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VIA FEDEX

March 26, 2018

Gwen R. Pinson, Executive Director
Kentucky Public Service Commission
211 Sower Blvd
P.O. Box 615
Frankfort, KY 40602-0615

Re: Response to Request for Intervention
PSC Case No.: 2018-00031
Site Name: Fortner Ridge

Dear Ms. Pinson:

We have received and responded to comments from Don and Deborah Arnold concerning this tower site. Please find enclosed our response to their concerns and make this letter and its enclosures a part of the administrative record. Do not hesitate to contact us with any concerns regarding this matter

Sincerely,

David A. Pike
Attorney for New Cingular Wireless PCS, LLC
d/b/a AT&T Mobility

Enclosure

cc: Brittany Hayes Koenig, Div. of General Counsel

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE APPLICATION OF	)
NEW CINGULAR WIRELESS PCS, LLC,	)
A DELAWARE LIMITED LIABILITY COMPANY,	)
D/B/A AT&T MOBILITY	)
FOR ISSUANCE OF A CERTIFICATE OF PUBLIC	) CASE NO.: 2018-00031
CONVENIENCE AND NECESSITY TO CONSTRUCT	)
A WIRELESS COMMUNICATIONS FACILITY	)
IN THE COMMONWEALTH OF KENTUCKY	)
IN THE COUNTY OF OWEN	)

SITE NAME: FORTNER RIDGE

* * * * * * *

RESPONSE TO LETTERS FROM
DON AND DEBORAH ARNOLD

Applicant New Cingular Wireless PCS, LLC, d/b/a AT&T Mobility ("AT&T Mobility"), by counsel, makes this Response to the letters submitted by Don and Deborah Arnold in the within proceeding. Applicant respectfully states, as follows:

1. Don and Deborah Arnold by letters submitted March 7, 2018 and March 23, 2018 to the Kentucky Public Service Commission have voiced generalized concerns regarding, tower safety, property values, aesthetics, lightening, and alternative locations for the facility proposed in the within Application. However, as presented in the subject Application and as discussed herein below, there is no ground for denial of the subject application, and substantial evidence supports approval of the requested Certificate of

Public Convenience and Necessity ("CPCN").

2. Applicant is licensed by the Federal Communications Commission ("FCC") to provide wireless communications services to the area to be served by the proposed wireless communications facility, and a copy of the relevant FCC license granted to AT&T Mobility was filed as part of the subject Application.

3. In response to the Arnold's generalized concerns regarding safety, Applicant has attached a structural safety report prepared by William E. Grigsby, Jr., PE SE an engineer licensed in the Commonwealth of Kentucky stating that the proposed wireless communications facility meets or exceeds all of the building and engineering standards for a tower of this type and does not pose a threat to public health or safety as **Exhibit A**. The site plan, geotechnical study, tower and foundation drawings submitted with the Application have been signed and sealed by a professional engineer licensed in the Commonwealth of Kentucky. It should also be noted, that the only building within 500' of the proposed tower is owned by AT&T's landlord, who has consented to the construction of the tower at the proposed location. This is a remote rural area and Mr. Grigsby points out that any discussion of "fall zones" is misleading since the tower is designed to bend or buckle rather than fall like a tree.

4. In response to generalized concerns regarding property values, Applicant has attached a report from Glen D. Katz, MAI, SRA, AI-GRS, AI-RRS, a property valuation expert, concluding that the proposed tower will not have an impact on surrounding

property values as **Exhibit B**. In this instance, Owen County has not adopted planning and zoning regulations, nor has it adopted regulations regarding the placement, construction and modification of wireless communications facilities. Any property purchased in Owen County is acquired with the understanding that the surrounding neighbors are free to develop their property in any manner they desire without regulation from local government or input from area residents. This circumstance is factored into the sales price of all real estate in Owen County. For this reason, area residents have no reasonable expectation of input into the land use of surrounding properties or the impact a proposed land use will have on their property values.

5. In response to generalized concerns regarding aesthetics and unspecified alternate locations, the proposed facility has been designed, configured, and located in such a manner that it will prevent or limit potential adverse effects on surrounding properties. Furthermore, the tower will be galvanized steel to minimize its visibility. This is a remote rural area and proposed location is the least intrusive available alternative.

6. The U.S. Court of Appeals for the Sixth Circuit has upheld that lay opinion or generalized aesthetic concerns are not substantial evidence justifying a rejection of this application. Any decision rendered by state or local authorities must be in writing and supported by substantial evidence in a written record. Federal Courts in the 6th Circuit has defined "substantial evidence" in previous cases. For example, the locality's own zoning requirements are an example of substantial evidence. Cellco Partnership v. Franklin Co., KY, 553 F. Supp. 2d 838, 845-846 (E.D. Ky. 2008). Of course, in this

instance Graves County has not adopted zoning requirements. Courts in the 6th Circuit have found that lay opinion is not substantial evidence. Cellco Partnership at 852 and T-Mobile Central, LLC v. Charter Township of West Bloomfield, 691 F.3d 794, 804 (6th Cir. 2012). They have also found that unsupported opinion is not substantial evidence. Cellco Partnership at 849. Generalized expressions of concerns with "aesthetics" are not substantial evidence. Cellco Partnership at 851. Claims the tower is unsightly are generalized expressions of aesthetical concerns and the same objection could be made by any resident in any area in which a tower is placed. Cellco Partnership at 852. General concerns that the tower is ugly or unwanted near an individual's residence are not sufficient to meet the 6th Circuit substantial evidence test. T-Mobile Central at 800. Finally, anyone who opposes a tower in their backyard can claim it would be bad for the community, not aesthetically pleasing, or is otherwise objectionable, but such claims would not constitute substantial evidence. T-Mobile Central at 801.

7. In response to generalized concerns regarding the tower lighting, the FAA conducted an aeronautical study and determined that the tower must be lit with a med-dual system to insure air safety. The dual system is designed with an alternating white light in the day-time and a red light at night-time to minimize visibility to area residents.

8. In response to the request for intervention, the Arnolds do not provide any evidence to support their assertions, and therefore, are unlikely to present issues or develop facts that will assist the Commission in considering this matter.

WHEREFORE, there being no ground for denial of the subject application and substantial evidence in support of the requested CPCN, Applicants respectfully request the Kentucky Public Service Commission:

(a) Accept this Response for filing;

(b); Issue a Certificate of Public Convenience and Necessity to construct and operate the WCF at the location set forth herein without further delay; and

(c) Grant Applicant any other relief to which it is entitled.

Respectfully submitted,

David A. Pike
Pike Legal Group, PLLC
1578 Highway 44 East, Suite 6
P. O. Box 369
Shepherdsville, KY 40165-0369
Telephone: (502) 955-4400
Telefax: (502) 543-4410
Email: dpike@pikelegal.com

CERTIFICATE OF SERVICE

The undersigned hereby certifies that on this 26th day of March 2018, a true and accurate copy of the foregoing was sent by U.S. Postal Service first class mail, postage prepaid, to Don and Deborah Arnold, 99 Pleasant Ridge Avenue, Fort Mitchell, KY 41017.

David A. Pike
Attorney for Applicant

LIST OF EXHIBITS

A - Tower Safety Report

B Real Estate Valuation Report

EXHIBIT A
TOWER SAFETY REPORT

William E. Grigsby, Jr. PE SE

Kentucky Structural Engineer License No. 16114
1320 Main Street
Shelbyville, KY 40065

Report of Structural Engineering and Safety Considerations
Application for Wireless Communications Facility

TO: Kentucky Public Service Commission

RE: Applicant: AT&T Mobility
Site Name: Fortner Ridge
Proposal: New Wireless Communication Facility
Location: 410 Fortner Ridge Road; Owenton KY 40359

Dear Commissioners:

My name is Bill Grigsby. I am a Structural Engineer, licensed in the Commonwealth of Kentucky. My qualifications are outlined in the resume attached as a part of this report. As set out below, I have reviewed the engineering drawings for the above referenced proposed new tower. The Structural Engineer of Record (SER) has certified that this tower meets or exceeds all building code requirements and engineering standards for a structure of this type. In my opinion, it does not pose a threat to public health or safety for the following reasons:

Tower Description:

The tower drawings indicate a 355' Tall Self-Support Tower with a 15' Lightning Arrestor

A triangular-shaped, latticed steel tower with a 37'-0" spread of tower legs at the base

Designed to support antennae at the 350', 338', 326' and 314' elevations.

The SER has provided a drilled pier (caisson) foundation design for this tower. The drawing indicates a 36'-6" long by 4'-0" diameter reinforced concrete drilled pier centered under each tower leg. The drilled pier bears on rock at 36'-0" below finish grade. The drilled pier is shown to extend to 6" above finish grade at the tower base. The SER has also provided a mat foundation design. The drawings indicate a 45'-6" square x 2'-0" thick reinforced concrete mat bearing on native soil at 11'-0" below finish grade. There are three (3) 5'-6" diameter reinforced concrete piers – one (1) under each tower leg. All concrete elements will be reinforced in accordance with applicable codes and standards.

Blasting will not be used in any way in the construction of the foundation of this tower.

The structural steel material specified for the construction of this tower is Grade 50 material. The tower legs are A500, Grade 50. The tower braces are specified to be A572, Grade 50.

Design Standards:

The 2012 International Building Code (IBC) governs construction within the Commonwealth of Kentucky. The IBC references ANSI Standard TIA/EIA-222 as the controlling standard for the design of these types of structures.

This tower was designed to conform to the requirements of ANSI Standard TIA/EIA-222-G, "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures". (ANSI is the American National Standards Institute; EIA is the Electronic Industries Association; TIA is the Telecommunications Industry Association.) Revision G is the current revision of TIA/EIA-222.

This communication tower was designed by a Professional Engineer, registered in the Commonwealth of Kentucky. The SER has certified that the tower design conforms to the requirements of TIA/EIA-222-G.

The design wind speed specified for Kentucky in EIA/TIA-222-G is a wind speed of 89 miles per hour (mph) for a 3-second gust.

The "design wind speed" must not be construed as a "collapse wind speed". That is; saying that the tower is designed for 89-mph wind does not mean that the tower will collapse if subjected to a 90-mph wind. It can be demonstrated that towers of this nature can withstand wind speeds far more than 90-mph. In fact, some monopole cell towers have survived, intact, a direct hit from a tornado.

In addition to the wind load, the design of this tower assumes that the entire structure along with the antennae and other miscellaneous attachments are covered with a 0.75"-thick layer of ice along with a 30-mph wind. EIA/TIA-222 allows for this reduction of the design wind speed in combination with this radial ice loading.

Construction Procedures and Standards:

ECS Southeast, LLP prepared a geotechnical report for this project (Re: Report No. 26:3125-D dated 02/28/17). The geotechnical report provides foundation design data and criteria along with recommendations for foundation construction. The geotechnical report was based on testing performed and samples taken at the tower site. The report was prepared by a Licensed Professional Engineer registered in the Commonwealth of Kentucky.

The tower foundation design was based on the criteria and recommendations contained in the geotechnical engineer's report as well as recognized engineering principles. The tower foundation was designed by a Licensed Professional Engineer registered in the Commonwealth of Kentucky.

When the tower foundation is constructed, a representative of the geotechnical engineering firm will be on site for inspections to ensure that the findings outlined in the geotechnical report are consistent with the subsurface conditions encountered during construction and that the recommendations set forth in the geotechnical report are followed. Again, the geotechnical engineer is a Licensed Professional Engineer.

Construction of the tower foundation and erection of the tower are monitored by a "Special Inspector" under the provisions Chapter 17 of the International Building Code (2012 IBC).

All these levels of inspection and engineering control give the construction of cell towers a high level of quality assurance in the commercial construction industry.

Discussion of Structural Integrity:

There are conservatisms inherent in all tower construction regardless of the tower height. For example, wind is a "dynamic load". However, the analysis of the tower is based on an "equivalent static force" that is calculated to model the dynamic load of the wind. The conversion of the dynamic

load of the wind into an equivalent static force is very conservative. In other words, the calculation of the equivalent static force significantly ***overestimates*** the actual wind forces on the tower.

There are additional conservatisms involved in the analysis of the tower to distribute the equivalent static wind forces to the individual tower structural members. There are also conservatisms involved in the calculation of stress in the individual tower structural members.

There are factors of safety and conservatisms involved in determining the allowable stress levels in each individual tower structural member. For example, the code allows the engineer to utilize only 60% of the specified elastic strength or "yield strength" of a structural member in tension. The "elastic limit" for a structural member is defined as the point beyond which a member deflecting under a load will not rebound to its original shape when a load is removed. This is distinguished from the "ultimate strength", where the structural member breaks under the load.

The specified elastic limit for the types of steel used to fabricate these types of structures is generally very conservative. For example, ASTM A500 steel is specified for the tower legs on this project. This is a common grade of steel used to fabricate structural elements in the construction industry. Grade 50 steel is specified for the tower. Grade 50 steel is also specified for the tower braces. The yield strength for grade 50 material is a stress of 50,000 pounds per square inch (psi). The actual yield strength for A500, Grade 50 material is almost always greater than 50,000 psi and sometimes greater than 55,000 psi. Limiting the calculated stress to 60% of the specified yield strength of 50,000 psi for A500, Grade 50 material can underestimate the actual capacity of a steel member by as much as fifty percent or more.

The specified ultimate strength of A500, Grade 50 material is 62,000 psi or 1.24 times the specified yield strength. Again, the engineer is limited to about 60% of the yield strength when designing structural members. In other words, if the engineer pushed the stress levels right to the code allowable limit (which few engineers will do), the stress levels in the structural members subjected to a 90-mph wind will be less than 50% of the stress that would fracture that member.

There are six (6) anchor bolts specified for each tower leg that are to be fabricated using 1.75" diameter ASTM F1554, Grade 105 material. Anchor bolts are designed utilizing the "ultimate strength" of the anchor bolt material. The engineer is limited to about sixty-five percent (65%) of the "ultimate strength" (breaking strength) or eighty-five percent (85%) of the yield strength the anchor bolt material. And, just like the specified yield strength of Grade 50 material discussed above, the specified value for the breaking strength of the anchor bolt is conservative.

The accumulated effect of all these conservatisms and factors of safety (and others not discussed here) is that the actual wind speed at which this tower will "fail" is significantly higher than 90 mph. It is important to understand that the use of the word "fail" in the paragraphs above does not imply that the tower will fall over. The tower foundation is designed to ensure that it is not the weak link. In other words, the tower foundation is much stronger than the tower itself. The code prescribes a factor of safety against overturning of 1.67. The methodology used by engineers to calculate this factor of safety is conservative. The "allowable" design parameters provided by the geotechnical engineer and used in the foundation design typically have a factor of safety of at least 3.
The tower geometry assures that the tower is stronger at the base than at higher elevations. A structural failure of the tower will manifest itself in the top of the tower bending over, not breaking off and falling to the ground. It is my understanding that towers "failed" in exactly this fashion during Hurricane Andrew in Florida (wind speeds exceeded 140-mph during Hurricane Andrew). That is, the tops of the towers bent over, but did not break off and did not become wind-generated missiles.

"Failure" of the communication tower does not imply that the tower will break of at the base and fall over. Any discussion of "fall radius" is misleading because the tower will not simply fall over except in circumstances of sabotage, human misadventure, faulty construction practices or faulty materials.

Because of the levels of control and inspection, the probability of faulty construction materials or faulty workmanship resulting in a catastrophic failure is minimal. Any failure in the tower will occur only under a very high wind and will manifest itself in the top of the tower bending over, not in the tower breaking off at the base and falling over.

Most modern towers are designed as "zero fall radius" towers. This is accomplished by ensuring that the point of highest stress is located at about 2/3 of the tower height above the ground. Logically, any failure due to high winds will occur at that point. The tower will bend over at the point of highest stress. This "failure" will reduce the exposure to wind thus reducing the stresses in the lower portion of the tower.

In large cities around the country, there are buildings that are as tall as or taller than this proposed communication tower. I am unaware of any discussion of "fall radius" relative to any of these buildings. The design and construction of a self-support communication tower is much less complex than that of a so-called "skyscraper" and yet the communication tower is designed and constructed with levels of control and inspections like those for a skyscraper. It is safe to say that a heavily occupied skyscraper "falling" over in a large city, would be a far greater catastrophic disaster than a falling communication tower.

Extreme Winds (Tornadoes):

Building codes do not address designing for tornado level winds except for certain special structures, such as nuclear power plants. There are several reasons for this, the primary one being the very low probability of occurrence of a tornado at any given location. Another reason is that the cost to "tornado proof" a structure would exceed the cost to re-build a conventional structure in the aftermath of a tornado.

It is not clear that this tower would withstand a "direct hit" from a tornado. However, since the engineering controls over the design and construction of cell towers far exceeds that of any of the residential structures in the vicinity, it is almost certain that a communication tower will be the "last structure standing" in the aftermath of a tornado.

A major concern with respect to tornadoes is the issue of "tornado-generated missiles". A tornado-generated missile is any object picked up by the tornado and thrown great distances at fantastic speeds by the tremendous force of the wind. In the design of nuclear power plants, one of the more devastating design scenario is a tornado-generated missile consisting of a telephone pole hitting the structure at 300-mph.

The communication tower will likely survive a "near-miss" by a tornado in one piece. The top of it may "bend over" but the tower will not break apart. If this communication tower takes a "direct hit" by a tornado, there is the possibility that pieces of the antennae assembly may become tornado-generated missiles. However, there are literally thousands of other objects near this communication site, most notably utility poles, which would be just as potentially devastating as tornado-generated missiles. To the extent that this communication tower is "one more potential missile", it does represent a minuscule increase in the risk of tornado related damage. However, this increase in risk is so small as to be zero for all practical purposes.

Below is photographic evidence of a monopole communication tower surviving an F2/F3 tornado near Dunwoody, Georgia. An F2 tornado has wind speeds of 113 to 157-mph. An F3 tornado has wind speeds of 158 to 206-mph. This storm occurred at about 10:30pm on April 8, 1998. Records from the Climatic Data Center in Asheville, North Carolina indicate wind speeds up to 175-mph in this storm system. As can be seen in the photograph, the tower structure is undamaged. Dunwoody, Georgia is in DeKalb County. According to the EIA/TIA-222 standard the design wind speed for DeKalb County, Georgia is the same as that for Kentucky. Yet, this tower withstood a wind speed of 175-mph. This is a very powerful illustration of the conservatism inherent in the design of these types of structures.

ATLANTA TORNADO AFTERMATH

In conclusion, the proposed communication tower meets or exceeds all of the building and engineering standards for a tower of this type and does not pose a threat to public health or safety.

Respectfully Submitted,

William E. Grigsby
1302 Main Street; Shelbyville, KY 40065

EXHIBIT B

REAL ESTATE VALUATION REPORT

REAL ESTATE VALUE IMPACT STUDY

FOR

PROPOSED WIRELESS COMMUNICATIONS FACILITY
NEW CINGULAR WIRELESS, PCS, LLC, D/B/A AT&T MOBILITY
SITE NAME: FORTNER RIDGE
PCS CASE #2018-00031/SITE NUMBER KYL01219
ASSESSOR PARCEL NUMBER: 091-00-00-029.02
410 FORTNER RIDGE ROAD
OWENTON, OWEN COUNTY, KY 40359

DATE OF REPORT

March 12, 2018

PREPARED FOR

Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, KY 40601

PREPARED BY

Glen D. Katz, MAI, SRA, AI-GRS, AI-RRS
Realty Solutions Co., Inc.
P.O. Box 20983
Louisville, KY 40250

March 12, 2018

Realty Solutions Co., Inc.
Finding Answers to Real Estate Questions

Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, KY 40601

Subject: Real Estate Value Impact Study
Proposed Wireless Communications Facility
New Cingular Wireless, PCS, LLC, d/b/a AT&T Mobility
Site Name: Fortner Ridge
PCS Case #2018-00031/Site Number KYL01219
Assessor Parcel Number: 091-00-00-029.02
410 Fortner Ridge Road
Owenton, Owen County, KY 40359

Commissioners:

I have completed an impact study regarding potential influence of wireless communications tower facilities on market value of surrounding residential properties, specifically addressing the subject project low-density residential and agricultural neighborhood. The study consists of analyzing sale prices and value trends of properties located in proximity to cell towers, as compared to properties which are not in proximity, but competitive in all other respects.

Based on investigation and analysis of reactions of market participants buying, occupying, and selling residential properties, it is clear that the proposed facility will not result in any diminution of value for low-density residential and agricultural properties located with proximity to the proposed facility, or the neighborhood in general. Consistently, 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 due to expansion of public utilities, including wireless telecommunications tower infrastructure.

The attached report illustrates 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

Glen D. Katz, MAI, SRA, AI-GRS, AI-RRS
Realty Solutions Co., Inc.
P.O. Box 20983
Louisville, KY 40250

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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 and commercial properties, I have performed impact analysis on wireless communications tower facilities, high-voltage overhead transmission lines, storage towers, oil pipelines, and federal interstates. For this report, the analysis consists of analyzing value trends of residential properties in proximity to public utility tower facilities.

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

The subject neighborhood does not have land-use zoning regulations. This is a frequent occurrence in low-density development and rural areas, and there are accepted risks by property owners because of the lack of control on land uses. Without localized land-use regulations, all legal uses of land are available. Land uses with a high impact on surrounding properties or a community in general, typically are characterized as producing adverse noise, odor, traffic, lighting, view, or neglected construction.

As a result, there is a higher risk expectation by buyers when making purchase decisions, regarding the quality and type of use of neighboring un-zoned properties. These risks are reflected in prices paid and resulting value trends. Regardless of these risks, communities without land-use controls continue to expand and develop need and demand for public utilities. The neighborhoods and communities are still influenced by social, economic, governmental, and environmental forces. There is no difference in regards to impact on surrounding values from tower communication facilities if a neighborhood does not have land-use zoning regulations.

Residential properties, whether urban, suburban, or rural, 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.

Rural residential properties are frequently 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.

Rural residential 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 demand characteristics, but are more resilient than other residential categories.

Facility Identification

The facility will be located in a low-density residential and agricultural area. The construction improvements will be comprised of a 355' Self-support structure with 15' lightning arrestor, totaling a structure height of 370 feet. The construction will be located on a generally 100' x 100' leased site area with a 75' x 75' fenced compound. There will be supporting storage cabinets and gravel paving. There will be space available for co-location of other cell service providers in the facility. The facility will be accessed by a gravel drive extending from Fortner Ridge Road. These characteristics are some of the most common for wireless communications facilities in similar areas of the United States.

Study Methodology

The impact study applying to this project 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 over time, and; direct comparison of properties with, and without, distance or view proximity exposure.

Specifically, the following steps comprise the analysis:

- Identify existing tower locations with surrounding developed land uses.
- Examine the surrounding neighborhood and market area to determine if there are compatible and competing properties with adequate sale activity to provide statistically 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. 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 facility is constructed, and 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, the values, and rates of value change for proximity and non-proximity residential properties are similar. This is not unusual or unexpected. The market forces that drive real estate value also create complimentary demand for public utility projects. These market forces are discussed as follows:

- Social forces are influenced by; population, education, and lifestyles. There is increasing need for communications facilities, and the population expects satisfying that demand as part of the core supply of public services. In particular, cellular phone service has become predominant in the functions of businesses, schools, healthcare providers, emergency services, and households. Anything less than adequate service is detrimental to value or demand for real estate.

- Economic forces are influenced by; employment, wages, business, regional and community development. With the increasing diversification of work forces and efficiencies needed to be competitive, effective communications facilities are required. Cellular signal capacity creates a significant amount of positive externalities for its users and their communities.

- Governmental forces respond to community needs for; laws and policies; public services; zoning, and building codes. Many jurisdictions have specific guidelines requiring local government agencies to expand public utilities and services. The regulations that enable public services provided by communications facilities are a direct reaction to public needs. Another major impact of governmental influences in expansion of public services is developing wider choices through 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.

  As indicated prior, the subject neighborhood does not have land-use zoning regulations. Buyers have absorbed the risk associated with lack of zoning when making purchase decisions regarding the quality and type of use of neighboring un-zoned properties, and related influences on value. Regardless of these risks and buyer activity, communities without land-use controls continue to expand and develop need for public utilities.

- 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, and where supporting infrastructure will be most effective and valuable as a resource.

Study Analysis Conclusion

As illustrated by study results, the forces of value are consistent. Public utilities and related services are essential to meeting accepted standards of living. 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. In order to meet population needs, telecommunications facilities have become a common part of the landscape in much the same way that power and telephone lines and other utilities have. Like all utilities, there is need for telecommunications facilities in strategic locations in any community.

Property owners near tower facilities, other highly visible utility structures, underground pipelines, associated easements, etc., are not penalized on value. Effectively, communications tower structures, like overhead electric distribution lines, signage, and buried utility easements, are beneficial. Due to expanding utilities and increased services, residential and commercial properties experience positive influences. Because of the increasing volume of similar structures over the past several decades, owners and buyers of residential properties expect service-related infrastructure. Cell towers satisfy demand and are 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 appreciable negative effect on value – just as telephone poles, utility lines, streetlights, and the other infrastructure of modern life do not negatively affect real estate values.

Therefore, based on investigation and analysis of reactions of market participants buying, occupying, and selling real estate properties, it is clear that the proposed facility will not adversely impact the demand for, or value of, properties in the immediate or general area. Consistently, 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 due to expansion of public utilities, including wireless telecommunications tower infrastructure.

Report Development – Scope of Work

Extent to which the property is identified

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

Extent to which the property is inspected

- Reviewing aerial photography of the surrounding neighborhood to recognize land uses and development patterns.
- Reviewing the tower facility development plans

Type and extent of the data researched

- Tower facilities, wireless communications, high-tension electrical transmission, or water storage, are identified for analysis based on residential and commercial exposures.

Type and extent of analyses applied

The 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 nearby 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 as follows:

- First is analyzing "before and after" sale data. This analyzes value trends before and after installation of a 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. When resold, 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, 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 neighborhood properties that are identical in all aspects except proximity. The unit value will typically be price per-square-foot of gross living area (sale price divided by above-grade living area). The information will identify any differences between the two proximity categories. This method has limitations due to the large number of property differences and related difficulty in matching properties that are adequately identical with the exception of proximity.

- The most common method is "timeline trend" analysis. This compares value trends of properties located in close proximity to existing tower facilities, to value trends of properties located without proximity. Rates of value change due to market conditions (time) are compared between the two property types to extract any differences due to proximity to a tower facility. This is most meaningful with sale data from the post-recession period beginning in 2010 to a current date.

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

Purpose of Report

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

Intended User of the Report

This report is intended solely for use by Pike Legal Group, PLLC, and the identified governmental approving panel for the project, Kentucky Public Service Commission.

Intended Use of the Report

The intended use of the appraiser's opinions and conclusions is to assist Pike Legal Group, PLLC and the governmental approving panel, Kentucky Public Service Commission, in making permitting decisions regarding the subject property. This report is not intended for any other use.

Definition of Value

This report analysis is based on ***market value*** of real estate. The most common accepted definitions of ***market value*** include the following components:

- *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-tension electrical, or storage tower, sale activity of homes is analyzed.

Timeline Trend Method

For projects that have been in place for a long period, timeline trend analysis is most applicable. The steps of analysis consist of:

- Research properties with tower proximity that have sold repeatedly in the identified period.
- Determine the annual 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 annual 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 consists of:

- Research residential properties with tower proximity that sold prior to the tower installation, and then sold again after the tower installation.
- Determine the annual 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 annual 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 date range for sale data is from 2010 to the current date. This minimizes potential influence from the 2007-2009 recession. 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 on appreciation or depreciation from market conditions and proximity, 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 significant physical changes that would influence value between the initial and subsequent transfers, such as renovation, construction addition, or deferred maintenance or neglect resulting in unusual physical deterioration.
- 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. Ultimately, 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; high-tension electrical transmission lines, and wireless communications tower facilities. Two of the case studies compare rates of value change between proximity and non-proximity properties, and one case study has value change trends, and compares values of proximity and non-proximity properties before and after installation of a facility.

Case Studies

Case Study 1 – This study involves a high-tension overhead electric power line corridor with 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 in the middle of residential subdivision development, crossing a public street in a long diagonal direction, and continuing through residential subdivision development.

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 are developed, and 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 developed, 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 developed, and the two categories are compared to analyze any potential impact.

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

Case Study 1 - Proximity Sales

- Facility: High tension overhead electric 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 of analysis: The data represents sale activity between 01/01/2010 and 09/21/2017. Each of the properties transferred two or more times in the period. The price difference between back-to-back transfers of each property is the amount of value change due to market conditions, or time. The range of annual value change is -0.21% to 6.73%. The average rate of appreciation is 2.66%, and the median or middle point of the range is 2.55%.

Street #	Street	St	Sale Date	Adj Sale Price	% Change	Months	% Change Annually
4707	Vinecliff	Pl	2/12/2010	$218,000			
4707	Vinecliff	Pl	7/14/2017	$259,900	19.22%	89	2.59%
4733	Ferrer	Way	7/26/2011	$141,500			
4733	Ferrer	Way	5/22/2014	$160,000	13.07%	34	4.63%
4800	Hat	Ct	10/26/2010	$125,000			
4800	Hat	Ct	10/4/2016	$175,000	40.00%	71	6.73%
4802	Burris	Dr	8/10/2012	$127,400			
4802	Burris	Dr	2/17/2015	$130,950	2.79%	30	1.10%
4904	Bova	Way	3/25/2010	$140,000			
4904	Bova	Way	11/14/2014	$141,000	0.71%	56	0.15%
8804	Loch Lea	Ln	12/6/2013	$130,500			
8804	Loch Lea	Ln	12/2/2016	$149,900	14.87%	36	4.97%
8919	Gutenberg	Rd	12/30/2011	$160,000			
8919	Gutenberg	Rd	3/24/2017	$175,500	9.69%	63	1.85%
9302	Villa Fair	Ct	4/29/2011	$132,000			
9302	Villa Fair	Ct	6/10/2016	$149,750	13.45%	61	2.63%
10509	Vintage Creek	Dr	4/15/2014	$249,500			
10509	Vintage Creek	Dr	9/11/2015	$255,000	2.20%	17	1.57%
10601	Vintage Creek	Dr	3/28/2012	$211,500			
10601	Vintage Creek	Dr	11/25/2013	$222,500	5.20%	20	3.13%
10603	Alderbrook	Pl	2/17/2012	$216,000			
10603	Alderbrook	Pl	4/15/2015	$247,000	14.35%	38	4.54%
10605	Vintage Creek	Dr	9/10/2010	$217,000			
10605	Vintage Creek	Dr	8/25/2017	$255,000	17.51%	84	2.52%
10608	Alderbrook	Pl	8/12/2011	$237,900			
10608	Alderbrook	Pl	5/4/2015	$236,000	-0.80%	45	-0.21%
10803	Vintage Creek	Dr	5/25/2010	$239,000			
10803	Vintage Creek	Dr	11/15/2016	$255,000	6.69%	78	1.03%
				Annual Average Appreciation			2.66%
				Annual Median Appreciation			2.55%

Case Study 1 - Non-Proximity Sales

- Facility: High tension overhead electric 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 of analysis: The data represents sale activity between 01/01/2010 and 09/21/2017. Each property transferred two or more times in the period. The price difference between back-to-back transfers of each property is the amount of value change due to market conditions, or time. The range of annual value change is -0.41% to 5.97%. The average rate of appreciation is 2.91%, and the median or middle point of the appreciation range is 2.49%.

Street #	Street	St	Sale Date	Adj Sale Price	% Change	Months	% Change Annually
4409	Taft	Ct	10/15/10	$135,000			
4409	Taft	Ct	03/03/16	$150,000	11.11%	65	2.06%
4509	Marse	Pl	01/30/12	$141,900			
4509	Marse	Pl	06/30/14	$152,500	7.47%	29	3.09%
4608	Haeringdon	Dr	10/21/10	$152,000			
4608	Haeringdon	Dr	03/06/17	$184,900	21.64%	77	3.39%
4615	Stony Brook	Dr	05/10/13	$159,900			
4615	Stony Brook	Dr	08/18/17	$181,500	13.51%	51	3.16%
4704	Jolynn	Dr	03/28/13	$147,500			
4704	Jolynn	Dr	06/01/16	$159,500	8.14%	38	2.56%
4902	Stout	Blvd	08/24/12	$140,000			
4902	Stout	Blvd	08/17/15	$157,500	12.50%	36	4.19%
4904	Flora Springs	Cir	09/02/10	$219,000			
4904	Flora Springs	Cir	11/05/15	$242,000	10.50%	62	2.03%
4904	Flora Springs	Cir	12/13/16	$258,000	6.61%	13	5.97%
4905	Roman	Dr	08/22/12	$138,900			
4905	Roman	Dr	06/08/16	$164,500	18.43%	46	4.85%
5001	Fairwood	Ln	09/17/10	$136,000			
5001	Fairwood	Ln	02/08/16	$138,000	1.47%	65	0.27%
5001	Volney	Ct	12/14/12	$168,000			
5001	Volney	Ct	11/15/16	$184,000	9.52%	47	2.43%
5003	Volney	Ct	08/26/11	$145,000			
5003	Volney	Ct	07/15/14	$150,200	3.59%	35	1.24%
5103	Flora Springs	Cir	10/10/12	$247,500			
5103	Flora Springs	Cir	09/26/14	$258,900	4.61%	24	2.35%

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Street #	Street	St	Sale Date	Adj Sale Price	% Change	Months	% Change Annually
8607	Michael Edward	Dr	02/19/10	$160,500			
8607	Michael Edward	Dr	07/31/14	$176,000	9.66%	53	2.17%
8612	Longborough	Way	11/29/11	$162,000			
8612	Longborough	Way	12/11/14	$160,000	-1.23%	36	-0.41%
8708	Loch Lea	Ln	12/28/12	$150,000			
8708	Loch Lea	Ln	03/20/15	$157,500	5.00%	27	2.25%
8718	Loch Lea	Ln	08/02/11	$147,000			
8718	Loch Lea	Ln	08/04/17	$193,870	31.88%	72	5.30%
9002	Hatlerhall	Dr	08/15/14	$135,000			
9002	Hatlerhall	Dr	03/09/17	$153,000	13.33%	31	5.19%
9102	Marse Henry	Dr	03/15/13	$152,335			
9102	Marse Henry	Dr	04/17/15	$163,500	7.33%	25	3.51%
9115	Marse Henry	Dr	05/07/15	$166,000			
9115	Marse Henry	Dr	05/15/17	$183,000	10.24%	24	5.06%
9204	Marse Henry	Dr	09/27/12	$150,000			
9204	Marse Henry	Dr	06/16/15	$159,900	6.60%	33	2.43%
9307	Marse Henry	Dr	10/28/10	$100,000			
9307	Marse Henry	Dr	02/03/17	$110,100	10.10%	75	1.61%
9311	Marse Henry	Dr	07/13/12	$189,000			
9311	Marse Henry	Dr	02/18/15	$197,900	4.71%	31	1.81%
9402	Talitha	Dr	06/24/10	$155,225			
9402	Talitha	Dr	11/21/16	$180,000	15.96%	77	2.49%
9405	Marse Henry	Dr	03/22/13	$157,000			
9405	Marse Henry	Dr	05/01/17	$187,000	19.11%	49	4.65%
10404	Lark Park	Dr	12/13/13	$150,000			
10404	Lark Park	Dr	08/21/15	$159,900	6.60%	20	3.91%
10704	Vine Hill	Dr	05/17/12	$197,900			
10704	Vine Hill	Dr	05/24/13	$199,900	1.01%	12	0.99%
				Annual Average Appreciation			2.91%
				Annual Median Appreciation			2.49%

Case Study 1 Reconciliation

The sale evidence represents sales and resales of residential properties in a neighborhood containing a high-tension overhead electric power lines with lattice construction towers. The facility existed prior to construction of homes in the neighborhood. There is volume sale evidence for analysis between 2010 and the current date. The non-proximity sales show a slightly higher average rate of appreciation, and the proximity sales show a slightly higher median rate. The difference between both indications is negligible and not statistically significant. Comparing all proximity sales to non-proximity sales in the neighborhood, both categories show a consistent trend of values on a dwelling size per square foot basis. In summary, there is no negative impact on value from the facility.

Case Study 2 - 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 of analysis: The data represents sale activity between 01/01/2010 and 01/01/2018. Each property transferred two or more times in the period. The price difference between back-to-back transfers of each property is the amount of value change due to market conditions, or time. The range of annual value change is 0.0% to 4.75%. The average appreciation is 2.37%, and the median or middle point of the range is 2.67%.

#	Street	St	Sold Date	Adj Sale Price	Total Value Change %	Annual Value Change %
8501	Missionary	Ct	5/21/2010	$248,500		
8501	Missionary	Ct	2/17/2014	$252,000	1.41%	0.38%
8505	Missionary	Ct	5/28/2010	$210,475		
8505	Missionary	Ct	4/28/2015	$225,000	6.90%	1.40%
8505	Missionary	Ct	8/25/2017	$239,000	6.22%	2.67%
8509	Missionary	Ct	6/17/2010	$245,000		
8509	Missionary	Ct	1/31/2017	$271,000	10.61%	1.60%
8734	Lough	Dr	10/11/2013	$205,000		
8734	Lough	Dr	6/29/2016	$225,000	9.76%	3.59%
8925	Gentlewind	Way	8/30/2012	$200,000		
8925	Gentlewind	Way	10/26/2017	$249,000	24.50%	4.75%
8931	Gentlewind	Way	6/1/2010	$232,000		
8931	Gentlewind	Way	7/13/2015	$275,000	18.53%	3.62%
10612	Glenmary Springs	Dr	10/13/2015	$179,900		
10612	Glenmary Springs	Dr	4/27/2016	$179,900	0.00%	0.00%
10619	Glenmary Springs	Dr	11/24/2014	$229,950		
10619	Glenmary Springs	Dr	11/14/2016	$244,900	6.50%	3.29%
				Average Annual Appreciation		2.37%
				Median Annual Appreciation		2.67%

Case Study 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 of analysis: The data represents sale activity between 01/01/2010 and 01/01/2018. Each property transferred two or more times in the period. The price difference between back-to-back transfers of each property is the amount of value change due to market conditions, or time. The range of annual value change is -8.25% to 6.36%. The average appreciation is 2.26%, and the median or middle point of the range is 3.16%.

#	Street	St	Sold Date	Adj Sale Price	Total Value Change %	Annual Value Change %
8607	Sanctuary	Ln	8/2/2010	$227,000		
8607	Sanctuary	Ln	7/25/2014	$231,000	1.76%	0.44%
8607	Sanctuary	Ln	3/30/2016	$245,000	6.06%	3.60%
8614	Roberta	Ct	1/21/2013	$147,000		
8614	Roberta	Ct	10/23/2017	$187,500	27.55%	5.79%
8622	Sanctuary	Ln	6/21/2013	$240,000		
8622	Sanctuary	Ln	7/13/2015	$257,500	7.29%	3.54%
8622	Sanctuary	Ln	12/21/2017	$265,000	2.91%	1.19%
8702	Lough	Dr	12/1/2011	$161,635		
8702	Lough	Dr	9/9/2016	$207,000	28.07%	5.87%
8702	Meadow Springs	Way	8/2/2012	$148,600		
8702	Meadow Springs	Way	1/8/2016	$165,500	11.37%	3.31%
8721	Lough	Dr	11/25/2013	$165,000		
8721	Lough	Dr	7/29/2016	$170,000	3.03%	1.13%
8815	Gentlewind	Way	2/23/2011	$195,000		
8815	Gentlewind	Way	10/14/2016	$218,900	12.26%	2.17%
8824	Gentlewind	Way	2/12/2010	$262,500		
8824	Gentlewind	Way	6/1/2011	$245,000	-6.67%	-5.13%
8903	Gentlewind	Way	8/1/2014	$290,000		
8903	Gentlewind	Way	9/30/2016	$307,500	6.03%	2.78%
8911	Gentlewind	Way	7/30/2010	$240,000		
8911	Gentlewind	Way	2/26/2014	$247,500	3.13%	0.87%
8919	Gentlewind	Way	11/22/2013	$252,000		
8919	Gentlewind	Way	11/23/2015	$273,000	8.33%	4.16%
8921	Gentlewind	Way	4/17/2012	$244,000		
8921	Gentlewind	Way	6/22/2016	$269,000	10.25%	2.45%

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#	Street	St	Sold Date	Adj Sale Price	Total Value Change %	Annual Value Change %
10229	Pine Glen	Cir	9/27/2010	$227,500		
10229	Pine Glen	Cir	9/14/2012	$224,000	-1.54%	-0.78%
10229	Pine Glen	Cir	3/3/2017	$260,000	16.07%	3.60%
10305	Pine Glen	Cir	8/13/2010	$208,000		
10305	Pine Glen	Cir	8/2/2013	$197,000	-5.29%	-1.78%
10405	Pine Glen	Cir	11/2/2012	$212,900		
10405	Pine Glen	Cir	1/19/2016	$240,000	12.73%	3.96%
10423	Pine Glen	Cir	7/29/2010	$170,000		
10423	Pine Glen	Cir	8/6/2014	$185,450	9.09%	2.26%
10427	Pine Glen	Cir	2/28/2013	$195,000		
10427	PINE GLEN	Cir	10/14/2016	$230,000	17.95%	4.95%
10500	Parkhurst	Ct	4/4/2011	$160,000		
10500	Parkhurst	Ct	10/11/2013	$175,000	9.38%	3.72%
10502	Gentlewind	Ct	2/19/2014	$267,500		
10502	Gentlewind	Ct	2/29/2016	$270,000	0.93%	0.46%
10503	Gentlewind	Ct	10/1/2010	$200,000		
10503	Gentlewind	Ct	4/6/2012	$175,000	-12.50%	-8.25%
10504	Providence	Dr	7/8/2013	$246,500		
10504	Providence	Dr	7/3/2014	$248,700	0.89%	0.90%
10504	Providence	Dr	10/19/2017	$254,000	2.13%	0.65%
10601	Providence	Dr	12/16/2011	$232,000		
10601	Providence	Dr	7/2/2015	$257,000	10.78%	3.04%
10601	Providence	Dr	8/9/2017	$282,400	9.88%	4.69%
10605	Avenel	Ct	7/11/2013	$145,000		
10605	Avenel	Ct	7/21/2017	$175,000	20.69%	5.13%
10609	Providence	Dr	2/15/2013	$225,000		
10609	Providence	Dr	11/8/2016	$260,000	15.56%	4.17%
10611	Providence	Dr	9/7/2012	$230,000		
10611	Providence	Dr	5/22/2017	$272,500	18.48%	3.93%
10712	Glenmary Springs	Dr	6/27/2012	$159,000		
10712	Glenmary Springs	Dr	11/22/2016	$182,000	14.47%	3.28%
10720	Glenmary Springs	Dr	6/11/2014	$174,000		
10720	Glenmary Springs	Dr	4/1/2016	$194,000	11.49%	6.36%
				Average Annual Appreciation		2.26%
				Median Annual Appreciation		3.16%

Case Study 2 Reconciliation

The sale evidence represents sales and resales of residential properties in a neighborhood containing a wireless communications facility. The tower existed prior to construction of homes in the project. There is volume sale evidence for analysis between 2010 and the current date. The rates of value change between the two categories are consistent. The non-proximity sales show a slightly higher median rate of appreciation, and the proximity sales show a slightly higher average rate. The difference between both indications is negligible and not statistically significant. Comparing all proximity sales to non-proximity sales in the neighborhood, both categories show a consistent trend of values on a dwelling size per square foot basis. In summary, there is no negative impact on value from the facility.

Case Study 3 - 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 of analysis: The data represents sale activity between 01/01/2010 and 01/01/2018. Each property transferred two or more times in the period. The price difference between back-to-back transfers of each property is the amount of value change due to market conditions, or time. The range of annual value change is 2.79% to 9.47%. The average appreciation is 5.26%, and the median or middle point of the range is 4.16%. Note that the sales of 5900 Woodhaven Ridge Court 7118 occurred both before and after the facility installation. The rates of value change are consistent with the general trend.

#	Street	St	Sold Date	Adj Sale Price	Total Value Change %	Annual Value Change #
5900	Woodhaven Ridge	Ct	8/22/2011	$180,000		
5900	Woodhaven Ridge	Ct	10/19/2017	$211,000	17.22%	2.79%
5914	Woodhaven Ridge	Ct	12/14/2012	$155,000		
5914	Woodhaven Ridge	Ct	8/1/2014	$172,675	11.40%	7.00%
5921	Woodhaven Ridge	Ct	12/20/2011	$125,000		
5921	Woodhaven Ridge	Ct	1/24/2013	$138,000	10.40%	9.47%
5921	Woodhaven Ridge	Ct	10/22/2014	$148,000	7.25%	4.16%
7215	Chestnut Tree	Ln	6/10/2011	$131,000		
7215	Chestnut Tree	Ln	11/1/2013	$140,000	6.87%	2.87%
				Average Annual Appreciation		5.26%
				Median Annual Appreciation		4.16%

Case Study 3 - 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 of analysis: The data represents sale activity between 01/01/2010 and 01/01/2018. Each property transferred two or more times in the period. The price difference between back-to-back transfers of each property is the amount of value change due to market conditions, or time. The range of annual value change is 2.31% to 6.67%. The average appreciation is 4.78%, and the median or middle point of the range is 5.21%. Note that the sales of 7118 and 7102 Ridge Creek Road occurred before and during the facility installation, and the sales of 7403 Covey Place occurred both before and after the facility installation. The rates of value change are consistent with the general trend.

#	Street	St	Sold Date	Adj Sale Price	Total Value Change %	Annual Value Change %
5904	Bluffington	Ct	7/28/2011	$124,000		
5904	Bluffington	Ct	11/21/2012	$130,685	5.39%	4.08%
7102	Ridge Creek	Rd	10/3/2011	$135,500		
7102	Ridge Creek	Rd	5/6/2016	$149,900	10.63%	2.31%
7118	Ridge Creek	Rd	3/28/2011	$119,000		
7118	Ridge Creek	Rd	3/25/2016	$150,000	26.05%	5.21%
7403	Covey	Pl	2/26/2014	$135,500		
7403	Covey	Pl	10/31/2016	$156,000	15.13%	5.65%
7404	Covey	Pl	2/8/2013	$109,000		
7404	Covey	Pl	12/30/2015	$130,000	19.27%	6.67%
				Average Annual Appreciation		4.78%
				Median Annual Appreciation		5.21%

Case Study 3 Reconciliation

The sale evidence represents sales and resales of residential properties in a neighborhood containing a wireless communications facility. Tower installation occurred after homes were constructed in the project. There is volume sale evidence for analysis between 2010 and the current date. The non-proximity sales show a slightly higher median rate of appreciation, and the proximity sales show a slightly higher average rate. The difference between both indications is negligible and not statistically significant. In addition, properties with sales both before and after the installation date illustrate consistent values and appreciation trends. Comparing all proximity sales to non-proximity sales in the neighborhood, both categories show a consistent trend of values on a dwelling size per square foot basis. In summary, there is no negative impact on value from the facility.

Study Analysis Conclusions

As illustrated by study results, the forces of value are consistent. Public utility infrastructure and related services are essential to meeting the accepted standard of living in municipal areas. Without adequate services, there will be a tendency for decreasing demand and property values in a neighborhood and market area. In order to meet needs of a neighborhood population, telecommunications tower facilities have become a common part of the landscape in much the same way that power and telephone lines and other utilities have. Like these other utilities, there is need for telecommunications facilities in locations throughout any community.

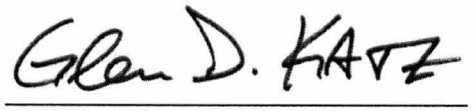
Property owners near tower facilities, other highly visible utility structures, underground pipelines, associated easements, etc., are not penalized on value. Effectively, communications tower structures, like overhead electric distribution lines, signage, and buried utility easements, are beneficial. Due to expanding utilities and increased services, residential and commercial properties experience positive influences. Because of the increasing volume of similar structures over the past several decades, owners and buyers of residential properties expect service-related infrastructure. Cell towers satisfy demand and are absorbed by the landscape of a neighborhood and lifestyles of the population. Cell towers are much like other modern infrastructure. Although cell towers may initially be noticed, they quickly fade into the background and have no appreciable negative effect on value – just as telephone poles, utility lines, streetlights, and the other infrastructure of modern life do not negatively affect real estate values.

Therefore, based on investigation and analysis of reactions of market participants buying, occupying, and selling residential properties, it is clear that the proposed facility will not result in any diminution of value for low-density residential and agricultural properties located with proximity to the proposed facility, or the neighborhood in general. Consistently, 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 due to expansion of public utilities, including wireless telecommunications tower infrastructure.

Disclosure Certification

I certify that, to the best of my knowledge and belief:

- The statements of fact contained in this report are true and correct.
- 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 property that is the subject of this report and no personal interest with respect to the parties involved.
- I have performed no services, as an appraiser or in any other capacity, regarding the property that is the subject of this report within the three-year period immediately preceding acceptance of this assignment.
- I have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment.
- My engagement in this assignment was not contingent upon developing or reporting predetermined results.
- My 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 appraisal consulting report.
- No one provided significant real property analysis assistance to the person signing this certification.



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

Appraiser Qualifications

GLEN D. KATZ, MAI, SRA, AI-GRS, AI-RRS

P.O. Box 20983, Louisville, KY 40250 · (502) 396-6664

Professional Experience

Glen Katz has been involved in the appraisal of real estate for over 25 years. Beginning in both the commercial and residential fields, he has transitioned to roles as consultant, reviewer, and expert witness. As owner 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 general practice, Mr. Katz has achieved the Appraisal Institute MAI (general) designation, and SRA (residential) designation. In specialized practice, Mr. Katz has achieved the Appraisal Institute appraisal review designations of AI-GRS (general) 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

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 an expert witness, Mr. Katz has participated in cases regarding land and building damage, insurance claims, value impact studies, property tax assessment, construction defects, divorce settlements, boundary disputes, zoning noncompliance, bankruptcy, and alleged fraud.

Areas of expertise include:

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

Significant Achievements

- Condemnation and right-of-way; 2008 to 2011 - Right of way value analysis for Keystone and Keystone XL pipeline segments in South Dakota, both East River and West River areas. The project included a market study on pipeline eased properties, sale book, and appraisals.
- Tax assessment appeal; 2014 – Representing Walgreen Co., appraised and testified as expert witness before the Kentucky Board of Tax Appeals (KBTA), regarding methodology in developing a value opinion for "Absolute NNN" properties for ad valorem tax purposes.
- Performing county-level tax appeals for Walgreen store properties in Kentucky.
- Development panel member for the Appraiser Supervisor and Associate Training program curriculum for the Kentucky Real Estate Appraisers Board, Commonwealth of Kentucky.

Education

- Bachelor of Science in Business Administration, Marketing, 1984, University of Louisville
- Study focusing on real estate economics, 1990 to 1993, Eastern Kentucky University
- Ongoing real estate economics education since 1993 has been obtained through the Appraisal Institute, and from professional groups serving specific real estate related fields. (education reference attached)

Professional Qualifications and Memberships

- Certified General Real Property Appraiser, Kentucky License #1533
- Certified General Real Estate Appraiser, Tennessee License #5312
- MAI designated Member, Appraisal Institute
  *(The MAI designation is held by individuals experienced in the valuation and evaluation of commercial, industrial, residential and other types of properties, and who advise clients on real estate investment decisions)
- SRA designated Member, Appraisal Institute
  *(The SRA designation is held by individuals experienced in the analysis and valuation of residential real property)
- AI-GRS designated Member, Appraisal Institute
  *(The AI-GRS designation is held by individuals experienced in commercial, industrial, residential and other types of properties appraisal review, to assist clients in satisfying issues related to due diligence and risk management)
- AI-RRS designated Member, Appraisal Institute
  *(The AI-RRS designation is held by individuals experienced in residential appraisal review, to assist clients in satisfying issues related to due diligence and risk management)
- Professional Development Programs – Appraisal Institute
  - Litigation
  - Valuation of the Components of a Business Enterprise
  - Valuation of Sustainable Buildings: Residential
  - Valuation of Conservation Easements
- Member, International Right of Way Association (IRWA)
- Marshall & Swift Valuation Service Commercial Cost Approach Certification #782092

Appraisal Institute Service

- 2018 – President, Bluegrass Chapter, Appraisal Institute
- 2008 to 2017 – Education Chair, Bluegrass Chapter, Appraisal Institute
- 2014 to 2017 – Vice President, Bluegrass Chapter, Appraisal Institute
- 2012 to 2013 – Second Vice President, Bluegrass Chapter, Appraisal Institute
- 2015 to present – Region V Regional Nominating Committee, Member, Appraisal Institute
- 2013, 2014 and 2016 – Leadership Development & Advisory Council, Appraisal Institute
- 2009 - 2012, 2014 – Alternate Regional Representative, Bluegrass Chapter, Appraisal Institute
- 2007 – Membership Development/Retention Committee, Bluegrass Chapter, Appraisal Institute
- MAI, SRA, AI-GRS, and AI-RRS, Candidate Advisor, Appraisal Institute

ADVANCED EDUCATION

PROVIDER/TITLE	YEAR
APPRAISAL INSTITUTE PROFESSIONAL DEVELOPMENT PROGRAMS	
VALUATION OF SUSTAINABLE BUILDINGS: RESIDENTIAL - REGISTRY	2017
VALUATION OF THE COMPONENTS OF A BUSINESS ENTERPRISE - REGISTRY	2013
LITIGATION PROFESSIONAL DEVELOPMENT PROGRAM - REGISTRY	2010
VALUATION OF CONSERVATION EASEMENTS - REGISTRY	2008
GENERAL DEMONSTRATION REPORT - CAPSTONE PROGRAM	2014
INSTRUCTOR QUALIFYING CONFERENCE	2016
LEADERSHIP DEVELOPMENT AND ADVISORY COUNCIL - WASHINGTON D.C.	2013/14/16
APPRAISAL INSTITUTE, COURSES	
UNIFORM APPRAISAL STANDARDS FOR FEDERAL LAND ACQUISITIONS	2017
RESIDENTIAL & COMMERCIAL VALUATION OF SOLAR	2017
APPLICATION & INTERPRETATION OF SIMPLE LINEAR REGRESSION	2016
CASE STUDIES IN APPRAISING GREEN RESIDENTIAL BUILDINGS	2016
REVIEW THEORY - GENERAL	2014
REVIEW THEORY - RESIDENTIAL	2014
QUANTITATIVE ANALYSIS	2013
FUNDAMENTALS OF SEPARATING REAL PROPERTY, PERSONAL PROPERTY, AND INTANGIBLE BUSINESS ASSETS	2012
THE APPRAISER AS AN EXPERT WITNESS: PREPARATION AND TESTIMONY	2010
LITIGATION APPRAISING: SPECIALIZED TOPICS AND APPLICATIONS, COURSE 705GRE	2010
CONDEMNATION APPRAISING: PRINCIPLES & APPLICATIONS	2009
ADVANCED SALES COMPARISON & COST APPROACHES	2008
VALUATION OF CONSERVATION EASEMENTS CERTIFICATE PROGRAM	2008
ADVANCED RESIDENTIAL REPORT WRITING, PART II	2007
ADVANCED RESIDENTIAL APPLICATIONS & CASE STUDIES, PART I	2007
APPRAISAL INSTITUTE, SEMINARS	
DRONE TECHNOLOGY AND ITS IMPACT ON THE APPRAISAL INDUSTRY	2017
RESIDENTIAL APPLICATIONS: USING TECHNOLOGY TO MEASURE AND SUPPORT APPRAISAL ASSIGNMENT RESULTS	2017
RESIDENTIAL APPLICATIONS 2: USING MICROSOFT EXCEL TO ANALYZE AND SUPPORT APPRAISAL ASSIGNMENT RESULTS	2015
INCOME APPROACH FOR RESIDENTIAL APPRAISERS	2014
MARKETABILITY STUDIES: ADVANCED CONSIDERATIONS AND APPLICATIONS	2013
ADVANCED SPREADSHEET MODELING FOR VALUATION APPLICATIONS	2011
ONLINE APPRAISING MANUFACTURED HOUSING	2011
VALUATION OF GREEN RESIDENTIAL PROPERTIES	2010
AN INTRODUCTION TO VALUING COMMERCIAL GREEN BUILDINGS	2010
APPRAISING DISTRESSED COMMERCIAL REAL ESTATE: HERE WE GO AGAIN	2010
EVALUATING RESIDENTIAL CONSTRUCTION	2009
REO APPRAISAL: APPRAISAL OF RESIDENTIAL PROPERTY FORECLOSURE	2009
REGRESSION ANALYSIS IN APPRAISAL PRACTICE: CONCEPTS AND APPLICATIONS	2008
SELF STORAGE ECONOMICS AND APPRAISAL	2007
SUBDIVISION VALUATION: A COMPREHENSIVE GUIDE	2007
APPRAISING CONVENIENCE STORES	2005
EVALUATING COMMERCIAL CONSTRUCTION	2005
APPRAISAL CONSULTING: A SOLUTIONS APPROACH FOR PROFESSIONALS	2003
APPRAISING THE TOUGH ONES	2003
ATTACKING & DEFENDING AN APPRAISAL IN LITIGATION	2002
APPRAISAL OF NONCONFORMING USES	2000
DYNAMICS OF OFFICE BUILDING VALUATION	1998
ENVIRONMENTAL RISK AND THE APPRAISAL PROCESS	1995
LITIGATION SKILLS FOR APPRAISERS	1997
APPRAISAL OF SPECIAL-PURPOSE PROPERTIES	1996

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PROVIDER/TITLE	YEAR
INTERNATIONAL RIGHT OF WAY ASSOCIATION	
COURSE 105 - THE UNIFORM ACT - EXECUTIVE SUMMARY	2017
MARSHALL & SWIFT	
COMMERCIAL COST APPROACH CERTIFICATION PROGRAM	2015
AMERICAN BANKERS ASSOCIATION	
FEDERAL APPRAISAL POLICIES: HOTLINES, COMPLAINT FORMS AND REVISED POLICY STATEMENTS	2013
CCIM INSTITUTE	
COURSE CI-101, FINANCIAL ANALYSIS FOR COMMERCIAL INVESTMENT REAL ESTATE	2006
COURSE CI-103, USER DECISION ANALYSIS FOR COMMERCIAL INVESTMENT REAL ESTATE	2006
COURSE CI-104, INVESTMENT ANALYSIS FOR COMMERCIAL INVESTMENT REAL ESTATE	2006
COURSE 411, GAP ANALYSIS AND REAL ESTATE MARKET DYNAMICS	2006
COURSE 412, ECONOMICS OF COMMERCIAL LEASES, AND 1031 EXCHANGES	2006
HUD/FHA	
HUD/FHA APPRAISER TEST AND CERTIFICATION	2000
THE MODEL ENERGY CODE (MEC), U.S. DEPARTMENT OF ENERGY	1997
APPRAISING FHA PROPERTIES	1997
HOME BUILDERS ASSOCIATION OF LOUISVILLE	
SITE PLANNING	1997
BASICS OF BUILDING; BLUEPRINT READING, BUILDING CODES, SITING	1996
SHELBY COUNTY INDUSTRIAL FOUNDATION	
ENVIRONMENTAL ISSUES SEMINAR	1997
LORMAN EDUCATION SERVICES	
CURRENT ISSUES IN KENTUCKY REAL ESTATE DEVELOPMENT	2000
CLE INTERNATIONAL	
EMINENT DOMAIN, THE LAW OF CONDEMNATION AND LAND USE	2002
EASTERN KENTUCKY UNIVERSITY	
REAL ESTATE FINANCE, RST 330	1993
ADVANCED APPRAISAL APPLICATION/INCOME PROPERTY VALUATION, RST 410	1991
APPRAISAL OF RESIDENTIAL PROPERTY, RST 330	1990
UNIVERSITY OF LOUISVILLE	
BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION - MARKETING	1984