

## Average Market Rate Recommendations

### Executive Summary:

The Office of Research and Analysis recommends the following Average Market Rates for use by the Department of Revenue in levying the excise tax on the sale or transfer of Retail Marijuana from a Retail Marijuana Cultivation Facility.

	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/EA)
Average Market Rate	\$1,948	\$464	\$9

The Average Market Rate was calculated based on retail marijuana transactions recorded from July 1, 2015 through October 31, 2015 in Marijuana Enforcement Division's marijuana inventory tracking system (METRC). Transactions excluded the following data:

- Confirmed transfers between cultivators and retailers occurring within a vertically-integrated business structure;
- Data entered with obvious incorrect units of measurement (e.g. immature plants by pounds);
- Identified manifests contain the processed products (e.g. PreRoll or PreRoll Cone);
- Medical Marijuana transfers.

Detailed information related to the methodology and estimation techniques used to arrive at these results can be found on pages 2-5 of this document.

## Average Market Rate Methodology

The Department of Revenue’s Taxation Division has determined that the excise tax upon wholesale sales of Retail Marijuana can effectively be levied upon three product categories:

1. Flower (or bud, smoke-able product)
2. Trim (remaining parts of the plant that contain some amount of THC)
3. Immature Plants (plants that could be transferred to other Licensees)

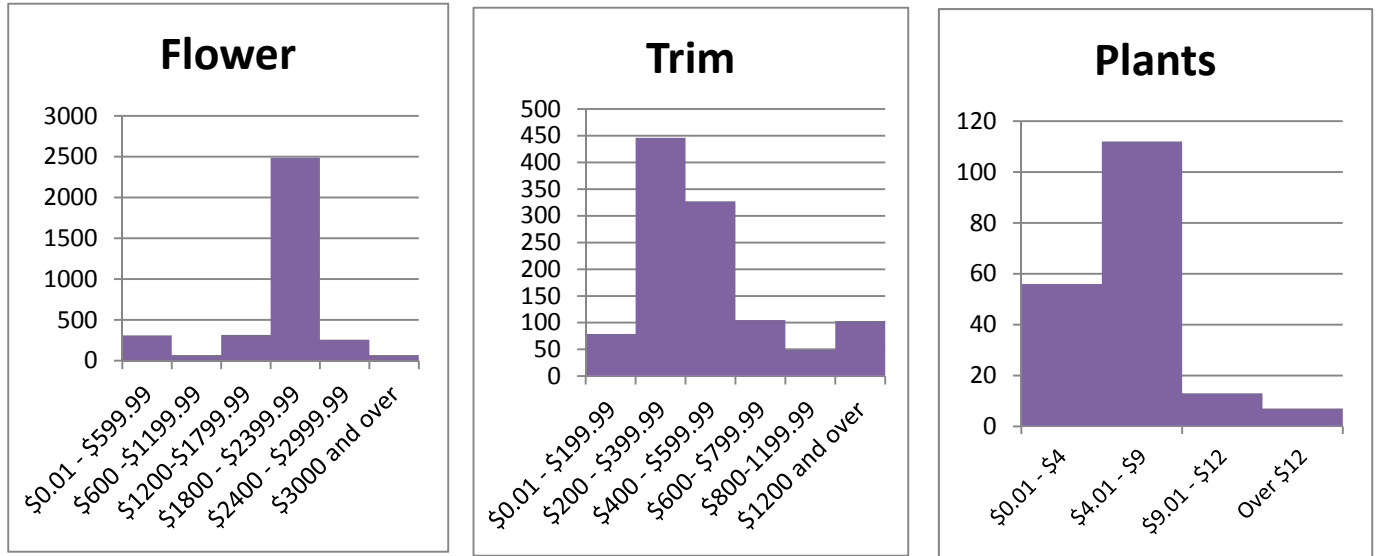
In order to estimate the Average Market Rate (AMR) for each of the categories and in order to comply with the rate-setting requirements of §39-28.8-101(1), C.R.S., Office of Research and Analysis (ORA) calculated the AMR for January 1, 2016 based on wholesale transactions recorded by manifest numbers from July 1, 2015 through October 31, 2015 in Marijuana Enforcement Division’s marijuana inventory tracking system (METRC). Manifest transactions excluded the following data:

- Confirmed transfers between cultivators and retailers occurring within a vertically-integrated business structure;
- Data entered with obvious incorrect units of measurement (e.g. immature plants by pounds);
- Identified manifests contain the processed products (e.g. PreRoll or PreRoll Cone);
- Medical Marijuana transfers.

Pursuant to §12-43.4-104, C.R.S., October 1, 2014 marked the beginning of the retail marijuana market for businesses which did not previously hold medical marijuana licenses. At this time, the Marijuana Enforcement Division updated the METRC system and required that price data be entered and recorded for wholesale marijuana transfers. Initially, price data for entire manifests containing multiple categories was entered into METRC and as a result, category prices were not able to be calculated. However, in February 2014, the price field was revised to allow prices with multiple categories under the same manifest number.

For each taxable category, prices were calculated from each individual manifest and their frequencies were used to assess the distribution and identify any outliers. The following tables and graphs display the raw data of all single category transfer manifests from July 1, 2015 through October 31, 2015 as of November 6, 2015.

Raw Frequencies Flower		Raw Frequencies Trim/Shake		Raw Frequencies Immature Plant	
<i>Rate (\$/lb)</i>	<i>Frequency</i>	<i>Rate (\$/lb)</i>	<i>Frequency</i>	<i>Rate (\$/each)</i>	<i>Frequency</i>
\$0.01 - \$599.99	309	\$0.01 - \$199.99	79	\$0.01 - \$4	56
\$600 - \$1199.99	68	\$200 - \$399.99	446	\$4.01 - \$9	112
\$1200 - \$1799.99	316	\$400 - \$599.99	327	\$9.01 - \$12	13
\$1800 - \$2399.99	2,487	\$600 - \$799.99	105	Over \$12	7
\$2400 - \$2999.99	257	\$800 - \$1199.99	49		
\$3000 and over	68	\$1200 and over	103		



Next, each rate for each product category was combined into an un-weighted arithmetic mean (each manifest counts as an observation in the weight, regardless of the volume it sold). Additional summary statistics related to the distribution of these values, such as the maximum and minimum by transaction rates as well as the median and mode values by transaction rates are shown in the tables below.

**Summary Statistics (Including Outliers)**

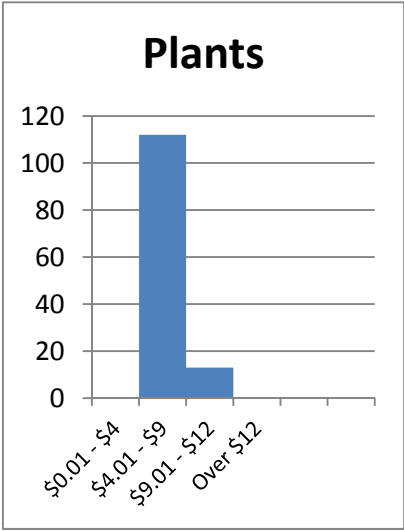
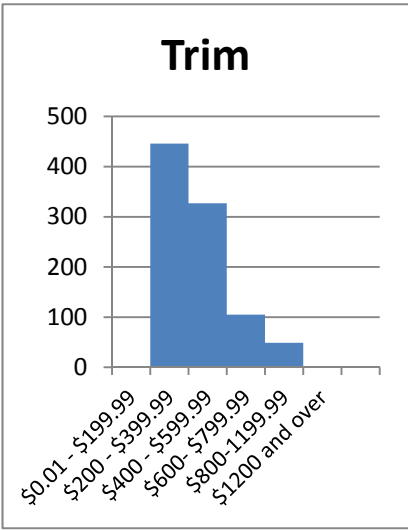
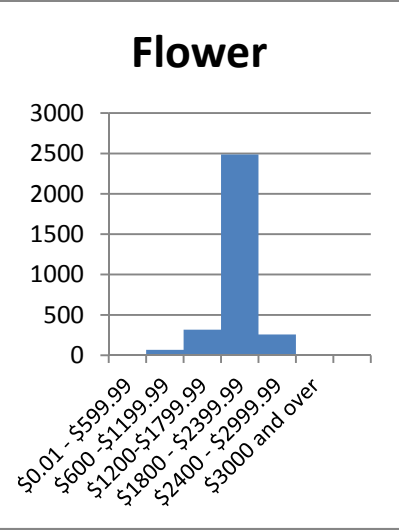
	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/EA)
Max Rate	\$106,728	\$42,102	\$50
Min Rate	\$0.01	\$0.00	\$0.00
Median Rate	\$1,891	\$405	\$9
Mode Rate	\$1,869	\$376	\$9
Standard Deviation	5,596	1,821	5.29

The frequency tables show that the rates for Immature Plants are often within a fairly tight range. There are relatively few transactions reported for Immature Plant rates, although these tend to be the most clustered, with most observations clustered within \$4.01 to \$9 per Immature Plant. The average is fairly close to the median and the mode values. Most of the rates for Individual Flower transactions are between the values of \$1,800 and \$2,400 per pound. However, the mean price for Flower shows substantial variation with a standard deviation of 5,596. The data for Trim also shows substantial variation. There are several data values that could be considered outliers due to possible data entry errors or taxpayer difficulty understanding the form.

It is ORA’s recommendation that the Department should levy the excise tax using the AMR where observations equal to a rate of \$0.01-\$599.99 and over \$3,000 for Flower, \$0.01-\$199.99 and over

\$1,200 for Trim, and \$0.01-\$4 and over \$12 for Immature Plant as identified outliers for the rates have been removed. After removing outliers, the frequency tables shown below reflect the normalized data of single category transfer manifests from July 1, 2015 through October 31, 2015 as of November 6, 2015. The calculation based on the normalized data would equate to an AMR of \$1,948 per pound for Flower, \$464 per pound for Trim, and \$9 for each Immature Plant. These average rates are consistent with the median and mode rate analysis in the above tables and are recommended to be used for January 1, 2016.

Flower		Trim/Shake		Immature Plant (Combined)	
Rate (\$/lb)	Frequency	Rate (\$/lb)	Frequency	Rate (\$/each)	Frequency
\$0.01 - \$599.99	0	\$0.01 - \$199.99	0	\$0.01 - \$4	0
\$600 - \$1199.99	68	\$200 - \$399.99	446	\$4.01 - \$9	112
\$1200-\$1799.99	316	\$400 - \$599.99	327	\$9.01 - \$12	13
\$1800 - \$2399.99	2487	\$600- \$799.99	105	Over \$12	0
\$2400 - \$2999.99	257	\$800-1199.99	49		
\$3000 and over	0	\$1200 and over	0		



**Summary Statistics (Excluding Outliers)**

	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/EA)
Max Rate	\$2999.99	\$1999.99	\$12
Min Rate	\$600	\$200	\$4
Median Rate	\$1,891	\$405	\$9
Mode Rate	\$1,891	\$376	\$9
Standard Deviation	296	148	1.17