

Appendix 1.

OCCUPATION CHANGE DATA COLLECTION AND ANALYSIS GUIDE

As one of the three principal elements of the Ford Foundation research project, the research team developed and employed a methodology to examine occupation changes in 22 colonias and informal low-income subdivisions (IfHSs) over the past decade. The majority of these neighborhoods (20/22) formed part of an earlier lot density study, *Residential Land Market Dynamics, Absentee Lot Owners and Densification Policies for Texas Colonias*, written by Ward et al (2000). The following guide details the methods used for data collection and analysis in the hopes that future researchers will be able to conduct similar studies in other areas and is intended to serve as a compliment to Methodology chapter in the complete report (*Documenting a Decade of Lot Occupation Change in 22 Texas Colonias and Subdivisions*).

The data collection methodology is divided into three phases: lot coding, hard counts, and ownership searches. The analysis methodology is divided into information on the master database (included as a part of the report package) and guides for employing a few useful analysis tools found in Excel.

In addition the following guide, this report package includes two Excel Workbooks: the study workbook and a master workbook. The **Lot Occupation Study Workbook** contains the database (first sheet) and the separate calculations that inform the findings and analysis in our study. The **Master Template Workbook** contains a database template that is intended to serve as a frame into which future researchers may enter their own data and conduct their own analysis.

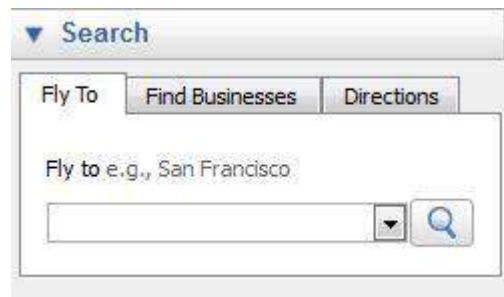
DATA COLLECTION GUIDE

PHASE ONE: LOT CODING

1. Locate the colonia/IFHS in Google Earth, searching by the colonia/IfHSs name, a close street name or intersection, or beginning from a known landmark or place, such as a nearby city.

*****NOTE – Colonia/IFH Placemarks:** We recommend that researchers create a placemark for each colonia/IfHS once they have located it in order to avoid the need to search for the location each time they return to Google Earth.

Google Earth Search Box





2. Use the Historical Imagery tool (*shown below*) to review available satellite images of the colonia/IfHS. Identify three images from three different years for the community(ies) that you wish to analyze. Try to ensure that the image dates for each colonia/IfHS are the same. For example, in our study, 2002, 2006, and 2010 were the preferred image dates, but when the specific dates were unavailable researchers selected the closest alternative. (*Image dates for each community can be recorded in the General Information section of the master database (discussed below)*).

Google Earth Historical Imagery Tool



3. Use the placemarks available in Google Earth to code the lot occupancy statuses in each image according the satellite image coding guide below. Each placemark in the coding guide below is based on a specific lot occupancy combination. “V” stands for vacant. “O” stands for occupied. So, for example, if a lot is vacant in 2002, occupied in 2006, and vacant again in 2010 the lot occupancy combination would be V-O-V and the lot would be marked with the yellow with a black circle placemark.

Satellite Image Coding Guide

Image 1 (2002)	Image 2 (2006)	Image 3 (2010)	Placemarks	
v	v	v	Red with black square	
o	o	o	n/a	
v	v	o	Dark blue with image 2 year (2006) in white letters	
v	o	o	Dark blue with image 3 year (2010) in white letters	
v	o	v	Yellow with a black circle	
o	v	o	Teal	
o	v	v	Green	
o	o	v	Magenta	
o	v	?	Grey Triangle	
v	o	?	Grey Star	

(The grey triangle and the grey star are temporary placemarks. See **Coding Methods** below for more information.)

In phase one, researchers also code alternative-use lots using the red triangle with a black exclamation point placemark (pictured below). However, alternative-use lots should only be coded in the most recent image (see **Coding Methods** below and Tracking Changes Over Time in the report's Methodology chapter). Future research might benefit from creating several placemarks (similar to the system used in the guide above) to track changes in alternative-use lots.



(Red triangle with exclamation point): **Indicates alternative land use.** For example, the lot is used to park cars or for some other clear industrial or commercial use.

Particularly during Phase One, researchers could benefit from using a placemark to identify questions or concerns. For example, marking and reviewing lots when the occupancy status is questionable, i.e. the researcher is unsure of whether to mark the lot as vacant or occupied could help researchers build more nuanced and contextually informed definitions for “occupied” versus “vacant” lots. (See the Identifying Structures and Deciding on Definitions section of the Methodology chapter for more information on building definitions.) We suggest that researchers store specific information about the question/concern in the placemarks note section *pictured below in new placemark window*) and keep a close record of their ultimate decision regarding the lot in question.



(Volcano): **Indicates unknown occupancy or a question/concern.**

Adding a Placemark

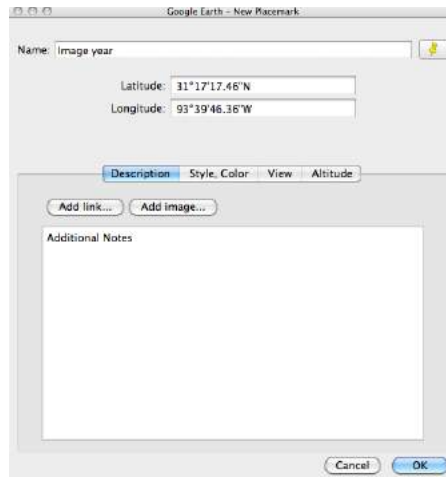
To add a placemark to the satellite image click the Google Earth placemark tool (below) and select from the options.

Google Earth Placemarks Tool



A new placemark window will open into which you can enter additional information, such as the image date. For example, we entered the differing image dates for the dark blue placemark (see *the coding guide*) in the name window at the top so that it would be displayed on the satellite image with the pushpin. The new placemark window also provides a number of options to change/adjust the placemarks. **To edit existing placemarks right click the placemark and select Properties.**

New Placemark Window



Drawing Property Lines

Using Google Earth's polygon tool (*below*) to draw property lines on the satellite image may facilitate the process of identifying vacant and occupied lots (see *Tracking Changes Over Time* section in the *Methodology* chapter). More information on the polygon tool is also available in the Google Earth tutorials provided over the internet, free of charge. If available from the county's tax appraisal office you might also pull plat maps to verify the property lines. When plat maps are not available it is usually OK to **assume relatively uniform lot sizes.**

Google Earth Polygon Tool



Coding Methods

Our research team members used two different methods to code the satellite images. Both methods should yield the same results. However, some researchers may prefer one method over the other, depending on their personal working style. Method A is based on completely analyzing the satellite images of the colonia/lfHSs one-by-one. Method B is based on following the changes in individual lots of the colonia/lfHS over the three images.

Method A:

- Visually scan the **1st image** (2002) and mark all vacant lots with red with a black square placemark
- Move to the **2nd image** (2006) and review the previously marked lots. If the previously vacant lot is now occupied, replace the previous placemark (red with a black square) with the temporary vacant-occupied (VO) marker (the grey star placemark)
- Scan the 2nd image and mark any new vacant lots with the temporary occupied-vacant (OV) marker (the grey triangle placemark)
- In the **3rd image** (2010), review previously marked lots for changes (e.g. VOO, VOV, OVO, and OVV) altering the placemarks as needed (see *coding guide above*)
- Scan the 3rd image and mark any new vacant lots with the magenta placemark (OOV)
- Scan the 3rd image again, this time marking any alternative uses with the red triangle with an exclamation point placemark

Method B:

- Visually scan the 1st image (2002) and mark all vacant lots with red with a black square placemark
- On a lot-by-lot basis:
 - Check the previously marked lots for changes in the 2nd (2006) and 3rd (2010) images (*Use the historical imagery tool to flip through the images*).
 - In the 3rd image (2010) replace the initial red with a black square placemark with the appropriate placemarks based on the occupancy changes observed in the 2nd and 3rd image (VOO, VOV, OVO, and OVV)

- Return to the 2nd image (2006) and mark any new vacant lots with the temporary occupied-vacant (OV) marker (the grey triangle)
 - Go to the 3rd image (2010) and adjust the newly marked vacant lots (grey triangle) from the 2nd image to according to any changes in occupancy (OVO - teal, OVV - green)
 - Scan the 3rd image for any new vacant lots and mark them with the magenta placemark (OOV)
 - Scan the 3rd image again, this time marking alternative-uses with the red triangle with an exclamation point placemark
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A Note on Storing Placemarks

To the side of the virtual globe in Google Earth there is a window that displays any added placemarks, as well as a search box and layers options. Throughout the coding process it is important to save the placemarks. Google Earth is a rather large program and, depending on the computer's capacity, the program may close unexpectedly. New placemarks will appear automatically under the "Temporary Places" folder. Temporary places will not be saved once the program has closed. Thus, it is a good idea to store all placemarks in the **My Places** folder which saves the placemark data in the program. The entire My Places folder, sub-folders within "My Places", and even individual placemarks, can also be saved as .kmz files, enabling researchers to share information and to work on multiple machines. If a researcher plans to work on the same machine throughout the process, Google Earth will save the My Places data and the placemarks will appear each time the program is opened. Nonetheless, **we strongly suggest that researchers keep multiple backups of the .kmz files throughout the project.**

Organization within My Places is also important. If the researcher is working on multiple colonias, then clearly it will be important to have a different folder for storing placemarks for each colonia. New folders can be added to the My Places folder by right clicking the mouse and selected add, then folder. In addition, the researcher may want to create folders for each individual placemark, e.g. a folder for red, with a black square, placemarks, a folder for magenta placemarks, etc. Creating individual folders will greatly reduce the time needed for Phase Two (see below). Initially, as placemark colors will change throughout the coding process, it may be frustrating to keep the placemarks separated. The researcher may prefer to wait until the coding is completed and then create individual folders before dragging and dropping each individual placemark into

the appropriate folder. **In our experience organizing the placemarks in this way was well worth the time and effort.**

PHASE TWO: HARD COUNTS

1. Count the total number of lots in the community based on the property divisions taken from plat maps or assumed during the first phase.

*****NOTE - Property Lines:** Total lot counts can be broken down to ease calculation by storing counts of total lots per street in placemarks and then summing up the totals from the street placemarks.

*****NOTE – Alternative-Use Lots:** The lots that have been marked as alternative-use lots (red triangle with exclamation point placemark) should also be included in the total lot count (see **Phase Two: Hard Counts** section in the *Methodology* chapter for more information).

2. Tally the placemarks for each community

*****NOTE – See the **A Note on Storing Placemarks** above).**

3. Add the total lot and placemark counts to the Excel database sheet (*further discussed below*)

*****NOTE – Automatically Generated Figures:** Most of the master database is automatically populated based on placemark data. For example, vacant lot counts for each image are automatically generated based on the following placemark combinations.

- **Image 1 (2002):** red with black square (VVV), both dark blue placemarks (i.e. dark blue placemarks with white writing for image 2 (2006) (VVO) and image 3 (2010) (VOO)), and yellow placemarks (VOV).
- **Image 2 (2006):** red with black square (VVV), dark blue with image 2 date in white letters (2006) (VVO), teal (OVO), and green (OVV) placemarks.

- **Image 3 (2010):** red with black square (VVV), yellow (VOV), green (OVV), and magenta (OOV) placemarks.

PHASE THREE: COMBINED LOTS

This phase is only for those lots that are vacant in the most recent satellite image (2010):

- **red with a black square placemarks**
- **magenta placemarks**
- **green placemarks**
- **yellow with a black circle placemarks**

In phase three researchers obtain property ID's and ownership information for the appropriate vacant lots, as well as for any adjacent lots. Using the ownership information, researchers identify vacant lots that are owned by the developer and lots that are formally or informally combined.

The combined lots guide is divided into two sections – Obtaining Property IDs and Ownership Information and Marking Lot Combinations - to ensure clarity. However, we suggest that researchers conduct the property searches and mark the developer-owned lots and lot combinations as one process, e.g. on a lot-by-lot basis researchers should:

- 1.) Locate the precise lot in both Google Earth and the tax appraisal map
- 2.) Review the owner information for the vacant lot and all adjacent lots (in the tax appraisal map(s))
- 3.) If relevant, add a placemark to the vacant lot denoting it as a developer-owned lot or as a lot combination in Google Earth (*placemarks below*)

County Information:

Often both information about which county a colonia/IfHS is located in and the appropriate county tax appraisal website can be found through internet searchers. For example, researchers could search "Cameron Park, Texas" in order to identify county information and then search "Cameron County AND Tax Appraisal" in order to locate the tax appraisal website. However, the internet searches are only likely to work for very large and/or established colonias. Another, potentially more complicated, option would

be to review county level maps of the area and locate the exact location of the colonia or IfHS. *(The county names can be recorded in the General Information section of the master database, discussed below).*

Obtaining Property IDs and Ownership Information

1. Identify the precise location of a vacant lot in the most recent satellite image in Google Earth. For example, a precise location may be the seventh lot on the eastern end of the street, on the south side. Identifying the precise location of a given lots is vital as the researcher will need to locate the exact same lot on the tax appraisal map.
2. Identify the same vacant lot and its property ID number in the tax appraisal map for the county where the colonia/IfHS is located
 - a. Locate the property search in the tax appraisal website for the county where the community is located
 - b. Searching under property address, use a street name from the colonia/IFH to search for and view the tax appraisal map of the area. *(The street names should be automatically displayed in the Google Earth images. If necessary, street names can be added/removed by checking the appropriate box in the Layers window, located in the lower right-hand corner of Google Earth).* Open the map in a new window.

Property Address Search Example

The image shows a web form titled "Property Search Options". At the top, it says "Select a search type. Then enter the search criteria. Click 'Advanced' for more search options." Below this, there are several input fields: "Search type:" with a dropdown menu set to "Property Address"; "Street Number:" with a text box and a "Go" button; "Street Name:" with a text box containing "Aval" and a "Go" button; "Year to Display:" with a dropdown menu set to "2010". At the bottom right, there is a "Search" button and a link for "Advanced >>".

Property Address Search – View Map Option

Guadalupe CAD Property Search Map Search Map Administration Login

Property Search Results > 1 - 25 of 262 for Year 2010 New Search

Click the "Details" or "Map" link to view more information about the property or click the checkbox next to each property and click "View Selected on Map" to view the properties on a single map.

Property Address
 Legal Description

Property ID	Geographic ID	Type	Property Address	Owner Name	Appraised Value
<input type="checkbox"/> 129200	200018-0001-00900-0-02	Mobile Home	1111 ASHLEY RANCH RD TX	TERRY GREGORY K & SANDRA M	\$1,320
<input type="checkbox"/> 48438	200018-0001-00900-0-02	Real	1111 ASHLEY RANCH RD	TERRY GREGORY K & SANDRA HAASE	\$26,374
<input type="checkbox"/> 48440	163710-0001-07900-0-00	Real	1133 ASHBY ST TX	WITTIG CHESTER J & CLARA S	\$75,612
<input type="checkbox"/> 48393	163710-0001-00000-0-00	Real	1133 ASHBY ST	WOODS HIRE CONDOMINIUM HOMEOWNERS ASSN	\$1,608
<input type="checkbox"/> 48407	163710-0001-00200-0-00	Real	1133 ASHBY ST	JURUTOWICZ N JUC LOGUNOKER	\$95,913
<input type="checkbox"/> 48406	163710-0001-00200-0-00	Real	1133 ASHBY ST	DOUGHERTY DAVID WAYNE & DAVID P MARLYN	\$80,854
<input type="checkbox"/> 48404	163710-0001-00200-0-00	Real	1133 ASHBY ST #1	BENTON EDITH J	\$91,433
<input type="checkbox"/> 48401	163710-0001-00100-0-00	Real	1133 ASHBY ST #13 TX	LANGE WAYNE W & PARY E	\$78,888
<input type="checkbox"/> 48402	163710-0001-00100-0-00	Real	1133 ASHBY ST #11	BOGGS JOE D JR & JUDY A GIBSON	\$77,604
<input type="checkbox"/> 48398	163710-0001-00100-0-00	Real	1133 ASHBY ST 412 TX	JONES RUFUS BESS	\$71,547
<input type="checkbox"/> 48399	163710-0001-00100-0-00	Real	1133 ASHBY ST #13	FARNE JACQUE V	\$70,808
<input type="checkbox"/> 48400	163710-0001-00200-0-00	Real	1133 ASHBY ST #2 TX	COULDS LOREN K & CATHY E	\$91,571
<input type="checkbox"/> 48394	163710-0001-00100-0-00	Real	1133 ASHBY ST #5	SHANAFELT RALPH JACKSON SR	\$76,754
<input type="checkbox"/> 48385	163710-0001-00200-0-00	Real	1133 ASHBY ST #6	BOWDEN DANIEL	\$76,259
<input type="checkbox"/> 48396	163710-0001-00300-0-00	Real	1133 ASHBY ST #7	BUZEK JO T	\$75,661
<input type="checkbox"/> 48397	163710-0001-00400-0-00	Real	1133 ASHBY ST #8	SHANAFELT RALPH J	\$75,303
<input type="checkbox"/> 48400	163710-0001-00100-0-00	Real	1133 ASHBY ST, #14 TX	BAKER NILEV H	\$70,426
<input type="checkbox"/> 48014	163805-0001-00100-0-00	Personal	2215 ASHBY ST	NESSBIT NURSING HOME	\$125,340
<input type="checkbox"/> 48013	163805-0001-00100-0-00	Real	2215 ASHBY ST	NESSBIT DARYL	\$5,000,100
<input type="checkbox"/> 51210	200003-0001-00000-0-00	Real	1255 ASHBY ST	FLEMING R E & R H FLORE	\$231,046
<input type="checkbox"/> 51572	200003-0001-00000-0-00	Real	1255 ASHBY ST	SOLIMON HOWARD D MD	\$164,588
<input type="checkbox"/> 51514	200003-0001-00400-0-00	Real	1255 ASHBY ST	NAIMEL GEORGE S	\$275,126
<input type="checkbox"/> 51043	200003-0001-00100-0-00	Real	1255 ASHBY ST	WALKER GEORGE E	\$273,572
<input type="checkbox"/> 51215	200003-0001-11100-0-00	Real	1255 ASHBY ST	SOUTHERNCROSS AMBULANCE INC	\$137,862
<input type="checkbox"/> 130491	200003-0001-00000-0-00	Personal	1255 ASHBY ST #A TX	FLEMING EYE CARE	\$11,291

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- c. In the tax appraisal map, locate the same vacant lot previously identified in Google Earth. Note the lot's property ID number. (*Property ID information can be stored in the placemarks in Google Earth*).

Tax Appraisal Map Displaying Property IDs



- Return to the tax appraisal website's property search and, this time searching under account number; enter the property ID number displayed on the tax appraisal map to find ownership information for the vacant lot.

Property ID Search Example

- Note the ownership information for the given lot, i.e. the owner's name. (*Ownership information can be stored in the placemarks in Google Earth.*)

Owner Name Location in the Property ID Search

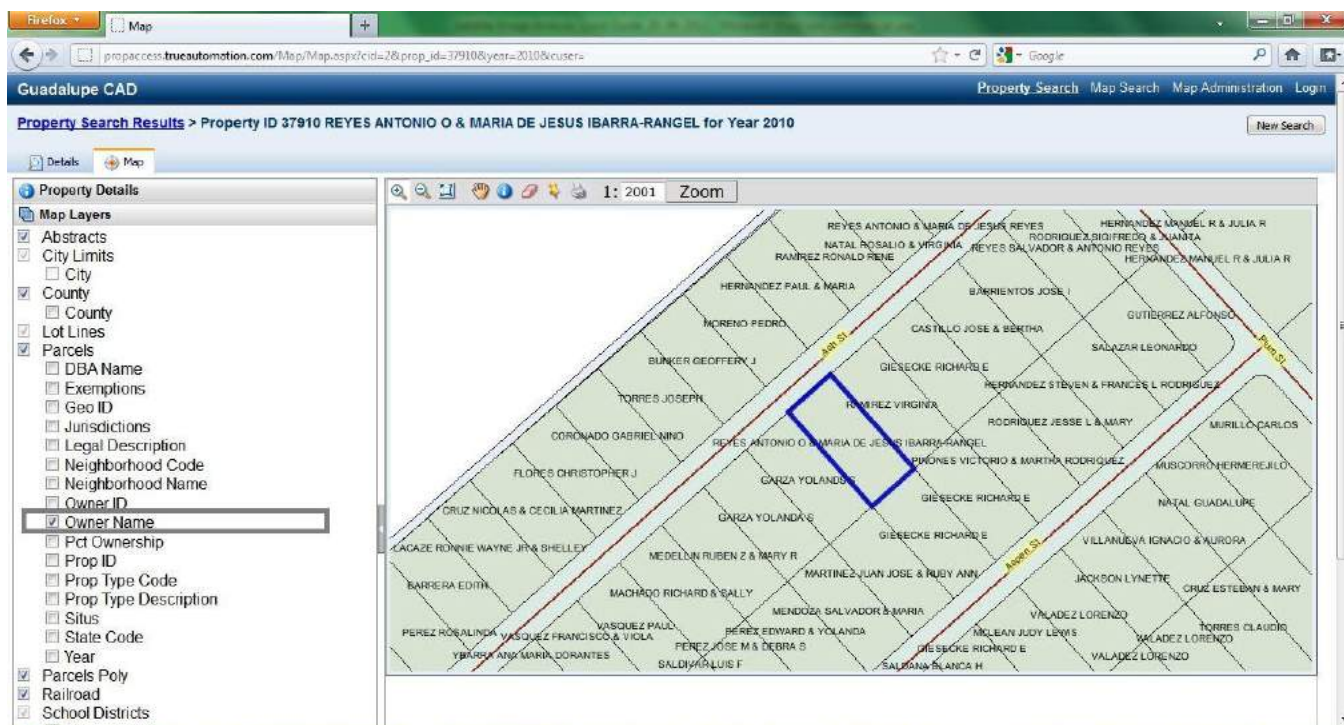
Property ID	Geographic ID	Type	Property Address	Owner Name	Appraised Value
229280	200018-0001-00910-0-00	Mobile Home	1111 ASHLEY RANCH RD TX	TERRY GREGORY K & SANDRA M	\$1,320
81248	200018-0001-00910-0-00	Real	1111 ASHLEY RANCH RD	TERRY GREGORY K & SANDRA M	\$26,374
48403	163710-0001-07910-0-00	Real	1133 ASHBY ST TX	WITTIG CHESTER A & CLARA S	\$75,612
48393	163710-0001-07910-0-00	Real	1133 ASHBY ST	WOODS LORE CONDOMINIUM HOMEOWNERS ASSN	\$5,638
48407	163710-0001-07910-0-00	Real	1133 ASHBY ST	BUNYOWICZ N SUE LOEFLANDER	\$45,913
48406	163710-0001-07910-0-00	Real	1133 ASHBY ST	DOUGHERTY DAVID WYANNE & DAVID P MARLYN	\$45,424
48414	163710-0001-07910-0-00	Real	1133 ASHBY ST #1	BENTON EDITH J	\$91,433
48411	163710-0001-07910-0-00	Real	1133 ASHBY ST #12 TX	LANGE WAYNE W & PARY E	\$78,888
48402	163710-0001-07910-0-00	Real	1133 ASHBY ST #11	EGLOSS JOE D JR & JUDY A GARDNER	\$77,604
48398	163710-0001-07910-0-00	Real	1133 ASHBY ST #12 TX	JONES JAMIE BESS	\$77,547
48399	163710-0001-07910-0-00	Real	1133 ASHBY ST #13	FAIRRE JACKIE BESS	\$76,888
48400	163710-0001-07910-0-00	Real	1133 ASHBY ST #12 TX	VORDES LUREN S & CATY E	\$91,371
48394	163710-0001-07910-0-00	Real	1133 ASHBY ST #5	SHANAPFELT RALPH JACKSON JR	\$74,754
48395	163710-0001-07910-0-00	Real	1133 ASHBY ST #6	BOWDEN DANIAL	\$70,259
48396	163710-0001-07910-0-00	Real	1133 ASHBY ST #7	BUZER JO T	\$75,461
48397	163710-0001-07910-0-00	Real	1133 ASHBY ST #8	SHANAPFELT RALPH J	\$75,203
48400	163710-0001-07910-0-00	Real	1133 ASHBY ST #14 TX	BAKER NADY H	\$75,424
48614	163805-0001-03130-0-00	Personal	1215 ASHBY ST	NESSBIT NURSING HOME	\$125,340
48613	163805-0001-03130-0-00	Real	1215 ASHBY ST	NESSBIT WAYNE	\$5,091,196
59210	200035-0001-13830-0-00	Real	1255 ASHBY ST	FLEWING P L & H H FRORE	\$230,046
59572	200035-0001-13830-0-00	Real	1255 ASHBY ST	GOLDFON HOWARD D MD	\$164,308
59514	200035-0001-13830-0-00	Real	1255 ASHBY ST	MANUEL GEORGE S	\$175,126
59010	200035-0001-13830-0-00	Real	1255 ASHBY ST	WALKER GEORGE E	\$271,372
59215	200035-0001-13830-0-00	Real	1255 ASHBY ST	SOUTHBRIDGE AMBULANCE INC	\$137,862
119491	260035-0001-13830-0-00	Personal	1255 ASHBY ST #A TX	FLEWING EYE CARE	\$11,251

- b. Repeat the previous steps for all adjacent lots. Adjacent lots are ALL lots that share a property line with the vacant lot in question

*** NOTE - Comparing Google Earth and Tax Appraisal Maps: If possible, we suggest that researchers conduct the phase three searches in tandem keeping both the Google Earth and the Tax Appraisal windows open and side-by-side on their computer screen. This greatly facilitates correctly matching the lots in both windows. Property lines marked using Google Earth's polygon tool will also speed up the comparative process. Alternatively, if conducting the searches in tandem is not an option, our team found it useful to add ownership and property information to the placemarks in Google Earth so that the data was available for quick reference.

***NOTE – Layers in Tax Appraisal Maps: Some tax appraisal websites will have multiple maps layers that will provide the option to display, among other information, property IDs and owner names. Where this is the case, the researchers will be able to bring up the ownership information directly on the map rather than returning to do a search by the property ID.

Example of Tax Appraisal Map with Multiple Layers



Marking Lot Combinations

The ownership information pulled from the tax appraisal website is used to identify vacant lots in the most recent image that are developer-owned and both formal and informal lot combinations. Although information on developer-owned lots and combined lots cannot be used to recalculate the colonia/IfHS occupancy levels, it does provide insights into the degree of influence these processes likely have on the community's overall vacancy.

All placemarks for lot combinations should be ADDED to a given property. DO NOT delete any of the previous placemarks as they trace a different phenomenon – lot occupation changes.

Lot Ownership Coding Guide

Ownership/Combinations	Placemarks	
Developer-Owned Lot	Blue Flag	
Formal Lot Combination	Yellow House	
Informal Lot Combination	Gray Bubble	

Developer-Owned Lots:

If a particular name appears several times in the property searches it is possible that this person is the developer. It is very important that the repeated name is identical, or so similar as to avoid any reasonable doubt. Developer names can be confirmed through discussions with community members or by examining a plat map. If the researcher is reasonably certain that a lot is developer owned, she/he should add a **blue flag placemark** to the lot to indicate developer ownership.

Lot Combinations:

Lot combinations occur when two or more lots belong to the same owner(s). Combinations can be formal (i.e. registered) or informal. When a lot combination is **formal** the tax appraisal map will provide one property ID for two adjacent lots, i.e. the property line will be redrawn to surround both lots and one ID will describe the newly created larger lot. When the tax appraisal maps reveal that two or more lots have been formally combined add a **yellow house placemark** to each combined vacant lot in Google Earth.

Often two or more lots will have owner names that are exactly the same or very similar, but will still have two different property IDs. For example, lot A might be registered to Joe Hernandez Morales and lot B registered to Joe. M. Hernandez, or lot A might be registered to Jose Miguel Smith and lot B registered to J.M. Smith. When it appears probable that the same person owns both lots but has just not formally registered them under one property ID, the lots are considered to be **informally combined**. Mark informal lot combinations by adding a **grey bubble** pushpin to any vacant lots in the combination.

If there are two vacant lots that form a lot combination (formal or informal) add a yellow house placemark or grey bubble to each lot.

The total number of formally combined and informally combined lots, as well as the total number blue flag developer placemarks, should be recorded in the Placemarks section of the database Excel sheet (discussed below).

ANALYSIS GUIDE

Master Database

The master database is located in the master workbook (included as a part of this report package). The database holds satellite image coding data and generates additional information for analysis on the basis of those numbers. The database has ten sections. Only the first two sections require data entry; the remaining sections are automatically sourced to and/or are calculated from the entered data. **The formulas for calculating the automatically generated data are included in the section or title columns.** Each section is briefly described below.

1. **General Information** (*columns B through G*) - holds data such as the colonia/lfHS name, the county where it is located, and the total number of lots, as well as the precise date for each of the satellite images examined in Google Earth
2. **Placemarks** (*columns H through R*) - holds lot occupancy change placemark tallies, as well as lot ownership placemark tallies
3. **Vacant Lots Counts** (*columns S through V*) –generates vacant lot counts for each image from the Google Earth analysis and an overall change in vacancy measurement based on specific placemark combinations. (*For more information see Phase 2 in the Methodology chapter*).
4. **Occupied Counts** (*columns W through Y*) –generates occupied lot counts for each image from the Google Earth analysis
5. **Vacancy Levels** (*columns Z through AB*) - generates vacancy level percentages for each image in the Google Earth analysis
6. **Occupancy Changes** (*columns AC through AE*) - generates change in occupancy percentages for time horizons B and C based on the difference between vacancy levels in the satellite images. For example, the occupancy change for time horizon B is based on the difference between the percentage of vacant lots in 2002 and the percentage of vacant lots in 2006.
7. **Infill** (*columns AF through AS*) – contains two subsections. The 1st subsection (*columns AF through AL*) contains generated infill hard counts, based on placemark combinations, for time horizons B and C. The 2nd subsection (*columns AM through AS*) generates infill percentages, based on previous hard counts, such as the percentage of lots that experienced early infill and remained occupied.

8. **Outflow** (*columns AT through BG*) – contain two sections. The 1st subsection (*columns AT through AZ*) contains generated outflow hard counts, based on placemark combinations, for time horizons B and C. The 2nd subsection (*columns BA through BG*) contains generated percentages, based on the previous hard counts, such as the percentage of lots that experienced early outflow, but were later reoccupied.
9. **Current Vacancies- Ownership** (*columns BH through BO*) - identifies the percentage of lots that were never occupied (based on the previously entered placemark and vacancy data), as well as percentage data that relates to ownership of vacant lots in the last image, such as the percentage of currently vacant lots that are developer owned, or the percentage of currently vacant lots that are formally or informally combined.
10. **Alternative Use** (*columns BP*) - calculates the percentage of currently occupied lots that are alternative use lots based on the data entered for the alternative placemark in section 2.

The master database also has three additional rows located below the data section that provide aggregate numbers based on the individual colonia data that has been entered and/or generated.

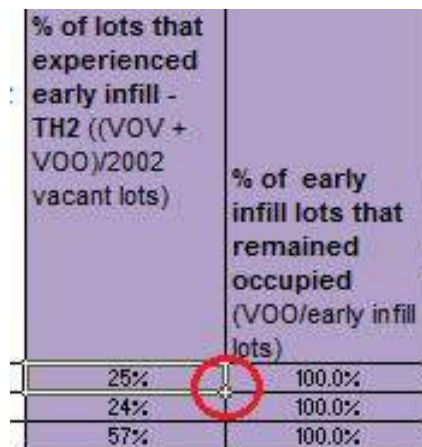
- **Total #s** (*row 28, highlighted in red*) - generates sums of the data where appropriate, such as the total number of vacant lots in 2002 (W28) or the total number of lots that experienced ReOutflow (AY28).
- **Total %s** (*row 29, highlighted in yellow*) - uses the numbers generated in the total #'s row to generate aggregate percentages, such as the overall vacancy level for 2002 (Z29) or the percentage of all currently vacant lots that have never been occupied (BH4).
- **Difference** (*row 30, highlighted in blue*) - calculates the difference between 2 given numbers, such as T30, which calculates the difference between the total vacant lots in 2002 and the total vacant lots in 2006.

Adjusting the Database to your Own Data

The current master database has 22 rows available for entering information on 22 communities and sixty-seven columns for data entry and calculations. Additional columns can be easily inserted should the researcher desire to create additional calculations (*right-click the desired column letter and select insert from the drop down menu*), and the number of rows can be easily reduced by deleting unnecessary rows (*right-click the desired row number and select delete from the drop down menu*). However, adding rows is more complicated (*right-click the desired row number and select insert from the drop down menu*) as the formula informing the other columns and rows will not automatically transfer.

Since the majority of the columns are based on formulas, it is very important to make sure that the formula is applied to each row in a given column, i.e. to ensure that each cell contains the appropriate formula. Thus, we suggest that the researcher return to the first cell in each column after all new rows have been added. Once a cell is selected (*by clicking on it*) a small white plus symbol will appear in the lower right hand corner of the cell. The red circle in Figure 2.2 highlights the plus symbol. When the mouse is placed over the small white plus symbol, the cursor becomes a slightly larger black plus symbol. Clicking on the plus symbol and dragging the cursor down to select each additional row will automatically transfer the correct formula to the newly add rows. However, we recommend that the researcher click on a few of the individual cells, particularly those in newly added rows, to ensure that the formula has transferred correctly (see formula reveal in the Methodology section of the paper).

Formula Pull Down Option in Excel

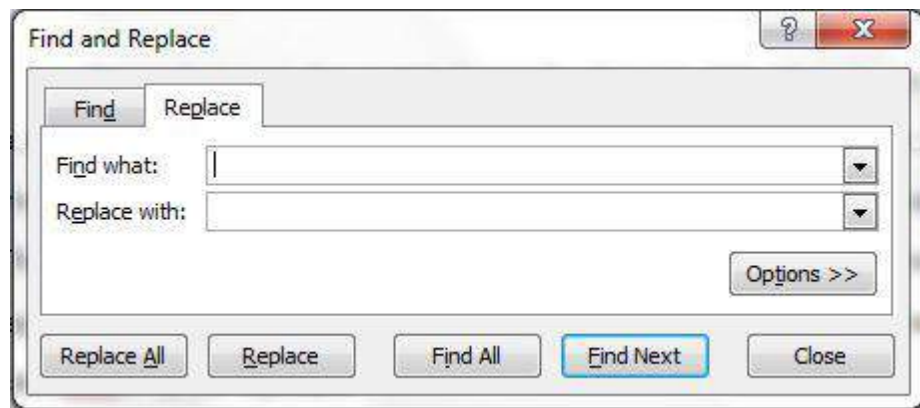


% of lots that experienced early infill - TH2 ((VOV + VOO)/2002 vacant lots)	% of early infill lots that remained occupied (VOO/early infill lots)
25%	100.0%
24%	100.0%
57%	100.0%

Researchers may also want to change the elements of the title/category row. Specifically, researchers are encouraged to change the dates specified in the titles and

formulas to match their own study. Dates can be easily adjusted by using the find and replace feature in Excel. The feature can be accessed by clicking the **Find and Select** button under the home tab (symbolized by pair of binoculars) and selecting **Replace** from the drop down menu or simply by clicking **CTRL, F** on the keyboard. Both options will pull up the find window, pictured below (Figure 2.3). In the **Find and Replace**, click the **Replace** tag. In the Find what box, enter the year you would like to replace and in the Replace with box enter the new year you will be using. **Make sure to select the title/category row before using Find and Replace to ensure that other data is not altered.**

Find and Replace Window in Excel



Additional Useful Tools in Excel

During the analysis phase researchers may become frustrated by the need to scroll through and around the database. Excel's hide and freeze options provide easy options to manage worksheets and to review data.

Excel's Hide Option

The hide option hides selected cells from view on the worksheet screen. The rows, columns and data are preserved, but out of sight. For example, the option could be used to hide the individual colonia data, enabling researchers to easily review the aggregate numbers generated in the highlighted rows at the bottom of the sheet, as well as the title/category to which the rows refer.

To hide columns rows:

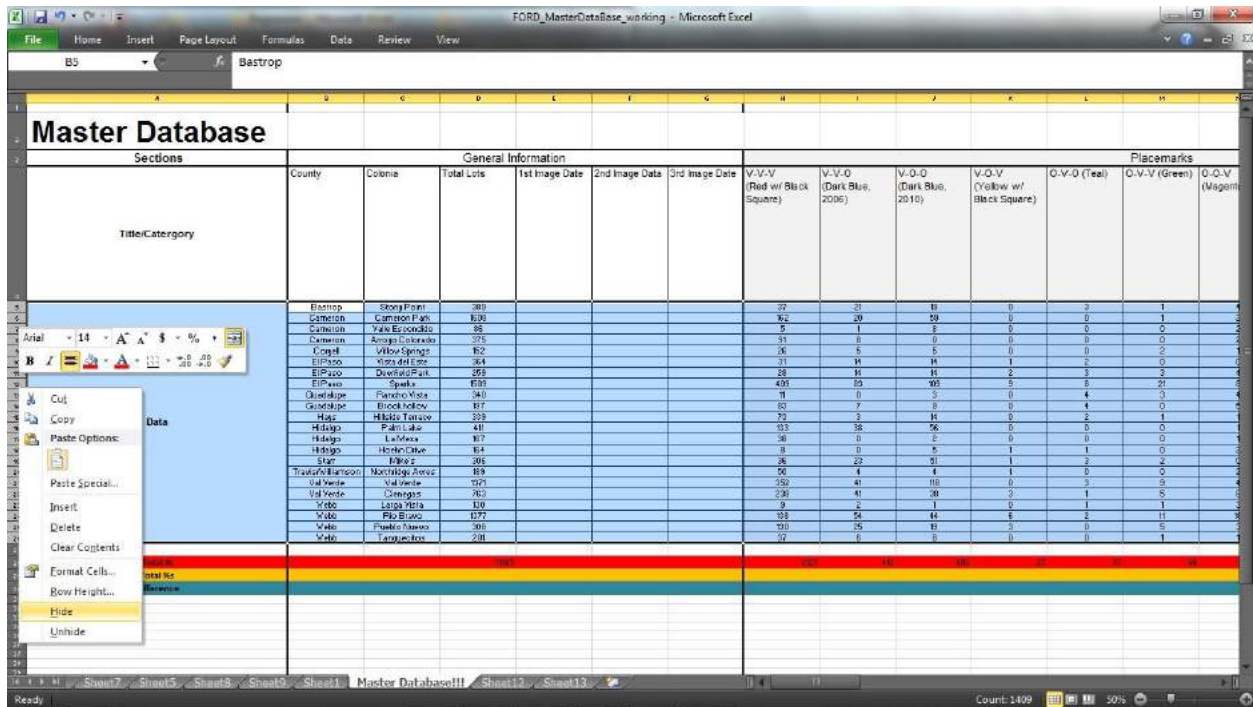
1. Select the area you would like to hide

2. Right-click the mouse and select **Hide** from the options window that appears (*displayed below*)

To unhide columns/rows:

1. Select the columns/row around the area that was previously hidden (easily identified by looking for jumps in the numbering or lettering sequence, e.g. 1, 2, 3, 10 or A, B, C, H).
2. Right click the mouse and select **Unhide** from the options widow that appears

Screen Shot of the Hide Option in Excel



Excel's Freeze Option

The freeze option keeps selected columns or rows from moving while allowing others to move. Researchers could use this option to scroll through the database's other column data while keeping the column with the colonia names frozen, avoiding the need to scroll back and forth to link the data in the columns to the specific colonia to which they refer.

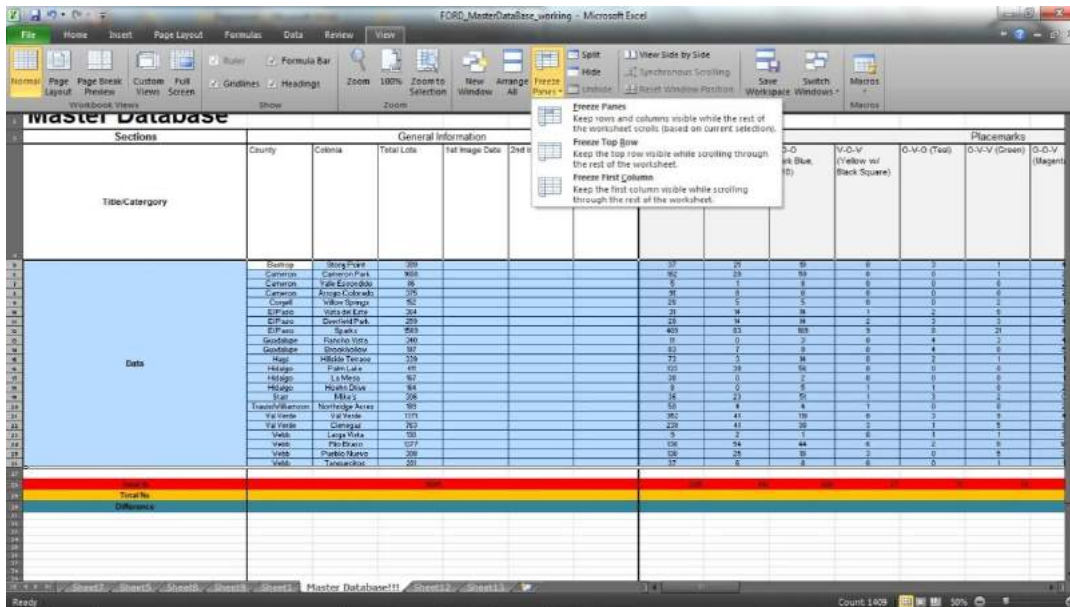
To freeze columns/rows:

1. Under the **View** tab, click on the **Freeze Panes** icon
2. Select one of three options in the pop-down window: Freeze Panes, Freeze Top Row and Freeze First Column. While the last two options freeze specific rows/columns, the first option can be used to freeze and row/column on the worksheet. To use the Freeze Panes options selected the row or column after the pane you would like to Freeze, then return to view tab and click on Freeze panes

To unfreeze columns/rows:

1. Under the **View** tab, click on **Freeze Panes**
2. Select the option in the pop down window that refers to the row(s)/column(s) that you would like to unfreeze (e.g. Unfreeze Panes, Unfreeze Top Row, Unfreeze First Column).

Screen Shot of the Freeze Option in Excel



Excel also contains several easy-to-use tools that can be used to further analyze information in the database worksheet. For each of the following tools, **we recommend selecting and copying the data you wish to analyze into a new worksheet to avoid accidental changes to the formulas or entered data.**

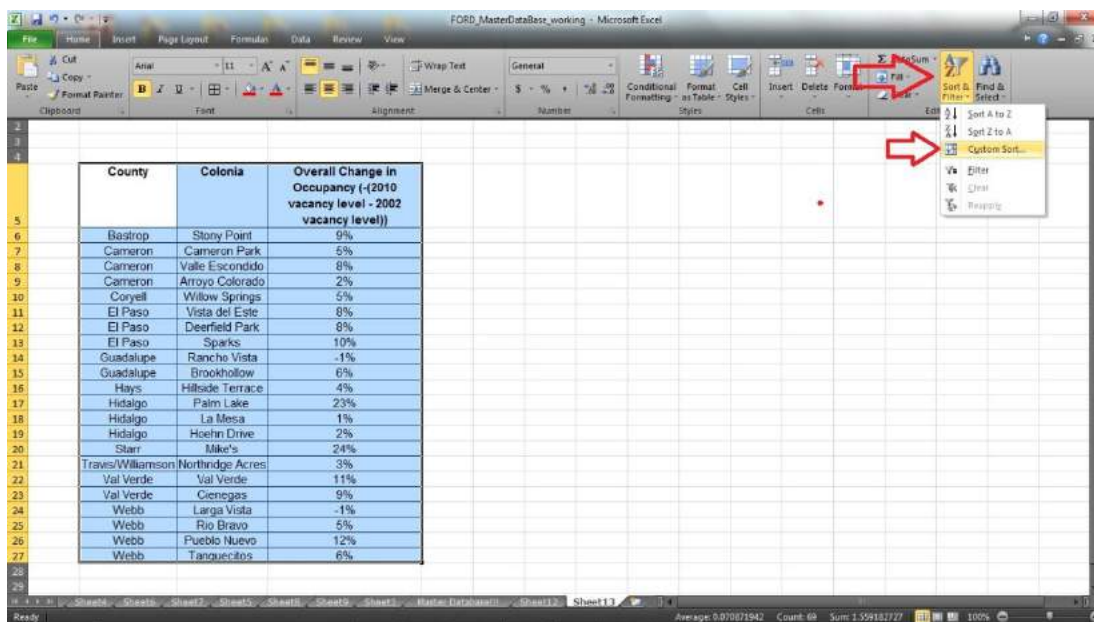
Sort and Filter Tool

The Sort and Filter tool permits researchers to custom sort and organize multiple columns of data according to the order of a single column. In the example used for the following images, the County and Colonias columns are organized according to the sequential ordering of the Overall Change in Occupancy Column.

To use the Sort and Filter tool:

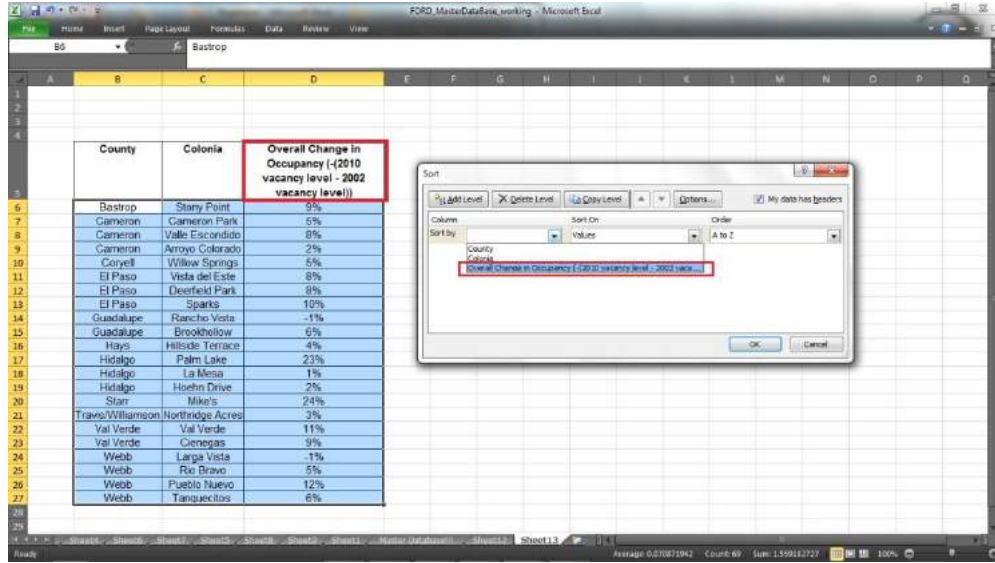
1. Select the entire table, including titles. Under the **Home** tab, click on the **Sort and Filter** button and select **Custom Sort**, *identified with red arrows in the image below.*

Sort and Filter and Custom Sort Locations in Excel



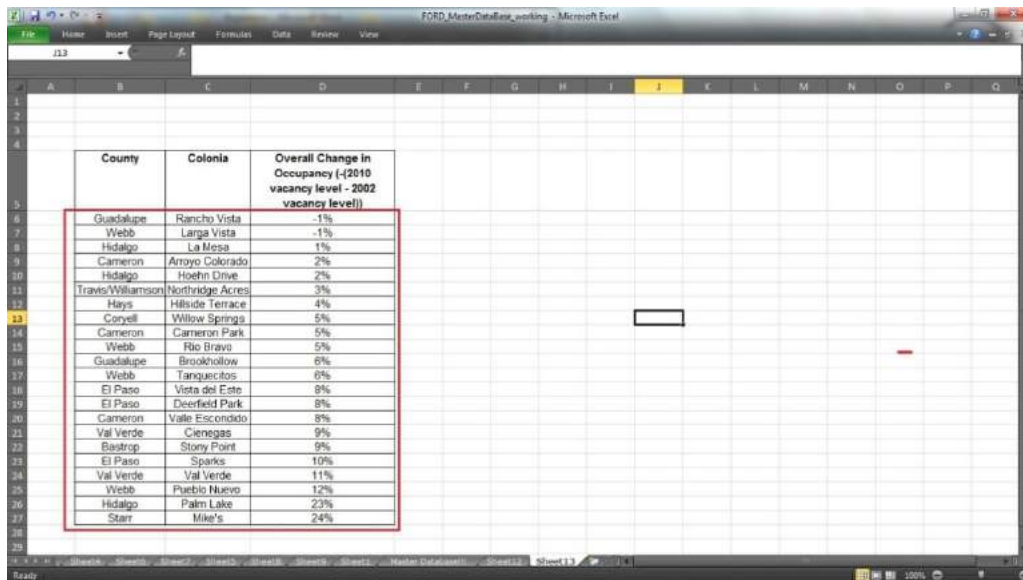
2. A sort window (pictured *below*) will open. Under the **Sort By** menu select the name of the column you would like order and use to the other columns. As previously mentioned, in this example columns will be sorted by the Overall Change in Occupancy ordering (*identified in the sort window and the excel sheet with red rectangles*). Sort according to **Values** from **lowest to highest (A to Z)**.
- 3.

Sort Window



4. Excel will resort the rows according to the order of the chosen column (*in this case Overall Occupancy Change*). For example, in the table in the previous sort window image and in the Resorted columns image below, the overall occupancy change for Rancho Vista was -1%. In the latter image, however, the Rancho Vista and Guadalupe County cells have been moved to the top of the list as they are associated with lowest overall occupancy change in the group.

Resorted Columns



Correlations

Researchers can use the correlation tool to examine the relationship between study variables as well as the relationship between study variables and any externally collected variables that may be of interest.

First, make sure that the version of Excel you are using has the data analysis tool kit. There should be a tab called “data” on the top of the Excel window (the tab is located where “File”, “Home”, “Insert” etc.) If the data tab is not visible, you do not have the data analysis toolkit.

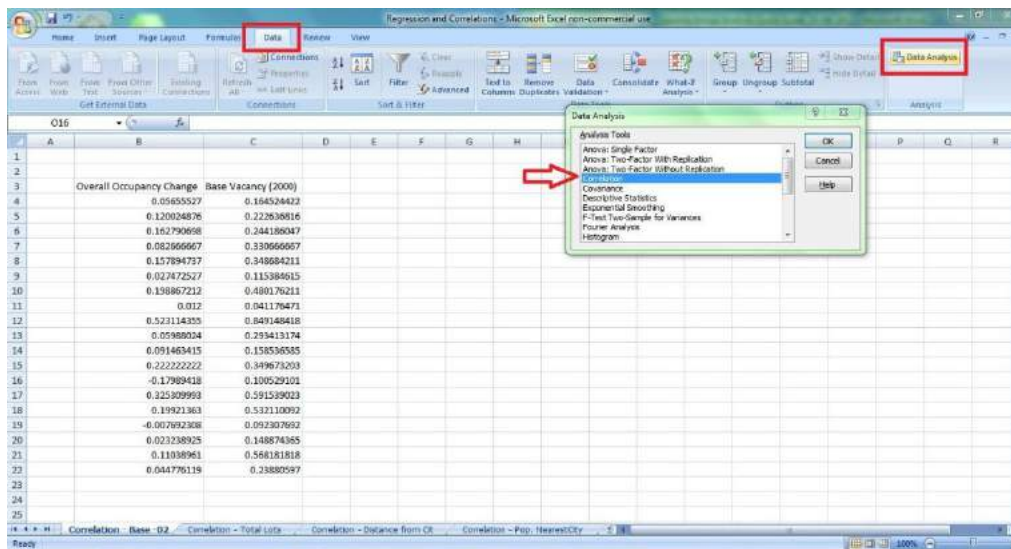
To add the Tool Kit:

1. (In Excel) Go to the **File** tab and select **Excel Options**
2. Click **Add-Ins**.
3. In the **Manage** box (located in the lower left corner of the window) select **Excel Add-ins** and click **Go**
4. In the pop-up add-ins available box, check the box next to **Analysis Tool pack**. The tool pack should automatically begin to download.

To run a correlation analysis:

1. Copy and paste the two variables that you would like to test into a new worksheet
2. Under the **Data** tab, click the **Data Analysis** icon. In the pop up window, select **Correlation** and click **ok**

Correlation Analysis Location in Excel



3. A correlation window will open (*pictured below*). Click inside of the window next to **Input Range** and select the entire table that you would like to analyze (see *blue rectangles*). Make sure to check the columns or rows option immediately below, depending on how your data is analyzed. In the case, the variables are organized into two columns - Overall Occupancy Change and Base Vacancy (see *the top blue arrow*). If you selected the titles as well as the data, make sure to check the box next to Labels in the First Row (see *the bottom blue arrow*). Finally, select the bubble next to **Output Range** and, after click inside of the adjacent window, select the area where you would like the correlation analysis numbers to appear.

Correlation Data Entry Window

The screenshot shows a Microsoft Excel spreadsheet with the following data table:

Overall Occupancy Change	Base Vacancy (2000)
0.05655527	0.164524422
0.120024876	0.222636816
0.162790698	0.244198047
0.082666667	0.336666667
0.157894737	0.348694211
0.027472527	0.115384615
0.198867212	0.480176211
0.012	0.041176471
0.523114355	0.849148418
0.05988024	0.293413174
0.091463415	0.158336585
0.222222222	0.349673203
-0.1789418	0.100329101
0.325309993	0.591539023
0.19921363	0.532110092
-0.007692308	0.092307692
0.023238925	0.148874365
0.11038961	0.568181818
0.044770119	0.23880597

The Correlation dialog box is open with the following settings:

- Input Range:
- Grouped By: Columns Rows
- Labels in first row
- Output options: Output Range: New Worksheet By: New Workbook

Correlation Analysis Result

The screenshot shows an Excel spreadsheet with the following data:

	Overall Occupancy Change	Base Vacancy (2000)
3		
4	0.05655527	0.164524422
5	0.129024876	0.222696816
6	0.162790698	0.244186047
7	0.082666667	0.330666667
8	0.157894737	0.348684211
9	0.027472527	0.115384615
10	0.198867212	0.480176211
11	0.012	0.041176471
12	0.523114355	0.849148418
13	0.05988024	0.293413174
14	0.091463415	0.158536585
15	0.222222222	0.349679203
16	-0.17989418	0.100529101
17	0.325309993	0.591539023
18	0.19921363	0.532110092
19	-0.007692308	0.092307692
20	0.023238925	0.148874365
21	0.11038961	0.568181818
22	0.044776119	0.23880597

The highlighted correlation table is as follows:

Overall Occupancy/Vacancy (2000)	
Overall Occupancy Change	1
Base Vacancy (2000)	0.861922

For information on interpreting correlation analysis numbers see [Correlations](#) in the Methodology chapter