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14 April 2016

Rio Verde Policy Brief

Introduction:

The Rio Verde community is a lively adult community located North East of Scottsdale, Arizona and has a current population of around 1,400 residents and 1,000 custom-built homes. Over fifty percent of the residents within this community can be described as "snowbirds" and only have a seasonal home in Rio Verde for the colder, winter months. This area features a variety of communal structures such as the Community Center, a community garden and the Country Golf Club. Two golf courses and multiple recreational centers are also key elements in maintaining an energetic and social lifestyle for their residents. Rio Verde is the only community west of the Mississippi to be a certified Audubon International Sustainable Community as of 2015 and have been designated a green community since 2011.

In recent years, Rio Verde has made many important strides toward sustainability throughout the entire community. The community has a long-term plan with several focus areas. The group decided to focus on recycling because they felt it was an area where the residents of the community could also easily become involved. They currently have several goals and policies in place when it applies to reusing. Recycling bins have been distributed to each of the 1,000 homes in order to promote residential recycling and waste reduction. Currently, solid waste management company, Republic Services, manages Rio Verde's waste and Fridays have been designated as waste pickup day. Every year, the Rio Verde community holds an E-waste/Shredding event that invites all community members to come together and recycle items that are not acceptable/too large to throw into their residential recycling bins such as sofas, computers, and ink cartridges. The fire department also plays a role in contributing to the E-

waste and shredding event by providing a way to dispose of medication pills for the residents throughout the year. According to key community stakeholders, residents are content with the current recycling program. However, it is not a question that has actually been asked.

Many key stakeholders were involved throughout the entirety of this project and assisted in providing useful information for the development of the recycling metric. Sal Celona, the Rio Verde Sustainability Coordinator, worked very closely with the group and helped guide many of the decisions made. Kevin Waring, another Rio Verde representative, aided in advising the group what direction to take in the beginning. From Republic Services, the group was able to work with Mark Rodermund to obtain numerical values related to recycling in the community. The executive director of the Rio Verde community, Doris Findling, gave the group more insight on the possibilities available to work with. As executive director, Doris had more information regarding policies and rules set on the community. She informed the group when an idea or proposal was not realistic or possible. Lastly, Joanna Nadeau, Associate Director of Environmental Programs, provided the group with resources from Audubon International.

Scope and Objectives:

When we started this project, we quickly identified various systems that Rio Verde has adopted in an effort to become a more sustainable place to live. Rio Verde has a recycling system established by community leaders to promote sustainable practices among residents. Thus, our objective was not to recreate the system for Rio Verde, rather improve the efficiency of the system the community already has in practice. After speaking with community representatives, we narrowed our scope of work to focus on developing a metric that efficiently, and effectively tracks raw recycling data. The first challenge our group faced was identifying quantifiable indicators, which could be used to track the efficiency of the current system. Our goal in

designing a metric was to produce a tool for community leaders to track observable data that in the long-term will allow community leaders to monitor progress, and deficiencies within their system.

Our group agreed unanimously that our metric would need to be organized into an electronic spreadsheet. Using an electronic format to log data, allows for community leaders to continue utilizing the metric we created moving forward. Creating a metric for Rio Verde was more complex than observing the community and providing a current state analysis. Understanding current state does not provide much benefit to Rio Verde if it cannot be compared with past, or future trends, and objectives. The indicators that our group identified can be objectively recorded to monitor the correlation between variables such a seasonal community population, and community recycling participation.

Our final objective for this project was to conclude, and provide Rio Verde with suggestions that would ultimately result in their ability to analyze various sustainable solutions. Creating a metric helps set standards, and goals for community leaders to manage system efficiency. Our group is optimistic that Rio Verde will be empowered to propose the solutions independently moving forward. That is why our group focused on developing an accurate baseline, since our objective was not to make decisions for the residents of Rio Verde. Our goal was to empower the leaders of this community to analyze, and act independently without our involvement.

Findings:

For this project, a problem analysis was conducted looking at the importance of metric systems in recycling, the ecological impacts of not recycling, and small-community based recycling programs. This helped guide our project and allowed us to develop a better

understanding of how to address the recycling program in Rio Verde. In order to investigate the ecological impact of not recycling, the environmental consequences of landfills were evaluated because this is where all the waste is diverted if recycling programs are not accessible. Landfills pose a myriad of negative externalities for surrounding communities, as well as the global population as a whole. These externalities include: hazardous gas emissions, groundwater pollution, vegetation damage and global warming (El-Fadel et al., 1997).

Hazardous gas emissions are mobile and are very difficult to contain. In many cases, they have been found to pose other dangers such as explosions and health hazards to people exposed to them. These emissions also lead to oxygen displacement, and cause the surrounding vegetation to suffocate as the plants are engulfed by increased concentrations of noxious gases like carbon dioxide and methane (El-Fadel et al., 1997). These same emissions release heat as methane is oxidized, increasing the temperature of the neighboring soil and ultimately getting trapped in the atmosphere, causing a rise in global climate over time. Landfills also produce leachate, which can be defined as the water that has percolated through a solid substance after it has leached out of a separate component (El-Fadel et al., 1997). Leachate pollutes groundwater by passing through the ground laterally toward the earth's surface. All of these negative ecological impacts illustrate the urgency of the promotion of recycling programs and show that it is a worthy investment for communities.

Coconut Creek Example:

Coconut Creek is one example of an Audubon International Certified Sustainable Community using various metrics to track their progress. While there are some striking differences between Rio Verde and Coconut Creek, most notably that Coconut Creek is a city in Florida and Rio Verde is an active adult community in Arizona, we feel that these metrics can still be effectively applied to Rio Verde's Long Range Plan. Coconut Creek develops an annual

City Green Plan Report, which compiles data from throughout the year to create numerical measurements, very similar to what was asked of us by our stakeholders from Rio Verde. According to their website, "The City Green Plan establishes a framework for achieving environmental leadership with the adoption of a City green image, the identification of environmental themes, a range of action steps, and a method for annual monitoring. By using this plan, the City will implement programs and policies regarding sustainable growth. The plan addresses both community-wide programs and government operations" (coconutcreek.net, 2016).

Since our group was tasked with developing a metric for recycling and related waste management, we focused on Coconut Creek's waste reduction and recycling category. The report is similar to the layout of Rio Verde's Long Range Plan, which consists of a spreadsheet based on category, objectives, indicators, and results. The most useful tool from Coconut Creek's City Green Plan Report is the numerical performance measure given for each action step. Some of these measurements include; number of recycling containers distributed, average capture rate ratio, number of participants in annual recycling events, and number of pounds of paper shredded. All of these metrics could be applied to the Rio Verde Long Range Plan since their community also distributes recycling containers and holds annual waste and recycling events including paper shredding and e-waste collection. This data could be collected by number of individuals who participate or by number of households, and we would also recommend the inclusion of common areas such as the country club in this data collection. We feel that referring to Coconut Creek's City Green Plan Report for setting numerical goals would be a useful addition to the metric our group has developed.

Challenges Faced:

There were many challenges faced during the research process. For one, the information available to us was very limited. It was rather difficult to gather information on recycling and waste tonnage percentages. Rio Verde's recycling services are managed by Republic Services. Due to privacy concerns and contracts between Rio Verde and Republic Services, some beneficial information was not disclosed. Due to lack of information, it was a challenge to project numbers and predict trends, therefore difficult to set numerical goals. Also, the recorded data that was available is actually lumped together with other communities. The group reached out to a representative from Chandler that was introduced to us to see how they have their numerical amounts set up into a metric. This would have aided the group tremendously. However, the representative did not want to provide the information advising us it would not make sense and that it was confidential. Aside from numerical data, Rio Verde is a community with a very fluctuating population. With Rio Verde being an adult community, many residents come and go throughout the year. There are many snowbirds that live in Rio Verde, which means during the summer they return back to their other homes. This factor can play a huge role in inconsistent data for the Rio Verde community. Therefore, tracking numbers with information that is available was also a challenge. Due to the time constraint of just a couple months, we were not able to complete as much research as we would have liked. Not only time, but distance from the ASU campus to Rio Verde was also inconvenient. The group successfully made a few trips down to Rio Verde, which helped tremendously with obtaining data and learning more about Rio Verde in general. Had these trips been more frequent, the group may have accomplished more. These challenges we faced put a damper on our project success, however there was a lot we did learn and complete for the future success of Rio Verde's recycling effort.

Rio Verde Metric Information

Trash Day Metric	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Shredded Material Weight	10,000 lbs	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	
E-Waste Weight	3,642 lbs	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	
Bulk Roll Off Weight	1,440 lbs	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	

As stated in the original scope of work our primary objective for the Rio Verde community was to create a metric where raw data could be inputted and could easily be compiled and analyzed. After facing challenges and being able to only gain a limited amount of past information the group was able to create an extremely simple set of spreadsheets where the community could input their data. When the group met up with the primary stakeholder, Sal Celona, the group was advised that they were only looking for the tonnage information to be inputted in the metric. The first spreadsheet shown is the "Trash Day Metric". The Trash Day information is gathered on a yearly basis when the community completes the E-Waste/Shredding Event. Unfortunately, no numerical information could be gathered from previous years that could be inputted in that specific metric. It is set up where the information can easily be recorded by a member from the community. This metric has the ability to be enhanced on a larger scale, but being able to gather this information would be a continuous challenge. The potential idea that was thought of was being able to gather the data of the amount of refurbished E-Waste that was gathered for that particular day as well as the Bulk Roll off that was reused.

Monthly Waste Gatherings	January	February	March	April	May	June	July	August	September	October	November	December
Trash Waste Weight												
Recycled Waste Weight												

The second metric is labeled the "Monthly Waste Gatherings" metric. This metric was developed to have information be inputted based on the tonnage information split up by trash waste and recycled waste. After contacting the other primary stakeholder,

Mark Rodermund from Republic Services, the group was advised that Republic Services was and is going to be able to provide this information on a monthly basis so that they can enhance and document their sustainability efforts. That is an excellent step in the right direction. However, this current metric has the potential to be even more effective. The Rio Verde community needs to potentially form a contract with Republic Services where exact percentages are given showing the difference in amount between trash waste and recycled waste. The "Monthly Waste Gatherings" metric shown above was the group's first draft.

Monthly Waste Gatherings	January	February	March	April	May	June	July	August	September	October	November	December
Trash Waste Tonnage	10000	9000	7800	8600	5500	5000	4800	4600	7000	8900	9000	11000
Recycled Waste Tonnage	5900	6000	3500	6800	2000	1000	1200	1900	3000	3400	4200	5600
Recycling Rate	0.37106918	0.4	0.30973451	0.44155844	0.26666667	0.16666667	0.2	0.29230769	0.3	0.27642276	0.31818182	0.3373494
Average Recycling Rate	0.3066631											

The "Monthly Waste Gatherings" metric shown above is the group's final draft of that specific metric. After doing research it was also found that the recycling rate could be calculated through this equation: (Recycled Waste Tonnage / (Recycled Waste Tonnage + Trash Waste Tonnage)) (University of Chicago, 2016). This was found after extensive research and ended up being a primary part in the metric proposed. The metric shown above exemplifies what a typical year could like in Rio Verde. The tonnage numbers shown within this example are not accurate numbers and were picked at random since the group did not have background information provided by Republic Services. Moving forward, Republic Services will provide the tonnage amounts where a representative from Rio Verde will then input the information and the rates will automatically populate. As stated before community board members should continue to work with Republic Services to further obtain specific data, but with this particular metric, it is a wonderful step in the right direction. Setting numerical goals can be accomplished through this since you can compare recycling rates from month to month leading to setting goals for the community. It is an overall efficient and simple analysis that tracks and reviews data from past performance, which is what was set forth in the original scope of work.

Rio Verde Recycling Survey

Please take a moment of your time to complete this survey. We are attempting to gather more information to further enhance our sustainability status and reduce our overall carbon footprint. Thank you.

Why do you recycle? If you do not recycle, why do you decide not to

recycle? _____

_____

Do you know what and what not to recycle? ☐ Yes ☐ No

Do you think stickers on bins would help you recognize what should be recycled? ☐ Yes ☐ No

Would you support holding the E-Waste/Shredding event more than once a year? ☐ Yes ☐ No

Are you content with what Rio Verde is currently doing in their recycling efforts? ☐ Yes ☐ No

Is recycling an inconvenience for you? ☐ Yes ☐ No

If yes, why? _____

Do you typically fill up the trash bin more than the recycling bin? ☐ Yes ☐ No

What would encourage you to maximize recycling?

_____

Do you have any suggestions to make recycling easier for you and the

community? _____

_____

If Rio Verde is your part-time home please answer these questions…

Does your other local community recycle similar to Rio Verde? ☐ Yes ☐ No

If no, how so? _____

Does your other community offer you incentives to recycle? ☐ Yes ☐ No

If yes, what do they do? _____

This survey will be sent in the community's monthly newsletter. Sal asked the group to prepare this survey to be able to get the resident's input on recycling.

The Future:

To expand upon the metric shown above, the group would like to see the community engage in composting, and reduce their overall community non-recyclable waste disposal tonnage. In the group's proposed metric we introduced the idea of collecting monthly data records showing tonnage of non-recyclable waste versus recyclable waste. Implementing a system that encourages residents to contribute to community compost could end up being resold for profit, or recycled back into the community at no cost. After meeting with community board members it was concluded that composting was not an option that they wanted to require from their residents. However, encouraging residents could lead to future success within this subject area.

As with any sustainability approach, education is a key component of the efficacy of a recycling program. By distributing educational information sheets to new and current residents, Rio Verde will be able to keep the local community aware of all the ongoing sustainability efforts. Rio Verde can also keep residents properly informed about recycling etiquette by labeling the recycling bins with some sort of info graphic; this will let the public know what items they can and cannot be recycled. This feature can follow the bins observed around ASU campus with a set of very simple, yet helpful pictures to guide and reduce the uncertainty a person may experience when trying to recycle everyday items. Another way to expand upon the current recycling regime in Rio Verde would be to increase the spread of these bins and informational graphics into more communal areas such as the golf resort, the community center and the other recreational areas. For example, the residents with plastic water bottles that

frequently make their way into recreational areas, such as the pickle ball courts, will have a more accessible location to recycle their waste. This would ultimately reduce the possibility of recyclable items ending up in the trash. The more accessible the recycling bins are to the community, the more likely they are to participate. Though these additional bins will require additional work in collection, the community involvement and benefits for the environment as a whole will prove worth the extra effort. Likewise, this specific expansion of the recycling program will help the Rio Verde community reach their sustainability goals listed in their long-range plan.

One of the main issues the Rio Verde community informed the group on was the constant concerns from residents regarding paint disposal. Many of the homes in Rio Verde are fairly new, therefore many residents paint inside and outside their homes often. The executive director of Rio Verde, Doris Findling, stated, "We get many calls often from our residents asking, 'what should we do with our leftover paint?', 'Is there somewhere we can throw away our paint?', 'Is it recyclable?'" (Findling, 2016). One suggestion the group would like to offer Rio Verde is to implement an educational flyer or letter in the mail that provided the residents options to recycle paint and informs them of the negative externalities paint causes. This would also reduce waste and recycling contamination. Another suggestion we have is to implement a monthly paint collection, where residents can bring their excess paint and dispose of it properly. This would also contribute to reducing recycling contamination and it something that could eventually be added into the metric as more information is delivered.

Adding on to the suggestions, the group would like to see Rio Verde Community utilize the information they have from the fire department and add this to the recycling metric provided to them. This could not only be beneficial to their understanding of the amount they recycle, but

this could help them see what areas they may need to improve. Also, fire department involvement in their community could become more frequent. The fire department has helped Rio Verde tremendously with reducing recycling contamination and helping out with E-waste shredding events according to the meeting with Doris.

Conclusion:

Overall, the Rio Verde Community has a wonderful sense of what sustainability is. The board members have a forward thinking mentality. As stated initially, the primary purpose of this project was to provide them with a metric. The group most definitely provided that. Moving forward, the community will be able to expand the metric as they advance through the group's recommendations. Initially the group did not recognize the complexity of the problem. However, as time went on and the group encountered challenges and communicated with the stakeholders it was obvious it was and is a problem that needs to be addressed with multiple solutions and approaches. There are multiple resources needed to create a "simple" metric. Stakeholders will have their differing perspectives when it comes to the importance of the proposed solutions, so there is not a priority set forth on the groups behalf. It was a pleasure working with Rio Verde, and the group has high hopes for their future sustainability endeavors.

Works Cited

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