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HEMP DERIVED CANNABINOIDS IN THE LONE STAR STATE

**An Economic Impact Analysis of the
Hemp Cannabinoid Industry in Texas**

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DISCLAIMER

Whitney Economics does not take a position on the legalization of cannabis nor does it take positions on proposed legislation; however, it does derive revenue from cannabis and hemp related companies and stakeholders. The views, opinions, and positions expressed in this paper are those of its author Beau Whitney, and do not necessarily reflect the views, opinions, or official positions of any of our affiliated organizations, groups or clients.



EXECUTIVE SUMMARY

This report is one in a series of economic reports that Whitney Economics (W.E.) has been commissioned to produce on the CBD and converted cannabinoid markets in the United States. W.E. has looked at the economic impact that this industry is having on individual states throughout the U.S. from agricultural, manufacturing, distribution and retail sales perspectives.

Whitney Economics has been tracking the Texas hemp industry from a cultivation, manufacturing, distribution and retail perspective since 2020. It has conducted periodic surveys of the industry and published reports on the economic impact that the industry is having on Texas. This report is a follow up to our 2023 report and examines the state of the industry, its revenues, employment, wages and economic potential of the market. It examines the supply chain, product segmentations and business sentiment. An additional focus was made on the potential impact proposed legislation that would restrict or prohibit sales of hemp cannabinoid products would have on the industry. If restrictions are imposed on the industry, there will be an immediate and negative effect on the industry and the Texas economy.

In examining the results of the business conditions survey deployed in Q1'2025, the data showed again in 2025 that the hemp cannabinoid industry is a major force in the Texas economy. It employs a large number of individuals, paying reasonable, living

wages, contributes to the tax revenues of the state and is producing thriving, profitable businesses. The supply chain extends throughout the country, but also provides opportunities for Texas farmers, manufacturers, distributors and retailers. The industry is very concerned about the potential impacts that legislation will have on their business and employees. Despite this concern, their outlook is positive for the future.

The objective of this report is to ascertain the total economic impact the hemp-derived cannabinoid industry is having on the Texas economy and to understand the implications that a ban on sales would have on the state and the industry.

Key Findings contained in this report:

The Hemp cannabinoid industry is a major contributor to the Texas economy

- The total estimated revenue derived from businesses involved in the hemp derived cannabinoid industry in Texas is approximately \$5.5 billion.
- The \$5.5 billion is calculated based on the total number of licensed manufacturers and retailers and does not include unauthorized sales from gas stations.
- The retail sector alone generates \$4.3 billion, with an overall economic impact of \$10.2 billion in economic activity.
- Sales tax revenues from the retail sector alone generate an estimated \$267.7 million in sales tax revenue for the state.

The hemp industry is a significant employer that pays reasonable, living wages to its workers

- The industry, based on the survey employs in excess of 53,000 workers, receiving \$2.1 billion in wages

The hemp industry is healthy, profitable and has a nationwide supply chain

- 93% of businesses in this sector are either profitable or breaking even. 72% of the businesses are profitable, which is higher than the 66% of small businesses nationally that are profitable based on data from the U.S. Chamber of commerce.
- Overall, the industry grew in the past year and is forecasting growth again in 2025.
- Hemp operators have suppliers from all 50 states, but sourcing locally is the most common.
- Most operators source supply from between 3 and 4 states.
- Hemp related licenses have increases steadily since 2022 for both retailers and manufacturers.

The economic impact of highly restrictive policies would have a significant and negative impact on the industry

- The impact of anti-hemp or restrictive laws is significant, with roughly 6,350 business failures, displacing 40,201 workers generating \$1.6 billion in wage losses
- The economic impact of these policies would reduce the economic activity by over \$10.2 billion in the state

Recommendation:

Based upon the level of business creation, employment and economic activity, legislation and policies that restrict consumer access and sales is not recommended. A more supportive and collaborative approach that develops and implements practical policies related to public safety would support industry growth while maintaining public policy objectives.

INTRODUCTION



CBD is an Extract of Hemp Biomass

CBD and converted cannabinoid products are derived from extracts of the hemp plant. The plant's flower and leaves are first extracted to produce an oil. The oil is then refined in order to separate the cannabinoids from the plant matter, lipids and water that make up the extracted oil. Technicians have the ability to further refine the oils in order to isolate certain compounds. CBD can then be productized into vaporizers, edibles (ex. gummies), balms, tinctures and other wellness products. CBD also serves as a base for further refinement and conversions into other THC and cannabinoid products.

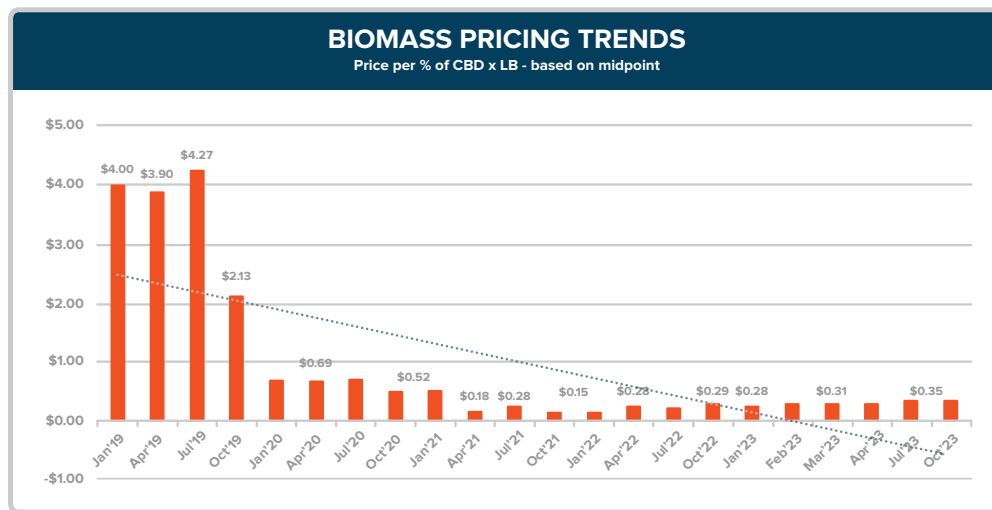
A lot has happened in the CBD space since 2018. Little known by consumers even 10 years ago, CBD has increased in popularity in recent years, particularly after the passage of the 2018 Farm Bill which legalized hemp and hemp derived products. Converted cannabinoid products evolved, as did the market, and consumer demand for these products surged in 2019 - 2020.

U.S. Hemp Production Capacity and Acres Licensed Increased Dramatically in 2019

The U.S. hemp industry has evolved in the short period after the 2018 farm bill. Hemp cultivation and production for cannabinoids, while a niche market prior to 2018, burst onto the scene in a big way after 2018. Previously, hemp for fiber and grain encompassed a majority of the acres licensed under the 2014 farm bill, acre allocations in favor of cannabinoid cultivation surged to nearly 82% of the nation's acres licensed.¹

Excess Cannabinoid Inventories Led to Collapsing Prices from 2019 through 2021

With the surge in supply, the infrastructure required to handle the volume output of the farms became a limiting factor in the ability to bring the cultivated output to market. As a result, there was more supply of cultivated output than the processors could handle. With supply greater than demand, prices for cannabinoid materials collapsed, as did prices further down the value chain, including that for cannabinoid crude, distillate and isolate.



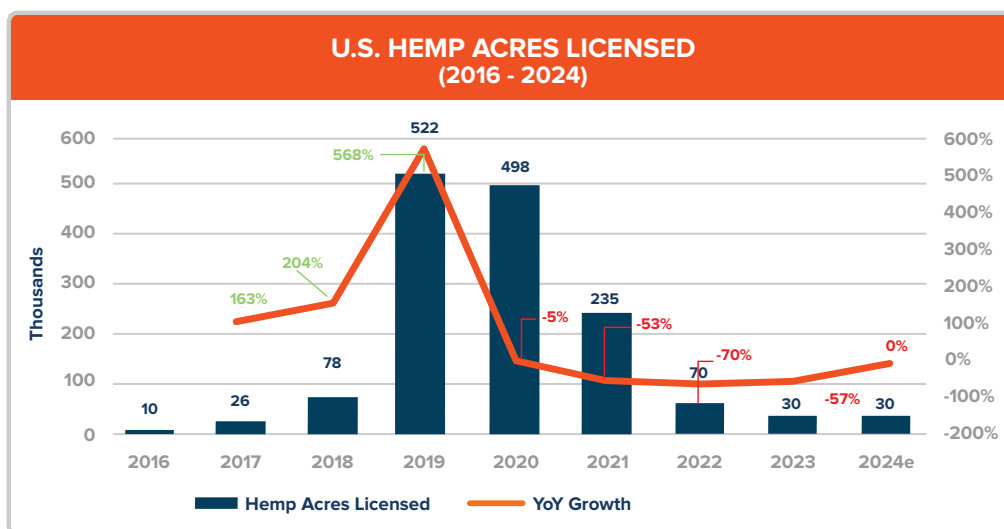
Since 2018, Federal Regulatory Murkiness Has Created Uncertainty and Impacted Growth

Uncertainty at the federal level has also influenced the opportunities for cultivators and operators in the cannabinoid space. With the deployment of Epidiolex, a marijuana-based CBD seizure medication, in the U.S. market, the FDA determined that CBD is a drug. This guidance meant that marijuana-derived CBD could not be used as an ingredient for food or as a supplement, and created enough ambiguity that product manufacturers and investors pulled back. They were not interested in investing into and deploying products into a potentially illegal market. As a result, market growth has been inhibited despite significant demand

for hemp-based cannabinoid products. Regulatory ambiguity at the federal level has presented too much risk for investors and manufacturers to absorb and has inhibited the growth of the market.

Uncertainty Has Driven Out Operators and Constricted the Market Since 2020

Uncertainties have consistently dogged hemp operators across the country. The combination of collapsing prices, a lack of regulatory certainty, a lack of legal certainty, a shortage of product development and not enough access to markets was too much to bear for many hemp operators. There has been a major pullback in the number of acres licensed as well as the number of processors in the U.S.²

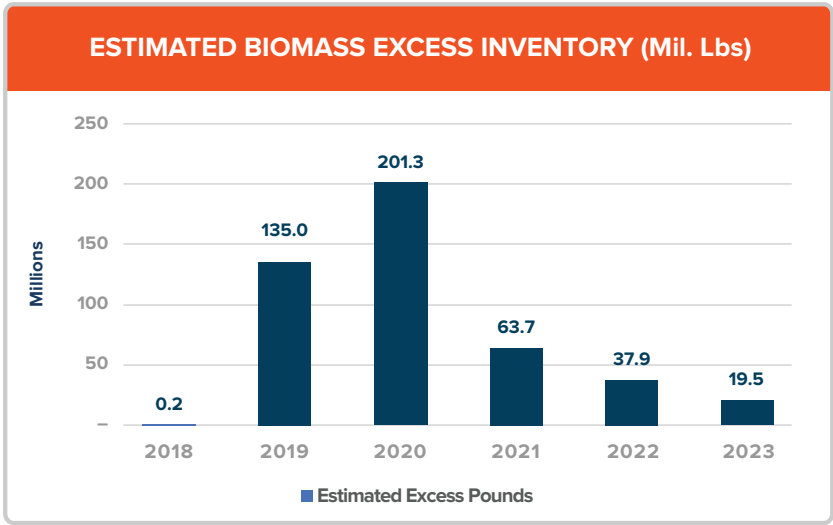


Fewer Suppliers and Reduced Hemp Biomass and CBD Inventories Since Peaking in 2020

With a lack of consistent orders from product manufacturers, regulatory murkiness at the federal level, and dramatically falling prices, U.S. hemp cultivators and cannabinoid processors saw their inventories increase significantly in 2019 and again in 2020. At its peak there were approximately 201 million pounds of excess hemp biomass in the U.S. marketplace and in excess of 1.6 million kilos of processed cannabinoids.

Raw Material Shortage Supply

2022 and 2023 saw further reductions in excess inventories to such an extent that processors of CBD and cannabinoid manufacturers are anticipating further drawdowns of raw material supply in 2024.³ While this has led to stable and even increasing prices for biomass, material shortages at the manufacturing levels could significantly impact both revenues and employment.



Source: Whitney Economics Hemp Cultivation Surveys (2019, 2020, 2021, 2022)

Economic Stress Drives Innovation and Opens New Market Opportunities in 2020

With little economic value left in the inventories of excess biomass and processed cannabinoids, farmers and processors have looked for innovative ways to monetize their inventory. Many sold their inventory below their costs of production, which resulted in continued downward pressure on prices. This unabated decline in pricing has put many operators out of business. Others found ways to monetize their

inventory through process innovations. This led to a significant increase in processed materials that were further refined or converted into products, beyond the original CBD content. These products included gummies, vapes and other derivative products containing minor cannabinoids such as CBG and CBN, as well as products containing other forms of THC beyond the traditional THC delta-9 such as delta-8, delta-9, delta-10 and further refined products, such as HHC.

“Unlike adult-use and medical cannabis, hemp-based products can be sold in all traditional distribution channels and retail outlets.”

Converted Products Were Creating Consistent Demand for Hemp by 2021

The deployment of products beyond traditional THC delta-9 and CBD have been a lifeline for farmers and processors in the hemp-based cannabinoid industry. **Given that all products derived from hemp are considered hemp, converted hemp-based cannabinoid products found new market opportunities that have not been available to medical or adult-use cannabis operators.** Hemp-based operators were also able to conduct interstate commerce, rather than being restricted only to the markets where the products were grown and processed (which is required of adult-use and medical cannabis products).

Consumers Are Seeing the Benefits of CBD and other Cannabinoid-based Products

Consumer demand has been steadily increasing as the potential benefits of hemp and hemp derived products became more widely known. Consumers began substituting hemp, hemp-based oil and oil derivative products for opioid and pharmaceutical medicines, particularly for pain management, anti-inflammatory, anxiety and diet issues. Seeing an opportunity to expand revenues in small businesses, hemp operators started offering more products. In many states, hemp is the only source of cannabinoids allowed, so the consumer demand has steadily increased, while regulatory oversight was limited to hemp at the farm gate. **From the period from 2019 through 2022, sales of hemp-based cannabinoids exploded and is estimated to be between \$21.3 - \$35.8 billion in the U.S. alone.**⁴ Unlike adult-use and medical cannabis, hemp-based products can be sold in all traditional distribution channels and retail outlets. This has given the U.S. consumer unprecedented access to cannabinoid products.

In 2024/2025, a Nimble Industry Continues to Outpace Product Safety Regulations

Similar to the early days of adult-use and medical cannabis, the pace of expansion in the hemp market has surpassed the ability or federal willingness to regulate it. As a result, **some products that have been tested have shown discrepancies in labeling, cannabinoid content, the levels of THC, CBD and**

other ingredients and have shown indications of other “unknown substances”. These issues will require further regulations, as the current environment is self-regulated, and federal regulation stops at the farmgate. **Regulatory ambiguity could be solved with greater clarity at the FDA and other federal agency levels.** That reform has so far been elusive to date.

Adult-use and Medical Operators Have Pushed Back Against Hemp-Based Cannabinoids

As the sales of hemp-based cannabinoids increased from 2019 – 2024, adult-use and medical cannabis operators have cried foul. Many companies highlighted the lack of regulations have led to a “public safety crisis”, while others have cited the competition hemp cannabinoids represents and threatens their revenues derived from impairing hemp cannabinoids.⁵ Most public safety issues discussed were associated with youth access and usage by consumers who lack any knowledge of what they are ingesting. Many of these concerns can be addressed through basic regulations, yet it seems that adult-use and medical operators are calling for a complete and total ban on sales of hemp products, or for hemp to be regulated in a similar manner as a Schedule One narcotic. The trade-off between working to address gaps in the regulatory process, versus an outright ban, is too large to be economically justifiable. ***While it is appropriate to regulate cannabinoids, it seems unnecessary to force a dramatic change from ‘unregulated’ to ‘schedule one narcotic.’*** The negative economic impact appears to exceed the justification.

FDA Issued a 2022 Update on Hemp-Derived Delta-8 Products

The FDA has issued an update specifically about delta-8 which provided consumers with a good overview for consumer awareness. ***The FDA has stated that these products have not been evaluated or approved by the FDA for safe use in any context.*** Extending this further, the FDA issued a statement in early 2023, that said the existing regulatory frameworks for foods and supplements are not appropriate for Cannabidiol and that they will work with Congress on a new way forward. Precisely the same thing can be said for almost all adult-use and

medical cannabis products. One might ask, if hemp derived cannabinoid products are a risk to public safety, how are adult-use and medical products not a similar risk? The difference, adult-use operators would say, is that cannabis for adult-use and medical purposes is tightly regulated while hemp is not. Further, **regulation for hemp products stops at the farmgate and does not extend to the product levels. A lack of**

product regulation of hemp-derived products creates a competitive advantage for the hemp industry, and it may allow for the opportunities to sell potentially harmful products to unsuspecting consumers. This point of view further demonstrates the importance of reasonable policies with regard to regulating market access and sales of hemp-based products.

“*From an economic perspective, Whitney Economics has determined that all cannabis-derived products (adult-use, medical and industrial) would be best regulated based on product intention rather than based on a determination of legality at the farmgate.*”

Since 2018, State Legislatures Have Stepped in to Fill the Regulatory Void

With continued regulatory murkiness around hemp at the federal level, pressure has mounted on state legislators to take action. State legislatures have been compelled to address issues surrounding hemp cultivation and product manufacturing on their own. The result is an inconsistent patchwork of regulations, from state to state. So far, 33 states allow for the sales of hemp-based cannabinoids and converted cannabinoids in either a regulated or loosely regulated manner. Other approaches being used by states include⁶:

- Prohibiting the sales of products that compete with cannabis products until a tax program has been developed and implemented
- Implementing moratoria on the cultivation of hemp
- Proposing the ban on sales of hemp-based cannabinoids within the state but allow for manufacturing and processing for out-of-state export
- Allowing sales of cannabinoid products, but with restrictions of cannabinoid content

Since 2020, State Legislative Actions Have Impacted the Hemp Industry at the National Level

With the regulatory uncertainty already high due to federal inaction, additional uncertainty around state regulations has negatively impacted the national hemp industry. Within this dynamic and changing environment, many operators cannot formulate

meaningful long-term plans, or even short-term operational strategies, as they are not sure what the rules will be in three months, six months or a year. The market is understandably seizing up, with investments planned for hemp projects now being allocated elsewhere. At a time when, in order to accelerate the growth of the market, supportive policies are necessary, more restrictive measures are being put into place that are doing just the opposite. Data show that these policies are suppressing the growth and expansion of the industry.

What are the Impacts of this Environment of Uncertainty?

- A lack of investment and deployment of the hemp infrastructure *reduced the economic potential of the U.S. hemp industry by \$20 - \$25 billion in 2024 for fiber and grain alone.* The value of this shortfall is the same size as the entire legal U.S. sales of the adult-use and sales of the adult-use and medical cannabis retail industry in 2021.
- Uncertainty at the state level has reduced acreage and business licenses, limiting cultivation capacity
- The impact on the fiber and grain industries has been further exacerbated by the reduction of investments in infrastructure and the ability to obtain banking services
- The lack of acreage may result in a supply constraint in 2025 or 2026 that will limit the growth of the U.S. cannabinoid industry. This may force U.S. manufacturers to source raw materials from outside of the U.S. including China.

Hemp and Hemp Derived Products are Deemed Legal in U.S. 9th Circuit Court Ruling

Hemp derived products are hemp by definition and are therefore legal to sell and productize, according to the U.S. 9th Circuit. As such, they do not require as much regulation as does the federally illegal adult-use and medical cannabis. While the adult-use and medical industry is crying foul and attempting to paint hemp derived products in a negative light, the fact remains that until policy changes are made at a federal level, hemp derived products will remain legal.

DEA Has Reaffirmed the Legality of Delta-8 THC, Delta-10 THC, HHC

On or about February 13, 2023, the DEA responded to an inquiry from Attorney Rod Knight regarding the legal status of THCO (only). The DEA stated that THCO is a schedule 1 controlled substance applying the Analogue Act. The DEA letter was solely about THCO, specifically delta-8 THCO and delta-9 THCO. It did not in any way address delta-8 THC or any other compound. ***The legal status of delta-8 THC was not impacted in any way by the DEA's letter, except to the extent that its lawful status as "hemp" was reinforced.*** The DEA could have said that Delta-8-THC was unlawful or was synthetic; it did not. Instead, previously, the 9th Circuit Court of Appeals had indicated that Delta-8 'fits comfortably' within the hemp definition of the Farm Bill.

In 2025, A Lack of Data has Led to Even Greater Uncertainty

Due to the federal illegality of cannabis at the federal level, most federal agencies are not allowed to collect data on the economics of cannabis. There are a handful of NAICS codes (North American Industrial Classification System) that are used to track the flow of goods and services throughout an economy, but there is currently only a very limited ability to track such things as revenues, employment, economic impact, taxes and the flow of cannabis goods and services throughout the economy. As a result, most of the data gathering has been in the form of meticulous manual data collection: compiling data from state regulators, parsing together point of sale data, and conducting business and consumer surveys. With

the lack of centralized data in the marketplace, it is understandably tough to be able to ascertain risks felt by operators, investors and stakeholders participating in the hemp industry. This lack of basic economic measurements has led to even greater uncertainty.

Access to Data is Limited; Some States Report Better than Others

In adult-use and medical cannabis, there has been very little data collected at the federal level. This is beginning to change and some data is being published by state regulatory agencies. Because hemp is a federally legal agricultural crop, the ability to analyze the market is limited to the data that is collected by the USDA. This data is recent and not comprehensive, as it only goes back to 2021, the whole industry has very few NAICS codes and, unfortunately, despite its legality, hemp has been caught up in the debate and politics around cannabis data collection. A few teams of analysts, like the one at Whitney Economics, have been manually collecting data at the state level since 2019. Published data is largely limited, however, to the higher aggregated levels, and it does not include sales data at the product manufacturing or retail levels. This manual collection of regulatory and economic data is further supplemented by regular surveys of cannabis operators and stakeholders. This ongoing research is inspired by the lack of available, accessible data. The lack of data has hindered the ability to analyze the hemp market, and has limited the ability to provide useful, timely insights to regulators and policy makers on key issues, including the impacts of policy changes on the industry.

PROPOSED STATE LEGISLATION: Texas has Proposed Legislation that Impose Restrictions on the Sale of Hemp-derived, Converted Cannabinoids in 2023 in 2024

There have been multiple efforts in Texas to pass legislation ***that restricts sales of converted CBD Cannabinoid products and limits the THC content beyond the federal definition of marijuana.*** These bills made assumptions about the public safety and health implications of cannabinoid products and also assumed that the health and safety issues outweighed the economic impacts of the sales limitations. In examining the potential impact, it appears that the

legislature may have underestimated the effect that such legislation would have on the Texas economy. Advocates for access to hemp-derived cannabinoids in Texas have come out in force against these bills, particularly veterans.

Lack Of Data Is Leading to Poor Policy Decisions and Misunderstandings

The data suggest that these proposed restrictions have the potential to do far more economic harm than good, while still not meaningfully addressing the public safety and regulatory concerns that drove the initial legislation. We should point out that much of the narrative associated with this conversation has been qualitative in nature, but not supported by data. Depending upon their source, qualitative inputs can lead to the development of uninformed policies that do not support larger public safety goals or regulatory objectives.

The Intention of this Report is to Fill the Void with Data

This project attempts to address the lack of data on the hemp-based cannabinoid market in Texas. Most estimates have vastly underestimated the amount of revenue being derived from Texas's hemp retail industry. This report intends to build off of a 2023 Whitney Economics report that examines the impact hemp derived cannabinoid industry is having on the Texas economy. Whitney Economics has combined its expertise and extensive data set for the cannabis and hemp industries, with a survey of retailers, wholesalers and manufacturers of hemp-based cannabinoids in Texas.



OBJECTIVE OF THE REPORT

The objective of this report is to ascertain the total economic impact the hemp-derived cannabinoid retail industry is having on the Texas economy and to understand the implications that restrictions on sales would have on the state and the industry. In addition, the objective was also to assess the amount of employment, wages, and revenue derived from these products, to identify key issues facing the hemp, CBD and converted cannabinoid industry and to then summarize and articulate the quantitative and qualitative results for educational purposes.

Limitations in scope

The quantitative economic impact research from our fact finding was limited to the following items:

- **Types of business**
- **Monthly revenues**
- **Average sales per transaction**
- **Percentage of revenues derived from CBD and Cannabinoid based**
- **Types of product form factors**
- **Total labor demand**
- **Total wages paid**
- **Profitability**
- **Sales trends**
- **Sources of supply (states)**
- **Sources of risk to the business operators**
- **Possible reaction to legislation if bans or THC content restrictions are passed and signed into law**

In addition to the above mentioned specific quantitative data points, some qualitative data were gathered from interviews. These data include:

- **Key regulatory and strategic issues facing operators,**
- **General comments about the industry or regulations**
- **Qualitative data has revealed some useful insights into the mindset of Texas hemp-derived cannabinoid operators.**

SURVEY COVERAGE

There were over 290 survey responses representing over 500 individual locations. Within roughly 8,500 licenses, plus manufacturing and wholesale, the

findings have a confidence level of 95%, with +/- 5.5% error. This is a very high confidence mark, representing over 6.5% of all licensees.

Sector	Number of Respondents	Average # of Outlets	Total Outlets Covered
Retail	228	2.27	518
Wholesale	39	5.1	204
Manufacturing	33	4.35	148

DATA AND FINDINGS

Texans have limited access to cannabinoids

Despite being one of the largest states in terms of cannabis consumption, Texans currently have a very limited access to cannabinoids. Unlike many other states, Texas does not allow for adult-use cannabis production or sale, and has very restricted access to cannabis for medical purposes. As a result, hemp-derived is the only legal source of cannabinoids in Texas for consumers. Consumer interest in hemp-derived cannabinoids has increased since the passage of the farm-bill in 2018. It is notable that if legislation is passed to restrict or prohibit access to hemp-derived

cannabinoids, Texas consumers would lose all access to the benefits of cannabinoids.

The Texas cannabinoid market has grown significantly

With the growing number of consumers purchasing hemp-derived cannabinoids, businesses have seen an economic opportunity associated with this emerging industry. This has led to a surge in the number of licensed operators in Texas. While the number of physical locations has increased access, the number of manufacturing licenses has remained steady, increasing 14.7% since 2022.⁷

Year	Registrations	Physical Locations	Consumable Hemp Licenses
2022	3,059	5,072	606
2023	2,913	4,079	588
2024	4,266	7,550	694



HEMP BY THE NUMBERS

The data showed again in 2025 that the hemp cannabinoid industry is a major force in the Texas economy. It employs a large number of individuals, paying reasonable, living wages, contributes to the tax revenues of the state and is producing thriving, profitable businesses. The supply chain extends throughout the

country, but also provides opportunities for Texas famers, manufacturers, distributors and retailers. The industry is very concerned about the potential impacts that legislation will have on their business and employees. Despite this concern, their outlook is positive for the future.

REVENUES

Overall, there are over 8,500 businesses associated with the Texas hemp-cannabinoid market. The market generates roughly \$5.5 billion in revenue. Whitney Economic feels this is conservative, because gas station demand and the revenues of larger

manufacturers are not represented in the survey findings. Retail revenues have increased slightly from our previous survey (\$567k in 2025 versus \$513k in 2023).

Total Estimated Revenue Statewide		
Retail	7,550	\$4,282,555,168
Wholesale	300	\$308,832,000
Manufacturing	694	\$955,868,708
Total Estimated Revenue		\$5,547,255,876

SALES TAX REVENUES

The total amount of sales tax derived from the retail sales of hemp-derived cannabinoids is estimated to be \$267.7 million per year. This assumes a sales tax rate

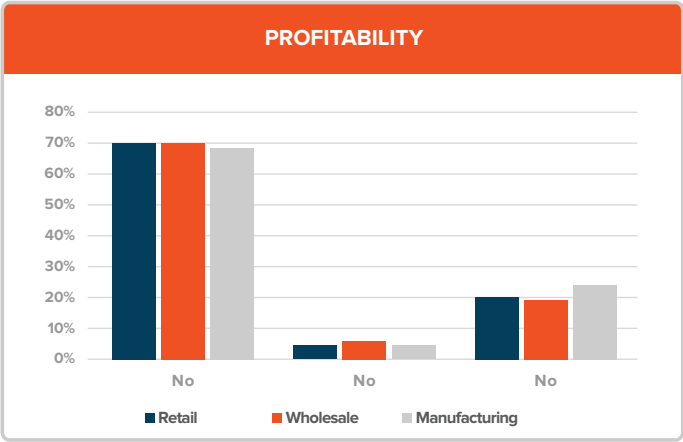
of 6.25%. Additional taxes are derived from business taxes, payroll taxes and local taxes, but are not included in this analysis.

Total Sales Tax Estimate Statewide	Amount
Retail Sales	\$267,659,698

PROFITABILITY

The hemp derived cannabinoid businesses are economically healthy. 72% of the respondents indicated that they were profitable, with an additional 21% responding that they were breaking even. Only

7% are not making a profit. This shows how viable the businesses are. By comparison, according to the U.S. Chamber of Commerce, approximately 66% of small businesses are profitable.



Profitability is consistent from sector to sector. This implies the entire supply chain is healthy and thriving.

Profitable	Yes	No	Break Even
Retail	72%	7%	21%
Wholesale	72%	8%	21%
Manufacturing	70%	6%	24%

Sector coverage

Overall, responses represented 6.9% of the retail sector, and 21.3% of the manufacturing sector. Enough

to enable an extrapolation of the results to the broader Texas market.

EMPLOYMENT

Overall, the hemp derived cannabinoid market employes over 53,300 workers paying nearly \$2.1 billion in wages. This is an increase from 51,100 workers and \$1.6 billion in 2023. The overall market is expanding in terms of the number of businesses,

however the existing business are getting more efficient, while paying more per hour overall. This shows that the overall supply chain is expanding in a controlled manner.

Statewide Jobs and Wages	Jobs	Wages
Retailers	41,359	\$1,533,910,333
Wholesalers	4,043	\$189,938,366
Manufacturers (Processors / Extractors)	7,981	\$374,344,995
Total Estimated Jobs and Wages	53,382	\$2,098,193,694

Retail

Retail employment on average has become leaner. The average number of workers per location in 2023 was 9.3, whereas in 2025 it was 5.5. To a certain extent this can be attributed to doing more with less (efficiencies gleaned during the pandemic), but also due to more companies having multiple locations. Multiple locations can utilize shared resources, such as HR, accounting and other administrative roles. This allows each store to focus their labor on the sales floor. Despite the efficiencies, given the increase in the number of stores, the retail sector has increased wages paid from \$1.2 billion in 2023 to \$1.5 billion in 2025.

In the retail sector, wages have increased from \$14.19/hour in 2023 to \$17.83/hour in 2025. The increase in wages is attributed to companies doing more with less, a theme developed during the pandemic. Also, average number of workers declined in the retail sector, while those remaining received an increase in wages.

Wholesale

The wholesale market has also become more lean and efficient. They are paying more wages though. The average employees per location in 2023 was 16.5 whereas in 2025 it was 13.5 employees. Total wages paid declined as a result. In 2023, total wages paid were estimated to be \$245.3 million, lowering to \$189.9 million by 2025. This is a natural evolution in a maturing

market. Overall, wages paid declined, but wages per hour increased. Average hourly wages were \$21.09 in 2023 and increased to \$22.59 in 2025. Part of this overall decline could be attributed to some notable exits from the market that resulted from uncertainty related to potential changes in the laws. Companies literally voted with their feet or reduced their footprint in Texas to reduce risk and exposure.

Manufacturing

The average number of employees in the manufacturing sector was 12.8 in 2023 versus 11.5 in 2025. Although there was a slight decrease in the number of workers, those who remained were rewarded with increased hourly earnings from \$21.25 in 2023 versus \$22.55 in 2025. Although there was a slight reduction in the average number of employees, the increase in wages more than offset this decline and wages paid in 2025 are forecasted to increase from \$127.4 million in 2023 to \$374.3 million this year.

Manufacturing outperformed other sectors in this space. The average number of employees were consistent, while wages increased per hour and overall. The number of firms licensed by the State of Texas also increased significantly from 606 at the end of 2022 to 588 at the end of 2023 to 694 by the end of 2024. Given the consistency, the manufacturing sectors seems to be in balance with the consumer demand.

Sector	Number of Respondents	Average Wages (228)	Anualized	Total Per Respondent	Average wage / employee	Percentage of Average revenue
Retail	228	\$52,440	\$109,075,200	\$210,570	\$37,088	37.12%
Wholesale	39	\$73,505	\$152,890,400	\$749,463	\$46,985	72.80%
Manufacturing	33	\$71,800	\$149,344,000	\$1,009,081	\$46,905	73.26%



OVERALL ECONOMIC IMPACT BASED ON RETAIL SALES

In economics there is a concept called the multiplier effect. It tries to measure the amount of economic value in an economy derived off of each dollar of activity. The concept is that when a dollar is spent in an economy, it creates a ripple effect and additional spending occurs.

Different activities have different levels of multiples. For hemp, the multiplier is 2.4x. Based on \$4.28 billion in retail spending on hemp -derived cannabinoids, there is a total economic impact of \$10.78 billion on the state.

The Multiplier Effect - 2.4x (Retail only)	
Total Estimated Sales	\$4,282,555,168
Total Economic Impact	\$10,278,132,402

Source: Whitney Economics

PRODUCT TYPES AND PRODUCT SEGMENTATION

While a few cannabinoids have been making most of the headlines, there are multiple cannabinoids derived from hemp that have been commercially viable. CBD is the most common as it is in many products and is non-impairing. Other cannabinoids such as delta-8 have received significant amounts of negative press.

Delta-9 derived from hemp is an impairing ingredient that has been productized in the form of beverages and is gaining wide spread popularity. Cannabinoid beverages have helped to restore the health of business in other industries that have experienced

revenue declines over the past 5 years. These industries include craft beer producers, alcohol distributors and distilled spirits manufacturers.

THCA is a chemical that when heated can change into impairing hemp derived Delta-9. THCA has gained in popularity throughout the U.S. and is being productized in flower form (buds) or in pre-rolled cigarettes. We have captured the level of market share for each of these major cannabinoid categories.

Sector	Retail	Wholesale	Manufacturing
THCA Flower	25.3%	23.2%	21.3%
Edibles	26.4%	26.3%	25.5%
Vapes	24.3%	17.2%	21.3%
Beverages	18.6%	25.3%	22.3%
Other	4.9%	8.1%	9.6%
None of the above	0.4%	0.0%	0.0%

Businesses are starting to derive a significant amount of revenue from THCA over the past 2 – 3 years. All sectors within the hemp-derived cannabinoid sector list similar percentages of revenue, thereby increasing the confidence in our results and survey findings.

Revenues derived from these various product segments have been listed below. While CBD has the greatest amount of retail sales, other product types are gaining traction as well. Having an even distribution of sales by product reduces risks to businesses. This demonstrates the health and breadth of the cannabinoid industry in Texas.

Total Sales Statewide	Retail	Wholesale	Manufacturing
THCA	\$571,007,356	\$38,604,000	\$114,913,178
Delta-9 THC	\$567,970,082	\$50,667,750	\$120,136,504
Delta-8 THC	\$473,814,614	\$31,365,750	\$109,689,852
Delta-10 THC	\$242,981,853	\$4,825,500	\$26,116,631
CBD	\$607,454,634	\$53,080,500	\$141,029,809
CBG	\$482,926,434	\$36,191,250	\$125,359,831
CBN	\$455,590,975	\$36,191,250	\$114,913,178
HHC	\$346,249,141	\$16,889,250	\$57,456,589
Hybrids – a combination of two or more of the above	\$476,851,887	\$36,191,250	\$120,136,504
Other (please specify)	\$45,559,098	\$4,825,500	\$26,116,631

In sum, the hemp-derived cannabinoid industry is continuing to expand, but in terms of business creation, but also in terms of the types of products being sold.

A restriction imposed on the industry would have a significant economic impact across multiple sectors in the economy.

SUPPLY CHAIN ANALYSIS

Texas hemp operators utilize an extensive supply chain. Operators source their hemp materials from all 50 states. Most operators, however, utilize suppliers from a handful of states, with sourcing from Texas

being the most common. Changes to laws would impact businesses throughout the entire value chain and would impact Texas suppliers the most.

Number of States Traded with	Retail	Wholesale	Manufacturing
Average States Sourced From —>	3.45	3.51	3.12
Top State Source of Supply	Texas	Texas	Texas
#2	California	California	Colorado
#3	Florida	Florida	California
#4	Oregon	Oregon	Oregon
#5	Colorado	Colorado	Florida
#6	Oklahoma	North Carolina	North Carolina

TOP CONCERNS OF BUSINESS OPERATORS

Changes to state laws viewed as top risk to the hemp-derived cannabinoid industry

To assess the potential impact, the survey examined which issue represented the greatest risk to the hemp industry. Survey respondents overwhelmingly stated

that changes to state regulations and the federal farm bill were perceived to be the greatest risks to their businesses. Regulatory ambiguity at the federal level is considered a top concern as well.

Top Risks - % of Respondents	Top Issue #1	Top Issue #2	Top Issue #3
Retail	Proposed state regulation (82.4%)	Potential changes in the upcoming farm bill (81.6%)	Current Federal regulatory ambiguity (53.5%)
Wholesale	Proposed state regulation (92.3%)	Potential changes in the upcoming farm bill (82.1%)	Current Federal regulatory ambiguity (59.0%)
Manufacturing	Proposed state regulation (93.9%)	Potential changes in the upcoming farm bill (78.8%)	Current Federal regulatory ambiguity (66.7%)

THE IMPACTS OF ANTI-HEMP LEGISLATION OR LEGISLATION TO LIMIT ACCESS TO HEMP-DERIVED CANNABINOIDS

Survey results indicate that hemp-derived operators are extremely concerned about potential legislation that will impair their ability to support the consumers. These fears, if realized would lead to severe actions taken by the operators. In fact, if laws are passed that will limit or prohibit sales of hemp-derived cannabinoid products, a majority of the businesses would either

be forced out of businesses or would move their operations to another state. These are not results that should be summarily dismissed. In surveys on this same topic conducted in other states that were conducted prior to and post legislation, job losses occurred and businesses either folded or moved.

If laws are passed prohibiting sales of CBD or cannabinoid products, what will you do?				
Reaction	We will go out of business	We will remain in business, just with less revenue	We will move our business to another state.	Other or N/A
Retail	63.2%	19.7%	9.6%	7.5%
Wholesale	57.1%	3.6%	32.1%	7.1%
Manufacturing	72.7%	6.1%	21.2%	0.0%

IMPACTS OF POTENTIAL LEGISLATION THAT RESTRICTS ACCESS TO HEMP DERIVED CANNABINOIDS IN TEXAS

Based on the average sales per sector of each cannabinoid, legislation that would prohibit or severely

restrict sales of cannabinoids would impact multiple product types and sectors.

IMPACTS OF POTENTIAL LEGISLATION THAT RESTRICTS ACCESS TO HEMP DERIVED CANNABINOIDS IN TEXAS

Based on the average sales per sector of each cannabinoid, legislation that would prohibit or severely restrict sales of cannabinoids would impact multiple product types and sectors.

Total Lost Sales Statewide	Retail	Wholesale	Manufacturing
THCA	(\$415,733,426)	(\$24,746,154)	(\$107,948,743)
Delta-9 THC	(\$413,522,078)	(\$32,479,327)	(\$112,855,504)
Delta-8 THC	(\$344,970,289)	(\$20,106,250)	(\$103,041,982)
Delta-10 THC	(\$176,907,841)	(\$3,093,269)	(\$24,533,805)
CBD	(\$442,269,602)	(\$34,025,962)	(\$132,482,548)
CBG	(\$351,604,333)	(\$23,199,519)	(\$117,762,265)
CBN	(\$331,702,201)	(\$23,199,519)	(\$107,948,743)
HHC	(\$252,093,673)	(\$10,826,442)	(\$53,974,371)
Hybrids – a combination of two or more of the above	(\$347,181,637)	(\$23,199,519)	(\$112,855,504)
Other (please specify)	(\$33,170,220)	(\$3,093,269)	(\$24,533,805)

Economic Impact of Prohibiting or Restricting Access to Cannabinoid Products. would be a \$7.5 billion negative economic impact to the state.

Overall, based only on the decline in retail sales, there

The Multiplier Effect - 2.4x (Retail only)	
Total Estimated Lost Sales	(\$3,118,000,692)
Total Economic Impact	(\$7,483,201,661)

Source: Whitney Economics

In terms of the potential impact of legislation that prohibits or severely restricts access to hemp-derived cannabinoids, revenues would decline, tax revenue would decline, unemployment would increase and wages would decline.

Impact of Restrictions or Bans	Retail	Wholesale	Manufacturing	Total
Revenue Impact	(\$3,118,000,692)	(\$197,969,231)	(\$897,937,271)	(\$4,213,907,194)
Lost Sales Tax Potential	(\$194,875,043)			(\$194,875,043)
Employment	(30,112)	(2,591)	(7,497)	(40,201)
Wages	(\$1,116,794,365)	(\$121,755,363)	(\$351,657,420)	(\$1,590,207,147)
Business Failures / Relocations	(5,497)	(192)	(652)	(6,341)

Should legislation be passed, the retail sector would be hit the hardest, with 30,112 lost jobs, a decline in wages paid by \$1.1 and a decline in taxable revenue by \$3.1 billion. In total, the employment would decline by 40,201, paying \$1.59 billion in wages and generating \$4.2 billion in sales.

CONCLUSION

Cannabinoid Retail Is Viable in Texas

Despite the federal regulatory uncertainty and the dynamic market conditions, falling prices and uncertainty from regulators and policy makers, the Texas hemp-derived cannabinoid retail sector has quickly evolved into an economically viable and sustainable industry. With a national supply chain, this sector has had a positive economic contribution to the state of Texas.

The Overall Industry is Growing

The hemp industry is growing. Overall, revenues, employment, hourly wages have all increases since our last survey. The survey respondents indicated that revenues have grown over the past year and are forecasted to increase again in 2025.

Economic Impact of Hemp Cannabinoid Processing and Manufacturing on Texas

In addition to employing over 53,380 workers, generating \$2.1 billion in wages in Texas, the influence of this industry is felt beyond state borders. The \$10.0 - \$10.5 billion economic impact of hemp to the Texas economy is significant enough to justify more favorable policies, not less favorable ones.

Near-Unanimous Concerns from Texas Hemp Cannabinoid Retailers

When asked, nearly 73% of respondents said that a restriction on cannabinoid retail sales would result in them either going out of business or completely exiting the state, taking with it the jobs, taxes and economic contributions with them. Public safety remains a concern for every company contributing to this report.

Whitney Economics does not recommend enacting restrictions on cannabinoid sales for several reasons:

- The economic damage in terms of business failures, job losses and adjacent economic activity to Texas would be too great.
- There would be a shift of \$10.2 billion in economic activity away from the state, without addressing some of the stated underlying public safety concerns regarding hemp-derived products.
- Restrictions on sales would displace tens of thousands of workers during a time of national economic uncertainty
- Texas cannabinoid restrictions would disrupt the hemp supply chain throughout the United States at a time when opportunities for hemp farmers are being lost at a rapid pace.

Based upon the level of business creation, employment and economic activity, legislation and policies that restrict consumer access and sales is not recommended. A more supportive and collaborative approach that develops and implements practical policies related to public safety would support industry growth while maintaining public policy objectives. A trade-off between working to address gaps in the regulatory process, versus what would result in an outright ban, is too large to justify these restrictions on hemp-based cannabinoids. We feel that moving away from self-regulation, and toward being regulated at the product level, is a middle ground solution that makes sense, especially when compared to a complete ban of the industry.

Beau Whitney | Whitney Economics

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APPENDIX

About the Author / Statement of Conflicts

Beau Whitney, Cannabis Economics, Operations and Supply Chain Expert

Beau Whitney is the founder and Chief Economist at Whitney Economics, a global leader in cannabis and hemp business consulting, data, and economic research. Whitney Economics is based in Portland, Oregon.

Serving an international clientele, Beau is considered one of the leading cannabis economists in the U.S. and globally. His applications of economic principles to create actionable operational and policy recommendations has been recognized by governments, and throughout the economic, investment, and business communities. In 2022, Beau presented data and insights about cannabis and hemp economics at the United Nations.

His white papers analyzing the adult-use, medical and industrial cannabis markets have been referenced in the Wall Street Journal, Washington Post, New York Times, USA Today, the Associated Press, as well as in leading cannabis industry publications.

Beau Whitney is a member of the American Economic Association, the Oregon chapter president of the National Association for Business Economics, is a member of multiple regulatory advisory committees throughout the U.S. and participates on the Oregon Governor's Council of Economic Advisors.

Beau has provided policy recommendations at the state, national and international levels and is considered an authority on cannabis economics and the supply chain. Whitney Economics does not take a position on the issue of cannabis legalization or on pending legislation.



Beau Whitney
WHITNEY ECONOMICS

Statement Of Conflicts

Whitney Economics does not take a position on this issue of cannabis legalization, however there are potential conflicts while presenting economic and market analysis.

- Whitney Economics receives compensation for business and economic analysis of the cannabis industry.
- Mr. Whitney has previously held positions and licenses within the legal regulated cannabis industry.
- Mr. Whitney currently has investments in a cannabis investment fund, Mantis Growth Investments, and he is a member of the fund's Board of Directors.
- Mr. Whitney is a director for the Cannabis Advisory Group (CAG) in New Jersey, a non-profit policy think tank.
- Whitney Economics is a member of the European Industrial Hemp Association (EIHA).
- Beau Whitney is serving a volunteer role as the Chief Economist for the Federation of Industrial Hemp Organizations (FIHO).
- Mr. Whitney is a founder of Every Day Hemp Company, an Oregon-based manufacturer of hemp based plastic products

APPENDIX

Methodology

Whitney Economics was selected to provide a report on the economic impact of the Hemp-based cannabinoid industry in the state of Texas. With a demonstrated track record of creating unbiased economic reports in the cannabis and hemp for industry groups and officials at every level of government, Whitney Economics is uniquely positioned to assess the market from an operational and policy perspective. Whitney Economics has dedicated resources for the ongoing collection and analysis of the cannabis and hemp industries, both in the U.S. and internationally. As such, we have an extensive database upon which to draw.

NOTES ON DATASET

- As part of this report, the data was gathered with a targeted survey of Hemp operators as well as smoke shops, vape shops, gas stations and CBD stores. Manufacturers and distributors were also included in the survey. Emails were sent directly to the operators and reminders were sent to drive more participation.
- Whitney Economics conducted a 22-question survey of leading hemp-based cannabinoid companies in Texas. This survey was conducted during a six-week period in Q1'2025.
- The survey was sent to over 4,500 (approximately 52.9%) of the estimated 8,500 Hemp, CBD and Cannabinoid retailers, manufacturers and distributors in Texas.
- The data does not include assessments of the revenues derived by CBD and cannabinoid products sold at grocery stores or gas stations. As a result, Whitney Economics feels that the total revenues and economic impact is understated.
- There was a response rate of 6.5% which is high. This enables statistically extrapolation to the extent the results and projections have a 95% confidence level with a margin of error of +/- 5.5%
- The response rates represented 21.3% of all permitted manufacturers, 68.0% of wholesalers and 6.9% of retailers.
- Separate research was conducted to ascertain the number of smoke shops, vape shops, hemp operators, CBD stores, gas stations, distributors and manufacturers there were in the state.
- Whitney Economics also supplemented the data with

observations and data from other markets both on the adult-use and medical industries as well as with the industrial hemp industry, much of which came directly from state and federal regulators.

NOTES ON DATA FROM SURVEYS

- All data from surveys was self-reported: some data was independently verified, while some was unable to be verified.
- The data was self-reported and was not validated for accuracy, although data in the responses was triangulated for accuracy based on other survey responses.
- Data was then aggregated and then included in economic models to determine impacts
- Once the data was reviewed and tabulated, there were certain averages that stood out in the report and those averages were then extrapolated to the rest of the industry and hemp permit holders.
- Whitney Economics compiled confidential information from these surveys and the information is tightly restricted in its use and confidentiality.
- No specific company or data is mentioned in this report as a condition of the survey.

NOTES ON CALCULATION OF ECONOMIC IMPACT

- Economic impact relates in part to employment, revenues of operators, the amounts of suppliers into the market. It also examines the direct and indirect effects from the industry, such as ancillary services.
- Whitney Economics also applied a multiplier effect to the revenues derived from the hemp cannabinoid retail sector.
- Whitney Economics has previously calculated the multiplier effect for cannabis. This established cannabis multiplier (2.4x) was applied to the hemp revenues to ascertain the direct and indirect effects of the proposed legislation.
 - For comparison's sake, the multiplier effect of the construction industry is 1x and the multiplier effect of a national park relative to the local economy is 6x.

APPENDIX

Survey Questions

This is a sample list of questions for the survey of CBD and Cannabinoids Retailers.

These questions helped form the basis for the data and impacts presented in the report.

GENERAL:

- Do you sell hemp-derived cannabinoid products?
- How would you describe your business?
- How many locations do you have in operation?
- Please enter the five digit zip code for your main office.

SALES

- What is the average revenue per store each month?
- Are you profitable?
- What are the average sales per transaction at your company?
- Over the past quarter have your sales... Increased, Decreased or Stayed the Same
- Over the next quarter do you expect your sales to... Increase, Decrease or Stay the Same
- In terms of the overall market for hemp-derived cannabinoids in your state, what percentage do you estimate are sold online?

EMPLOYMENT:

- How many employees do you have at each of your locations?
- What is the average hourly wage per employee?

PRODUCT TYPES AND SEGMENTATION:

- Which cannabinoid products do you sell? (List all that apply)
- What percentage of revenue come from the following hemp-derived cannabinoid products?
- What percentage of cannabinoid products are sold in the following formfactors?

SUPPLY CHAIN:

- How many states do you receive your products / raw materials from?
- What are the top three states you get product from?

OTHER:

- Do you have access to banking and financing?
- What are the greatest risks to your business? (Check all that apply)
- If laws are passed in your state prohibiting sales of CBD or cannabinoid products, what will you do?
- Any comments you would like to add about this industry or regulatory environment?
- What help do you need as a business operator?

APPENDIX

Sources / Footnotes

<https://www.texastribune.org/2024/05/14/texas-senate-hemp-marijuana/>

In 2020, the first year the Texas Department of State Health Services began registering retailers, some 1,948 retailers were actively registered. By 2023, that number had jumped to 8,343. And in the first four months of 2024, the state has already seen more than 7,700 active registrations.

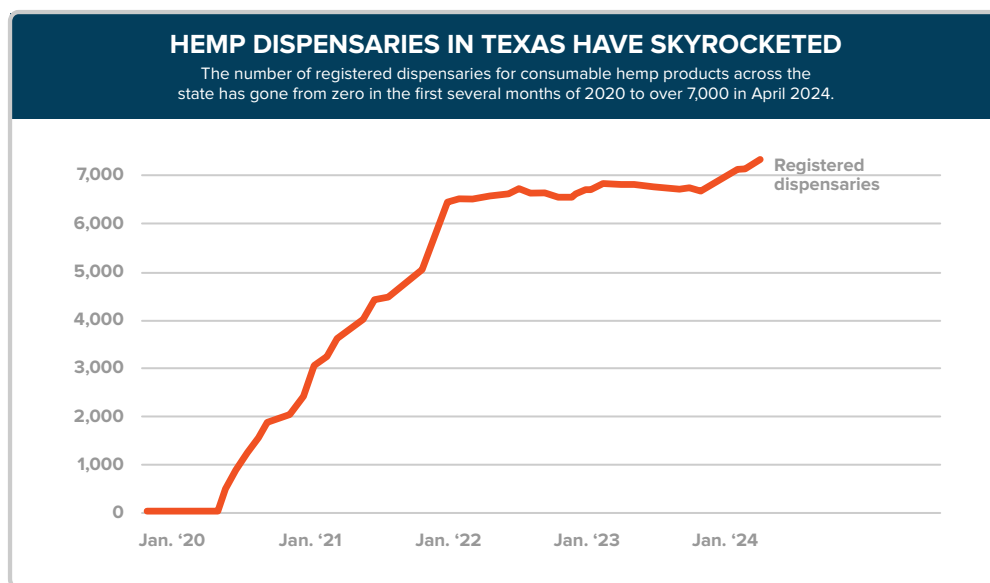
<https://ministryofhemp.org/2024-hemp-report-us-hemp-acres/>

Number of hemp acres increased in 2024

<https://www.cannabisindustrydata.com/how-many-hemp-dispensaries-are-there-in-texas/>

Texas leaders zero in on exploding hemp market

<https://www.texastribune.org/2024/05/14/texas-senate-hemp-marijuana/#:~:text=Active%20retail%20hemp%20licenses%20in,over%207%2C000%20in%20April%202024.>



Source: Texas Department of State Health Services
Credit: Yuriko Schumacher and Chris Essig

Hemp Acres Nationally

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APPENDIX

Sources / Footnotes (continued)

Legal Overview – Delta-8

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Texas

<https://www.reformaustin.org/marijuana/texas-lawmakers-seeking-to-outlaw-delta-8-have-formidable-foe-in-texas-veterans/>

<https://www.texastribune.org/2023/02/06/texas-veterans-delta-8-hemp-market/>

<https://www.statesman.com/restricted/?return=https%3A%2F%2Fwww.statesman.com%2Fstory%2Fbusiness%2F2022%2F11%2F11%2Fgrowing-pains-or-flop-texas-hemp-industry-falls-short-of-early-hype%2F69630400007%2F>

<https://www.bls.gov/eag/eag.tx.htm>

Hemp Surveys (Whitney Economics)

Whitney Economics U.S. Hemp Cultivator and Processing Surveys (2019, 2020, 2021, 2022)

Footnotes

Introduction

1. *Whitney Economics U.S. Hemp Cultivator Survey (2019, 2020, 2021)*
2. *Vote Hemp, Whitney Economics, State Departments of Agriculture, USDA*
3. *Whitney Economics National Hemp Surveys (2019, 2020, 2021, 2022)*
4. *Whitney Economics 2023 U.S. National Cannabinoid Report*
5. *FDA statement at NoCo hemp conference, Estes Park, CO (April 2024)*
6. <https://www.bakerinstitute.org/research/mapping-hemp-products-legal-status-across-us-states>

Objective

1. *Texas Department of Health and Human Services (in an email to Whitney Economics)*