

The eCon Planning Suite:

Analytics Tool Handbook

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GUIDE SECTIONS

This guide is organized in the following sections.

Section I: *Introduction* – this section discusses the relevance of data in the context of strategic housing and economic development, while defining the Housing Market Index and Analytics Widget as well as beginning the case study

Section II: *Using the Housing Market Index Map Layers* – this section introduces how to use the Housing Market Index map layer and its components in a step-by-step process.

Section III: *Interpreting the Housing Market Index* – this section reviews the context and applications for how the index can be used through a case study approach

Section IV: *Using the Analytics Widget* – this section introduces the Analytics Widget and provides step-by-step instructions to generate data tables, run reports, and create maps

Section V: *Interpreting the Analytics Widget Results* – this section provides description and application for how the widget can be used, continuing with a case study example

Section VI: *Technical Application* – this section reviews additional information about the data used and its sources, while noting limitations of the Housing Market Index and the Analytics Widget



I. INTRODUCTION

As part of the Consolidated Plan process, grantees complete a comprehensive assessment of the jurisdiction's housing, economic, and demographic conditions within the Needs Assessment and Market Analysis sections of the Consolidated Plan process. This data analysis, in conjunction with qualitative input received from stakeholders and residents serves as the basis for the grantee's Strategic Plan, which guides goals and projects for the 5-year Consolidated Plan period.

The process of completing the Consolidated Plan is driven by the eCon Planning Suite, which includes the Consolidated Plan Template in IDIS and CPD Maps. The template provides a framework to ensure that the Plan fully addresses the Consolidated Plan regulations (24 CFR Part 91) and pre-populates much of the required data needed for the Needs Assessment and Market Analysis to allow for more time to be focused on data analysis versus data gathering.

For more information on the [Consolidated Plan Template in IDIS](#) and [CPD Maps](#), review the Desk Guides developed for both tools.

CPD Maps provides a publically available mapping and analysis tool for the same demographic, housing, community, and economic development data indicators to assist with the data analysis required for the Needs Assessment and Market Analysis.

In preparing the Consolidated Plan, grantees are encouraged to develop the Strategic Plan in a manner that identifies and targets activities in designated areas as determined by the needs assessment, market analysis, consultation and citizen participation processes that occur during a strategic planning process. As stated in the regulations:

Jurisdictions are encouraged to identify locally designated areas where geographically targeted revitalization efforts are carried out through multiple activities in a concentrated and coordinated manner.

24 CFR Part 91.215(g)/325(g)

To aid grantees in using data to inform the Strategic Plan, HUD has released another component of CPD Maps: the Housing Market Index and its companion, the Analytics Widget, as components of CPD Maps. This Guidebook focuses exclusively on the Housing Market Index data layers and the Analytics Widget. To learn about the other widgets and components of CPD Maps in more detail, please review the CPD Maps Desk Guide.

Housing Market Index: Provides users with basic market-based data such as median home sales price, vacancy, homeownership rate, and share of subsidized rental housing per tract. CPD Maps then aggregates data into an index to help assess housing market conditions throughout a jurisdiction or region.

Analytics Widget: Provides a series of built-in queries to identify potential areas to target activities, including queries to identify areas for large-scale developments or challenging areas for sustainable moderate-income homeownership or rental.

Collectively, these tools will assist grantees to better understand market conditions as part of their housing and community development planning processes and make data-based decisions to better place and target HUD investments to maximize benefits.

This Handbook provides guidance on how to access and use these new data elements as well as how to perform the built-in queries to develop reports that will help you identify different, potential needs within your community.

There are a lot of ways to develop structured plans around housing and community and economic development, especially with the growing range of resources available in today's world. This Housing Market Index and Analytics Widget is another resource for planners to use from their planning toolbox.

Introduction to Hill Valley: A Fictional Case Study

To illustrate the various features and functions of the Housing Market Index and the Analytics Widget, we will follow the planning story for the fictional town of Hill Valley, Oklahoma, as its planning team works to better understand local conditions and develop the planning process. (Look for the highlighted blue boxes to follow along).

More specifically, the Hill Valley team is striving to improve its effort to use housing data as a complement to the team's local knowledge of housing investment and subsidy programs. Their goal in using these new tools in CPD Maps is to think differently about strategic housing investment. In particular, the Hill Valley team anticipates using the mapping and data display features of CPD Maps to ensure strategic distribution of programs, resources and funding and to better understand the communities they are serving.

To first understand the conditions in Hill Valley, the staff created a number of maps illustrating housing, demographic, and socioeconomic conditions using the Layers widget. The city also created and downloaded a Report using the Reports widget to understand basic conditions in the city.

In reviewing the report and the maps, the city staff noted that there appeared to be a rapid population increase in Hill Valley as well as a high level of cost burden, especially in the quickly redeveloping downtown area. To better understand the differences among neighborhoods as well as how the city compares to the surrounding metropolitan area, it created a Data Toolkit.

The data toolkit results and comparisons to the surrounding county, metropolitan area, and neighboring cities illustrated that the city's housing costs were rising at a faster rate than the region and that there were clear pressures on the housing market.

To further understand the market conditions and how they vary within the community, the planning staff used the Housing Market Index data layers and Analytics Tool in CPD Maps to further understand the community's needs and identify potential activities to address them.

WHAT IS DATA-BASED DECISION MAKING?

Over the last several years, greater public attention has been focused on making *data-based decisions* about program design and resource allocation (e.g., using data to design and resource programs to reduce recidivism or the reduction in the use of emergency rooms for illnesses and conditions that could be more efficiently treated). This approach has more recently been a consideration in the housing and community development fields and it arises both in response to constriction of resources (e.g. the decline in resources available from many federal, state and local budgets) and a sincere desire to make demonstrable change with the resources dedicated to a problem.

All grantees to an extent are engaging in data-based decision making by using the needs assessment and market analysis to help inform the Consolidated Plan's Strategic Plan and ultimately each year's projects and activities. Through the Housing Market Index and the associated Analytics Widget in CPD Maps, HUD has made it easier for grantees to apply data-based decision making, based on reasonably contemporary market data, as part of establishing goals and target areas in planning processes.

Stated differently, the Housing Market Index offers grantees an opportunity to better understand the current condition of the housing market within their jurisdiction at a reasonably refined geographic level – Census tracts – with contemporary, market-based data so that they can invest in and program those things that work. The data comprising the Housing Market Index have been organized, cleaned, statistically analyzed and mapped so that grantees can understand the conditions of sub-areas within their jurisdictions as well as how those areas compare to other parts of their respective regions. It is intended that the Housing Market Index help grantees better understand the market conditions within which they are making housing and community development investments (both with federal as well as state and local resources), thereby improving the likelihood of achieving the ultimate objectives.

STRENGTHS OF THE HOUSING MARKET INDEX AND ANALYTICS WIDGET

The Housing Market Index and associated Analytics Widget have a number of relevant strengths to help guide users in place based planning efforts. These strengths include:

Key Strength	Why does this strength matter?
Data-driven approach	This approach allows for objective and systematic assessments of regional housing markets and needs. This strength meets the standard of data-driven decision making in place based planning by using relevant Census and related databases reflective of a housing market.
Regional scaling of data	This strength matches the regional nature of planning, analysis, resource allocation and investment. By evaluating market types relative to regional characteristics, the Housing Market Index better reflects regional housing choices that owners and renters can select.
Use of reasonably contemporary data	With housing data covering the two-and-a-half years leading up to June 2013, the use of contemporary data in the Housing Market Index ensures that insights and planning are made using reasonably current data, providing more time-appropriate data analysis.
Use of data sources beyond Census data	Census data updates every 10 years (or in 5-year running samples, such as the American Community Survey). Incorporating RealtyTrac housing data allows for more contemporary data as well as data that is more regularly updated. Similarly, data from HUD and the USPS (on an annual update cycle) allow for the Housing Market Index to be more current than if it just used Census data.



II.USING THE HOUSING MARKET INDEX MAP LAYERS

This section provides guidance on how to access and display the Housing Market Index layers in CPD Maps.

1. To access the Housing Market Index map layers, first choose a jurisdiction/geography in CPD Maps by using the Grantee Search box.

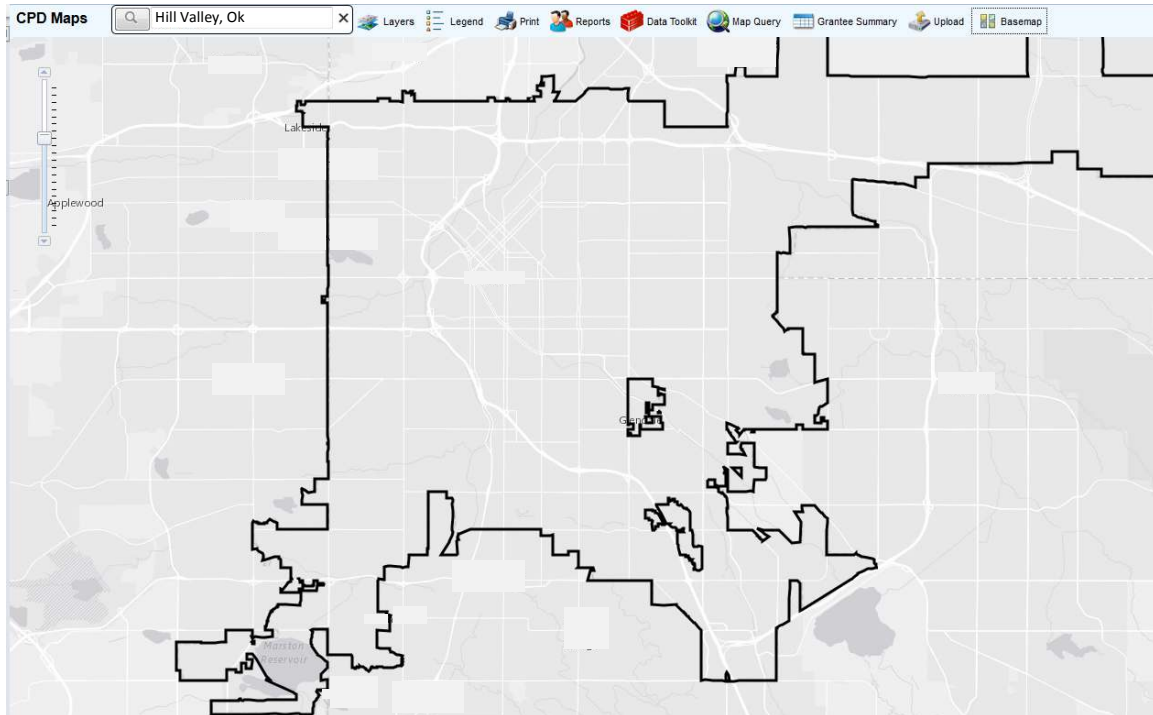
For guidance on navigation of CPD Maps, please reference the Desk Guide for CPD Maps. This guide serves as an introduction to CPD Maps' functionality for new users.

The planning team from our fictional case study city, Hill Valley, took their first steps in using the Housing Market Index by typing their city and state in the Grantee Search box below ("Hill Valley, OK").



2. Select the desired grantee from the Search Box and click "Finish." This will zoom the map to the grantee jurisdiction.

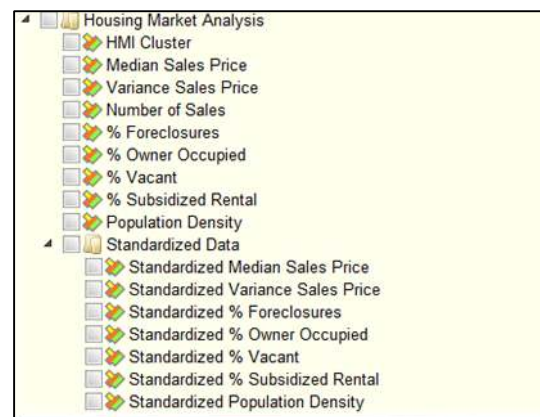
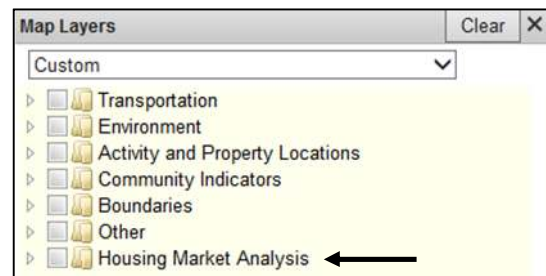
If your area of interest does not correspond with the jurisdictions available in the Grantee Selection Field search box, you can use your mouse and zoom function to move the map extent and display the desired geography.



The Hill Valley team has just clicked “Finish” to find their local grantee mapped with its boundaries.



3. Next, to display the Housing Market Index data on your jurisdiction’s map, you can select from a number of data layers. These Housing Market Index data layers can be found in the Layers widget under the category labeled “Housing Market Analysis.” To open the category to view all associated data layers, click the triangle to the left of the category name.
4. Once opened, all associated data layers for the Housing Market Index are visible under the Housing Market Analysis category and can be selected to display on the jurisdiction map. Data layers can be added to the map by clicking the box



next to the name of each data layer. The mapping of these various data points can help grantees think differently by examining the visual, geographic display of data. Visualized geographic data can confirm user's knowledge of local conditions on the ground while also providing information for areas which may be less familiar to users. The available data layers are described in more detail in the table below.

Data Name	Description	Data Source
HMI Cluster	The Housing Market Index (HMI) market type derived from a statistical cluster analysis (further explained in next section).	HUD, 2014
Median Sales Price	Median home sales price for the years 2010 through Q2, 2013.	RealtyTrac 2010-2013
Coefficient of Variance of Sales Price	This is a measure of how variable home sale prices are in a given Census tract. Tracts with a high coefficient of variance have a group of home sale prices that, no matter what the average of them all, are each very different from the other. Tracts with a low coefficient of variance have a group of home sale prices that, no matter what the average of them all, are each very similar to one another.	RealtyTrac 2010-2013
Percent Foreclosures	The number of mortgage foreclosures 2010 through Q2, 2013 over the number of housing units.	RealtyTrac 2010-2013
Percent of Housing Units that are Owner Occupied	The number of owner occupied housing units over the number of occupied housing units, 2010.	US Census, 2010
Percent of Housing Units that are Vacant	The number of vacant housing units 2010 through Q2, 2013 over total housing units.	HUD/USPS, 2010-2013
Percent Subsidized Rental	The number of subsidized rental units 2010 through Q2, 2013 over total rental units.	HUD, 2010-2013
Population Density	The population count divided by the total land area in miles, 2010.	US Census, 2010

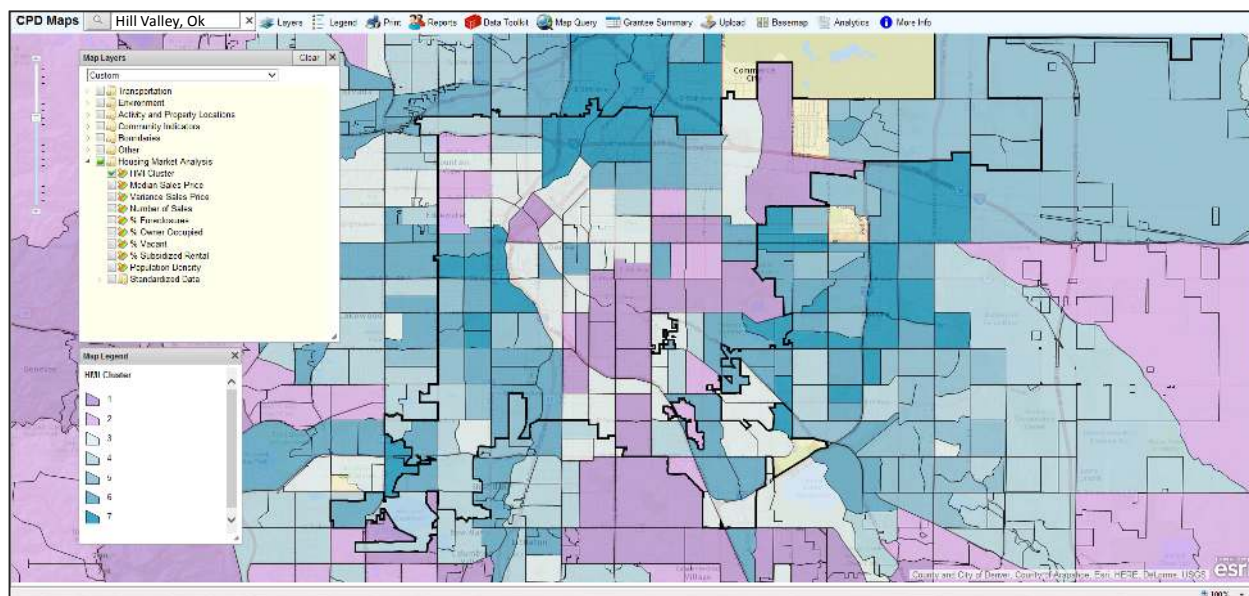
What's the difference between standardized and non-standardized data?

You may have noticed the “Standardized Data” subfolder (see image from page 8) among the data layers under the “Housing Market Analysis” category. Data from the Housing Market Index can be displayed as either non-standardized or standardized layers. Non-standardized data is the value of the original data variable, derived from the sources listed in the table above in its raw format. This non-standardized data is more straightforward and typically more intuitive to understand. In the Hill Valley case study, an example of non-standardized data from their most competitive market is the “non-standardized median sales price” of \$457,682.

For more advanced users, standardized variables represent the degree to which tracts in a grantee’s jurisdiction are usual (or unusual) compared to their respective region’s average. This was the intermediate data format used to develop the Housing Market Index, and is included as a data option for advanced users. An example of standardized data from that same highly competitive market in Hill Valley is the “standardized median sales price”, which is equal to 1.68. The standardized data represents the number of standard deviations above (positive values) or below (negative values) the regional average a place is for each of the six data categories.

For more details, please refer to the Technical Appendix.

5. Once the data layer is selected, the data will be displayed on the map. It is best to only display one thematic layer at a time in CPD Maps, as two or more layers shown at the same time may overlap on top of each other or even blend together, depending on their transparency settings. For more on how to understand and distinguish between market types on your map, see the following section on “Interpreting the Housing Market Index.”



To visualize the data and orient themselves to the Housing Market Index in their jurisdiction, the Hill Valley planning team began by mapping the “HMI Cluster” market types. They clicked on and selected the “HMI Cluster” map layer under the “Housing Market Analysis” folder. The resulting map, seen above, shows several “1” and “2” markets (purple hues) in the central downtown areas, while “6” and “7” markets (darkest hues of blue) are found on the western, northern and eastern outskirts of the city and just beyond the city’s limits (black outline). “3”, “4” and “5” markets (lighter blue hues) are concentrated northwest of downtown, as well in farther outlying areas from the city. While the team had yet to learn the exact meaning of these 1 through 7 market types, this map layer helped align the newly introduced Housing Market Index with their knowledge of local areas.

To understand and interpret the different housing markets types from the Housing Market Index in further detail, turn to the next section on “Interpreting the Housing Market Index”.

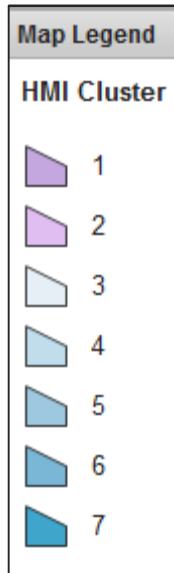
6. You may want to lighten the transparency settings in order to show relevant land marks on the underlying base map, such as highways, rivers, and jurisdiction labels. Users can adjust the transparency of displayed data layers by either right clicking or hovering over the desired data layer and clicking on “Layer Settings.” Then, drag the bar left to make the displayed data layer more transparent, or drag right to make it darker and more opaque.





III. INTERPRETING THE HOUSING MARKET INDEX

WHAT IS THE HOUSING MARKET INDEX CLUSTER LAYER?



The Housing Market Index provides CPD Maps users with a valuable set of data tables and mapping layers to assist with housing and community planning.

This index places Census tracts into one of seven “buckets” or market categories based on a tract’s unique pattern of housing data. These seven categories are based on carefully selected data elements that, when taken together, represent key elements of a housing market.

By combining six key housing data elements into a single index, the index results can be used to help identify markets that have similar traits more quickly. Similarly, the index makes it easier to identify differences between tracts according to our six key housing data points. Identifying similarities and differences across targeted investing areas is valuable when considering future interventions or evaluating past targeted investments in a local area.

Full descriptions of each of the six housing data points used to create the Housing Market Index are listed in the table in the prior section. To refresh, these six data point include a tract’s

- median home sales price
- coefficient of variance of sales price
- percent of housing units with mortgage foreclosures
- percent of housing units that are owner occupied
- percent of housing units that are vacant, and
- percent of all rental units that are subsidized.

The Housing Market Index is a tool to use key housing data quickly and easily, which is relevant when evaluating target areas for investment in a time-sensitive setting.

What’s an index?

An index is a way of combining several indicators into a single measure. While an index is made up of many data sets, the single scale of an index can be understood more quickly and easily than by studying its many parts separately.

MARKET DESCRIPTORS- MEDIAN SALES PRICE AND OWNER OCCUPANCY

Median home sales price is a key variable in the creation of the Housing Market Index. Areas designated as “1” markets (darkest purple) tend to have the most competitive real estate prices. On the other hand, “4”, “5”, and “6” markets (moderate to darker shades of blue) are typically more affordable middle markets. Based on median home sales prices alone, “7” markets (the darkest blue) tend to be more stressed housing markets. Historically, public investment and program activities have tended to occur in “4”, “5”, “6”, or “7” markets.

Which markets in your area have had the majority of public investment and program activities? Do they tend to be concentrated solely at the lower end of the markets, or do they cross into middle or even higher markets in some instances? Use the CDBG, HOME, and LIHTC point layers from CPD Maps layer options to display historic investments on your jurisdiction’s map.

Another input variable which can be helpful to make distinctions between markets when thinking about housing investment and intervention is “% Owner Occupied”. This data can provide planners insights as to where owner occupancy is lowest, and therefore, where concentration of renters is the highest. Trends in “% Owner Occupied” are more varied across the Housing Market Index than median home sales price, and ultimately local data will prove most useful. But in general terms, “2”, “5” and “7” markets have much lower owner occupancy rates (and are therefore predominantly renter based), whereas “1”, “3”, and “4” markets have much higher rates of owner occupancy. A general summary of each market type can be found in the next section.

Which markets in your own jurisdiction will have the lowest rates of owner occupancy (and therefore the highest rates of rental occupancy)? How can that knowledge help shape future program activities?

INDICATORS OF MARKET CHALLENGES – MORTGAGE FORECLOSURE AND VACANCY

Other key input variables which are often of concern for housing departments are the “% Foreclosures” and “% Vacancy”. Anecdotal experience often shows foreclosures hit the hardest in those markets in the middle of the Housing Market Index. The general trend in the data reflects this experience, as “4” and “6” markets are found to have the two highest “% Foreclosures”.

Which markets in the Housing Market Index in your jurisdiction will have the highest rates of foreclosure? Are foreclosure-related interventions already active in these areas?

Vacancy is the other key indicator in the Housing Market Index which is often of concern for community and economic development. Notably, there are often two types of vacancy that can be found in the Housing Market Index, one near the more robust end of the market and the other at the more challenged end. Vacancy in the more challenged end of the market is often the kind that is of most concern because it can be reflective of housing quality issues and a lack of demand, and general trends indicate that “6” and “7” markets often show the highest rates of vacancy.

Where will vacancy rates be highest in your local areas, and how is the type of vacancy different at the strongest versus most challenged parts of the real estate market there?

WHAT IS VARIANCE OF SALES PRICE?

While many of the variables used in the Housing Market Index are relatively straightforward, variance in sales prices may be a newer concept worth reviewing. The variance in sales prices measures how different the home sale prices are in a given Census tract. Tracts with a high variance have a group of home sale prices that are very different from the other. Tracts with a low coefficient of variance have a group of home sale prices that are each very similar to one another. This knowledge may help identify areas with a wider range of home sales prices (versus a narrow range), which can indicate a diversity of housing stocks (versus a homogenous housing market) in a given Census tract. Areas with higher variance could be worth exploring at an even smaller geographic level, to understand housing submarkets that may coexist in the same Census tract and which may warrant different intervention strategies.

What exactly is variance?

Variance is a measurement of how spread out a group of numbers is. Higher variances indicate a wider spread, while relatively low variance reflects a narrower dispersion.

A WORD OF CAUTION: COMPARE MARKETS ONLY WITHIN REGIONS

It is important to note that housing markets can differ widely from region to region. As a result, the index categories were calculated with data that has been standardized for the specific region in which a Census tract is located (i.e., for counties within metropolitan Core Based

Statistical Area (CBSAs), the CBSA averages are used; for areas outside of CBSAs, non-metro area averages of each state set the standard). The federal government establishes the formal definition of CBSAs. Typically, they are urban areas with at least 10,000 people, frequently with many jurisdictions, that are socially and economically tied to the urban center.

Users should take note: Housing Market Index analysis will best describe a Census tract relative to other tracts in the same region. Making comparisons of Census tracts across different regions is discouraged, and standards of comparison were developed in the data on a region-by-region basis to measure tracts' relative position only in their own region.

For example, the data describing a Hill Valley "1" market will be different from a "1" market in your own region.

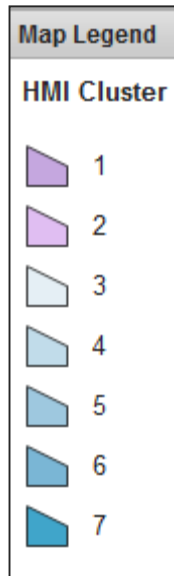
Therefore, it would not make sense to assume that "1" markets in Hill Valley have the exact characteristics of any other region in the country.

Comparing areas *within regions* by HMI category can be very informative and useful.

But comparing HMI categories *across different regions* (e.g. from one CBSA to another) is not a valid comparison as the data is standardized to each individual CBSA.

For more detail on the limits of the Housing Market Index analysis, see the "Limitations" in the Technical Appendix section of this document. For a detailed description of the methodology behind developing the Housing Market Index, users can also refer to the Technical Appendix.

GENERAL DESCRIPTION OF MARKET TYPES



The Housing Market Index provides CPD Maps users with a valuable set of data to assist with housing and community development planning. Section IV describes a series of recommended maps to use with these data layers as part of the Analytics Widget. Before describing these recommended maps, it is important to first understand the index data layer (HMI Cluster). The HMI Cluster data layer is an Index that combines the six data elements included in the Housing Market Index category of CPD Maps data layers.

The HMI Clusters are divided into seven categories or market types. Remember, users are recommended to only compare market conditions within a single region as the market clusters are based on their own region's housing conditions.

The section below provides a description of each market type and a profile of the general conditions of that category, using broad descriptions of national trends.

MARKET TYPE 1 (HIGH DEMAND):

Contains 4,756 of the nation's Census tracts (6.4%) and is home to 6.7% of the 2010 population and 6.9% of the housing units. "1" markets generally have high average home sale prices and lower levels of variation in sales prices. Foreclosures tend to be relatively low in these areas, while owner occupancy is often quite high in "1" markets. The percent of housing units identified as vacant is generally higher than in other market types, but subsidized rental housing (as a percent of all rental housing) is the lowest in "1" market types.

MARKET TYPE 2 (COMPETITIVE):

Contains 7,196 of the nation's Census tracts (9.7%) and is home to 6.5% of the 2010 population and 11.0% of the housing units. "2" markets have higher than average home sale prices but have much lower levels of owner occupancy than do "1" market-types. Variation in sales prices are generally lower in "2" markets. Foreclosures are relatively low in these areas as well. Vacant housing is moderate relative to other markets, with moderate levels of subsidized rental housing as a percent of all rental housing in "2" markets in general.

MARKET TYPE 3 (EMERGING):

Contains 12,528 of the nation's Census tracts (16.9%) and is home to 19.2% of the 2010 population and 18.1% of the housing units. Home sale prices in "3" market-types are still above average with among the highest levels of owner occupancy, in general. Variation in sales prices tend to be low in "3" markets. Foreclosure rates tick slightly higher in "3" markets than in "1" and "2" markets, although levels of vacant housing are often lower relative to other markets. Subsidized rental as a percent of all rental housing is generally lower in "3" markets.

MARKET TYPE 4 (STABLE):

Contains 13,943 of the nation's Census tracts (18.8%) and is home to 20.8% of the 2010 population and 19.7% of the housing units. Home sale prices in "4" market-types tend to be below national average sales prices. Levels of owner occupancy, in general, are still very high, though just below typical levels of "1" and "3" markets. Variation in sales prices is still generally lower in "4" markets, while vacant housing is among the lowest in "4" markets. Foreclosure rates jump higher in "4" markets and tend to only be lower than rates in "6" market types. Subsidized rental housing as a percent of all rental housing is typically moderate in "4" markets.

MARKET TYPE 5 (AT RISK):

Contains 7,731 of the nation's Census tracts (10.4%) and is home to 10.4% of the 2010 population and 10.7% of the housing units. Home sale prices in "5" markets tend to be below the national average with a moderate variation in sales prices. Owner occupancy is generally quite low in "5" markets. Vacant housing tends to be moderate in these areas, with foreclosure rates at more moderate levels than "4" or "6" market types. Subsidized rental as a percent of all rental housing in "5" markets is elevated compared to other market areas.

MARKET TYPE 6 (MODERATELY DISTRESSED):

Contains 8,043 of the nation's Census tracts (10.9%) and is home to 11.3% of the 2010 population and 10.5% of the housing units. "6" markets have the second lowest sales prices on average among all market types, with a moderate amount of variation in sales prices. In general, "6" markets have higher foreclosure rates than any other HMI market types. Owner occupancy tends to be moderate in these areas, whereas vacant housing is slightly higher in "6" markets. The typical percent of subsidized rental housing as a percent of all rental housing in "6" markets also tends to be moderate relative to other areas.

MARKET TYPE 7 (SEVERELY DISTRESSED):

Contains 4,714 of the nation's Census tracts (6.4%) and is home to 5.1% of the 2010 population and 5.2% of the housing units. Home sale prices in "7" market types are, on average, among the lowest in the country. Variation in sales prices in these markets is higher than other markets, generally speaking. Foreclosures also are relatively high, though not quite as high as rates in "6" markets. Also, vacancy tends to be highest in "7" markets. In these areas, subsidized rental as a percent of all rental housing is also generally the highest among the 7 HMI market types. Finally, owner occupancy is quite low in "7" market types.

20.4% of the nation's Census tracts are not included in the HMI analysis, as sufficient data was not available for all areas. These tracts represent 17% of the 2010 population and 18% of the nation's housing units. For more info, see the "Limitations" section at the end of this guide.

As discussed in further detail in this Handbook, using the HMI Cluster Data Layer in CPD Maps can provide valuable information to understand market conditions and can aid in evaluating housing and community development investments where those activities are most appropriate.



IV. USING THE ANALYTICS WIDGET

In addition to the Housing Market Index data layers, users can access the Analytics Widget in CPD Maps to assist with housing and community development planning.

First, the Analytics Widget is where the data from the Housing Market Index can be accessed. Secondly, the Analytics Widget provides a set of prepared maps and analyses using the Housing Market Index dataset as well as other datasets in CPD Maps.

These prepared analytics reports assess data to determine potential actions that may be appropriate for that area and display the outcomes on a map for easy visualization. For example, one prepared report from the Analytics Widget suggests where there may be the greatest need for infill housing based on the HMI Cluster Category, Vacancy Rate, and presence of HUD Multifamily Activities. This tool can be very helpful to grantees as they prepare (or review) federal, state and/or local housing and community development plans and strategies.

Using the Analytics Widget is a two-step process. The first step displays key data layers and points from CPD Maps for the analytics report you select. This gives users a general understanding of an area by looking broadly across a jurisdiction. The second step is to run a query report, which highlights and zooms into areas for further analysis based on the analytics' query variables. This step allows users to drill down and examine sections of a jurisdiction that may be an area for concern or further focus.

This section of the handbook provides users with an overview of how to access and use the Analytics Widget.

What is the Analytics Widget?

Analytics is a section of the CPD Maps tool wherein the user can discover trends and patterns in housing market data instructive of where certain investments may make the most sense. Analytics can offer new insights and knowledge through visual display of the data by overlaying related data sets on a map. Analytics offers some pre-set maps but also gives the user the opportunity to adjust those maps to their own market.

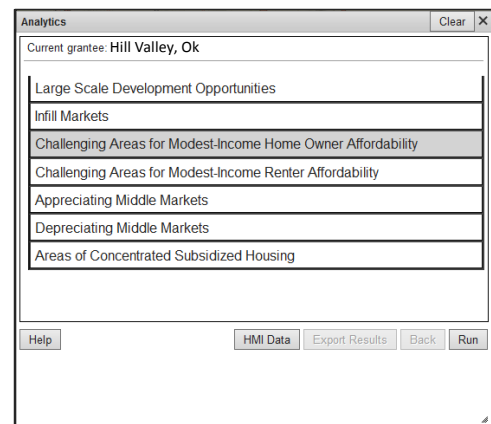
WIDGET INSTRUCTIONS

1. To begin using the Analytics Widget, select a grantee using the Grantee Search box.
2. To open the Analytics Widget, select it from the widgets menu at the top of the screen.



3. Clicking on the Analytics Widget opens the Analytics Toolbox. The toolbox displays the current grantee selected, the seven prepared analytics reports, and the HMI Data download button.

As noted above, seven prepared analytics reports are based on the different Housing Market Index categories (1-7) described in Section III of this handbook. The data associated with each report is described in more detail at the end of this section.



4. To download both the County and CBSA Housing Market Index data tables and maps for your Grantee jurisdiction, begin by clicking on the “HMI Data” button. This report is downloaded as an Excel File and can be used to assess overall market conditions within the jurisdiction as compared to the CBSA.

The Hill Valley Planning Team wanted to use data in the Analytics Tool to focus on identifying areas experiencing the stress of rapid housing growth in their city. To first access the housing market data and get a general picture of their local market types, the Hill Valley planning team: 1) selected their grantee, 2) clicked on the Analytics widget, and then 3) clicked on “HMI Data” in the “Analytics Toolbox”. These three steps downloaded a file with their local Housing Market Index data tables and maps. The Hill Valley Regional Table below introduces you to the one of the two tables that the Hill Valley planning team generated using CPD Maps.

The team was intrigued to also find their Hill Valley County table, as well as county and regional maps, were also included in the Excel file download, as they wanted to compare difference in the market types between Hill Valley County and its surrounding region.

HILL VALLEY REGIONAL TABLE

Region: **Hill Valley Metropolitan Statistical Area**

Cluster	Number of Tracts	Median Sales Price	Variance Sales Price	% Foreclosures	% Owner Occupied	% Vacant	% Subsidized Rental	Total Population	% Region Population	Total Housing Units	% Region Housing Units	Total Occupied Housing Units	% Region Occupied Housing Units
1	61	\$466,947	0.59	3%	86%	6%	3%	229,777	9.2%	97,221	9.2%	90,730	9.1%
2	113	\$291,921	0.43	4%	85%	4%	2%	470,407	18.8%	181,618	17.6%	174,353	17.0%
3	77	\$232,746	0.63	2%	53%	13%	6%	273,242	10.9%	148,114	13.4%	132,676	13.8%
4	134	\$201,209	0.44	5%	76%	5%	5%	568,738	22.7%	227,195	21.8%	215,461	21.2%
5	78	\$150,727	0.35	9%	75%	5%	9%	359,278	14.3%	131,625	12.4%	122,829	12.3%
6	99	\$141,343	0.62	3%	53%	11%	7%	418,551	16.7%	197,078	18.2%	179,639	18.4%
7	39	\$91,180	0.71	5%	48%	9%	12%	153,398	6.1%	65,929	5.9%	58,648	6.2%
NA	19	\$132,648	0.56	0%	32%	16%	42%	31,875	1.3%	21,771	1.4%	13,994	2.0%

* The model that created the Housing Market Index (HMI) uses the standardized version of the above variables.

Other variables are included for informational purposes.

For context and points of reference with the Housing Market Index cluster in general, it may be helpful to point out some broad trends in Hill Valley from the region's output table above.

When reviewing the output tables for the first time, the Hill Valley planners noticed that median sales price in their region decreases from \$466,947 in "1" markets to \$91,180 in "7" markets in the table above.

Will this decreasing sales trend from "1" markets to "7" markets hold true in your own area?

In Hill Valley, the planning team also noticed that "4" and "5" markets in their community had higher average rates of owner occupancy, at 76% and 75% respectively. In contrast, "3" markets only had an average rate of 53% owner occupancy, while "6" markets and "7" markets had lower owner occupied rates as well (53% and 48%, respectively). This insight gave the planning team some early leads about how to target owner-specific and renter-specific interventions when looking at the Housing Market Index map (on page 11).

The Hill Valley team turned to examine the foreclosure data by market type. They found "5" markets had the highest "% Foreclosures" in the region at 9%. The planning team turned to their map of the Housing Market Index to find "5" markets, comparing their findings on data-generated map with their team's local knowledge of foreclosure reports.

Are local foreclosure-related interventions already active in these markets with elevated foreclosures in your local jurisdiction?

Next, the Hill Valley planners also considered the “% Vacancy” data column, noting two peaks of vacancy in that data series. First, “3” markets had a higher vacancy rate at 13%, and then “6” and “7” markets also had elevated rates, at 11% and 9% respectively. An astute member of the team noted that these three markets were the same ones identified as being relatively low on the “% Owner Occupancy.” Therefore, these three markets may represent challenges with vacancy specifically in the rental market. While this is less problematic for “3” markets, where a higher median sales price indicates a more robust market, the elevated vacancy in “6” and “7” markets signals a red flag for these market types, which are already challenged by weaker median sales values.

HILL VALLEY COUNTY TABLE

County: **Hill Valley**

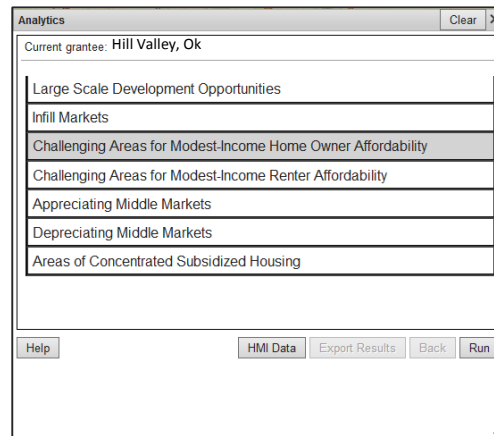
Cluster	Number of Tracts	Median Sales Price	Variance Sales Price	% Foreclosures	% Owner Occupied	% Vacant	% Subsidized Rental	Tot al Population	% County Population	Tot al Housing Units	% County Housing Units	Tot al Occupied Housing Units	% County Occupied Housing Units
1	19	\$457,682	0.56	2%	70%	8%	5%	82,059	13.9%	39,923	14.1%	36,466	14.1%
2	10	\$293,047	0.45	3%	71%	6%	7%	34,487	5.8%	16,983	6.3%	16,185	6.0%
3	41	\$261,227	0.53	2%	36%	9%	15%	142,545	24.1%	82,587	28.5%	73,630	29.1%
4	13	\$200,369	0.41	4%	70%	5%	16%	48,148	8.2%	20,785	7.6%	19,487	7.3%
5	17	\$134,574	0.40	10%	69%	6%	25%	87,073	14.8%	29,678	10.8%	27,973	10.5%
6	31	\$140,381	0.60	4%	44%	8%	16%	148,112	25.1%	72,314	25.4%	65,498	25.5%
7	11	\$81,841	0.60	4%	39%	9%	26%	43,841	7.4%	18,823	6.5%	16,736	6.6%
NA	2	NULL	NULL	0%	1%	13%	51%	4,242	0.7%	2,565	0.8%	2,157	0.9%

Note: Raw county scores are standardized against associated regional footprint scores.

Finally, the Hill Valley team wanted to know how their county data compares to the region. While they planned to look at each of the six indicators, the first thing they noticed was that median sales prices in “1” markets in the county were lower on average than median sales prices in “1” markets in the region (\$457,682 vs. \$466,947) and “3” markets in the county had higher average prices (\$261,227 v. \$232,746).

What differences will you find between the county and regional tables in your own jurisdiction?

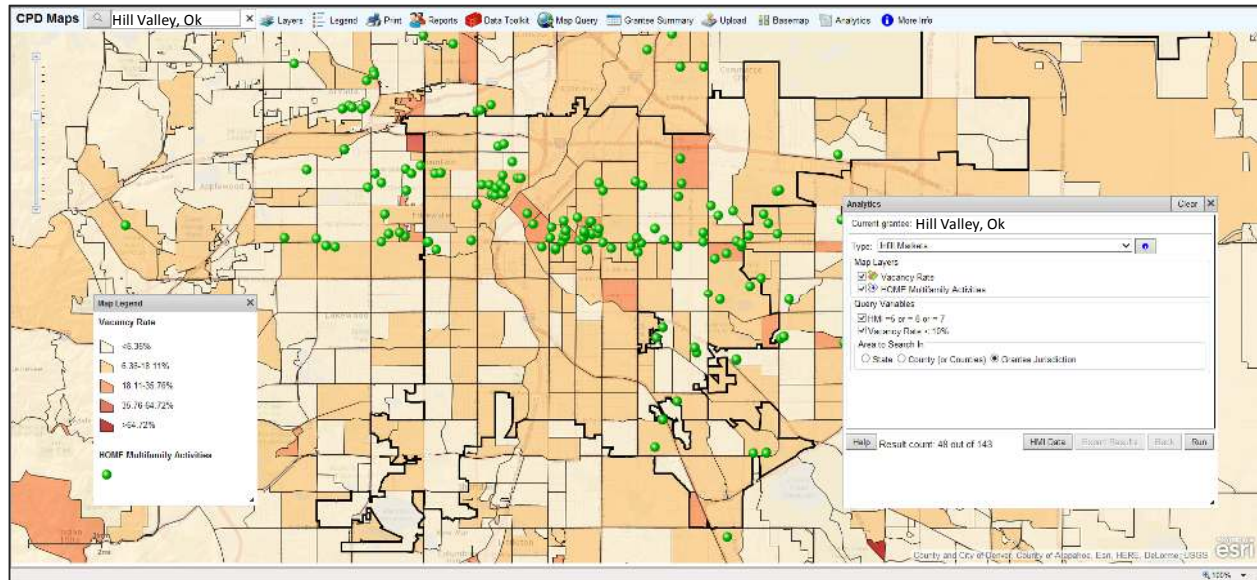
5. Next, to run one of the Analytics reports and perform a targeted search of your jurisdiction, click on the desired report so that it is highlighted. From there, the system will display the data layers and pre-set points on the map. For a full description of each of the Analytics reports, you can refer to the following section entitled “Interpreting the Analytics Widget Results”. You will find a complete listing of the layers associated with each of the seven Analytic widgets in the next section under the “Analytics Summary”.



The Hill Valley planning team identified several Analytics reports to use to inform their planning process. Recent community feedback had pointed to struggles with homeowner affordability in Hill Valley’s rapidly appreciating housing market, especially in middle and lower-income areas. To corroborate the community feedback with data insights from the Analytics Widget, the Hill Valley team first chose to explore the widget for “Challenging Areas for Modest-Income Home Owner Affordability” by clicking on its name in the Analytics toolbox.

Which Analytics report might be the most intriguing or useful for work in your own jurisdiction?

- Once you click on one of the analytics, the map will display the pre-set data layers associated with that analytics report category.



The Hill Valley planning team clicked through several of the Analytics widgets. This map of Hill Valley shows the data layers for the “Infill Markets”, including the vacancy rate (red and tan color ramp), along with the HOME Multifamily Activities locations (green points). You can find a complete listing of the layers associated with each of the seven Analytic widgets in the next section under the “Analytics Summary”.

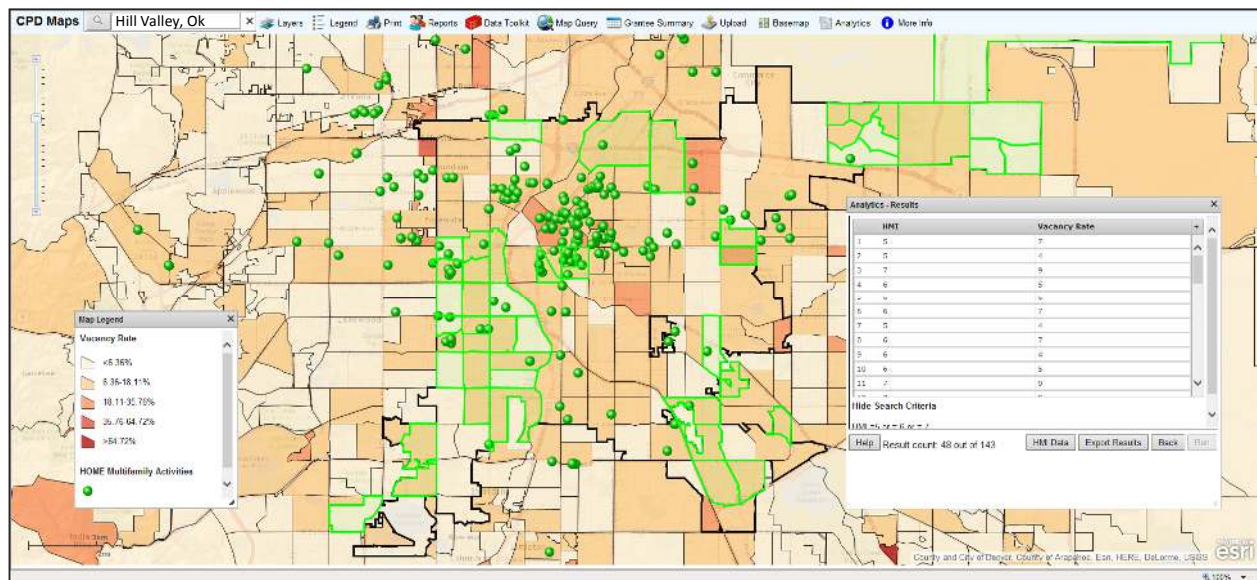
The variables used to query the database are also revealed in the Analytics Toolbox, as seen at the right. The default setting in this example, HMI = 5 or = 6 or = 7, and vacancy rate under 10% refers to the selection of only those Census tracts that are “5”, “6”, or “7” markets in the Housing Market Index with modest to lower levels of vacancy. For a full description of each of the Analytics reports and how to apply this tool, refer to the following section on interpreting the Analytics.

The screenshot shows the 'Analytics' panel in the CPD Maps application. The current grantee is 'Hill Valley, Ok' and the type is 'Infill Markets'. Under 'Map Layers', both 'Vacancy Rate' and 'HOME Multifamily Activities' are checked. Under 'Query Variables', 'HMI = 5 or = 6 or = 7' and 'Vacancy Rate < 10%' are selected. The 'Area to Search In' is set to 'Grantee Jurisdiction'. At the bottom of the panel, it shows 'Result count: 48 out of 143' and buttons for 'HMI Data', 'Export Results', 'Back', and 'Run'.

The Analytics Widget is designed so users have the capacity to turn on or off the map layers by clicking the listed map data layer. Users can also choose to turn on or off or modify the query variables for the analytics report.

While new users may simply want to use the default settings for the Analytics widget, experienced users who wish to change the default settings will find more details on how and why to make such changes in the next section.

7. Once you have reviewed the default data map layers and query variables, confirm that the jurisdiction is correct and then click “Run” to query the selected Analytics report. (Advanced users can modify the query variables before clicking the “Run” button.)
8. The map will automatically zoom to Census tracts in the target area(s) which meet the threshold requirements for the query variables. These areas are also outlined in light green on the map below.

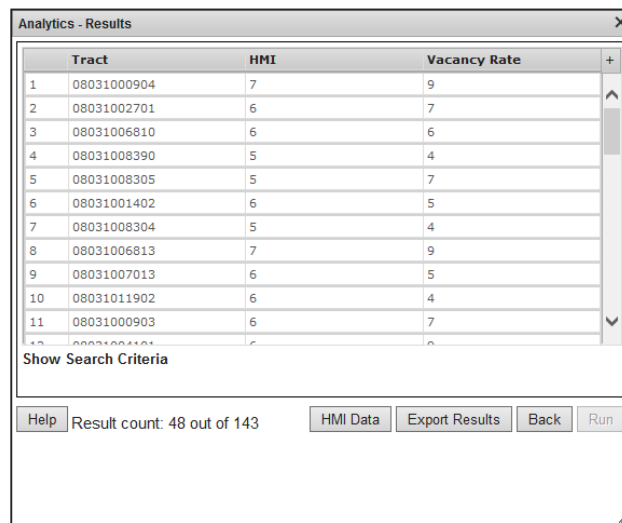


The Hill Valley planning team used the default settings for the “Infill Markets” analytic, clicking “Run” in the Analytics Toolbox to produce the above map of potential areas for infill development. Census tracts which match these criteria in Hill Valley County are now showing on the map in green outlines. The list of these Census tracts, with Census ID and related data inputs for the selected analytic, also appears on the screen in the “Analytics – Results” display. Using this list will help the planning team prioritize and focus their infill development activities. Gathering additional Tract level data through CPD maps, as well as using local data sources at smaller geographies or even parcel levels can serve as the next steps towards implementing a larger infill strategy.

You can find a complete listing of the layers associated with each of the seven Analytic widgets in the next section under the “Analytics Summary”.

9. In addition to CPD Maps highlighting the tracts that met the query thresholds, the Widget also displays the query variable data for these tracts in a table. The total number of Census tracts that meet this threshold are listed in the result count at the bottom of the table.

Users can also export these values and the map as an Excel report by clicking on the “Export Results” button at the bottom of the table. With the list of Census Tract ID’s from the analytic report results, users can gather related data describing an area of interest from additional sources, such as from local municipal databases.



	Tract	HMI	Vacancy Rate	
1	08031000904	7	9	
2	08031002701	6	7	
3	08031006810	6	6	
4	08031008390	5	4	
5	08031008305	5	7	
6	08031001402	6	5	
7	08031008304	5	4	
8	08031006813	7	9	
9	08031007013	6	5	
10	08031011902	6	4	
11	08031000903	6	7	

Show Search Criteria

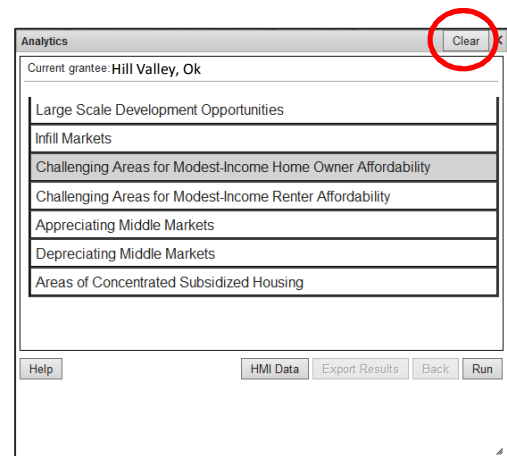
Help Result count: 48 out of 143 HMI Data Export Results Back Run

A zoom in view of the results set of Census tracts from the Hill Valley “Infill Markets” analytic is shown above. The Hill Valley planners will take this list of Census tracts and match it against the locations of past infill activities to see how well the data in CPD Maps matches that of past infill investment strategy. This list of tracts will also serve as a starting point to help prioritize future selection of areas for infill development activity in combination with local knowledge and other related criteria.

SWITCHING BETWEEN ANALYTICS

To move from one Analytics Report to another, users may experience better performance by first clearing the report that is currently open. Simply find the “Clear” button in the upper right hand corner of the Analytics toolbox. Click this button to deselect the current map layers and return the map to only show its basemap.

The Analytics toolbox will also return to its original display, showing each of the seven analytics from which users can choose to display.





V. INTERPRETING THE ANALYTICS WIDGET RESULTS

The prepared Analytics reports help users understand various components of housing and community development markets within their county or region. Each report is comprised of a series of displayed data and variables that are queried to identify specific Census tracts that meet the default or custom threshold levels. A summary table of the default settings for each is listed below.

ANALYTICS SUMMARY

<u>Analytics</u>	<u>Description of Areas Identified</u>	<u>Description of Default Query Variables Used</u>	<u>Map Thematic Backgrounds</u>	<u>Map Point Layers</u>
Large Scale Development Opportunities	Distressed real estate markets with high levels of vacancy that are also nearby, or adjacent to, areas of market strength	<ul style="list-style-type: none"> • HMI Cluster Category is 6 or 7 • Adjacent to strongest markets where HMI Cluster Category is 1, 2, or 3 • Vacancy Rate is greater than 15% 	Vacancy Rate	Transit Stations
				CDBG Economic Development Activities
			100 Year flood plain	CDBG Public Improvement Activities
				CDBG Public Service Activities
Infill Markets	Areas of modest distress with lower than typical levels of vacancy	<ul style="list-style-type: none"> • HMI Cluster Category is 5, 6, or 7 • Vacancy Rate is less than 10% 	Vacancy Rate	HOME Multifamily Activities
Challenging Areas for Modest-Income Home Owner Affordability	Markets in the middle where home prices went up faster than income	<ul style="list-style-type: none"> • HMI Cluster Category is 3, 4, or 5 • Difference between % Change in Median Home Value (2000-2010) and % Change in Median Household Income (2000-2010) is greater than 50% 	% Owner Occupied Units Affordable to 80% HAMFI	HOME Multifamily Activities
Challenging Areas for Modest-Income Renter Affordability	Markets in the middle where rents went up faster than income	<ul style="list-style-type: none"> • HMI Cluster Category is 3, 4, 5 or 6 • Difference between % Change in Rent Value (2000-2010) and % Change in Median Household Income (2000-2010) is greater than 30% 	% Renter Units Affordable to 80% HAMFI	HOME Multifamily Activities

Appreciating Middle Markets	Middle of the market on an upward trajectory	<ul style="list-style-type: none"> ● HMI Cluster Category is 4, 5, or 6 ● % Change in Median Home Value is greater than 75% 	Change in Median Home Value	
Depreciating Middle Markets	Middle of the market on an downward trajectory	<ul style="list-style-type: none"> ● HMI Cluster Category is 4, 5, or 6 ● % Change in Median Home Value is less than 35% 	Change in Median Home Value	
Areas of Concentrated Subsidized Housing	Places where subsidized rental housing is a relatively large portion of all rental housing	<ul style="list-style-type: none"> ● HMI Cluster Category is 5, 6 or 7 ● % of Subsidized Rental Housing Units is greater than 35% 	% of Structures with 20 or more units	LIHTC Properties
				CDBG Economic Development Activities
				Transit Stations

INTERPRETING THE ANALYTICS REPORT

Each Analytics Report offers valuable data and analysis to support grantees and planners in identifying community needs and conditions and establishing potential target areas for different housing and community development activities.

The descriptions below provide a profile of each Analytics Report, what it helps assess and determines and how it can be applied to the planning process.

(1) Large Scale Development Opportunities- This analytic helps to identify a specific type of distressed real estate markets. The areas that will be highlighted in this analytic are distressed real estate markets with high levels of vacancy that are also nearby, or adjacent to, areas of market strength. Such unique proximity can provide market strength upon which to build momentum in your target, distressed market. Identifying these areas through this analytic's data-based lens can guide users who are considering market interventions at a larger scale.

In areas where distress and high vacancy are both found, transforming the market often requires large and catalytic investments. Large scale investments may have a higher chance of successfully impacting positive change, whereas small-scale investments would be lost and ineffective at improving a market.

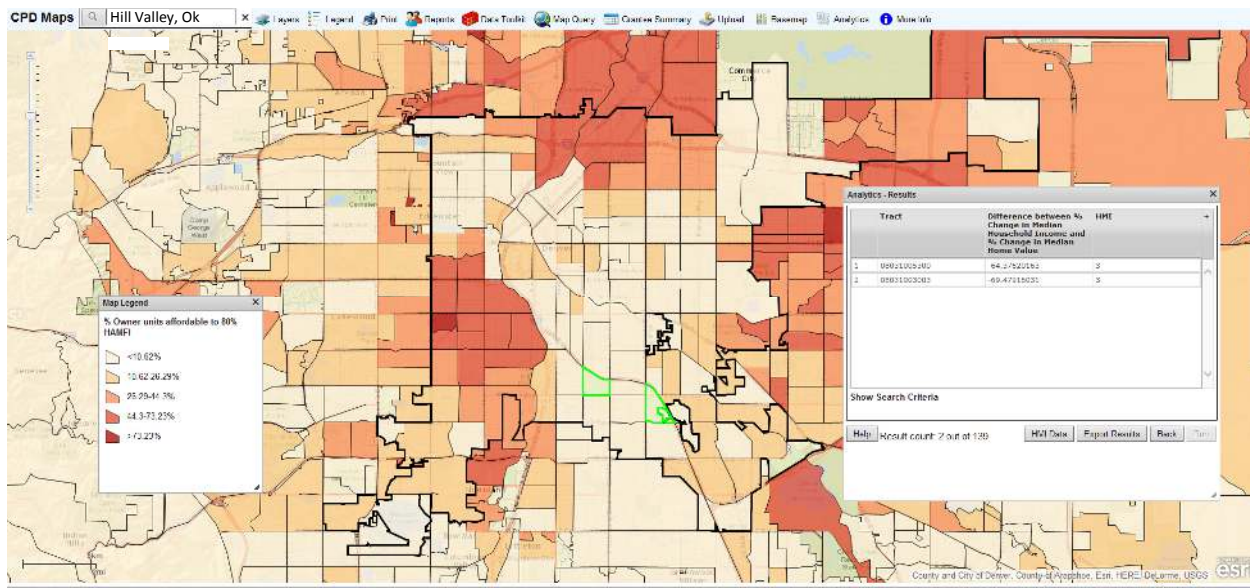
One thing that can differentiate distressed markets with elevated vacancy is a node of strength. In this analytic, we use a distressed market's adjacency to a strong real estate market as a potential node of strength. Accordingly, areas in this analytic are identified as those **markets with a "6 or 7" Housing Market Index classification type with elevated levels of vacancy (15%+)** that are also **adjacent to a region's strongest markets (1 and 2 markets)**. Local knowledge should be utilized to confirm the identified connectivity between markets. That is, the adjacent market may be separated from the distressed market by an Interstate or a railroad track and thus the apparent adjacency on the map will not likely impact the distressed market on the ground.

In summary, the map's thematic layers for this analytic are the vacancy rate and the 100-year floodplain layers. Points on the map represent potential nodes of strength - transit stations and prior CDBG investment activity (economic development, public improvements and public service). Each of these was selected to further describe condition (i.e., vacancy rate), limitations (i.e., floodplain) and potential assets (e.g., prior CDBG investments).

(2) Infill Markets- The second analytic also focuses on a specific type of distressed real estate markets. Places that have some modest distress but also have lower than typical levels of vacancy are markets where infill housing may be more appropriate. In contrast to the previous analytic, these are areas where small scale investments could be most impactful by resolving the issues destabilizing a local market.

The guiding logic is that this analytic helps to identify places where spot rehab work or small-scale new construction could stabilize the market, given that vacancy rates are already relatively low. Using a data-driven approach, this analytic includes **market areas with "6" and "7" Housing Market Index classifications** where **vacancy rates are less than 10%**.

The thematic layer displayed on this map analytic is the vacancy rate, with the point layer of HOME multi-family activities.



An example of the analytic “Challenging Areas for Modest-Income Home Owner Affordability” from Hill Valley.

(3) Challenging Areas for Modest-Income Home Owner Affordability – In this analytic, the focus shifts away from distressed markets and begins to emphasize areas in middle markets. Specifically, the attention of this analytic is on affordability in the middle markets of the Housing Market Index. The focus here too is on maintaining a population profile of relatively similar income levels.

These may be areas of concern for users when considering rapid market change and the effects of rapid change on long-time residents in an identified area. Low and moderate income residents, including older adults, may be disproportionately affected by rapid change in their areas. Identifying these challenging areas for affordability through a data-driven approach can assist in targeting specific interventions to a particularly vulnerable area, especially those which support members of vulnerable communities to thrive in place.

Accordingly, identified markets are those in the middle (**“3”, “4”, and “5” market-types**) and where the difference between **the percent change in median home value (2000-2010)** and **the percent change in median household income (2000-2010)** is greater than 50 percent (i.e., home prices went up substantially faster than resident income).

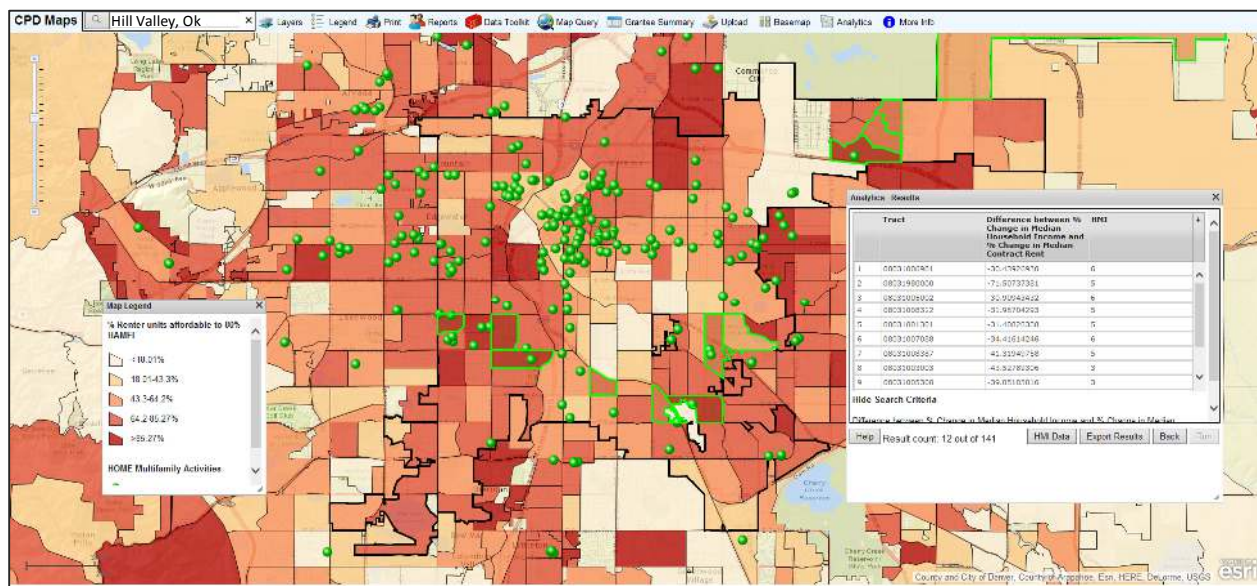
As the thematic layer, the map shows the percent of owner occupied housing affordable at 80% HAMFI. The point layer shown is HOME multi-family activities.

(4) Challenging Areas for Modest-Income Renter Affordability – This analytic focuses on middle market areas as well. Similar to the previous analytic, this one seeks to identify areas which may be experiencing rapid change. In contrast to the prior analytic, this analytic hones in on renter affordability rather than owner affordability.

Again, areas captured by this analytic may be of concern for users when considering the effect of rapid market change on residents who are renting in an identified area. As noted before, low and moderate income residents, including older adults, may be negatively affected by rapid change. Using data to identifying challenging areas for renter affordability can help target interventions specific to moderate income renters and thereby support housing stability.

To reflect challenges for renter affordability in middle markets of the Housing Market Index, markets identified in this analytic are ones in the middle (**“3”, “4”, “5”, and “6” market-types**) where the difference between **the percent change in median rent (2000-2010) and the percent change in median household income (2000-2010) is greater than 30 percent** (i.e., rent went up substantially faster than resident income). Market level “6” is included in this analytic as well, as “6” markets tend to have relatively greater percentage of renters.

As the thematic layer, this analytic shows a map layer with the percent of renter occupied housing affordable at 80% HAMFI. The point layer displayed is HOME multi-family activities.



An example of the analytic “Challenging Areas for Modest-Income Renter Affordability” from Hill Valley.

(5) Appreciating Middle Markets – Continuing the focus on middle markets, in this analytic, the focus is on those markets in the middle of the Housing Market Index range. Markets highlighted by this analytic are places that are in the middle of the market but on an upward trajectory. This analytic removes median household income, which was included as a variable in the two previous analytic measures, and focuses exclusively on the changing housing market data.

These are places that show signs of market strength and at the same time may be places where modest and middle income homeowners may find it difficult to obtain housing. Users may consider how best to leverage and build upon such market strength from the perspective of a neighborhood or jurisdiction, while also providing intervention support to individual residents who may be negatively impacted by rapid market growth.

Thus, areas in this analytic are identified as **“4” and “5” market-types** where the **percent change in median home value (2000-2010) is greater than 75%**. The thematic layer is the percent change in the median home value.

(6) Depreciating Middle Markets – This analytic is the flip side to the one above it. While the focus continues to be on markets in the middle of the HMI range, this analytic highlights markets in the middle but on a downward trajectory.

These are places where middle markets are experiencing challenges. Users of this analytic may want to explore these areas further as to the source of the challenges. When coupled with appropriate program/resource delivery, such interventions might serve to stabilize these middle market areas before the market deteriorates further.

To summarize the criteria of this analytic, identified areas are **“4” and “5” HMI markets-types** where the **percent change in median home value (2000-2010) is less than 35%**. The thematic layer is the percent change in the median home value.

(7) Areas of Concentrated Subsidized Housing- This analytic points to those places where subsidized rental housing represents a relatively large portion of all rental housing. These are places where the policy objective of deconcentrating poverty may be challenged as more than one-third of the rental stock is publicly subsidized.

Public policy over the last several years has stressed a more even distribution of assisted rental housing so that tenants are able to avail themselves of the many housing and non-housing related opportunities in non-concentrated areas. By identifying areas of concentrated subsidy, this analytic may detect areas for which additional services, ranging from social services to transportation routes, may be targeted to support residents' and communities' well-being. This analytic also provides relevant information for users who are evaluating future rental subsidy applications, with the goal of achieving a more geographically distributed set of rental subsidy programs.

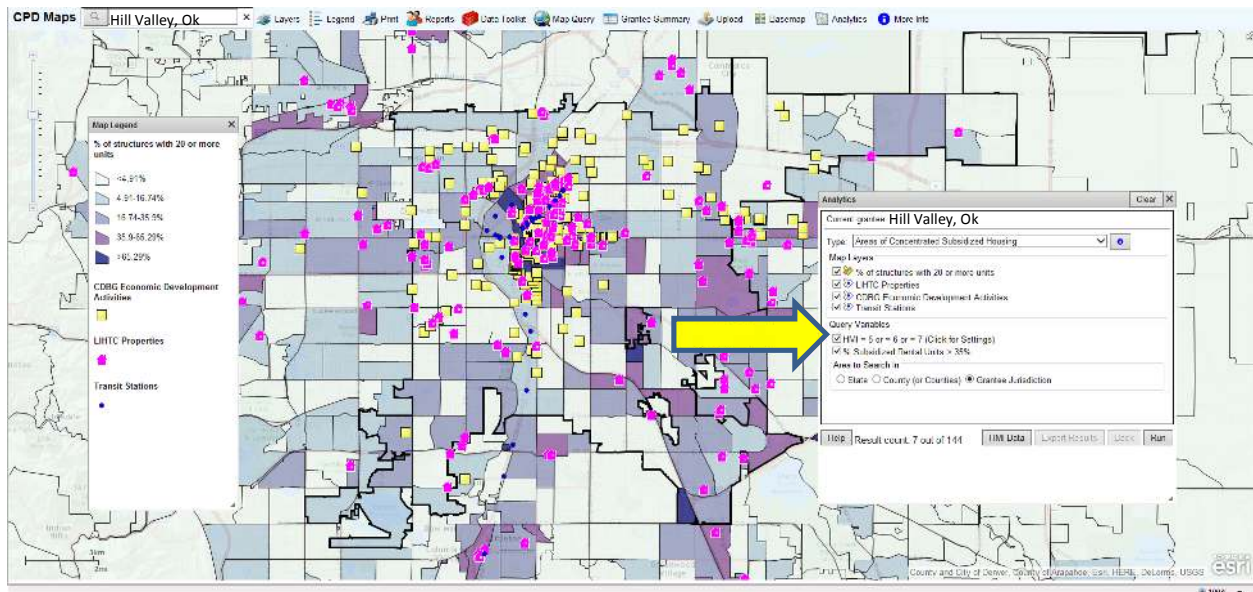
Highlighted areas in this analytic are those where the market types are showing signs of distress (**"5", "6", and "7" market-types**) and where **the number of subsidized rental housing units divided by all rental occupied units is greater than 35 percent**.

As the thematic layer, the percent of structures with 20 (or more) housing units is shown. For the point layers, there are locations of LIHTC properties, CDBG economic development activities and transit stations.

CHANGING DEFAULT SETTINGS FOR QUERY VARIABLES

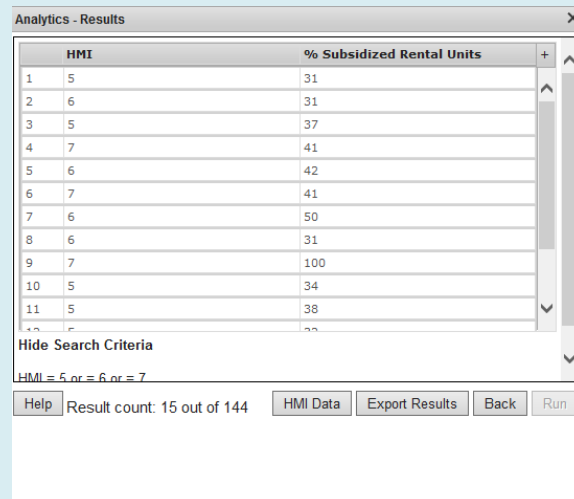
Users may find that the default settings of any Analytics Report may not serve their local needs. This may happen if very few or a very large number of Census tracts are returned after running a report. For example, if no areas have been identified as potential infill housing areas when experience suggests that there are places where this activity has and should be impactful in the market, then you may want to consider changing the default settings. On the other hand, if too many tracts in a jurisdiction are highlighted as appropriate when experience suggests that many of those places are not appropriate for infill housing, then this may also be a scenario to change the default settings as well. Therefore, users are encouraged and able to customize the settings for the query variables to best fit their needs based on evidence-informed experience.

The Hill Valley planners began by selecting and running the analytic with the default settings for the “Areas of Concentrated Subsidized Housing” analytic. However, in Hill Valley, this analytic only returns 7 out of 144 Census tracts, which seemed relatively low based on their local knowledge of concentrated subsidy. To include more tracts and widen their search process, the Hill Valley planning team decided to lower the threshold for “% Subsidized Rental Units”, which is one of the query variables for the “Areas of Concentrated Subsidized Housing” analytic.



Within the Analytics toolbox, the Hill Valley staff found the section marked “Query Variables,” as shown in the image above. In this particular analytic for “Areas of Concentrated Subsidized Housing”, there are two query variables. They are “HMI = 5 or = 6 or =7” and “% Subsidized Rental Units > 35%”. This statement means that when the query is run, it will highlight those tracts that fall in market types “5”, “6”, or “7” in the Housing Market Index and which also have a rental subsidy percentage greater than 35% of the total rental units.

The Hill Valley team elected to lower the “% Subsidized Rental Units” variable from “greater than 35%” to “greater than 30%” in order to expand the search criteria for “Areas of Concentrated Subsidized Housing”, based on their knowledge of local subsidized housing placements. Following the instructions below, they toggled the down arrow in the Analytics-Configuration box to change the threshold level. Once the value reached 30%, the Hill Valley team clicked the “Run” button to see an updated results set.



	HMI	% Subsidized Rental Units
1	5	31
2	6	31
3	5	37
4	7	41
5	6	42
6	7	41
7	6	50
8	6	31
9	7	100
10	5	34
11	5	38

Hide Search Criteria
HMI = 5 or = 6 or = 7

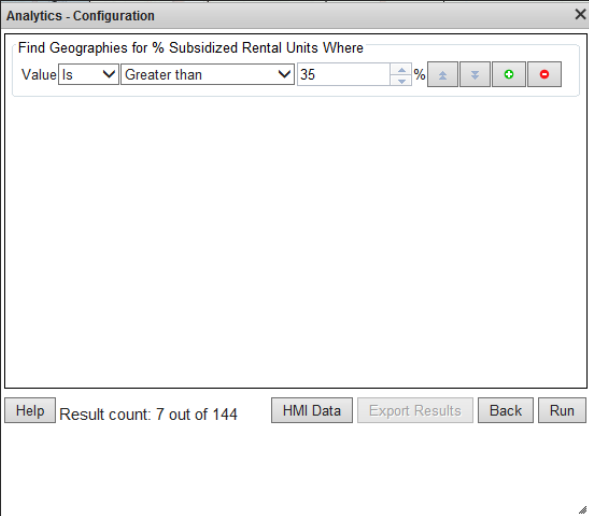
Help Result count: 15 out of 144 HMI Data Export Results Back Run

Now 15 Census tracts are included in the search results, up from the original 7 Census tracts found while using this Analytics default settings. This expanded list of 15 tracts is more in line with the team’s expected areas of concentrated housing subsidy, which they will use going forward in their work to disburse subsidy more evenly.

To change the default settings, follow the steps described below. These directions can be applied to any of the seven Analytics Tools.

1. Within the Analytics toolbox, hover the mouse over the relevant Query Variable (in this case the “% Subsidized Rental Units” variable). The words “(Click for Settings)” will appear next to the variable name. Once “(Click for Settings)” appears, click the variable name to open the Analytics configuration, as shown as the right.

2. Within the Analytics – Configuration box, you can adjust the setting of the variable which you have selected. To make adjustments, you can start by changing the original threshold value by using the up and down toggle arrows to the right of the value display. You can make more involved changes to a query by opening the drop down toolbars to change the values from “greater than”, “less than”, or “equal to”. These are made available for more advanced users of the tool.



Gradual adjustments which fine-tune the default variables are recommended. Making large adjustments may end up including too many or too few tracts to make the search results meaningful.

Once all the Query Variables are fine-tuned to the user’s satisfaction, click on “Run” to return an updated result set that matches the new criteria.



VI. TECHNICAL APPENDIX

Using raw data to make universal comparisons of housing markets across the nation presents challenges, as housing markets are very different and can vary by prices, foreclosure levels, and vacancy rates from region to region. To address this potential obstacle in the Housing Market Index, the six input data variables are first standardized. To begin the standardization process, Census tracts within the same Core Based Statistical Area (CBSA) are identified, and tracts which do not fall within any CBSA are noted as rural tracts. These rural, non-CBSA tracts are then grouped by state. Next, average values for each of the 6 input variables are calculated within each CBSA or state rural region. Finally, these regional averages are used as a benchmark against which to compare all Census tracts in each region. From these final comparisons against the regional CBSA average, the standardized version of each variable are then calculated for each Census tract, relative to the average value in that particular region. Management of this database was performed using Microsoft SQL server.

Data Components	Description	Source of Data
Median Sales Price	Median home sales price for the years 2010 through Q2, 2013.	RealtyTrac 2010-2013
Coefficient of Variance of Sales Price	Coefficient of variance of home sales prices for the years 2010 through Q2, 2013.	RealtyTrac 2010-2013
Percent Foreclosures	The number of mortgage foreclosures 2010 through Q2, 2013 over the number of housing units.	RealtyTrac 2010-2013
Percent of Housing Units that are Owner Occupied	The number of owner occupied housing units over the number of occupied housing units, 2010.	US Census, 2010
Percent of Housing Units that are Vacant	The number of vacant housing units 2010 through Q2, 2013 over total housing units.	HUD/USPS, 2010-2013
Percent Subsidized Rental	The number of subsidized rental units 2010 through Q2, 2013 over total rental units.	HUD, 2010-2013

After each Census tract's data components have been standardized against regional averages, tracts are then run through a statistical clustering analysis to assign Housing Market Index values to each tract. The statistical clustering technique is a method to group cases, in this instance Census tracts, based on all of their characteristics. From the analysis of each tract's standardized data, tracts that are the most similar, statistically speaking, are placed in the same group. The number of different groups is predetermined. The cluster analysis was performed in The R Project for Statistical Computing.

In certain instances, tracts were not included in the HMI analysis. This removal of tracts was often due to a lack of data in certain areas or localities, especially in more rural settings. Home sales data and mortgage foreclosure data were often the most limiting data points. Tracts without data for all 6 of the data components could not be run through the cluster model and were removed from the HMI analysis as a result. Additionally, tracts with fewer than 50 households were also removed from the analysis. This minimum threshold for number of households was selected to ensure that the housing data would not be inappropriately influenced by areas with a small number of housing data points, many of which are not fully residential (e.g., some Census tracts are actually parks or airports with no – or few - residents). This combined filtering resulted in about 20% of the nation's Census tracts being removed from the analysis out of an initial universe of 74,002 possible tracts.

While the Housing Market Index has a number of strengths, users should be aware of several limitations to get the most out of your data use. These limitations include:

1. The regional variation that exists across various housing markets, thus our standardizing data within regions. Notwithstanding our standardizing data to its region, it is important to remember that while the Housing Market Index scale is the same "1" to "7" range across the nation, you should resist the temptation to compare markets across regions. Put another way, the sales prices for "1" markets in Manhattan will be much different than the sales prices for "1" markets in Wichita, Kansas, even though "1" markets in both regions will be at or near the top of the sales price data for their respective area.
2. The Housing Market Index uses Census tracts as the geographic level to balance granular analysis without overwhelming user and data capacity. While Census tracts are common geographies for data planning and visualization, you should note that in many instances within Census tracts, local variation could be better captured by examining data at even smaller geographies, such as Census block groups. Tracts provide an excellent reference for regional analysis, but users are encouraged to dig deeper, combining insights from the Housing Market Index with local knowledge, especially when contemplating

activities that require drilling down below the tract level to block group, block and specific parcels / properties.

3. The analysis results are not locally verified nationwide. While limited results-testing has been conducted in a number of local areas, performing systematic on-the-ground verification of results is limited by the national scope that the Housing Market Index covers. Traveling to all localities across the nation was unrealistic. Therefore, users again are encouraged to supplement insights from the Housing Market Index in the larger context of their knowledge of the local housing market.
4. As was just mentioned, the Housing Market Index lacks universal coverage. While the index's scope includes a wide range of geographies and market types, instances occur where insufficient data is available to perform the analysis.