

Abstract

Cities in the Southeast region of the United States have chosen to become climate leaders through setting emissions reduction goals and creating climate action or sustainability plans to address climate change threats. The City Winston-Salem in the Piedmont region of North Carolina, however, had not taken those actions to address the increasing threat of climate change, indicating the city lagged in climate best practices. While the City of Winston-Salem Office of Sustainability was created in 2010, the office had not implemented sustainability efforts beyond annual benchmarking and reporting efforts for local government operations. But beginning in 2017, the local government started showing more interest in sustainability initiatives. That year, the Office of Sustainability had completed a thorough sustainability gap analysis and the mayor signed the Climate Mayor's Agreement in support of the Paris Climate Agreement. The Office of Sustainability decided to use the growing momentum and their previous benchmarking efforts to create the first sustainability plan for internal local government operations. The plan was created through a detailed planning and review process involving feedback from relevant city staff, research of plans from other cities, and research of other plans Winston-Salem's local government had. The ultimate goal was to help reduce greenhouse gas emissions from local government operations through action in transportation, energy systems, green space and waste goal areas. The plan will be submitted to City Council to pass in favor of the Internal Sustainability Action Plan and begin implementation.

City of Winston-Salem Internal Sustainability Action Plan

The threat of climate change in recent years has become clearer and more present to natural and human systems. The predicted impacts from increasing temperatures “means more intense heat waves, windier hurricanes, and bigger floods – with ever-increasing economic impacts,” according to Andrew Winston in his 2014 publication *The Big Pivot* (p.1). Since then, the world reached human-induced global warming of 1 degree Celsius in 2017 (Allen, et al. 2018 p. 59). The observed impacts from that global warming trend include land warming on all continents, ocean warming, and more extreme hot and cold temperatures (Hoegh-Guldberg, et al. 2018, p. 188). Furthermore, in 2018, the International Panel on Climate Change (IPCC) released the *Special Report on Global Warming of 1.5° C*. In the report, the IPCC presents information about why the world needs to limit warming to 1.5° C. This temperature threshold is important because

exceeding it will have significant impacts on all aspects of human and environmental health, like increased death and illnesses from climate-related reasons, lack of access to food and water, an increase in extreme weather events, and more species loss and extinction (Masson-Delmotte, et al. 2018, p. 32).

In response to that special report, the CDP, formerly the Carbon Disclosure Project, released the For Cities By Cities report in 2019 to summarize key takeaways from the IPCC report. In this report, they stressed the importance taking action to prevent the potentially harmful impacts of global warming of 1.5° C. The cities group placed importance for leadership on a local level as necessary to achieve the limited warming of 1.5° C since “the effects of a city’s actions are not limited to its own borders or region...,”(Orr, et al. 2019, p. 2). Considering the lack of leadership from the federal government and with the emphasis on local governments to take action to help preserve various community systems, this led to creating the first sustainability action plan for the City of Winston-Salem.

A sustainability plan was an idea that I had from the beginning of my time with the City of Winston-Salem Office of Sustainability. Early on in my career, I became part of a network of sustainability professionals in the southeast region, aptly called the Southeast Sustainability Director’s Network. It was after joining the network I noticed that a best practice of many cities across the region and the state of North Carolina was to have an emissions reduction goal and a plan to identify ways to achieve the goal (STAR Communities 2017 p. 10).

The City of Winston-Salem seemed to be deficient in taking action to address climate threats and greenhouse gas emissions in comparison to our regional and state peers. Not only that, but other cities also seemed to have been able to begin incorporating sustainability principles within their organizational systems. In North Carolina alone, at least a dozen cities had an emissions reduction goal and/or a sustainability plan at either the community or local government operations level, or both. As one of the largest cities in the state, we were not keeping pace with the other cities and communities. Even the Governor has been pushing a more climate action focused agenda. In 2018 he signed Executive Order 80: North Carolina’s Commitment to Address Climate Change and Transition to a Clean Energy Economy and in 2019 had the NC Department of Environmental Quality create the State Clean Energy Plan. Progress was happening across North Carolina at every level which at that point, the City of Winston-Salem

has been a nominal part of. With all that happening, it was clear that Winston-Salem needed to make a stronger impact beginning within its own community.

Some smaller action had been taken by the City of Winston-Salem before this point. The city had been tracking local government emissions since 2008 for electricity, natural gas and local government vehicle fuel use through data provided by the various utility companies. The data gathering was done by the energy manager, whose position existed in the Property and Facilities Management Department at the time since the Office of Sustainability had not yet been created. 2008 was also the year the Greenhouse Gas Inventory and Local Action Plan to Reduce Emissions was released which analyzed local government and community wide emissions from 2000 to 2006. The plan was completed by a third party and suggested twelve data-based recommendations. With the extensive research included in the plan, it laid the groundwork for a solid baseline of understanding of local government and community emissions. The recommendations provided next steps that would begin the integration of sustainability into the City of Winston-Salem's organizational culture. The more significant recommendations that were accomplished included creating a Sustainability Manager position and the Community Sustainability Program Committee. The new sustainability manager position was established in unison with the Office of Sustainability. The Greenhouse Gas Inventory and Local Action Plan to Reduce Emissions was an important and necessary step towards sustainable efforts as it led to the local government having the office and position necessary to lead sustainability efforts.

The Office of Sustainability and the Sustainability manager position were both created in 2010 from funds that were part of a grant. The first sustainability committee was also created to handle the remaining funds from that grant through 2013. Unfortunately, when funding ran out, the committee disbanded and the main initiatives that had been created in those three years became inactive. From that point on, the lack of funding for sustainability programming greatly restricted the actions the office was able to take, which is why annual reporting became the focus. And up until recently, not much action had been taken towards sustainability action beyond the reporting and benchmarking. The Office of Sustainability was looking for a way to jumpstart sustainability efforts in the city when an opportunity arose from another online reporting platform, which led to helping create the city's first sustainability action plan.

One of the more important reporting tools used by Office of Sustainability was the STAR Communities online reporting platform. Through that program, the office completed a thorough gap analysis of sustainability systems in the city in 2016. The gap analysis looked at seven major goal areas to identify the strengths and weaknesses of the city as a system. The seven goal areas were:

- Built Environment
- Climate & Energy
- Economy & Jobs
- Education, Arts & Community
- Equity & Empowerment
- Health & Safety
- Natural Systems

The results showed that the strengths of the City of Winston Salem were in Education, Arts & Community, Economy & Jobs, and Health & Safety. The weakest goal areas were Climate & Energy, Equity & Empowerment and Natural Systems. The gap analysis was important to have before undertaking a long-term project like a sustainability plan for months and years in the future (Bloom 2019). The strongest objectives under the top performing goal areas were educational opportunity and attainment, business retention and development, and food access and safety, respectively. The weakest objectives under the lowest performing goal areas were climate adaptation, environmental justice, and green infrastructure. These results were evidence to support the idea that the city needed to focus more on the environment and climate action, which is what the plan was intended to do. Because of these results, the Office of Sustainability was able to answer the key gap analysis questions of “where are we now” and “where do we want to be” and move onto the “how are we going to close the gap” question (Bloom 2019). It was at a point where the investment in the local economy and education were showing strong results, while there was clear lack of support for the environmental sector. In the view of the Office of Sustainability, there needed to be a more equal consideration for the economic, social and environmental sectors than what the analysis showed.

Even with all of the work that had been done through STAR Communities, the City of Winston-Salem as an organization was still working to understand the concept and possible benefits of

sustainability. While the local government established an Office of Sustainability in 2010, it took a few years more before city management began to look at further integrating the concepts of sustainability with city systems. In 2016, the Office of Sustainability began annual benchmarking related to local government operations greenhouse gas emissions, energy upgrades and waste generation among other topics. As this work continued, it built a stronger base of data. The city could have used the data to estimate realistic targets in areas like future city emissions, financial savings, waste reduction and energy efficiency improvements among other things, but didn't. However, the mayor and city council started to take action to push Winston-Salem towards a more sustainable future. Mayor Allen Joines was one of the first 60 mayors in the country to sign on to the Climate Mayors Agreement in 2017 to adopt, honor and uphold the climate goals of the Paris Agreement. Other cities' mayors in the state quickly followed suit, making this a baseline action for sustainability and emissions reduction progress, and no longer unique to Winston-Salem.

Once that agreement was signed, combined with the STAR Communities work, there was interest building around the sustainability efforts. To take advantage of that opportunity, it was decided to create the city's first sustainability plan. The plan would help guide the next five years of sustainability efforts in the local government with the goal being to lower emissions from municipal functions.

The table below shows the strengths, weaknesses, opportunities and threats (SWOT) analysis that was considered during the project. Each point in the different areas was relevant in helping make the plan something that city management and elected officials wanted to invest time and money in, and that city staff would be willing to support.

Strengths	Weaknesses
<ul style="list-style-type: none"> - The plan only targeted the city operations which made the actions more specific, achievable and relevant and the results measurable. 	<ul style="list-style-type: none"> - Ultimately the plan is a sustainability plan that would require financial support that the city had never provided to sustainability projects or initiatives in the past. For example, LED lighting and solar panels had

<ul style="list-style-type: none"> - The plan was created for a shorter timeline of five years, providing more immediate results. - The plan focused on actions that were not a huge financial cost compared to other capital projects, potentially making a stronger case to elected officials. - We secured buy in and interest from certain key players in the city including stakeholders in other departments and the Operations Director. 	<p>been removed from site plans due to extra costs up front. While it is true that the plan focused on actions with smaller financial costs as stated in the Strengths section, it was still more money than sustainability had ever received for projects, which is why it was also considered a potential weakness.</p>
Opportunities	Threats
<ul style="list-style-type: none"> - The plan provided an opportunity to progress sustainability efforts in the community - Could lead to a community wide plan if the municipal plan is accepted 	<ul style="list-style-type: none"> - A threat is lack of follow through once plan is approved. This would place efforts back to square one. - A threat to the timeline of the project is being held up in the city manager's office or the Operations Director's office.

Project Process

Listed below were the steps taken to create the first sustainability plan for local government operations in Winston-Salem. The entire process took significant time to complete from the very beginning, however this was to be expected considering the pace of local government projects and the necessary research and feedback. There were several other reasons for the longer time frame, the biggest one being that the Office of Sustainability had only one dedicated sustainability employee, the Sustainability Director. The Office itself includes a recycling

division and the local Keep America Beautiful affiliate as well as an energy manager. Each of the employees in these positions contributed to the plan, but the project lead fell to the only dedicated sustainability employee, the Sustainability Director. It is common for sustainability employees to take the lead on projects like this as local government sustainability divisions in the southeast to have 1-3 employees depending on the size of the jurisdiction.

- 1. Created a detailed outline for the sustainability plan that included an introduction, background and broad goal areas.**

The introduction and background sections acted as justification for the creation and implementation of the sustainability plan. The plan was focused on internal local government operations, so the broad goal areas focused on internal areas and departments where action could be taken to reduce emissions. The goal areas chosen were Transportation, Energy Systems, Green Space and Waste Systems. Transportation and Energy Systems are responsible for significant emissions within city operations, while Green Space and Waste Systems represent opportunities to offset emissions from the first two areas. These sections were chosen due to the potential emissions reduction impacts and based on the best practices from other cities' plans. The analysis that determined the best practices of sustainability and climate action planning was previously done by another city in the region that was able to share data with other sustainability managers to use for their own planning purposes. This saved significant time and effort in doing this in-house but was an important step as there hadn't been a similar plan in place in the city before.

Identifying the goal areas also helped identify who within the City of Winston-Salem organization would be involved in contributing to the rest of the process. There was a short list made of who would be contacted to act as support staff during this project. The list included the bicycle and pedestrian transportation project planner from the city's Department of Transportation, the energy manager and recycling coordinator from the Office of Sustainability, the vegetation management director and urban forester from the Vegetation Management division, and the Bee City USA liaison from the Operations Department.

- 2. Created a list of achievable and actionable measures included in the plan for the goal areas through the guidance and expertise of relevant support staff.**

In each of the four areas, one to three objectives were first identified as achievable and feasible opportunities to reduce total emissions from the local government. From there, even more specific strategies and actions were identified as steps to take to achieve the objectives. Certain objectives, strategies and actions were taken from the city's long-term comprehensive plan to help show alignment with current priorities.

It was also important to consider the culture of the organization in setting measures. As a local government, the pace of decision-making and implementation of projects and initiatives is slower than many realize. This is in part due to communication and information sharing barriers that exist in most communities, like not enough openness and politics getting in the way (Ohren 2007, p. 20).

Also, as part of the organizational culture at the city, there was an established history of more economic and infrastructure focused projects that led to significant financial gains. The slower returns on investment from sustainability projects have meant generally denying funding for those types of projects in Winston-Salem. Sustainability related returns on investment need to be considered in a different way than other project returns are considered. Doing so will provide opportunity to get the real value out of projects that aren't necessarily easily measured (Winston 2014, p. 176). This meant that not only would there need to be consideration of what type of projects would be approved by elected officials and management, but consideration for what projects would demonstrate positive results in a measurable way.

Other specific measures were included based on feedback from certain staff in other departments who would be impacted by the creation of the plan. Since there were going to be measures that would fall under the responsibility of other departments, it was important to get their input and approval.

The objectives under each goal area were:

- Transportation
 - Encourage employees to use more diverse transportation options
- Energy Systems
 - Energy use conservation in city facilities
 - Increase efficiency in city facilities
 - Explore renewable energy generation options

- Green Space
 - Carbon Sequestration
 - Bee City USA
- Waste Systems
 - Waste reduction in city operations
 - Sustainability education and awareness for employees
 - Recycling market awareness

Policy options were also added to each section. This was done to ensure that more systemic changes were made for long term and future sustainable development. The policies under each goal area were:

- Transportation
 - Implement electric vehicle policies that include details about parking, fees, and other necessary information
- Energy Systems
 - Update street light policies to reflect current street light technologies
 - Create a resolution supporting high efficiency lighting in all new construction and major up-fit projects on city facilities
- Green Space
 - Increase the required Tree Save Area for all development, including residential
 - Create a least toxic pesticide policy in city field operations
 - Create a policy for allowing more city-owned landscape to grow naturally to benefit wildlife and cut down on mowing expenses
- Waste Systems
 - Enact a sustainable purchasing policy for the city that includes specific goals for recycled content products

This list of measures, once added to the outline, acted as a checklist to keep track of progress made during the project.

2a. A feasible emissions reduction target was identified to include as the first goal area.

Since the main purpose of the sustainability plan for internal operations was to reduce emissions, it was important to identify a feasible reduction target. With the help of the energy manager, it was determined the target should be a 10-15% reduction below the baseline year of 2008 in the next five years, in this case by 2025. A shorter-term target was chosen because the progress and results would have more immediate impact if successful. It was important to demonstrate success to city management and the city's elected officials that sustainability efforts and reducing emissions have measurable outcomes that improve the city. This type of success and evidence would be important for securing future support for other sustainability projects.

The five-year timeframe for the reduction target also aligned with the timeframe for the implementation of the measures in the plan.

3. Compiled the final list of measures in a draft of the plan that includes the completed introduction and background.

With the specific measures identified for each goal area, background information for each area was added. This was done to provide context to why each objective was identified and how it related to the overall goal of reducing emissions. At the same time, the plan introduction and background were completed, helping finalize the plan further.

This step took significant time to complete, because the objectives, strategies and actions were continuously changing to match feedback that came in from the support staff. Finalization of sections could only truly be completed once the objectives and specific measures were set. The introduction and background were also constantly being worked on since at the time of creating the plan, the Governor of North Carolina was helping advance similar efforts at the state level. Those efforts and the progress made at the state level were an important aspect of the plan to show that the state, along with other cities, was also making emissions reduction and climate action a priority.

4. Reviewed and edited the first draft of the plan.

After putting the entire plan together, it was important to review it for clarity, length, and to make sure it met official city standards. After working with a colleague to complete the edits, the revised version was sent to the support staff one last time for approval. This was also when the

plan got sent to the relevant department heads, so they were on the same page and ready for future collaboration.

5. Send the revised version of the plan to the immediate supervisor and the city manager for comments.¹

The immediate supervisor in the City of Winston-Salem is the Operations Director, who oversees the Office of Sustainability, Sanitation, Property and Facilities Maintenance and Traffic Field Operations. All of these departments except Traffic Field Operations were involved in the plan process and would therefore also be involved in the implementation phase. It is therefore important that the Operations Director knew of the actions and approved the plan. The Operations Director also functions as an assistant city manager in the organization, so he is responsible for taking it directly to the city manager. The city manager is the highest level in the organization before reaching elected officials, so his suggestions and comments are important to make sure the plan is acceptable for city council. After receiving comments from both of these individuals, final revisions to the plan will be made to create the final completed plan. This step may also involve further discussions with staff support from other departments to help address any concerns regarding specific measures and actions that were included in the plan.

6. Present the plan at the relevant City Council Committee meetings to ask them to pass a resolution for the sustainability action plan. The appropriate committee identified was Community Development/Housing/General Government Committee.

There are four committees that are made up of various council members in the City of Winston-Salem. Those are the Finance Committee, Public Safety Committee, Public Works Committee, and the Community Development/Housing/General Government Committee. This last committee is commonly known as General Government because it deals with the topics that don't fall under that categories of the other three committees. This committee is the one that was most appropriate for a project like the sustainability plan to be presented to.

An item on the agenda for any committee meetings requires the completion of a Council Action Request Form (CARF) to show how it relates to the City Council Strategic Plan and give a brief

¹ This step and the ones after are steps that have not yet been taken in the process. This is why they use future tense.

description of the project. The CARF is due the week before the meetings to give the committee time to review everything. Once the CARF is submitted, the item is added to the meeting agenda. In the meeting itself, it can be pulled and discussed further or automatically approved. Approval means the committee has passed the resolution.

7. Present the plan at the City Council meeting.

This meeting consists of all City Council members and the Mayor. Once the resolution from the General Government Committee is passed, the plan will be sent to the City Council meeting for a final vote to approve. If approved, the Office of Sustainability will begin to work towards implementation of the plan measures.

Important Takeaways

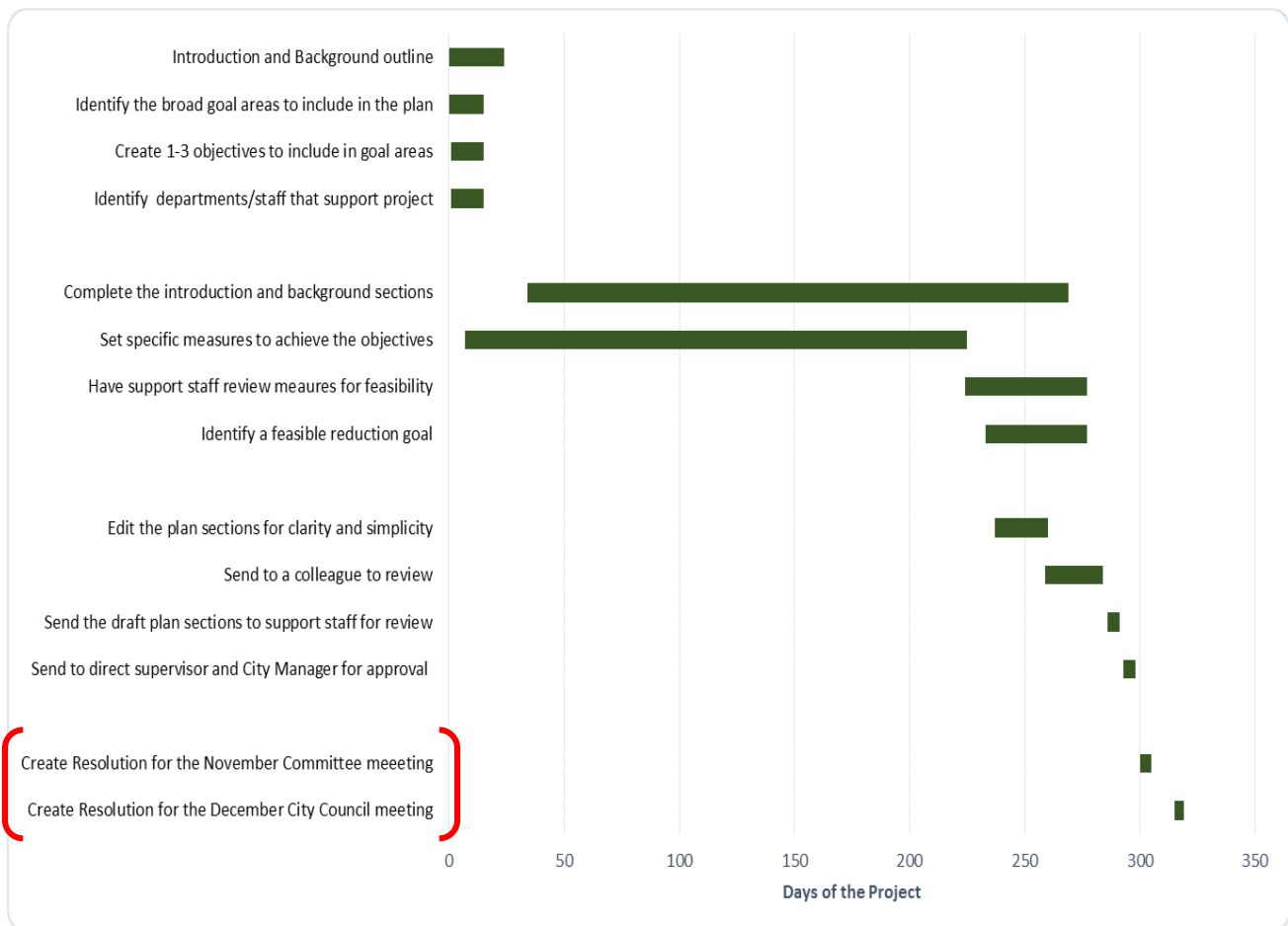
Throughout the process of creating the first sustainability plan for the City of Winston-Salem, there were several challenges as well as opportunities that affected the outcome. The first challenge was dealing with general work-related delays. These challenges were unavoidable, and happened at both the departmental level and on the organizational level, which served to slow the project process. This is something anyone can expect in doing a long-term project like this. A more sustainability-specific challenge that was encountered during this process was the small number of dedicated sustainability staff available to create the plan. While it is true that smaller sustainability divisions in local governments are typical in North Carolina and across the Southeast, it still impacts the timeline of the project. Some local governments, based on discussions with other sustainability managers, put together a “green team” or group of staff to assist in the creation of the plan that meets regularly. This eliminates some of the waiting that might occur from individually contacting staff at various times, which was the final challenge in the process. This problem was predicted but still impacted the project timeline, mostly towards the end when seeking feedback. To combat this, setting reasonable expectations with the understanding that other staff may have their own projects to work on before establishing a timeline could help.

At the same time, there were several opportunities that helped improve project. The first was mentioned earlier as a reason to create the plan in the first place: a shift in momentum from elected officials. Since the elected officials are the decision makers in the organization, if they

want more effort from any sector or department, it is expected to happen. This was a great benefit to this project. A second opportunity came from working with various staff from other departments. In having conversations with those employees, new allies were found who were interested in supporting sustainability efforts. These new allies could be of assistance in future efforts that may come from the Office of Sustainability. The final opportunity was the re-establishment of the Community Sustainability Program Committee. This was important as this group would act as support for the plan as well as support for the implementation of the specific actions and strategies.

Work Breakdown Schedule

Figure 1 shows the work breakdown structure showing the timeline of this project. The main party responsible for these items is the project developer. The items in the red brackets are those that have yet to be started. The placement in the timeline is an estimate of when those might be completed.



Conclusion

The City of Winston-Salem Office of Sustainability has undertaken the task of completing the city's first Sustainability Action Plan for Internal Operations. The main goal of the plan was to reduce the emissions from local government operations as a mitigation tactic in addressing climate change. Reducing greenhouse gas emissions was the goal of the plan because it was something measurable, had an established baseline, and something the local government could control from its own operations.

Setting reduction targets for greenhouse gas emissions for various city sectors is a best practice among cities in the state, region, and across the world. This is likely because local governments see these emissions as the strongest tie between climate change and sustainability (Tozer 2018, p. 185). Tozer goes on to state that “governing carbon by ‘setting GHG emission reduction targets’, [and] developing a ‘greenhouse gas emissions inventory for municipal operations’... is frequently reinforced as a central task of sustainability planning” (2018, p. 185).

Relevant goal areas for the City of Winston-Salem that were included in the plan were transportation, energy systems, green space, and waste systems. These goal areas have impacts on total greenhouse gas emissions from local government operations. Working to take more sustainable action in these areas would help reduce these emissions.

By employing a sustainability best practice, the city is once again striving to compete with peer cities in North Carolina and the Southeast region in the sustainability field. If the plan finds success in implementation and results, there is strong possibility the plan leads to further and more ambitious sustainability efforts throughout the community.

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