Division of Medicinal Marijuana Biennial Report

April 1, 2019

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EXECUTIVE SUMMARY

P.L. 2009, c. 307, approved January 18, 2010, and codified at N.J.S.A. 24:6I-1 *et seq.,* is the New Jersey Compassionate Use Medical Marijuana Act (the Act). The Act is the enabling authority for the **Division of Medicinal Marijuana** within the Department of Health.

Pursuant to N.J.S.A. 24-6I-12, the Department shall report to the Governor and to the Legislature on a biennial basis to assess the following factors:

- Whether the maximum amount of medical marijuana allowed pursuant to the Act is sufficient to meet the needs of qualified patients;
- Whether any alternative treatment center has charged excessive prices for the marijuana that the center dispensed; and
- Whether there are sufficient numbers of alternative treatment centers to meet the needs of qualified patients.

Pursuant to that statutory charge, the Department has assessed those factors as part of this report and the findings are presented in the following document.

The report covers 2016 and 2017 for some measures. Additionally, due to the expansion in the program that occurred in 2018 and that significantly altered market conditions, the Department also utilized 2018 data for several measures. The dates for each measure are noted in the report.

EVALUATION 1: IS THE 2 OUNCE MONTHLY LIMIT SUFFICIENT?

MEASURE 1: ANALYSIS OF PURCHASE AMOUNTS

The Department analyzed average monthly purchases of qualified patients and found that while many patients purchase less than the 2 ounce statutory limit, a significant percentage do purchase up to the limit. Based on this analysis and patient feedback, the Department recommends – consistent with prior recommendations – raising the monthly allotment over time for all patients and eliminating the statutory limit altogether for terminal patients.

Conclusion: Raise the monthly allotment for all qualifying patients. Eliminate the limit for terminal patients.

EVALUATION 2: HAVE ALTERNATIVE TREATMENT CENTERS CHARGED EXCESSIVE PRICES?

MEASURE 1: REGULATED MARKET AND ILLEGAL MARKET PRICE COMPARISON

The Department analyzed price data from the inventory management systems of Alternative Treatment Centers (ATCs) to compare the average price of an ounce sold during 2017 and 2018 compared to prices on the illegal market. The Department's analyses of prices showed no evidence of **excessive** prices during the time period studied. However, prices were higher than the illegal market for roughly half the patient population. If qualifying for a discount, a patient may pay equal to or less than illegal market prices at New Jersey's ATCs. If not qualifying for a discount, patients will pay greater than illegal market prices.

Conclusion: Prices are not excessive, but high prices are artificially suppressing demand from patients. The best way to reduce prices is to expand supply and increase competition and choice for patients.

MEASURE 2: REVENUE PER ATC

The Department compared revenue per ATC in the years of 2017 and 2018. The total medicinal marijuana market resulted in total revenues of $29 million (2017) and $53 million (2018), amounting to an average of approximately $5.8 million (2017) and $8.83 (2018) million in annual revenue per ATC across the two years. The Department

lacks information regarding the cost side of the business, and therefore cannot make a determination as to whether prices are excessive based on total revenues. However, the Department may consider requiring audits of ATCs under N.J.A.C. 8:64-13.8 to better assess the relationship between revenue and prices for the next biennial report.

Conclusion: Revenues nearly doubled in 2018, but the Department needs more information to determine whether revenues far exceed costs and point to excessive pricing.

EVALUATION 3: ARE THERE SUFFICIENT NUMBERS OF ALTERNATIVE TREATMENT CENTERS?

MEASURE 1: CURRENT MARKET ASSESSMENT

The Department announced an expansion of the conditions available for treatment with medical cannabis at the end of March 2018. Since that time there has been a significant expansion of the patient population. Since that expansion, the Department has been monitoring overall supply. Based on this monitoring, during the study period the Department observed that while the market has been keeping pace with global demand, there have been periodic shortages at every ATC.

Conclusion: Because every ATC has experienced product shortages during the study period, the current market assessment supports the need for additional ATCs.

MEASURE 2: FUTURE MARKET ASSESSMENT

Two scenarios were evaluated to predict future market demand. The status quo scenario assumes static numbers of alternative treatment centers, physicians, and no additional policy changes to the program. The second scenario assumes all EO6 recommendations are implemented, there are increased prescribers in the program, and increasing numbers of ATCs. Under the two scenarios, the Department estimates that in 3 years New Jersey will need between 440,000 and 1,000,000 square feet of licensed cultivation capacity to meet growing demand – or between 25 and 50 cultivation sites, depending on average size of site.

Conclusion: The future market assessment supports the need for additional ATCs. At current average cultivation capacity, the Department projects the need for between 24 and 50 cultivation sites.

MEASURE 3: NETWORK ADEQUACY DRIVE TIME ANALYSIS

Beyond cultivation capacity, the Department also sought for this report to analyze the network adequacy of the current distribution of dispensaries. Using GIS (Geographic Information System) mapping software, the Department mapped the six operational ATCs and used an algorithm to determine all areas within the state that are a 30 minute distance or less from those locations. The algorithm projects "best-case" drive times.

Conclusion: Less than half the state is within 30 minutes of an ATC under a best-case drive time scenario. The drive time analysis supports the need for additional ATCs.

MEASURE 4: MEDICINAL MARIJUANA DISPENSARY POPULATION COMPARISON

The Department utilized a survey of publicly available data on the number of dispensaries in states with medicinal marijuana programs and used that data to extrapolate a projection for the number of medical dispensaries needed in New Jersey. **In New Jersey, there are 1.5 million people per open dispensary, whereas the aggregate average of population per dispensary in other states was roughly 100,000 people per dispensary. If New Jersey was at the average, the state would have 90 medical dispensaries to serve our population.**

Conclusion: The analysis strongly supports the need for additional dispensary sites in New Jersey.

NEW JERSEY COMPASSIONATE USE MEDICAL MARIJUANA ACT

P.L. 2009, c. 307, approved January 18, 2010, and codified at N.J.S.A. 24:6I-1 *et seq*., is the New Jersey Compassionate Use Medical Marijuana Act (the Act). The Act is the enabling authority for the Division of Medicinal Marijuana. P.L. 2013, c. 160, effective September 10, 2013, amended various sections of the Act, such as providing that alternative treatment centers (ATCs) shall not be limited in the number of strains of medical marijuana cultivated;[1] that ATCs are allowed to cultivate and dispense medical marijuana in dried form, oral lozenges, topical formulations, or edible form as well as any other form as authorized by the Commissioner; that the edible form shall include tablets, capsules, drops or syrups and any other form as authorized by the Commissioner; and that the edible form[2] shall be available only to qualifying patients who are minors. P.L. 2016, c. 53, effective September 14, 2016, expanded the definition of "debilitating medical condition" to include Post-Traumatic Stress Disorder and to permit individuals who suffer from Post-Traumatic Stress Disorder to qualify to obtain and use marijuana for medicinal purposes. In March 2018, the Department's Final Agency Decision to add new conditions to the program made Chronic Pain related to Musculoskeletal Disorders, Chronic Pain of Visceral Origin, Tourettes Syndrome, Migraine and Anxiety to the list of debilitating conditions that can be treated with medicinal marijuana. In February 2019, the Department amended that Final Agency Decision to add Opioid Use Disorder, which had been accepted as petition by the review panel. The Department also implemented measures to streamline the enrollment process for patients, allow physicians to opt out of being listed publicly, and have started the permitting process for 6 new ATCs.

As of the publication of this report, there were 44,000 patients enrolled in the Medicinal Marijuana Program (MMP), over 930 physicians, and 1800 caregivers.

EVALUATION 1: IS THE 2 OUNCE MONTHLY LIMIT SUFFICIENT?

MEASURE 1: ANALYSIS OF PURCHASE AMOUNTS

Pursuant to N.J.S.A. 24:6I-10, physicians can only certify registered patients and caregivers for a maximum of 2 ounces of medicinal marijuana every month, and only in increments of 90 days (certification periods). Every two years, the Department is directed to analyze whether two ounces is a sufficient limit to meet patient needs.

Method: The Department utilized historical data from the Patient Registry established pursuant to N.J.S.A. 24:6I-4 to analyze purchase patterns of patients in the program. The Department looked at average purchase amount per month per patient making a purchase in that month, and the percentage of patients purchasing the maximum amount in a given month.

Limitations: Because medicinal marijuana is not reimbursed by insurance and can be costly for patients, and because many of the patients in New Jersey's program are either seniors or on Government Assistance and thus have fixed incomes, the high prices of the product are likely depressing demand. Patients have to pay the full cost out-of-pocket, which combined with high prices leads to patients purchasing less than they would otherwise. For example, the Department's analysis looks at patients making purchases in a given month – but many patients in the program don't purchase every month and the average purchase per month across the

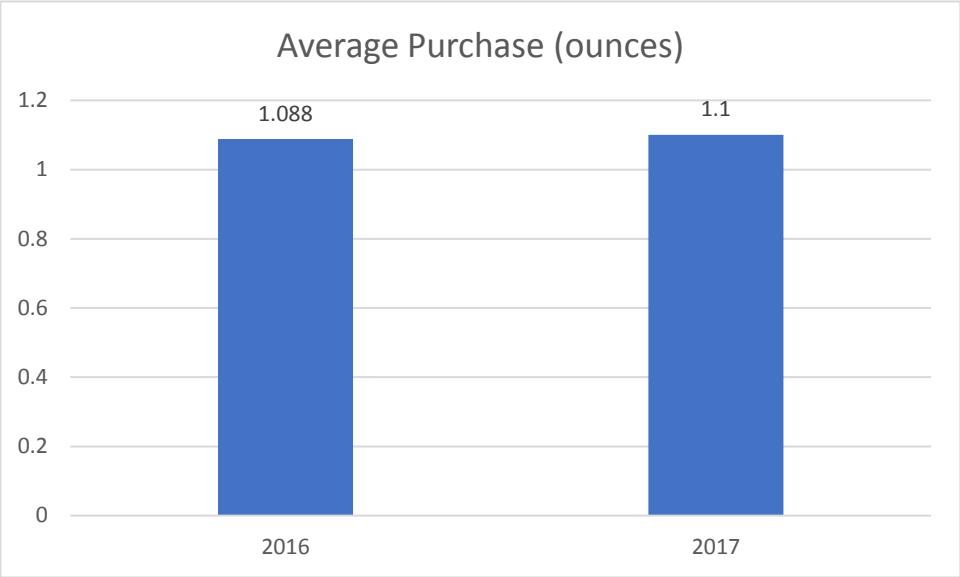
[1] Although the Department rules currently limit the number of strains of medical marijuana to three that an ATC may cultivate, N.J.A.C. 8:64-10.7(a), that provision will be repealed and has not been enforced by the Department as of the law being amended in 2013.

[2] Oral lozenges are not classified as "edible form" and are available to both qualifying adult and minor patients.

entire patient population is about a half ounce. In Colorado, where prices are considerably lower, the average purchases per month reported in 2015 for medicinal marijuana patients were 1.291 ounces per patient[3].

Results and Discussion:

Average Purchase Per Month by Patients Making Purchases



Percentage of Active Patients Purchasing Maximum Allotment

Year	% of Patients Purchasing Up to Limit	# Number of Months
2016	6.82%	6 of 12 months
2016	24.24%	1 of 12 months
2017	8.62%	6 of 12 months
2017	27.71%	1 of 12 moths

Although the average purchase amount by patients making a purchase in a given month was just over one ounce in both 2016 and 2017, the analysis of the percentage of patients purchasing up to the allotment in a given month shows that for many patients, the 2 ounce per month restriction may cap the amount of medicinal marijuana they would otherwise purchase.

Given that many of the qualifying conditions can be severe, and increase and decrease in severity month to month, patients' demand for relief may change month to month along with their symptoms. For example, a patient with inflammatory bowel disease may have relatively minimal symptoms for several months and then have a period of active disease that would increase their need for treatment with medicinal marijuana and other medications. Or a cancer patient may start a new round of chemotherapy, or face a setback in treatment, for which they need relief.

[3] Olson, Becky. "Chart of the Week: Average Annual MMJ Purchases By State Vary Widely." *Marijuana Business Daily*, 17 Aug. 2015, mjbizdaily.com/chart-of-the-week-average-annual-mmj-purchases-by-state-vary-widely/.

For that reason, it is the Department's estimation that these results point to the need to increase allotments over time to allow more flexibility for physicians and their patients to manage symptoms and conditions that are effectively treated with medicinal marijuana. Furthermore, for terminal patients relying on medicinal marijuana for hospice related care, there should be no limit imposed by the State. That should be entirely dependent on their needs, and their clinicians' judgement.

Because roughly a quarter of all active patients in both years purchased the maximum allotment in at least 1 month, consistent with the Department's Executive Order #6 report, it is recommended to increase the allotment as supply increases and allows for it, and an immediate repeal of the maximum allotment for terminal patients.

Conclusion: The Department finds that the maximum allotment should be increased for all patients.

EVALUATION 2: HAVE ALTERNATIVE TREATMENT CENTERS CHARGED EXCESSIVE PRICES?

MEASURE 1: REGULATED AND ILLEGAL MARKET PRICE COMPARISON

The Department analyzed total sales (in ounces and dollars), gross revenue, total discounts (in dollars), and sales minus discounts (in dollars), to determine the average price per ounce at each individual Alternative Treatment Center, and the aggregate across the entire market. The results were then compared against the crowd-sourced prices of cannabis purchased on the illegal market using data from PriceofWeed.com to determine whether the prices at New Jersey's dispensaries could be considered excessive.

Method: The Department analyzed sales data taken from the Inventory Management Systems (IMS) of New Jersey's Alternative Treatment Centers. The first period studied was the entire year of 2017. The second period was the entire calendar year of 2018. 2018 was included instead of 2016 because the market conditions significantly changed in 2018 and therefore the Department determined 2018 would be a far more accurate representation of current prices than 2016. 2018 provides the best representation of pricing in the market during a significant expansion of the patient population, which is critical to understanding the overall market condition. It provides a good indicator of how the market is responding to increased demand, and what impact that is having on prices. The data used included aggregate gross sales, aggregate discounts, net sales (gross minus discounts), and number of ounces sold during each period. The Department then derived average cost per ounce and average cost per ounce with discounts for each individual ATC, and for the entire market.

The Department included all flower sales in this analysis, including those of shake, or ground up cannabis that is often sold for cheaper prices. This decision was made because many patients resort to shake or "trim" when they can't afford whole flower – so it is a part of total sales. It is worth noting that in other medicinal marijuana markets, trim is generally not sold but is rather used to make extracts. Certain sales, particularly those related to paraphernalia, were excluded to focus just on the medicinal marijuana prices.

Using the data collected, the Department then utilized data from PriceofWeed.com, which compiles crowd-sourced data on the price of cannabis in states across the country, to compare the regulated market prices with prices of the illegal market.

Limitations: 2017 and 2018 were used instead of 2016 and 2017 because 2018 provides a more accurate representation of market conditions post-expansion.

For illegal market prices, there are not many reliable sources of publicly available information on the price of illegal cannabis. The Department conducted an online survey of available sources and determined that "PriceofWeed.com" presented the best data. Accurate data on illegal market prices is naturally hard to get,

which is why PriceofWeed.com has been used in several peer reviewed studies on cannabis. Because of its inclusion in peer-reviewed literature, and the lack of other data, the Department determined it was the best data source available for this study.

However, the data is crowd-sourced and therefore could be subject to manipulation and/or over-reporting by a specific set of users. But even with that limitation, it presents a worthwhile comparison to New Jersey's regulated market prices.

Harmony Dispensary was only included in the 2018 report, as they did not open until July 2018.

Additionally, these prices are aggregated across all product lines and therefore include shake and trim, which are offered in New Jersey as a "value" product to patients, often at a discount. The average cost of an ounce of whole flower would be higher than what is represented in this analysis. To account for this difference, the Department has included a snapshot of prices per ounce of whole flower as a point of comparison:

Price of Whole Flower at New Jersey's ATCs

ATC	*1/8 Ounce Whole Flower Price*	*1/4 Ounce Whole Flower Price*	*Whole Ounce*
Breakwater ATC (Cranbury)	$58.00	$115.00	$460.00
Compassionate Care Foundation (Egg Harbor Twp)	$59.00	$118.00	$472.00
Curaleaf (Bellmawr)	$50.00	$90.00	$360.00
Garden State Dispensary (Woodbridge)	$64.50	$125.00	$500.00
Greenleaf Compassion Center (Montclair)	$65.00	$125.00	$500.00
Harmony Foundation (Secaucus)	$60.00	$120.00	$480.00

Source: ATC Menus; includes NJ sales tax

It's important to note that in competitive medicinal marijuana markets, shake and trim are used for extracts – not sold to patients. However, because the Department wanted to represent actual sales, they were included in this analysis.

Also, it's important to note that the ATC menu includes sales tax, but the analysis taken from the ATC's Inventory Systems in 2017 and 2018 does not. Therefore, the actual cost to patients would be even higher. The Department used price before sales tax to show the actual price received by the ATC and how that compares to the illegal market prices where no sales taxes are paid.

Discussion: The analysis of New Jersey's prices shows that the aggregate average price per ounce before sales tax in 2017 was $381.26 without discounts and $337.60 with discounts. With sales tax, the average prices would be $407.47 without discounts and $360.81 with discounts.

The aggregate average price per ounce in 2018 was $372.51 per ounce without discounts and $338.81 per ounce with discounts. With sales tax, the average prices would be $397.19 without discounts and $361.26 with discounts.

In both years, Greenleaf Compassion Center was the most expensive with and without discounts. Breakwater ATC had the lowest prices without discounts in both years, and with discounts in 2018. Curaleaf had the lowest price without discounts in 2017.

In both 2017 and 2018, Compassionate Care Foundation had the highest discounts, with discounts averaging between 16% and 17% per ounce.

Cost of Medicinal Marijuana in 2017 and 2018

2017

Alternative Treatment Center	Avg Full Price Ounce	Avg Ounce with Discount
Greenleaf Compassion Center	***$448.47***	***$413.24***
Garden State Dispensary	***$413.99***	***$387.69***
Breakwater Dispensary	***$357.41***	***$322.11***
Compassionate Care Foundation	***$400.43***	***$332.00***
Curaleaf	***$358.18***	***$307.32***
TOTAL	***$381.26***	***$337.60***

2018

Alternative Treatment Center	Avg Full Price Ounce	Avg Ounce with Discount
Greenleaf Compassion Center	***$453.54***	***$409.52***
Harmony Foundation	***$455.83***	***$401.87***
Garden State Dispensary	***$412.60***	***$392.30***
Breakwater Dispensary	***$345.22***	***$310.87***
Compassionate Care Foundation	***$365.29***	***$321.22***
Curaleaf	***$349.81***	***$316.51***
TOTAL	***$372.51***	***$338.81***

Using the price data from the ATCs' inventory management systems, the Department compared the average price in the medicinal market year over year to the average price per ounce in the illegal market.

	Illegal			**Regulated**		
State	**Crowd-Sourced Cost***		**Year**	**Price**	**Discounts**	**% Difference**
NJ	$343.52		2017	$381.26		10.99%
			2017	$337.60	x	-1.72%
			2018	$372.51		8.44%
			2018	$338.81	x	-1.37%

Without discounts included, the average prices per ounce on New Jersey's regulated medicinal marijuana market were 11% (2017) and 8% (2018) higher than the illegal market price.

With discounts included, the average price per ounce in New Jersey's medicinal marijuana market were 2% lower (2017) and 1% lower (2018) than the illegal market price.

The Department also compared the crowd-sourced cost with the average prices at New Jersey's individual ATCs. For this, the Department utilized the average price per ounce with discounts, as that calculation represents the actual purchases made by made by patients in the study years.

2017

Alternative Treatment Center	Avg Ounce with Discount	% of Illegal Price
Greenleaf Compassion Center	***$413.24***	120%
Garden State Dispensary	***$387.69***	113%
Breakwater Dispensary	***$322.11***	94%
Compassionate Care Foundation	***$332.00***	97%
Curaleaf	***$307.32***	89%

2018

Alternative Treatment Center	Avg Ounce with Discount	
Greenleaf Compassion Center	***$409.52***	119%
Harmony Foundation	***$401.87***	117%
Garden State Dispensary	***$392.30***	114%
Breakwater Dispensary	***$310.87***	90%
Compassionate Care Foundation	***$321.22***	94%
Curaleaf	***$316.51***	92%

The results of this comparison show that the highest price ATC was roughly 20% higher than the illegal market price in both years, while the lowest price ATC was roughly 10% lower than the illegal market price.

Conclusion: Because the average price with discounts represents the actual money spent by patients in both 2017 and the first half of 2018, the Department finds that the average price during the period studied is roughly equal to the average price on the illegal market. Furthermore, while there is price variation at individual ATCs and prices are higher in places than the illegal market, the Department does not find a 20% difference to be "excessive."

However, because the prices with discounts refer to averages it is worth noting that only about half of the patients in the program qualify for discounts at ATCs. So for patients that qualify for discounts, the price may be on par with illegal market prices, but for patients who do not qualify for discounts, prices may be up to $100 more per ounce than the equivalent illegal market price, depending on which ATC they visit. Additionally we know that patients in New Jersey's program purchase less than patients in a lower priced program like Colorado.

New Jersey patients purchase roughly .5 ounces per month while according to data from Colorado from 2015, CO patients purchased roughly 1.3 ounces per month[4].

Finally, while the actual prices paid with discounts across the entire market – which includes shake and trim – were on par with the illegal market cost, if compared with the menu of whole flower prices (pg 8) we can see that only 1 ATC is even remotely close to the illegal market price (Curaleaf). **5 out of 6 of New Jersey's ATCs charge over $100 more per ounce for whole flower than the average illegal market price.**

It is perhaps this price difference that contributes to the fact that New Jersey's patients purchase considerably less per month than in Colorado, where prices are lower. **For a patient in New Jersey, buying an ounce of whole flower per month without a discount could cost as much as $6,000 per year.**

In an ideal market, prices both before and after discounts would be well below the illegal market. Keeping prices of medical cannabis below the price of illegal cannabis is the best way to ensure patients purchase at regulated dispensaries, under supervision of their physician, instead of via the unregulated illegal market.

Conclusion: ***The Department finds that the ATCs did not charge excessive prices during the time period studied. However, because many patients are paying full cost and the full cost is often above illegal market prices, the Department also found evidence that the high prices in NJ may be artificially suppressing demand from patients. Therefore, lowering prices should be an explicit policy goal of the Division of Medicinal Marijuana. Lowering prices is best accomplished by increasing competition, access and supply in the marketplace, with more options for patients to obtain the therapy.***

EVALUATION 2: REVENUE AT ALTERNATIVE TREATMENT CENTERS

In addition to examining prices, the Department also analyzed total revenue at New Jersey's Alternative Treatment Centers over two years – 2017 and 2018. The Department extracted sales data from the ATCs Inventory Management Systems across the two years for all sales. The sales include flower, extracts, as well as any paraphernalia they might sell. Money collected for sales tax is excluded from this analysis, so this represents actual revenue to each ATC. Harmony opened in 2018 and is therefore excluded from the 2017 report.

2017 ATC Revenue

ATC	Total Revenue
Breakwater ATC	$5,587,010.37
Compassionate Care Foundation Inc	$3,499,533.86
Curaleaf NJ, Inc	$11,905,722.41
Garden State Dispensary	$6,359,566.60
Greenleaf Compassion Center	$2,035,777.78
TOTAL	**$29,387,611.02**

[4] Olson, Becky. "Chart of the Week: Average Annual MMJ Purchases By State Vary Widely." *Marijuana Business Daily*, 17 Aug. 2015, mjbizdaily.com/chart-of-the-week-average-annual-mmj-purchases-by-state-vary-widely/.

2018 ATC Revenue

ATC	Total Revenue
Breakwater ATC	$10,900,845.35
Compassionate Care Foundation Inc	$4,905,560.61
Curaleaf NJ, Inc	$19,144,246.69
Garden State Dispensary	$11,814,608.23
Greenleaf Compassion Center	$3,644,321.30
Harmony Dispensary	$3,038,975.17
TOTAL	**$53,448,557.35**

Discussion: From 2017 to 2018, total sales revenue at New Jersey's Alternative Treatment Centers almost doubled, rising from $29 million in 2017 to $53 million in 2018. While revenue alone does not indicate profitability, the high revenue in 2018 points to a significant increase across the entire market that bears further study. For that reason, the Department intends to further study the costs associated with running an Alternative Treatment Center in New Jersey. If these revenues do in fact represent profitability, then it begs the question as to whether profitability at New Jersey's ATCs will eventually result in lower costs for patients. To date, that does not appear to be the case.

In order to better assess the relationship between price and revenue, the Department may consider requiring audits of ATCs under N.J.A.C. 8:64-13.8 for the next biennial report. Additionally, the Department will look at different product lines, like extracts versus flower, to better understand the costs with producing a particular type of medicinal marijuana and how that relates to profitability.

Conclusion: Revenues at ATCs nearly doubled in 2018, rising from $29 million to $53 million, but the Department needs more information to determine whether revenues far exceed costs and point to excessive pricing.

EVALUATION 3: ARE THERE SUFFICIENT NUMBERS OF ALTERNATIVE TREATMENT CENTERS?

MEASURE 1: CURRENT MARKET ASSESSMENT

Since the Department announced an expansion of the conditions available for treatment with medical cannabis at the end of March 2018, there has been a significant expansion of the patient population which has also led to an expansion in the need for cultivation capacity in New Jersey's market. Since that expansion began, the Department has been monitoring overall supply. Based on this monitoring, during the study period the Department observed that while the market has been keeping pace with demand globally, there have been shortages at individual ATCs.

Methods: Using historical inventory data extracted from the inventory management systems of the ATCs, the Department looked at overall inventory trends from June to December 2018. The Department analyzed:

- Total inventory of flower, extracts and shake delineated by product line;
- Total inventory aggregated
- Total cannabis plants

- Inventory by ATC

Market Keeping Pace with Demand Globally

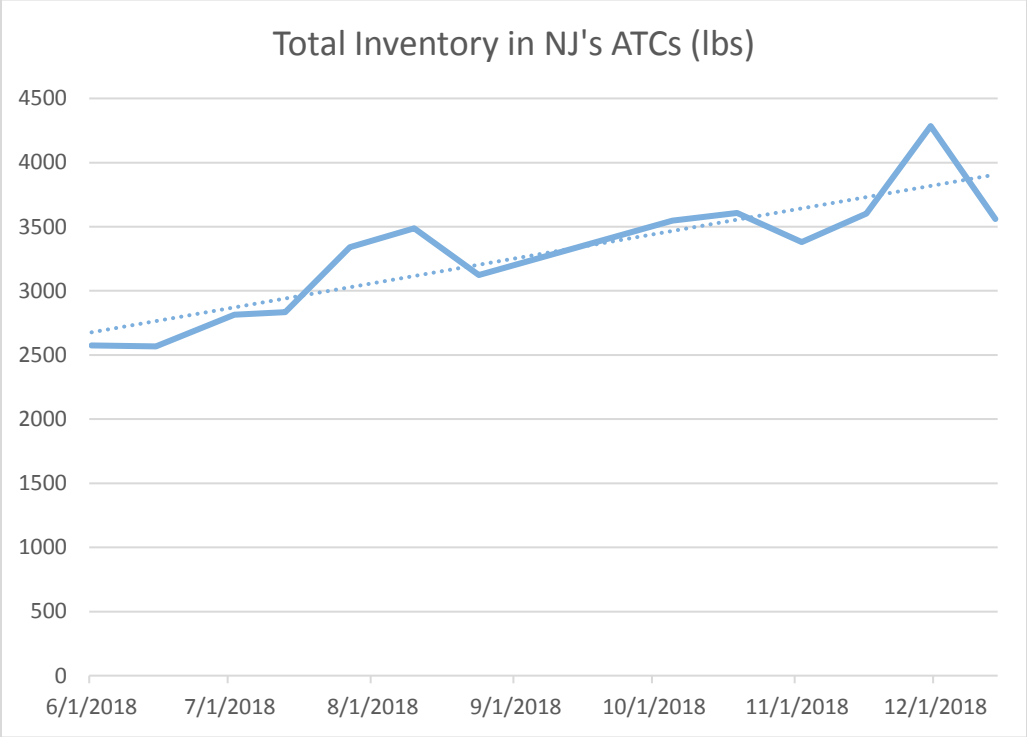
The Department has been consistently monitoring overall inventory to ensure there are not global shortages. On the following page are two longitudinal looks at overall inventory in the New Jersey Medical Marijuana Program.

The first graph shows the total inventory of products in the market between June and December of 2018. This includes flower, shake and extracts, as well as both packaged and bulk product.

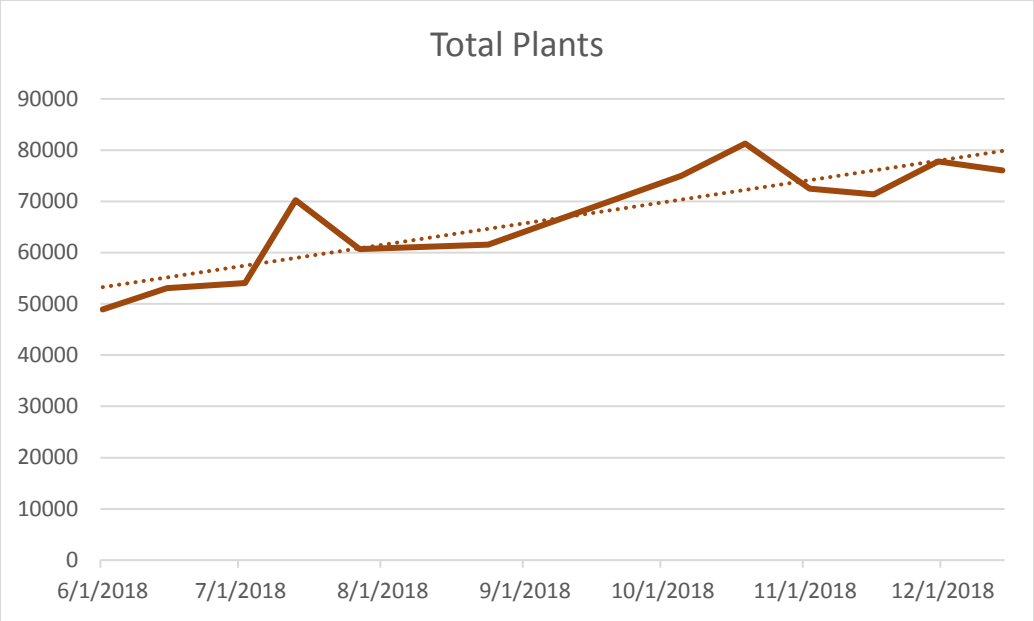
The second shows the number of plants being cultivated by ATCs in New Jersey over the same time period.

Total inventory has fluctuated since the beginning of summer 2018, initially trending up sharply from July to September, and then slowly trending down from September to November before a sharp increase and corresponding decrease at the end of the year.

Additionally, total plants in the market have been trending up gradually over time, helping to keep pace with growing demand.



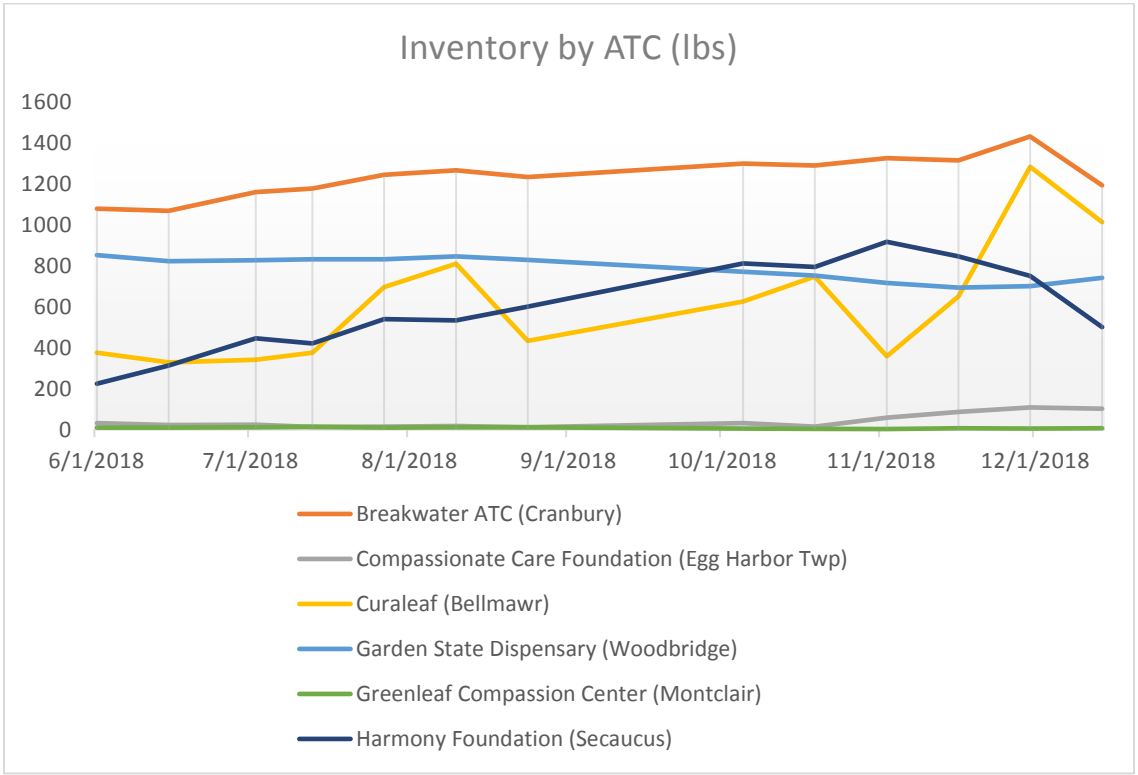
Source: MMP Inventory Reports



Source: MMP Inventory Reports

Regional and periodic issues with supply have occurred.

Even with global supply keeping pace with demand, the Department has seen shortages at certain ATCs since the beginning of the summer, and with only 6 operating ATCs, the effects of those shortages become more problematic for patients. Additionally, inventory numbers vary widely from ATC to ATC.



Source: MMP Inventory Reports

Looking at total inventory, neither Greenleaf Compassion Center nor Compassionate Care Foundation eclipsed 200 lbs of total product from June to December of 2018.

During the study period, Compassionate Care Foundation had a range of between 12 and 102 lbs of product on-hand and an average of 41 lbs, while Greenleaf had a range between 5 and 12 lbs of product on hand and an average of 8 lbs on-hand.

Every other ATC in New Jersey had an average inventory of close to or over 500 lbs during same time period.

Discussion: Since the Department enacted reforms to New Jersey's Medicinal Marijuana Program, the program has seen significant expansion, with the patient population growing to more than twice what it was in January 2018. Globally the market has been able to keep pace with demand, however, there have been shortages at individual ATCs and the expansion is starting to strain the market. The shortages have pointed to a need for additional capacity, especially where existing ATCs have struggled to keep up with increasing demand.

Even with an average inventory of over 500 lbs at three of six ATCs, the Department has received reports from all six ATCs that at times throughout the study period they limited patients to a specific purchase amount to ensure they did not run out of supply. In some cases that related to specific strains of medicinal marijuana, in other cases it related to their entire inventory.

While there is an expectation that in-demand products could be limited even in a well-supplied market, overall caps on purchases due to supply issues point to a need for additional ATCs to help meet the demand of the continually expanding patient population.

Conclusion: Globally, the market is keeping pace with demand, but individual ATCs have struggled to keep pace with a growing patient population, and every ATC limited patients' purchases at points during the study period. ***Therefore, the current market assessment points to the need for additional alternative treatment centers.***

MEASURE 2: FUTURE MARKET ASSESSMENT

Beyond looking at current production, the Department also utilized a few projections to determine potential program growth over the next several years. This allows the Department to assess future licensing needs in terms of potential numbers of cultivation sites, beyond just answering the question of whether more ATCs are needed.

For context, here is a snapshot of permitted cultivation space in New Jersey at the close of 2018:

Permitted Cultivation Capacity (2018)

Total Square Feet of Permitted Cultivation Space	105,437
Average Capacity in Sq Ft Per ATC (6 ATCs)	17,573

Methods: The Department utilized two models for this exercise. The first, titled "Status Quo Scenario" is a conservative model that uses enrollment from the last 6 months in 2018 to set an expected growth month over month and uses that growth rate in perpetuity. It is intended to set an absolute "floor" (or lower bound)

expectation as to the minimum cultivation capacity needed to supply the medical cannabis market in New Jersey.

It must be emphasized the Status Quo Scenario is only meant as a reference point. The assumptions of the Status Quo Scenario – high prices, few suppliers, a small change in the number of physicians in the program, no action by the Legislature to provide relief for patients, and no additional action by the Department to alleviate regulatory issues – would be unacceptable for patients if such conditions were to continue in perpetuity.

The second model, titled "Executive Order #6," is more conceptual and makes some assumptions as to what may happen should all of the Department's Executive Order #6 recommendations be implemented – including some additional reforms that have been recommended to the Legislature since the publication of the report in March. Most importantly, the list includes patient-focused reforms that would make it easier for patients to enroll and stay enrolled in the program. This model is meant to set a more realistic expectation as to what a mature medical cannabis market in New Jersey would look like, and what the necessary cultivation capacity would be to supply that market.

The patient-focused reforms that are most critical to driving enrollment and future demand are:

- **Expand the number and types of health care professionals able to recommend medicinal cannabis.**
- **Make regulatory changes to emphasize that physicians only need to see a new patient once to certify them for the use of medicinal marijuana (The current rules from the Board of Medical Examiners give physicians the option to require 4 visits for new medicinal marijuana patients, which is overly burdensome for patients)**
- **Eliminate the requirement that patients see a physician every 90 days.**
- **Increase monthly purchase limits for all patients, and eliminate limits for terminal patients.**
- **Allow edibles for all patients and increasing access to extracts.**
- **Allow medical cannabis as a first-line treatment for all qualified conditions.**
- **Eliminate the sales tax.**
- **Lower prices by increasing supply.**

For the second model, the Department analyzed growth rates in other states with either new or expanded medicinal marijuana programs and combined those findings with program history to develop an educated guess as to projected growth rates in the future should NJ continue to reform our program.

The growth rate in the "Status Quo Scenario" model is an increase in total enrollment by just under 2,500 patients per month. This growth rate was determined by measuring the growth month over month from May 2018 to December 2018. The growth per month was then averaged over 8 months, and then an attrition factor was applied to account for patients dropping out of the program. The attrition rate is derived from actual attrition in the program.

Status Quo

New Patients Per Month (avg): 2,944

Monthly Attrition as a Percentage of New Patients: 17%

Registry Growth Per Month (avg): 2,444

Per Month Allotment: 2 ounces

EO6

The growth rate in the "Executive Order #6" model starts at the same rate as the Status Quo model but increases gradually to a month-over-month increase in patient in the registry of just over 4,000 patients.

New Patients Per Month (upper and lower bounds): 2,944 – 5,500

Monthly Attrition as a Percentage of New Patients: 10-17% (starting high and trending lower)

Registry Growth Per Month (upper and lower bounds): 2,444-4,950

Per Month Allotment: 2 ounces initially, increased to 3 ounces.

In both models, the Department took the projected enrollment and then used those numbers to project max cultivation capacity needed. The formula for projecting that capacity was:

Formulas for Determining Needed Cultivation Capacity

Maximum Demand Annualized (lbs) = [Enrollment * Purchase Limit (oz) * 12 months]/16 (oz per lb)

Total Cultivation Capacity =

[Maximum Demand * 454 (grams per lb)]/(Avg Yield per Sq Ft * Avg Harvests per Sq Ft in 1 year)

In this calculation, Average Yield Per Sq Ft was roughly 40 grams, which is sourced from the BOTEC Report commissioned by Washington State[5]. The Average Harvests per Sq Ft in 1 year used was 5, which was based on program experience and a survey of publicly available cultivation methods and data.

For the max demand calculations, the Department used 2 ounces per month in the Status Quo model, and an increase over time from 2 ounces per month to 3 ounces in the EO6 model.

In both models, the Department then estimated the numbers of cultivation sites needed at different levels of capacity. The Department estimated for average cultivation capacities of 17,753 sq ft, 20,000 sq ft, and 30,000 sq ft. The current market average is 17,753 sq ft per facility, with just over 100,000 sq ft of licensed cultivation space (as of the end of 2018), which is why that tier was included in the analysis.

Limitations: While the Status Quo model is based on historical program data, there are some variables that could cause the floor to increase that are not factored in to this calculation. Primarily, because physicians are the gatekeepers to the program, if physicians start to enroll at a higher rate that will bump up patient enrollment beyond these projections. Furthermore, once new alternative treatment centers open the mere

[5] Caulkins, Jonathan, et al. "Estimating Adequate Licensed Square Footage for Production." *BOTEC ANALYSIS CORPORATION*, pp. 1–11., lcb.wa.gov/publications/Marijuana/BOTEC reports/5a_Cannabis_Yields-Final.pdf.

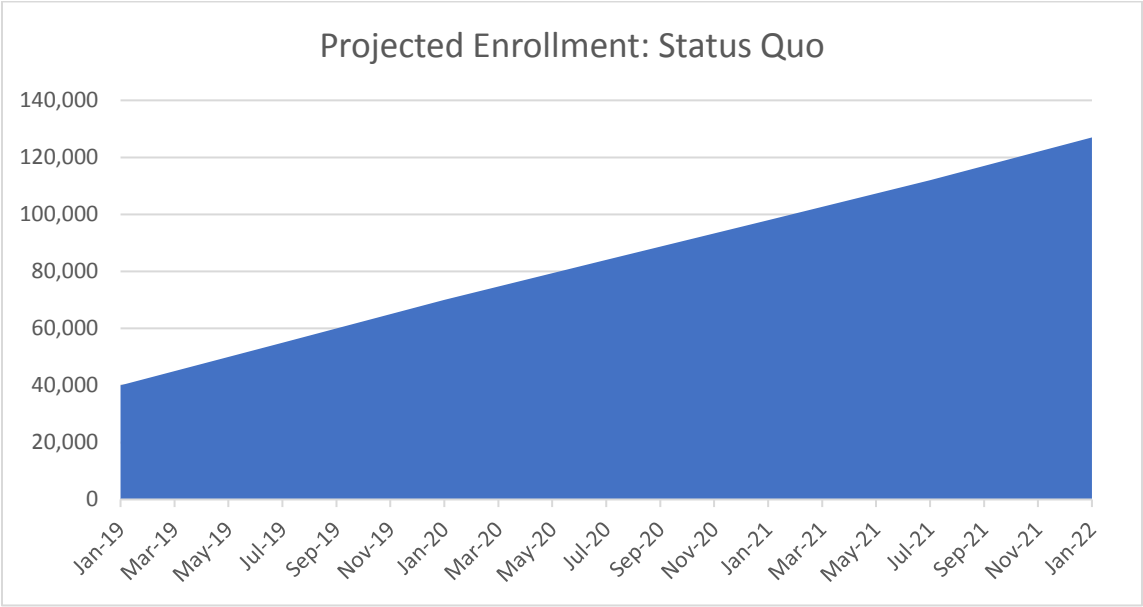
fact of having more access points, more competition and greater product variety will lead to a bump in enrollment.

For the "Executive Order #6" model, the main limitation relates to the projected increase in the patient population. Enrollment rates in new medicinal marijuana programs, and immediately following policy changes have been all over the map, and range as high as 10,000 patients per month. For this model, the Department chose to show a gradual increase in month over month enrollment to reach a total increase of just over 4000 patients each month, which is a conservative approach when looking at enrollment in newer, more liberalized medical marijuana programs. It is very possible that these projections are too low. It is also possible they are too high – which is why the Department included the "status quo" model as a minimum assessment of future cultivation needs.

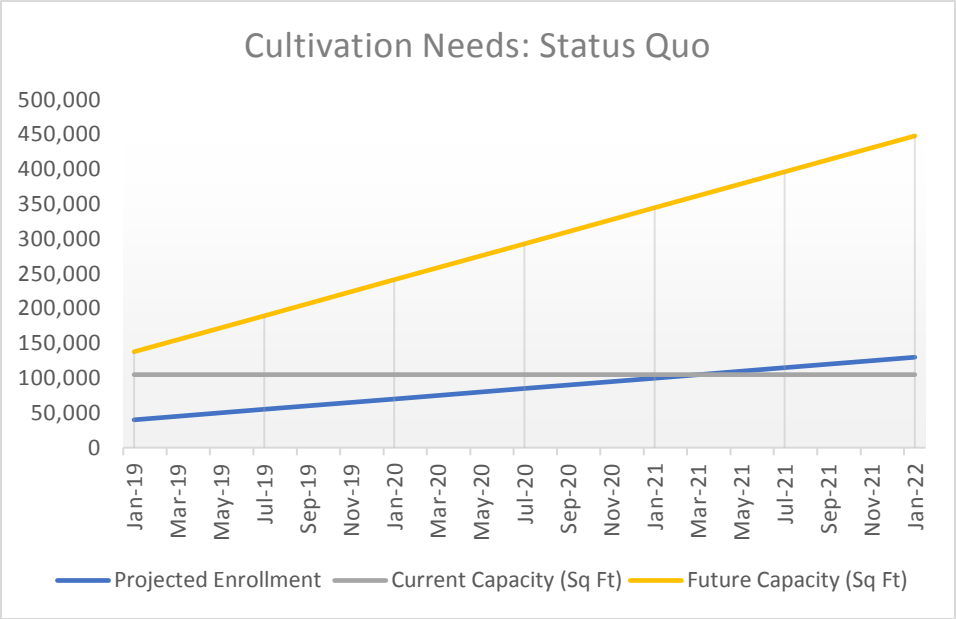
It is important to note that these models reflect maximum demand in the market based on the projected enrollment. Actual demand may very well be lower. But the Department chose to use this approach to allow an estimate of what sort of licensed capacity would be needed to accommodate a growing patient population and potentially growing demand from existing patients due to policy changes. This also removes the need to factor in calculations for average utilized space versus unutilized space within facilities, or to add a factor to allow for excess capacity in every licensed facility to accommodate unexpected program growth. Finally, this approach also accommodates the inevitability that extracts will play a much more dominant role in the market. Extracts require a greater amount of plant material to produce and will result in additional cultivation capacity needed across the entire market. By estimating up to the maximum demand, these models build in that needed excess capacity.

Model 1: Status Quo Scenario

Enrollment Growth



Growth in Cultivation Capacity



Status Quo: Enrollment Growth vs Cultivation Needs

Month	Projected Enrollment	Future Capacity (Sq Ft)
Jan-19	40,000	137,924
Jul-19	55,000	189,646
Jan-20	70,000	241,367
Jul-20	84,000	289,641
Jan-21	98,000	337,914
Jul-21	112,000	386,187
Jan-22	127,000	437,909

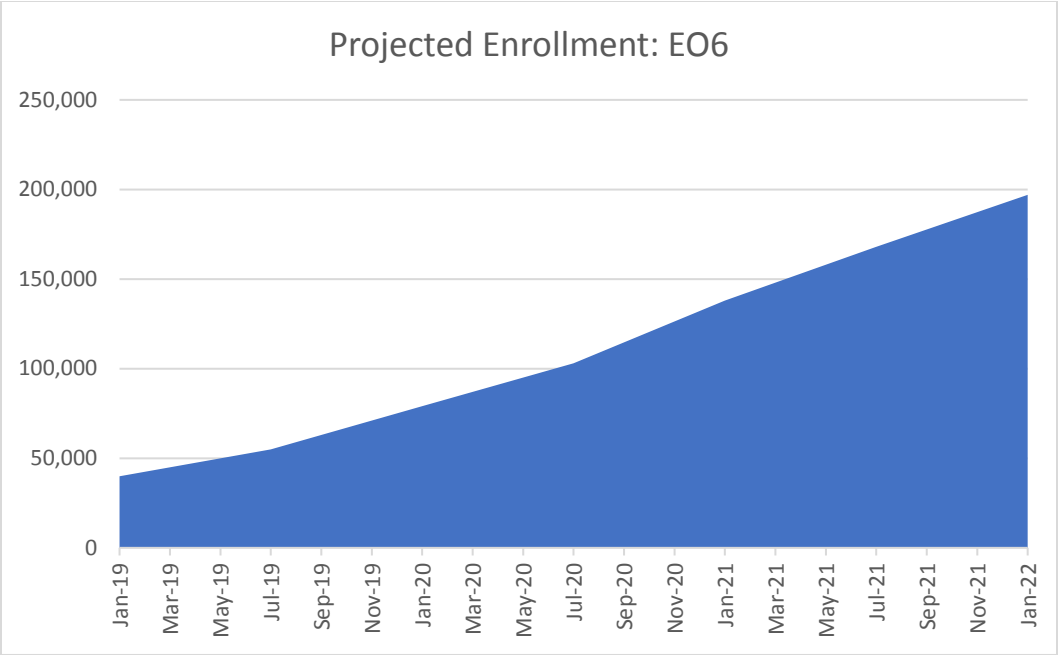
Status Quo: Number of Cultivation Facilities Needed by Average Facility Size

Month	17,573 sq ft[6]	20,000 sq ft	30,000 sq ft
Jan-19	8	7	5
Jul-19	11	9	6
Jan-20	14	12	8
Jul-20	16	14	10
Jan-21	19	17	11
Jul-21	22	19	13
Jan-22	25	22	15

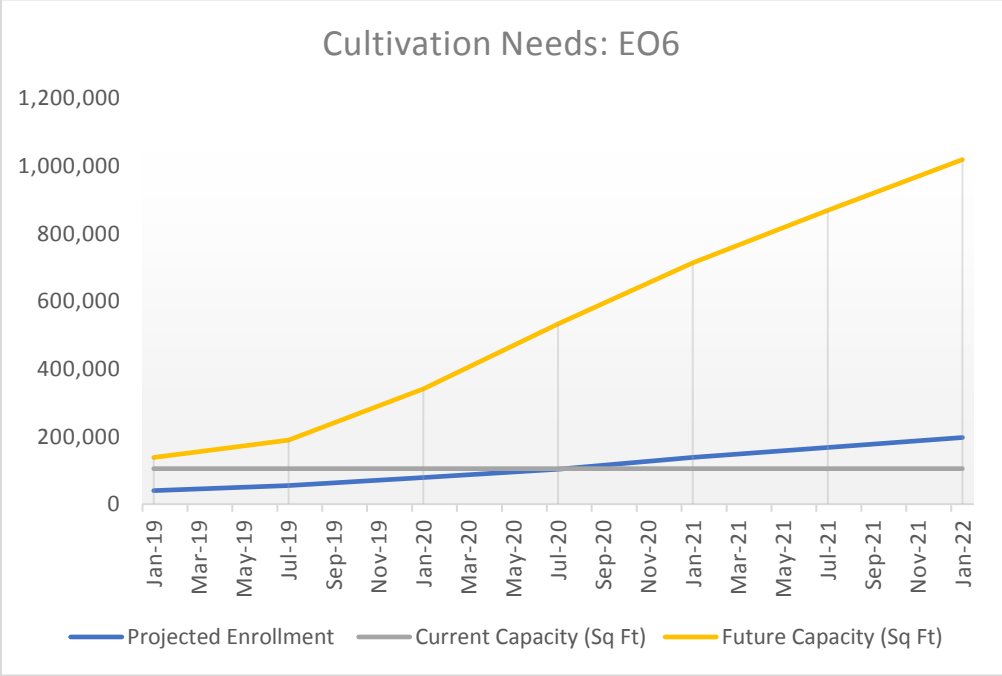
[6] Average cultivation facility size in NJ in 2018.

Model 2: Executive Order #6

Enrollment Growth



Growth in Cultivation Capacity



EO6: Projected Enrollment vs Needed Capacity

Month	Projected Patient Enrollment	Future Capacity (Sq Ft)
Jan-19	40,000	137,924
Jul-19	55,000	189,646
Jan-20	79,000	340,500
Jul-20	103,000	532,732
Jan-21	138,000	713,757
Jul-21	168,000	868,922
Jan-22	197,000	1,018,914

EO6: Number of Cultivation Facilities Needed by Average Facility Size

Month	17,573 sq ft[7]	20,000 sq ft	30,000 sq ft
Jan-19	8	7	5
Jul-19	11	9	6
Jan-20	19	17	11
Jul-20	30	27	18
Jan-21	41	36	24
Jul-21	49	43	29
Jan-22	58	51	34

Discussion: Both scenarios strongly support the need for additional cultivation capacity in New Jersey, and thus the need for additional ATCs.

The absolute floor in both analyses is 15 sites (30,000 sq ft average capacity, Status Quo model). The ceiling for needed cultivation sites is 58, which is based on the 2018 New Jersey ATC average facility size in the E06 model.

The problem with the floor projection is that starting with 30,000 sq ft of average capacity represents a concentrated market in terms of suppliers, which could present challengers for smaller operators, and favor larger entities. Additionally, with so few suppliers, should one fail it could have severe negative impacts on patient access. Plus, limited competition in the market results in what we have now – high prices, fewer products, and a lack of patient choice.

That is why looking at this data two numbers and dates are especially notable: the Status Quo model projects there would need to be 25 cultivators by 2022, with the average capacity of the current ATCs. The EO6 model projects that 24 cultivators would be able to supply the market with an average capacity of 30,000 sq ft per

[7] Average cultivation facility size in NJ in 2018

cultivator by 2021. That means that regardless of the model, **the need for at least 24 cultivation sites for medicinal marijuana demand alone is supported by the data**.

However, if some of the more onerous statutory requirements are eliminated for patients, New Jersey could need significantly more cultivators than that – depending on the average size.

Conclusions: Both future market assessment models support the need for additional Alternative Treatment Centers. Plus, both models support the need for at least 24 cultivation sites total for the medicinal marijuana market alone. However, if facilities maintained the current average cultivation capacity in the market, New Jersey could require more than 50 cultivation sites to meet medicinal marijuana patient demand in several years. It is imperative that the number of cultivation sites is expanded in order to keep pace with demand.

MEASURE 3: NETWORK ADEQUACY DRIVE TIME ANALYSIS

Beyond cultivation capacity, the Department also sought for this report to analyze the network adequacy of the current distribution of dispensaries. Using sophisticated mapping software, the Department mapped the six operational ATCs and used an algorithm to determine all areas within the state that are a 30 minute distance or less from those locations.

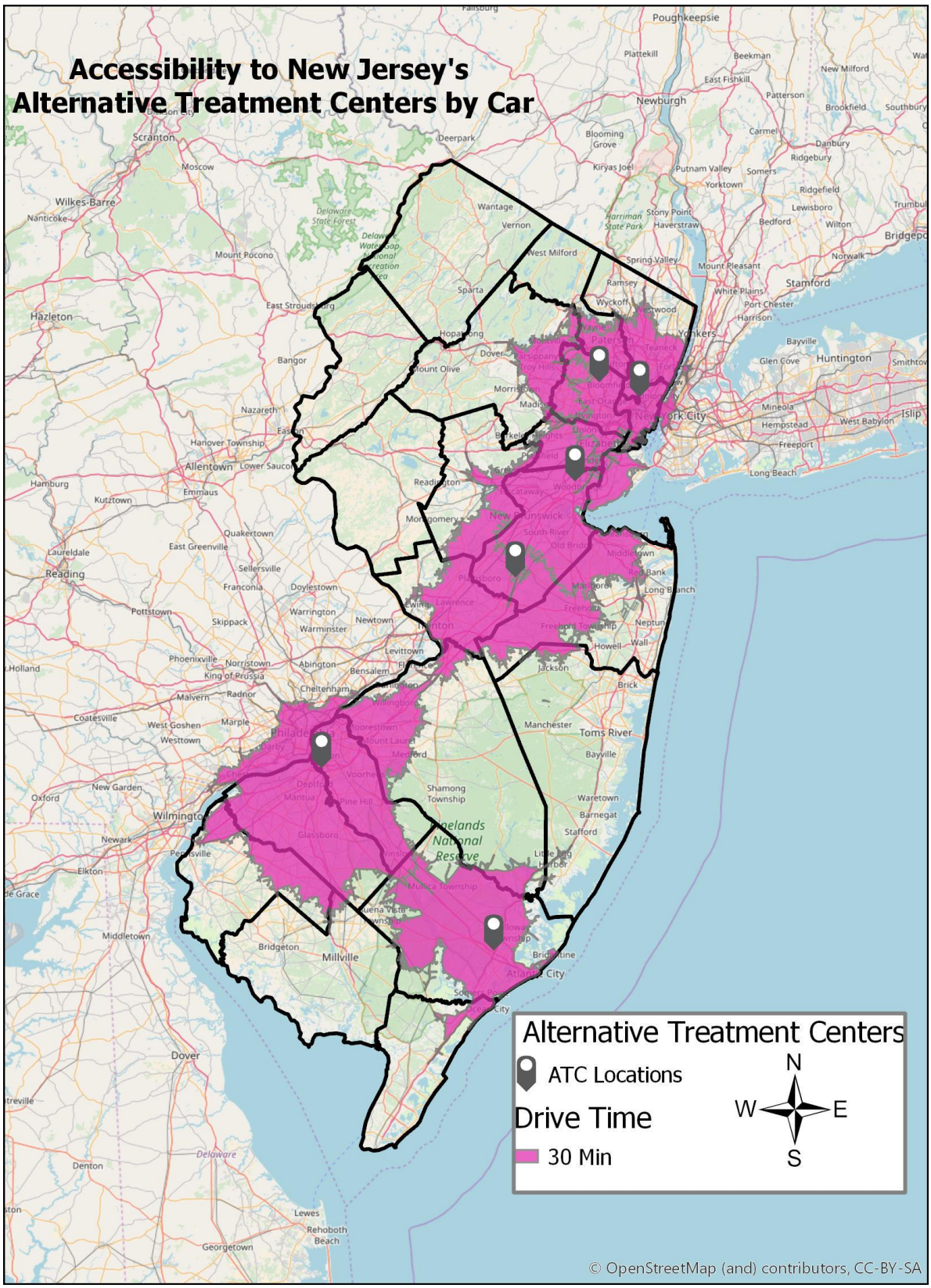
Method: The Department utilized Geographic Information System (GIS) mapping software to first plot the ATCs, and then overlay analysis of drive times. The Department utilized 30 minutes as the measure, as this is a measure commonly used for high volume specialty care in healthcare more broadly.

The Department conducted two simulations using this software. First, the Department analyzed 30 minute drive times from all ATCs. Second, the Department analyzed 30 minute drive times from all ATCs that sold extracted products.

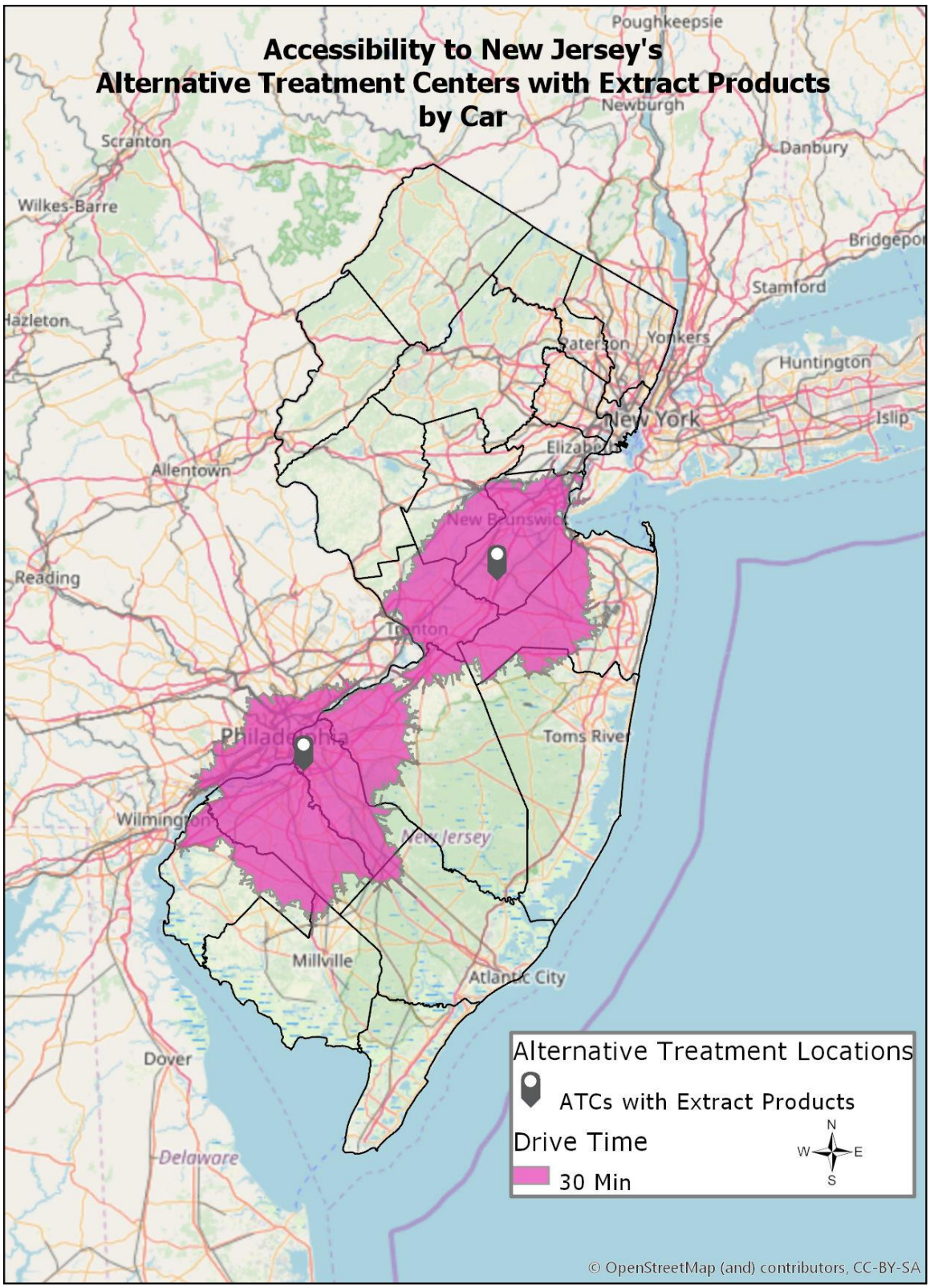
The second analysis was included for two reasons: first, because there are many patients in the program who rely on non-smokable forms for their treatment, and these patients tend to suffer from the most debilitating conditions; and second, because the Department encourages physicians to emphasize non-combustible forms because they can pose an even lower risk profile than smokable cannabis for patients. For example, patients with ALS who can no longer physically smoke must rely on lozenges, oils, and topicals for their treatment.

Limitations: The algorithm used to determine drive time presents a “best case” scenario with light traffic. Depending on the volume of traffic, the service areas could be significantly lessened, particularly in more densely populated areas like the northeastern New Jersey by New York City.

Map 1: All ATCs



Map 2: ATCs with Extracted Products



Discussion: According to the drive-time analysis, there are several large gaps in coverage related to ATCs. The four highest priority by population and patient population are far northeastern New Jersey (Bergen/Passaic), western and northwestern (Warren/Sussex/Hunterdon), central/eastern (Burlington/Ocean/Monmouth), and far south (Cumberland/Salem/Cape May).

Additionally, because only two New Jersey ATCs have extracted products (Breakwater in Cranbury, and Curaleaf in Bellmawr), if a patient wanted to take a non-smokable application of medicinal marijuana, the access map would be much more dire, with additional holes encompassing the entire Northern Region as well as the entire eastern portion of the Southern Region. This presents a significant problem for some of the program's most vulnerable patients – those individuals that can't smoke for medical reasons. These individuals may need to travel hours to get their medicine since there are only two sites in the state that have extracted, non-smokable forms.

With the recent announcement of awardees from the July 2018 Request for Applications (RFA), the Department expects to improve access significantly in Bergen, Passaic, Warren, Hunterdon, Burlington, Cumberland, Salem, Atlantic, and Cape May counties. The new awardees will also buttress areas where supply has struggled to keep pace with demand, including Atlantic County and Essex and eastern Morris counties, and expand access to extracted non-smokable products where that access did not previously exist.

Even with 6 more Alternative Treatment Centers in the permitting process, gaps in service areas will remain and therefore according to Measure 3, additional dispensary sites are needed, especially in targeted areas throughout the state.

Conclusion: The network adequacy drive time supports the need for additional alternative treatment centers.

MEASURE 4: ASSESSING THE NEED FOR DISPENSARIES STATEWIDE

Measure 3 clearly demonstrates a need for more dispensaries in New Jersey, but does not provide insight into how many are needed. The Department utilized a survey of publicly available data on the number of dispensaries in states with medicinal marijuana programs and used that data to extrapolate a projection for the number of medical dispensaries needed in New Jersey.

Method: Easily searchable pubicly available data on the number of dispensaries is severely limited. However, the Department compiled data from states that regulate medicinal marijuana programs, and in cases where the data was not available, the Department used what existing public sources were available to show the number of dispensaries per state. Then the Department used Census data from 2017 to show population data for each state with a medical marijuana program. The population was then divided by the number of dispensaries to show population per dispensary. Once that was determined, the average population per dispensary was then applied to New Jersey's total population to determine how many dispensaries New Jersey should reasonably have to serve the entire population.

Limitations: Because the data was pulled from disparate sources, some numbers may be outdated or slightly innacurate. Additionally, because there are states that license a single dispensary but allow for multiple sites, the actual number of locations may be higher in some of these instances. Nonetheless, this is still a suitable cross-section of the medical marijuana markets around the country. Finally, the Department did not remove potential outliers from this analysis. States with either exceptionally low or exceptionally high numbers of

dispensaries could be considered outliers. However, given that New Jersey itself is an outlier in that respect with only 6 active dispensaries for a population of over 9 million, and because the analysis was an average (mean), the Department used all programs for which data was collected.

Total Medical Dispensary Needs in New Jersey:

State *only medical sites counted	**Medical Dispensaries**	**Population**	**People per Dispensary**
Arizona	99	7,016,270	70871
California*	516	39,536,653	76621
Colorado*	474	5,607,154	11829
Connecticut	21	3,588,184	170866
Delaware	2	961,939	480970
D.C.*	5	693,972	138794
Florida	82	20,984,400	255907
Hawaii	6	1,716,943	286157
Illinois	55	12,346,948	224490
Louisiana	10	4,684,333	468433
Maine*	8	1,335,907	166988
Maryland	76	6,052,177	79634
Massachusetts*	42	6,859,819	163329
Michigan	39	9,962,311	255444
Minnesota	8	5,576,606	697076
Montana	120	1,050,493	8754
Nevada*	64	2,998,039	46844
New Hampshire	4	1,342,795	335699
New Mexico	78	2,088,070	26770
New York	40	19,849,399	496235
North Dakota	8	755,393	94424
Ohio	60	11,658,609	194310
Oregon*	4	4,142,776	1035694
Pennsylvania	50	12,805,537	256111
Rhode Island	3	1,059,639	353213
Vermont	5	623,657	124731
Virginia	5	8,470,020	1694004
Washington*	170	7,405,743	43563
Average Population/Dispensary			**102029**
New Jersey	6	9,005,644	1500941
Dispensaries Needed to Serve NJ Population	**88**		

Discussion: According to this analysis, when looking at medical programs across the country, the average population per dispensary is just under 100,000. When applying that to New Jersey's population, it shows that New Jersey should have 90 medical dispensaries to serve our population.

Further, if full enrollment in the Medical Program is expected to be around 180,000 patients, that means that 90 dispensaries would equate to roughly 2,000 patients per dispensary.

Using 2,000 patients per dispensary as the goal, and applying that to the previous projections of enrollment growth, by the beginning of 2021, New Jersey will need between 50 and 70 operational dispensaries to serve the growing patient population.

Based on this analysis, New Jersey will need to rapidly expand the number of dispensaries in the coming years to keep pace with demand.

Conclusion: The analysis of average population per dispensary supports the conclusion that more ATCs are needed. To serve New Jersey's population, the Department estimates that roughly 90 medicinal marijuana dispensaries are needed.

CONCLUSION

Pursuant to N.J.S.A. 24-6I-12, the Department issues the following report to the Governor and to the Legislature with the following conclusions:

- The 2 ounce per month statutory allotment for qualified patients is not sufficient and should be raised.
- New Jersey's ATCs did not charge excessive prices, but high prices are likely artificially suppressing demand among qualified patients. **Lowering prices must be an explicit goal for policymakers and the Department. The best way to lower prices is to expand supply, access and competition.**
- There is a strong need for additional ATCs, even with 6 more in the permitting process. **The absolute minimum number of cultivation sites needed to meet projected patient demand for medicinal marijuana in the future is 24, plus over 50 dispensary sites.**