# Land Value Grid Explanation

### Outline of purpose

Verified sales data for a particular property class and from a given neighborhood is entered into the spreadsheet. Calculations are automatically run against the entered data using approved sales analysis techniques to project a regression trend. From said trend, costs per unit are concluded to complete the land value study.

Users will have the ability to quickly pair sales to calculate time adjustments as well as the ability to quickly visualize and exclude sales from the regression trend calculation.

### Breakdown of primary worksheets

The Global Settings tab stores user entered information as well as calculated information that drives other parts of the workbook
 The Data Entry tab provides a layout for users to enter relevant verified sales data for a given neighborhood.

The Time Adjustment tab serves as an interface to pair sales and calculate a percent per month time adjustment to apply to sales outside of the study period. This is not needed if only sales within the time period are used.

Calculations are applied against entered data to derive tabulated statistical observations on the Analysis tab. The tab is further utilized to visualize the effect
each statistical observation has on the representation trend as observations are added or removed

Once the line of best fit is finalized, the Conclusions tab is utilized to determine the indicated cost per unit of any sized parcel as it would fall on said line. Thus
price intervals are determined and entered into CAMA software for interpolation.

## Step by step process (simplified)

1. Save a new workbook for each neighborhood (land table) for each class.
 2. Enter verified sales data into established fields.
 3. Pair sales to calculate monthly time adjustment if sales outside the time period are used.
 4. Remove sales as warranted.
 5. Review conclusions.

## Step by step process (broken-down)

1. Enter Global Settings a. The dates of the study period should be entered.

i. Note this area will also store information on time adjustments once calculated. Users can manually override the calculated time adjustment if they so choose.

b. Take note of the Land to Building raito loterance.
i. Once sales data has been entered, this section will determine a Land Allocation Multiplier. By default, the tolerance will automatically use statistics to establish parameters. In particular: Abstracted sales with an indicated LB Raito that is plus or minus one standard deviation from the mean indicated LB Raito. Note the tolerance and concluded Land Allocation Multiplier. The user's discretion.

Populate Data Entry tab with verified sales data.
 Mandatory fields include:

Valuation Method, Parcel Number, Sale Date, Sale Price, Total Acre, and Improvements Value. b. For each row, be certain to select a Valuation Method. i. Note that Improved sales should be entered twice:

#### Once using Abstraction and once using Allocation.

c. Multi-Parcel Sales should only be entered once under one primary parcel number. Be certain to include the net sale price, net acres of all parcels included in the sale, and net building values (all improvement TCVs) of all parcels included in the sale.

d. Improvement values should be as of the date of sale.
e. The sheet is designed for entry of Total Acres and Rights of Way to be separately listed for later exclusion from the total. If acreages are entered that are not inclusive of rinks for way, there nere "0" in the rink of way column.

3. Use the Time Adjustment tab to perform paired sales analysis and calculate a monthly time adjustment.

a. An observation or row will populate in the bottom section of the Time Adjustment tab for each row entered on the Data Entry tab.
b. Sales can be added in the Data Entry tab to be used in the Time Adjustment pairing interface, even if said sales won't ultimately be used in the final land value conclusions.

c. Use the first column of the bottom section of the Time Adjustment tab to designate "pair groups

- i. For instance, enter "1" to assign a sale to be pared.
- ii. Enter "1" on another sale to pair it with the first sale.
- iii. Do not enter a third "1" on another sale. Each pair group should only have two sales.
- iv. There are 6 total groups available on the Time Adjustment interface.

## 4. Review the Analysis tab.

a. An observation or row will populate for each row entered on the "Data Entry" tab.
 b. Observations can be removed or included in the analysis by entering a 0 (removed) or 1 (included) in the "Use" column.

By default, newly entered data is automatically included unless specifically excluded in the "Use" column.

By details, newly where a data is detained by monocorrate column explaining the rationale used to eliminate an observation.
 An exclusion comment should be entered in the appropriate column explaining the rationale used to eliminate an observation.

c. You may encounter an error stating "Some trendlines cannot be calculated from data containing negative or zero values."

i. Seek out observations with a zero or negative value in the "Adjusted Price Per Sq Ft" column and set their use to 0 in the "Use" column to correct the error.

ii. Observations with a negative land residual (abstracted sales where the appraised building value exceeds the sale price) will cause this to happen.

iii. It may be worth reviewing these occurrences to determine the cause and if it was in error.

d. Data on the Analysis tab can be filtered and sorted for review using the pre-established arrows next to each column header.

 Sorting the "Residual Acre" or "Residual Sq Ft" column from smallest to largest can be very helpful for analysis. With such an array, the "Adjusted Price Per Sq. Ft column can be reviewed for a-typical observations. The principle of economies of scale tells us that we should expect the price per unit to decrease as the size of the parcel increases.

e. The chart is useful for spotting outliers and visualizing the effect on the overall trend as observations are removed or added in the "Use" column.

 It may be helpful to adjust the maximum values for the Y and/or X axis to a smaller number to zoom in to where the data is most dense.
 Especially large parcels or externey high prices per unit can result in undesizely where or tall charts.

ii. Note that while "not used" observations will not contribute to the calculation of the regression trend, the data points are still visible on the chart.

## 5. Review the Conclusions tab

a. After establishing which observations will be used for land value determinations, the conclusions tab indicates the concluded value of a given area of land, based on its size, according to the regression trend of the sales data.

i. The square foot table indicates concluded values for the intervals pre-canned in the square foot table of Assessing.net for interpolation.

ii. The acreage table indicates concluded values for the intervals pre-canned in the square foot table of Assessing net for interpolation.
 b. Note: Other statistics on the Conclusions tab can be useful in conducting the analysis as well. Different acreage ranges may be entered to analyze statistics of sales within usubm caduations.

6. A new workbook can be saved for each neighborhood, each year.

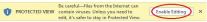
a. This is useful to display conclusions.b. This is useful to justify conclusions.

c. This is useful to monument improvement values as of the date of sale outside of your database

The workbook is designed to analyze sales within an already established neighborhood or land table boundary and assumes the established neighborhood is homogeneous. The workbook is not designed to help establish neighborhoods.

8. Conclusions will require common sense, analysis, and appropriate judgement. This workbook is a tool and cannot conclude anything on its own. It falls to the user to appropriately consider and examine the data to eventually arrive at a reasonable conclusion Developer/s of this workbook are not responsible for resulting conclusions, errors, or omissions. Users of this workbook voluntarily assume all liabilities.

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## **User Defined Section**

Dates for sales period	Dates for sales period									
Enter the dates for the sales period:										
Out Year Start:	4/1/2021									
Out Year End:	3/31/2022									
In Year Start:	4/1/2022									
In Year End:	3/31/2023									

Land to Building Ratio

Enter the LB Ratio tolerance (optional): Set Min LB Ratio Abstracted Sales: Set Max LB Ratio Abstracted Sales:

₽

#DIV/0! #DIV/0!

		Dates for sales period
Title	Value	Explanation
Midpoint Study Period:	4/1/2022	Sales outside of the study period will be adjusted to the midpoint of the Study Period
Time Adjustment Per Month:	4.6927%	The rate of adjustment is a <b>percent per month</b> which is calculated on the "Time Adj" sheet

Land to Building Ratio												
The LB Ratio of Abstracted Sales is us	The LB Ratio of Abstracted Sales is used to calculate a "global" or weighted mean LB ratio (the Land Allocation Multiplier).											
The Land Allocation Multiplier is applied to verified improved sales to conclude a price per unit using the Allocation method.												
Some Abstracted Sales will have an unusually low or high LB ratio indication and will disproportionally weight the Land Allocation Multiplier calculation.												
To the left, set the min & max LB rat	To the left, set the min & max LB ratio tolerance to prevent outliers from contributing to the calculation.											
(By default, unless overridden, this a	utomatically excludes Abstracted sale	es with an LB ratio indication plus or minus one standard deviation from the mean.)										
Title	Value	Explanation										
Weighted Land Residual:	\$0	The sum of the indicated Land Residuals of Abstracted Sales within specified tolerance										
Weighted Sale Price:	\$0	The sum of the Sale Prices of Abstraced Sales within specifed tolerance										
Land Allocation Multiplier: #DIV/0! This is the concluded LB ratio applied to sales using the Allocation method.												

Meaning: Improved sales should be twice entered!

					Verified Sales
County & Un	it Name		Туре	Desc	Explanation
l local unit name if applicable:			Vacant	Vacant Sales	Verified vacant sales should be entered on the DataEntry tab
l county name:			Abstraction	Improved w/ Land Residual	Improved sales should be entered and assigned the Abstraction valuation method
		•	Allocation	Improved w/ Land Allocation	Improved sales should be entered and assigned the Allocation valuation method

Workbook Version: v1.3.2

## **Informational Section**

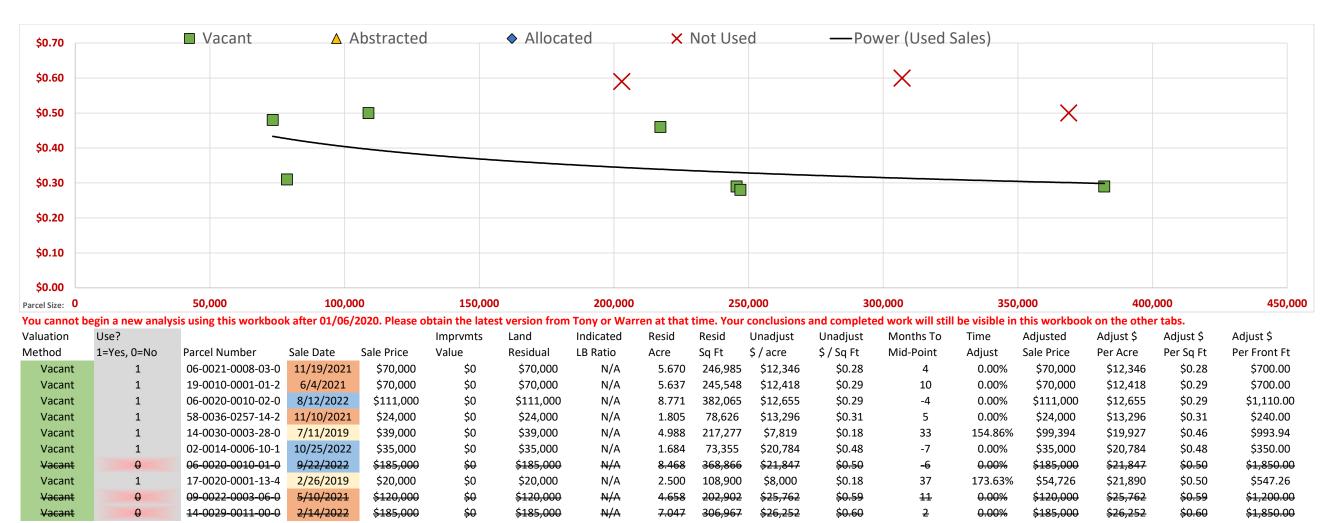
Valuation	Parcel		Sale	Sale		Liber/	Total	Total	Total	ROW	Imprvmts	Other Parcels		Use?
Method	Number	Address	Date	Price	Conf.	Page	Acre	Sq Ft	Front Ft	(Sq Ft)	Value	in Sale	Comments	1=Yes, 0=No
Vacant	02-0014-0006-10-1		10/25/2022	\$35,000		3392/0795	1.924	83,809	100	10454.4	\$0			1
Vacant	58-0036-0257-14-2		11/10/2021	\$24,000		3353/0742	1.805	78,626	100	0	\$0			1
Vacant	09-0022-0003-06-0		5/10/2021	\$120,000		3332/3308	5.008	218,148	100	15246	\$0			0
Vacant	19-0010-0001-01-2		6/4/2021	\$70,000		3330/2081	5.937	258,616	100	13068	\$0			1
Vacant	06-0021-0008-03-0		11/19/2021	\$70,000		3354/0679	6	261,360	100	14374.8	\$0			1
Vacant	14-0029-0011-00-0		2/14/2022	\$185,000		3365/1574	7.047	306,967	100	0	\$0			0
Vacant	06-0020-0010-01-0		9/22/2022	\$185,000		3388/0655	8.788	382,805	100	13939.2	\$0			0
Vacant	06-0020-0010-02-0		8/12/2022	\$111,000		3383/2764	9.091	396,004	100	13939.2	\$0			1
Vacant	14-0030-0003-28-0		7/11/2019	\$39,000		3243/0412	4.988	217,277	100	0	\$0			1
Vacant	17-0020-0001-13-4		2/26/2019	\$20,000		3241/2182	2.5	108,900	100	0	\$0			1
								0	100	0				1
								0	100	0				1
								0	100	0				1
								0	100	0				1
								0	100	0				1
								0						1

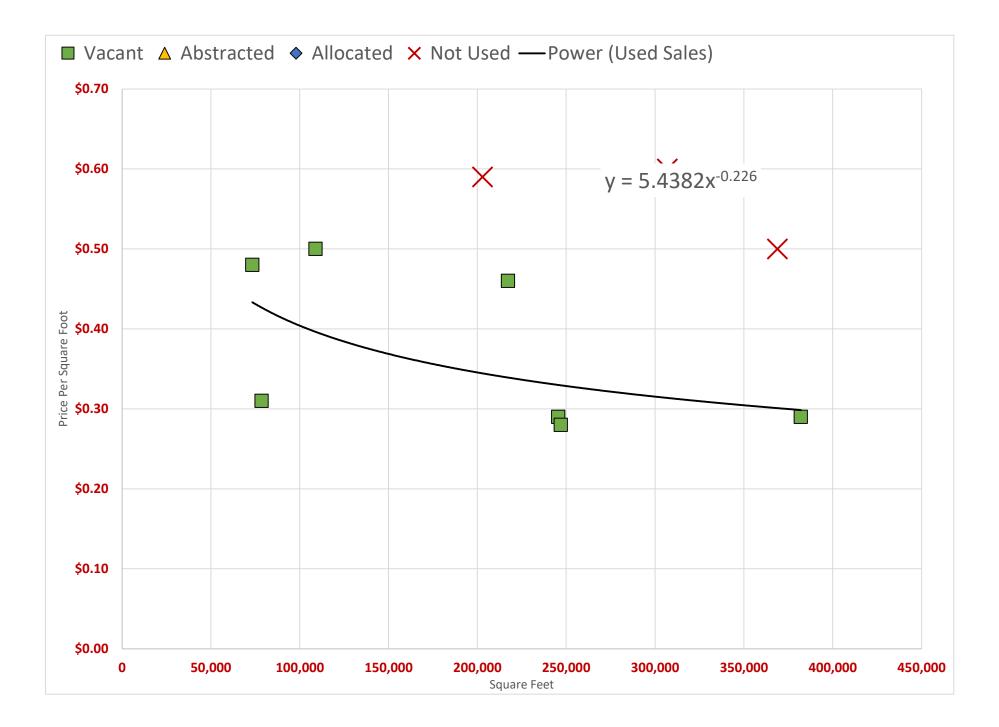
Pair	Valuation	Parcel		Sale	Sale	Residual	Front	Imprvmts	Land	Indicated	Unadjusted	Unadjusted	# of	# of	%	% per	% per
Group	Method	Number	Address	Date	Price	Acre	Ft	Value	Residual	LB Ratio	\$ / acre	\$ / Sq Ft	Days	Months	Change	Month	Year
1	Vacant	02-0014-0006-10-1	0	10/25/2022	\$35,000	1.684	100.00	\$0	\$35,000	N/A	\$20,784	\$0.48	345	12	56.31%	4.69%	56.31%
1	Vacant	58-0036-0257-14-2	0	11/10/2021	\$24,000	1.805	100.00	\$0	\$24,000	N/A	\$13,296	\$0.31	545	12	50.5170	4.0978	50.5178
2																	
_																	
3																	
4																	
5																	
6																	
												-					1

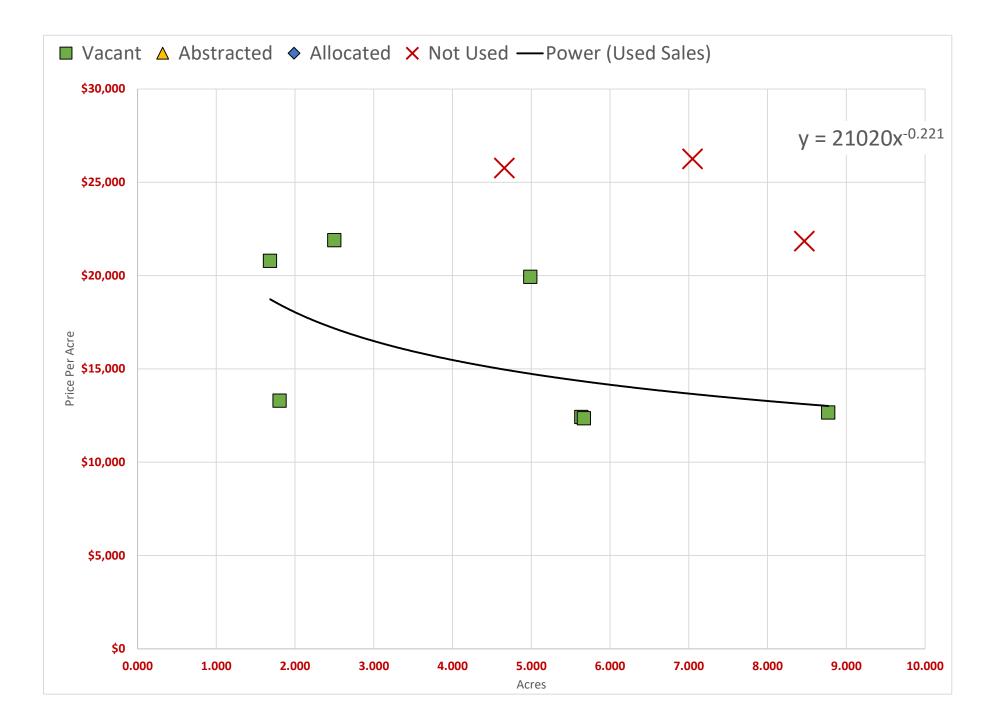
#### Designate sale pairings here. Assign the same group number to two sales you wish to pair. ➡

4.69% Indicated % time adjustment per month:

₽	Designate sa	ale pairings here. Assign the same group nu	mber to two	sales you wisł	n to pair.				*If all sales are within the study time period, a time adjustment does not need to be calculated.					
Pair	Valuation	Parcel	Sale	Sale	Residual	Front	Imprvmts	Land	Indicated	Unadjusted	Unadjusted			
Group	Method	Number Address	Date	Price	Acre	Ft	Value	Residual	LB Ratio	\$ / acre	\$ / Sq Ft			
1	Vacant	02-0014-0006-10-1 0	10/25/2022	\$35,000	1.684	100.00	\$0	\$35,000	N/A	\$20,784	\$0.48			
1	Vacant	58-0036-0257-14-2 0	11/10/2021	\$24,000	1.805	100.00	\$0	\$24,000	N/A	\$13,296	\$0.31			
	Vacant	09-0022-0003-06-0 0	5/10/2021	\$120,000	4.658	100.00	\$0	\$120,000	N/A	\$25,762	\$0.59			
	Vacant	19-0010-0001-01-2 0	6/4/2021	\$70,000	5.637	100.00	\$0	\$70,000	N/A	\$12,418	\$0.29			
	Vacant	06-0021-0008-03-0 0	11/19/2021	\$70,000	5.670	100.00	\$0	\$70,000	N/A	\$12,346	\$0.28			
	Vacant	14-0029-0011-00-0 0	2/14/2022	\$185,000	7.047	100.00	\$0	\$185,000	N/A	\$26,252	\$0.60			
	Vacant	06-0020-0010-01-0 0	9/22/2022	\$185,000	8.468	100.00	\$0	\$185,000	N/A	\$21,847	\$0.50			
	Vacant	06-0020-0010-02-0 0	8/12/2022	\$111,000	8.771	100.00	\$0	\$111,000	N/A	\$12,655	\$0.29			
	Vacant	14-0030-0003-28-0 0	7/11/2019	\$39,000	4.988	100.00	\$0	\$39,000	N/A	\$7,819	\$0.18			
	Vacant	17-0020-0001-13-4 0	2/26/2019	\$20,000	2.500	100.00	\$0	\$20,000	N/A	\$8,000	\$0.18			







		If you're using the Square Footage Table in Assessing.net												
Curve Fe	ormula	SqFt	Acres	\$/sf	\$/ac	Concluded \$								
From	Chart	2,500	0.057	#NAME?	#NAME?	#NAME?								
Formula Pt 1:	#NAME?	5,000	0.115	#NAME?	#NAME?	#NAME?								
Formula Pt 2:	#NAME?	7,500	0.172	#NAME?	#NAME?	#NAME?								
		10,000	0.230	#NAME?	#NAME?	#NAME?								
If the above for	mulas	12,500	#NAME?	#NAME?										
are not calculat	ting, make	15,000	0.344	#NAME?	#NAME?	#NAME?								
sure that any sa	ales with	20,000	0.459	#NAME?	#NAME?	#NAME?								
a 0 or less \$ pe	r unit	25,000	0.574	#NAME?	#NAME?	#NAME?								
are set to "not	used". If	30,000	0.689	#NAME?	#NAME?	#NAME?								
they are still no	ot	40,000	0.918	#NAME?	#NAME?	#NAME?								
calculating, ref	resh them	50,000	1.148	#NAME?	#NAME?	#NAME?								
by double click	ing them	60,000	1.377	#NAME?	#NAME?	#NAME?								
and pressing "e	enter".	87,120	2.000	#NAME?	#NAME?	#NAME?								
		130,680	3.000	#NAME?	#NAME?	#NAME?								
		174,240	4.000	#NAME?	#NAME?	#NAME?								
		217,800	5.000	#NAME?	#NAME?	#NAME?								
		435,600	10.000	#NAME?	#NAME?	#NAME?								
		653,400	15.000	#NAME?	#NAME?	#NAME?								
		871,200	20.000	#NAME?	#NAME?	#NAME?								
		1,089,000	25.000	#NAME?	#NAME?	#NAME?								

lf y	ou're using the	Acreage Table	in Assessing	.net
SqFt	Acres	\$/sf	\$/ac	Concluded \$
43,560	1.0	#NAME?	#NAME?	#NAME?
65,340	1.5	#NAME?	#NAME?	#NAME?
87,120	2.0	#NAME?	#NAME?	#NAME?
108,900	2.5	#NAME?	#NAME?	#NAME?
130,680	3.0	#NAME?	#NAME?	#NAME?
174,240	4.0	#NAME?	#NAME?	#NAME?
217,800	5.0	#NAME?	#NAME?	#NAME?
304,920	7.0	#NAME?	#NAME?	#NAME?
435,600	10.0	#NAME?	#NAME?	#NAME?
653,400	15.0	#NAME?	#NAME?	#NAME?
871,200	20.0	#NAME?	#NAME?	#NAME?
1,089,000	25.0	#NAME?	#NAME?	#NAME?
1,306,800	30.0	#NAME?	#NAME?	#NAME?
1,742,400	40.0	#NAME?	#NAME?	#NAME?
2,178,000	50.0	#NAME?	#NAME?	#NAME?
4,356,000	100.0	#NAME?	#NAME?	#NAME?

This slope should not be downward facing. A person wouldn't pay less for 5,000 sf than they would for 2,500 sf.

		The Grey fi	elds below	/ can be edite	d to adjust acre	eage ranges. En	ter acreag	ges to two deo										
Acre R	langes			Vacant			Abs	traction			Α	llocation		All Methods				
Low	High	# of Sales	COD	Mean \$/SF	Median \$/SF	# of Sales	COD	Mean \$/SF	Median \$/SF	# of Sales	COD	Mean \$/SF	Median \$/SF	# of Sales	COD	Mean \$/SF	Median \$/SF	
0.00	0.99	0	0.00%	\$0.00	\$0.00	0	0.00%	\$0.00	\$0.00	0	0.00%	\$0.00	\$0.00	0	0.00%	\$0.00	\$0.00	
1.00	1.99	2	21.52%	\$0.40	\$0.40	0	0.00%	\$0.00	\$0.00	0	0.00%	\$0.00	\$0.00	2	21.52%	\$0.40	\$0.40	
2.00	4.99	2	4.17%	\$0.48	\$0.48	0	0.00%	\$0.00	\$0.00	0	0.00%	\$0.00	\$0.00	2	4.17%	\$0.48	\$0.48	
5.00	9.99	3	1.15%	\$0.29	\$0.29	0	0.00%	\$0.00	\$0.00	0	0.00%	\$0.00	\$0.00	3	1.15%	\$0.29	\$0.29	
10.00	10000.00	0	0.00%	\$0.00	\$0.00	0	0.00%	\$0.00	\$0.00	0	0.00%	\$0.00	\$0.00	0	0.00%	\$0.00	\$0.00	
0.00	10000.00	7	26.73%	\$0.37	\$0.31	0	0.00%	\$0.00	\$0.00	0	0.00%	\$0.00	\$0.00	7	26.73%	\$0.37	\$0.31	

											lana and Males	Land		Resid	Resid	Unadjust	Unadjust	Months To	Time	Adjusted	Adjust \$	Adjust \$	Adjust \$	Other Brussle in Colo	<b>.</b> .
Valuation Method	Parcel Number	Address	Sale Date	Sale Price	Conf. L	Liber/ Page	Total Acre	Total Sq Ft	Total Front Ft	ROW (Sq Ft)	Imprvmts Value	Residual	LB Ratio	Acre	Sq Ft	\$ / acre	\$ / Sq Ft	Mid-Point	Adjust	Sale Price	Per Acre	Per Sq Ft	Per Front Ft	Other Parcels in Sale	Comments
Vacant	17-0020-0001-13-4		2/26/2019	\$20,000	3	3241/2182	2.500	108,900	100	0		0 \$20,000	N/A	2.500	108,900	\$8,000	\$0.18	37	173.63%	\$54,726	\$21,890	\$0.50	\$547.26		
Vacant	14-0030-0003-28-0		7/11/2019	\$39,000	3	3243/0412	4.988	217,277	100	0		0 \$39,000	N/A	4.988	217,277	\$7,819	\$0.18	33	154.86%	\$99,394	\$19,927	\$0.46	\$993.94		
Vacant	19-0010-0001-01-2		6/4/2021	\$70,000	3	3330/2081	5.937	258,616	100	13,068		0 \$70,000	N/A	5.637	245,548	\$12,418	\$0.29	10	0.00%	\$70,000	\$12,418	\$0.29	\$700.00		
Vacant	58-0036-0257-14-2		11/10/2021	\$24,000	3	3353/0742	1.805	78,626	100	0		0 \$24,000	N/A	1.805	78,626	\$13,296	\$0.31	5	0.00%	\$24,000	\$13,296	\$0.31	\$240.00		
Vacant	06-0021-0008-03-0		11/19/2021	\$70,000	3	3354/0679	6.000	261,360	100	14,375		0 \$70,000	N/A	5.670	246,985	\$12,346	\$0.28	4	0.00%	\$70,000	\$12,346	\$0.28	\$700.00		
Vacant	06-0020-0010-02-0		8/12/2022	\$111,000	3	3383/2764	9.091	396,004	100	13,939		0 \$111,000	N/A	8.771	382,065	\$12,655	\$0.29	-4	0.00%	\$111,000	\$12,655	\$0.29	\$1,110.00		
Vacant	02-0014-0006-10-1		10/25/2022	\$35,000	3	3392/0795	1.924	83,809	100	10,454		0 \$35,000	N/A	1.684	73,355	\$20,784	\$0.48	-7	0.00%	\$35,000	\$20,784	\$0.48	\$350.00		

	Exclusion												Land	Indicated	Resid	Resid	Unadjust	Unadjust	Months To	Time	Adjusted	Adjust \$	Adjust \$	Adjust \$		
Valuation Method	Comment	Parcel Number	Address	Sale Date	Sale Price	Conf.	Liber/ Page	Total Acre	Total Sq Ft	Total Front Ft	ROW (Sq Ft)	Imprvmts Value	Residual	LB Ratio	Acre	Sq Ft	\$ / acre	\$ / Sq Ft	Mid-Point	Adjust	Sale Price	Per Acre	Per Sq Ft	Per Front Ft	Other Parcels in Sale	Comments
Vacant		09-0022-0003-06-0		5/10/2021	\$120,000		3332/3308	5.008	218,148	100	15,246		0 \$120,000	N/A	4.658	202,902	\$25,762	\$0.59	11	0.00%	\$120,000	\$25,762	\$0.59	\$1,200.00		
Vacant		14-0029-0011-00-0		2/14/2022	\$185,000		3365/1574	7.047	306,967	100	0		0 \$185,000	N/A	7.047	306,967	\$26,252	\$0.60	2	0.00%	\$185,000	\$26,252	\$0.60	\$1,850.00		
Vacant		06-0020-0010-01-0		9/22/2022	\$185,000		3388/0655	8.788	382,805	100	13,939		0 \$185,000	N/A	8.468	368,866	\$21,847	\$0.50	-6	0.00%	\$185,000	\$21,847	\$0.50	\$1,850.00		