



**2021**

**Recreational Marijuana  
Supply and Demand  
Legislative Report**

Oregon Liquor Control Commission

February 1, 2021

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## Executive Summary

Pursuant to [ORS 475B.548](#), the Oregon Liquor Control Commission (OLCC) is required by law to report to the Legislature the amount of marijuana produced by Recreational Producers and bought by consumers in Oregon from Recreational Retailers. The 2021 edition of the biennial Supply & Demand Report also includes an analysis of Oregon Medical Marijuana Program (OMMP) demand based on data entered into the Cannabis Tracking System by larger medical grow sites. This report does not analyze personal home grow marijuana nor the illicit market.

This report finds that since the study period of the 2019 Supply & Demand Report, production has increased by 78% while the amount of cannabis sold increased by 150%. This comparatively larger increase in consumption has helped boost demand from 50% of total annual supply to 65%.

The Oregon cannabis market has achieved a more sustainable price level for Producers while consumer prices have remained low. However, aggregate supply continues to exceed annual demand, despite a historic level of sales in Oregon in the months following COVID-19. While the supply of usable marijuana has tightened, the supply of cannabis extracts and concentrates, which are comparatively shelf-stable and have been buoyed by cheap input prices, have remained abundant.

The growth trajectory of cannabis demand in 2021 and beyond is highly uncertain. If not for COVID, growth in demand in 2020 would have almost certainly been flatter. If consumers return to the patterns of consumption they exhibited pre-COVID, demand will almost certainly decline or flatten in 2021. If, however, at least some aspect of COVID-era consumption persists as a “new normal,” demand will likely remain stable or increase. In either case, demand in 2021 is unlikely to exhibit the same levels of growth that 2020 saw.

Supply, on the other hand, will almost certainly grow at higher rates in 2021. Although Senate Bill 218 in the 2019 Legislative Session established a moratorium on Producer licenses, the law only affects applications submitted after June 15, 2018; the OLCC is still processing the final batch of applications received by that deadline. The number of issued Producer licenses increased by only 30 between December 2019 and December 2020 – but due to efforts by the OLCC to clear its application backlog, this number may grow by as much as 100 before April 2021. The amount of cannabis harvested in 2020 increased by 37% compared to 2019, and a growth in Producer licenses will continue this trend of increasing supply.

With the prospect of increasing supply, flattening growth in demand, and a large pre-existing baseline of extract/concentrate inventory, it is unclear how long the market’s healthy balance will continue to play out. If demand flattens or declines at the same time that supply continues to rise, competition among Producers may drive wholesale prices back into the price spiral seen in late 2017.

Oregon cannabis licensees have proven themselves adaptable and resilient, whether in the face of price shocks, historic wildfires, or a once-in-a-century pandemic. Regardless of what happens over the next two years, the current state of the OLCC cannabis market is much improved over early 2019. And as the last two years have shown, licensees are likely to adapt to any challenges that arise.

To obtain a paper copy of this report contact the Oregon Liquor Control Commission’s Recreational Marijuana program at [marijuana@oregon.gov](mailto:marijuana@oregon.gov). Published online at <https://marijuana.oregon.gov> under the “Legislative Reports” header.

## Introduction

Pursuant to ORS 475B.548, by February 1 of each odd-numbered year the Oregon Liquor Control Commission (OLCC), which licenses and regulates production and sales of recreational marijuana in Oregon, must submit a report to the Legislative Assembly on the following:

*the approximate amount of marijuana produced by marijuana producers that hold a license issued under ORS 475B.070 and the approximate amount of marijuana items sold by marijuana retailers that hold a license issued under ORS 475B.105, and whether the supply of marijuana in this state is commensurate with the demand for marijuana items in this state.*

At the time of last biennium's Recreational Marijuana Supply & Demand report (submitted to the Legislature on January 31, 2019),<sup>1</sup> OLCC licensees faced daunting challenges: wholesale prices were at all-time lows, annual supply was double annual demand, the market contained a significant amount of inventory stock that had accumulated year-over-year, and pending applications for additional Producer licenses would have represented a further doubling of annual harvest yield (had those licenses been issued).

In the intervening two years, the market conditions for those operators that have weathered the challenges are significantly brighter. COVID-19 certainly brought its own set of challenges, but substantial growth in consumer demand in spring and summer within the regulated OLCC cannabis market resulted in \$1.1 billion in total sales during 2020. This rise in demand, both due to COVID-19 and routine year-over-year increases since the Oregon cannabis market's inception, has contributed to the wholesale price of usable marijuana flower sold at retail to recover to levels last seen in late 2017. The recovery of wholesale prices (for usable marijuana) has occurred at the same time that retail prices for consumers have remained at or below \$5.50 per gram for nearly every month since July 2018.

However, much of the future of supply and demand in the OLCC marketplace remains uncertain. Demand spiked in the spring and summer following Oregon's "stay home, stay safe" orders amid an influx of federal relief money to consumers via increased unemployment insurance payments and federal stimulus checks. If this rate of growth in demand can be sustained, even partially, then businesses will likely continue to experience this more stable market environment. If, however, this level of growth in demand proves unsustainable, market conditions for OLCC licensees may deteriorate. Moreover, OLCC's processing of the backlog of pending applications has reached those applications submitted in June 2018; as of January 8, 2021, 117 "pre-moratorium" producer applications for new licenses were assigned to OLCC license investigators.<sup>2</sup> Based on proposed square footage, these applications would increase the total recreational productive capacity by nearly 11%.

In short, the OLCC cannabis marketplace has a significantly brighter, albeit unpredictable, outlook for OLCC licensees in January 2021 than in January 2019 while continuing to offer the illicit market steep competition.

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<sup>1</sup> Oregon Liquor Control Commission. "2019 Recreational Marijuana Supply and Demand Legislative Report." January 31, 2019.

[https://www.oregon.gov/olcc/marijuana/Documents/Bulletins/2019%20Supply%20and%20Demand%20Legislative%20Report%20FINAL%20for%20Publication\(PDFA\).pdf](https://www.oregon.gov/olcc/marijuana/Documents/Bulletins/2019%20Supply%20and%20Demand%20Legislative%20Report%20FINAL%20for%20Publication(PDFA).pdf).

<sup>2</sup> This reflects applications pending for new licenses; it excludes Change of Ownership applications.

## Results and Methods

This section of the report provides a brief overview of the methodology and primary findings of the analysis. Later sections of the report evaluate supply and demand conditions, as well as the characteristics of the current inventory stock. Based on data recorded in the Cannabis Tracking System by Oregon Medical Marijuana Program growers since June 2018, this report also includes an appendix that analyzes medical marijuana supply and demand.

Using data on sales and harvests in the Oregon Cannabis Tracking System, the OLCC estimates that between January and December 2020, OLCC Producers harvested 7.66 million pounds of wet cannabis, and 65% of that supply was purchased by consumers. This is a significant increase from the prior report's estimate demand being 50% of supply over the July 2018 to June 2019 time period. However, it is a more modest rise in the demand-to-supply ratio than may have been expected by both the degree of recovery of usable marijuana wholesale prices and the size of the increase in sales dollars in 2020.

As discussed in greater depth below, this topline finding illustrates the paradox of the Oregon cannabis market. On the one hand, supply of usable marijuana that will be sold as usable marijuana has shifted towards supply/demand equilibrium, and in fact during the summer months that supply becomes comparatively tight. On the other hand, *overall* supply of harvested marijuana is abundant, with a large portion of the harvest functioning as low-cost input material for extracts and concentrates. The extract and concentrate demand segment has seen strong growth, but the growth in extract/concentrate supply continues to outpace it.

The short answer to why the OLCC cannabis market moved closer to equilibrium compared to the prior study period (July 2017 to June 2018) is that demand witnessed unprecedented increases – due first to declining retail prices that boosted demand, then a surge in purchases caused by COVID-19 – while supply has increased more modestly. Compared to the prior study period, the amount of THC sold in 2020 increased by 150%, while the wet weight harvested grew by only 78%. These distinct growth paths have been a boon in helping the market self-correct and come more into line with consumer demand.

### *Method of Calculating Supply and Demand*

This report utilizes the same supply and demand estimation methodology as the 2019 Supply and Demand Report. For a more complete description of the method used, see the 2019 report's Technical Appendix.

As a brief overview, this report's method calculates the aggregate milligrams of THC for all cannabis items sold in the OLCC system. This amount of THC is then converted to a "wet weight equivalent" of the amount of cannabis that would have had to have been harvested in order to supply this amount of THC.

The calculated wet weight equivalent of demand is compared to the *actual* wet weight that was harvested by OLCC producers within the same period; this comparison provides the degree to which the OLCC market is in equilibrium between supply and demand.

This report is descriptive, not predictive. It is a point-in-time estimate based on behavior already exhibited by suppliers (OLCC licensees) and demanders (consumers). Shifts in these behaviors – for example, consumers shifting towards one product type and away from another – can result in a different supply/demand degree of equilibrium, even with the same amount of wet weight harvested.

Figure 1: 2019 Supply and Demand Report Distribution of Wet Weight Equivalent of Demand Results

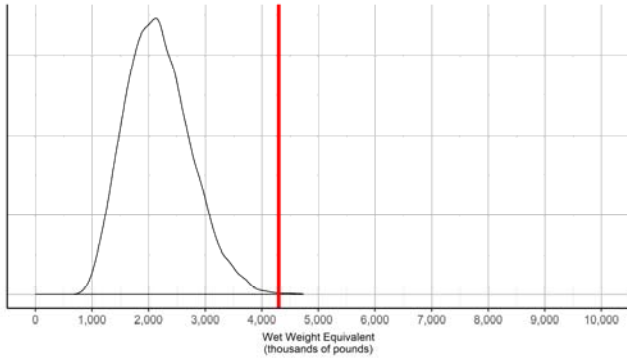
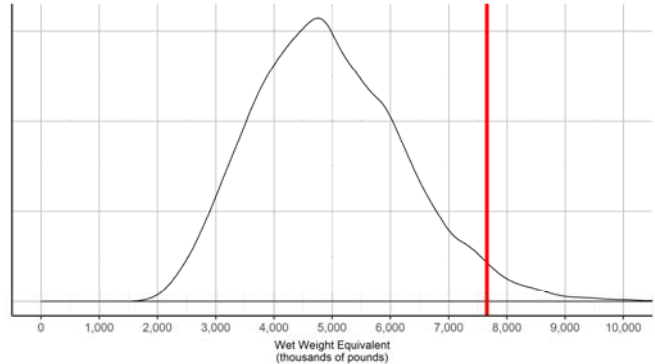


Figure 2: 2021 Supply and Demand Report Distribution of Wet Weight Equivalent of Demand Results



\* Red line represents actual wet weight harvest amount in the study period

This topline improvement in equilibrium between the two reports (demand as 65% of supply in the 2021 report versus 50% of supply in the 2019 report) may seem understated compared to other signs of market health. For example, wholesale prices for usable marijuana sold by Producers to Retailers increased by 32% between June 2018 and December 2020 (from \$1,129 to \$1,499), and sales in 2020 were nearly 40% higher than in 2019. Why isn't the ratio of demand to supply even higher, given the unprecedented surge in cannabis sales in 2020?

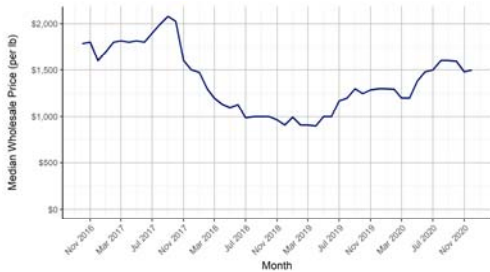
First and foremost, most discussions of demand focus exclusively on *dollars* sold, rather than quantity sold – and when both prices and quantities are increasing, there is an additive effect on the amount of revenue. For example, between March 2019 and March 2020 the quantity of THC sold increased by 18%, but total dollars of sales surged by 38%. Because retail prices rose between June 2018 and December 2020, the increase in sales in terms of *dollars* overstates the growth in quantity demanded.

Second, and more importantly, the method used in this report standardizes *all* marijuana items sold to a single unit (milligrams of THC) and compares that to a single equivalent unit (wet weight of raw cannabis harvested; see sidebar on page 3 for more details). In other words, this is a “whole basket” approach that looks at the market *overall* and determines total market equilibrium for the full year. This method does not speak to the degree of equilibrium of specific product categories (e.g. usable marijuana) versus others (e.g. cannabinoid products) nor to degrees of “intra-year” equilibrium (e.g. summer vs. fall). The cannabis market, like other markets, is self-correcting (to a degree); consumers substitute across product classes based on availability and prices. Substitution also exists at the supply level, with OLCC Producers and Wholesalers choosing “channels” to sell into (retail versus processing) based on current and anticipated prices.

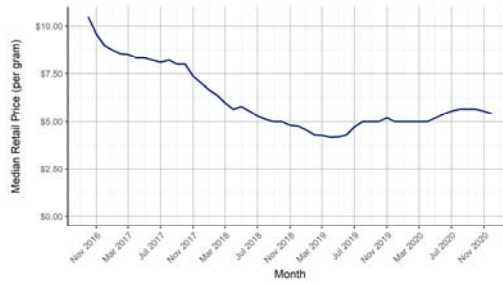
This observation is critical in order to understand why demand in the OLCC cannabis market is “only” 65% of supply: the supply of usable marijuana, which is comparatively perishable, has grown significantly tighter (particularly during certain portions of the year) at the same time that the supply of cannabis extracts and concentrates, which are comparatively shelf-stable and have been buoyed by cheap input prices, have remained abundant.

This “tale of two product types” is illustrated in Figures 3 through and 6: Extract/Concentrate Wholesale and Retail Price Trends. Both wholesale and retail prices have increased for usable marijuana, with price bumps occurring in late spring when usable marijuana supply traditionally tightens. Extracts and concentrates, on the other hand, stand in stark contrast, with wholesale and retail prices remaining remarkably stable since late 2018. Later sections of this report further analyze this dichotomy of usable marijuana and extract/concentrate supply.

Figures 3 and 4: Usable Marijuana Wholesale and Retail Price Trends

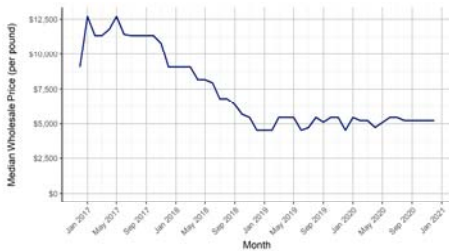


Wholesale price per pound, usable marijuana

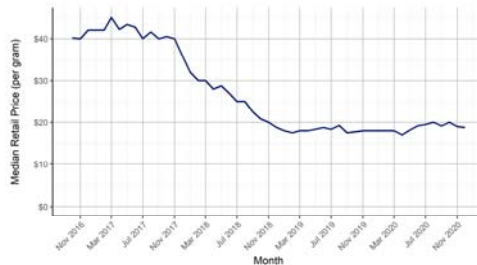


Retail price per gram, usable marijuana

Figures 5 and 6: Extract/Concentrate Wholesale and Retail Price Trends



Wholesale price per ounce, extracts and concentrates



Retail price per gram, extracts and concentrates

## Trends in Demand

Front and center in any discussion of cannabis demand is the effect of COVID-19 on consumer behavior. Oregon was far from the only state to experience an increase in demand for cannabis products,<sup>3</sup> and cannabis was far from the only market to experience a surge in demand.<sup>4</sup> Consumer behaviors shifted during 2020, and demand for cannabis within the OLCC market could have been driven by any one of three (non-mutually exclusive) factors: increases in demand from the pre-existing base of consumers, new consumers trying cannabis for the first time, or consumers from other markets (medical or illicit)

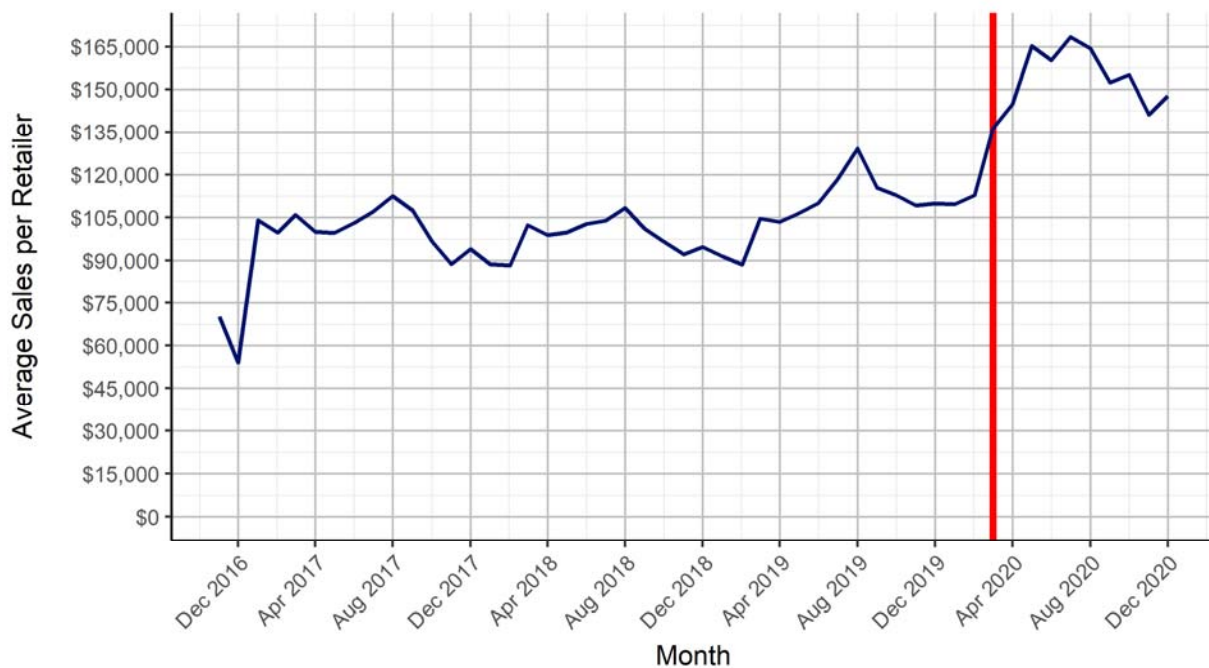
<sup>3</sup> Barcott, Bruce. “Marijuana sales data reveal Americans bought 67% more weed to survive 2020.” *Leafly*. December 22, 2020. <https://www.leafly.com/news/industry/marijuana-sales-data-americans-bought-more-weed-to-survive-2020>.

<sup>4</sup> Narishkin, Abby; Steve Cameron; and Victoria Barranco. “Why toilet-paper demand spiked 845%, and how companies kept up with it.” *Business Insider*. September 28, 2020. <https://www.businessinsider.com/why-toilet-paper-demand-spiked-845-how-companies-kept-up-2020-5>.

transitioning to OLCC retailers in order to minimize prolonged contact with other individuals. Although each particular factor’s unique contribution to overall demand is unknown, as is how much this increase in demand will persist into future years, the overall effect on demand in 2020 is clear: cannabis sales increased 40% year-over-year and total sales broke the \$1 billion mark for the first time.

This increase in demand can be illustrated in two ways: dollars sold and quantities sold. Since January 2017 (the month after “Early Start Sales” by medical dispensaries to recreational consumers ceased), monthly sales per OLCC retailer have been extremely consistent: mean monthly sales per retailer in February 2020 were \$112,000, compared to \$104,000 in January 2017.<sup>5</sup> In March 2020, however, the average sales per retailer increased by 21% to \$136,000 – and grew another 24% when it peaked in July at nearly \$168,500 (see Figure 7).

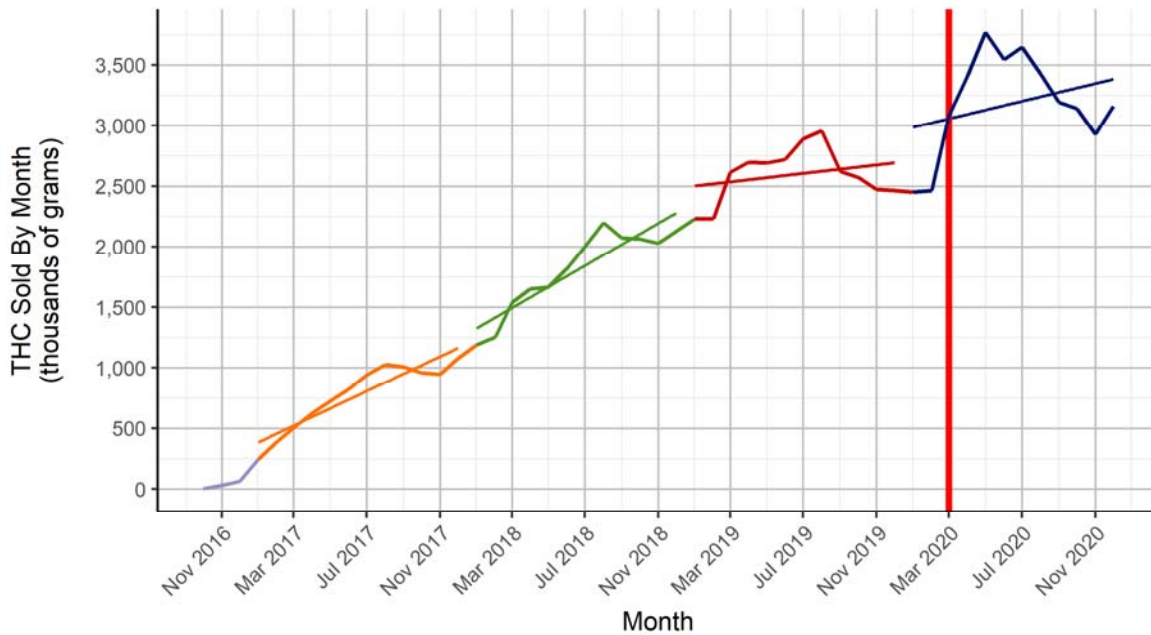
Figure 7: Average (mean) monthly sales per licensed retailer



In terms of quantity demanded, the trend line of THC sold annually had started to flatten in 2019 and the beginning of 2020 – until it ballooned by 25% between February and March 2020. Similar to dollars sold, the amount of THC purchased peaked in the summer before decreasing to a level slightly above the pre-COVID trend (see Figure 8).

<sup>5</sup> Total sales have increased 128% over that same time period. The number of retail licenses with recorded sales also grew by 112% between January 2017 and February 2020, from 293 to 619.

Figure 8: Quantity Demanded, milligrams of THC



The long-term demand trend since mid-2018 has been one of strong growth. However, in the absence of COVID's influence on consumer behavior, it is unclear what demand would have been – or what it will become when the pandemic subsides. It is undeniable that COVID caused a large demand spike between March and July. What is less clear is how much of the demand in the second-half of 2020 was COVID-induced versus a “new normal.” The answer to that question will in all likelihood determine whether the Oregon cannabis market over the next year moves towards or away from equilibrium.

## Trends in Supply

At the same time that consumer demand surged in 2020, cannabis supply has also continued to increase – particularly levels of concentrate and extract inventory. This illustrates the central paradox of the Oregon cannabis market: price signals for usable marijuana continue to exhibit signs of health, but supplier behavior and decision-making is resulting in a more than adequate supply of extracts and concentrates.

## Gross Harvest Yields

The 2019 Supply and Demand report relied on harvest and sales information between July 2017 and June 2018. With the benefit of hindsight, it is clear that by selecting that time range, the 2019 report relied on overly lagged data and missed important harvest trends occurring in late 2018. By the date that the 2019 report was published, cannabis supply had already begun to temper and self-correct: despite OLCC Producer licenses increasing by 37% between October 1, 2017, and October 1, 2018, harvest yields in October 2018 were only 2.6% higher than in October 2017. Because of Oregon's preponderance of outdoor production and the majority of the annual harvest occurring in October (see Figure 9), that modest increase in October 2018 harvests meant that the total annual harvest only rose by 8.6% (see Figure 10). But in recent years as wholesale prices have begun to rise, Producers have

responded to these market signals by increasing production. As seen in both Figure 10 and Figure 11, harvest yields increased by 37% in 2020 compared to 2019, and the year-over-year increase in the amount of wet pounds harvested is now on par with the growth in retail sales.

Figure 9: Quantity Harvested by Year and Month

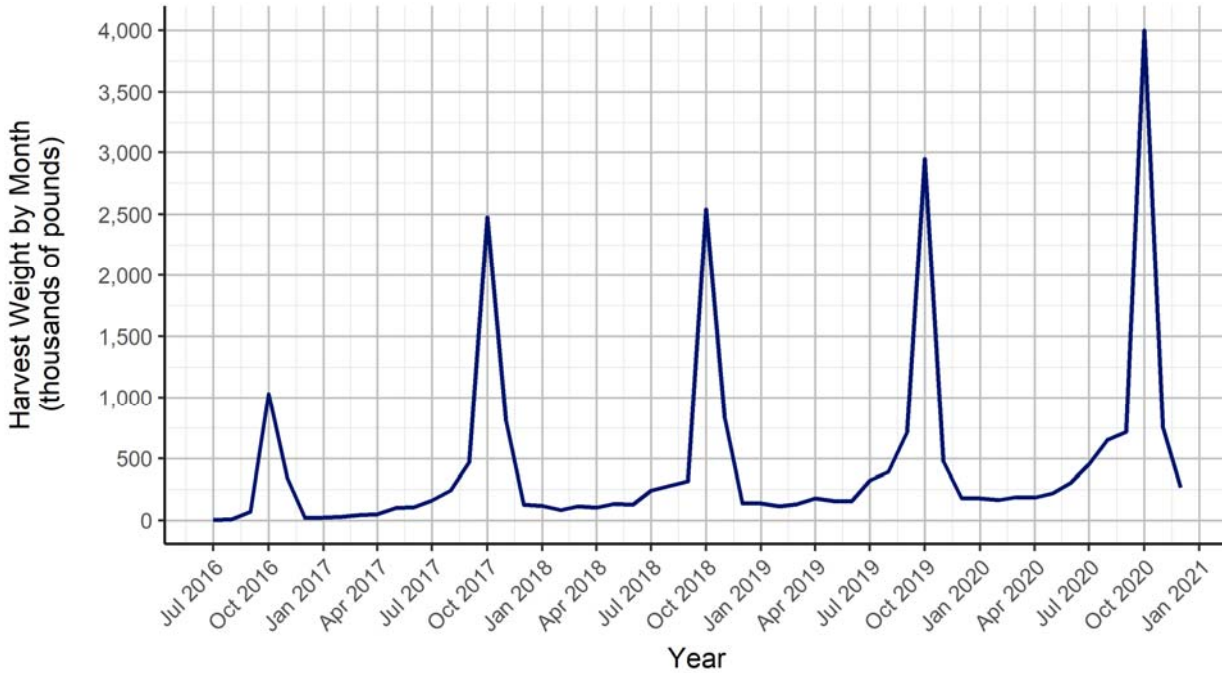


Figure 10: Total Annual Harvest, by Year

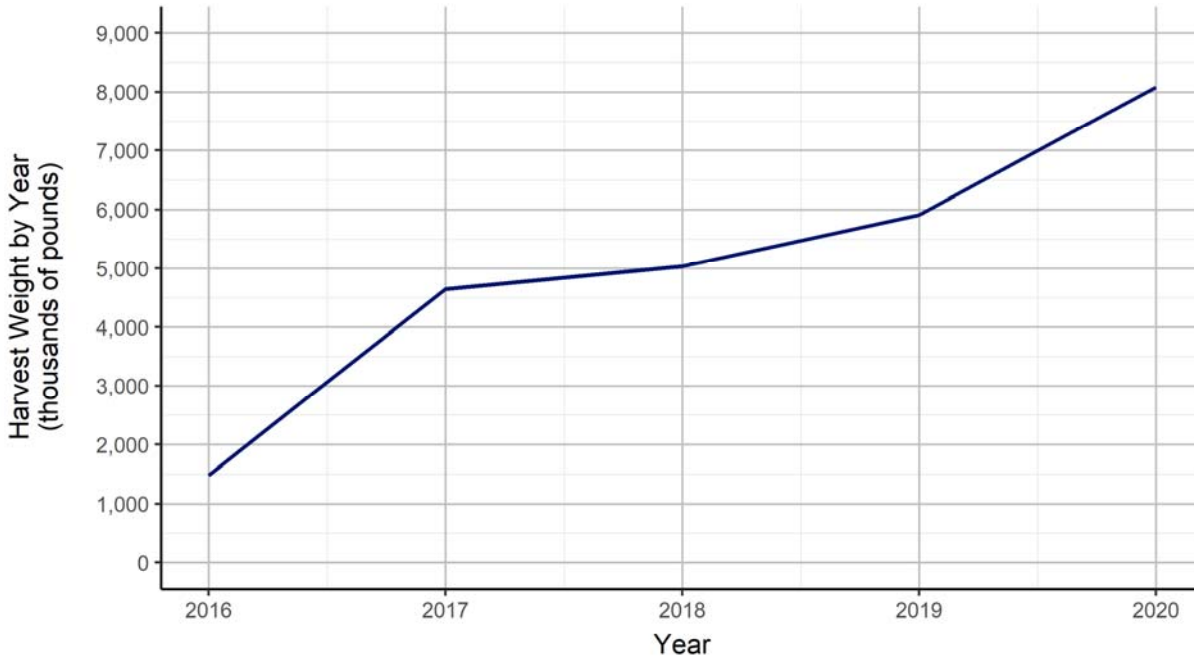
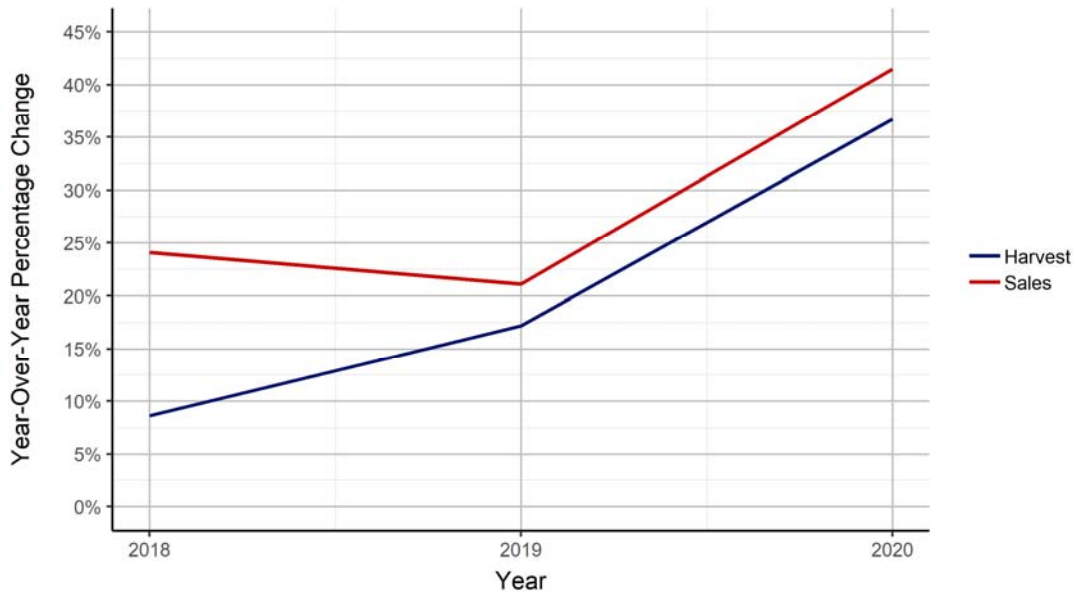


Figure 11: Year-Over-Year Growth in Sales and Harvests

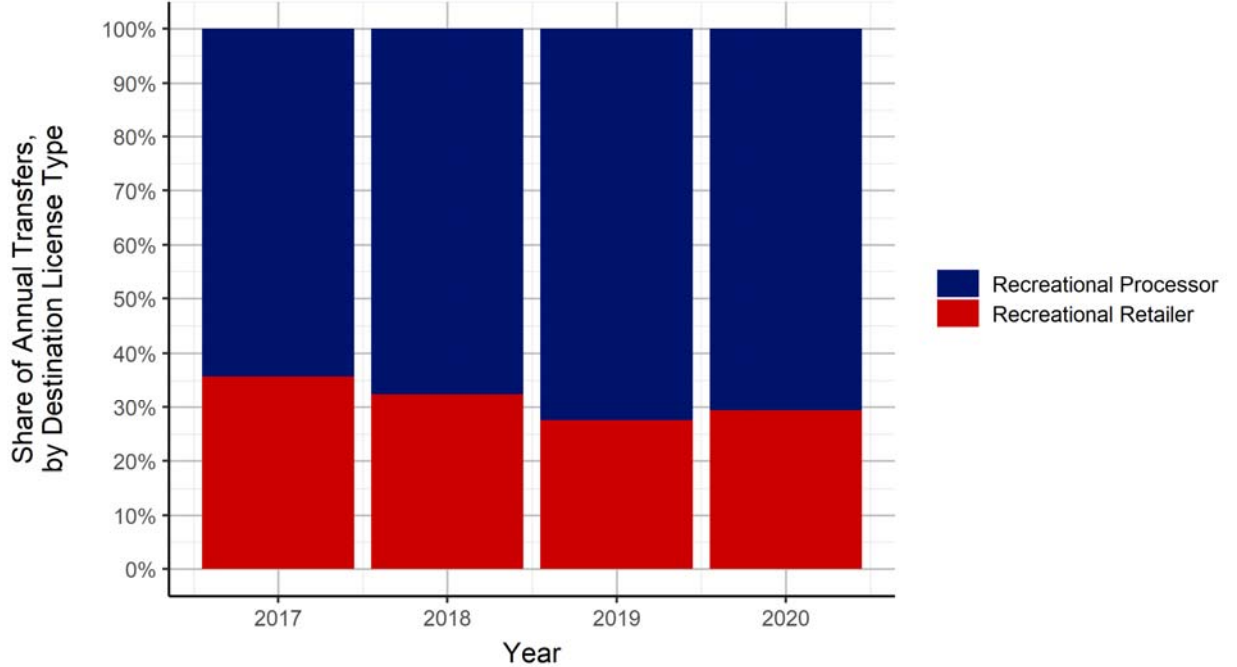


### Transfers and Market Channels

The fact that the majority of Oregon’s annual cannabis yield occurs in a single month (October) introduces significant path dependency of supply to the Oregon marketplace. Outdoor Producers are making decisions for the entire year in a short time window, at the same time that all other outdoor Producers are making the same calculations with the same available information. Once cannabis is sent to a Processor and converted to extract or concentrate, that supply is “locked in,” regardless of shifts in future supply or demand. At that point it can either be sold as extract/concentrate or converted into cannabinoid products, but it cannot be “unconverted” back to usable marijuana. This results in seasonal shortages of usable marijuana (evidenced by the “price bumps” in Figures 3 and 4: Usable Marijuana Wholesale and Retail Price Trends), when outdoor usable marijuana (particularly flower) is at a premium and as consumer demand exhibits seasonal spikes in demand for usable marijuana.

The supplier trend of transferring a greater share of usable marijuana to Processors for conversion into secondary and tertiary products accelerated in 2018 and 2019. Although in 2020 a marginally larger share of usable marijuana has been sent to Retailers than in 2019, likely in response to rising wholesale prices, the rate of usable marijuana sold to Processors is still higher than in 2018.

Figure 12: Share of transfers by destination and year



These transfers of usable marijuana to Processors exhibit an interesting phenomenon. The months with the largest amount of usable marijuana being sent to Processors are the five months that span the period immediately prior to the outdoor harvest season through the month immediately thereafter. As seen in Figure 13, transfers to processors begin to rise in July, peak in October, decline, and then largely plateau for the remainder of the year. The average age<sup>6</sup> of product being transferred helps illuminate the underlying factors driving these volume trends: the age of the product being transferred is at its highest just prior to the harvest season, decreases precipitously in October through December, then begins to increase as the year progresses. In other words, Wholesalers and outdoor Producers liquidate inventory in the late summer to make room for October's yields; lock in deals with Processors in the fall with the newly harvested product; then sell more incrementally throughout the remainder of the year, likely as product proves unable to gain shelf space at retail.

The trend of transfers of usable marijuana to Retailers displays some similarities in regards to the general age trend of product being transferred, but there are also notable differences compared to the transfers to Processors. In terms of similarities, the average age of product being transferred is at its lowest immediately following the outdoor harvest season, and increases throughout the winter and summer. However, one major difference is that, except for the month of October, the usable marijuana being transferred to Retailers is on average younger than the usable marijuana being transferred to Processors. Additionally, the amount being transferred per month to Retailers has remained remarkably stable since March 2018 (with the notable exception of an increase in transfers in line with rising COVID-induced demand).

<sup>6</sup> As measured by the most recent harvest date of the co-mingled product being sent.

Figure 13: Quantity Shipped, by Month and Destination License Type

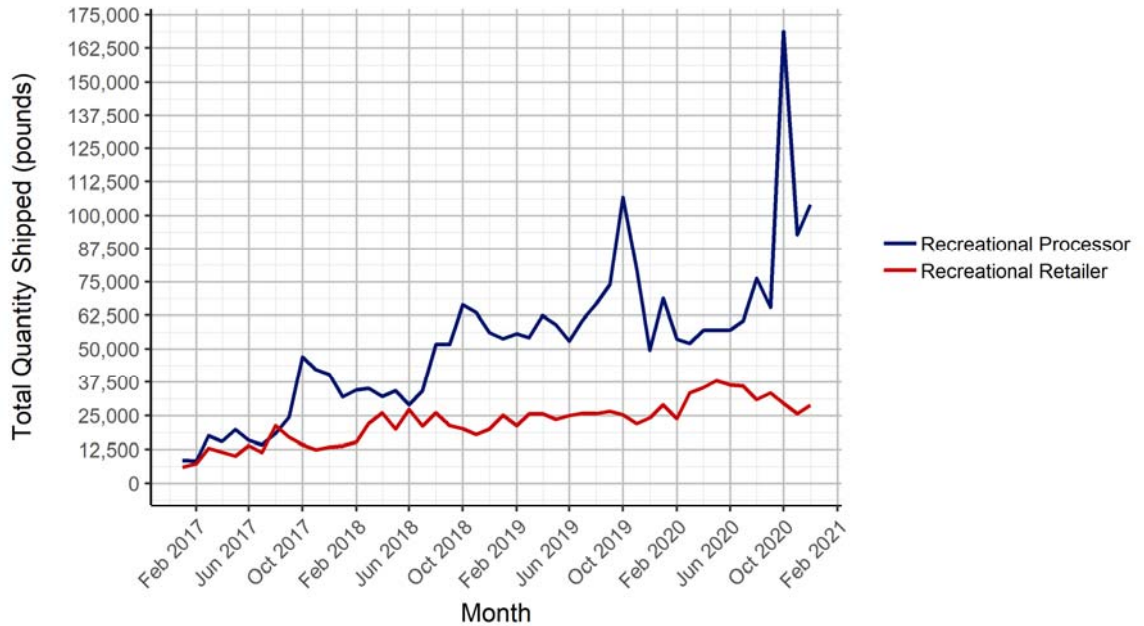
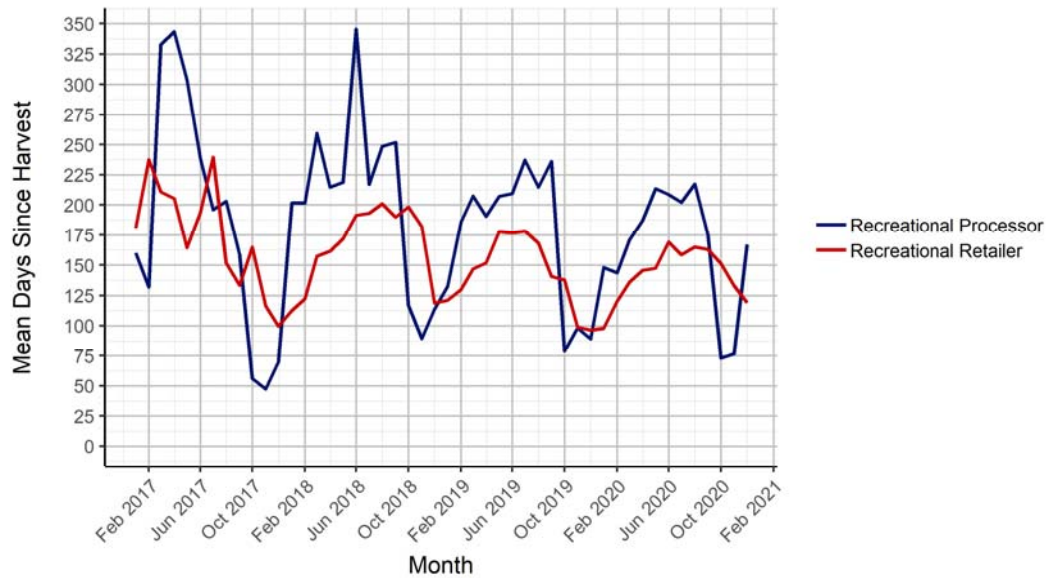


Figure 14: Days since Harvest for Product Shipped, by Destination License Type



The story of annual supply in the OLCC cannabis market is one of Processors benefitting from a seasonal glut of usable marijuana and the correspondingly low input prices, and of Processors remaining an outlet for usable marijuana that does not or cannot end up at Retailers. However, as will be discussed in the next section, given the uncertainty of year-over-year growth in demand and the sizeable existing inventory of extracts and concentrates, it is unclear the degree to which the market can continue to sustain this trend.

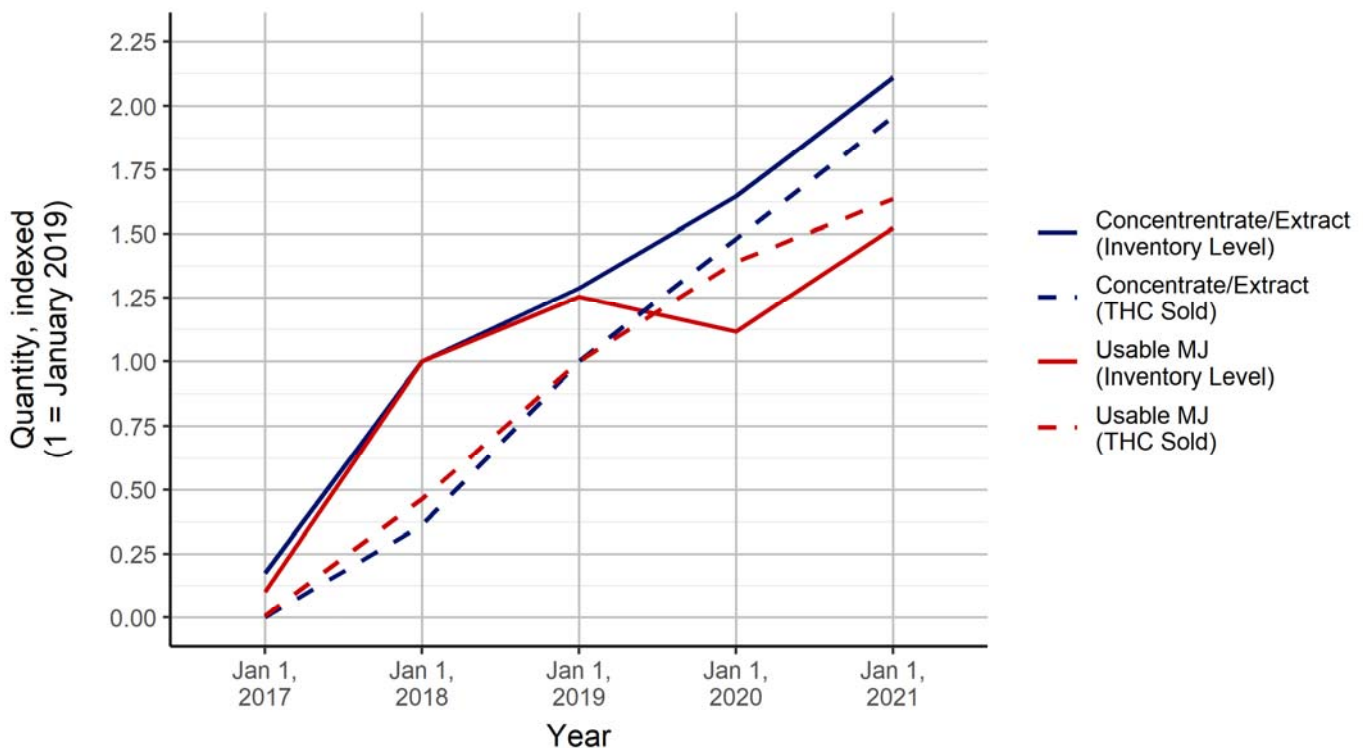
### Characteristics of Existing Inventory Stock

Separate from the question of *annual flow* of supply is the question of the *current stock* of inventory. The current stock is the accumulation of the inventory that has been produced in the system but has not yet flowed out of the system (via waste, sales, or further processing).

The primary concern raised in the 2019 Supply and Demand report was not simply the one-year gap between supply and demand, but that the market effect of the single-year disequilibrium was magnified by the accumulation of continuous disequilibrium – an ever-increasing stock of inventory.

The issue of accumulating surplus for usable marijuana is less present in 2021 than 2019. Usable marijuana inventory levels are higher than in January 2019, but have seen a more gradual increase than the corresponding *sales* of usable marijuana. This is in large part due to a year-over-year decline in inventory between January 2019 and January 2020. Extracts and concentrates, however, continue to show steady growth in inventory stock. While this growth in inventory has been on trend with a rise in extract/concentrate sales, a flattening of the demand growth curve would leave operators with a disproportionately high stock on hand (see Figure 15).

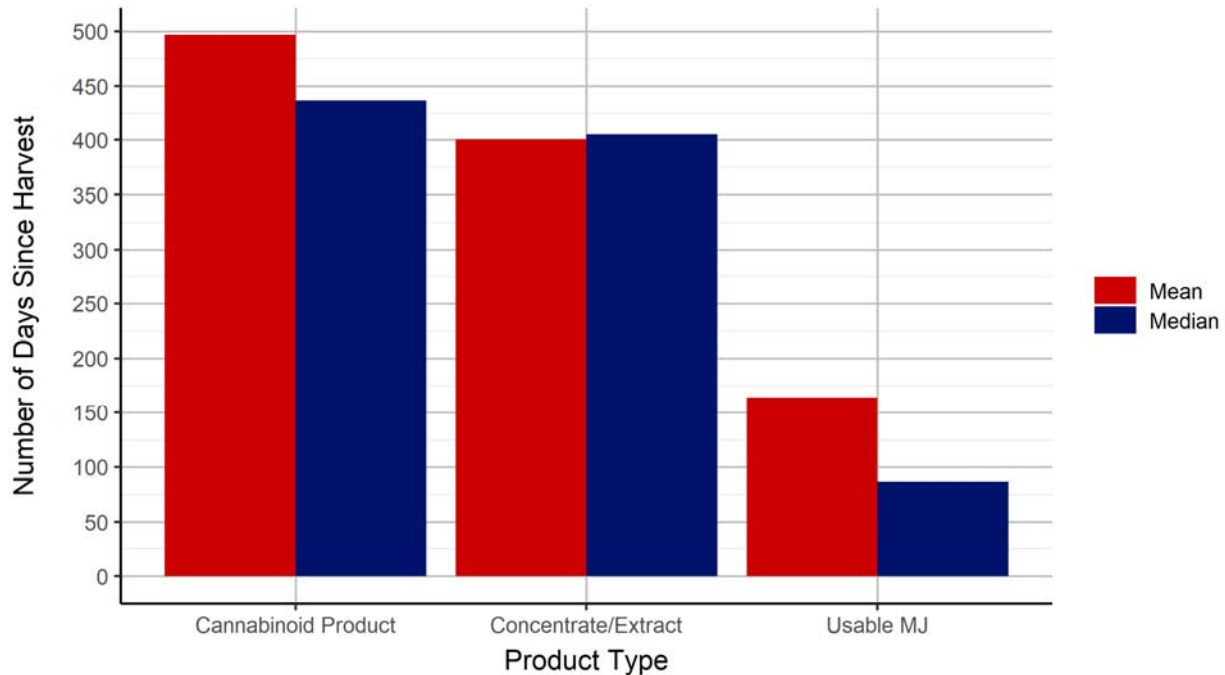
Figure 15: Quantity of THC Sold (for preceding 12 months) and Current Stock of Inventory, as of January 1, by Year and Product Type



This difference is also illustrated by the average age of the existing inventory by product type. Whereas usable marijuana in current inventories has an average age of less than 6 months, the average time

since concentrate and extracts’ input material was harvested is more than 13 months (see Figure 16).<sup>7</sup> Combined with the findings of the discussion above, it is clear that concentrates and extracts use older material and sit on shelves longer when compared to usable marijuana that will be sold at retail.

Figure 16: Average Number of Days Since Harvest, by Product Type



## Future Trends in Supply and Demand

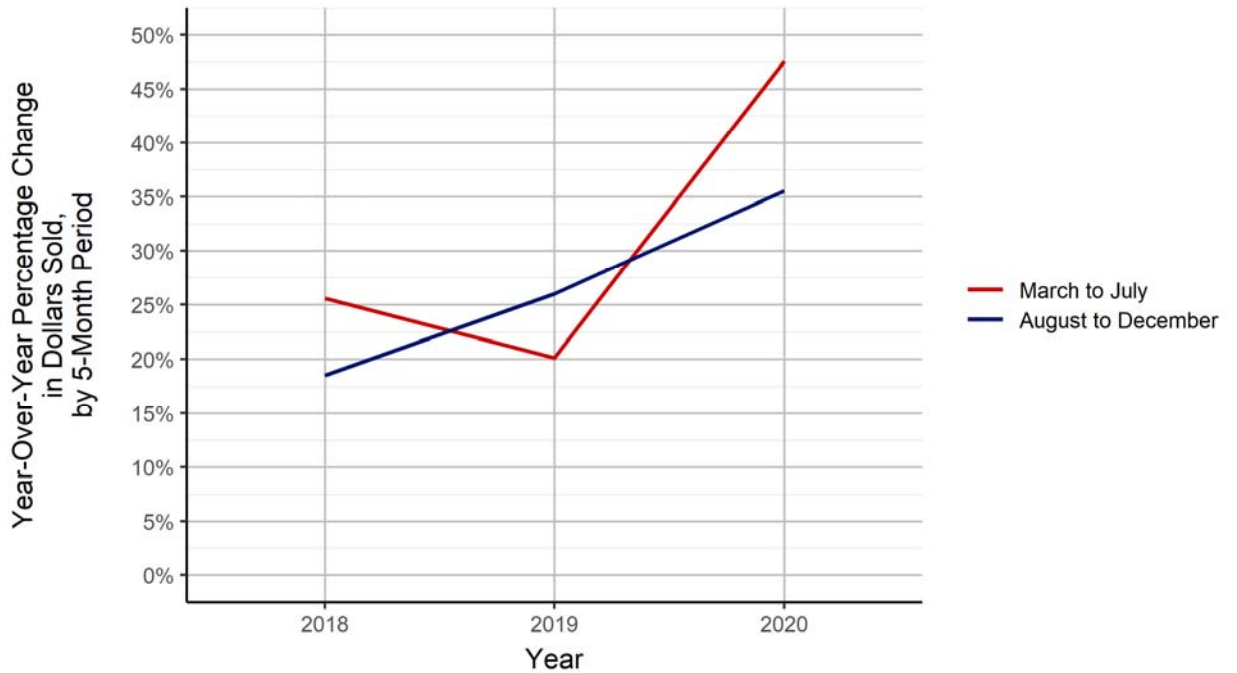
There is considerable uncertainty about the paths supply and demand will take over the next two years. This makes predicting the degree to which the OLCC cannabis market will be at equilibrium in two years’ time virtually impossible. However, this section does lay out factors that will influence the direction each trend moves and the effects they may have on possible equilibrium. It is almost certain that both supply and demand will continue to grow, with each potentially experiencing double-digit growth each year. The central question will be whether demand in 2021 is more like 2020 or 2019.

### Demand

The central question for predicting demand is how much the 2020 “COVID bump” will be sustained in 2021 as opposed regress to pre-pandemic levels. Because of the unique confluence of factors in March to July 2020 (the initial onset of COVID, issuance of the first stay-at-home orders, federal stimulus checks, and expansions of unemployment all co-occurring), sales growth will almost certainly not reach the heights of this period, when sales (in terms of dollars) grew nearly 50% year-over-year. Even the relatively “normal” subsequent five-month period (August to December) saw robust year-over-year growth (see Figure 17).

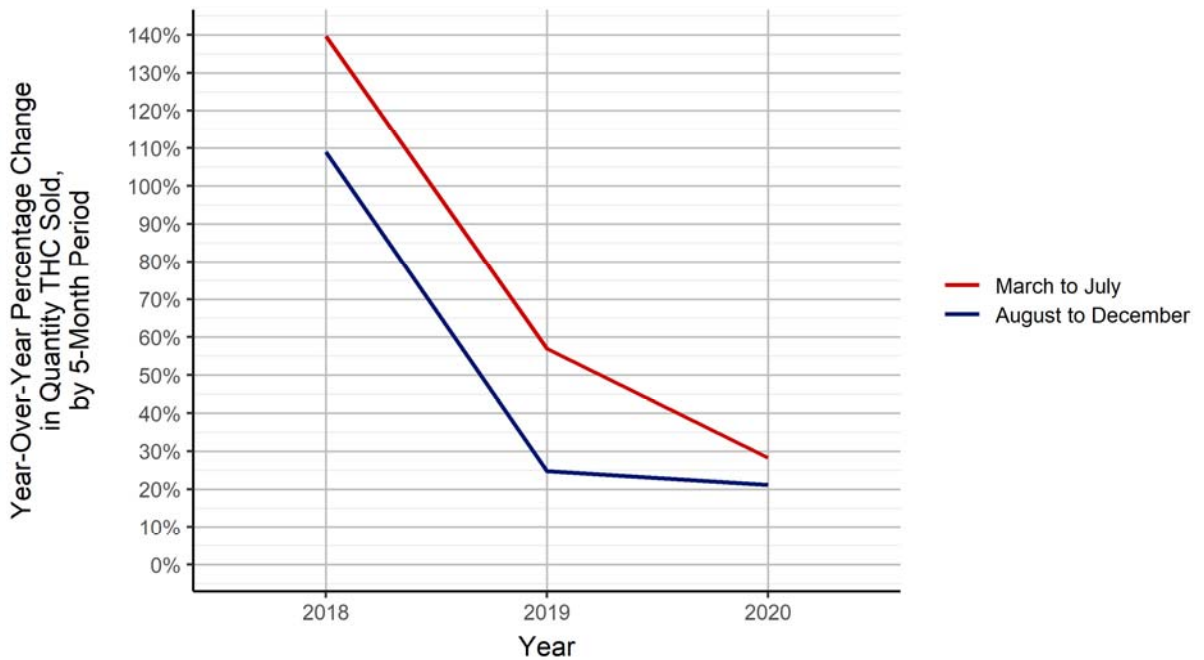
<sup>7</sup> Means and Medians are weighted by inventory quantity. The much lower weighted mean value for usable marijuana (86 days, or less than 3 months as of January 8, 2021) represents the large amount of freshly harvested product that is not fully trimmed, dried, and cured.

Figure 17: Year-Over-Year Change in Dollars of Product Sales, by 5-Month Period and Year



However, dollars sold paint only a partial picture, due to annual fluctuations in prices. In terms of actual supply/demand equilibrium, the *quantity* demanded is what matters. Quantity sold (in terms of milligrams of THC) actually illustrates a contrary trend: March to July 2020 saw a steeper decline of year-over-year growth in *quantity* sold, and the August to December 2020 period was more or less unchanged from the same period in 2019 (see Figure 18).

Figure 18: Year-Over-Year Change in Quantity THC Sold, by 5-Month Period and Year



This contrast illustrates the fundamental feature of demand: as prices decline the quantity demanded increases, and as prices rise the quantity demanded decreases. The March to July 2020 period, while strong, is lower in terms of year-over-year growth simply because the 2018 to 2019 growth, in response to freefalling prices, had been so remarkable. As seen in Figures 3 and Figure 8, consumer demand rose considerably at the same time that retail prices fell precipitously. Throughout 2019, however, retail prices for usable marijuana stabilized and then increased, creating downward pressure on sales and the 2019 trend line of the quantity sold began to flatten. In other words, 2020 exhibited strong growth because of COVID and in spite of rising prices.

It is virtually impossible to accurately predict demand after the “COVID effect” ends, let alone over the next two-year period, without first knowing what type(s) of consumers comprised the “COVID bump” in the first place. There are three (non-mutually exclusive) possibilities:

- 1) New consumers – either those who had never tried cannabis before, or had done so a long time prior but stopped consuming – began purchasing cannabis.
- 2) Consumers who relied on the illicit, home-grow, or medical markets transitioned to the OLCC market.
- 3) Existing patrons of OLCC Retailers increased their consumption.

Also important to know is how much of the increase in consumption is unique to COVID and its effects. For example, federal stimulus and temporary expansions of unemployment insurance boosted household incomes in the period immediately after COVID restrictions were first put in place. A large segment of the workforce is teleworking from home while also unable to pursue typical leisure activities. If the rise in consumption has been driven entirely, or predominantly, by preexisting OLCC Retailer customers increasing their purchase amounts, it seems likely that a societal “return to normal” would also result in a return to pre-COVID cannabis consumption patterns. However, if new or non-OLCC consumers shifted to the OLCC market due to COVID, it seems reasonable to assume that at least some of the new behavior will be “sticky” and result in demand that remains higher than the pre-pandemic levels.

Unfortunately, there are no good tools to yet understand the cause of the “COVID bump,” particularly the characteristics of consumers. Oregon’s Cannabis Tracking System records inventory and sales, but does not collect the characteristics of consumers.<sup>8</sup> The best alternatives for understanding this consumption trend are *post-hoc* surveys of cannabis use, which by their nature operate on a lag. For example, the National Survey on Drug Use and Health (NSDUH), the federal survey that provides the best long-term apples-to-apples comparison between years and states, only published its 2018-19 report in December 2020. Other Oregon-specific public health surveys may elucidate consumer characteristics and changes in behavior due to COVID, but those too operate on too large of a lag to have yet finalized data.

It will be some time before we definitively know what caused sales to rise so precipitously during COVID and how demand will be affected by a “return to normal” after COVID subsides. Despite the lack of conclusive evidence, however, the sales data does provide a basis to make some rough predictions regarding the course demand will take. As seen in Figure 8 above, the quantity sold in November 2020

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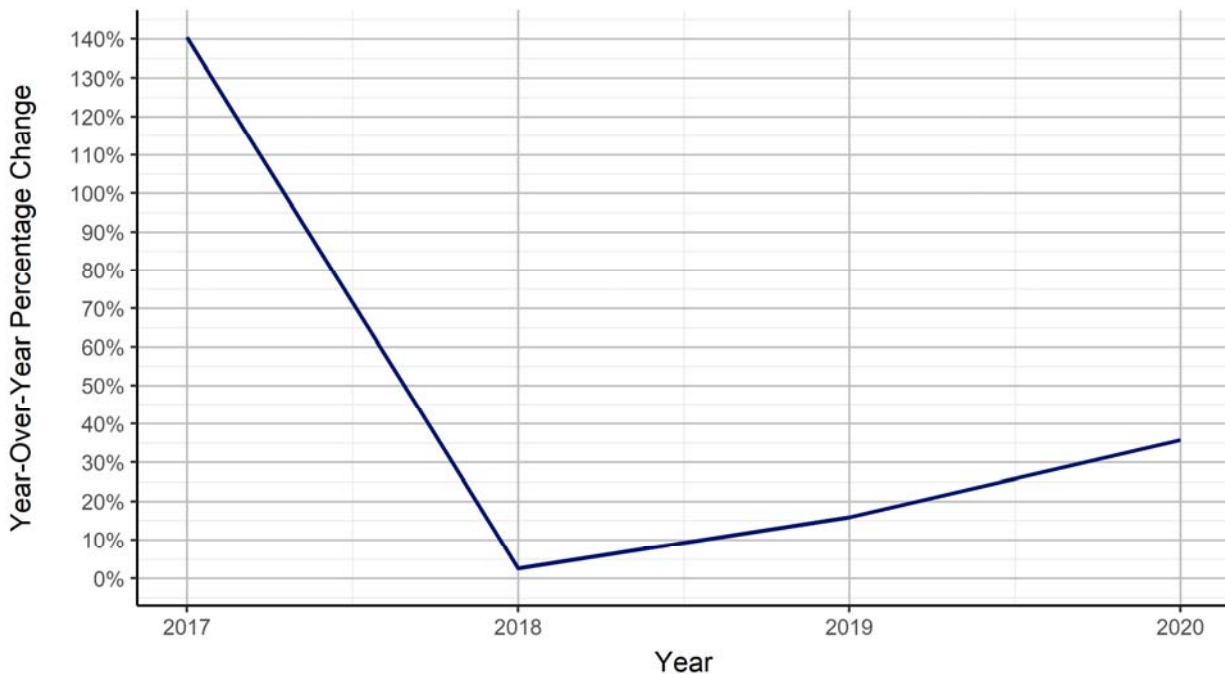
<sup>8</sup> In fact, ORS 475B.220 prohibits OLCC Retailers from recording any personally identifiable information without express consent of the purchaser.

was more or less on pace with what would have been expected pre-COVID. Even without knowing the exact cause(s) of the “COVID bump,” it is safe to say that the months of March through July 2020 were unprecedented for consumers, and therefore saw unprecedented growth in sales. Although the aggregate *level* of THC sold in 2020 was considerably higher due to COVID, the slope of the trend line was only moderately steeper than in 2019. While rising prices may (in the near-term) push the dollars sold above pre-COVID year-over-year growth levels, the growth rate of the annual *quantity* sold seems most likely to fall somewhere in between August-December 2020 and August-December 2019. At best that would mean levels of demand that buoy prices and make modest inroads with supply; at worst it would mean flattening (or flat) demand that falls behind growth in supply.

### Supply

As shown in Figure 11, 2020 saw a significant growth in harvest yields compared to both 2018 and 2019. In the same way that outdoor Producers responded to 2018 market signals by scaling back production, they are now responding to rising prices by planting and harvesting larger crops. Figure 19 shows the year-over-year harvest trends for October of each year since 2017; this year’s growth rate is at its highest level since 2017.

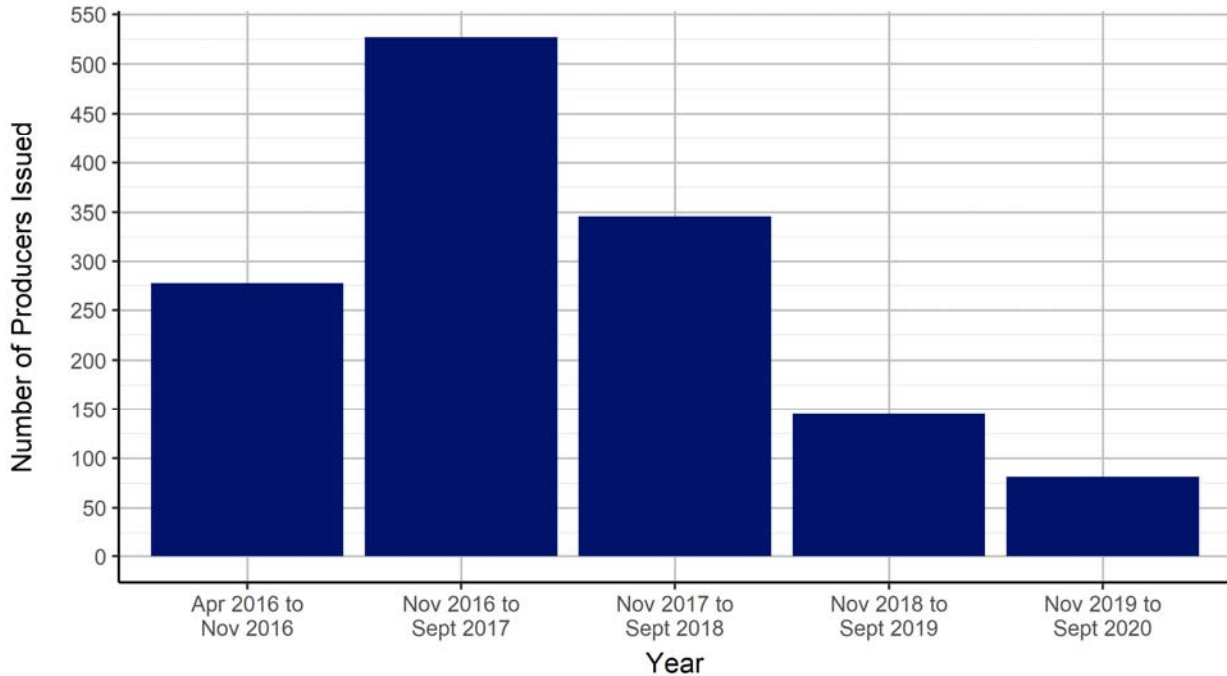
Figure 19: Year-Over-Year Percentage Increase in October Harvest, by Year



However, unlike in 2017 when increasing yields were in large part a function of new Producer licenses becoming active, the growth in production in 2020 has been driven to a much greater extent by more production from the same base of Producers. As seen in Figure 20, only 81 new Producer licenses were

issued between November 1, 2019 and September 30, 2020 – the lowest number issued in any similar period since licensing by OLCC began.<sup>9</sup>

Figure 20: Number of Producer Licenses Issued, by Period



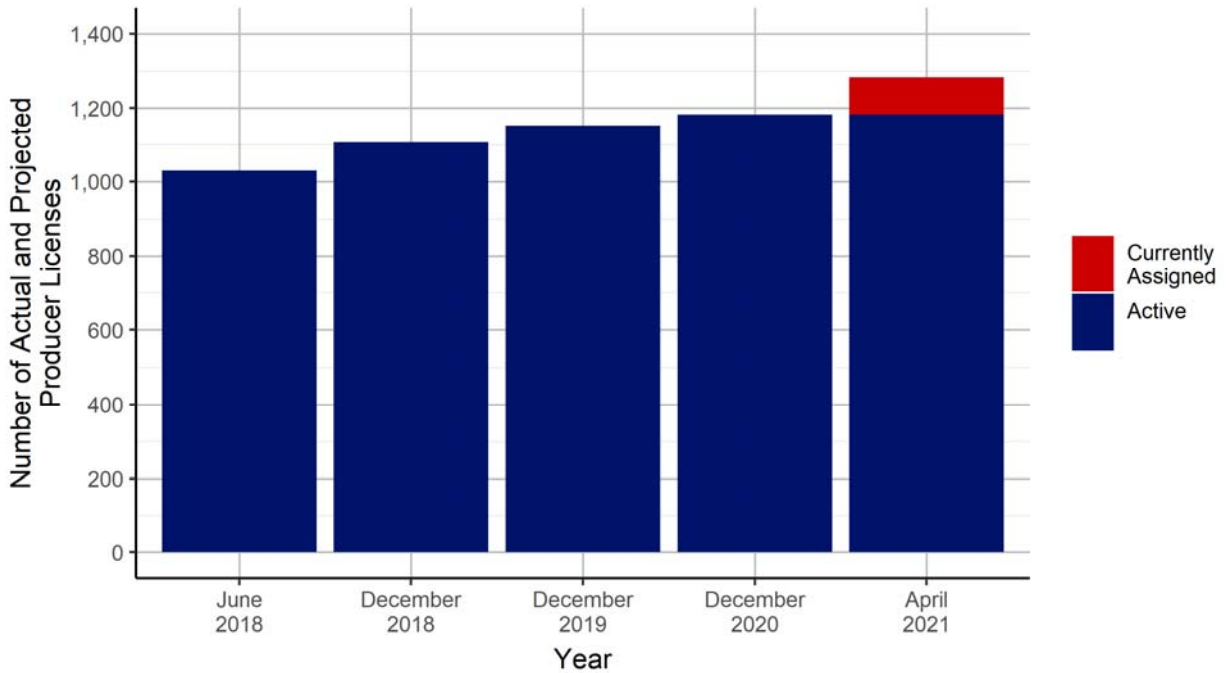
But this licensing trend is on the cusp of being reversed, which will only accelerate the growth in supply. Senate Bill 218 during the 2019 Legislative Session placed a moratorium on new Producer licenses, but this moratorium only affects Producer applications submitted after June 15, 2018. The OLCC is still processing the final batch of applications received by that deadline.

In fact, given the queue of Producer applications, the OLCC market is poised to see significant growth in 2021 harvests. Figure 21 shows the trajectory of the growth in Producer licenses since June 15, 2018. While the number of active Producers grew by only 152 between the 18 months of June 15, 2018 to December 28, 2020 – and by only 30 between December 2019 and December 2020 – this number may grow by as much as 100 (9%) over the next 3 months.<sup>10</sup> In terms of square footage, the increase would be even higher (nearly 11% more compared to current licensed production canopy).

<sup>9</sup> This represents the number of licenses issued, which includes both brand new licenses as well as changes of ownership. This, combined with license attrition, means that the cumulative number of issued licenses will not equal the growth in point-in-time active licenses.

<sup>10</sup> There were 1,182 licensed producers as of December 28, 2020. The estimate of newly issued producers before April 2021 is based the number of pending applications that are assigned for (investigative) processing as of January 8, 2021 (157). The estimate of 100 new licenses was based on adjusting the count of applications assigned (157), subtracting those applications that are for change of ownerships and would not result in a net increase of licenses (40), and adjusting for the overall approval rate over the last 12 months of applications assigned or pending assignment (87.4%).

Figure 21: Active and Projected Producer Licenses by Date

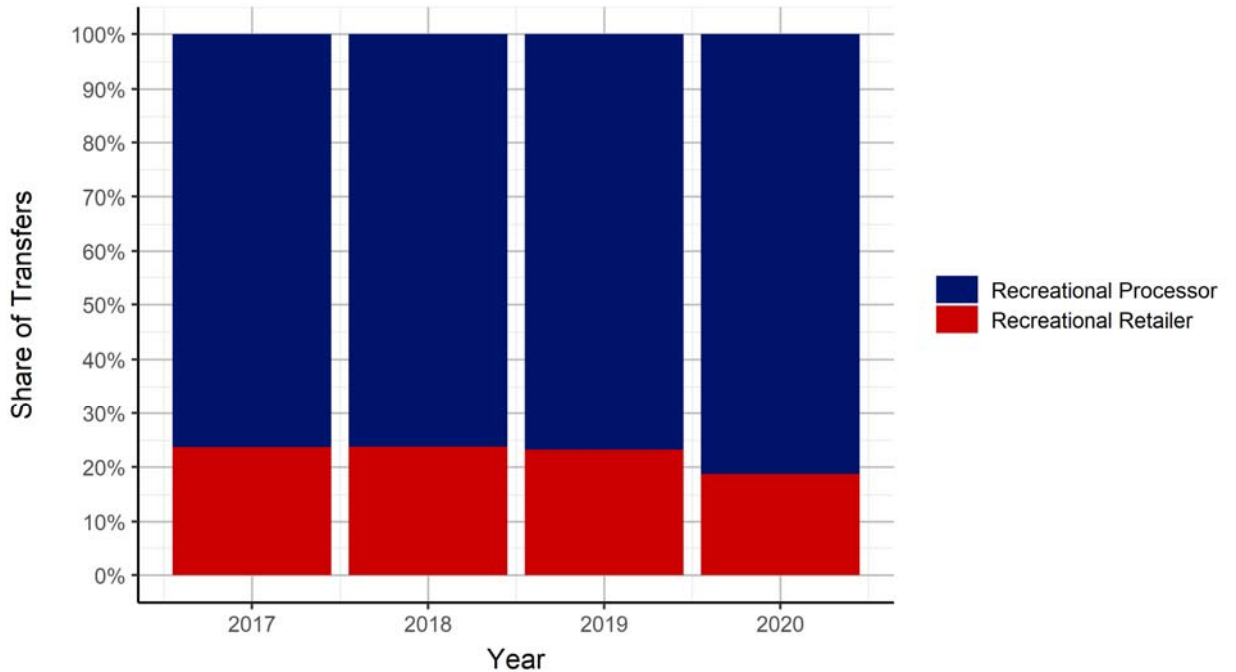


Despite this anticipated surge in the number of new Producer licenses, the effect on supply is unlikely to be felt before October 2021 for two reasons. First, approximately 84% of the proposed production square footage for these pending applications is outdoor, meaning that their productive capacity will be realized primarily in October.<sup>11</sup> Second, the October to December 2020 transfer trends show an increase in the share being sent to Processors compared to the same period in both 2018 and 2019 (see Figure 22). While Processors’ annual aggregate share of usable marijuana transfers declined slightly between 2019 and 2020 (as discussed above and shown in

<sup>11</sup> This is more or less on par with the current proportion of indoor/outdoor; 84.9% of the currently licensed productive square footage is outdoor.

Figure 12), this increase in the share immediately following harvest indicates that the summer of 2021 is likely to see another tight supply of usable marijuana and a continued glut of processed products.

Figure 22: Share of Transfers (October to December each year), by Receiving License Type



The 2018 harvest and rising usable marijuana wholesale prices show that the OLCC cannabis market, like other markets, self-corrects in the face of supply and demand imbalances. However, this self-correction operates on a lag, in large part due to the heavy concentration of production in a single month. Outdoor Producers make decisions and investments regarding planting, labor, and material in the spring in anticipation of future market conditions. Consequently, the harvests in October and the levels of supply throughout the subsequent year are based on market signals from six (or more) months prior.

The OLCC market is almost certain to see significantly higher rates of production in October 2021 compared to October 2020, which itself was an acceleration over the most recent two years. So long as a federal prohibition on interstate trade of cannabis remains, the health of the Oregon cannabis market will be dictated entirely by the extent to which in-state demand keeps pace with this rising supply.

## Conclusion

The OLCC market is currently a story of two micro-markets: one for usable marijuana, the other for extracts and concentrates. In the aftermath of the 2017 market glut, Producers have turned to Processors as an outlet for their harvest yields. Processors, in turn, are more than happy to take in cheap cannabis flower inputs to meet rising demand for extracts and concentrates. While this leaves usable marijuana scarcer during summer months and stocks of extracts and concentrates comparably ample year-round, the market has achieved its own healthy balance through this dynamic.

Demand in 2020 was strong, and in spite of sales by the end of the year regressing back towards the pre-COVID mean, 2021 will likely see continued growth. However, 2021 is unlikely to see the unprecedented

growth that the Oregon market witnessed between March and July of 2020. Moreover, an anticipated surge in Producer licenses in 2021, combined with an already strong growth in supply from the existing base of Producers, means that growth in supply will likely be quite high.

With the prospect of increasing supply, flattening growth in demand, and a large pre-existing baseline of extract/concentrate inventory, it is unclear how long the market's healthy balance will continue to play out. If supply in late 2021 increases above what the usable marijuana market channel can sustain, will Processors continue to operate as a "safety net" for Producers? Or will Processors, with ample inventory of processed items and the prospect of flattening consumer demand, start turning Producers away? If this latter scenario were to happen, then a deterioration of Producers' wholesale prices across the board would risk sending the market back into the late-2017 price spiral.

Oregon cannabis licensees have proven themselves adaptable and resilient, whether in the face of price shocks, historic wildfires, or a once-in-a-century pandemic. Regardless of what happens over the next two years, the current state of the OLCC cannabis market is much improved over early 2019: consumer prices remain low, wholesale Producer prices are significantly higher, and aggregate supply and demand are more closely balanced. Amid signs of uncertainty, one thing remains clear – Oregon cannabis will continue to mature in 2021 and, if the past is any predictor of the future, adapt to any challenges that arise.

## Appendix: Medical Marijuana

Oregon’s medical marijuana program (OMMP), established in by Measure 67 in 1998, is overseen and regulated by the Oregon Health Authority. Until OLCC began licensing businesses in 2016, OMMP was the only legal supply chain for cannabis in the state – and for a period of time known as “Early Start Sales,” this supply chain served both medical and recreational customers.<sup>12</sup> As the recreational cannabis market was established in 2016, however, there was an exodus from OMMP as businesses, particularly medical dispensaries, transitioned to become licensed with the OLCC. For example, in October 2016, OMMP had 27,200 grow sites, 117 processors, and 425 dispensaries.<sup>13</sup> As of October 2020, those numbers had declined to 7,322 grow sites, 0 processors, and 2 dispensaries.<sup>14</sup>

Since June 2018, OMMP grow sites with three or more patients registered at the site are required to report using the OLCC’s Cannabis Tracking System (CTS).<sup>15</sup> Currently there are approximately 460 OMMP grow sites active in CTS. If a grow site dips below three patients, that grow site instead reports into the Oregon Medical Marijuana Online System (OMMOS). The major difference between CTS and OMMOS is that, like recreational licensees, OMMP grow sites using CTS are required to reconcile inventory each day. In OMMOS, reporting is done in aggregate for the month.

For purposes of this report, the benefit of CTS tracking is that patient-level production and transfer data can be analyzed to quantify medical marijuana harvest and transfer activity. However, the major disadvantage of the way in which tracking requirements are structured is that it is porous because of substantial “churn” of grow sites in and out of CTS. For example, if a grow site has three patients in one month, but the next month one of the patient’s registration expires, that grow site is “bumped out” of CTS until that patient’s registration is renewed. Importantly, activity is only recorded in CTS if that activity was conducted when the grow site met the criteria to track in CTS. In the same example as above, a harvest or transfer is only recorded in CTS if the harvest or transfer is done in the month when the grow site had three patients; any harvest or transfer that is conducted at the time that the grow site had only two patients would be reported in OMMOS and not CTS.

To make this difficulty more concrete: there are currently 458 grow sites that meet the criteria for CTS tracking. Of those, approximately 270 were in CTS both in September 2019 and August 2020 and also recorded at least one harvest in CTS within that 12 month period. And of those, only 201 had recorded harvests in CTS prior to September 2019. To evaluate supply and demand equilibrium, both sides of the equation (harvests and transfers to patients) must be recorded – but if grow sites record one or both sides of that equation outside of CTS, that data is unavailable for analysis. In other words, while 458

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<sup>12</sup> Early Start Sales began in October 2015 and ended December 31, 2016.

<sup>13</sup> “Oregon Medical Marijuana Program Statistical Snapshot October, 2016.”

<https://www.oregon.gov/oha/PH/DISEASES/CONDITIONS/CHRONICDISEASE/MEDICALMARIJUANAPROGRAM/Documents/OMMP-Statistic-Snapshot-10-2016.pdf>.

<sup>14</sup> “Oregon Medical Marijuana Program Statistical Snapshot October, 2020.”

[https://www.oregon.gov/oha/PH/DISEASES/CONDITIONS/CHRONICDISEASE/MEDICALMARIJUANAPROGRAM/Documents/OMMP\\_Statistical\\_Snapshot\\_10-20.pdf](https://www.oregon.gov/oha/PH/DISEASES/CONDITIONS/CHRONICDISEASE/MEDICALMARIJUANAPROGRAM/Documents/OMMP_Statistical_Snapshot_10-20.pdf).

<sup>15</sup> OMMP processors and dispensaries are also required to report into CTS. Due to the overwhelming majority of OMMP users of CTS being medical grow sites (there are currently 0 medical processors and only 1 medical dispensary), this section exclusively discusses CTS data in regards to medical grow sites.

grow sites are currently in CTS, only 201 grow sites had the data in CTS that is necessary to evaluate supply and demand.

For the 201 grow sites with sufficient data to include in this analysis (approximately 44% of the grow sites tracked in CTS), the ratio of demand (measured by transfers to patients) to supply (measured by the amount of harvested material “packaged” in CTS) during the 12-month study period was approximately 80%.<sup>16</sup> As with the recreational market estimate, the medical supply estimate takes into account harvest waste but does *not* include estimates of “spoilage.”<sup>17</sup> This estimate also does not take into account transfers to medical processors, dispensaries, or the limited transfers allowed to recreational licensees, due to the small size of such activity. In the case of medical processors and dispensaries, that portion of the supply chain has essentially dried up completely, leaving those outlets irrelevant in discussions of demand. In the case of the transfers to recreational licensees, only 19 grow sites exercised that privilege in 2020.<sup>18</sup>

While useful as a “gut check” of medical supply and demand, the limitations of the data prevents meaningful conclusions from being drawn for the degree of equilibrium in the medical market as a whole. The 201 grow sites included in the analysis (representing 2.7% of the total number of OMMP grow sites in the state) are unlikely to be representative of the average grow site – the majority of grow sites grow for only one patient and are not required to report in either OMMOS or CTS.

However, extrapolating from the transfer activity of the 201 analyzed grow sites may elucidate an estimate of the maximum scope of *demand* in the OMMP system. Using these 201 grow sites, it is possible to evaluate the average number of transfers per year per patient, as well as the average amount of usable marijuana sent per transfer, and convert to a wet weight equivalent of supply needed. Using the median value of amount sent per transfer to each patient (2.1 pounds) and the most recent number of OMMP patients associated with a grow site (11,554 in October 2020), the extrapolated wet weight equivalent of demand from grow sites ranges between approximately 400,000 and 1,000,000 pounds (see Table 1).

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<sup>16</sup> The method used to analyze the recreational and medical marijuana demand-to-supply ratios are not comparable. Due to the need to standardize a wide variety of product types in the recreational market, this report converted all sales to units of THC and then calculated a “wet weight equivalent” of the supply required to produce that much THC. However, because the medical marijuana market is at this point almost exclusively medical grow sites – which can only transfer usable marijuana to patients – this appendix uses the simpler approach of directly comparing the amount “packaged” from harvests to the amount actually transferred to patients.

<sup>17</sup> The rationale for this is that rates of “spoilage” and other waste can itself be a function of excess supply. In a supply environment more favorable to growers or Producers, lower quality usable marijuana (e.g. lower potency flower) would be saleable, whereas in a supply environment with excess capacity, such product would be more likely to be wasted.

<sup>18</sup> Under this privilege, medical grow sites are limited to 20 pounds each year.

Table 1: Medical Marijuana Extrapolated Demand by Multiplier Estimates

|  |                             | <i>Dry-to-Wet Weight Ratio Estimate</i> |                             |
|--|-----------------------------|---|-----------------------------|
|  |                             | <b>Upper Bound</b><br>(14.3%)           | <b>Lower Bound</b><br>(10%) |
| <i>Number of transfers per patient, per year</i> | <b>Upper Bound</b><br>(4.1) | 707,220                                 | 1,011,325                   |
|  | <b>Lower Bound</b><br>(2.4) | 409,670                                 | 585,830                     |

Table 1 varies two primary multipliers: the number of annual transfers per patient, and the weight ratio of “packaged” cannabis ready for transfer with its wet form. The upper bound of the annual transfers per patient is based on the mean and median values from CTS for the grow sites included in this analysis. In the case of the dry-to-weight ratio estimates, 14.3% is the actual ratio derived from CTS for the grow sites in the analysis, whereas 10% is the multiplier used in the recreational wet weight equivalent calculation.<sup>19</sup>

Combining this analysis with the recreational supply and demand analysis in the main body of this report, the aggregate amount of “slack supply” currently in the OLCC market would more than accommodate the entirety of demand from medical patients associated with an OMMP grow site. The 2020 estimate of the OLCC demand-to-supply ratio is 65% of 7.66 million wet pounds. The 17% remainder of this production amount is 2.7 million pounds – more than enough to accommodate the upper bound estimate of demand from OMMP grow sites. In fact, in 2020 there would have been a nearly 90% probability that the OLCC market could have sustained even the uppermost medical demand estimate of 1.01 million pounds.<sup>20</sup>

As noted above, this production amount is also anticipated to grow at a higher rate in 2021 and beyond, which would increase the OLCC system’s capacity to accommodate medical demand.

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<sup>19</sup> Some grow sites transfer whole harvested plants to patients, which at minimum would increase this ratio by reducing the amount of harvest waste that is generated. The recreational supply and demand estimate relies on data for usable marijuana that is being dried and cured for sale at retail, which on average will have generated more harvest waste.

<sup>20</sup> Probability based on the percentage of Monte Carlo simulations in which the wet weight equivalent of demand was 1.01 million pounds or more away from the actual wet weight harvest of 7.66 million pounds.