Real Estate Value Impact Study

For

Proposed Wireless Communications Facility
New Cingular Wireless, PSC, LLC, d/b/a AT&T Mobility
Site Name: Headley Hollow
Project #: 21CELL0001
Assessor Parcel Numbers: 1054-0013-0000 and 1054-0221-0000
4513 Blevins Gap Road
Louisville, Jefferson County, Kentucky 40272

Date of Report:

February 25, 2021

Prepared For:

Louisville Metro Planning Commission
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Prepared By:

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February 25, 2021

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Finding Answers to Real Estate Questions

Louisville Metro Planning Commission
444 S. 5th Street
Louisville, Kentucky 40202

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Commissioners:

I have completed an impact study regarding potential influence of wireless communications tower facilities on market value of surrounding properties. The study consists of analyzing sale activity and value trends of properties located in proximity to tower structures and tower systems, as compared to properties which are not in proximity but are otherwise competitive as replacements in the market.

Public utilities provide a platform for economic sustainability, community growth, safety and education. These factors in turn influence value and demand for real estate. Based on the actions of buyers, occupants, and sellers of real estate, it is clear that communications towers are part of this platform. There are no indications for value diminution of properties with suburban or low-density residential and recreational characteristics similar to the project neighborhood, or neighborhoods in general. Consistently, factual market evidence shows this type of facility has not, and does not, negatively impact surrounding property, and supports the positive influences on value and demand for real estate.

The attached report is a summary of the research and analysis performed. Thank you for the opportunity to present this information. Please contact me if you have questions or comments.

Respectfully,

Glen D. Katz

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Summary of Facts and Conclusions

Problem Identification

Proximity impact is a frequent question in real estate. In the course of studying value influence due to proximity of private or public utility facilities to residential, commercial and agricultural properties, I have performed impact analysis on wireless communications tower facilities, high-voltage overhead transmission lines (HVOT), storage towers, oil pipelines, agricultural facilities, and federal interstates. For this report, the analysis consists of analyzing value trends of properties in proximity to public utility tower facilities.

Residential and commercial properties, whether urban, suburban or rural, and agricultural properties, follow similar demand patterns. In a 2012 study article published in *The Appraisal Journal* 80, (no. 1 (Winter 2012): 30-45), James A. Chalmers identifies three general characteristic that drive property sensitivity to price effects:

- use;
- size; and
- uniqueness.

Non-suburban, rural residential and commercial properties are often part of agricultural or recreational environments. Site sizes are larger, or they may be adjacent to large land parcels. They are also unique; because of the low-density development characteristics, there are fewer available, and even fewer available with specific classes of features such as site size, quality, floor plan, or auxiliary buildings. Low density development area properties are similar to urban and suburban properties in terms of use, but are superior in the sensitivity categories of site size and uniqueness/scarcity. In summary, they share the same use characteristics, but are more resilient than other residential and commercial categories.

In this study, urban/suburban residential properties are researched because of their high sale volume, and because they would be the first to show sensitivity. As illustrated, these properties and their values are not adversely sensitive to, and are not negatively impacted by, wireless communications tower facilities. Respectively, rural residential, agricultural, recreational, and commercial properties follow the same pattern.

Facility Identification

The facility will be in a low-density residential and recreational area. The construction improvements will be comprised of a 195’ monopole structure with 4’ lightning arrestor, totaling a structure height of 199 feet. Base elevation will be ~593 feet. The construction will be located on a generally 100’ x 100’ leased site area with a 65’ x 75’ fenced compound. There will be supporting storage cabinets, treed buffering, and gravel ground cover. There will be space for co-location of other wireless service providers in the facility. The facility will be accessed by a gravel covered easement driveway extending from the north side of Blevins Gap Road. These characteristics comprise the most common features of wireless communications facilities in similar areas of the United States.

Study Methodology

This impact study consists of studying real estate value trends at existing tower locations. The methodology is comprised of;

- paired sales and sale/resale analyses, focusing on measurement of value change due to market conditions, and;
- direct comparison of properties with, and without, distance or view proximity exposure.

Specifically, the following steps form the analysis:

- Identify existing tower locations with surrounding developed land uses.
- Examine the neighborhood and market area to determine if there are compatible and competing properties with adequate sale activity to provide reliable and valid results.
- Categorize property sales by proximity characteristics for measurement of influence: A distance of 500' to 750' is the threshold of measure for the close-proximity category, depending on the topography and direction of development characteristics. At further distances, the category changes to non-proximity, as tower views become blurred or obscured by trees, roofs, or topography. Other skyline features of power lines, towers, or tanks also absorb tower view.
- Track value change over time for the two proximity categories and compare the results to determine if there is a difference due to tower facility exposure, or;
- Track value change of properties before and after a tower facility is constructed. Then compare results to determine if there is a difference between the two categories attributed to tower facility exposure.

Based on the data and analysis for tower projects like the subject; values and rates of value change for proximity and non-proximity properties are similar. There is no compelling evidence that either the anticipation of, or the existence of, tower facilities negatively impacts surrounding property values. This is not unexpected. Market forces that drive real estate value also create complimentary demand for public utility projects. These market forces are discussed as follows:

- **Social Forces:** Social forces are influenced by; population, education, and lifestyles. There is an exponential increase in digital data, and the public demands satisfying that need as part of the core supply of public services. In particular, cellular service is essential infrastructure and has become a predominant function in businesses, schools, and social services. Regarding U.S. households, over 59% are served solely by cellular phone service, and only 2.5% of households have only landline service. Over 70% of children live in homes with only cellular service, and less than 1% live in homes with only landline service. Regarding emergency services, over 70% of emergency calls are made with cellular phones. As a result, anything less than consistent in-building service is detrimental to value and demand for real estate.

- **Economic Forces:** Economic forces are influenced by; employment, wages, business, schools, and regional community development. Communications facilities are required for education and efficient and competitive diversification of work forces. Cellular service has a direct connection to economic development. Cellular signal capacity creates a significant number of positive externalities for its users and their communities.

- **Governmental Forces:** Government responds to community needs for, laws and policies, public services, zoning, and building codes. Many jurisdictions have comprehensive plans requiring government agencies to expand public utilities and services. The regulations enabling public utilities are a direct reaction to public needs, particularly for education, economic purposes, and health and safety services. Another major impact of governmental influence in expansion of public services is developing wider choices of service providers and related fee competition in the private sector. This helps erase the digital divide problem, which is the economic gap between those who have adequate access to services and those who do not. This gap is influenced by income, location, and level of education among other factors, and can affect further development in areas where the divide exists.

- **Environmental Forces:** Environmental forces are the final determining factor. They deal with climate, topography/soil, natural barriers, transportation systems and linkages, and the nature and desirability of the neighborhood surrounding a property. These forces shape population location, growth, and where supporting infrastructure will be most effective and valuable as a resource.

Market Concepts for Property Ownership

Frequently, concepts regarding property rights, property insurability, and property mortgage are topics for questions and discussion from property owners regarding value influences. In summary, the following information is provided for insight.

Property Rights: In regard to property rights, owners near cell tower facilities retain all rights normally associated with ownership. There are no additional easements, encroachments, or use restrictions on surrounding properties.

Insurability: In regard to insurability, there are no insurability risk changes to physical property, ownership, or insurance availability or cost. Interviews with property owners, insurance professionals, lenders, and title companies, confirms there are no conflicts on availability or premiums for physical property or title insurance for properties located near cell towers.

Mortgage Terms: The following national programs influencing mortgages have been researched to determine status of cell towers in relation to mortgage financing. In regard to lending, there is no influence on mortgage availability or terms.

FHA: Federal Housing Administration (FHA) through the Dept. of Housing and Urban Development (HUD), provides mortgage insurance on loans made by FHA-approved lenders throughout the U.S. It is the largest insurer of mortgages in the world. FHA has minimum loan program property standards contained in *HUD Handbook 4000.1*. In particular, there is a section on 'Externalities' and requirements for property compliance. Externalities are identified by FHA/HUD as off-site conditions that have an adverse influence on a property, such as heavy traffic, special airport hazards, proximity to high pressure gas lines, high voltage electric overhead transmission lines and local distribution lines, smoke, fumes, and other offensive or noxious odors, and stationary storage tanks.

Cell towers are not identified or mentioned as a specific hazard for surrounding properties by FHA/HUD. Cell towers are not a specific criterion for hazard analysis in obtaining FHA/HUD funding insurance for mortgage lenders.

VA: Veterans Administration (VA) helps Servicemembers, Veterans, and eligible surviving spouses become homeowners. VA provides home loan guaranty benefits and other housing-related programs to help buy, build, repair, retain, or adapt homes for occupancy. VA Home Loans are provided by private lenders, such as banks and mortgage companies. VA guarantees a portion of the loan and lowers risk as a result, enabling the lender to provide the borrower with more favorable terms.

VA guidelines (Chapters 10 and 12) identifies *HUD Handbook 4000.1* as the resource for minimum property requirements. An addition, in reiterating hazard issues in the VA guidelines, cell towers are not identified or mentioned as a specific hazard for surrounding properties. Cell towers are not a specific criterion for hazard analysis in obtaining VA loans.

USDA: United States Department of Agriculture (USDA), through its Rural Development program (RD), assists approved lenders in providing low- and moderate-income households the opportunity to own adequate, modest, decent, safe and sanitary dwellings as their primary residence in eligible rural areas. The program provides loan guarantees to approved lenders in order to reduce the risk of extending 100% loans to eligible rural homebuyers. USDA publishes *Handbook 3550 (HB 3550)* containing minimum property requirements for USDA loan programs. Cell Towers are not included for consideration. Cell towers are not a specific criterion in hazard analysis for obtaining loans under USDA/RHS programs.

FNMA: Federal National Mortgage Association (FNMA), aka Fannie Mae, is a government-sponsored enterprise (GSE). Fannie Mae purchases and guarantees mortgages made to borrowers via the secondary mortgage market, creating liquidity for Banks and Credit Unions. The mortgages it purchases and guarantees must meet strict criteria. Its "*Selling Guide*" publication is a primary information guide for secondary mortgage market lending. The *Selling Guide* does not include cell towers for any specific analysis in the publication. Cell towers are not, and historically have not been, a hazard criterion in analysis for obtaining mortgage loans that will be purchased by Fannie Mae.

FHLMC: The Federal Home Loan Mortgage Corporation, (FHLMC), aka Freddie Mac, is a government-sponsored enterprise (GSE). Freddie Mac purchases and guarantees mortgages made to borrowers via the secondary mortgage market, creating liquidity for Banks and Credit Unions. The mortgages it purchases and guarantees must meet strict criteria. Its "*Seller/Servicer Guide*" publication is a primary information guide for secondary mortgage market lending. The *Seller/Servicer Guide* does not include cell towers for any specific analysis in the publication. Cell towers are not, and historically have not been, a hazard criterion in analysis for obtaining mortgage loans that will be purchased by Freddie Mac.

In addition, national, regional, local, and private sources of mortgage financing for commercial, industrial, agricultural, and residential property, have similar guidelines. In summary, cellular tower structures are not identified as a hazard criterion in making mortgage loan decisions.

Study Analysis Conclusions

As illustrated by study results, both in this report and in published studies nationally, the forces of value are consistent. Public utilities and related services are essential to meeting current and future requirements for standards of living. Public utilities and services, by nature, expand to meet demands of expanding population and community growth. The benefits of communication facilities for economic and community development are clear. Without adequate services, there will be a tendency for decreasing demand and property values in a neighborhood. Where services already exist, coverage and data capacity may need to be adjusted due to population changes. As a result of meeting population needs, telecommunications facilities have become a common part of the landscape in the same way that power, telephone, and other utilities have. Like all utilities, there is requirement for telecommunications facilities in strategic locations in any community.

Property owners near tower facilities, highly visible utility structures, associated easements, etc., are not penalized on value. There are no changes to ownership rights. Insurability is not affected. Mortgage terms to buyers and owners are not influenced. Consistently, communications tower structures, like overhead electric distribution lines, signage, and buried utility easements, are beneficial. Due to expanding utilities and increased services, residential, commercial and agricultural neighborhoods and properties experience positive influences. Because of the deployment of cellular facilities over the past several decades, owners and buyers of real estate expect excellent cell phone reception, and that connectivity requires adequate infrastructure. Cell towers satisfy demand and are visibly absorbed by the landscape of a neighborhood and lifestyles of the population. Cell towers are much like other modern infrastructure. Although cell towers may be noticed initially, they quickly fade into the background and have no negative effect on value – just as telephone poles, utility lines, streetlights, and the other visible infrastructure components of modern life do not negatively affect real estate values.

Consistently, market evidence shows this type of tower facility has not, and does not, negatively impact surrounding property. Market evidence consistently illustrates the positive influences on value and demand for real estate due to expansion of public utilities, which includes wireless telecommunications tower infrastructure.

Report Development – Scope of Work

Extent to which the project is identified

- The project is identified by a site and neighborhood analysis using aerial maps and government census data. Construction plans, aerial maps, and government census data is reviewed. Neighborhood and market characteristics are observed to understand the four forces that affect value:
    - social forces;
    - economic forces;
    - governmental forces, and;
    - environmental forces

Type and extent of the data researched

- Existing tower facilities, wireless communications, high voltage electric overhead transmission, or water tower storage tanks, are identified for analysis based on residential and commercial exposures. In some cases, there are multiple towers involved in a public utility system, such as high voltage electric overhead transmission lines.

Type and extent of analyses applied

Data extraction is available through several econometric methods. Sales of residential properties are tracked to establish rates of change in value due to market conditions, and to determine potential influence from proximity to tower facilities. Comparison is made between value trends of properties in proximity, and without proximity to tower facilities. Three methods of data extraction are discussed:

- First is analysis of "before and after" sale data. This method tracks value trends before and after installation of a tower facility. Property sale data before a facility is installed is compared to sale data occurring after a facility is installed. This method will have limitations when a facility installation occurred in the distant past. Older sales occurring before the installation frequently experience significant changes before they resell in a current market: physical changes such as renovation, updating, addition, and/or economic changes (i.e.; 2007-2009 recession, 2019 pandemic, changes in highest and best use, etc.) In these cases, value change over a long time period is attributed to multiple sources, and allocating value change solely to tower influence would be misleading.

- Next is "unit-value" comparison of properties that are functionally identical in all aspects except proximity. The unit value will typically be price per-square-foot of gross living area (sale price / above-grade living area). The information will reveal any differences between the two proximity categories. While providing excellent evidence, this method has limitations due to the number of property differences and related difficulty in matching properties that are adequately similar with the exception of proximity.

- One of the most common analysis methods is "market conditions" value trend analysis. This compares value trends of properties located with proximity to existing tower facilities, to value trends of properties located without proximity. Rates of value change due to market conditions are compared between the two property types to extract any differences due to proximity to a tower facility.

In all cases, the methodologies allow controlling the physical and locational attributes of the two sets of properties. In this way, price and value effects or differences due to other characteristics of the properties are held constant, and the effect, if any, due to proximity is isolated. For this study, because of the data available, the "before and after" and "market conditions" methods are utilized.

Purpose of Report

The purpose of this report is to develop an opinion of market value impact on surrounding properties from proximity to wireless communications tower facilities.

Intended User of the Report

This report is intended solely for use by Applicant, and the identified governmental review panel for the project, Louisville Metro Planning Commission.

Intended Use of the Report

The intended use of the reported opinions and conclusions is to assist Applicant, and the governmental review panel, Louisville Metro Planning Commission, in making permitting decisions regarding the subject project. This report is not intended for any other use. The undersigned, Glen D. Katz, MAI, SRA, AI-GRS, AI-RRS, recognizes this report will be submitted as part of the public record.

Definition of Value

The research analysis is based on '*market value'* of real estate. The Appraisal Institute's *The Dictionary of Real Estate Appraisal, 6th Edition*, includes the following entry for "market value", which contains the most widely accepted components of market value.

- *The most probable price, as of a specified date, in cash, or in terms equivalent to cash, or in other precisely revealed terms, for which the specified property rights should sell after reasonable exposure in a competitive market under all terms requisite to a fair sale, with the buyer and seller each acting prudently, knowledgeably, and for self-interest, and assuming that neither party is under undue duress.*

Case Study Introduction

The following case studies are developed through researching market activity of residential properties in neighborhoods adjacent to tower facilities. After identification of a tower facility, whether wireless communications, high voltage electric overhead transmission, or water storage tower, sale activity of homes are analyzed. The following recognized methods of data extraction are discussed.

Market Conditions Value Trend Analysis

For projects that have been in place for a long period, market conditions analysis is very applicable. The steps of analysis consist of:

- Research properties with tower proximity that have sold repeatedly in the identified period.
- Determine the periodic rate of market value change, appreciation or depreciation, for properties in the proximity category.
- Research properties in the same neighborhood, without tower proximity, with repeat or back-to-back sales.
- Determine the periodic rate of market value change, appreciation or depreciation for properties in the non-proximity category.
- Compare value change trends between the two groups of properties to extract any value change differences related to proximity influence.

Before and After Method

For projects recently constructed, the before and after method steps of analysis consist of:

- Research residential properties with tower proximity that sold prior to the tower installation, and then sold again after the tower installation.
- Determine the periodic rate of market value change, appreciation or depreciation, for properties in the proximity category.
- Research properties in the same neighborhood without tower proximity that sold prior to the tower installation, and then sold again after the tower installation.
- Determine the periodic rate of market value change, appreciation or depreciation, for properties in the non-proximity category.
- Compare value change trends between the two groups of properties to extract any value change differences related to proximity influence.

Methodology Summary

The time range for sale data is from 2011 to the market prior to the Covid-19 pandemic. This minimizes potential influence from the 2007-2009 recession, and influence from imbalance between supply and demand resulting from the pandemic. In order to track rates of value change during the period, repeat or back-to-back sales of individual residential properties inside and outside a proximity distance range of 500' to 750' from a facility are researched.

In order to focus on the influence market conditions and proximity on appreciation or depreciation, emphasis is placed on properties with stable physical characteristics, and without unusual sale conditions or buyer/seller motivation influences. Specifically, sales involving properties with the following characteristics are discounted from analysis:

- Properties with substantial physical changes that influence value between the initial and subsequent transfers, such as renovation, construction addition, or incursion of deferred maintenance or neglect resulting in unusual physical deterioration and market response.
- Properties with distress socioeconomic characteristics, such as foreclosure, short-sales, auctions, and sales of bank-owned homes.
- Properties with unusual buyer or seller motivations, such as family transactions, estate liquidation, or investor activity in a predominantly owner-occupied market.
- Properties close to interstates and limited access roads are avoided to ensure home sales were not affected by highway access or traffic noise variables.
- In the study, sale price is adjusted by netting out seller-paid concessions if they occur.

If the above types of transfer activity are prevalent in a neighborhood, the facility and neighborhood is removed from consideration. The focus is to measure market activity that is not influenced by unusual property-specific or market-specific characteristics.

The following case studies illustrate analysis for two categories of tower facilities; wireless communications tower facilities and high voltage electric overhead transmission lines (HVOT). Two of the case studies compare rates of value change between proximity and non-proximity properties at existing facilities, and one case study additionally compares values of proximity and non-proximity properties before and after installation of a tower facility. In the case of the HVOT study, there are multiple towers involved in the utility system.

Case Studies

Case Study 1 – This study involves a high voltage electric overhead transmission power line corridor with 100' height lattice construction towers. The corridor traverses a residential single-family and condominium neighborhood. The tower structures and overhead electric lines in this location are located in easements amidst residential subdivision development, crossing a public street in a long diagonal direction, and continuing through residential subdivision development. The tower structures are generally spaced approximately 1,000' apart.

The project was installed pre-1993. The value evidence represents sales and resales of properties within 500' proximity to the facility, and outside 500' proximity to the facility. Rates of value change for each of the categories measured, and the results of the two categories of proximity are compared to analyze any potential impact.

Case Study 2 – This study involves a wireless communications facility adjacent to a residential single-family and condominium neighborhood. The tower structure is 219' height, self-support construction.

Installation of the project occurred in 2002. The value evidence represents sales and resales of properties within 500' proximity to the facility, and outside 500' proximity to the facility. Rates of value change of each of the categories are measured, and the two categories are compared to analyze any potential impact.

Case Study 3 – This study involves a wireless communications facility adjacent to a residential single-family detached neighborhood. The structure is 140' height, monopole construction.

Installation of the project occurred in 2016. The value evidence represents sales and resales of properties within 750' proximity to the facility, and outside 750' proximity to the facility. Rates of value change in each of the categories are measured, and the two categories are compared to analyze any potential impact.

For Case Study 3, it is important to note there are repeat sales of individual properties in each category, before and after installation, that illustrate consistent values and rates of value change.

Case Study 1 – Group 1 (Proximity Sales)

- Facility: High voltage electric overhead transmission power lines and lattice construction towers, residential single-family detached and condominium subdivision location.
- Address: Gutenberg Road, Louisville, Jefferson County, Kentucky
- FCC Identification: N/A
- Year of installation: Pre-1993
- Information source: Maps and individual research
- Neighborhood location: Jeffersontown
- Property Group Identification: Within 500' proximity to facility installation
- Reconciliation: The data represents sale activity beginning 01/01/2013. Each property transferred two or more times in the period. The price difference between transfers of each property is value change due to market conditions. The range of annual value change is 0.84% to 9.10%. The average rate of annual appreciation is 4.07%, and the median or middle point of the range is 4.28%.

Address	Sale Date	Sale Price	% Change	Months	% Change /Month	% Change /Year
4701 Silverado Pl	10/26/2018 11/30/2016	$273,000 $264,000	3.41%	23	0.15%	1.79%
4704 Silverado Pl	9/1/2016 3/21/2013	$270,000 $235,000	14.89%	41	0.36%	4.31%
4709 Stony Brook Dr	5/31/2019 6/8/2017	$195,000 $186,000	4.84%	24	0.20%	2.44%
4723 Ferrer Way	6/15/2018 12/5/2014	$185,000 $140,000	32.14%	42	0.76%	9.10%
4916 Bova Way	4/29/2019 5/30/2014	$193,000 $155,000	24.52%	59	0.42%	4.98%
8804 Loch Lea Ln	12/2/2016 12/6/2013	$149,900 $133,000	12.71%	36	0.35%	4.24%
9319 Villa Fair Ct	5/18/2018 1/22/2015	$174,000 $150,000	16.00%	40	0.40%	4.82%
10509 Vintage Creek Dr	9/11/2015 4/15/2014	$255,000 $252,000	1.19%	17	0.07%	0.84%
			Average		0.34%	4.07%
			Median		0.36%	4.28%

Case Study 1 – Group 2 (Non-Proximity Sales)

- Facility: High voltage electric overhead power lines and lattice construction towers, residential single-family detached and condominium subdivision location.
- Address: Gutenberg Road, Louisville, Jefferson County, Kentucky
- FCC Identification: N/A
- Year of installation: Pre-1993
- Information source: Maps and research
- Neighborhood location: Jeffersontown
- Property Group Identification: Outside 500' proximity to facility installation
- Reconciliation: The data represents sale activity beginning 01/01/2015. Each property transferred two or more times in the period. The price difference between transfers of each property is value change due to market conditions. The range of annual value change is 1.12% to 6.59%. The average rate of annual appreciation is 4.00%, and the median or middle point of the appreciation range is 3.64%.

Address	Sold Date	Sale Price	% Change	Months	% Change /Month	% Change /Year
4310 Lochridge Pkwy	1/14/2016	$195,000	0.52%	6	0.09%	1.12%
4310 Lochridge Pkwy	7/30/2015	$194,000				
4510 Jolynn Dr	6/24/2019	$225,400	12.70%	31	0.42%	4.98%
4510 Jolynn Dr	12/6/2016	$200,000				
5003 Fairwood Ln	3/28/2019	$175,000	21.53%	39	0.55%	6.57%
5003 Fairwood Ln	12/18/2015	$144,000				
5008 Bowcester Dr	3/4/2019	$176,000	21.38%	39	0.55%	6.59%
5008 Bowcester Dr	12/7/2015	$145,000				
5105 Cynthia Dr	1/4/2019	$163,500	7.57%	34	0.22%	2.69%
5105 Cynthia Dr	3/15/2016	$152,000				
8711 Michael Edward Dr	11/13/2018	$175,000	12.54%	44	0.28%	3.39%
8711 Michael Edward Dr	3/4/2015	$155,500				
8902 Loch Lea Ln	8/7/2019	$182,000	10.98%	52	0.21%	2.54%
8902 Loch Lea Ln	4/16/2015	$164,000				
9105 Talitha Dr	2/22/2019	$187,000	5.95%	27	0.22%	2.61%
9105 Talitha Dr	11/14/2016	$176,500				
9115 Marse Henry Dr	5/15/2017	$188,000	13.25%	24	0.55%	6.54%
9115 Marse Henry Dr	5/7/2015	$166,000				
9402 Talitha Dr	9/27/2019	$200,000	11.11%	34	0.32%	3.90%
9402 Talitha Dr	11/21/2016	$180,000				
10202 Saint Rene Rd	5/9/2018	$222,513	11.31%	32	0.35%	4.21%
10202 Saint Rene Rd	9/1/2015	$199,900				
10609 Wildflower Woods Ct	9/4/2019	$248,000	12.73%	54	0.24%	2.84%
10609 Wildflower Woods Ct	3/13/2015	$220,000				
			Average		0.33%	4.00%
			Median		0.30%	3.64%

Case Study 1 Reconciliation

The sale evidence represents sales and resales of residential properties in a neighborhood containing a high voltage electric overhead transmission power lines with lattice construction towers. The tower facility existed prior to construction of homes in the neighborhood. There is volume sale evidence for analysis between 2013 and 2020. The proximity sales show a slightly higher average rate of appreciation, and a slightly higher median rate. The difference is negligible.

Additionally, the average sale price per square foot of gross living area and total living area for each proximity category is illustrated in the following table.

Category	In Proximity	Outside Proximity
Price Per Square Foot Gross Living Area	$124	$121
Price Per Sq. Foot Total Finished Area	$103	$95

The difference between all indications is negligible and not statistically significant. Comparing proximity sales to non-proximity sales in the neighborhood, both categories show a consistent trend of value change, and price based on dwelling size per square foot. In summary, there is no negative value impact from the tower facility.

Case Study 2 – Group 1 (Proximity Sales)

- Facility: Wireless Communications Facility, self-support construction, 219' height, residential single-family detached and condominium subdivision location
- Address: 8400 Bardstown Road, Louisville, Jefferson County, Kentucky
- FCC Registration: 1232839
- Year of installation: 03/7/2002
- Information source: FCC recordings, maps and individual research
- Neighborhood location: Fern Creek
- Property Group Identification: Inside 500' proximity to facility installation
- Reconciliation: The data represents sale activity beginning 01/01/2014. Each property transferred two or more times in the period. The price difference between transfers of each property is value change due to market conditions. The range of annual value change is 0.64% to 3.29%. The average annual appreciation is 2.25%, and the median or middle point of the range is 2.67%.

Address	Sold Date	Sale Price	% Change	Months	% Change /Month	% Change /Year
8503 Missionary Ct	9/27/2018 8/12/2014	$302,000 $268,500	12.48%	50	0.25%	3.02%
8505 Missionary Ct	8/25/2017 4/28/2015	$239,000 $225,000	6.22%	28	0.22%	2.67%
8931 Gentlewind Way	5/15/2018 7/13/2015	$280,000 $275,000	1.82%	34	0.05%	0.64%
8937 Gentlewind Way	3/15/2019 1/8/2016	$282,000 $268,000	5.22%	38	0.14%	1.64%
10619 Glenmary Springs Dr	11/14/2016 11/24/2014	$244,900 $229,950	6.50%	24	0.27%	3.29%
			Average		0.19%	2.25%
			Median		0.22%	2.67%

Case Study 2 – Group 2 (Non-Proximity Sales)

- Facility: Wireless Communications Facility, self-support construction, 219' height, residential single-family detached and condominium subdivision location
- Address: 8400 Bardstown Road, Louisville, Jefferson County, Kentucky
- FCC Registration: 1232839
- Year of installation: 03/7/2002
- Information source: FCC recordings, maps and individual research
- Neighborhood location: Fern Creek
- Property Group Identification: Outside 500' proximity to facility installation
- Reconciliation: The data represents sale activity beginning 01/01/2014. Each property transferred two or more times in the period. The price difference between transfers of each property is value change due to market conditions. The range of annual value change is -0.25% to 3.60%. The average annual appreciation is 2.26%, and the median or middle point of the range is 2.22%.

Address	Sold Date	Sale Price	% Change	Months	% Change /Month	% Change /Year
8607 Sanctuary Ln	3/30/2016 7/25/2014	$245,000 $231,000	6.06%	20	0.30%	3.60%
8622 Sanctuary Ln	12/21/2017 7/13/2015	$265,000 $257,500	2.91%	29	0.10%	1.19%
8627 Sanctuary Ln	10/31/2018 8/5/2016	$279,300 $280,900	-0.57%	27	-0.02%	-0.25%
8728 Broadwood Ct	6/11/2019 2/16/2016	$204,000 $166,000	22.89%	40	0.57%	6.90%
8737 Broadwood Ct	4/29/2019 6/6/2014	$188,900 $162,500	16.25%	59	0.28%	3.31%
8819 Gentlewind Way	5/18/2018 5/22/2015	$255,000 $243,000	4.94%	36	0.14%	1.65%
8903 Gentlewind Way	9/30/2016 8/1/2014	$307,500 $290,000	6.03%	26	0.23%	2.78%
10105 Cedar Garden Dr	11/1/2019 5/30/2018	$299,900 $286,130	4.81%	17	0.28%	3.38%
10500 Parkhurst Ct	8/27/2018 7/14/2017	$220,000 $219,500	0.23%	13	0.02%	0.20%
10502 Gentlewind Ct	2/29/2016 2/19/2014	$270,000 $267,500	0.93%	24	0.04%	0.46%
10504 Providence Dr	10/19/2017 7/3/2014	$254,000 $248,700	2.13%	40	0.05%	0.65%
10614 Providence Dr	9/20/2019 2/18/2014	$290,000 $245,000	18.37%	67	0.27%	3.28%
			Average		0.19%	2.26%
			Median		0.18%	2.22%

Case Study 2 Reconciliation

The evidence represents sales and resales of residential properties in a neighborhood containing a wireless communications tower facility. The tower existed prior to construction of homes in the project. There is volume sale evidence for analysis between 2014 and 2020. The rates of value change between the two categories are consistent. The non-proximity sales show a slightly higher average rate of appreciation, and the proximity sales show a slightly higher median rate.

Additionally, the average sale price per square foot of gross living area and total living area for each proximity category is illustrated in the following table.

Category	In Proximity	Outside Proximity
Price Per Square Foot Gross Living Area	$111	$116
Price Per Sq. Foot Total Finished Area	$99	$108

The difference between all indications is negligible and not statistically significant. Comparing proximity sales to non-proximity sales in the neighborhood, both categories show a consistent trend of value change, and price based on dwelling size per square foot. In summary, there is no negative value impact from the tower facility.

Case Study 3 – Group 1 (Proximity Sales)

- Facility: Wireless Communications Facility, monopole construction, 140' height, residential single-family detached location
- Address: 7200 Woodhaven Road, Louisville, Jefferson County, Kentucky
- FCC Registration: 1298049
- Year/Date of installation: 05/13/2016
- Information source: FCC recordings, maps and individual research
- Neighborhood location: Woodhaven
- Property Group Identification: Inside 750' proximity to facility installation
- Reconciliation: The data represents sale activity beginning 01/01/2011. Each property transferred two or more times in the period. The price difference between transfers of each property is value change due to market conditions. The range of annual value change is 2.79% to 9.47%. The average appreciation is 5.73%, and the median or middle point of the range is 5.58%. Note that sales of 5900 Woodhaven Ridge Court, 5921 Woodhaven Ridge Court, and 6005 Hurstview Road occur before and after the facility installation. The rates of value change are consistent.

Street #	Street	St	Sale Date	Adj Sale Price	Percent Change	Months	% Annual Change
5900	Woodhaven Ridge	Ct	8/22/2011	$180,000			
5900	Woodhaven Ridge	Ct	10/19/2017	$211,000	17.22%	74	2.79%
5914	Woodhaven Ridge	Ct	12/14/2012	$155,000			
5914	Woodhaven Ridge	Ct	8/1/2014	$172,675	11.40%	20	7.00%
5921	Woodhaven Ridge	Ct	12/20/2011	$125,000			
5921	Woodhaven Ridge	Ct	1/24/2013	$138,000	10.40%	13	9.47%
5921	Woodhaven Ridge	Ct	10/22/2014	$148,000	7.25%	21	4.16%
5921	Woodhaven Ridge	Ct	7/25/2018	$187,400	26.62%	45	7.08%
6005	Hurstview	Rd	7/30/2013	$124,900			
6005	Hurstview	Rd	4/20/2018	$148,000	18.49%	57	3.91%
					Annual Average		5.73%
					Annual Median		5.58%

Case Study 3 – Group 2 (Non-Proximity Sales)

- Facility: Wireless Communications Facility, monopole construction, 140' height, residential single-family detached and condominium subdivision location
- Address: 7200 Woodhaven Road, Louisville, Jefferson County, Kentucky
- FCC Registration: 1298049
- Year/Date of installation: 05/13/2016
- Information source: FCC recordings, maps and individual research
- Neighborhood location: Woodhaven
- Property Group Identification: Outside 750' proximity to facility installation
- Reconciliation: The data represents sale activity beginning 01/01/2011. Each property transferred two or more times in the period. The price difference between transfers of each property is value change due to market conditions. The range of annual value change is 2.31% to 7.99%. The average appreciation is 4.97%, and the median or middle point of the range is 5.21%. Note that sales of 7118 Ridge Creek Road, 7102 Ridge Creek Road, and 7403 Covey Place occurred before and after the tower facility installation. The rates of value change are consistent.

Street #	Street	St	Sale Date	Adj Sale Price	Percent Change	Months	% Annual Change
5904	Bluffington	Ct	7/28/2011	$124,000			
5904	Bluffington	Ct	11/21/2012	$130,685	5.39%	16	4.08%
7102	Ridge Creek	Rd	10/3/2011	$135,500			
7102	Ridge Creek	Rd	5/6/2016	$149,900	10.63%	55	2.31%
7118	Ridge Creek	Rd	3/28/2011	$119,000			
7118	Ridge Creek	Rd	3/25/2016	$150,000	26.05%	60	5.21%
7215	Chestnut Tree	Ln	6/10/2011	$131,000			
7215	Chestnut Tree	Ln	11/1/2013	$140,000	6.87%	29	2.87%
7403	Covey	Pl	2/26/2014	$135,500			
7403	Covey	Pl	10/31/2016	$156,000	15.13%	32	5.65%
7404	Covey	Pl	2/8/2013	$109,000			
7404	Covey	Pl	12/30/2015	$130,000	19.27%	35	6.67%
7405	Stone Bluff	Ct	3/28/2017	$190,000			
7405	Stone Bluff	Ct	8/27/2018	$211,500	11.32%	17	7.99%
					Annual Average		4.97%
					Annual Median		5.21%

Case Study 3 Reconciliation

The evidence represents sales and resales of residential properties in a neighborhood containing a wireless communications tower facility. Tower installation occurred after homes were constructed in the neighborhood. There is volume sale evidence for analysis between 2011 and 2020. The non-proximity sales show a slightly higher median rate of appreciation, and the proximity sales show a slightly higher average rate. As noted, properties with sales both before and after the installation date illustrate consistent values trends.

Additionally, the average sale price per square foot of gross living area and total living area for each proximity category is illustrated in the following table.

Category	In Proximity	Outside Proximity
Price Per Square Foot Gross Living Area	$116	$115
Price Per Sq. Foot Total Finished Area	$93	$88

The difference between all indications is negligible and not statistically significant. Comparing proximity sales to non-proximity sales in the neighborhood, both categories show a consistent trend of value change, and price based on dwelling size per square foot. In summary, there is no negative value impact from the tower facility.

Study Analysis Conclusions

As illustrated by market response, both in this report and in published studies nationally, the forces of value are consistent. Public utilities and related services are essential to meeting current and future requirements for standards of living. Public utilities and related services, by nature, expand to meet demands of expanding population and community growth. The benefits of modern communication facilities for economic and community development are clear. Without adequate services, there will be a tendency for decreasing demand and property values in a neighborhood. Where services already exist, coverage and data capacity may need to be adjusted due to population changes. As a result of meeting population needs, telecommunications facilities have become a common part of the landscape in the same way that power, telephone, and other utilities have. Like all utilities, there is requirement for telecommunications facilities in strategic locations in any community.

Property owners near tower facilities, other highly visible utility structures, and associated easements, etc., are not penalized on value. There are no changes to ownership rights. Insurability is not affected. Mortgage terms to buyers and owners are not influenced. Consistently, communications tower structures, like overhead electric distribution lines, signage, and buried utility easements, are beneficial. Due to expanding utilities and increased services, residential, commercial and agricultural neighborhoods, and properties, experience positive influences. Because of the deployment of cellular facilities over the past several decades, owners and buyers of real estate expect excellent cell phone reception, and that connectivity requires adequate infrastructure. Cell towers satisfy demand and are visibly absorbed by the landscape of a neighborhood and lifestyles of the population. Cell towers are much like other modern infrastructure. Although cell towers may be noticed initially, they quickly fade into the background and have no negative effect on value – just as telephone poles, utility lines, streetlights, and the other visible infrastructure components of modern life do not negatively affect real estate values.

Therefore, based on the actions of market participants buying, occupying, investing, and selling real estate properties, consistent market evidence shows this type of tower facility has not, and does not, negatively impact surrounding property, and supports the positive influences on value and demand for real estate due to expansion of public utilities, which includes wireless telecommunications tower infrastructure.

Professional Disclosure

I certify that:

- The statements of fact contained in this report are true and correct to the best of my knowledge and belief.
- The reported analyses, opinions and conclusions are my personal, impartial, and unbiased professional analyses, opinions, and conclusions.
- I have no present or prospective interest in the project that is the subject of this report and no personal interest with respect to the parties involved.
- I have no bias with respect to the project that is the subject of this report or to the parties involved with this assignment.
- My engagement and compensation for completing this assignment is not contingent upon the development or reporting of a predetermined opinion that favors the cause of the client, the magnitude of the opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this report.
- This report complies with applicable sections of the Uniform Standards of Professional Appraisal Practice for Valuation Services and Appraisal Practice: Preamble, Definitions, Ethics Rule, Jurisdictional Exception Rule, Competency Rule.

Glen D. Katz, MAI, SRA, AI-GRS, AI-RRS

Professional Qualifications

Glen Katz has been in the field of real estate analysis for over 25 years. Beginning in both the commercial and residential arenas, he has transitioned to roles as consultant, reviewer, subject matter expert witness, and appraisal practice instructor. As principal of Realty Solutions Co. Inc., relationships have been developed with user-clients, peer appraisers, and appraisal firms. Resulting projects have been performed individually and as coordinating peer groups.

In appraisal practice, Mr. Katz has achieved the Appraisal Institute MAI (general/commercial) designation, and SRA (residential) designation. In specialized appraisal practice, Mr. Katz has achieved the Appraisal Institute appraisal review designations of AI-GRS (general/commercial) and AI-RRS (residential), as well as completing the following Appraisal Institute Professional Development Programs:

- Litigation
- Valuation of the Components of a Business Enterprise
- Valuation of Conservation Easements
- Valuation of Sustainable Buildings: Residential
- Valuation of Sustainable Buildings: Commercial

As a reviewer of appraisals, Mr. Katz serves clients in both the litigation and lending fields. Appraisal review reports are commonly performed under Uniform Standards of Professional Appraisal Practice (USPAP), Uniform Appraisal Standards for Federal Land Acquisitions (Yellowbook), and local jurisdictional guidelines.

As a subject matter expert witness, Mr. Katz has participated in cases regarding land and building damage, proximity influence, insurance claims, property tax assessment, construction defects, divorce settlements, boundary disputes, zoning noncompliance, bankruptcy, and alleged fraud.

As an appraisal practice instructor, Katz is qualified to teach the following Appraisal Institute residential, commercial, and specialized practice classes and seminars.

- Basic Appraisal Principles
- Basic Appraisal Procedures
- General Appraiser Sales Comparison Approach
- General Appraiser Site Valuation and Cost Approach
- Residential Market Analysis and Highest and Best Use
- Residential Sales Comparison and Income Approaches
- Residential Site Valuation and Cost Approach
- Appraisal of Manufactured Homes Featuring Next Generation Manufactured Homes
- Residential Applications: Using Technology to Measure and Support Assignment Results
- Rural Area Appraisals: Freddie Mac Guidelines and Property Eligibility Requirements
- Desktop Appraisals (Bifurcated, Hybrid) and Evaluations
- FHA Appraising for Valuation Professionals: FHA Single Family Housing Appraisal Requirements
- Ignorance Isn't Bliss: Understanding an Investigation by a State Appraiser Regulatory Board or Agency

Areas of appraisal expertise include:

- Commercial, industrial, complex residential, agricultural, special purpose properties
- Appraisal review, commercial and residential
- Proximity impact
- Eminent domain
- Expert witness/litigation support
- Property damages
- Insurance claims and reconstruction cost analysis
- Tax Appeal
- Estate valuation
- Green/high performance residential and commercial construction (sustainable/energy efficient)

Education

- Bachelor of Science in Business Administration, Marketing, University of Louisville
- Study focusing on real estate economics, Eastern Kentucky University
- Ongoing real estate economics education since 1993 has been obtained through the Appraisal Institute, and other professional groups serving specific real estate related fields.

Professional Qualifications and Memberships

- Certified General Real Property Appraiser, Kentucky License #1533
- MAI designated Member, Appraisal Institute
  *(MAI designation is held by professionals who can provide services relating to all types of real property, such as value opinions, evaluations, review, consulting and advice regarding investment decisions, among others. Property types may include commercial, industrial, agricultural, residential, vacant land and others.)
- SRA designated Member, Appraisal Institute
  *(SRA designation is held by professionals who can provide services relating to residential properties, including opinions of value, evaluations, review, consulting and advice regarding investment decisions, among others)
- AI-GRS designated Member, Appraisal Institute
  *(AI-GRS designation is held by professionals who can provide reviews of appraisals, including commercial, industrial, agricultural, residential, vacant land and others.
- AI-RRS designated Member, Appraisal Institute
  *(AI-RRS designation is held by professionals who have the tools to provide reviews and address the related issues unique to residential real property appraisals.
- Professional Development Programs – Appraisal Institute
  - Litigation
  - Valuation of the Components of a Business Enterprise
  - Valuation of Conservation Easements
  - Valuation of Sustainable Buildings: Commercial
  - Valuation of Sustainable Buildings: Residential

Appraisal Institute Service

- 2018 to present – National Education Committee Liaison, Region V (Indiana, Kentucky, North Carolina, Ohio, Virginia, West Virginia)
- 2008 to 2017, 2020 to present – Education Chair, Bluegrass Chapter, Appraisal Institute
- 2018 – President, Bluegrass Chapter, Appraisal Institute
- 2014 to 2017 – Vice President, Bluegrass Chapter, Appraisal Institute
- 2016 and 2017 – Government Relations Committee, Bluegrass Chapter, Appraisal Institute
- 2016 and 2017 – Regional Representative, Bluegrass Chapter, Appraisal Institute
- 2013, 2014 and 2016 – Leadership Development & Advisory Council, Appraisal Institute
- Candidate Advisor - MAI, SRA, AI-GRS, and AI-RRS, Appraisal Institute

ADVANCED STUDY CURRICULUM

Provider/Title
Appraisal Institute Professional Development Programs
Valuation Of Sustainable Buildings: Commercial - Registry
Valuation of Sustainable Buildings: Residential - Registry
Valuation of the Components of A Business Enterprise - Registry
Litigation Professional Development Program - Registry
Valuation of Conservation Easements - Registry
General Demonstration Report - Capstone Program
Instructor Qualifying Conference
Leadership Development & Advisory Council - Washington D.C.
Appraisal Institute, Courses
Appraisal of Manufactured Homes Featuring Next-Generation Manufactured Homes
Application & Interpretation of Simple Linear Regression
Practical Applications in Appraising Green Commercial Properties
Uniform Appraisal Standards for Federal Land Acquisitions
Residential & Commercial Valuation of Solar
Case Studies in Appraising Green Residential Buildings
Review Theory - General
Review Theory - Residential
Quantitative Analysis
Fundamentals of Separating Real Property, Personal Property, and Intangible Business Assets
The Appraiser as an Expert Witness: Preparation and Testimony
Litigation Appraising: Specialized Topics and Applications, Course 705GRE
Condemnation Appraising: Principles and Applications
Advanced Sales Comparison & Cost Approaches
Valuation of Conservation Easements Certificate Program
Advanced Residential Report Writing, Part II
Advanced Residential Applications & Case Studies, Part 1
Appraisal Institute, Seminars
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Subdivision Valuation: A Comprehensive Guide
Appraising Convenience Stores
Evaluating Commercial Construction
Appraisal Consulting: A Solutions Approach for Professionals
Appraising the Tough Ones
Attacking & Defending an Appraisal in Litigation
Appraisal of Nonconforming Uses
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Environmental Risk and the Appraisal Process
Appraisal of Special-Purpose Properties

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Marshall & Swift
Commercial Cost Approach Certification Program
American Bankers Association
Federal Appraisal Policies: Hotlines, Complaint Forms and Revised Policy Statements
CCIM Institute
Course CI-101, Financial Analysis for Commercial Investment Real Estate Course CI-103, User Decision Analysis for Commercial Investment Real Estate Course CI-104, Investment Analysis for Commercial Investment Real Estate Course 411, Gap Analysis and Real Estate Market Dynamics Course 412, Economics of Commercial Leases, and 1031 Exchanges
HUD/FHA
HUD/FHA Appraiser Roster HUD/FHA Appraiser Test and Certification The Model Energy Code (MED), U.S. Department Of Energy Appraising FHA Properties
Home Builders Association of Louisville
Site Planning Basics of Building; Blueprint Reading, Building Codes, Siting
Shelby County Industrial Foundation
Environmental Issues Seminar
Cle International
Eminent Domain, the Law of Condemnation and Land Use
Eastern Kentucky University
Real Estate Finance, RST 330 Advanced Appraisal Application / Income Property Valuation, RST 410 Appraisal of Residential Property, RST 330
University of Louisville
Bachelor of Science in Business Administration - Marketing