




Evaluation of the Colorado Department of Revenue's Use of Marijuana Inventory Tracking Data

August 2019

**Submitted to the Colorado Office of the
State Auditor by:**

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Members of the Legislative Audit Committee:

This report contains the results of a performance evaluation of the Colorado Department of Revenue's use of marijuana inventory tracking data. This evaluation was conducted pursuant to Section 2-3-103, C.R.S., which authorizes the State Auditor to conduct audits of all departments, institutions, and agencies of state government. The State Auditor contracted with BerryDunn to conduct this evaluation. The report presents our findings, conclusions, and recommendations, as well as the Department of Revenue's responses.



Bill Brown, Principal
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REPORT HIGHLIGHTS

Report Highlights

Use of Marijuana Inventory Tracking Data
Performance Evaluation, August 2019

Department of Revenue

CONCLUSION

The Department uses a variety of data and analytical tools to monitor marijuana inventory and identify risks, such as the risk of diversion of marijuana outside the legal market, or the failure of businesses to report all taxable activities. The Department investigates and audits businesses based on its risk assessments to ensure compliance with marijuana-related laws and regulations and that all required marijuana sales and excise taxes are paid.

KEY FACTS

- f Medical and retail marijuana are both legal in Colorado; however, the retail marijuana market is the primary driver for overall industry trends:
 - o The average number of marijuana plants being cultivated per month increased from about 704,000 plants in January 2016 to about 977,000 plants in December 2018.
 - o Total combined marijuana sales increased by almost 400%—from \$307 million in Fiscal Year 2014 to more than \$1.5 billion in Fiscal Year 2018.
 - o State tax revenues from marijuana increased by over 890%, from \$25.3 million in Fiscal Year 2014 to \$250.7 million in Fiscal Year 2018.
- f A cornerstone of the State's regulatory structure is a statewide "seed-to-sale" inventory tracking system, known as Metrc[®] (pronounced "metric"), that allows licensees and the Department to identify and account for all marijuana grown, processed, sold, and disposed of in the commercial marijuana market.
- f The Department's Marijuana Enforcement Division (MED) analyzes marijuana inventory tracking data from Metrc[®] to generate investigation leads and target its investigation activities. For example, MED uses inventory tracking data to establish industry norms for every step in the cultivation, harvest, and packaging process, and to identify those businesses that are outliers. MED also analyzes inventory tracking data to identify situations in which there may be a higher risk of diversion of marijuana out of the regulated market.
- f The Department's tax divisions analyze data from tax returns and Metrc[®] to target W K H L U tax activities and ensure the accurate reporting and remittance of marijuana tax liabilities. For example, the Department's Field Audit Section has audited approximately \$2.2 billion—or about 34%—of the nearly \$6.6 billion in combined marijuana transfers and sales subject to excise and sales taxes between July 1, 2015, and June 30, 2019.

BACKGROUND

- Marijuana refers to the dried leaves, flowers, stems, and seeds of the *Cannabis sativa* or *Cannabis indica* plant.
- Marijuana contains chemicals called cannabinoids in varying ratios. THC is the more widely known cannabinoid because of its psychoactive effects creating a "high" in users.
- Through amendments to the Colorado Constitution, voters legalized the use of medical marijuana in 2000 and the use of retail marijuana in 2012.
- The Department of Revenue (Department) is the state agency responsible for the administration and enforcement of Colorado's tax laws, as well as laws related to the cultivation, manufacture, distribution, sale, and possession of marijuana in Colorado.
- The transfer and sale of medical and retail marijuana are subject to state excise and sales taxes.

KEY RECOMMENDATIONS

The Department should strengthen inter-divisional communication about marijuana-related compliance and enforcement activities by (a) establishing procedures that specify what information should be communicated between divisions, the frequency of the communication, and which personnel should have access to the information being communicated; and (b) re-instituting routine inter-divisional meetings to share information about issues and trends with individual marijuana businesses and the marijuana industry overall.

The Department agreed with these recommendations.

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Chapter 1: Overview

Marijuana refers to the dried leaves, flowers, stems, and seeds of the *Cannabis sativa* or *Cannabis indica* plant, and contains chemicals called cannabinoids. Cannabinoids are similar to endocannabinoids produced by the human body and affect processes and functions such as pleasure, memory, thinking, concentration, body movement, sensory and time perception, appetite, and pain.

Of the more than 100 cannabinoids known to exist, two are of primary therapeutic interest—cannabidiol (CBD) and delta-9-tetrahydrocannabinol (THC). These two cannabinoids are found in varying ratios in the marijuana plant. THC is the more widely known of the two because of its psychoactive effect that creates a “high” in users, whereas CBD is non-psychoactive.

A glossary of key terms is provided at the end of this report for reference.

Regulatory Framework

Through amendments to the Colorado Constitution, voters legalized the use of medical marijuana in 2000 and the use of retail marijuana in 2012. For **retail marijuana** (also often referred to as “recreational” marijuana or “adult use” marijuana), Article XVIII, Section 16 of the Colorado Constitution legalizes the personal use of marijuana, and established the structure for regulating the cultivation, sale, and use of marijuana. Specifically, persons aged 21 and older are allowed to purchase, use, and possess up to one ounce of marijuana. Adults may grow up to six plants, and keep the marijuana harvested from these plants or share it with other adults. The State is required to operate a regulatory structure for retail sales of marijuana that includes licensing for stores, cultivators, manufacturers, staff, testing labs, and investors.

For **medical marijuana**, Article XVIII, Section 14 of the Colorado Constitution provides an affirmative defense against criminal prosecution for marijuana-related offenses for individuals (patients) with debilitating medical conditions (e.g., cancer, glaucoma, severe pain or nausea, HIV/AIDS), and whose physicians have advised that they might benefit from the use of medical marijuana. Patients and their primary caregivers, who must register with the State, may grow up to six plants and possess up to two ounces of marijuana. These limits may be exceeded in cases where a patient has a medical need for more plants to treat their condition.

Within the confines of the voter-approved amendments to the Colorado Constitution, state statutes and rules govern the cultivation, manufacture, distribution, sale, and testing of retail and medical marijuana in Colorado. There are separate statutes and rules governing medical and retail marijuana; however, the regulatory structure generally operates in a parallel fashion between the two environments.

The Medical Marijuana Code is located in Title 44, Article 11, C.R.S., and the Retail Marijuana Code is located in Title 44, Article 12, C.R.S. Additionally, statute grants the Department of

Revenue (Department) the authority to promulgate rules that are necessary for the proper regulation and control of the cultivation, manufacture, distribution, sale, and testing of medical and retail marijuana. State rules pertaining to medical and retail marijuana are located in 1 CCR 212-1 and 212-2, respectively.

Despite the fact that more than half the states have laws that allow for some type of legalization for medical and/or retail marijuana, the federal Controlled Substances Act classifies marijuana as a Schedule I drug. Therefore, marijuana's cultivation, use, possession, and distribution remain illegal under federal law.

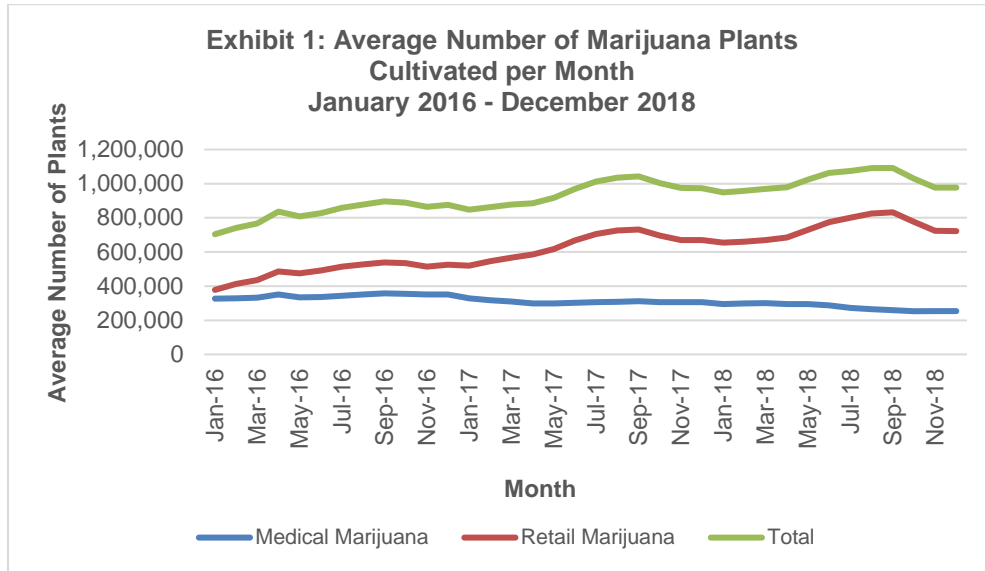
Marijuana Industry Statistics

Colorado's medical and retail marijuana industries (also referred to collectively as the commercial marijuana industry) continue to grow and become more established. The Department collects, analyzes, and reports on a considerable amount of data about Colorado's commercial marijuana industry. The following figures provide some key summary statistics about marijuana cultivation, marijuana sales, and marijuana business licenses. Although medical marijuana was the first to be legalized, retail marijuana accounts for the majority of marijuana cultivation and sales in Colorado.

Marijuana Cultivation

According to Department data, the average life cycle of a marijuana plant in 2018 was 130 days from immature plant to harvest. Cultivated plants are those plants that are actively being grown but are not yet at the point in their growth cycle where they are mature and ready for harvest. The average number of plants being cultivated per month provides information about the size of the industry in terms of the plant stock available for harvest and subsequent production.

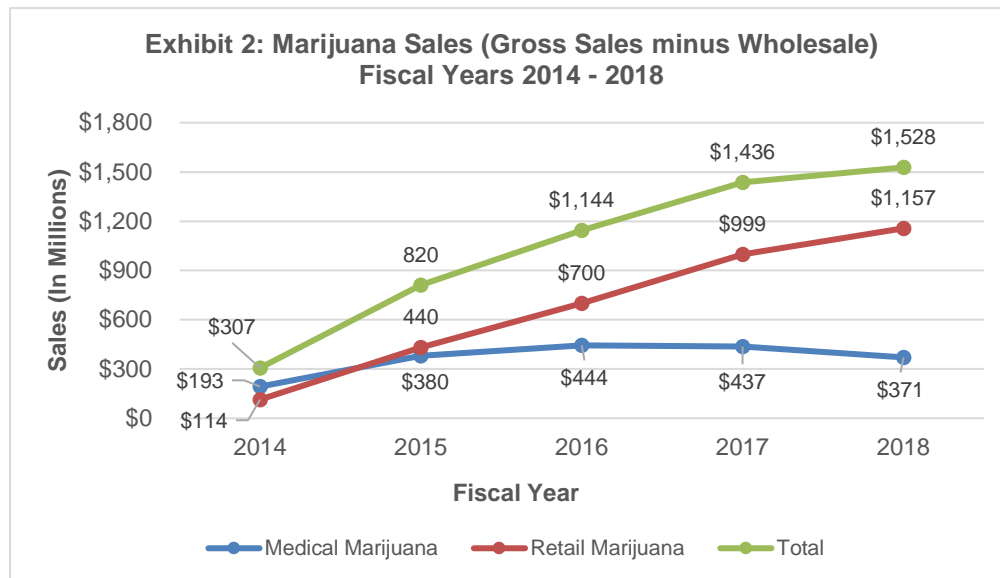
Exhibit 1 shows that from January 2016 through December 2018, Colorado saw an overall increase in the average number of marijuana plants cultivated per month. This increase was driven largely by retail marijuana, with the average number of retail marijuana plants being cultivated per month increasing from about 378,000 plants in January 2016 to about 723,000 plants in December 2018. The average number of medical marijuana plants being cultivated per month decreased slightly over this time period, from about 326,000 plants in January 2016 to about 254,000 plants in December 2018.



Source: Colorado Department of Revenue, Marijuana Enforcement Division, 2016-2018 Annual Updates.

Marijuana Sales

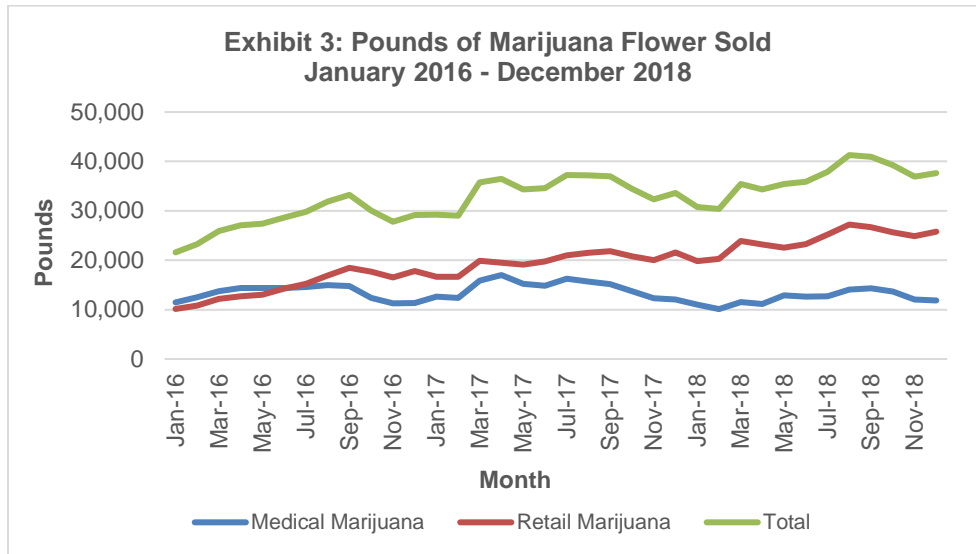
Exhibit 2 shows that marijuana sales have increased significantly since Fiscal Year 2014. Total combined sales of medical marijuana and retail marijuana increased by almost 400%—from \$307 million in Fiscal Year 2014 to more than \$1.5 billion in Fiscal Year 2018, with most of the increase being driven by retail marijuana sales.



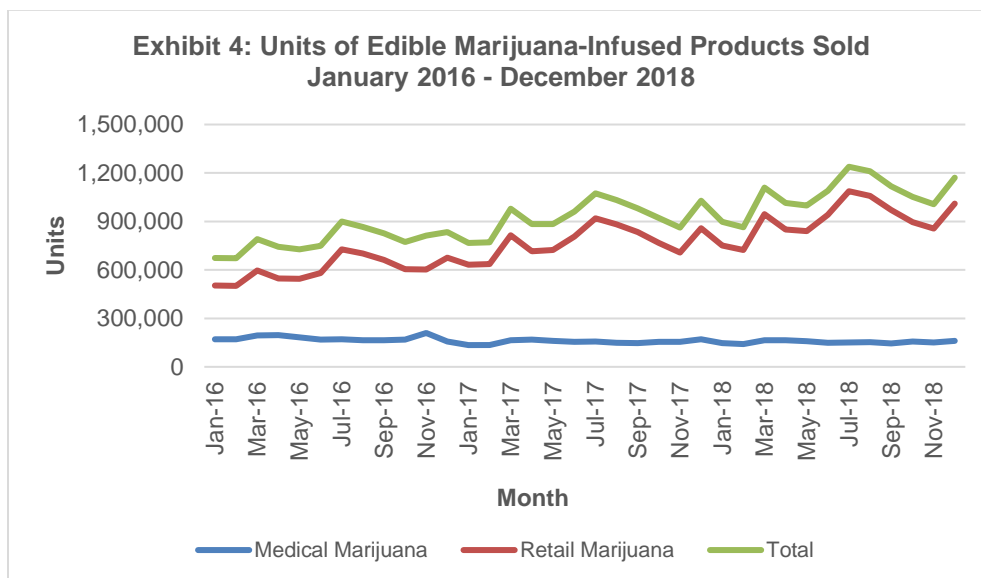
Source: Colorado Department of Revenue, 2018 Annual Report.

Note: The sale of retail marijuana began January 1, 2014. Data for Fiscal Year 2014 are for January through June 2014.

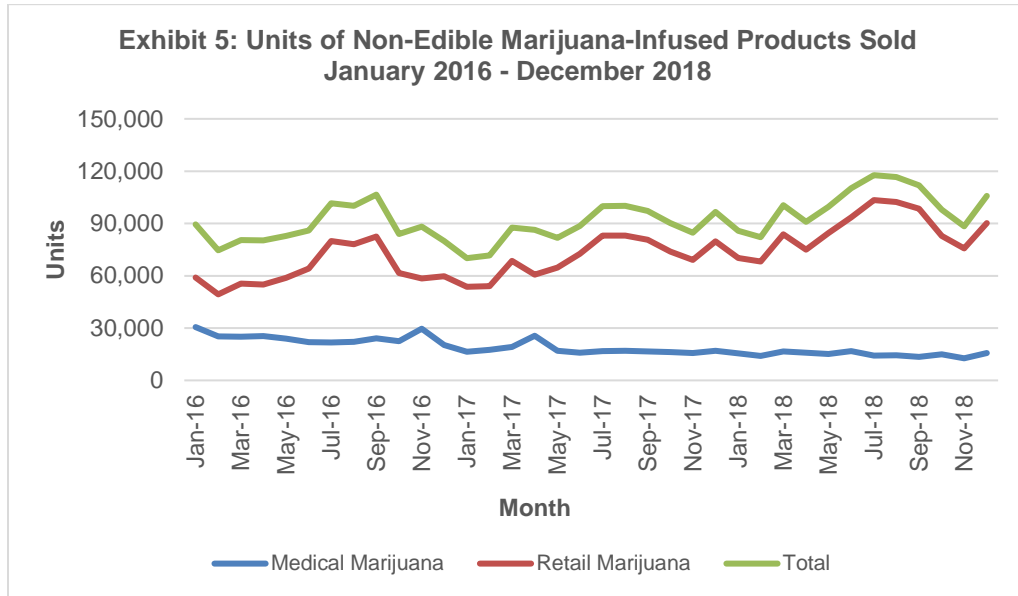
In terms of the volume and types of marijuana product sold to consumers, Exhibits 3, 4, and 5 show monthly sales of marijuana flower, marijuana edibles, and non-edible marijuana-infused products (e.g., ointments), respectively. Although monthly sales figures vary, all three exhibits show general increases in the overall volume of products sold to consumers and the significant effect that retail sales have had on these trends, especially with respect to edible and non-edible marijuana-infused products.



Source: Colorado Department of Revenue, Marijuana Enforcement Division, 2016-2018 Annual Updates.



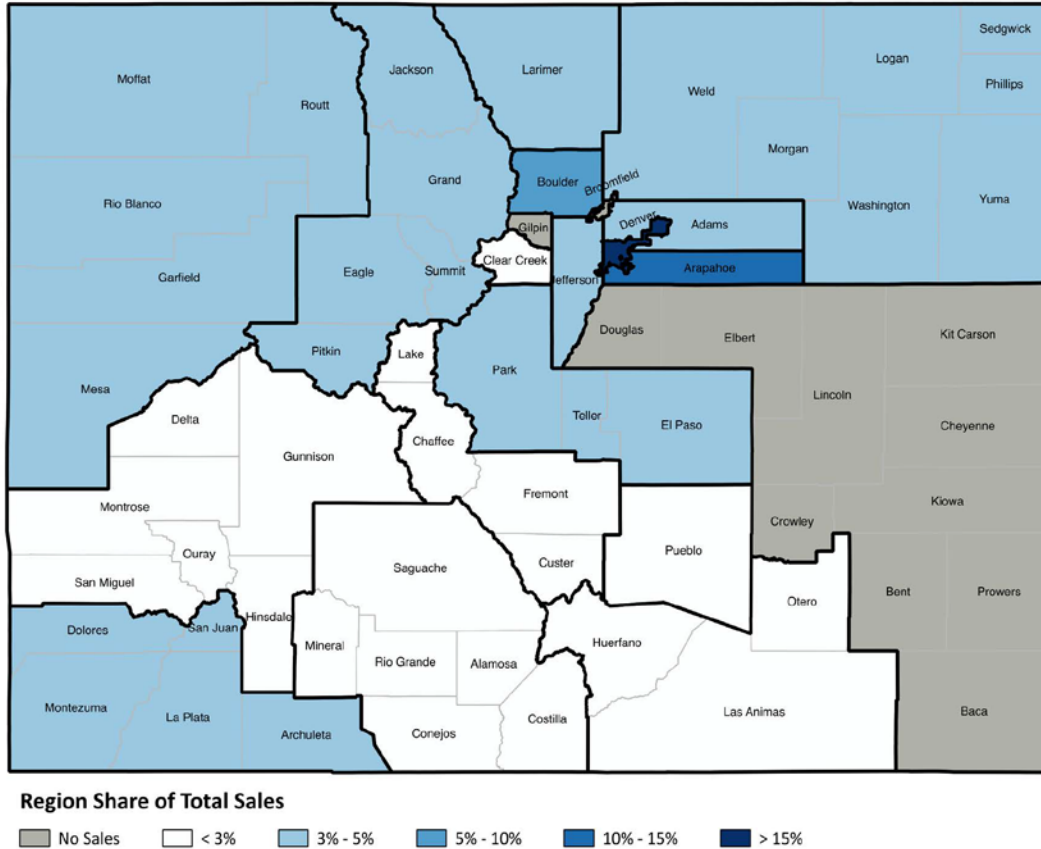
Source: Colorado Department of Revenue, Marijuana Enforcement Division, 2016-2018 Annual Updates.



Source: Colorado Department of Revenue, Marijuana Enforcement Division, 2016-2018 Annual Updates.

Marijuana sales also vary by region. For example, according to a 2017 market study commissioned by the Department and conducted by the Marijuana Policy Group and the University of Colorado at Boulder’s Leeds School of Business, the majority of retail marijuana sales in 2017 occurred in Front Range counties. The study found that, in general, marijuana sales correlate closely with population, and that sales patterns remain consistent across regions when distinguishing between retail and medical marijuana sales. Exhibit 6 shows each region’s share of the total statewide retail marijuana sales in 2017.

Exhibit 6: Total Retail Marijuana Sales by Region Calendar Year 2017



Source: Colorado Department of Revenue, Marijuana Enforcement Division, Market Size and Demand for Marijuana in Colorado: 2017 Market Update.

Marijuana Licenses

Any person or entity performing commercial activities, such as growing, preparing, manufacturing, packaging, transferring, transporting, or selling medical or retail marijuana or marijuana products must be licensed by the Department’s Marijuana Enforcement Division (MED). Thus, licensing statistics provide another perspective on the size and scope of the marijuana industry in Colorado, including the number of individuals working in the industry. As shown in Exhibit 7, MED reported a total of 2,901 active medical and retail marijuana business licenses and 41,812 active individual occupational licenses as of July 1, 2019.

Exhibit 7: Marijuana Business and Individual Occupational Licenses by Type as of July 1, 2019

Marijuana Business Licenses			
Medical Marijuana		Retail Marijuana	
License Type	Number	License Type	Number
Centers Sell medical marijuana and medical marijuana-infused products to patients.	454	Stores Sell retail marijuana and retail marijuana products to purchasers age 21 or older.	566
Cultivators Grow and cultivate medical marijuana at an additional premises that may not be contiguous with a licensed medical marijuana center or medical marijuana-infused product manufacturer.	610	Cultivators Cultivate retail marijuana for sale and distribution to other retail marijuana licensees.	699
Infused-Product Manufacturers Manufacture medical marijuana-infused products intended for consumption other than by smoking (e.g., edible products, ointments, tinctures).	224	Product Manufacturers Manufacture retail marijuana products intended for consumption other than by smoking (e.g., edible products, ointments, tinctures).	287
Testing Facilities Perform testing (e.g., potency, contaminants, and pesticides) on medical marijuana for medical marijuana licensees.	11	Testing Facilities Perform testing (e.g., potency, contaminants, and pesticides) on retail marijuana for retail marijuana licensees.	13
Operators Own or operate a licensed medical marijuana establishment or receive a portion of the profits as compensation.	6	Operators Persons operating a licensed retail marijuana establishment, owners, and those who receive a portion of the profits as compensation.	8
Transporters Provide logistics, distribution, and storage of medical marijuana and medical marijuana-infused products for other medical marijuana licensees.	9	Transporters Provide logistics, distribution, and storage of retail marijuana and retail marijuana products for other retail marijuana licensees.	13
Research and Development/Research Cultivation Grow, cultivate, possess, and transfer by sale or donation, medical marijuana for limited research purposes.	1		
Total	1,315	Total	1,586
Individual Occupational Licenses			
License Type		Number	
Associated Key Employees (Owner, Officer, Director)		1,665	
Key Employees (Manager, Supervisor, or Lead Worker)		13,465	
Support Employees (All Other Employees)		26,682	
Total		41,812	

Source: Colorado Department of Revenue, Marijuana Enforcement Division.

Marijuana Taxes

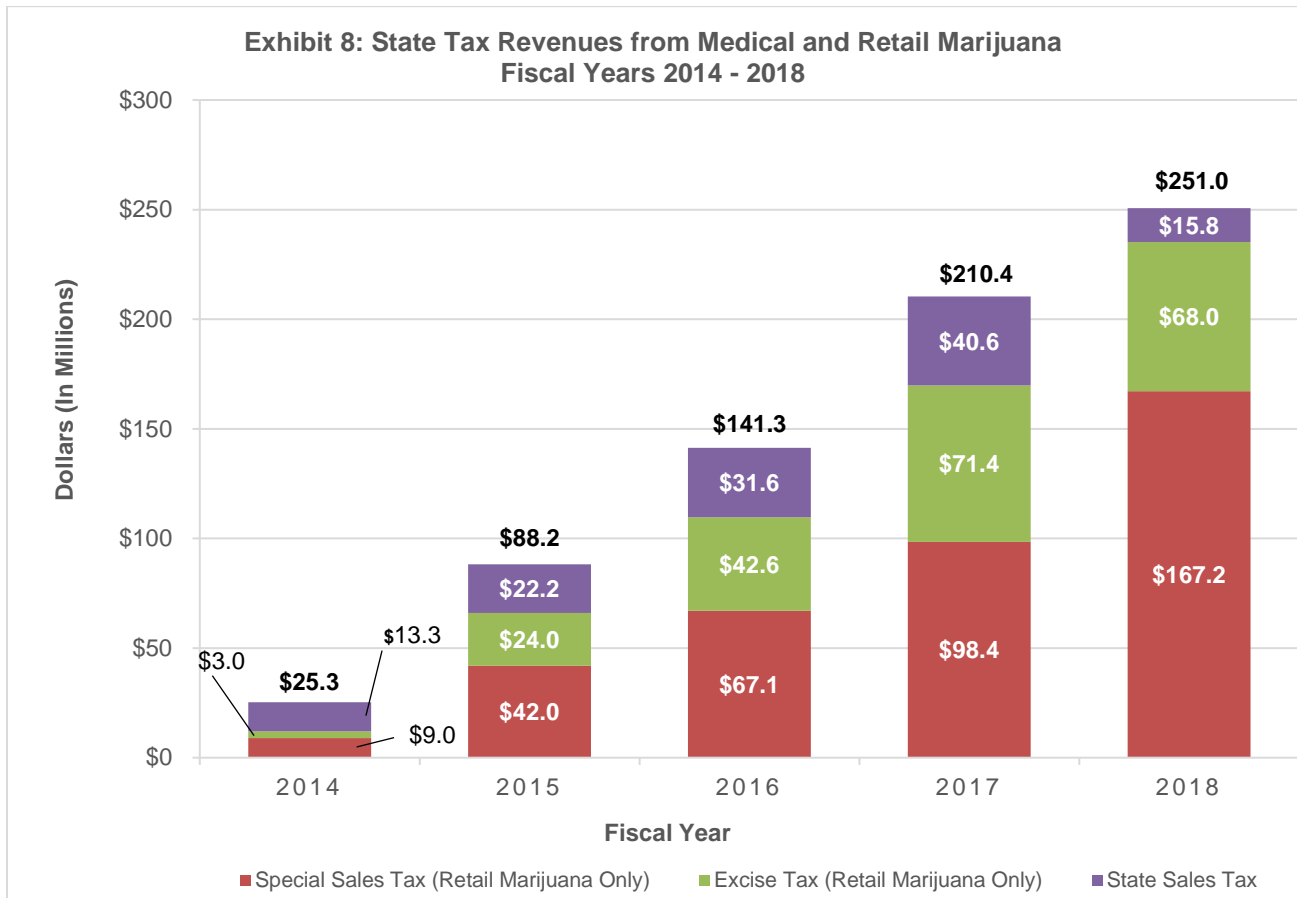
Sales of retail and medical marijuana, including marijuana-infused products, are subject to taxation in Colorado. Currently, the following taxes and tax rates apply:

- **State Sales Tax.** Medical marijuana is subject to the state sales tax of 2.9% [Sections 39-26-104(1) and 106(1)(a)(II), C.R.S.]. The consumer pays the sales tax, and the medical marijuana center is responsible for collecting and remitting it to the Department. Prior to July 1, 2017, retail marijuana was also subject to the standard 2.9% state sales tax.
- **Special State Sales Tax.** Effective July 1, 2017, retail marijuana is exempt from the standard 2.9% state sales tax and is subject to a special state sales tax of 15% [Sections 39-28.8-202(1)(a)(I) and 39-26-729(1)(a), C.R.S.]. The consumer pays the sales tax, and the retail store is responsible for collecting and remitting it to the Department.
- **State Excise Tax.** Retail marijuana is subject to a state excise tax of 15% [Section 39-28.8-302(1)(a)(I), C.R.S.]. Prior to July 1, 2017, the excise tax rate on retail marijuana was 10%. Excise taxes are not levied at the final point of sale to the consumer, but rather at the point at which unprocessed marijuana is first sold or transferred from a retail marijuana cultivation facility to a retail marijuana store or a facility that manufactures retail marijuana products. Cultivators are responsible for paying the excise taxes and remitting them to the Department; however, this cost is ultimately passed on to the consumer and reflected in the retail price of the product, similar to excise taxes on liquor or tobacco. The excise tax does not apply to medical marijuana.

In addition to state sales and excise taxes, local sales taxes apply to retail and medical marijuana unless the local government specifically exempts them. Local governments may also levy a special sales tax or an excise tax on retail marijuana with voter approval. For example, the City and County of Denver levies a 4.31% general sales tax on medical marijuana, and a 4.31% general sales tax and a 5.5% special sales tax (9.81% combined rate) on retail marijuana. The Town of De Beque on Colorado's Western Slope levies a 5% excise tax on the sale and cultivation of retail marijuana. The Town of Rocky Ford in southeastern Colorado levies a 3% general sales tax and a 6% special sales tax (9% combined rate) on retail marijuana. The Department does not collect or enforce local sales and/or excise taxes levied on retail marijuana, even if the Department collects the local jurisdiction's other general sales taxes [Section 39-28.8-203(1)(a)(VI), C.R.S.].

State Tax Revenues

Exhibit 8 shows that state tax revenues from medical and retail marijuana increased by over 890%, from \$25.3 million in Fiscal Year 2014 to \$250.7 million in Fiscal Year 2018, again driven primarily by increases in retail marijuana tax revenues. As a percentage of total marijuana tax revenues, tax revenues from retail marijuana increased from 36% in Fiscal Year 2014 to 67% in Fiscal Year 2018.



Source: Colorado Department of Revenue, 2018 Annual Report.

Note: The sale of retail marijuana began January 1, 2014. Data for Fiscal Year 2014 are for January through June 2014. Effective July 1, 2017, retail marijuana is exempt from the standard 2.9% state sales tax and is subject to a special state sales tax of 15%.

Department of Revenue

The Department is the state agency responsible for the administration and enforcement of Colorado’s tax laws, as well as laws related to the cultivation, manufacture, distribution, sale, and possession of marijuana and marijuana-infused products in Colorado.

Marijuana Enforcement Division

MED is the primary regulator for Colorado's commercial marijuana industry and is organized into four functional units, as follows:

- **Licensing** processes new and renewal applications for marijuana business and individual occupational licenses, including performing related background investigations, and applications for license modifications such as change of business ownership, change of business location, and physical modifications to licensed premises.
- **Analysis and Planning** analyzes data and prepares reports for internal and external users, such as reports that identify risk areas for potential investigation and reports that provide information on industry statistics and trends.
- **Operations** conducts field investigations and on-site inspections of licensees to enforce marijuana laws and rules. Inspections are handled by approximately 44 criminal and compliance investigators who are based in MED's four field offices (Denver/Lakewood, Longmont, Grand Junction, and Colorado Springs).
- **Policy, Regulations, and Communications** processes legal actions against licensees for violations of marijuana laws and rules, manages rulemaking activities, develops policies and procedures, and provides internal training.

MED is solely funded through the Marijuana Cash Fund, which receives revenues from licensing fees and fines and had a balance of about \$17.9 million as of June 30, 2019. For Fiscal Year 2020, MED was appropriated a total of about \$13.0 million and 112 full-time equivalent (FTE) positions.

Taxpayer Services Division

The Taxpayer Services Division (Taxpayer Services) processes excise and sales tax returns and payments filed by marijuana businesses. Taxpayer Services performs initial validations of the returns to assess whether they are properly completed and that the payments match the returns. Taxpayer Services also promotes taxpayer compliance with the State's tax system through outreach activities, such as sending information to new marijuana businesses informing them of their tax obligations, the tax rates, and the processes for filing excise and sales taxes; providing in-person training and online instructional materials and guidance; and staffing a telephone system for fielding questions from taxpayers.

Taxation Audit and Compliance Division

The Taxation, Audit, and Compliance Division (TAC) enforces Colorado's tax laws, including sales and excise taxes applicable to medical and retail marijuana businesses. Two separate units within TAC—Audit and Compliance and Field Audit—have agents who are assigned specifically to the marijuana industry. Audit and Compliance's activities include contacting delinquent taxpayers, collecting delinquent taxes owed by licensed marijuana businesses, and conducting criminal

investigations related to illegal, unlicensed marijuana businesses. Field Audit conducts audits of Colorado businesses, including marijuana businesses, to ensure that all tax liabilities owed to the State have been identified and paid.

Information Systems

The Department's marijuana enforcement and marijuana tax-related activities depend on, and are supported by, three primary information systems.

Metrc[®]

A cornerstone of the State's regulatory structure for medical and retail marijuana is a statewide "seed-to-sale" inventory tracking system, known as Metrc[®] (pronounced "metric") and stands for Marijuana Enforcement Tracking Reporting Compliance. Metrc[®] is a web-based interface coupled with radio frequency identification (RFID) technology that allows licensees and MED the ability to identify and account for all marijuana grown, processed, sold, and disposed of in the commercial marijuana market. Licensees use Metrc[®] to report required inventory-related information and events, and the Department uses Metrc[®] for general data reporting and analysis, as well as to support its enforcement and compliance monitoring activities. Other states that use Metrc[®] include Alaska, California, Louisiana, Maryland, Massachusetts, Michigan, Montana, Nevada, Ohio, and Oregon, as well as the District of Columbia.

MyLO

MED uses a system, known as My License Office, or MyLO, to track the licensure status for all retail and medical marijuana businesses and their employees. MED also uses MyLO to track information about investigation activities and administrative actions pertaining to licensees. MyLO is largely a document-based system that stores electronic copies of documents in a PDF file format and associates them with a specific licensee record. There is an automated interface between MyLO and Metrc[®] and data elements pertaining to licensing (e.g. licensee's name, address, and phone number; license effective date; and license status) are downloaded from MyLO into Metrc[®] on a daily basis.

GenTax

GenTax is an integrated tax processing and information system that the Department uses to administer the State's tax laws, including the processing and collection of sales and excise taxes applicable to medical and retail marijuana businesses. GenTax is used by 29 other state revenue departments.

Evaluation Purpose, Scope, and Methodology

The Colorado Office of the State Auditor contracted with BerryDunn to conduct this performance evaluation pursuant to Section 2-3-103, C.R.S., which authorizes the State Auditor to conduct audits of all departments, institutions, and agencies of state government. The evaluation was

performed from March 2019 through August 2019. We appreciate the assistance provided by Department management and staff during this evaluation, as well as those marijuana businesses that provided the evaluation team with access to their facilities for walkthroughs.

The evaluation's objective was to understand and assess how the Department is using the "seed-to-sale" marijuana inventory tracking data to inform, direct, and target its marijuana-related inspection, audit, and enforcement activities.

To accomplish the evaluation's objective, we performed the following work:

- Reviewed applicable state statutes and rules.
- Obtained and reviewed Department reports and statistics on marijuana licensing and sales activity and marijuana tax revenues.
- Interviewed Department staff and reviewed policies and procedures, documentation, and data applicable to the Department's marijuana-related auditing, inspection, and enforcement activities.
- Reviewed Metrc® requirements and documentation, including data dictionaries, workflows, user training materials, and standard and ad hoc reports used by MED analysts and investigators.
- Conducted walkthroughs of one marijuana testing facility and two marijuana businesses that cultivate and sell marijuana products for both medical and retail use.

A draft of this this report was reviewed by the Department. We have incorporated the Department's comments into the report where relevant. The written responses to the recommendations and the related implementation dates are the sole responsibility of the Department.

Chapter 2: Marijuana and Tax Enforcement Activities

The Department of Revenue (Department) is responsible for enforcing the State’s laws for the cultivation and sale of marijuana and marijuana products, and for collecting the related sales and excise taxes owed by medical and retail marijuana businesses. As we discuss in this chapter, the Department uses a variety of analytical tools, including analysis of seed-to-sale marijuana inventory tracking data and other available tax return data, to help identify risks, such as the risk of diversion or the failure to file all required tax returns and pay all required taxes, and generate leads for subsequent investigation and/or audit.

Metrc[®] Facilitates the Seed-to-Sale Workflow

State rules require all licensed marijuana businesses to use a statewide “seed-to-sale” inventory tracking system, Metrc[®] (pronounced “metric”), as their primary inventory system of record. This inventory tracking system helps licensees and the Department’s Marijuana Enforcement Division (MED) account for all marijuana, marijuana concentrate, and marijuana-infused products from the seed or immature plant stage, through growth, testing, and production, until the finished marijuana, marijuana concentrate, and marijuana-infused product is sold to a customer at a medical marijuana center or a retail marijuana store or is destroyed. Maintaining strict seed-to-sale inventory control helps to mitigate the risk of diversion of marijuana out of the regulated market and, because taxes are based on marijuana sales or transfers, ensure the complete and accurate reporting and remittance of tax liabilities to the State.

As we describe in this section, Metrc[®] is an essential tool for capturing the data needed to ensure strict seed-to-sale inventory control. State rules require marijuana businesses to measure and record in Metrc[®] the weight and/or count of plants at key transition points, and they must reconcile the weight and/or count of all on-premises and in-transit marijuana, concentrate, and product inventories at the close of business each day. Marijuana businesses must also identify, weigh, and track all marijuana waste material (e.g., roots, stalks, stems, damaged/unusable plants, other non-fibrous waste) that is maintained on site until its transfer or disposal. State rules further specify that marijuana businesses and their employees are responsible for the accuracy of all information entered into Metrc[®] and that any misstatements or omissions may be considered a license violation.

Exhibit 9 provides information about the overall seed-to-sale workflow and associated Metrc[®] data tracking at key phases/transition points in the growth and production of marijuana from its beginning as a seed or clone to its eventual sale to the consumer.

Exhibit 9: Marijuana Growth Phases/Transition Points and Associated Key Inventory Tracking Data




Growth Phase/Transition Point	Description	Key Data Points Recorded in Metrc®
<p>Immature Plant</p>  <p>23 Days*</p>	<p>Cultivators grow marijuana plants from seeds or the clones of a mother plant. Clones and seeds are planted into an immature plant batch. Only one strain of marijuana is allowed per immature batch. The immature batch is placed in an area (e.g., grow room) where lighting, temperature, and other environmental conditions are controlled. Not all immature plants develop properly; any plants that are not selected for continued growth are destroyed.</p>	<ul style="list-style-type: none"> • Group name (strain and date of planting) • Date of planting • Number of plants • Type of plant (seed or clone) • Plant strain • Destroyed plants
<p>Vegetative</p>  <p>49 Days*</p>	<p>Once a plant reaches the vegetative state (i.e., eight inches in height and/or width), cultivators must place a radio frequency identification (RFID) tag with a unique RFID number on the plant. The location where each plant is physically located must also start being tracked. Cultivators establish “rooms” by assigning names and numbers in Metrc® that represent the various physical locations on the licensee’s premises where plants are stored during the vegetative, flowering, and harvest phases. Cultivators have the flexibility to define a room how they choose. A new room must be recorded if the plant is physically moved to a new location. Any plants that are not selected for continued growth are destroyed.</p>	<ul style="list-style-type: none"> • Date of transition from immature plant to the vegetative phase • Date RFID tag is affixed to plant • Plant RFID number • Assigned room • Date plant is moved to the assigned room • Destroyed plants
<p>Flowering</p>  <p>58 Days*</p>	<p>Flowering is the reproductive state of the plant in which there are physical signs of flower or budding out of the nodes in the stem. A plant is considered to be in the flowering stage once the growing light cycle changes to 12 hours of light and 12 hours of darkness. At the start of the flowering phase, cultivators document the new phase and may transfer the plant to a new room, in which case the date of the move and the plant’s new location are tracked. If a replacement RFID tag is needed, the new tag is affixed to the plant during this transition. Plants are ready for harvest once they reach the end of the flowering phase. Any plants that are not harvested are destroyed.</p>	<ul style="list-style-type: none"> • Date of transition from vegetative phase to flowering phase • Replacement RFID tag number (if needed) • Assigned room • Date plant is moved to the assigned room • Destroyed plants

Exhibit 9: Marijuana Growth Phases/Transition Points and Associated Key Inventory Tracking Data



Growth Phase/Transition Point	Description	Key Data Points Recorded in Metrc®
<p>Harvest</p> 	<p>Once plants are ready for harvest, cultivators create a harvest batch in Metrc®, assign a harvest batch identification number, and record the harvest date to document that the plants are no longer active and viable. A harvest batch can be made up of many individual plants. The plant RFID tags are removed and destroyed; however, the harvest batch identification number is used to maintain inventory control and connect the harvested plant's RFID number to the resulting packaged product, which is assigned new RFID tag and number.</p> <p>At harvest, the marijuana plants are considered wet whole plants because they have not yet been dried out. Cultivators must calculate and record the overall wet weight of each harvested plant, which is the undried weight of the entire plant above the growing medium (e.g., soil, water). As the marijuana is cured, or dried, it loses a significant amount of its weight. Cultivators and MED use industry averages to ensure that harvest batches lose wet weight at an expected rate and identify anomalies. During the harvest and cure process, unusable excess plant material is generated as roots, leaves, and stems are removed. All such waste must also be weighed and tracked.</p>	<ul style="list-style-type: none"> • Harvest batch identification number • Plant RFID numbers included in harvest • Harvest date • Plant wet weight • Waste • Destroyed plants
<p>Testing</p> 	<p>Before a harvest batch can be released for packaging, a sample package is created and sent to a lab for potency, microbiological contaminant, and pesticide testing. The amount of each harvest batch that must be sampled for testing is determined by the weight of the harvest batch, and the number of samples a cultivator must submit for testing increases as the size of the harvest batches increases. Because the sample packages are transported from a cultivator to a testing facility, complete details of the transfer must also be tracked and recorded. The sampling manager verifies all sample package contents and weights before accepting them for testing. Once a sample passes all required tests, including any retests, the harvest batch is released for packaging, transfer, and sale. Cultivators must destroy or remediate harvest batches that fail the testing process.</p>	<ul style="list-style-type: none"> • Sample package identification number • Weight • Transfer vehicle's make, model, license plate number, and planned route • Transfer driver's name, phone number, and occupational license number • Date and time of acceptance by recipient • Recipient's name and license number • Test results

Exhibit 9: Marijuana Growth Phases/Transition Points and Associated Key Inventory Tracking Data



Growth Phase/Transition Point	Description	Key Data Points Recorded in Metrc®
<p>Packaging & Transfer</p> 	<p>At the completion of the harvest phase and successful testing, the cultivator packages the marijuana for transfer to a retail marijuana store, a medical marijuana center, or a product manufacturer for creating marijuana-infused products (e.g., edible products, ointments, tinctures). Multiple packages can be created from a single harvest batch. Cultivators affix an RFID tag with a unique RFID number on each individual package. Packages may contain a number of individual items and can be subsequently repackaged by the cultivator, store or center, or the product manufacturer. For example, a retail store may repackage the marijuana it receives from a cultivator into smaller units for individual sale. Any time marijuana or marijuana product is repackaged, a new package RFID tag must be created and details about the package entered and tracked.</p> <p>As packaged marijuana and marijuana products are transferred between cultivators, product manufacturers, and stores/centers, the complete details of the transfer must be recorded and tracked. For example, a cultivator assigns a package to a transfer batch and prepares a travel manifest with details on who the transfer is between, the date, what is being transferred, and how much is being transferred. The transporter delivers the package to the recipient (e.g., retail marijuana store) who is responsible for verifying the accuracy of the package contents before it is accepted. If the recipient identifies any major discrepancies with a package (e.g., missing contents), it can be rejected. Once accepted, custody and responsibility for the package passes to the recipient.</p>	<ul style="list-style-type: none"> • Package RFID • Package weight • Package contents • Package history (harvest batch, testing results, transfers, repackaging) • Travel manifest (what, how much, and to whom the package is being transferred) • Transfer driver's name, phone number, and occupational license number • Transfer vehicle's make, model, license plate number, and planned route • Date and time of acceptance by recipient • Recipient's name and license number

Exhibit 9: Marijuana Growth Phases/Transition Points and Associated Key Inventory Tracking Data

Growth Phase/Transition Point	Description	Key Data Points Recorded in Metrc®
<p>Purchase</p> 	<p>The sale of the marijuana or marijuana products to the end consumer is the final step in the seed-to-sale process. Metrc® is not a sales transaction system; however, all sales information is entered into Metrc® and tied to the specific package RFID tag so that inventory records are kept current.</p> <p>Specifically, the weight and/or count of all on-premises marijuana must be reconciled at the close of business each day. A summary of sales transactions, which includes total quantity, unit of measure, and total dollars for the day, is prepared daily for all packages sold. When the contents of a package are gone, either through sales or repackaging, that package and package RFID tag are removed from the system.</p> <p>Retail stores and medical marijuana centers have the ability to enter sales information manually or through an automatic interface between the store/center’s point-of-sale system and Metrc®.</p>	<ul style="list-style-type: none"> • Package RFID • Total quantity sold • Unit of measure • Date and time of sale • Dollar amount of sale

Source: Compiled by BerryDunn based on review of state rules, documentation and data from the Department of Revenue’s Marijuana Enforcement Division, Metrc® system documentation, and walkthroughs at licensed marijuana businesses. Photo Credits: Steven Whitney.

*Average grow time reported by the Marijuana Enforcement Division based on 2018 data.

MED Uses Data Analytics to Help Target Investigations

MED's investigations of licensees result from a number of different sources, including public tips and complaints; referrals by other federal, state, or local agencies; observations by MED personnel (e.g., newspaper or billboard advertisements, packaging and labeling of a product on a shelf, or other actions by a licensee that raise potential compliance questions); and analysis of licensing and inventory tracking data. Investigations focus on a number of different issues, ranging from noncompliance with regulatory requirements, and health and safety violations, to illegal cultivation and sale of marijuana. In Fiscal Years 2017 and 2018, MED initiated a total of 1,085 and 1,022 investigations, respectively.

We found that MED uses data analytics as a source for generating investigation leads and targeting its investigation activities. Specifically, MED's investigators use checklists to structure their review of information in Metrc[®] and its licensing system, MyLO, and develop an overall profile of the licensee. This preliminary data review is beneficial for evaluating complaints MED receives about licensees and, if an investigation is initiated, helping investigators to define the scope of the investigation. Additionally, as we describe in the following sections, MED uses proactive query and analysis of the marijuana inventory tracking data in Metrc[®] to identify and prioritize investigations of marijuana businesses, such as those businesses that are outliers with respect to industry norms or where, based on certain parameters, there may be increased risk of diversion.

Industry Benchmarking

MED maintains and uses historical data from Metrc[®] since Fiscal Year 2014 to establish industry norms for every step in the cultivation, harvest, and packaging process. MED analyzes these data to identify those businesses that are outliers and where whether further inquiry and investigation may be warranted. For example, MED compares data on current crops (e.g., weight of flower/buds, growth times, waste, production yields) against historical data to assess whether a marijuana business is within expected historical norms both for that business and for similar types of businesses, such as those that use the same type of growth environment or that grow the same strain of marijuana plants. Also, because licensees can adjust package weights in Metrc[®] for a number of reasons (e.g., original weight was recorded incorrectly due to human error, scale issues, moisture loss), MED analyzes Metrc[®] data to identify weight adjustments that are outside of expected and acceptable ranges.

Risk of Diversion

Marijuana's illegal status under federal law and other states' laws (including many of Colorado's neighboring states) means that diversion of marijuana to the black market is a serious concern. MED analyzes marijuana inventory tracking data from Metrc[®] to identify for investigation those circumstances in which there could be a higher risk of diversion or other noncompliant activity.

- Excess Inventory.** If a cultivation facility produces more marijuana than the commercial market can accommodate, there may be a higher risk for diversion and illegal sales of the excess marijuana. State rule [1 CCR 212-2, Section 506] is intended to encourage responsible production by retail marijuana cultivation facilities and includes specific parameters for how cultivators must manage their inventory, including the maximum amount of marijuana inventory that may be possessed at a cultivation location based on the total amount of inventory that licensee transferred to other licensed facilities over a given period of time.

On a biweekly basis, MED runs and distributes the “506 Report,” which analyzes the on-hand inventory of each retail marijuana cultivation facility throughout the state to identify those facilities whose inventory is greater than the amount of inventory they sold in the previous 6 months. MED’s investigators use the 506 Report to prioritize investigations of these higher risk businesses. Once on site, investigators compare data in Metrc® to the on-site inventory records and the physical inventory. Investigators count all concentrate and infused products and weigh all plant material. This inspection validates the Metrc® data and helps inspectors determine whether the facility has excess inventory.

- No Useable Marijuana Packages Created.** The average marijuana plant takes 130 days to move through the cultivation cycle until it is harvested and prepared for sale. However, when a licensee completes a harvest batch in Metrc® but does not report any usable products resulting from the harvest (i.e., tracked marijuana packages), this could be an indicator of higher risk activity. Exhibit 10 shows an example of the type of inventory data MED extracts from Metrc® and provides to investigators. In the example, the cultivator has three separate harvests without associated marijuana packages, resulting in approximately 7,000 grams of unreported marijuana. There may be several explanations for the lack of usable product reported from a harvest batch, including data entry error, failed product testing, or potential diversion. MED uses this type of analysis to identify cases where it should open an investigation for follow up.

Exhibit 10: Example of No Useable Marijuana Product Report						
Licensee	Harvest Batch	Batch Date	Number of Plants Harvested	Wet Weight (g)	Waste Weight (g)	Weight Left Unreported (g)
403R-XXXX1	BD050119	05-01-2019	6	4,000	1,200	2,800
403R-XXXX1	CC050119	05-01-2019	4	1,000	400	600
403R-XXXX1	XY042219	04-22-2019	8	6,000	2,400	3,600

Source: Colorado Department of Revenue, Marijuana Enforcement Division.

- Other Data Patterns.** As shown in Exhibit 11, MED relies on a number of other queries and analyses of Metrc[®] data to identify data patterns where there may be a higher risk of diversion and, therefore, prioritize further inquiry and follow up by MED’s investigators.

Exhibit 11: Examples of MED Data Analysis to Identify Diversion Risk	
Data Pattern	Diversion Risk
Medical-to-Retail and Retail-to-Medical Transfers	Such transfers are only permitted under limited circumstances and could indicate that inventory is being manipulated to mask diversion.
Expired Patients	Keeping patients active after their medical marijuana card has expired could be used to manipulate inventory limits to mask diversion.
Package Adjustments Over Certain Amounts	Large adjustments in product weights could indicate that inventory is being manipulated to mask diversion.
Atypical or Unusual Plant Life Cycles	Plant life cycles that are outside of typical ranges could indicate that plant inventories are being manipulated to mask diversion.
No Reported Sales	If no marijuana sales occur for a number of days, there is a risk that on-hand inventory could be diverted.

Source: Colorado Department of Revenue, Marijuana Enforcement Division.

MED is Pursuing Additional Data Analytic Capabilities

MED performs analysis of data from Metrc[®] and MyLO, as well as data from other sources to help target its inspection and enforcement activities. MED reported that these standalone systems and data sources do not communicate effectively with each other; consequently, data analysis and report preparation in the current environment is a time-consuming and inefficient process that requires custom written queries and manual combination of the query results into reports.

To address these issues, MED has been pursuing a “Big Data as a Service” solution to house data from multiple systems and sources in one centralized data repository (referred to as a Data Lake). MED reports that the Data Lake initiative will allow it to process more data, from more sources, and lead to more collaboration and data-driven decision making. By better leveraging existing data from these multiple sources, MED will be able to create dashboards with real-time analytics and facilitate data mining and other advanced analysis. MED selected a vendor for creating the Data Lake architecture in Fiscal Year 2018 and anticipates that it will be fully implemented in October 2019.

One other area where MED has identified a need to improve its information systems to support more robust data tracking and analytic capabilities is its licensing system, MyLO. MyLO is largely a document-based system that stores electronic copies of documents in a PDF file format and

associates them with a specific licensee record. However, MyLO is not a database that allows MED's analysts to extract, manipulate, and analyze data to the same degree that they can with Metrc[®] data. For example, although users can assess the information that is contained within MyLO for specific licensees, the data cannot be easily be queried and analyzed across licensees or types of licensees; information must be manually compiled for subsequent analysis.

Recently, the General Assembly passed and the Governor signed House Bill 19-1090, which modifies ownership and investment definitions and allows publicly traded corporations to own or invest in marijuana businesses. Because MED will be processing a greater number and more complex types of applications, the Department was appropriated about \$2.8 million from the Marijuana Cash Fund for Fiscal Years 2019 and 2020, some of which will fund MED's new licensing system. Costs for the new licensing system were estimated at \$857,000 to acquire the software platform and \$375,000 annually for licensing. The bill's fiscal note states that actual costs will be determined through the procurement process, including review by the Joint Technology Committee.

Tax Compliance

As discussed in Chapter 1, medical and retail marijuana are subject to state excise and sales taxes. Excise taxpayers are those businesses that cultivate retail marijuana for sale and distribution to other retail marijuana businesses; medical marijuana is exempt from the excise tax. Sales taxpayers are those medical and retail marijuana businesses that sell marijuana and marijuana products to consumers.

During Fiscal Years 2015 through 2019, 1,102 marijuana excise tax accounts and 650 marijuana sales tax accounts were registered with the Department. Based on tax return data, excise taxpayers reported taxable marijuana transfers totaling about \$1.8 billion. On a per-taxpayer basis, the average total dollar amount of reported marijuana transfers subject to excise tax was about \$1.6 million. Sales taxpayers reported taxable marijuana sales of approximately \$4.8 billion for the same 2015 through 2019 period. On a per-taxpayer basis, the average total dollar amount of reported marijuana sales subject to sales tax was about \$7.4 million.

Tax Divisions Use Data Analytics to Help Target Their Activities

Similar to other taxpayers, marijuana businesses self-report their tax data by filing a tax return with the Department and paying any related tax liabilities. Similar to other taxpayers, there is also a risk that marijuana businesses could fail to report and remit payment for all taxes owed. However, unlike other taxpayers, most marijuana businesses are cash only and have limited access to banking services (as discussed later in the report), which means there may be no or limiting banking information that can be audited.

The Department's Taxpayer Services Division (Taxpayer Services) and Taxation, Audit, and Compliance Division (TAC) have implemented administrative, monitoring, and enforcement

activities that are designed to ensure medical and retail marijuana businesses comply with applicable sales and excise tax requirements. Specifically, as we describe in the following sections, the Department's tax divisions use data analytics and information from GenTax (the Department's tax processing system), as well as MED's MyLO (licensing) and Metrc® (inventory tracking) systems, to help target their tax compliance activities and ensure the accurate reporting and remittance of marijuana tax liabilities.

Nonfilers

Taxpayer Services processes all excise and sales tax returns and payments filed by marijuana businesses. In addition to serving as a resource for taxpayers during the filing process, Taxpayer Services performs initial validations of the returns to assess whether they are properly completed and that the payments match the returns. With respect to identifying potential nonfilers, Taxpayer Services performs a daily data match between GenTax and MyLO to identify any marijuana business licensees that do not have a corresponding GenTax account. Taxpayer Services also uses data from MyLO to cross-verify information about marijuana businesses, such as the start and expiration dates of their license, which would define the period of potential marijuana transfers and sales activity for which tax returns should be filed.

If Taxpayer Services identifies a new marijuana licensee that has not filed a sales or excise tax return, it sends the business information about registering for a tax account and filing returns. If the business does not subsequently file a return, Taxpayer Services issues a follow-up notice. Similarly, if a taxpayer has been filing returns and then fails to file a return, Taxpayer Services sends the taxpayer a notice on the third day after the filing deadline. If the taxpayer fails to respond or file a return within 15 days after the filing deadline, Taxpayer Services sends a second notice. If the taxpayer does not respond to the second notice, Taxpayer Services can impute a tax liability based upon the taxpayer's historical filing data.

Audit Coverage

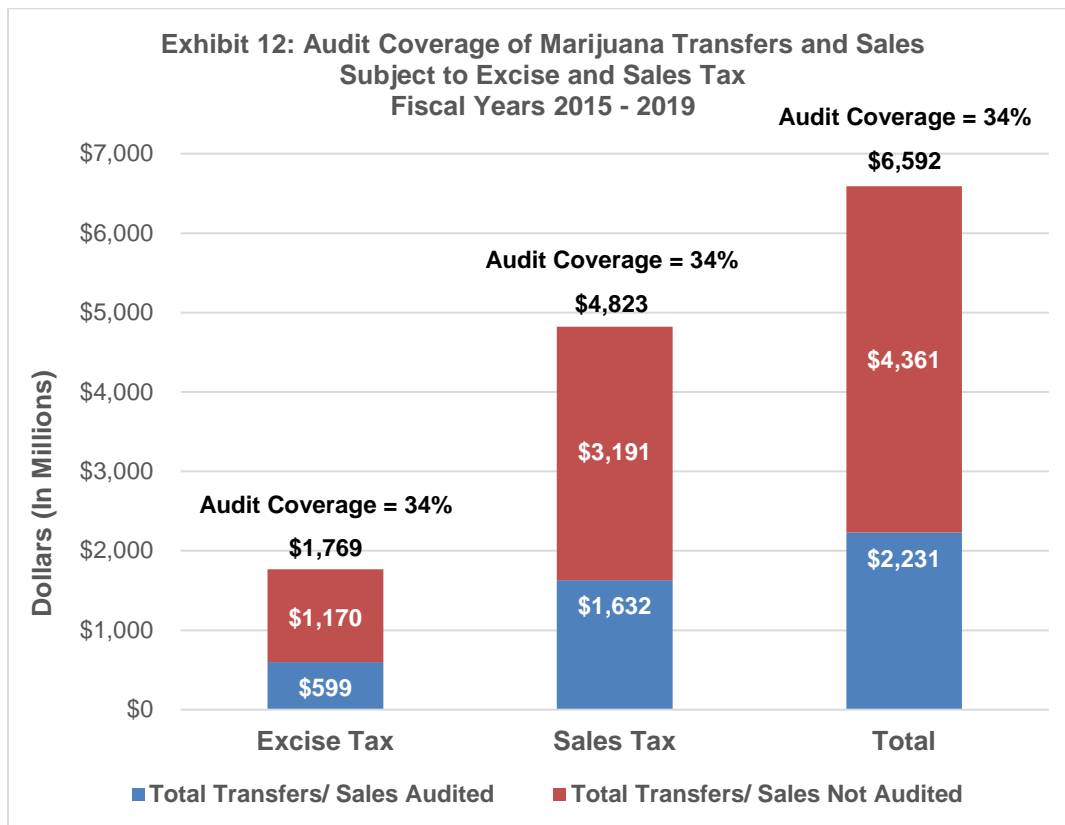
Field Audit is the unit within TAC that is responsible for conducting audits of Colorado businesses. It had 11 auditors dedicated full-time to audits of marijuana businesses in Fiscal Year 2017. Currently, Field Audit has nine auditors who spend 70% of their time on audits of marijuana businesses. Because auditing every taxpayer and tax return is resource prohibitive, one of the most important tasks performed by Field Audit is selecting those businesses it will audit during a given year.

Field Audit has developed four statistical models that it uses to generate leads for audits of marijuana businesses. Specifically, Field Audit uses "R," which is a language and environment for statistical computing, to analyze tax return and inventory data from GenTax and Metrc®, respectively. Based on analysis of the predictive value of prior statistical models and input from audit staff, Field Audit modifies its audit selection criteria each year. Examples of analysis and risk factors include, but are not limited to:

- Comparison of GenTax data on the volume of marijuana transfers reported on excise tax filings with Metrc® data to identify possible underreporting of marijuana transfers subject to excise tax.
- Analysis of Metrc® data on bud-to-trim weight ratios to identify possible misclassification of marijuana transfers subject to excise tax.
- Analysis of GenTax data on claimed deductions to identify possible overstatement of claimed deductions.

Field Audit combines these risk factors with other variables, such as the total taxes paid in the previous year, to generate a risk-scored list of potential audit candidates that is provided to the marijuana audit group. The marijuana audit group selects taxpayers from this list and engages them for audit.

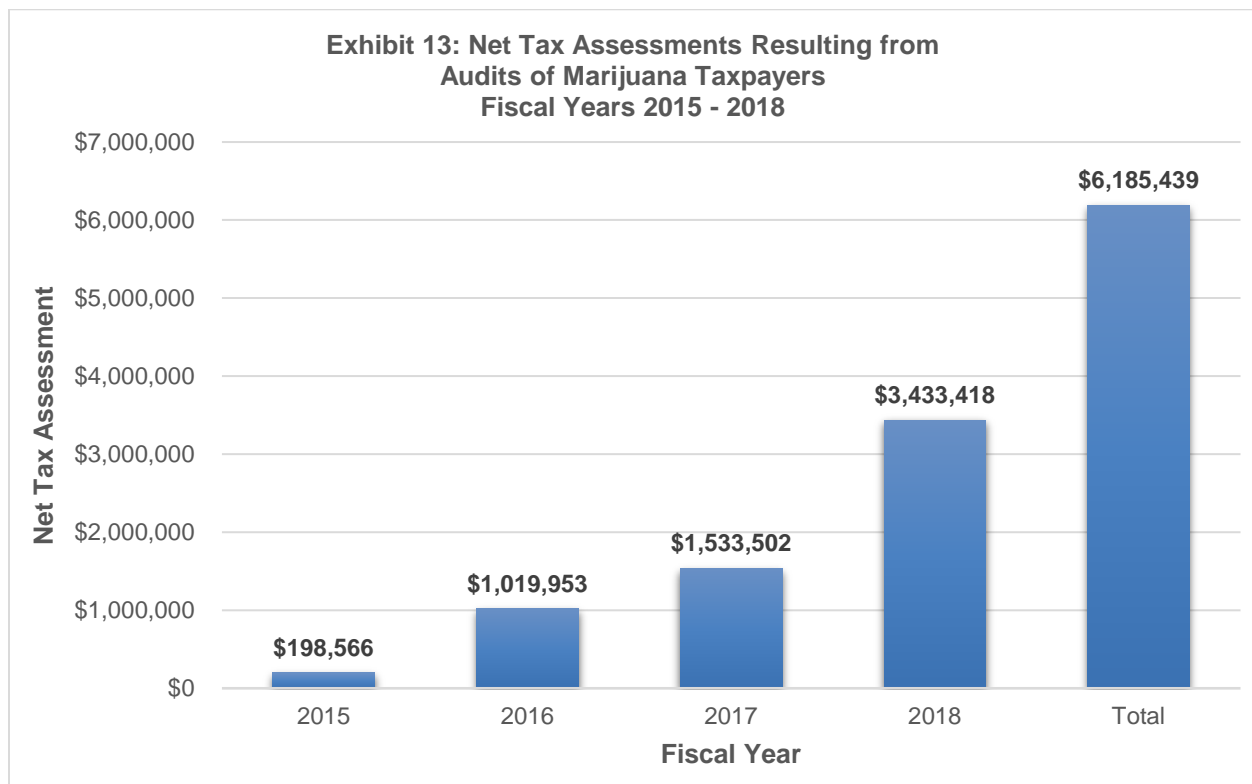
Overall, Exhibit 12 shows that Field Audit has audited over \$2.2 billion—or about 34%—of the nearly \$6.6 billion in combined marijuana transfers and sales subject to excise and sales taxes between July 1, 2015 and June 30, 2019. On a taxpayer basis, the audit coverage is higher, with Field Audit having audited approximately 55% of marijuana excise and sales taxpayers during this same period.



Source: Colorado Department of Revenue, Taxation, Audit, and Compliance Division.

Audit Assessments

The results of audits can be an indicator of how compliant taxpayers are when calculating their taxes and filing their returns. That is, an audit of a taxpayer who has calculated and filed their taxes correctly generally should not result in assessment of additional tax liabilities, whereas an audit of a noncompliant taxpayer would result in assessment of additional tax liabilities. Exhibit 13 shows the net tax assessments resulting from audits of marijuana sales and excise taxpayers performed by Field Audit. Specifically, net tax assessments resulting from audits totaled \$6.2 million for Fiscal Years 2015 through 2018, which represents less than 1% of the approximately \$691 million in marijuana taxes collected for the same period. Although audits of marijuana businesses have identified additional tax liabilities, these statistics also indicate that marijuana businesses generally are complying with applicable requirements when calculating their excise and sales tax liabilities and filing their returns.



Source: Colorado Department of Revenue, Taxation, Audit, and Compliance Division.

Banking Services and Payment Technologies

Marijuana’s illegal status under federal law complicates many issues with Colorado’s commercial marijuana industry, such as banking, because handling the proceeds of any marijuana transaction can expose the involved parties to federal money laundering and racketeering charges. Very few banks or credit card companies are willing to bear this risk; therefore, without widespread access

to the banking system, marijuana businesses have generally been forced to operate on an all-cash basis. That is, sales transactions between marijuana businesses (e.g., transfers between a retail marijuana cultivation facility and a retail marijuana store) or between marijuana businesses (e.g., retail marijuana store or medical marijuana center) and their customers occur in cash.

The banking landscape is slowly evolving, and financial institutions have started to provide marijuana businesses with access to limited banking services, such as deposit and checking accounts, but not loans. Financial institutions must monitor these accounts and report regularly to the U.S. Department of the Treasury. According to a September 2018 marijuana banking update from the U.S. Department of the Treasury's Financial Crimes Enforcement Network, a total of 486 depository institutions (375 banks and 111 credit unions) were actively providing banking services to marijuana-related businesses in the United States as of September 30, 2018. Federal legislation addressing banking issues in the marijuana industry continues to be debated. For example, in March 2019, the House Financial Services Committee voted 45-15 to advance H.R. 1595, the Secure and Fair Enforcement (SAFE) Banking Act, for consideration by the full U.S. House of Representatives.

Notwithstanding more significant changes to federal banking laws, existing and emerging payment technologies, including some that are already commonly used in the retail and hospitality environments, may also help provide assurances over cash-based marijuana sales transactions:

- **Point-of-Sale (POS) Systems.** A POS system is a computerized network of checkout terminals and other hardware (e.g., barcode scanners and card payment terminals) that facilitates the purchase transaction between the business and the customer. POS systems are being specifically designed for marijuana sales, and many marijuana businesses use POS systems because they provide additional controls over the sales transaction. For example, when a cashier uses a POS terminal to complete a sale to a customer, the system automatically captures the sales transaction data, links it to the unique package RFID, and updates the inventory data in Metrc®. Marijuana businesses are required to maintain complete sales and inventory data regardless of whether they use a POS system. However, the risk of human error, whether intentional or not, is much greater when transactions are entered manually into Metrc®. As the industry matures and marijuana sales volumes continue to increase, the use of Metrc®-integrated POS systems is likely to become more widespread.
- **Closed-Loop Payment Systems.** A closed-loop payment system allows consumers to load funds into a pre-paid spending account that is accessed through a payment card or mobile device (e.g., payment app or digital wallet) and used at the register to complete the purchase. Closed-loop payment systems can also integrate and be used in conjunction with POS systems. The primary advantage of closed-loop payment systems for the marijuana industry is that they facilitate the electronic transfer of funds between the customer and the retail store or medical marijuana center, thereby eliminating the

exchange of cash during the sales transaction. This has a secondary benefit of reducing the amount of cash the marijuana business has on its premises and the associated risks such as burglary. One disadvantage of closed-loop payment systems is that the consumer can only use their pre-paid account/payment card at those marijuana businesses that participate in the system.

During the 2018 Legislative Session, Senate Bill 18-021 was introduced, calling for the creation of a pilot project for a state-run closed-loop payment system for use by marijuana-related and affiliated businesses. Although Senate Bill 18-021 did not pass out of committee, the industry's use of closed-loop payment systems available in the private sector will continue to develop. Other states have also explored state-sanctioned closed-loop payment systems. For example, in 2018, legislation was introduced in the Ohio General Assembly creating a mandatory closed-loop payment system for that state's medical marijuana program, but, similar to Colorado's bill, it did not pass out of committee. Recently, in June 2019, the Nevada Assembly successfully passed and the governor signed Assembly Bill 466 requiring the state treasurer to create a pilot program for establishing one or more closed-loop payment processing systems for financial transactions relating to marijuana sales in Nevada.

- **Blockchain.** Often associated with cryptocurrencies (e.g., Bitcoin), blockchain technology is, at a basic level, a secure and public way to track and verify transactions between parties. A blockchain is a ledger that stores data (e.g., the details of a transaction or multiple transactions) in separate blocks that are verified, assigned a unique code, and linked together. Since a network of computers, rather than any one entity, verifies each block, there is greater confidence in the integrity of the data contained within the blockchain. Additionally, once a block is verified and added to the chain, it cannot be altered, even by the original creator. Some in the marijuana industry are looking to blockchain technology for solutions because the technology can potentially provide a high level of security and integrity to financial transactions that currently do not flow through the banking system. Unlike POS and closed-loop payment systems, the application and use of blockchain technology the marijuana industry appears to be the least well developed.

Chapter 3: Inter-Divisional Communication

The Department of Revenue's (Department) Marijuana Enforcement Division (MED) is responsible for ensuring that marijuana businesses comply with the statutory and regulatory requirements for the cultivation and sale of marijuana and marijuana products. The Department's Taxpayer Services Division (Taxpayer Services) has primary responsibility for the collection of excise and sales taxes associated with the transfer and sale of marijuana and marijuana products, and the Department's Taxation, Audit, and Compliance Division (TAC) has primary responsibility for audit and enforcement activities related to these taxes.

The Department's divisions perform different activities; however, these activities all target the same population of marijuana businesses. Additionally, an issue in one aspect of a marijuana business may indicate an issue in other aspects of the marijuana business. For example, if MED identifies an issue with how a business measures and accounts for its marijuana inventory, this could have an effect on how the business reports its marijuana sales and calculates its tax liabilities. Conversely, if TAC's auditors identify issues with how a marijuana business calculates and reports its tax liabilities, there may be problems with the manner in which the business manages and reports its marijuana inventory.

Our evaluation confirmed that the Department places data analytics at the forefront of its marijuana inspection, audit, and enforcement efforts. However, as we describe in this chapter, the Department also needs to strengthen inter-divisional communication about these collective marijuana-related activities.

What Evaluation Work Was Performed and What Was the Purpose?

We reviewed policies and procedures, training materials, reports, and data to understand the roles and responsibilities of the Department's three divisions involved in marijuana-related activities. We also interviewed key personnel to understand how information and data are communicated within and between these divisions.

How Were the Results of the Evaluation Work Measured?

In order for the Department to perform its job effectively and efficiently, it is important that staff have access to good quality information, and that information is communicated to staff who need it. The Office of the State Controller has adopted the Government Accountability Office's *Standards for Internal Control in the Federal Government* (Green Book) as the State's standard for internal controls, which all state agencies must follow. With respect to communicating internally, the Green Book states that management should:

- Communicate quality information throughout the entity using established reporting lines. Quality information should be communicated down, across, up, and around reporting lines to all levels of the entity.

- Communicate quality information down and across reporting lines to enable personnel to perform key roles in achieving objectives, addressing risks, and supporting the internal control system. Management should also assign the internal control responsibilities for key roles in internal communication.
- Receive quality information about the entity's operational processes that flows up the reporting lines from personnel to help management achieve the entity's objectives.

What Problem Did the Evaluation Work Identify and Why Did It Occur?

The Department lacks well-planned and coordinated processes for key communication among the many different divisions, work units, and staff involved in the Department's ongoing marijuana-related compliance and enforcement activities. Our interviews with Department staff suggest that inter-divisional communication and exchange of information is more ad hoc and that personnel are not necessarily aware of ongoing activities. For example:

- Staff reported that MED and TAC conduct informal discussions when an issue impacts both divisions' responsibilities or to communicate about specific marijuana businesses. MED staff reported that they contact Taxpayer Services or TAC if MED identifies a tax-related issue with a licensee. Field Audit staff within TAC confirmed they are occasionally notified of a tax-related issue via email, but generally are not aware of any past or present MED investigations. TAC staff reported they will contact MED about specific cases involving marijuana businesses, and MED confirmed it will file cases against licensees for tax delinquencies based solely on information received from TAC.
- Staff also reported that MED and TAC used to hold all-inclusive meetings to share information about issues and trends related to marijuana businesses and to coordinate activities. However, the Department stopped these meetings in mid-2017, because management felt that it was not an efficient use of attendees' time and, with such a large group, it was difficult to schedule regular meetings that all parties could attend. Instead, the focus shifted to holding meetings about specific issues or cases when necessary. For example, criminal agents working on a specific case or group of cases will have a meeting with MED to discuss issues with the taxpayers under investigation. As another example, Taxpayer Services will contact MED to discuss licensing/registration issues with specific taxpayers.
- As discussed previously, MED has been working on its Data Lake initiative for several months. The goal of this initiative is to facilitate the analysis of more data, from more sources, in different ways and in less time, thereby leading to better collaboration and more timely risk-based decision making about investigation leads. However, when we made inquiries with MED's investigators and TAC's auditors about the Data Lake's functionality and its potential benefits for their compliance and enforcement activities, staff generally were unaware of the initiative. We understand that the implementation and operation of this new system will rest with MED's analysis and planning unit. However,

even this general lack of awareness about the initiative within MED and TAC indicates a lack of communication with possible end users of the technology.

Overall, the Department does not have a formal communications plan or other procedural document that defines expectations for inter-divisional communication about marijuana-related compliance and enforcement activities, including what information should be communicated, how the information should be communicated, the frequency of the communication, or which personnel should receive and have access to the information being communicated.

Why Does This Problem Matter?

Although ad hoc communication takes place when needed, without more formal, routine communication between divisions, the Department lacks assurance that relevant information about marijuana compliance and enforcement activities is being communicated completely, systematically, and in a timely manner to those parties who are responsible for taking action, resulting in a loss of efficiency and effectiveness. Given the complexities of its operating environment, the Department would benefit from a more structured approach to its inter-divisional communications.

Recommendation No. 1:

The Department of Revenue should strengthen inter-divisional communication about marijuana-related compliance and enforcement activities by:

- A. Establishing a formal communications plan or other procedural document that specifies what information should be communicated between divisions, how the information should be communicated, the frequency of the communication, and which personnel should receive and have access to the information being communicated.
- B. Re-instituting routine inter-divisional meetings to coordinate and share information about observed issues and trends with individual marijuana businesses and the marijuana industry more generally.

Department of Revenue Response:

- A. Agree.

Implementation Date: September 2019.

MED will coordinate with the Tax Division, and its various components with an interest in aspects of Inventory Tracking, to formalize processes and procedures, and methods and frequency of communication, around marijuana-related compliance and enforcement. Components of Tax and MED have a long history of close collaboration, both formal and informal, but it would be beneficial for all concerned to more formally develop a collaboration and communications document so that work relationships and communication networks are clarified and systematized.

B. Agree.

Implementation Date: September 2019.

A key component of the collaboration plan will consist of instituting regular Tax Division (with relevant section personnel) and MED staff meetings to share data and information on both individual licensee businesses, as well as confer on industry sector trends and compliance issues. The initial recommendation will be to establish monthly meetings of relevant staff that will be guided by an agenda noting specific licensees of interest, as well as broader industry concerns. There may be opportunities to also institute quarterly meetings with a broader range of stakeholders to consider and evaluate strategic issues.

Glossary of Key Terms

Bud is a synonym for the flower of the mature marijuana plant.

Cannabinoid refers to any of the chemical compounds that are the active components of marijuana.

Cannabidiol or **CBD** is one type of cannabinoid found in the marijuana plant. CBD has no psychoactive effects and is commonly used in lotions, balms, creams, oils, and tinctures.

Clone is a marijuana plant clipping that can be planted and grown, creating a genetic copy of the mother plant.

Concentrate is any type of marijuana product that is refined from flowers into a more purified and potent form.

Cultivator is a marijuana business that grows, prepares, packages, transfers, and wholesales marijuana to other marijuana businesses. The cultivator may sell marijuana to a medical marijuana center or retail marijuana store. In order to sell marijuana or marijuana products directly to consumers, a cultivator must hold a separate license as a retail marijuana store or medical marijuana center.

Edibles are marijuana-infused products for which the intended use is oral consumption (e.g., food, drink, or pill).

Flowering is the reproductive state of the marijuana plant in which there are physical signs of flower or budding out of the nodes in the stem.

Flower is the part of the mature marijuana plant that is harvested, sold, and consumed by smoking in order to release its psychoactive components.

Grow room is a room where marijuana plants are grown under controlled conditions (e.g., lighting, temperature, and humidity).

Harvest batch is a specifically identified quantity of processed marijuana that is uniform in strain, cultivated using the same pesticide and other agricultural chemicals, and harvested at the same time.

Immature plant is a non-flowering marijuana plant no taller than eight inches and no wider than eight inches, which is produced from a cutting, clipping, or seedling and is in a cultivating container.

Licensee is any person or entity licensed by the State of Colorado, pursuant to state statutes and rules, to perform commercial marijuana activities, such as growing, preparing, manufacturing, packaging, transferring, transporting, or selling medical or retail marijuana or marijuana products.

Marijuana refers to the dried leaves, flowers, stems, and seeds of the *Cannabis sativa* or *Cannabis indica* plant.

Medical marijuana is marijuana that is grown and sold pursuant to Article XVIII, Section 14 of the Colorado Constitution; Title 44, Article 11 of the Colorado Revised Statutes (Medical Marijuana Code); and Section 1, Part 212-1 of the Colorado Code of Regulations.

Medical marijuana business is a licensed medical marijuana center, a medical marijuana-infused products manufacturer, an optional premises cultivation operation, a medical marijuana testing facility, a medical marijuana business operator, a medical marijuana transporter, a marijuana research and development facility, or a marijuana research and development cultivation facility.

Medical marijuana center is a person or entity that is not a primary caregiver and is licensed to sell medical marijuana to registered patients or primary caregivers.

Marijuana-infused products or **infused products** are products containing marijuana that are intended for use or consumption other than by smoking (e.g., edible products, ointments, and tinctures).

Package is any amount of marijuana or marijuana-infused product for sale, processing, or transfer that is placed into one or more containers, with each container having its own unique radio frequency identification tag.

Products manufacturing facility is an entity licensed to purchase marijuana; manufacture, prepare, and package marijuana products; and transfer or wholesale marijuana and marijuana products to other marijuana businesses, but does not sell directly to consumers.

Radio frequency identification (RFID) is technology whereby digital data is coded in physical RFID tags or smart labels that are affixed to the marijuana plants or products and can be captured by a remote reader via radio waves.

Retail marijuana is marijuana that is grown and sold pursuant to Article XVIII, Section 16 of the Colorado Constitution; Title 44, Article 12 of the Colorado Revised Statutes (Retail Marijuana Code); and Section 1, Part 212-2 of the Colorado Code of Regulations.

Retail marijuana business is a retail marijuana store, a retail marijuana cultivation facility, a retail marijuana products manufacturing facility, a retail marijuana testing facility, a retail marijuana establishment operator, or a retail marijuana transporter. (Note: State rules use the term “retail marijuana establishment” to refer to these entities.)

Retail marijuana store is an entity licensed to purchase retail marijuana from a retail marijuana cultivation facility and to purchase retail marijuana products from a retail marijuana products manufacturing facility and to sell retail marijuana and retail marijuana products to consumers.

Shake is the small pieces of the marijuana flower that break off of larger buds, generally as the result of regular handling. Shake is not discarded because it contains active ingredients that can be extracted and used to make marijuana concentrates and marijuana-infused products.

Testing facility is a public or private laboratory licensed and certified to conduct testing and research on marijuana, marijuana concentrate, and marijuana-infused products.

Tetrahydrocannabinol or **THC** is the most recognized cannabinoid found in the marijuana plant. THC has psychoactive properties that create a “high” in the user.

Transporter is a person who is licensed to transport marijuana, marijuana concentrate, and marijuana-infused products from one marijuana business to another, including temporarily storing the marijuana and marijuana-infused product being transported at its licensed premises.

Trim refers to the excess plant material (i.e., leaves) that are trimmed from the plant throughout its growth cycle and after harvest. Trim is not discarded because it contains active ingredients that can be extracted and used to make marijuana concentrates and marijuana-infused products.

Vegetative is the state of the marijuana plant during which plants do not produce resin or flowers and are bulking up to a desired production size for flowering.

Waste generally refers to excess plant material (e.g., roots, stalks, and stems), damaged marijuana plants that are not usable, and other non-fibrous marijuana, marijuana concentrate, and marijuana product waste produced prior or subsequent to harvest.