

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	\$1,876	\$296	\$9

The Average Market Rate was calculated based on responses by industry representatives of Medical Marijuana Businesses to the survey questions sent to them in October, November, and December 2013. The surveys included questions about both arms-length transactions and integrated sales in order to respond sensitively to the statutory requirement to base the Average Market Rate on the price of all unprocessed marijuana that is sold or transferred in the state.

These rates are a middle ground between using arms-length only or integrated-only transfers. The rates also reflect fairly consistent results among arms-length only, integrated only, and the combination of the two. They are reasonably consistent with industry “guesstimates” discussed in emergency rulemaking testimony and with the estimates generated by Legislative Council fiscal note staff using a different methodology. These rates were calculated excluding only a very few survey responses that were identified as outliers.

More detailed information related to the methodology and estimation techniques used to arrive at these results can be found on pages 2-7 of this document.

Average Market Rate Calculation Methodology Detail

The Department of Revenue 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., of House Bill 13-1318, the Office of Research and Analysis (ORA) determined that while there are currently no Retail Marijuana sales over the past six months that could be used to calculate an Average Market Rate, the sale or transfer of Medical Marijuana would make a reasonable proxy for retail sales for several reasons. First, the only businesses allowed to sell Retail Marijuana in the first nine months of 2014 will be Medical Marijuana Businesses that have been approved to convert, making their operation and cost structure in the beginning the most similar to the operation of Retail Marijuana Stores. Secondly, because many Medical Marijuana Businesses are likely to convert or transfer a portion of their business, they would have a vested interest in providing information that would affect their future tax rates.

ORA mailed and tracked 612 surveys to existing Medical Marijuana Businesses, including Medical Marijuana Centers, Medical Marijuana-Infused Product Manufacturing Businesses, and Optional Premises Cultivation Operations, to collect information related to the value or price of wholesale marijuana transfers. ORA mailed an initial survey on October 23, 2013; a follow-up mailing on November 20, 2013; and a set of supplemental questions were mailed to each business November 27, 2013. Of the 612 surveys sent, ORA received back 197 total survey responses as of December 16, 2013, which is an overall response rate of 32.19%.

The initial survey (10/23/2013) and the first follow-up survey (11/20/2013) only asked respondents to provide values or prices for wholesale sales or transfer of product from their business to non-associated businesses (or what would amount to arms-length transactions). The set of supplemental questions was mailed to each of the 612 Medical Marijuana Businesses containing a supplemental list of follow-up questions designed to incorporate values or prices for wholesale sales or transfer of product to associated businesses that are within their vertically integrated business model. These transactions would be more like internal transfers.

Below are frequency tables showing the frequencies of responses within certain ranges of rates for each category of product. The volume and value data for sales or transfer of each category of product (Flower, Trim, and Immature Plant) were used to calculate the Average Market Rate of each category for each individual business. These individual rates by business are described in the frequency tables to address their distribution to determine whether there were any individual respondents that would act as an unreasonable outlier and skew the average. The frequency tables shown reflect the raw data of the responses received as of December 16, 2013, with no outliers removed. Data is split among

observations that incorporate arms-length only sales, integrated only sales, or an un-weighted combination of both arms-length and integrated sales (when available). The frequency of respondents in the “Combined” category doesn’t necessarily sum to the “Arms-Length” plus the “Integrated” values. First, many respondents provided data for both arms-length and integrated sales together rather than only one or the other. In addition, when respondents provided information for both categories, the higher rates in the arms-length category sometimes moved to a lower bin when they were combined with the greater volume of a business’s integrated sales, which were often at a lower rate.

Flower (Arms-Length)		Flower (Integrated)		Flower (Combined)	
<i>Rate (\$/lb)</i>	<i>Frequency</i>	<i>Rate (\$/lb)</i>	<i>Frequency</i>	<i>Rate (\$/lb)</i>	<i>Frequency</i>
\$0	2	\$0	2	\$0	3
\$0.01 - \$500	1	\$0.01 - \$500	6	\$0.01 - \$500	6
\$500.01 - \$1000	1	\$500.01 - \$1000	6	\$500.01 - \$1000	2
\$1000.01 - \$1500	3	\$1000.01 - \$1500	9	\$1000.01 - \$1500	14
\$1500.01 - \$2000	37	\$1500.01 - \$2000	16	\$1500.01 - \$2000	39
\$2000.01 - \$2500	32	\$2000.01 - \$2500	13	\$2000.01 - \$2500	30
\$2500.01 - \$3000	3	\$2500.01 - \$3000	3	\$2500.01 - \$3000	4
More than \$3000	0	More than \$3000	3	More than \$3000	4

Trim (Arms-Length)		Trim (Integrated)		Trim (Combined)	
<i>Rate (\$/lb)</i>	<i>Frequency</i>	<i>Rate (\$/lb)</i>	<i>Frequency</i>	<i>Rate (\$/lb)</i>	<i>Frequency</i>
\$0	15	\$0	6	\$0	18
\$0.01 - \$150	21	\$0.01 - \$150	20	\$0.01 - \$150	35
\$150.01 - \$300	24	\$150.01 - \$300	5	\$150.01 - \$300	23
\$300.01 - \$450	7	\$300.01 - \$450	2	\$300.01 - \$450	7
\$450.01 - \$600	5	\$450.01 - \$600	4	\$450.01 - \$600	10
\$600.01 - \$750	0	\$600.01 - \$750	2	\$600.01 - \$750	1
\$750.01 - \$1000	6	\$750.01 - \$1000	5	\$750.01 - \$1000	9
More than \$1000	5	More than \$1000	4	More than \$1000	4

Immature Plant (Arms-Length)		Immature Plant (Integrated)		Immature Plant (Combined)	
<i>Rate (\$/each)</i>	<i>Frequency</i>	<i>Rate (\$/each)</i>	<i>Frequency</i>	<i>Rate (\$/each)</i>	<i>Frequency</i>
\$0	1	\$0	6	\$0	7
\$0.01 - \$4	3	\$0.01 - \$4	4	\$0.01 - \$4	5
\$4.01 - \$8	2	\$4.01 - \$8	5	\$4.01 - \$8	5
\$8.01 - \$12	1	\$8.01 - \$12	5	\$8.01 - \$12	5
\$12.01 - \$16	0	\$12.01 - \$16	2	\$12.01 - \$16	2
\$16.01 - \$20	0	\$16.01 - \$20	1	\$16.01 - \$20	1
\$20.01 - \$24	1	\$20.01 - \$24	0	\$20.01 - \$24	1
More than \$24	0	More than \$24	0	More than \$24	0

Next, each of the by-business rates for each product category was combined into an un-weighted arithmetic mean (each respondent/business counts as an observation in the weight, regardless of the volume it sold) for each product category. Additional summary statistics related to the distribution of these values, such as the maximum and minimum by-business rates as well as the median and mode values of by-business rates are shown in the tables below. Again, these are currently split out to show arms-length transactions separately from integrated transactions, as well as rates for both types of transactions combined with all data. The combined averages will be weighted more heavily toward the integrated sales values and rates in many cases because a minimum of 70% of each business's sales must be made to an integrated business. In addition to the mean of all observations, there is also a mean excluding observations with a calculated rate of "\$0" in the tables below.

As seen in these tables and in the frequency tables above, the rates for Flower are often within a fairly tight range. The average is usually fairly close to the median and the mode values in arms-length only, integrated only, and combined transactions. Most of the rates for Flower at individual businesses are between the values of \$1,500 and \$2,500 per pound. There are few transactions reported for Immature Plant rates, although these tend to be more clustered as well, with most observations clustered within \$0.01 to \$12 per Immature Plant. However, the rates for Trim, when calculated using all of the existing data, show much more variation. There are several data values that could be considered outliers. After consulting the paper or electronic versions of the surveys of these outliers for notes, it was determined that because Trim is transferred as an intermediate product, several of the respondents noted that the only way they could value Trim was at their cost of processing it or in what they sold the infused products for at retail.

Combined Overall Summary Statistics

	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/EA)
Max Rate	\$3,798.56	\$32,000.00	\$22.32
Min Rate	-	-	-
Median Rate	\$2,000.00	\$156.25	\$4.96
Mode Rate	\$2,000.00	-	-

Combined (All Observations) Average Rates

	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/EA)
Average Rate	\$1,821.06	\$554.74	\$6.25
Number of Observations	102	107	26

Combined (Non-Zero Observations) Average Rates

	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/EA)
Average Rate	\$1,876.24	\$666.93	\$8.55
Number of Observations	99	89	19

Arm's-Length Only Overall Summary Statistics

	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/each)
Max Rate	\$2,601.33	\$13,213.48	\$22.32
Min Rate	-	-	-
Median Rate	\$2,000.00	\$200.00	\$4.32
Mode Rate	\$2,000.00	-	\$5.00

Arm's-Length Only (All Observations) Average Rates

	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/each)
Average Rate	\$1,985.07	\$518.00	\$6.24
Number of Observations	79	83	8

Arm's-Length Only (Non-Zero Observations) Average Rates

	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/each)
Average Rate	\$2,036.63	\$632.26	\$7.13
Number of Observations	77	68	7

Integrated Only Overall Summary Statistics

	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/EA)
Max Rate	\$3,798.56	\$32,000.00	\$20.00
Min Rate	-	-	-
Median Rate	\$1,699.68	\$100.00	\$5.00
Mode Rate	\$2,000.00	\$100.00	-

Integrated Only (All Observations) Average Rates

	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/EA)
Average Rate	\$1,631.31	\$1,248.51	\$5.96
Number of Observations	58	48	23

Integrated Only (Non-Zero Observations) Average Rates

	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/EA)
Average Rate	\$1,689.57	\$1,426.87	\$8.07
Number of Observations	56	42	17

The decision was made to correct for the wide variation in Trim prices by removing outlier values of individual rates over \$1,000. This correction resulted in the removal of seven data points (out of 91) within the Trim category only. This threshold was chosen in part to avoid truncating additional respondents who reported rates that valued the Trim between \$750 and \$1,000 in response to feedback from the emergency rulemaking hearings that indicated some Trim could and would be sold at a premium price depending on the quality, the manufacturing and extraction process, and the intended end product for consumption. After removing the seven outlying values for Trim from the data, the Average Market Rates as shown in the second set of tables below were produced.

It is ORA’s recommendation that the Department should levy the excise tax using the combined Average Market Rates where observations equal to a rate of \$0 for any category and the seven identified outliers for Trim rates have been removed. This would equate to an Average Market Rate of \$1,876 per pound for Flower, \$296 per pound for Trim, and \$9 per each for Immature Plants. These rates should be used for the following reasons: First, they combine survey results that provide data on arms-length transactions as well as integrated sales in order to respond sensitively to the statutory requirement to base the Average Market Rate on the price of all unprocessed marijuana sold or transferred in the State. Next, they are a middle ground between using arms-length only or integrated only transfers. Also, the rates reflect fairly consistent results among arms-length only, integrated only, and the combination of the two. In addition, they are reasonably consistent with industry “guesstimates” discussed in emergency rulemaking testimony and with the estimates that were generated by Legislative Council fiscal note staff using a different methodology. Finally, these rates have been calculated excluding only a very few survey responses that were identified as outliers.

Combined (All) Summary Statistics

	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/EA)
Max Rate	\$3,798.56	\$1,000.00	\$22.32
Min Rate	-	-	-
Median Rate	\$2,000.00	\$150.00	\$4.96
Mode Rate	\$2,000.00	-	-

Combined (All Observations) Average Rates

	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/EA)
Average Rate	\$1,821.06	\$241.76	\$6.25
Number of Observations	102	103	26

Combined (Non-Zero Observations) Average Rates

	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/EA)
Average Rate	\$1,876.24	\$296.44	\$8.55
Number of Observations	99	84	19

Arm's-Length Only Overall Summary Statistics

	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/EA)
Max Rate	\$2,601.33	\$1,000.00	\$22.32
Min Rate	-	-	-
Median Rate	\$2,000.00	\$191.73	\$4.32
Mode Rate	\$2,000.00	-	\$5.00

Arm's-Length Only (All Observations) Average Rates

	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/EA)
Average Rate	\$1,985.07	\$239.13	\$6.24
Number of Observations	79	78	8

Arm's-Length Only (Non-Zero Observations) Average Rates

	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/EA)
Average Rate	\$2,036.63	\$296.07	\$7.13
Number of Observations	77	63	7

Integrated Only Overall Summary Statistics

	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/EA)
Max Rate	\$ 3,798.56	\$ 1,000.00	\$ 20.00
Min Rate	\$ -	\$ -	\$ -
Median Rate	\$ 1,699.68	\$ 100.00	\$ 5.00
Mode Rate	\$ 2,000.00	\$ 100.00	\$ -

Integrated Only (All Observations) Average Rates

	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/EA)
Average Rate	\$ 1,631.31	\$ 262.35	\$ 5.96
Number of Observations	58	44	23

Integrated Only (Non-Zero Observations) Average Rates

	Flower Rate (\$/lb)	Trim Rate (\$/lb)	Immature Plant Rate (\$/EA)
Average Rate	\$ 1,689.57	\$ 303.78	\$ 8.07
Number of Observations	56	38	17