

THE CHALLENGES OF A FIELD CANVASS IN WHISPERING RANCH

ABSTRACT

Whispering Ranch is a 19,000 acre area in Northwestern Maricopa County that was originally subdivided in the 1960's without County acceptance. There is no infrastructure and many of the residents prefer no government intervention into their affairs. No comprehensive canvass of the area has ever been done. While the Assessor's Office believes that it has accounted for most of the improvements to the land, the sheer size of the area and solitary nature of the residents mean that it is likely that there are improvements that are not on the tax roll. Several tools were experimented with to determine the best canvass for the area. Challenges were encountered with a short time window, technology and budgetary constraints. The Assessor's Office had done a good job of recording the improvements, but as expected some were missing. This project has provided insight into how future canvasses in remote areas might be executed.

INTRODUCTION

Maricopa County is located in central Arizona and contains the greater Phoenix Metropolitan area. It is 9227 square miles in area and is larger than the states of Connecticut and Rhode Island combined. Temperatures in Maricopa County can reach 122 degrees in the summer and there are 211 sunny days in a year and an average annual rainfall of 8.5 inches. The Maricopa County Assessor's Office has a staff of 320 employees, including 140 appraisers and a GIS staff of five. The main office is located in downtown Phoenix and has four satellite offices located throughout the county. It is responsible for locating and valuing the 1.5 million parcels within Maricopa County. Many of the field appraisal functions are done using a measuring tape and a clipboard. GIS involvement in appraisal functions has not been very involved up to now.

HISTORY OF WHISPERING RANCH

Whispering Ranch is a 19,000 acre community in northwestern Maricopa County consisting primarily of five acre parcels. It lies approximately 30 miles northwest of the city of Phoenix. It is bordered on the north and west by Federal Lands and the east by the Hassayampa River.



Where is Whispering Ranch?

It was developed in the 1960's and 1970's by the Horizon Land Corporation, who marketed it as an oasis in the desert. Many of these buyers purchased the land without seeing it firsthand, relying on the sales materials provided to them indicating that there would be amenities such as shopping, golf courses, lakes, etc. There were even promises that Walt Disney Enterprises planned to build an amusement park nearby. Unfortunately those promises never came to fruition and the Whispering Ranch area looks much the same as it did over 40 years ago. The development company was accused of making false statements to prospective buyers, including double selling properties, lying about the amenities provided, the availability of drinking water, and the locations of the lots.

Failure of the original land developers to seek an agreement with Maricopa County to provide road maintenance or other services meant that very few improvements were done to the infrastructure. The development did not construct many of the roads that they promised, and those that were constructed were of poor quality. There are only two entrances to the area, and when the Hassayampa River flows the east entrance becomes impassable. Many of the roads, both official and unofficial, require a high clearance or four-wheel drive vehicle to navigate. Residents of the area maintain the dirt roads themselves where possible or make bypasses where the roads have been too badly washed out. Some of the washes have actually become improvised roads through repeated use. Because of the poor road maintenance there is limited police and fire access.

There were no provisions by the original developer to secure electrical service or water service to the development. There are 500KV transmission lines running through the middle of the area, but they do not belong to the utility that services the area and the cost to bring electricity into the area is so great that the residents can't afford to pay for the infrastructure. There is limited electrical power available towards the south end of Whispering Ranch but not enough to supply the entire development. Many of the residents truck diesel fuel in to run generators but there are some properties using alternative power sources. There is also limited water access and most residents haul their own water. Nearly 20% of the property is in some form of floodplain or floodway.

Relationships between the residents and government organizations have been rocky. The lawsuits against the developer, a bad experience with a utility company in the 1990's and a feeling of abandonment by the local government have helped to foster these feelings. There are many unpermitted structures within the development and several of the owners have had unsatisfactory interactions with the County Planning department. Many of the residents have moved into Whispering Ranch because of its distance from the metropolitan area and they value their privacy. The remote nature of the area also increases the likelihood of illegal activities.

WHY WE DID THIS

A local real estate advocate approached the Assessor's Office with concerns that there were large numbers of single family residences that were not on the Assessor's Tax Roll. In May of 2009 he provided the office with a list of nine sample parcels that he had identified as having unpermitted structures on them. He indicated that there were many more parcels that contained escaped improvements. A check of the Assessor's Secured Property Roll showed that indeed these were not listed as having permitted structures on them. The appraisal staff reviewed our current records and checked the existing aerials to see if there was any merit in the complaint. Upon reviewing the parcels it was determined that most likely the structures were mobile homes, shipping containers or salvage properties.



To achieve due diligence it was decided that a comprehensive field canvass of the area should be undertaken. A field canvass of the Whispering Ranch area had never been done and there was some concern that there could be escaped improvements. It was determined that once the summer heat had subsided, the appraisal staff from the Northwest satellite office would do a complete field canvass of the area.

HOW WE DID THIS

In June it was requested that the GIS department print out maps showing the parcels in relationship to the aerial photography. The GIS department decided to create an ArcGIS Server 9.3 Web Mapping Application which showed not only the parcels and aerials, but also the Property Use Codes, and which properties had recorded improvements and permits. Having the application available in this form meant that more appraisers could review the area simultaneously and reduced the amount of paper maps being printed. The ability for the staff to print out maps did exist if they felt that they wanted paper copies.

While this was beneficial in determining the existence of some of the improvements the appraisers needed to physically access the properties to value the improvements. The aerial photography was one year old and it was difficult to determine the conditions and use of some of the structures. From an aerial photograph it can be hard to tell the difference between a storage container, a mobile home, and a travel trailer.



Online application

In September the GIS department was tasked with building maps for the appraisers to take out in the field. Previous canvasses were performed using paper maps and paper component forms. This was the first time that GIS was actively involved with a field canvass. Many ideas were thrown around using mobile GPS units with digital cameras, ruggedized laptops with air cards for a live link back to the office. Realizing the remote nature of the area it was assumed that communications might be spotty. The recommendation of the GIS department was to equip each appraiser with a laptop with ArcView and a tethered GPS unit. Unfortunately the reality of the budget situation sunk in. With a funding freeze for hardware and software, it was going to be nearly impossible to seek approval for the acquisition of new technology. There were talks of renting some equipment, but the final decision was to use what we had. There was some debate as to how much revenue would be generated by this canvass and whether it would even be enough to cover the cost of the gas used to perform it. The decision was to create static maps and load them on existing pool laptops.

ATLAS

Since time and funds were limited and wireless coverage can be spotty in Whispering Ranch, it was decided to create a digital Map Book in Adobe Portable Document Format (pdf) and load it along with ownership information onto laptops that the appraisers would use in their vehicles. The option to print out paper maps was retained in case the situation provided to be too tough for the technology. GPS coordinates were added to the maps to help the appraisers locate positions with their personal GPS units. Index maps were printed out to plan out routes and track which areas had been canvassed. A before snapshot of the area was created so that it could be compared to the results of the canvass. The atlas was created in several different formats. The original atlas was going to be based on a quarter/quarter of a section, but the size of the parcels, five acres on average, limited

the scope of each page to about ten parcels. A second and third set of maps were created at the quarter section and section size were created for navigation purposes and to allow for a 'larger picture' of the area. The tabular data from the Secured property roll was exported as an Excel file. This data contained information about the existing components and current property usage. Other relevant data such as building footprints were included as well.

EQUIPMENT

The field equipment for the teams consisted of Dell Latitude D830 laptops with car chargers. The appraisers were equipped with digital cameras, and some of the appraisers had their own GPS units to use for navigation. Each team of appraisers also carried a 30 mile consumer grade two-way radio.

PRE-MAPPING

The existing parcel maps did not have street names annotated. In fact most of the original maps didn't even indicate that there were any streets.



Original subdivision plat

Navigating the area can be a challenge despite the fact that it is built upon a grid system. There are no official established street signs. Some of the residents have installed their own street signs made of wood, cardboard or other available materials. There are steel survey markers that were installed by the original developers

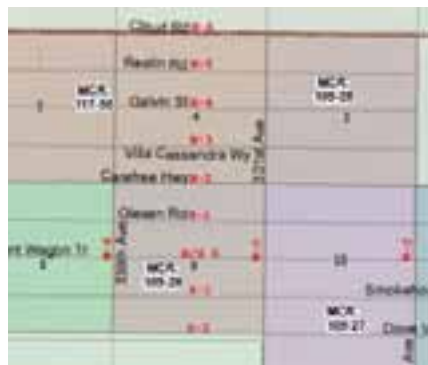
A hand-drawn map of a ranch property, likely a cattle ranch, showing various sections and features. The map is oriented with North at the top. Key features include:

- Top Section:** Labeled "Shopping Ranch" and "Pinto Horse Ranch". It shows a "Main Road" and a "Cattle Ranch" area.
- Left Section:** Labeled "TOYOTA TEST TRACK". It shows a "Main Road" and a "Cattle Ranch" area.
- Center Section:** A large area divided into numbered sections (1-14). It includes a "Main Road" and a "Cattle Ranch" area.
- Right Section:** Labeled "TOYOTA TEST TRACK". It shows a "Main Road" and a "Cattle Ranch" area.
- Bottom Section:** Labeled "TOYOTA TEST TRACK". It shows a "Main Road" and a "Cattle Ranch" area.

The map is a detailed sketch of a ranch layout, with various roads, tracks, and numbered sections. It appears to be a working document for a rancher or a surveyor.

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GRID DESIGNATION	ROAD NAME	ALTERNATE NAMES
E-2	291 st Ave.	
E-1	299 th Ave.	
E/W 0	307 th Ave.	307th Avenue Alignment
W-1	315 th Ave.	
W-2	323 rd Ave.	
W-3	331 st Ave.	
W-4	339 th Ave.	
W-5	347 th Ave.	
W-6	355 th Ave.	
N-12	LaSalle	
N-11	Tamar	
N-10	Joy Ranch Rd.	
N-9	Carlise Road	
N-8	Madlock	Maddock Road Alignment
N-7	(Not Known)	Delores Rd.
N-6	Cloud	Black Mountain Rd. (E. of 307 th Ave.)
N-5	Restin Rd.	
N-4	Galvin St.	
N-3	Villa Cassandra Way	
N-2	Carefree Highway	
N-1 + 1/2	West Entrance	Carefree Highway
N-1	Olsen	Olesen Rd.



Street reference

TEST RUN

The week before the field canvass members of the GIS department met up with the satellite office manager and went out to the site to test perform a test run. This served as an attempt to determine whether or not the atlas would work, if there were other items that would be needed and what the conditions of the roads were. The GIS department also brought along a laptop running ArcMap 9.3.1 and a tethered GPS to showcase what was possible. The GPS was a Garmin GPS III Plus and was communicating with ArcMap using the Minnesota Department of Natural Resources DNRGarmin program. This allowed the team to have a live update of their location.



GPS Track

One of the things learned during the test run was that finding your way around the ranch was more difficult than anticipated. The channels cut by the washes have made some of the roads impassable. There were several situations when you could see an area but not be able to get to it. Locating the parcels with the atlas using the quarter/quarter section maps was difficult because of the large scale of the maps. Using the 'experimental' tethered GPS worked well because of the 'live update' and the dynamic abilities of ArcMap. Cell phone reception was actually better than anticipated on the east side of the development, but there were many times when coverage was lost.

FIELD CANVASS

The field canvass took place over a three day period in October, using three teams of two residential appraisers each. The appraisal teams attempted to cover between three and four square mile sections each day. The two person teams helped to ensure the safety of the appraisers and provide a navigator for the computer. Non-governmental vehicles were used but each employee wore a uniform shirt. An RV was used as a command center and was parked at the entrance of the development. It served as a bathroom, lunch spot, communications post and technical support facility. A spare laptop was brought in case there were problems with a field unit. Appraisers would keep in contact using the two-way radios.

The goal of the canvass was to observe each property and inspect it for escaped improvements (structures, add-ons, mobile homes) to ensure that it is properly valued. If an escaped improvement was located the appraisers would do their best to value the property. Appraisers have the authority to enter a property however, if access to the property was risky or impossible the appraiser would estimate the size and quality of the structure from a distance. Letters to the owner on record would be sent out indicating that improvements to the property had been determined and that the owner should contact the Assessor's Office for further dialog. Valuation would include measurement, feature and quality notation. Pictures of the structures would be taken and a sketch of the property would be created to determine rough square footage. When a mobile home was found the appraiser would note the APN and the basic information about the building (single/double wide,

inhabited/abandoned/burnt out). Since there is no water service aside from the occasional well and no sewers and very limited electrical service, there is no need to note utility hookups.

SAFETY CONCERNS

Because of the remote area and the lack of law enforcement presence there was some concern about the safety of the staff. A local realtor who sees himself as an advocate for the residents of the area has put together a newsletter which is posted at the entrance to the development. The newsletter has some information regarding sales activity of properties in the area, information about attempts to bring power to the area, and a section for airing grievances about the local government. In the newsletter dated a week before the test run there was a paragraph that mentioned the Assessor's planned field canvass.

I also heard a rumor that Maricopa County has been going over maps and aerial photos and may be planning a sweep through Whispering Ranch to inspect all parcels identified as having "improvements" on them. There is the possibility at that point of 'notices of non-compliance' being issued, citations and fines assessed against properties. I sure hope this isn't true. I think that if they are stupid enough to pull this stunt, they might be surprised at the reception they get. After the hearing that the Hudson's had it is obvious that the County is not interested in working with any property owners. They just want the money.

Realtor's newsletter

It was not known what the author intended but given the history that some of the residents have with the local authorities and the remoteness of the area, the appraisal teams made sure to keep their guard up. Some of the appraisers observed areas that appeared to be abandoned meth labs and a possible chop-shop.

The 30 mile two-way radios had an effective range of about a third of a mile. They were not powerful enough to reach the teams from the command post and they were out of communication for great periods of time. Ironically cell phone service was generally available. There were times however, when contact with the team members was lost.

ANALYSIS AND RESULTS OF THE CANVASS

The canvass did reveal several escaped improvements, but nowhere near the numbers that were suggested. Out of the 3489 parcels only 23 were found to have escaped improvements on them. Twenty-one of those were single family residences however some of them may be manufactured houses. The total value that was added to the property roll was \$ 1,723,266.00. One improvement, a custom built earthen home was valued at \$515,000, but most of the majority of the properties were valued between \$25,000 and \$75,000. It is anticipated that most of those owners will appeal their values and the Assessor's Office welcomes them and will give each applicant an opportunity to do so. The appraisal staff was unable to find permits on most of the improvements that they located. Checks with the Planning department will be made to ensure permits weren't missed.

CHALLENGES / LESSONS LEARNED

After the canvass was completed a user survey was distributed to the appraisal staff to gather their opinions of the use of technology in the canvass. This, in conjunction with observations made during the canvass provided the office with a summary of the challenges that were experienced and opportunities for future enhancements.

No contact was established with the Sheriff's Office, so the appraisers weren't provided with information on hazardous situations or areas to avoid. The residents hadn't been contacted by the Assessor's Office so they generally weren't aware that we were coming. Previous canvasses were prefaced by a letter campaign to explain the intentions of the Assessor's Office. The lack of contacting the residents before the canvass may have actually worked in the appraisers favor as they may not have welcomed the appraisal staff.

Large parcels and a lack of fence lines make it hard to identify the parcel boundaries. There are several cases where the residents weren't aware of their own property lines and have built across the boundary lines. Unofficial roads cross parcel boundaries making knowing your exact position difficult without the aid of a survey or a GPS. Great care needed to be taken to ensure that the improvements were associated with the proper parcel.



Improvements built across parcel boundaries

Many structures were found to have been abandoned or foreclosed. Many of those had been vandalized or burned down. There was a lot of trash that from a distance appeared to be sheds or out-buildings. Some of the features that appear to be mobile homes from the aerials are shipping containers or travel trailers. The hilly terrain and washes made it hard to see some of the structures from a distance.

Communications with the team members during the canvass needs to be improved. The available radios were insufficient for the conditions and the appraisal staff shouldn't have to rely on personal cell phones to stay in touch. While each team was assigned an area to work in, it could be difficult to locate them if it was needed.

The laptops were difficult to work with. There were complaints that the equipment was too bulky and that it was hard to operate on the dirt roads. Dust was also a concern for the returning hardware. The greatest complaint was that it was difficult to see the screen in the bright sun. The appraisers weren't given enough time before the canvass began to familiarize themselves with the laptops.

The use of the static maps on the laptop did not meet the appraiser's needs. On the second day of the canvass most of them printed out paper copies of the maps and were using them to navigate with. Among the complaints that the appraisers expressed were the static nature of the PDF map book and the need to load the proper file for their location. They said that this was a good first step and might work well in a more densely built location than in Whispering Ranch. The appraisers indicated that they would rather have had paper copies which they could use in conjunction with their personal GPS units. But they were intrigued when shown the interactive map with their location. The staff is still highly reliant on paper data sources. Much of this is due to the transient locations of their jobs and the lack of available field technology.

More involvement with the appraisers prior to executing the canvass would have been desirable. The GIS staff did not meet most of the field appraisers until the day of the field canvass. Working solely with the managerial staff did not provide a complete picture of the field appraisers needs. Performing the test run was beneficial but ideally should have included one of the field appraisers and an opportunity to review the methods.

CONCLUSIONS/RECOMMENDATIONS FOR THE FUTURE

This was the first time a canvass of this size was created in this highly rural area of the county. Previous canvasses have been concentrated in more densely populated locations. Overall the canvass was a success. Escaped improvements were located and added to the property roll. The Assessor's Office demonstrated that while they had not known about some of the improvements that indeed they had captured quite a lot of the legal improvements through the normal business process. The appraisers all successfully survived the canvass without any major confrontations with property owners.

There were many things that make Whispering Ranch a unique area in Maricopa County but the lessons learned here can be applied in other situations. The area can be tough to navigate and the benefits of the interactive map in the field are apparent. This lessens the possibility of applying the improvements to the wrong parcel and allows for a more accurate valuation. The map book was definitely a simplistic approach to using GIS technologies. The interactive map had more promise but time and budgetary constraints prevented further investment. A freeze on hardware purchases prevented experimentation or purchasing GPS units for the appraiser.

Further exploration of technology is necessary. Screen glare and readability is a large problem in Maricopa County where the sun and the Arizona heat can be brutal on technology. Finding the proper mobile unit is important. Cost has to be low or functionality needs to be high. The appraisal staff needs the features of a desktop in the office and the portability in the field. Purchasing an expensive field unit, along with a desktop PC becomes cost prohibitive. Mobile units need to either be cheap enough to justify for the appraisers or versatile enough to serve the appraisers back in the office. To assist in the exploration of future technologies a Core GIS Steering Committee has been created consisting member from many different departments. This committee will review the needs of GIS functions throughout the office and seeks to involve other departments in GIS projects.

Involvement of the GIS department in this field canvass was a very good thing. The GIS department learned a lot about the canvass process and found many areas where it could benefit future canvasses. The appraisal staff also learned of some of the uses of GIS in the field and that it could encompass more than just paper maps. Future canvasses will hopefully involve more interaction between the field appraisers and the GIS department.

CONTACT INFORMATION

David Minton, GISP
Maricopa County Assessor
davidm@mail.maricopa.gov
www.maricopa.gov/assessor