution or forfeiture should diminish or eliminate the “risk premium” currently embedded in the price of illicit cannabis. Second, eliminating the need for subterfuge in the production of cannabis will give producers considerably more latitude in choosing key features of the production process, including type (outdoor, indoor, or greenhouse), location, and scale of production, enabling them to produce more efficiently. Increasing the scale of production creates numerous potential efficiencies through labor specialization and mechanization as well as opportunities to purchase inputs in bulk²⁴ and maximize the returns on capital investments. Legalization also creates a more fertile environment for innovation and investments in research and development to develop new products and improve plant strains, cultivation practices and production processes.²⁵

Competition between providers for market share is likely to have an especially profound impact on price. This analysis assumes that prices decline as the social use market matures and that lower prices for legal cannabis attract an increasing share of black and grey market activity.

This topic is addressed in more detail under “Price Elasticity of Demand” below.

All else being equal, states with robust pre-existing medical markets are expected to have lower first-year rates of conversion to the legal social use market than states with nascent or non-existent medical cannabis programs. In established medical cannabis states, a significant share of potential social use customers are already obtaining high-quality, legal cannabis at prices that are often lower than those available through social use channels.²⁶

Demand analyses of social use markets in other states have assumed conversion rates ranging from 18 percent (Colorado) to 40 percent (Oregon).²⁷ For purposes of this analysis, a 25 percent first year conversion rate is posited. Twenty-five percent was chosen because it is conservative and therefore unlikely to over-estimate the size of the first year market and because it incorporates the existence of New Mexico’s medical cannabis program, which would tend to reduce the conversion rate (as it did in the Colorado estimate),²⁸ but also acknowledges the MCP’s historic inadequacy in meeting patient demand.^{29 30} Table 4 illustrates the derivation of the estimate of net demand by New Mexico residents for social use cannabis in the first year of legalization.

Table 4. Net First Year Resident Demand for Legal Social Use Cannabis, Derivation of Estimate

Gross post-legalization consumption by New Mexicans 21 and over	57.3t
- Medical cannabis produced by LNPPs	-5.9t
- Medical cannabis produced by PPL holders	-0.4t
- Illicit social use home production for personal consumption	-0.6t
- 80% of the black/grey market	-33.9t
Net first year resident demand for legal social use cannabis	=16.5t

Price Elasticity of Demand

Price elasticity of demand will greatly influence the rate of conversion to the regulated, social use market post-legalization. The price elasticity of demand (PED) measures the change in demand resulting from a one percent change in price. When consumers are relatively unresponsive to price an increase in price causes a less-than-proportional decrease in quantity demanded and demand is said to be “inelastic.” Studies of the market for illicit and adult use retail cannabis suggest that demand is relatively inelastic – a 1 percent decrease in price induces an increase in demand of between .59 percent and .79 percent.^{31 32 33 34} However, own-price elasticity of demand (i.e. how consumption of a good or service responds to a change in its price) may not be as relevant to the present analysis as is *cross price elasticity of demand* – the change in consumption of a good or service resulting from a change in its price relative to that of another good or service. In this case, the price of legal cannabis may not be as meaningful as the price of legal cannabis relative to the price of cannabis from illicit suppliers. In addition, it is likely that different types of cannabis consumers differ in the elasticity of their demand and that demand will become increasingly elastic as the legal price nears the black market price. On these bases, recent demand estimates for other states have assumed that demand, particularly for heavy users, is relatively price elastic.³⁵

The early stages of social use cannabis sales in Washington and Colorado were characterized by a rapid influx of new providers, escalating competition, and rapidly declining prices.³⁶ In Colorado, between July 2014 and September 2015, prices declined from an average of \$400/ounce and \$50-\$70/eighth to \$300/ounce and \$30-\$45/eighth and the size of the market increased by 84 percent.³⁷ The Washington State Liquor and Cannabis Board reported that the average statewide price per gram of cannabis was nearing \$10 at the beginning of 2016 compared to over \$25 in July 2014.³⁸

OUT OF STATE VISITORS

If New Mexico’s experience of legalization resembles that of Colorado and Washington, out-of-state visitors will constitute a significant fraction of social use cannabis demand. The

Colorado Department of Revenue estimates that out-of-state visitors account for 44 percent of metro area social use cannabis sales and 90 percent of sales in resort areas.³⁹ These results are confirmed by informal surveys and anecdotal information collected by various entities, including researchers and industry groups.^{40 41}

Colorado implemented social use cannabis sales in January 2014. That year, tourism increased a record 10.4 percent.⁴² Although there is no way to know with certainty what portion of the increase was due to legalization, tourism industry data suggest that, on net, legal cannabis attracted more tourists than it deterred.⁴³

Table 5. New Mexico and Colorado Tourism Statistics

	New Mexico	Colorado
Tourist spending per capita	\$3,180	\$3,163
Visitors per capita	14	14
Tourism as a percent of GDP	7.5%	5.9%
Average age	42.8	45.1
Sources: U.S. Travel Association, Skift.com, Bureau of Economic Analysis, Longwoods International (2016) Colorado Travel Year 2015, and New Mexico Department of Tourism (2016) New Mexico Tourism Department 2015 Annual Report.		

Table 5 compares 2014-2015 tourism statistics for Colorado and New Mexico. The two states are quite similar in terms of visitors and visitor spending per capita, suggesting that, if New Mexico were to legalize social use cannabis and regulate its sale to out-of-state visitors in a manner similar to that of Colorado^e it could expect similar results. Legalization would also enable New Mexico to recapture cannabis sales and tax revenue lost to Colorado when New Mexico residents and visitors cross the border to visit Colorado dispensaries.

In 2015, 8 percent of out-of-state leisure visitors said that they visited a dispensary while in Colorado. Eighty-five percent of tourists who shopped for cannabis while vacationing in Colorado said that legal cannabis was a primary motivator of their visit.

The New Mexico Department of Tourism reports that 26 million residents of other states and countries visited New Mexico in 2015.⁴⁴ If, as in Colorado, 8 percent of leisure visitors shop at a dispensary, 2.1 million non-residents will purchase cannabis during New Mexico's first full year of social use sales. If each visitor purchases one-quarter ounce (7 grams) of flower or an equivalent value of other cannabis^f products, consumption by out-of-state visitors will total approximately 14.6 metric tons.

If out-of state visitors constitute 44 percent of social use cannabis demand as they do in Colorado, they will purchase 13 metric tons of cannabis from New Mexico dispensaries in the first full year of social use sales. Thirteen metric tons is roughly equivalent to 2.1 million out-of-state visitors each purchasing 6.2 grams.

^e Colorado and other states that allow sales to non-residents require that tourists purchase cannabis for in-state consumption only and cap the amount of cannabis that can be purchased at one time.

^f This amount is fairly consistent with dispensary owner reports of average per-visit sales (resident and tourist) of \$50-\$60 (See: Durden.T. (2016, March 24). Q1 2016 Marijuana Industry Survey & Outlook. Retrieved from: <http://www.zerohedge.com/news/2016-03-24/q1-2016-marijuana-industry-survey-outlook>)

Taking 13t as base year visitor demand and assuming visitor purchases remain a consistent 44 percent of social use sales yields visitor purchases totaling \$181.5 million in 2017 and \$298.2 million (37.3t) in 2021.

New Mexico's shared border with Texas greatly enhances the state's potential social use cannabis market. Over 119,000 Texans age 21 and over who use cannabis at least once per month live within 200 miles of the New Mexico border. These Texans constitute a potential customer base almost as large as New Mexico's (138,000).

5 Year Forecast

As the state's legal market for social use cannabis matures, it is expected to capture an increasing share of the total social use cannabis market. As sales volumes grow and new providers enter the regulated market, competition will force prices down. Depending on the regulatory environment and tax burden, legal cannabis prices could fall quite dramatically. As prices in the legal market decline relative to those in the black market, legal retailers' market share will expand. For the purposes of this analysis, the first-year (2017) reference price is \$14 per gram, which, in anticipation of additional state and/or local taxes and a greater variety of more costly manufactured cannabis products, is roughly 20 percent over the average price recently reported by New Mexico medical cannabis dispensaries.⁴⁵

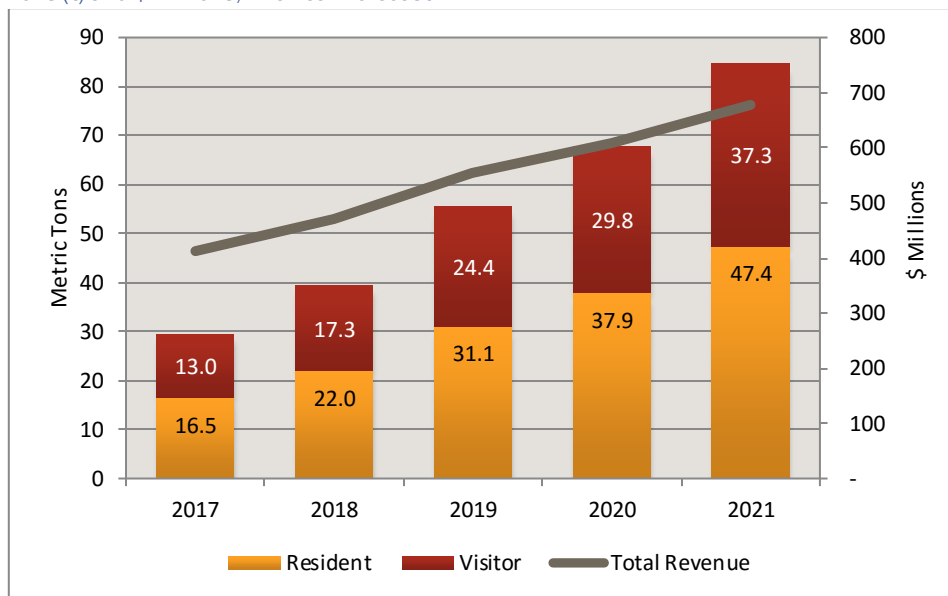
Table 6. Five-Year New Mexico Social Use Cannabis Demand Forecast

Frequency of Use	Year	2017	2018	2019	2020	2021
	Price	\$14.00	\$12.00	\$10.00	\$9.00	\$8.00
Price elasticity of demand	Legal Social Use Cannabis Consumed by State Residents					
Less than	-0.5	0.1	0.1	0.1	0.1	0.2
1-5 days/month	-0.7	0.4	0.5	0.6	0.6	0.6
6-10 days/month	-0.9	0.2	0.3	0.3	0.3	0.4
11-15 days/month	-1.1	0.2	0.2	0.2	0.3	0.3
16-20 days/month	-1.3	0.7	0.8	1.0	1.2	1.4
21-25 days/month	-1.8	3.1	4.1	5.8	7.0	8.6
26-31 days/month	-2	11.7	16.0	23.0	28.4	36.0
Resident social use consumption		16.50	22.02	31.05	37.92	47.44
Medical cannabis		6.3	6.3	6.3	6.3	6.3
Illicit sources		34.5	29.0	20.0	13.1	3.6
Total		57.30	57.30	57.30	57.30	57.30
Resident social use consumption		29%	38%	54%	66%	83%
Medical cannabis		11%	11%	11%	11%	11%
Illicit sources		60.2%	50.6%	34.8%	22.8%	6.2%

If, for example, the price of legal social use cannabis declines from \$14 per gram to \$8 per gram between 2017 and 2021, while the black market price remains constant, legal market share will increase from 29 percent to 83 percent of all non-medical cannabis transactions.

While most cannabis market analysts expect a marked decrease in the price of legal social use cannabis,^{46 47 48 49} prices in New Mexico will be determined, to a large degree, by state taxes and regulations. Realizing the full potential benefit of a robust market for social use cannabis means minimizing the size of the black market while maximizing economic activity, job creation, and tax revenue. To accomplish this, taxes must be set at rates that aren't so high as to make it impossible for the legal market to compete with the illegal ones and regulations must protect health, safety, and welfare without compromising the ability of market forces to produce the best outcome for consumers and the general public – efficient production, consistent quality, wide variety, and low prices. Figure 6 depicts resident and visitor demand for legal social use cannabis in New Mexico in both metric tons and millions of dollars over a five-year time horizon.

Figure 6: Annual Legal Social Use Cannabis Demand by New Mexico Residents and Out-of-State Visitors in Metric Tons (t) and \$ Millions, Five Year Forecast



As noted earlier in this report, the frequency of cannabis use and quantities consumed per instance of use are highly correlated, concentrating the bulk of cannabis consumption among a relatively small group of “heavy” cannabis users. Heavy, moderate, and light cannabis consumers are expected to differ in how their consumption responds to changes in the price of cannabis. Infrequent users will be relatively insensitive to price because cannabis constitutes such a small fraction of their overall budget. Generally speaking, changes in consumption resulting from changes in price (the price elasticity of demand) are expected to intensify with cannabis use, with heavy users who spend the largest relative share of income on cannabis having the most elastic demand.

Table 6 forecasts the size of the legal market, both in metric tons sold and as a share of the larger market for cannabis among New Mexicans age 21 and over. As the legal market price declines, the legal market’s share of cannabis sales increases and the illicit market’s share of all sales to New Mexico adults falls from 60 percent to 6 percent.

Table 7 presents total demand in metric tons and total revenue from legal social use cannabis sales from 2017 through 2021.

Table 7. Total Legal Social Use Cannabis Demand (t) and Revenue (\$ millions) 2017 to 2021

	2017	2018	2019	2020	2021
Resident	16.5t	22.0t	31.1t	37.9t	47.4t
Visitor	13.0t	17.3t	24.4t	29.8t	37.3t
Total demand	29.5t	39.3t	55.4t	67.7t	84.7t
Total revenue	\$412.5m	\$471.8m	\$554.5m	\$609.4m	\$677.7m

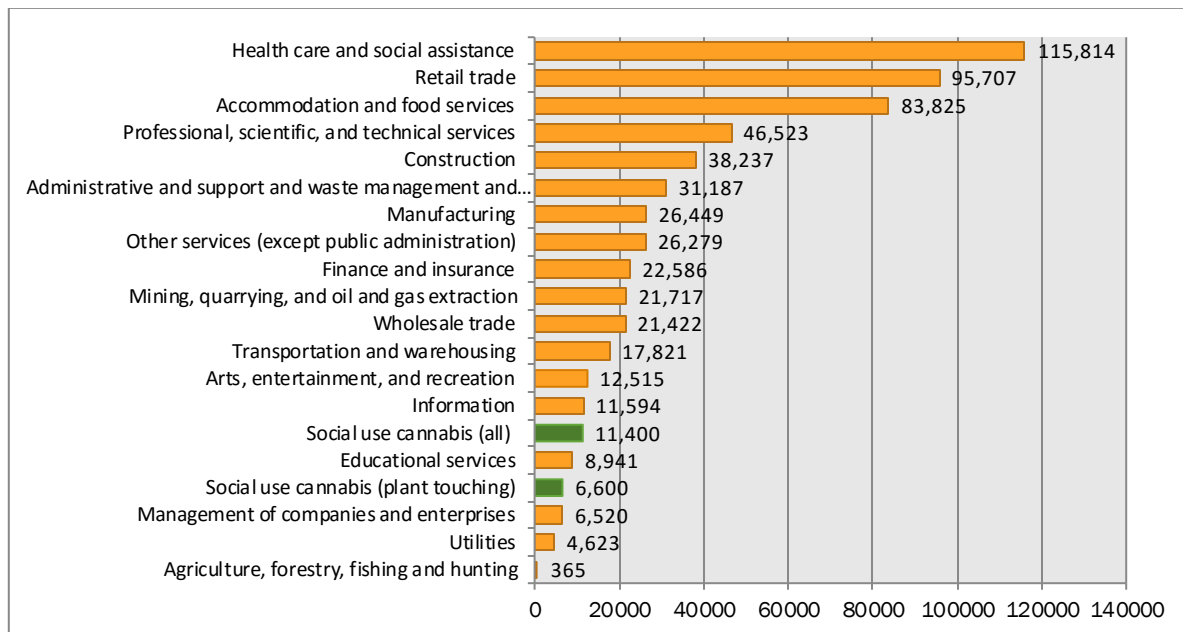
Social Use Cannabis in the New Mexico Economy

Legalization of cannabis for social use will have a tremendous impact on New Mexico's economy. Although a full economic impact analysis is outside the scope of this report, it is worth noting that agriculture and tourism, the two sectors most closely linked to cannabis production and sales, are also two of New Mexico's most vital economic base industries. Each year, state and local governments invest millions in subsidies, tax breaks, recruitment incentives, and marketing campaigns to bolster these industries and protect the jobs they create. In its first year, the New Mexico social use cannabis industry is expected to generate over three times more revenue than the state's entire pecan crop⁵⁰ and employ twice as many people as are currently employed in the state's motion picture and sound recording industries.⁵¹

In year one of legalization, New Mexico's social use cannabis industry would create over 11,400 new jobs -- 6,600 jobs in cannabis production and cannabis product manufacturing and 4,780 jobs in ancillary businesses including professional services, construction, cultivation supplies, and equipment for the production and consumption of cannabis.⁹ Figure 7 contrasts employment in social use cannabis to employment in New Mexico's other major industrial sectors.

⁹ Roughly 1 job per 9.9 pounds of cannabis produced based on the number of occupational licenses issued (15,000) and pounds of cannabis produced (148,000) listed in the Colorado Marijuana Enforcement Division's 2014 Annual Report. The ratio of "plant touching" jobs to ancillary employment is based on estimates in 2016 Marijuana Factbook. (Marijuana Business Daily). The estimates reflect direct jobs, no multiplier effects (indirect or induced jobs) are assumed.

Figure 7. Social Use Cannabis Employment (plant touching and total) Relative to Other New Mexico Industries (legal sales, year 1)



Source: U.S. Census Bureau, 2014 County Business Patterns and author calculation, see footnote e

Conclusion

A legal market for social use cannabis in New Mexico could capture a large volume of economic activity currently occurring outside legal channels while, at the same time, attracting out-of-state customers and tourism dollars to the state. Tax policy is outside the scope of this analysis, but the need for additional state revenue is major argument for legalization and it is hoped that this report will help inform fiscal impact analyses of legalization proposals considered by the state legislature. It is further hoped that the discussion of social use cannabis as an economic driver and revenue generator will result in sensible, administrable tax policy that generates adequate revenue with minimal market distortions, because, without sound fiscal and regulatory policy, the market will not reach its full potential to benefit New Mexico. The discourse on social use cannabis also provides an excellent opportunity to revisit the fiscal policy surrounding medical cannabis and the implications that cannabis policy choices have for public health, health equity, and economic growth.

¹ New Mexico Department of Agriculture. 2014 New Mexico Agriculture Statistics. Retrieved from: https://www.nass.usda.gov/Statistics_by_State/New_Mexico/Publications/Annual_Statistical_Bulletin/2014/2014_NM_Pub.pdf

² Kilmer, Beau, Jonathan P. Caulkins, Gregory Midgette, Linden Dahlkemper, Robert J. MacCoun, and Rosalie Liccardo Pacula. 2013. Before the Grand Opening: Measuring Washington State's Marijuana Market in the Last Year Before Legalized Commercial Sales. RAND Drug Policy Research Center.

³ Kilmer, Beau, Jonathan P. Caulkins, Gregory Midgette, Linden Dahlkemper, Robert J. MacCoun, and Rosalie Liccardo Pacula. 2013. Before the Grand Opening: Measuring Washington State's Marijuana Market in the Last Year Before Legalized Commercial Sales. RAND Drug Policy Research Center.

⁴ Kilmer, Beau, Jonathan P. Caulkins, Gregory Midgette, Linden Dahlkemper, Robert J. MacCoun, and Rosalie Liccardo Pacula. 2013. Before the Grand Opening: Measuring Washington State's Marijuana Market in the Last Year Before Legalized Commercial Sales. RAND Drug Policy Research Center.

- ⁵ Kilmer, Beau, Jonathan P. Caulkins, Gregory Midgette, Linden Dahlkemper, Robert J. MacCoun, and Rosalie Liccardo Pacula. 2013. Before the Grand Opening: Measuring Washington State's Marijuana Market in the Last Year Before Legalized Commercial Sales. RAND Drug Policy Research Center.
- ⁶ Kilmer, B., Jonathan Caulkins, Rosalie Pacula, & Peter Reuter 2011. Bringing perspective to illicit markets: Estimating the size of the U.S. marijuana market. *Drug and Alcohol Dependence*, 119, 153–160.
- ⁷ Kilmer, Beau, Jonathan P. Caulkins, Gregory Midgette, Linden Dahlkemper, Robert J. MacCoun, and Rosalie Liccardo Pacula. 2013. Before the Grand Opening: Measuring Washington State's Marijuana Market in the Last Year Before Legalized Commercial Sales. RAND Drug Policy Research Center.
- ⁸ Light, M.K., Orens, A., Lewandowski, B., Pickton, T.. (2014, May). Market Size and Demand for Marijuana in Colorado. Marijuana Policy Group and Colorado Department of Revenue.
- ⁹ ECONorthwest. (2014, July). Oregon Cannabis Tax Revenue Estimate Retrieved on August 30, 2016 from http://www.econw.com/media/ap_files/7-31-2014_CannabisFinalReport.pdf
- ¹⁰ Clements, K. and Daryal, M. "The economics of marijuana consumption." Economic Research Centre. Department of Economics at the University of Western Australia. 1999. Page 57.
- ¹¹ NMSA 1978, § 26-2B-7(G)
- ¹² NMAC 7.34.4.8
- ¹³ New Mexico Department of Health. Medical Cannabis Survey 2013
- ¹⁴ NMAC 7.34.4.8
- ¹⁵ New Mexico Department of Health Medical Cannabis Program Licensed Non-Profit Producer Report 2016 First Quarter Report Summary. May 26, 2016. <https://nmhealth.org/publication/view/report/1616/>
- ¹⁶ New Mexico Department of Health Medical Cannabis Program Licensed Non-Profit Producer Report 2016 First Quarter Report Summary. May 26, 2016. <https://nmhealth.org/publication/view/report/1616/>
- ¹⁷ New Mexico Department of Health. Medical Cannabis Survey 2013, p 11
- ¹⁸ Pacula, R. L., Jacobson, M., and Maksabedian, E. J. (2016) In the weeds: a baseline view of cannabis use among legalizing states and their neighbours. *Addiction*, 111: 973–980.
- ¹⁹ New Mexico Department of Health. Medical Cannabis Survey 2013
- ²⁰ Light, M.K., Orens, A., Lewandowski, B., Pickton, T.. (2014, May). Market Size and Demand for Marijuana in Colorado. Marijuana Policy Group and Colorado Department of Revenue.
- ²¹ Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health
- ²² ECONorthwest. (2014, July). Oregon Cannabis Tax Revenue Estimate Retrieved on August 30, 2016 from http://www.econw.com/media/ap_files/7-31-2014_CannabisFinalReport.pdf
- ²³ SAMHSA, Center for Behavioral Health Statistics and Quality. Results from the 2014 National Survey on Drug Use and Health: Detailed Tables. Table 6.44b.
- ²⁴ Denman and Cooley. (2013, January). "Legal Cannabis Production Costs: Estimating Costs Based on Medical Cannabis."
- ²⁵ ECONorthwest. (2014, July). Oregon Cannabis Tax Revenue Estimate Retrieved on August 30, 2016 from http://www.econw.com/media/ap_files/7-31-2014_CannabisFinalReport.pdf
- ²⁶ Light, M.K., Orens, A., Lewandowski, B., Pickton, T.. (2014, October). Market Size and Demand for Marijuana in Alaska. Marijuana Policy Group.
- ²⁷ ECONorthwest. (2014, July). Oregon Cannabis Tax Revenue Estimate Retrieved on August 30, 2016 from http://www.econw.com/media/ap_files/7-31-2014_CannabisFinalReport.pdf
- ²⁸ Light, M.K., Orens, A., Lewandowski, B., Pickton, T.. (2014, October). Market Size and Demand for Marijuana in Alaska. Marijuana Policy Group.
- ²⁹ New Mexico Department of Health. Medical Cannabis Survey 2013
- ³⁰ O'Donnell, K. (2016). The Medical Cannabis Market in New Mexico
- ³¹ Clements, K.W., Yan, Y., and Zhao, X. (2010). "The Demand for Cannabis and Alcohol: Inter-Commodity Interactions with Uncertainty." *Empirical Economics*, 39: 203-239.
- ³² Davis, A.J., Geisler, K.R., and Nichols, M.W. (2016). The price elasticity of cannabis demand: evidence from crowd-sourced transaction data. *Empirical Economics* Volume 50, Issue 4, pp. 1171-1192
- ³³ Clements, K. and Daryal, M. "The economics of cannabis consumption." Economic Research Centre. Department of Economics at the University of Western Australia. 1999. Page 40
- ³⁴ State of Oregon LEGISLATIVE REVENUE OFFICE THE REVENUE IMPACT OF CANNABIS LEGALIZATION UNDER MEASURE 91 September 2014
<https://www.oregonlegislature.gov/Iro/Documents/RR%203-14%20Measure%2091..>
- ³⁵ Light, M.K., Orens, A., Lewandowski, B., Pickton, T.. (2014, October). Market Size and Demand for Marijuana in Alaska. Marijuana Policy Group.
- ³⁶ Durden.T. (2016, March 24). Q1 2016 Marijuana Industry Survey & Outlook
<http://www.zerohedge.com/news/2016-03-24/q1-2016-marijuana-industry-survey-outlook>
- ³⁷ Durden.T. (2016, March 24). Q1 2016 Marijuana Industry Survey & Outlook
<http://www.zerohedge.com/news/2016-03-24/q1-2016-marijuana-industry-survey-outlook>

-
- ³⁸ Luck, M. Local marijuana retailers contend with falling prices. Longview Daily News. January 2, 2016. Retrieved from: http://tdn.com/news/local/local-marijuana-retailers-contend-with-falling-prices/article_72268328-fef1-5905-b2cd-e965add7a149.html
- ³⁹ Light, M.K., Orens, A., Lewandowski, B., Pickton, T.. (2014, May). Market Size and Demand for Marijuana in Colorado. Marijuana Policy Group and Colorado Department of Revenue.
- ⁴⁰ Durden.T. (2016, March 24). Q1 2016 Marijuana Industry Survey & Outlook <http://www.zerohedge.com/news/2016-03-24/q1-2016-marijuana-industry-survey-outlook>
- ⁴¹ Light, M.K., Orens, A., Lewandowski, B., Pickton, T.. (2014, May). Market Size and Demand for Marijuana in Colorado. Marijuana Policy Group and Colorado Department of Revenue. p.21
- ⁴² Colorado Department of Tourism. (2015, June). Retrieved from: <http://www.colorado.com/news/colorado-tourism-visitation-and-visitor-spending-set-all-time-records-2014>
- ⁴³ Colorado Department of Tourism. (2015, June) Retrieved from: <http://www.colorado.com/news/colorado-tourism-sets-all-time-records-visitation-and-spending-2015>
- ⁴⁴ Orr, J. (2015, September). New Mexico Department of Tourism 2015 Annual Report. Retrieved from : <http://nmtourism.org/wp-content/uploads/2015/10/2015-NMTD-Annual-Report-9-30-151.pdf>
- ⁴⁵ New Mexico Department of Health Medical Cannabis Program Licensed Non-Profit Producer Report 2016 First Quarter Report Summary. May 26, 2016. <https://nmhealth.org/publication/view/report/1616/>
- ⁴⁶ Light, M.K., Orens, A., Lewandowski, B., Pickton, T. (2014, October). Market Size and Demand for Marijuana in Alaska. Marijuana Policy Group.
- ⁴⁷ Kilmer, B., Caulkins, J.P., Pacula, R.L., MacCoun, R.J., and Reuter, P.H. (2010). Altered State? Assessing How Marijuana Legalization in California Could Influence Marijuana Consumption and Public Budgets, Santa Monica, Calif.: RAND Corporation, OP-315-RC, 2010. Retrieved on August 30, 2016 from: http://www.rand.org/pubs/occasional_papers/OP315.html
- ⁴⁸ Zamarra, L.. (2013, August). Modeling Marijuana Businesses and Costs of Legal Compliance. BOTEC Analysis Corporation, I-502 Project #430-5b. Retrieved on August 30, 2016 from: <http://liq.wa.gov/publications/Marijuana/BOTEC%20reports/5b-Modelling-Marijuana-Businesses-Final.pdf>
- ⁴⁹ ECONorthwest. (2014, July). Oregon Cannabis Tax Revenue Estimate Retrieved on August 30, 2016 from http://www.econw.com/media/ap_files/7-31-2014_CannabisFinalReport.pdf
- ⁵⁰ New Mexico Department of Agriculture. 2014 New Mexico Agriculture Statistics. Retrieved from: https://www.nass.usda.gov/Statistics_by_State/New_Mexico/Publications/Annual_Statistical_Bulletin/2014/2014_NM_Pub.pdf
- ⁵¹ New Mexico Department of Workforce Solutions. (2014). New Mexico Employment Projections 2012-2022 Growth Trends of New Mexico's Industries and Occupations