

Ann Arbor 2030 District Tenant Engagement

A practicum submitted in partial fulfillment of the requirements for an M.S. degree in The School for Environment and Sustainability at The University of Michigan

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Abbreviations

AA2030	Ann Arbor 2030 District
AAHC	Ann Arbor Housing Commission
GBC	Green Baxter Court
IRB	Institutional Review Board
LT	Lurie Terrace
MM	Miller Manor
Oxford	Oxford Companies
SEAS	School for Environment and Sustainability
UM	University of Michigan

Introduction

2030 Districts Network is a non-profit organization with local Districts in cities across North America striving to adapt to and mitigate climate change (2030 Districts Network, 2022a). Ann Arbor 2030 District (AA2030) has been a client for University of Michigan School for Environment & Sustainability (SEAS) master's projects in the past. AA2030 work focuses on reducing existing building energy consumption, water use, and transportation emissions by 50% for existing buildings and infrastructure before 2030 using estimated baselines (2030 Districts Network, 2022b).

Multifamily buildings have the largest floor area of any building type in Ann Arbor, Michigan, and have the largest carbon footprint in Ann Arbor, followed by office and retail (Smith, 2022). There is a need to determine how building owners and property managers can best engage occupants of commercial and multifamily buildings to start making reductions to meet carbon neutrality goals. Often landlords with tenants who pay the utility bills do not want to invest in improving their properties to be more energy and water efficient because the improvements do not save them money. Similarly, tenants do not want to invest in upgrades because they typically do not have extra financial resources and they do not want to invest in a place they only plan to be in temporarily. This is especially true in college towns like Ann Arbor where turnover is extremely high. This problem is called the “split incentive dilemma” and is a significant challenge to improving the sustainability of housing. There are ways to overcome the split incentive dilemma that share the benefits of the upgrades between building owners and tenants including green leases and various financing strategies (HVAC HESS, 2013). A study on split incentive conducted in Germany found that to make investing in energy efficiency more attractive for both landlords and tenants, strong policy action, aligned with social and urban development policy objectives is necessary (März, Stelk, & Stelzer, 2022).

A 2015 study found that social norms and large financial rewards were effective in reducing consumption by 6% and 8% respectively, but the larger effect of financial incentives disappeared when information on social norms was given (Dolan & Metcalfe, 2015). Another study found that personalized and real-time advice and feedback on ways to save electricity are more effective than feedback on electricity costs (bills) and general electricity savings tips (Buckley, 2020). Previous estimates of electricity savings that can be achieved through monetary, informational and behavioral incentives hovered at 6.4–7.4%, but a 2020 study found a more realistic estimate to be 1.9–3.9% reduction in consumption (Buckley, 2020). A similar study of college student dormitory residents that implemented a competition in addition to providing feedback, education, and incentives found that electricity use decreased by 32%, but water use only decreased by 3% (Petersen et al., 2007). I found the results of this study to be consistent with my findings that students are reluctant to change their water use habits. These previous studies were used to shape questions around what incentives tenants in this study are interested in and might respond to.

While building owners generally have control over building systems and operations, tenants play a critical role in achieving lasting reductions in the amount of energy used (US DOE, 2016). Collaboration between both tenant and landlord is essential to meeting Ann Arbor 2030 District goals. The responsibility of utilities and waste management are typically split between landlords and tenants. Landlords are typically responsible for energy and water uses such as hallway lighting and lawn watering, while tenants are responsible for things like plug loads, food waste,

and residential water consumption. This report focuses on non-policy strategies to engage tenants with the goal of reducing environmental impact at their residence. For example, people are more likely to commit to sustainable behaviors if there is public signaling of that commitment (Baca-Motes et al., 2013). Using this background coupled with tenant responses, I recommend ways to engage tenants in improving the sustainability of their residences based on communication, current efforts and barriers, and interest and behavior change.

In conjunction with the Ann Arbor 2030 District and the University of Michigan (UM), this project aims to create a suite of engagement tools to assist 2030 Districts Network members in meeting their reduction goals for transportation emissions, energy and water use, and waste. The goal of this research is to gather information about tenants' sustainability habits, interests, efforts, and barriers and identify ways AA2030 District can support landlords in engaging with tenants to reduce water consumption, energy consumption, waste production, and transportation emissions. Applicability in other 2030 Districts will also be a priority during engagement toolkit development.

The general approach is as follows:

- Work with a local property management company and city affordable housing to design and implement semi-structured interviews with AA2030 District member multitenant buildings
- Pilot the interview scripts, incorporate necessary changes, document process and results
- Conduct a qualitative analysis of interview results
- Develop an engagement toolkit including a broadly applicable set of tools for new District members to effectively engage building tenants in achieving reductions
- Produce a final report and toolkit that can be used by other districts and organizations

I am not the first person to do a project of this kind, and there are precedents to build on. Multiple organizations are doing similar work and research. Better Building Partnership has created a similar toolkit, which emphasizes a partnership between owners and occupiers of commercial buildings (Better Buildings Partnership, 2013). Energy Star has a toolkit with resources that focus on strategies to engage commercial tenants on energy efficiency (EPA, n.d.). National Renewable Energy Lab (NREL)'s recommendations for commercial buildings emphasize the voices of both parties being heard; the building needs to communicate energy use information and recommendations, and the occupant must respond by providing comfort feedback and requesting adjustments (Schott et al., 2012). The American Council for an Energy-Efficient Economy (ACEEE)'s toolkit focuses on the multifamily sector through engaging utility regulators, facilitating access to whole-building energy usage data, and reducing funding uncertainties (ACEEE, 2017).

These sources were used to shape the interview scripts for this research. I identified the types of tools in existing resources (e.g., competitions, data transparency, providing educational information, incentives) and formed questions to see if those resources would be a good fit for use in multitenant spaces. Most tenant engagement research is centered on the commercial space, and there is a need for more research in residential multitenant building engagement.

AA2030 has established baselines for water use (Johnson-Lane, 2021), energy use (Dukus, 2020), and transportation emissions (Fields, Pritchard, & Sivah, 2021) in previous University of

Michigan graduate student projects A partner of AA2030, Ann Arbor's A²Zero program, recently passed a benchmarking ordinance for city buildings and initiated a Rental Efficiency Standard and the city is drafting a Green Rental Housing Ordinance to be adopted before the end of 2022. The program is also applying for government funding to get 30 homes to net zero (Smith, 2022).

The goal of this project is to leverage the work and resources that already exist to create an engagement toolkit specifically for Ann Arbor, yet applicable to and available for other 2030 Districts to use. In this report, I build on previous tenant engagement research with the input of participating tenants from Oxford Companies (primarily off-campus student housing) and Ann Arbor Housing Commission (low-income family, single adult, and senior housing) to shape a playbook of strategies that work to implement individual and collective action in reaching Ann Arbor 2030 District emission and consumption goals. Using data collected from these semi-structured interviews, I gather tenant feedback regarding communication, interest and behavior change, and current efforts and barriers to construct an engagement toolkit to be used by building owners in the Ann Arbor 2030 District as well as the wider 2030 District network. I supplemented these data with three interviews with Ann Arbor Housing Commission (AAHC) partner organization service providers.

Future research into other types of tenant spaces, such as commercial spaces and single-family homes in wealthier areas, is needed. Inequities exist in household energy efficiency and carbon emissions in the U.S., and Ann Arbor is no exception. Residential energy use accounts for almost 20% of greenhouse gas emissions in the United States (Goldstein, Reames, & Newell, 2022). Wealthy American homes have carbon footprints 25% higher than low-income residences primarily due to home size (Goldstein, Gounaridis, & Newell, 2020). Addressing energy and water use of multiple building types is essential to the bigger picture of this research.

Methods

Timeline

This project was started in March 2021 and ended April 2022. Appendix A outlines the specific tasks necessary to complete this project and the approximate time needed. Ongoing activities not outlined in Appendix A include bi-weekly meetings with the project client and advisor. Note that the time allotted for each step depends on the number of interviewees.

Data Collection

The goal was to gather information on current practices (at management and tenant levels), and the effectiveness of these practices (at the tenant level). This was used to determine what tenants believe are best practices for incentivizing energy, water, and transportation emissions and waste reduction, what management believes is feasible, and to then share information with owners and tenants in a format that would be most effective in reducing emissions and waste.

The data collection method for all groups of interviewees was semi-structured qualitative interviews with building occupants and service providers working with Ann Arbor Housing

Commission (AAHC). The service providers working with AAHC are community partners from the Community Action Network (CAN) and Avalon Housing. CAN is onsite at the family housing site working to provide stability and community building for tenants through after school programming, summer camps, food distribution, and other supportive efforts. Avalon is onsite at the single adult housing site fielding tenant concerns, monitoring building guests and providing supportive housing for people who have been chronically homeless and who have behavioral and physical health challenges, including mental illness and substance use disorders (Avalon Housing, n.d.). The service providers have an important role to play in tenant engagement as they are the primary contact for many residents at the family housing and single adult sites. Service providers are the people who are primarily engaging with tenants and could potentially engage tenants in sustainability programming.

For the data collection preparation, I drafted and shared 3 interview scripts (see Appendix B) with the Executive Director at AAHC and the Associate Director at Oxford for feedback. The three interview scripts are tailored to:

1. Low-Income Housing Tenant (used for AAHC)
2. Low-Income Housing Service Provider (used for AAHC)
3. Off-Campus Student Housing (used for Oxford)

A fourth interview script template for commercial tenants that was not used can also be found in Appendix B. The AAHC interview script for service providers was shorter because I removed many of the tenant-specific questions and asked more general questions about the tenants overall. The AAHC service provider script was not piloted like the other two because I focused on improving the main piece of the research, which was the tenant script.

The interview scripts are organized by the following categories:

1. Participant information
2. Communication
3. Current Efforts and Barriers
4. Interest and Behavior Change

The AAHC and Oxford tenant interview scripts varied slightly based on specific information that the Executive Director at AAHC and Associate Director at Oxford were interested in. For example, Oxford interview questions are more sensitive to students and ask about lease length and campus involvement. Once the interview scripts were finalized and approved, I submitted an Institutional Review Board application (see Appendix C) and was approved to carry out the research.

After completing the pilot round, I revised the interview scripts to better capture the information that would best serve the research in contributing to a tenant engagement toolkit and threw out or revised questions that did not provide helpful information. For example, questions that tenants were confused by or did not know how to answer were either revised or replaced with more direct, clearer questions. The results of this research are based on the total cumulative responses from the pilot and the second round of interviews.

Sampling Approach

I asked my contacts at each organization and site to seek “engaged” tenants. The Oxford tenants interviewed were those who responded to a call for interviewees to participate in my research in exchange for a \$25 VISA gift card. Oxford recruited volunteers through a mass email to all their tenants with the subject line “EARN \$25 VISA GIFT CARD” and the following copy:

Good Morning,

We have partnered with the Ann Arbor 2030 District to reduce existing building energy consumption, water use and transportation emissions 50% by 2030.

Kacey Eis is a master's student in the University of Michigan's School for Environment and Sustainability. She is working with the Ann Arbor 2030 District for her capstone project where she is conducting interviews with building tenants to develop an engagement toolkit. In alignment with A2Zero goals, the toolkit will assist building owners in finding productive ways to engage tenants to reduce energy use, water use, transportation emissions, and material waste. She is looking to identify 10 engaged tenants who have lived in their residence for at least 3-6 months. Virtual interviews will take place in January 2022, and those participating in the interviews will receive a \$25 Visa gift card.

Please respond to this email if you are interested and I will put you in touch with Kacey.

Thank you for your consideration to participate.

AAHC participants were recruited via communication with the service providers at each of the three sites. Participants were informed of the research purpose and the \$25 gift card compensation and put in contact with me via phone or email to set up a time to conduct the interview.

The bias in this sampling method includes selection bias through voluntary response bias. There was also response bias in the survey design, as I prompted participation with gift cards. I was seeking out AAHC tenants who are more “engaged” and already care about the environment. I was also seeking “engaged” tenants from Oxford, but the recruitment style (via email) seemed to attract people who were motivated by the gift card. Multiple AAHC tenant participants forgot about the gift card or explicitly mentioned they were not participating solely for the gift card.

There may also have been some social desirability bias in survey design. For example, people would often respond in ways indicating that they felt bad for not taking public transit or recycling more diligently. Being interviewed by a School for Environment and Sustainability student and talking about personal habits may have led participants to respond in ways they thought were more socially desirable. This could be reduced in the future by having someone conduct interviews who is not affiliated with SEAS. I did not feel the need to reduce these biases because I had such a small sample size and needed whatever participants I could recruit. Future research with more time may be able to recruit a larger group by having a presence onsite such as tabling or waiting for more participants to respond to mass email recruiting efforts. A Google Forms survey may receive a higher response rate, may be easier to distribute and would remove

the human interaction piece, which could reduce any potential feelings of judgment or needing to answer “correctly.”

Two of the Oxford interviewees are acquaintances of mine. One works at SEAS and the other is a classmate from high school. I had not discussed my project with them before the interview and do not believe I am close enough in acquaintance for this to have impacted their interview responses.

The sample size for this research was relatively small, which is a constraint on generalizing my results. It is important to note as well that this was a particularly “engaged group” that may not be representative of the larger population but did demonstrate the potential interest at each property. This is something I kept in mind during analysis; 75% of respondents in my research for example, may seem significant, but 3 of 4 people may not be representative of the population, whereas 75 of 100 is more representative of the population. Table 1 shows the sample size relative to the approximate population size, demonstrating the relative smallness of the sample.

Table 1: Sample size compared to approximate total population size by interviewee group. Not included in this graph are the 3 (non-tenant) service providers I spoke with at AAHC sites. GBC units are 2-bedroom, 3-bedroom, 4-bedroom apartments and townhouse style units (City of Ann Arbor, n.d.)

Interviewee group	Number of interviewees (sample)	Approximate total tenant population
Low-income Family Housing – AAHC Green Baxter Court	4	~47 units
Low-income Senior Housing – AAHC Lurie Terrace	5	~136 units
Low-income Single Adult Housing – AAHC Miller Manor	4	~106 units
Off-campus Student Housing – Oxford Companies	12	~1500 tenants

Participants

The original research proposal aimed to interview low-income and student tenants in multifamily buildings (AAHC and Oxford), and commercial building tenants in collaboration with Ann Arbor real estate developer MAVD. MAVD dropped out of the research before the pilot interviews due to scheduling issues. MAVD would be a great partner to get the corporate, business, or commercial perspective to include in future iterations of the engagement toolkit.

The pilot round of interviews included 2 residents from 3 AAHC properties, who were chosen by service providers at the site who I asked to identify “engaged” tenants, which meant tenants who are active in the community. In the second round of AAHC interviews, I spoke with 10 participants – 7 tenants and 3 service providers. The second round AAHC participants were from the same 3 properties as the pilot interviews. AAHC connected me with interviewees from three of their 17 properties: Green Baxter Court (GBC), Lurie Terrace (LT), and Miller Manor (MM).

Green Baxter Court is low-income family housing. The household income must be below 50% or less of the area median income. Everyone I spoke to at GBC were mothers. At Lurie Terrace, residents are 62 years of age or older. Many of them come from middle-class backgrounds but are now qualifying as low-income as they are retired and are no longer working. At Miller Manor residents are typically single adults under 30% of area median income and a high proportion are transitioning from homelessness. Only one of the 13 participants was male. One of the three AAHC service providers interviewed was male.

The pilot round of interviews included 5 residents from 4 different Oxford properties. These participants were chosen through a mass email outreach and the first to respond were included. In the second round of Oxford interviews, I spoke with 7 residents from 4 additional properties. Participants from Oxford were a much younger group of interviewees, over 90% are students, and all are relatively short-term occupants staying less than two years. Of the 12 participants, five were men and seven were women.

Analysis

I used a free version of the Zoom transcription service called Otter for transcribing the interviews that were conducted virtually but had issues with saving transcriptions. I did not use a transcription service for the in-person interviews, and many of the people interviewed had accents or speech impediments, so I audio recorded interviews and transcribed them manually. Because the data set was not large, this was doable, and I wanted to work more intimately with the data by reading through it all and picking up anything I may have missed the first time around. I do not recommend this strategy for future iterations of the research as it was time-consuming and hopefully there will be more participants in the future. I recommend using the paid version of the Otter transcription service for future research.

I used Google Sheets (see template in Appendix D) to conduct analysis of the interviews. Many of the responses were not relevant or were tangential to the point of the question. For this reason, I wanted to intimately sift through the data and be sure I did not miss any points and decided to go line by line to pull out themes from the interviews. Data from the interviews were transcribed into each corresponding cell in Google Sheets by question and tenant. Once all the data were entered into the cells for each tenant's interview, I copied and pasted all the response values from each row into that row's cell in the column labeled "Combined Responses." I separated each tenant's response in the cell by using command + enter (Mac). Some data cleaning needed to be performed. For example, in-person interviews have many filler phrases like "um" and "like," as well as incomplete sentences that cut off in the middle when interviewees change their train of thought like, "I really don't think – I think we have more waste than we know – I don't think everybody knows what waste they have."

After the data were cleaned, I categorized and organized them. I looked for keywords and ideas that were mentioned and how many times different tenants mentioned them. For example, when analyzing what people said motivates them to care about their environment, I was looking for phrases that express some sense of moral responsibility such as "being a good person," "being a good citizen," "giving back," or "doing my part." These types of answers were grouped together into a category for moral responsibility. Other questions were more straightforward. For example, when I asked about factors participants used when deciding to live at their residence, I

looked for keywords in the responses and counted how many tenants mentioned them, such as “cost” “friends” and “renovated.” I also looked for phrases, for example, phrases suggesting that *not* wanting roommates was a factor in choosing their residence. I drew on textbook methods for analyzing semi-structured interviews to determine best practices (Newing, 2011).

Then I translated the data into something useful, such as a percentage clearly outlining the finding. Figure 1 shows a screenshot that reads, “50% of respondents are UM students and 50% are not UM students.” After this was done for the first property, I created a new tab for the next building and repeated the process for each of the other three groups. The screenshot below shows the Google Sheet Interview Analysis template.

	B	C	D	E	F	G	H	I	J	K	L	M	N
1	QUESTION	Tenant #1 Response	Tenant #2 Response	Tenant #3 Response	Tenant #4 Response	Tenant #5 Response	Tenant #6 Response	Tenant #7 Response	Tenant #8 Response	NOTES:	Combined Responses	Clean Data	Analysis
2	Participant Information										Copy and paste all value from this row into this cell. Separate by Tenant response.	Categorize and organize responses	What do the responses mean?
3	Are you a student at UM?	EXAMPLE: Yes	No	No	Yes	Yes	No	Yes	No		EXAMPLE: Yes No No Yes Yes No Yes No	Yes -- 4 No -- 4	50% of respondents are UM students and 50% are not UM students.

Figure 1: Screenshot of the Interview Analysis Template with an example question analyzed

Because the sample size was small and the nature of the toolkit deliverable, I did not want information that was only mentioned by one person to be overlooked. Some ideas, although only mentioned once, were still excellent suggestions that contributed to the goal of the engagement toolkit and were included.

For Likert scale questions, if the participant did not report a number, I assigned a number based on the rest of their response. I had to assign these numbers based on interpretations of the context of everything else the participant was saying. I tried to follow up and ask for a number, but sometimes I failed to follow up or receive a number response. Most assigned Likert scale responses were 3’s on a scale of 1 to 5 to be generally neutral. The face-to-face nature of the interviews was sometimes a challenge; if the interview were an online survey where they chose a number, I may have received more complete Likert scale responses and would not have needed to interpret. Regardless, I tried to be systematic and objective in assigning numbers by using the context of the participants’ response and often assigned a neutral 3.

Results

The following findings are based on the 4 different tenant populations. The 3 groups of AAHC tenants had been in their residences for 3 to 20 years, while Oxford students rarely planned to stay longer than 2 years. At least 1 person from each AAHC property mentioned a small group of engaged people at their site who want to do more.

Low-income family housing – Green Baxter Court (GBC)

Participant information

At GBC I was able to interview 4 tenants. 100% of tenants were aware of some sustainability efforts at GBC such as recycling, efficient water systems, or use of LED light bulbs, but they were unaware that AAHC had any sustainability goals.

Communication

All 4 participants from GBC were interested in knowing their electricity and water usage, interested in implementing energy saving behaviors, and believe there is a lot of food waste. 3 of the 4 GBC participants say using email is the most effective way to communicate, and multiple forms of communication are best. Figure 2 shows that email is the most effective method of communication for GBC, but texting, phone calls, face-to-face, and mail communication can be useful as well.

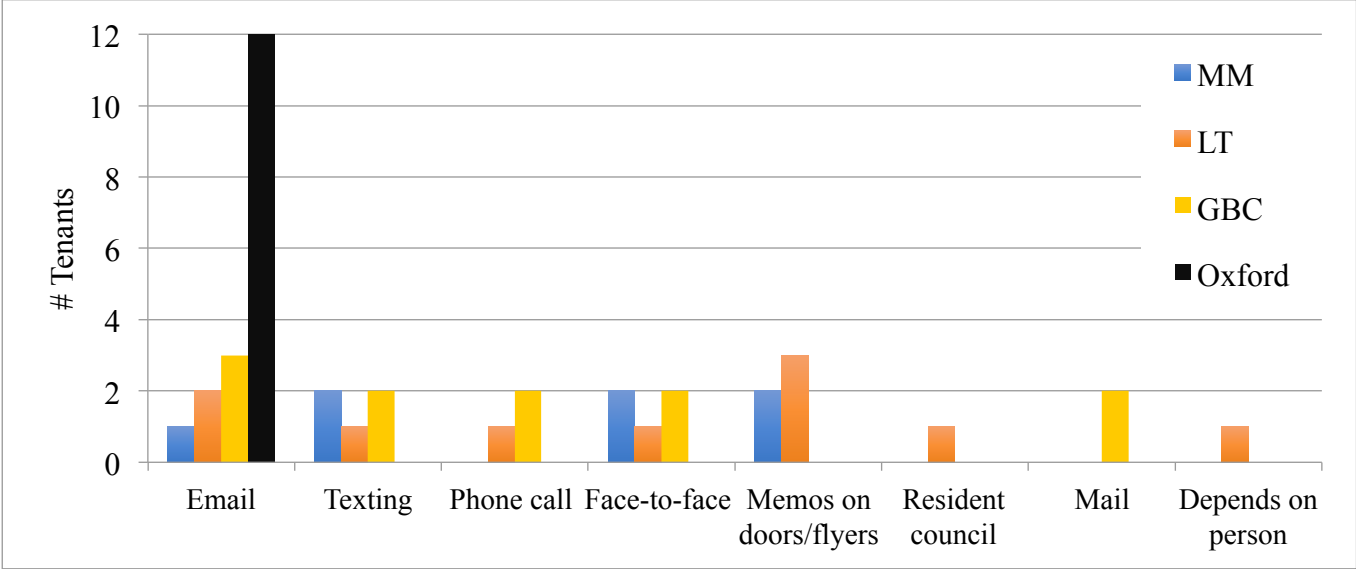


Figure 2: Preferred method of communication as reported by tenants from the 3 AAHC sites and Oxford

When asked about effective incentives for themselves, 75% said recognition is somewhat or very effective in getting people to change behavior. 50% of individuals are incentivized by learning, feedback, and materials, 25% are incentivized by gift cards/money, 25% by competition, and

25% said they are incentivized by being a role model. When asked about effective incentives for their neighbors, all GBC participants said money only. When asked about the minimum incentive required for action, 75% said the minimum amount is \$20 or more, 25% said the education would be enough, and another 25% said a starter kits/materials would be effective.

Current Efforts and Barriers

When asked about barriers to reducing water use, 100% of GBC tenants believe not having a dishwasher is a barrier. This could be a place to intervene and provide tenants with information on ways to save water when doing dishes.

Figures 3, 4 and 5 show the perceived barriers to reducing energy (Fig. 3) water usage (Fig. 4) and garbage produced (Fig. 5). A significant portion of tenants from each group, including at GBC, perceive no barriers to any reductions or believe they already do everything they could be doing to reduce their energy, water and material waste. This demonstrates a potential disconnect between what tenants believe their environmental impact is and what they could be doing to reduce their impact. The perceived barriers decrease from energy to water and water to waste. This could be due to the salience of how water is used and waste is thrown out; for example, leaving water running is a reminder of how much water you are wasting, or throwing out over ripe bananas may feel wasteful. Electricity is less tangible, which could potentially justify this decrease in perceived barriers from Figure 3 to Figures 4 and 5.

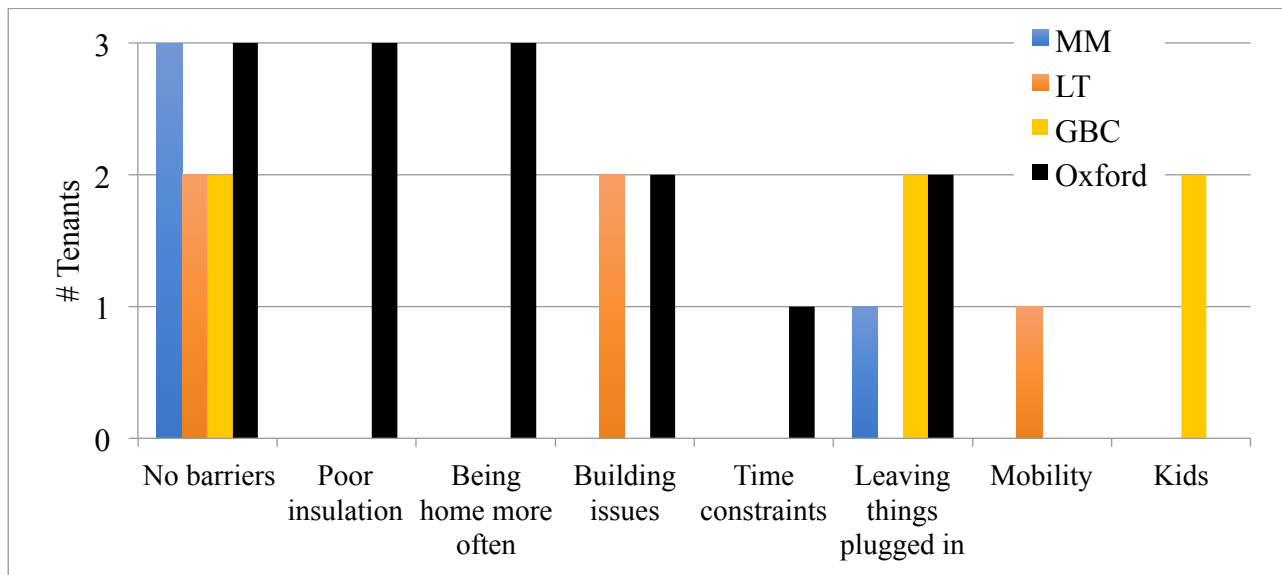


Figure 3: Barriers to reducing how much energy the household uses as reported by tenants from the 3 AAHC sites and Oxford

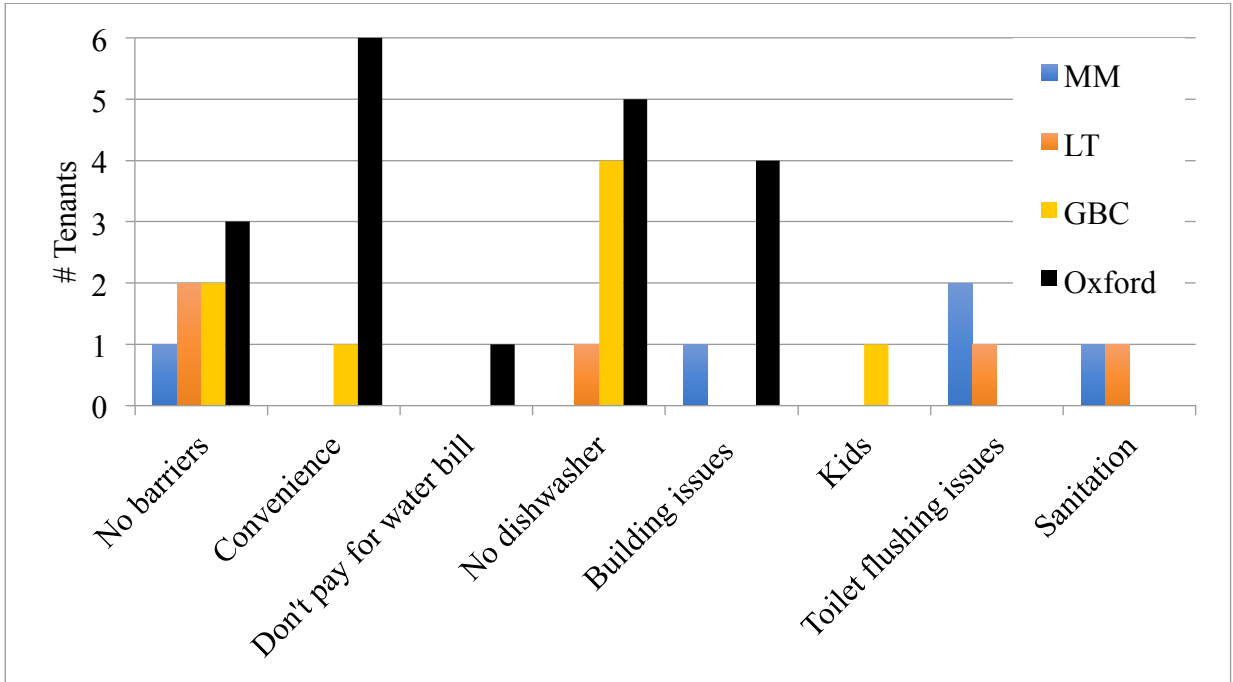


Figure 4: Barriers to reducing how much **water** the household uses as reported by tenants from the 3 AAHC sites and Oxford

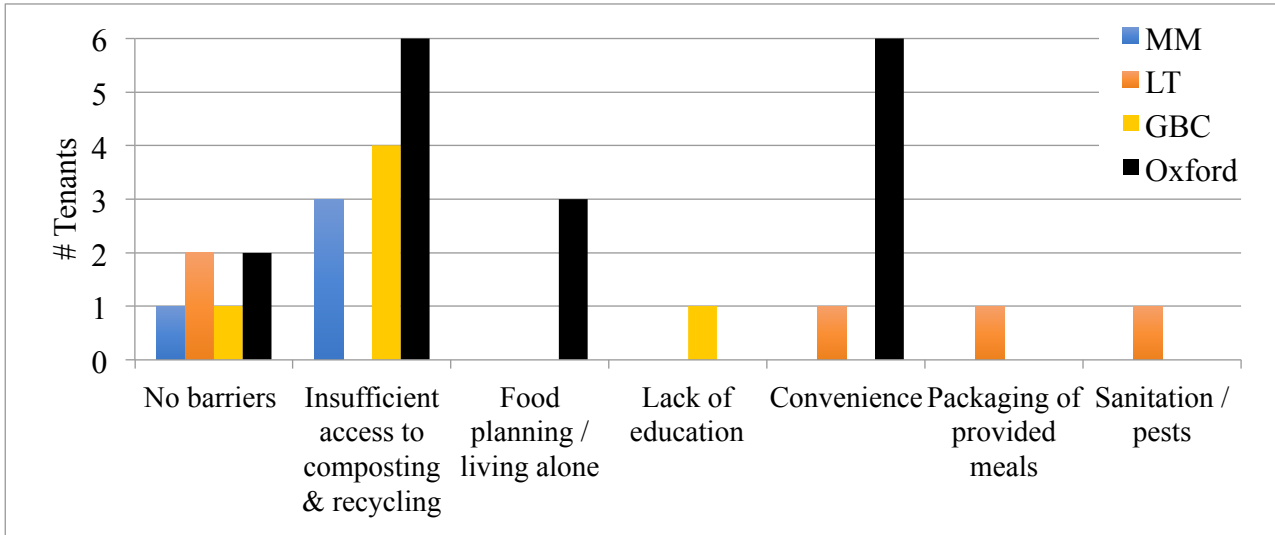


Figure 5: Barriers to reducing how much **garbage** the household throws out as reported by tenants from the 3 AAHC sites and Oxford

In the transportation section of the interview, 100% of GBC tenants said they drive personal vehicles, which is different from the other sites where walking, A Ride (a public transit service for eligible individuals with disabilities), or public transit are more common. Figure 6 shows GBC having the AAHC population with the highest rate of driving a personal vehicle. There is

potential for reducing greenhouse gas emissions at this site by planning for electric vehicle infrastructure, especially because 50% of GBC interviewees plan to buy a hybrid for their next vehicle.

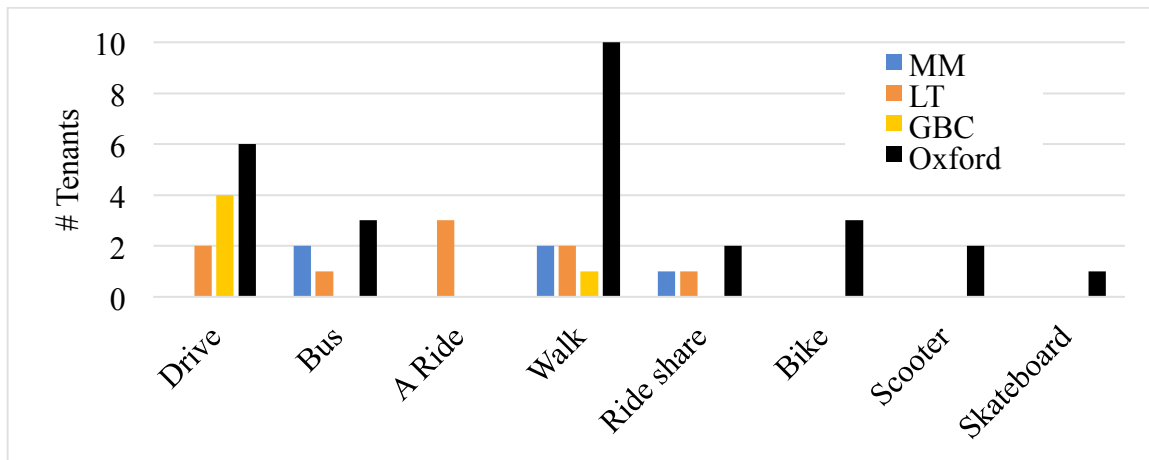


Figure 6: Transportation methods used by tenants from the 3 AAHC sites and the Oxford tenants

Interest and Behavior Change

25% of respondents said they are not motivated to care about neighbors or community, while the other 75% said they are motivated to care about neighbors and community due to a moral responsibility and caring about others. Half said they care about the environment because of concern for future generations and the other half said they care about the environment because they want to live in a good environment. Half of the GBC tenants interviewed said they want AAHC to bring sustainability ideas and goals to the table. 75% are interested in and likely to use composting (as seen in Figure 7), interested in a tip sheet, and interested in educational workshops and opportunities.

Figure 7 shows that there is at least some interest to compost for all tenant types if composting materials and educational information were to be provided to tenants. This suggests that implementing composting efforts may be an impactful strategy to try for property managers. GBC had the highest level of interest out of the AAHC groups, with 75% of tenants reporting they were at least somewhat like to compost.

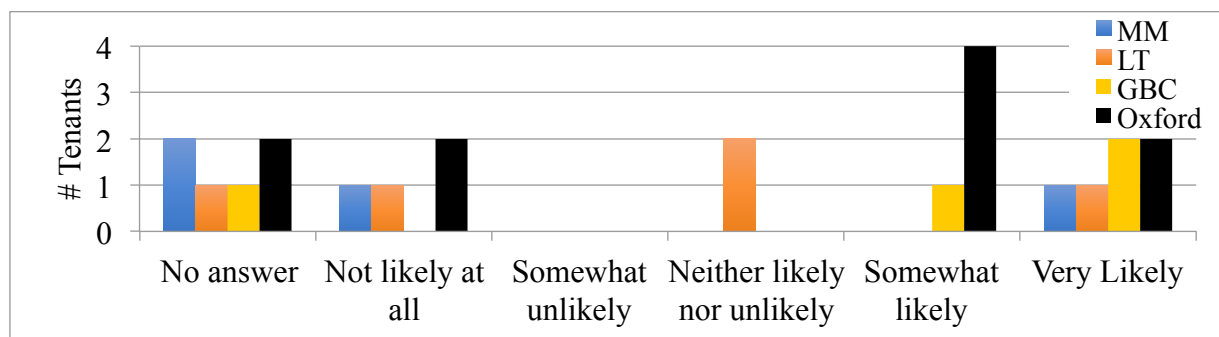


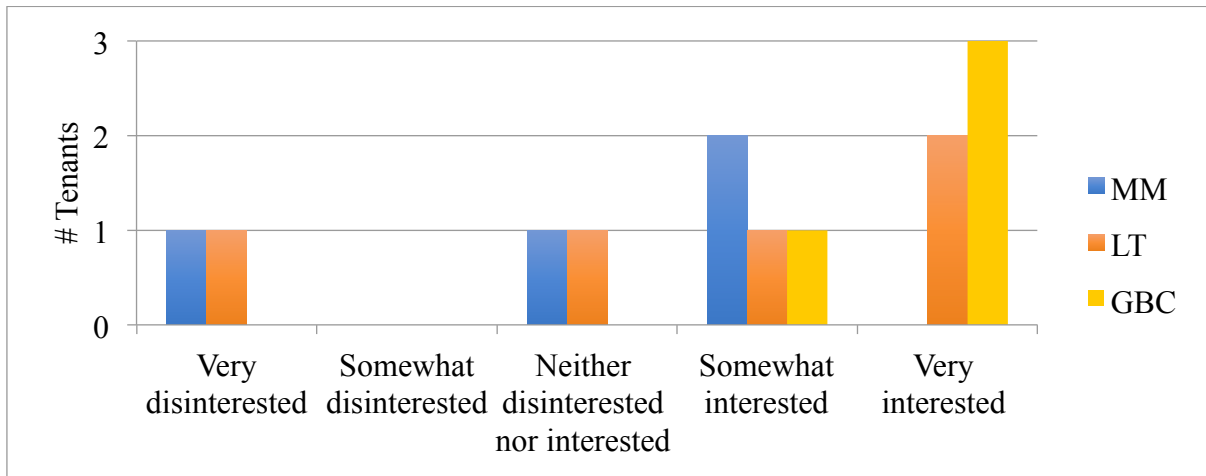
Figure 7: Likeliness to compost as reported by tenants from the 3 participating AAHC sites and Oxford

Low-income senior housing – Lurie Terrace (LT)

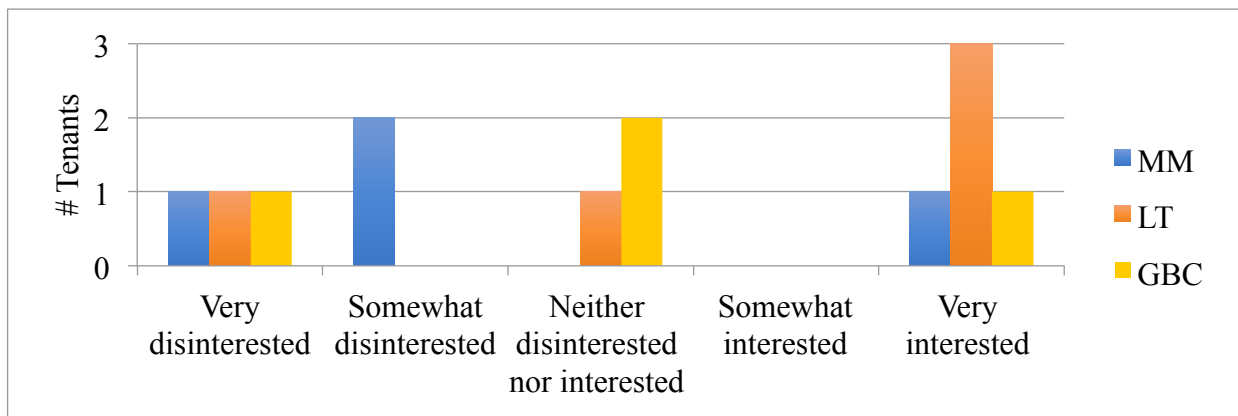
Participant information

At LT, I was able to interview 5 tenants. 60% of tenants interviewed said they were somewhat or very interested in knowing about their electricity and water usage. 80% were interested in implementing energy saving behaviors. 60% were interested in knowing their consumption compared to their neighbors, and said they were likely to engage in the same reduction behaviors if they knew their neighbors were doing so.

Figure 8 and Figure 9 below show the difference in responses of AAHC tenants when first asked about their own energy and water usage and then their usage compared to their neighbors. Having information about their neighbors’ usage might be a motivating factor to reduce usage at senior housing sites, but is not particularly effective at single adult or family housing.



*Figure 8: Level of interest in knowing **their own** household energy and water usage as reported by tenants from the 3 participating AAHC sites*



*Figure 9: Level of interest in knowing energy and water usage **compared to their neighbors** as reported by tenants from the 3 participating AAHC sites*

Communication

80% of the 5 LT tenants said reaching out to their landlord is typically done face-to-face, 60% of respondents mentioned communicating via phone, 40% said via email, and 40% said via meetings. 60% of tenants mentioned when the landlord reaches out to them it is via memos on doors or phone, 40% mentioned face-to-face, and 40% mentioned email. This depends on the issue being discussed. Because not everyone in the building has access to email or the internet, 60% of people said the most effective way to communicate with tenants is via memos on doors or flyers, as seen in Figure 2. All LT respondents said the memo or flyer on their door is their preferred method of communication to receive information on sustainability. All LT tenants said a meeting with follow-up documents that they could take with them would be the best way to introduce a new program, such as composting.

Current Efforts and Barriers

80% of 5 tenants at LT are aware of the recycling efforts and 40% mention the trash compactor as another sustainability effort that exists in the building. 20% mentioned that the building has efficient water systems. 40% of respondents said there are no barriers to reducing their water and energy use or material waste produced, as seen in Figures 3, 4, and 5. Others mentioned mobility issues in getting to the thermostat, not being mindful, building issues (e.g., bed bugs requiring tenants to run the washer and dryer on high heat), not having a dishwasher, convenience, or non-eco-friendly packaging of provided meals. 40% of LT interviewees did not believe there was a lot of food waste in the building.

60% of LT respondents reported not working or not travelling to work (e.g., working from home). 60% of respondents take A Ride to get around town, while 40% drive, 40% walk, and only 20% take the bus or rideshare. 40% of tenants said their method of transportation is impacted by weather, distance, or convenience, while only 20% mentioned cost. Those who drive said they would not switch to a method of transportation with lower GHG emissions unless they are too old to drive.

Interest and Behavior Change

The tenants at LT were motivated to care about their impact on their neighbors due to a moral responsibility or being a role model for others. When asked about motivation to care about their impact on their community, 20% of respondents said they are not motivated, 40% said because they want to live in a good environment, 40% mentioned because they care about people, and another 20% mentioned concern for future generations. When asked about motivation to care about their impact on the environment, 40% mentioned being against the wasteful throw-away culture and capitalism, 60% were concerned for future generations, and 40% mentioned they want to live in a good environment. Concern for future generations and wanting to live in a good environment were the most frequent responses.

When discussing what incentivizes them, 60% of tenants said recognition, while 40% said gift cards, being a role model, or having education, feedback, or materials provided. When asked about incentives for other tenants in the building, 60% believed others would be incentivized

money or education, 40% said food, 20% said recognition, and – unique to LT – 20% said working in groups or teams has been successful in the building. Tenants reported a minimum incentive of \$10 or more, food and beverages, or education. When asked specifically about the effectiveness of recognition, 60% said it would be effective. To get folks to attend a workshop, 40% of respondents suggested food and refreshments, and 40% said focus on getting the word out to tenants.

When tenants were asked what services they would use, 60% said recycling, 40% said move-in and move-out waste help, and only 20% said composting. This is different from the enthusiasm around composting among tenants at other properties. When asked specifically about composting, 60% of tenants were neutral or very unlikely to compost even if materials were provided.

60% of tenants at LT are willing to collaborate with AAHC to reach AA2030 district goals and said a sustainability tip sheet would be helpful. 40% of respondents said they would like to see more third-party guest speakers.

Low-income single adult housing – Miller Manor (MM)

Participant information

At MM I was able to interview 4 tenants. 50% of MM tenants interviewed said this was the first time they heard of any sustainability efforts, and they would like to hear more about it from AAHC. 50% of tenants were somewhat interested in knowing their electricity and water usage, while the other 50% were neutral or very uninterested, but 75% were interested in implementing energy saving behaviors. 75% of the interviewees at MM were not interested in knowing their consumption compared to their neighbors (Figure 8), and only 25% were likely to change their behavior if they knew their neighbors were doing so (Figure 9). This is different from the rest of the properties where tenants are more likely to change their behavior based on neighbors due to competitiveness or social pressure.

At GBC and LT the tenants mentioned something positive about the community 75% of the time. At MM there was no mention of community. In contrast, 75% of tenants interviewed expressed disappointment or frustration with the other tenants. As I found at the other AAHC properties as well, there is a subgroup of individuals who are open to being more involved, and at MM this group may be smaller than others. Many of the interviews at MM went off script, so more information is missing from these interviews than other sites. More interviews and a larger sample size will give a better understanding of how representative these results are of the larger population at each site.

Communication

75% of tenants said reaching out to their landlord is typically done face-to-face, 50% said via notes in mailbox or on doors, 25% said via email, and 25% of respondents mentioned communicating via phone. 75% of tenants mentioned when the landlord reaches out to them it is

via written letters, 75% through face-to-face, 50% mentioned phone, and 25% mentioned email. This does not depend on the issue being discussed, which is different from the other AAHC properties. Because not everyone in the building has access to email or internet, 50% of respondents said the most effective way to communicate with tenants is via memos on doors/flyers, face-to-face, or texting as seen in Figure 2.

All 4 MM respondents said the preferred method of communication to receive information on sustainability is via memos or flyers because it is something they can refer to. 50% of tenants said a meeting with follow-up documents they could take with them would be the best way to introduce a new program, and all respondents said this would require multiple forms of communication to get people involved (e.g., a combination of verbal notice, letters, kick off meeting, resident council, or a bulletin posting). 50% also said they would be likely to attend environmental sustainability focused community meetings.

Current Efforts and Barriers

Half of the participants mentioned recycling as a service that exists in their buildings, and the other 50% said they did not know of any sustainability efforts. 25% mentioned efficient water systems in the building.

75% responded there are no barriers to reducing electricity (Figure 3), and 25% mentioned the lights always being on, which is a concern also brought up by the MM service provider. 25% said there are no barriers to reducing water use (Figure 4), 50% stated toilets not flushing well as a barrier, and 25% said sanitation – like at LT, there were concerns about bed bugs. Another 25% mentioned inefficient water fixtures as a barrier to reducing water use. Even though 50% of respondents said lack of composting is a barrier to reducing waste, it does not seem likely that building wide composting would be adopted very quickly because only 25% said they would be likely to use composting if materials and information were provided. 25% said poor recycling implementation was a barrier, and 25% believed there were no barriers to reducing waste (Figure 5).

In the transportation section of the interview (Figure 6), 75% of the tenants said they do not work, and 25% said they walk to work. To get around town, 50% take the bus or walk and 25% reported using rideshare services or carpooling. The biggest factors for transportation are cost and convenience, which 75% of participants mentioned. 25% of participants reported weather, distance, or their health as other factors.

Interest and Behavior Change

25% of tenants said they are not motivated to care about their impact on their neighbors, while the other 75% reported caring because of a moral responsibility. MM tenants said they are motivated to care about their impact on their community by wanting to live in a good environment and caring about people. When asked about motivation to care about their impact on the environment, 25% mentioned being against the wasteful throw-away culture and capitalism, 50% were concerned for future generations, and 75% mentioned they want to live in a good environment.

When discussing what incentivizes them, 75% said gift cards or money, 50% mentioned having education, feedback, or materials provided, and 25% said being a role model or doing the right thing. When asked about incentives for others in the building, 50% believed others would be incentivized money or education. 25% of tenants reported a minimum incentive of \$20 or more and 25% said food and beverages. When asked specifically about the effectiveness of recognition, only 25% said it would be effective, while 50% said it would not be effective at all. To get folks to attend a workshop, 25% of respondents suggested food and refreshments, and 75% did not provide an answer.

All 4 participants from MM said a sustainability tip sheet would be useful to them. Figure 10 shows 100% of MM tenants are interested in having a sustainability tip sheet provided to them. This sheet would have tips on how to save energy and water and reduce waste in their households. This could be a fridge magnet or a handout that can be put on a fridge.

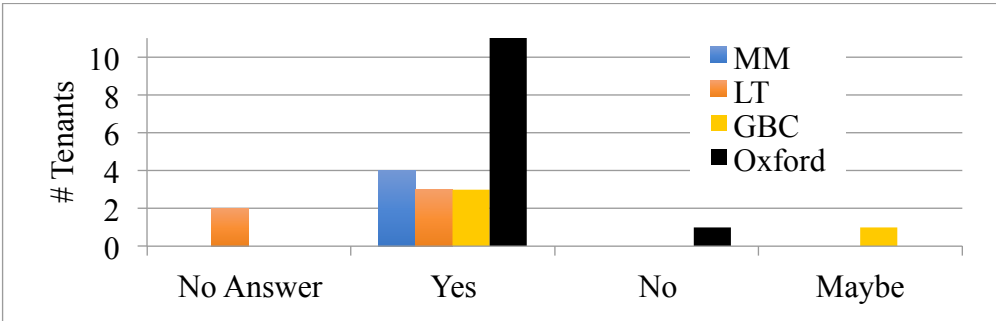


Figure 10: Responses about whether a “sustainability tip sheet” would be useful as reported by tenants from the 3 participating AAHC sites and Oxford

Figure 11 shows the responses of tenants when asked what sustainability services they would like to have in their building. MM tenants responded that they would like to have compost, better recycling, weatherization help, a community garden, and an RO water system.

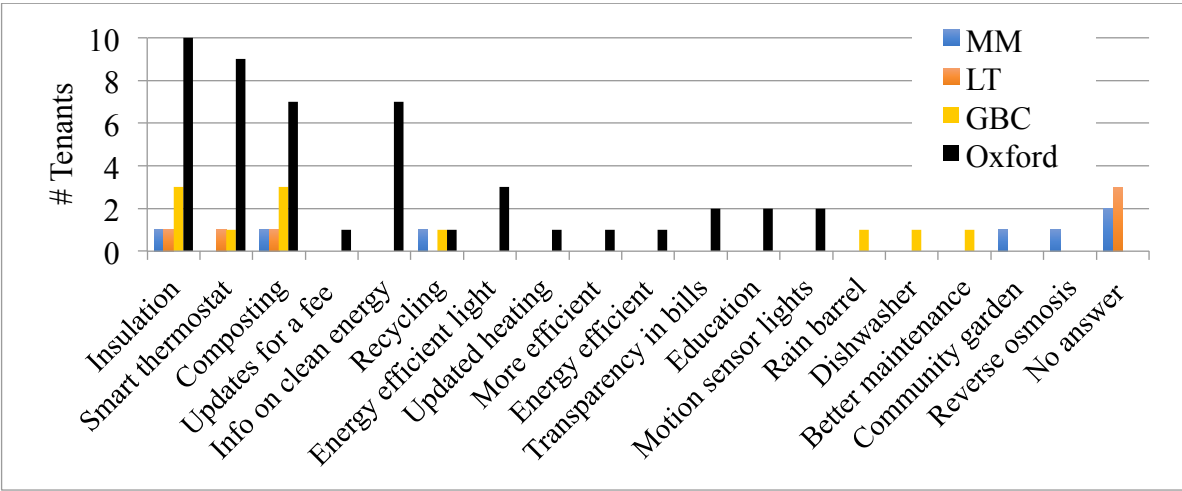


Figure 11: Sustainability products, services or features tenants would like to have access to or have at their residence

Only 25% of respondents said they were somewhat likely to collaborate with AAHC to meet AA2030 District goals, and only 25% said they would use recycling, compost, a community garden, or an educational workshop if these services were offered. 50% of participants said AAHC can help in providing more sustainability resources through increasing education and awareness, 25% said through taking care of building issues such as having the building too warm, and 25% justifying or giving reasons for changing actions would be helpful.

Non-tenant participants – AAHC

Participant information

This section will discuss the responses of the service providers or administrative staff at the 3 AAHC properties.

Communication

All 3 providers said that face-to-face communication is the most common, but multiple methods of distributing information about a new program or effort are necessary to get people engaged. GBC emphasized that both a physical (e.g., a flyer or memo on a door) and digital (e.g., texting or email) form of communication is best practice for that site, while LT said face-to-face (e.g., resident council or another type of meeting) and a physical posting is best. MM said the most effective method of communication for them is face-to-face through a supportive staff member. There is only one person in this role currently, but the role is crucial in connecting to tenants. This person is in tenants' spaces helping them clean and organize while engaging in conversation. Tenants trust this person, and it is a unique opportunity and way to engage with tenants.

Current Efforts and Barriers

GBC and LT each brought up a past success in behavior change techniques. GBC has used third party dispute resolution that has been effective for parking issues at the site. LT stopped providing trash bags to residents and asked residents to use grocery bags. This was a relatively seamless transition, showing that small, easy changes can be implemented.

GBC mentioned it has support from the partners at Community Action Network and tenant support for bigger sustainability ideas such as clean energy but needs AAHC on board for funding and navigating regulations. LT has a very social environment that should be used to AA2030 District's advantage.

The service providers discussed a few sustainability products, services, or features they would like to see at their sites. GBC mentioned programmable/smart thermostats and composting for their community gardens. LT mentioned anything cost effective would be nice, as well as composting. MM also mentioned composting as well as motion lights in the trash rooms and hallways and better recycling implementation.

When asked about barriers to reducing tenant energy use, water use, and material waste produced, GBC and LT respondents mentioned that tenants do not know how much they use because rent includes utilities. MM mentioned it is difficult for tenants to understand the reasoning behind why they should be doing something as well as a lack of education on the topic. For material waste specifically, GBC mentioned a lack of information and access to materials and education for composting. LT said tenants are good about not wasting, which is consistent with some of the tenants' responses. MM brought up mental health, specifically hoarding, and the difficulties in addressing material waste when transitioning out of homelessness. Something to be mindful of in the MM tenant population is while education is a good thing, some MM tenants have not had positive experiences with education in the past, and it may not always be effective or well-received. All service providers believed if these barriers did not exist, waste is somewhat likely to be lower.

Interest and Behavior Change

GBC and LT believed tenants are somewhat likely to be interested in implementing energy saving behaviors. MM was neutral, but if the behaviors were framed in a way that tenants cared about (e.g., health of the building, the community, future generations) the likelihood would increase. GBC and LT both mentioned tenants would be encouraged to make reductions if they saw their monthly rent decrease because of savings on utilities.

The service providers were asked what they think motivates tenants to care about their impact on their 1) environment, 2) community, and 3) neighbors. GBC said tenants are motivated to care for their environment if it affects the way they live, to care about their community by caring about impact on the kids and others in the community, and to care about their neighbors by interacting with each other which leads to caring for each other and their community. LT said tenants are motivated to care for their environment and their community because they are aware of climate change. The service provider said tenants likely care about their neighbors due to the social nature of the design and culture of the building. The building has many common areas and tenants are familiar with their neighbors. There may be greater accountability caused by tenants knowing their neighbors. MM said tenants are motivated to care for their environment because tenants have interesting connections to nature. Tenants spend a lot of time outdoors and are more environmentalist as a result. MM tenants are motivated to care about their community because they want to live their lives "unbothered" and many care about future generations. MM tenants care about their neighbors again because they want to keep the peace and "live life unbothered."

Effective incentives mentioned by the GBC service provider include food, beverages, and gift cards of \$25 to grocery stores. Incentives mentioned by the LT service provider include food and social or educational events, but most tenants are retired and do not need much incentive. MM did not mention specific incentives but did bring up the supportive staff member again, who can help contextualize the changes and show tenants how changes will have an impact on them.

If not motion lights, MM suggested light switch stickers and graphics for the recycling bins that can help tenants remember to turn off lights or sort trash properly. MM also mentioned that composting would require a lot of education and piloting a compost program with staff and

engaged tenants could be a great start. Many tenants at MM especially have personal issues and needs that are more urgent than reducing their waste. To work around this, AAHC can focus on changes that do not require tenants to change their behavior drastically such as an upgraded washer and dryer or motion lights.

Off-campus student housing – Oxford

Participant information

All 12 participants were affiliated with academia, although not all were students. 83% were students at UM, 8% were administrative staff at UM, and 8% were graduate students remotely at another institution. Oxford tenants are transient, typically staying less than 2 years in a place. The most prominent factors for Oxford tenants in deciding where to live were (as shown in Figure 12):

- Proximity /walkability to downtown and campus (100% of respondents)
- Cost (66% of respondents)
- Roommates (75% of respondents)
 - Living with friends (58% of respondents) or
 - Not wanting roommates (17% of respondents)

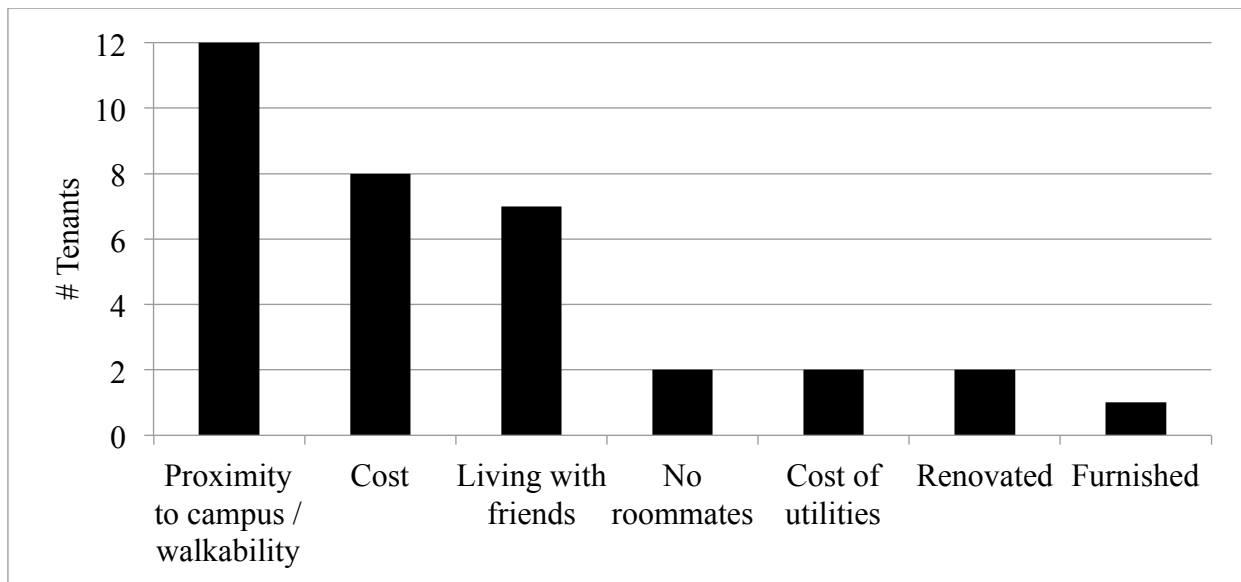


Figure 12: Factors impacting housing decision as reported by 12 Oxford tenants

71% of respondents were financially responsible for utilities, while 29% get help from parents, so most respondents would directly benefit from saving money on their utilities. Despite the potential to reduce utility costs, this group was generally not paying attention to their utility usage, but there was interest.

This group is generally uninvolved in sustainability efforts, with only 17% mentioning being involved in anything related to sustainability. All the respondents rated their knowledge of

sustainability as it relates to housing as average to below average, but they are not opposed to learning more or changing behavior with rewards, incentives, or materials provided.

Oxford tenants prioritize proximity when choosing where to live. This importance is salient in the transportation section of the interview, where 83% of tenants report walking as their method of transportation (Figure 2). 50% said they also drive depending on distance, parking availability, and weather. 25% said they ride the bus, but with the priority placed on proximity to campus and downtown, walking is often faster.

Communication

Tenants are very satisfied with the email communication from Oxford right now. Figure 2 shows that email is unanimously the most effective way to communicate with tenants in off-campus student housing. A significant portion of Oxford tenants said they read every email no matter what, so this is a good place to share information such as short videos, updates, tips, and resources on sustainability and ways to have the greatest impact.

Tenants want to know the ways they can have the biggest impact with the least change to their routine or effort put forth. There is a subgroup of people who are willing to collaborate and care. The rest of the tenants are not completely shut off and are open to increasing their willingness, but this needs to be in a way that is easy and low cost/low effort. Making these changes easier for them, perhaps using third-party expertise to determine ways tenants can have the greatest impact with lowest effort would be worthwhile.

58% of respondents said that some material incentive would be the easiest way to engage them, such as a compost bin and information on how to use it or a gift card. 42% of tenants said they would prefer Oxford to send the information via email. All Oxford tenants preferred email communication from Oxford for all issues, including communicating sustainability information. 86% of respondents said they are likely to read emails from Oxford, so email is a big opportunity to share sustainability tips and reach tenants. One-third said short videos and visuals would be helpful, but still preferred those to be sent via email. Meetings were not a popular way to be engaged among this group due to competing priorities and time constraints.

Current Efforts and Barriers

When asked what barriers exist to reducing the amount of **energy** their household uses, tenants' answers were ranked as follows:

1. Weatherization – *mentioned by 3 respondents*
2. Being home more often/working from home – *mentioned by 3 respondents*
3. Do not think consumption is high/no barriers – *mentioned by 3 respondents*
4. Outdated infrastructure – *mentioned by 2 respondents*
5. Leaving things plugged in – *mentioned by 2 respondents*
6. Time constraints – *mentioned by 1 respondent*

In the top 4 responses, tenants put the onus of reducing electricity usage somewhere else. In the bottom 2 responses with fewer respondents – leaving things plugged in and time constraints – tenants take responsibility for their usage. With energy, most people gave barriers that were out

of their control, potentially because there is not a clear barrier to reducing energy use, so when asked about removing barriers, it was not clear what they could or how it would help.

When asked what barriers exist to reducing the amount of **water** their household uses, tenants' answers were ranked as follows:

1. Convenience (Long showers, humidifiers, etc.) – *mentioned by 6 respondents*
2. Dishwashing situation – *mentioned by 5 respondents*
3. Building issues (inefficient water heaters, washing machines, poor water pressure etc.) – *mentioned by 4 respondents*
4. I do not waste water – *mentioned by 3 respondents*
5. Don't pay for the water bill – *mentioned by 1 respondent*

In this question, the top 2 answers are more related to personal responsibility, which is the opposite of what I found when I asked about electricity. It is much clearer when and how water is being used because they can see it when taking a shower or bath, using a humidifier, or washing dishes. Tenants understand how water is being used more clearly than how electricity is being used. Respondents were quicker to assume responsibility for water use and seemed to understand what changes can be made to make a difference – but not everyone was willing to make those changes.

When asked what barriers exist to reducing the amount of **garbage** their household throws away, tenants' answers were ranked as follows:

1. No access/insufficient access to composting and recycling in the building – *mentioned by 6 respondents*
2. Convenience – *mentioned by 6 respondents*
3. Food planning/living alone – *mentioned by 3 respondents*
4. I already do what I can to reduce my waste – *mentioned by 2 respondents*

Tenants were much clearer about what changes can be made to make a difference to reduce material waste, such as sorting out waste into recycling and composting. After each question about barriers, I asked a follow-up question:

On a scale of 1 to 5, (1 = not likely at all, 5 = very likely), if these barriers didn't exist, how likely is it that your [energy consumption, water consumption, or waste produced] would be lower?

Figure 13 shows the responses to this follow up question.

There is some confusion around barriers and what changes could reduce electricity use. The barriers to reducing water use and what changes can be made are clearer for water use, although convenience is a barrier and something people are hesitant to give up. The barriers and what changes can help reduce material waste are much clearer than water and energy use for tenants, and tenants show willingness to change with assistance. Focusing on waste may be an opportunity for the greatest impact. If bins are provided, 58% of participants are likely to use composting services. 42% of participants mentioned they would need materials and education/information to get started. Most UM students are already familiar with this and do this on campus, so it has potential to be an easy transition for Oxford tenants.

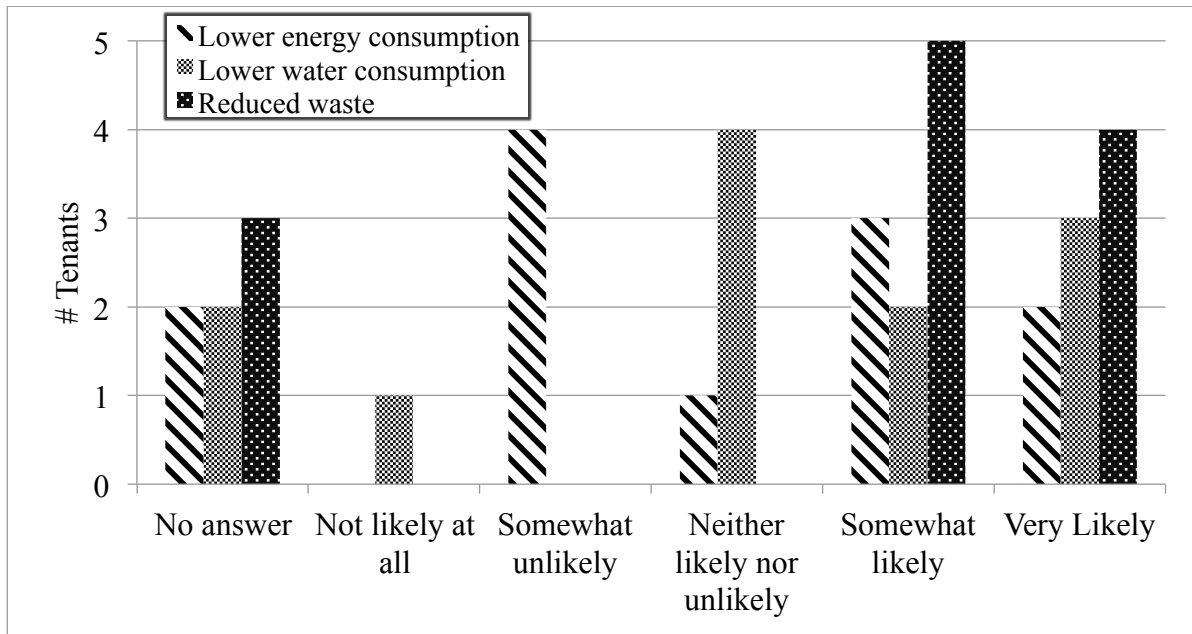


Figure 13: Likelihood of lower energy consumption, water consumption, and waste produced if barriers were removed as reported by Oxford tenants

Of the 12 participants, only 3 had heard of the DTE Insight app, which is a free app providing tenants with information to monitor their home energy use (DTE, 2022). Of those 3, only 2 used it, and one said it impacted their behavior. 5 respondents mentioned they would be interested in downloading the app, so there may be potential in promoting the app to see energy use reductions.

Interest and Behavior Change

75% of Oxford respondents said they are interested in having a reward or incentive program built into their lease to help them reduce their energy and water use and material waste. 75% of Oxford tenants are unaware of any Oxford sustainability and energy efficiency goals, efforts, or resources (except recycling), and almost 60% of respondents said they would like to know more about Oxford’s sustainability goals, especially at the time of move-in. One-third are interested in having resources provided from composting, transparency in their water bills, and quarterly walkthroughs of their space to check for efficiency issues such as drafty windows or leaky faucets.

83% of Oxford tenants said they are at least somewhat interested in implementing sustainable behaviors – but how do they want to be incentivized? Two-thirds of tenants said money in the form of dollars off rent or gift cards would be most effective. One-third mentioned recognition from Oxford (for example, a thank-you email), and another one-third mentioned food. 25% of the respondents said a low upfront cost or low inconvenience would be incentive enough.

Participants were asked what motivates them to care about their impact on their 1) environment, 2) community, and 3) neighbors. 42% were motivated to care about their environment by moral obligation. 42% said they were motivated to care about their community by feeling part of a positive space or contributing to shared values, and 33% said they are motivated by having a

collective impact. 58% said they are *not* motivated to care about their neighbors. 75% of respondents mentioned they do not know their neighbors. There is an opportunity here for community building alongside sustainability efforts. When communicating any efforts or programs to tenants, they are unlikely to care about improving anything on behalf of their neighbors. It might be more impactful to talk about it in other terms such as cost-reduction or improving the community or focus on working toward establishing a sense of neighborliness or community within buildings.

90% of respondents said they are willing to split the level of effort or cost of improving the sustainability and energy efficiency of their residences. Respondents said they were willing to cover as low as 25% and up to 60% of effort and cost. One-third of respondents were willing to collaborate with Oxford. The other two-thirds are not totally unwilling to collaborate; they mentioned low time commitment, low inconvenience, and low effort or cost as ways to increase their willingness to collaborate.

When asked how landlords and tenants can better work together to meet AA2030 District goals, 58% of tenants said landlords could provide more resources, tips, and bill transparency. 33% mentioned Oxford should humanize themselves and build community.

Tenants were asked about resources they would like to have at their residences. When brainstorming on their own, tenants brought up equipment and more tangible things that make behavior changes easier for them. The top 3 answers were compost bins, weatherization, and programmable/smart thermostats, with 83% of tenants mentioning each. When asked directly about access to data or information, people were very interested, which is seen in the high percentages below:

- 92% said a sustainability tip sheet (e.g., fridge magnet with tips) would be good/helpful/useful
- 83% said they are interested in more transparency in bills and access to energy and water use data
- 75% said access to energy use data of properties would impact their housing decision

92% of tenants are also interested in reducing move-in and move-out waste. The top ways they are interested in are handouts with tips such as big item pick up times, ways to dispose of things like batteries, or where they can donate, thrift, or dispose of items. They were also interested in property-specific data (e.g., realistic targets for consumption or historical data), additional bins for trash and recycling bins during move-in and move-out, and access to recycled cardboard boxes and bins.

Participants living alone tended to assume their consumption was lower or that they could not reduce consumption anymore. This might be a gap in knowledge of what they *think* they can be doing versus what they can be doing to reduce energy and water use and waste produced.

In summary, Oxford tenants are willing to collaborate with Oxford, willing to put forth effort, and interested in ways they can have the biggest impact, but they want it to be made convenient, and they need guidance on where and how to begin. It seems that tenants may have been willing

to work landlords in theory, but when considering the actual level of effort, they wanted the landlord to carry the load. Based on these responses, there are opportunities to meet tenants where they are, capitalize on email usage, make it easy for tenants to make changes, and foster community. This can be done through the following actions:

- Encourage behaviors at time of lease signing and/or move-in
- Move-in / move-out help
- Use Ann Arbor city composting program
- Improve transparency for bills paid by Oxford (water)
- Make tenants aware of/provide:
 - Oxford sustainability goals
 - DTE Insight app
 - Carbon footprint calculators
 - LED light bulbs
 - DTE energy efficiency kits
 - Sustainability tips / tip sheet magnet
- Continue communication via email
- Competitions: Community building opportunities

Respondents were interested in Oxford's sustainability goals and wanted to know more about them. Move-in time is ideal for inspiring sustainable habits and setting the tone of landlord-tenant collaboration. When student tenants move to a new place – potentially the first time living away from home or on their own – this is an important moment and opportunity to intervene and create lifetime habits. If composting is the norm at a certain property, a new tenant will likely engage with that norm, but might need the tools and information provided to get started or ensure the habit is created. Having information about ways to make reductions given to them at the beginning can encourage sustainable actions. In addition to this being a great time to target creating habits and behavior change, people were interested in move-in and move-out waste help. Providing these tools to tenants can be a great opportunity to set the tone of reducing waste. The 2015 Dolan & Metcalfe study mentioned in the introduction discussing social norms and incentives is relevant to our findings for LT and Oxford; LT tenants reported being more likely to engage in sustainable behaviors if their neighbors are doing it, and with Oxford tenants there is an opportunity for new tenants to be influenced by social norms upon move-in.

Composting was popular among tenants. Oxford and AA2030 District could work with the city of Ann Arbor to expand composting to multitenant buildings. As stated, most participants were UM students who are already used to sorting their trash on campus, so the transition to doing it at home too might be low hanging fruit. As shown in Fig. 7, there is significant interest in composting for off-campus student housing which may be due to the prevalence of existing composting activities and norms on the University of Michigan campus.

Tenants were also interested in data and transparency. Providing easily accessible information at time of lease signing and providing data that make it easy for tenants to see their impact are 2 low effort ways to bring the information to tenants rather than something they must look for. Currently they do not seem to know how much water and electricity they use because they do not

have access or do not know how to access that data. Encouraging people to use their data by showing them how to find it or providing it can be an effective way to show tenants the direct impact of their consumption behaviors. Tenants are interested in knowing what they are using so encouraging tenants to download the DTE Insight app when they sign their lease might expose them to how much they use and what opportunities exist to save. Sharing water bill information for the building, such as posting it in a place where everyone in the building can see how much they use month to month, could also be helpful. Tenants were split 50/50 on the idea of competition; 50% were not interested in competitions with other buildings, but 50% were interested in competing within their own building. This could be a valuable community building opportunity. Increasing awareness of resources and how their behavior has an impact.

Only one-third of tenants had used a carbon footprint calculator, and the experience did influence behavior change in those tenants. These tenants stated that they took actions such as going vegetarian, buying a compost bin, becoming a more conscious consumer and person, and eating less red meat after using a carbon footprint calculator. Oxford can send out an easy-to-use carbon footprint calculator, such as CoolClimate Calculator (<https://coolclimate.org/calculator>) and encourage students to use it by offering an incentive or holding a short virtual workshop (Beale, 2021). Providing resources that are feasible and effective, whether it is a magnet with sustainability tips, offering a tip or video in an email once a month (e.g., link to an easy-to-use carbon footprint calculator), or providing an LED light bulb upon move-in are a few examples. A small number of tenants mentioned energy efficiency kits that DTE provides for new customers. There might be an opportunity for partnering with DTE to provide those to new leaseholders.

Commercial

Although I did not conduct interviews with commercial building tenants, I did create an interview script that can be used for future research. The interview script for commercial tenants varies from the multitenant residential buildings because the spaces serve very different purposes. The commercial interview script concentrated on things like electric car charging stations, commuting, plug load, and corporate sustainability goals. This interview script can be found in Appendix B.

Discussion

Property managers and building owners can use certain communication strategies and provide certain products, services and incentives to engage tenants in more sustainable habits to meet 2030 District reduction goals. This section offers recommendations for each type of tenant.

Oxford – student housing

Student tenants are best engaged via email as seen in Figure 2. Student tenants are most interested in weatherization and insulation help, accessing programmable/smart thermostats, composting services, and information about clean energy, as seen in Figure 11. These 4

strategies have potential to be especially easy implementations for property owners of student housing. Tenant interest already exists, suggesting a willingness to engage with these strategies.

When receiving information about sustainability programs or efforts from their property manager or landlord, student tenants are most interested in receiving emails as seen in Figure 14.

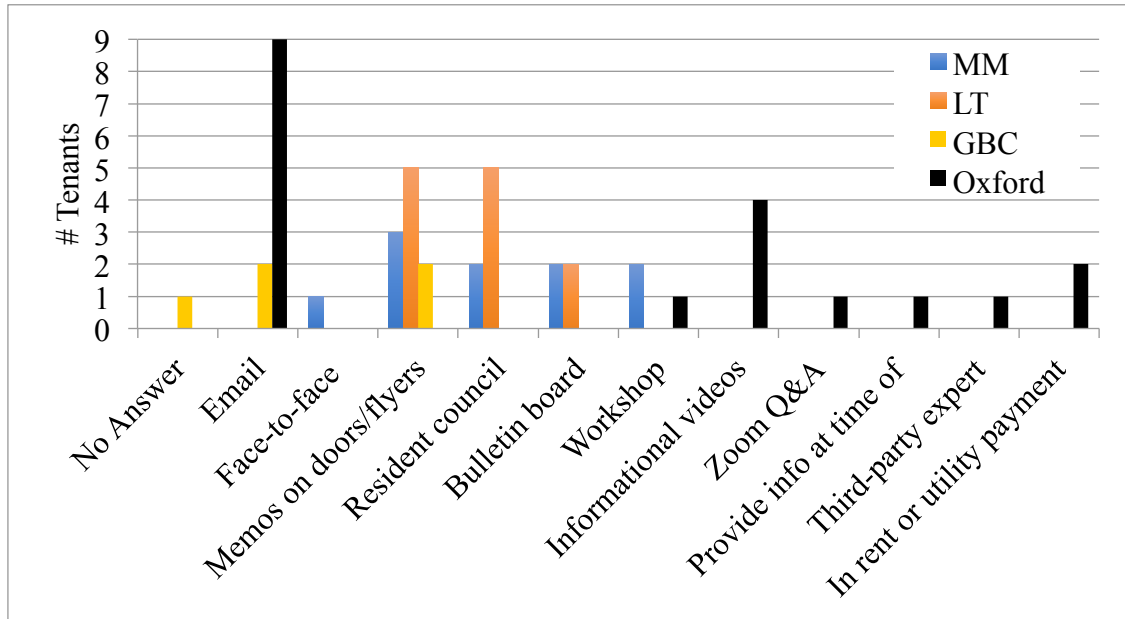


Figure 14: Preferred method of receiving information about a new sustainability program as reported by tenants from the 3 participating AAHC sites and Oxford

Student tenants are most incentivized by money or gift cards, food and recognition as shown in Figure 15. Student tenants may be likely to be incentivized by recognition, but this would likely need to be coupled with another form of incentive; tenants are not incentivized into action by receiving an email, but tenants said it would incentivize them to continue sustainable behaviors.

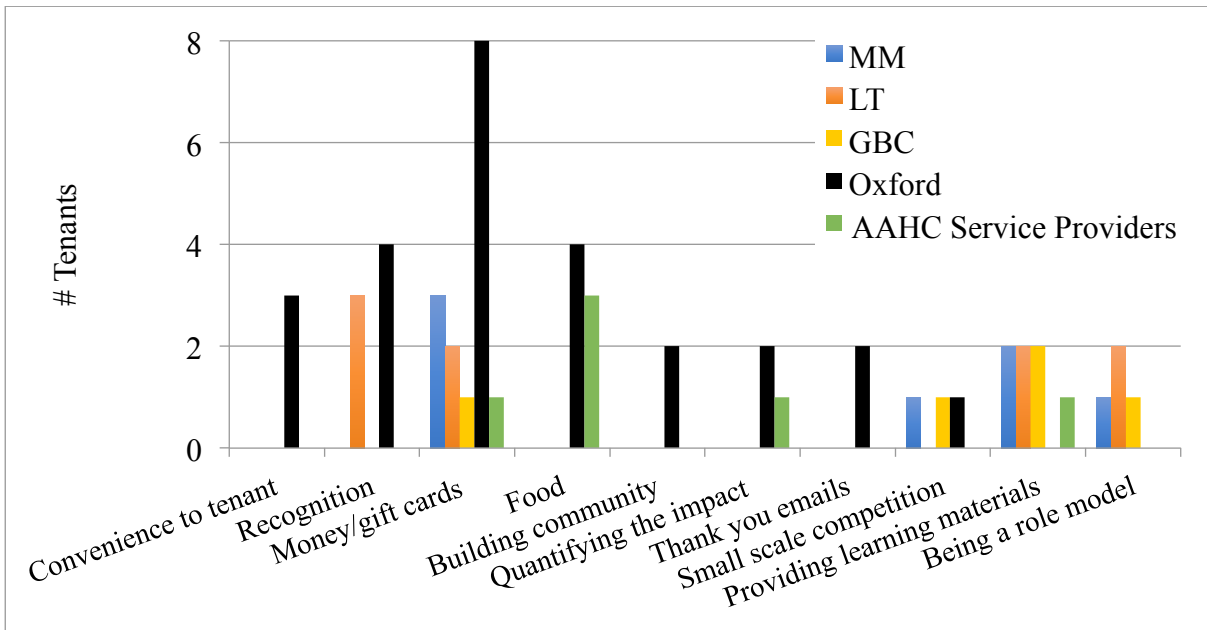


Figure 15: Preferred incentives for engaging in sustainable behaviors as reported by tenants and service providers from the 3 participating AAHC sites and Oxford tenants

AAHC – Low-income housing

As seen in Figure 2, low-income housing tenants are best engaged via face-to-face interactions and meetings coupled with take-home materials. Low-income tenants were less clear about sustainability products, services or features they would like to have access to at their residences, but weatherization help and access to composting are the most common responses as see in Figure 11. When receiving information about sustainability programs or efforts from their property manager or landlord, low-income tenants are more interested in receiving this information through meetings with materials that they can take home with them such as flyers. These findings are outlined in Figure 14.

Low-income tenants are most incentivized by money or gift cards or being provided educational materials (Figure 15). Providing educational materials could be impactful at AAHC sites, such as sustainability tip sheets. Low-income senior tenants would be most likely to be incentivized by recognition (e.g., an unexpected email thanking them for their efforts). As shown in Figure 10, the majority of low-income tenants are interested in having a sustainability tip sheet provided to them. This sheet would have tips on how to save energy and water and reduce waste in their households. This could be a fridge magnet or a handout that can be put on a fridge.

There are many things building owners can do that involve tenants changing their actions, things that do not involve tenants changing their actions, and things that require collaboration between building owners and tenants. To address the ways in which the findings suggest moving toward reducing energy and water consumption, emissions from transportation, and material waste produced, I compiled a comprehensive list to create a tenant engagement toolkit. I recommend

building owners read through the toolkit and pilot strategies they see as feasible and potentially fit at their properties to help meet Ann Arbor 2030 District goals. The toolkit outlines various strategies and discusses briefly how to implement each strategy based on tenant feedback and recommendations from the findings of this research. The Ann Arbor 2030 District Engagement Toolkit can be found in Appendix E. The idea behind this toolkit is that it can be a working document; there is an area for building owners to leave feedback for other 2030 Districts members to use regarding implementation challenges, wins, suggestions, and more.

The purpose of this research was to gather information about tenants' sustainability habits, interests, efforts, and barriers and identify ways AA2030 District can engage various tenants to reduce water consumption, energy consumption, waste production, transportation emissions. Applicability in other 2030 Districts was a top priority when developing the engagement toolkit to ensure its usefulness across the 2030 District network. Determining how building owners and property managers can best engage occupants to start making reductions to meet carbon neutrality goals is a hefty goal, and this toolkit can act as a kick-off for these efforts in Ann Arbor and other 2030 Districts. I recommend this toolkit and the data collected be used to fuel the efforts around increasing accessibility to Ann Arbor's city composting program to multitenant buildings.

Future research into other types of tenant spaces, such as retail spaces and single-family homes in wealthier areas with higher carbon footprints, is needed. Inequities exist in household energy efficiency and carbon emissions in the U.S., and Ann Arbor is no exception. Addressing energy and water use of multiple building types is essential to reaching 2030 District goals.

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Appendices

Appendix A – Timeline

The timeline was divided into six phases. Phase 1 focused on the literature review and project planning. Phase 2 focused on developing and preparing for the data collection process. Phase 3 consisted of data collection. Phase 4 focused on analysis and synthesis of the data collected, including creation of the toolkit. Phase 5 is a feedback and revision period for the toolkit. Finally, Phase 6 focuses on sharing results with stakeholders.

		2021											2022			
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	
Phase 1	Project planning															
	Literature Review															
	Other SEAS AA 2030 District projects															
	Interview and engagement methods/design															
	Consult with Ginsberg Center - ONGOING															
	Methods of other 2030 Districts															
	Methods of other organizations															
Behavior change																
Justice																
Phase 2	Interview Development															
	Identify interviewees															
	Meet with directors and community partners															
	Form interview questions															
	Finalize interview plan															
	IRB approval															
	Pilot with subjects - identify barriers															
Evaluation and revisions																
Phase 3	Data Collection															
	Conduct interviews															
Phase 4	Analysis/synthesis															
	Qualitative analysis															
	Outline initial findings															
	Create toolkit															
	Report 1st draft of work to date															
Phase 5	Feedback and Revision															
	Feedback period 1 (Jan and Geoff)															
	Revision period 1															
	Feedback period 2 (Katie, Jennifer, Jan, Geoff)															
Revision period 2																
Phase 6	Present and deliver															
	Prepare presentation															
	Present to client and advisor															
	Feedback															
	Revisions															
	External presentations															
Handoff final deliverables																
															19-Apr	

Table A.1: Ann Arbor 2030 District Engagement Toolkit Project Timeline

Low-Income Housing Tenant Engagement Interview Template:

Tips:

- 1a. Do not skip questions
- 1b. Be sure you receive a number answer for the Likert scale questions

Provide Background & Goals

- 2a. Include who you are, your research goals
- 2b. **Example:** *I am an intern working on a project with Ann Arbor 2030 District – a partnership of Property Owners, Managers, Developers, Tenants, and Professional and Community Stakeholders who are all working to reduce existing building energy consumption, water use and transportation emissions by 50% by 2030. I am conducting interviews with tenants to continue shaping an engagement toolkit. The toolkit will assist building owners in finding ways to engage tenants and collaborate with tenants to reduce energy use, water use, transportation emissions, and material waste.*

Participant Information

- 3. How long have you lived at your current residence?
- 4. If you have previously lived outside of Ann Arbor, MI, how has living in Ann Arbor changed your perception of the environmental impact, sustainability and energy efficiency of your residence, if at all?
- 5. On a scale of 1 to 5, 1 = none, 5 = expert, how would you describe your current knowledge of environmental sustainability as it relates to housing?

Communication

- 6a. How do you typically engage and communicate with [Ann Arbor Housing Commission]?
- 6b. Is that typically how [AAHC] communicates with you as well? (Tenants may call the emergency work order line; [AAHC] may put a notice on their door, etc.)
- 6c. Do you communicate with [AAHC] differently depending on the issue?
- 6d. What methods of communication do you think are most effective?
- 6e. What methods of communication do **not** work for you?
- 7. How would you prefer to receive information on ways to reduce your water and energy use and solid waste?

8. If [AAHC] were to roll out a new program, what is the best way for them to communicate that to you? (Through resident council, bulletin postings, meetings, mail, onsite AAHC or other staff if your building has them?)
- 9a. On a scale of 1 to 5, (1 = very unlikely 5 = very likely), Would you attend environmental sustainability focused community meetings organized by your landlord to reduce transportation emissions, energy and water use, and waste in your community?
- 9b. Why or why not?
- 9c. If unlikely, how would you prefer to receive this information rather than via meetings? (Videos, emails, etc.)

Current Efforts and Barriers

10. What sustainability, waste reduction or energy efficiency products, programs, or resources already exist in your building? (e.g., energy efficient furnaces, water saving faucets, recycling bins, or educational programs, a coordinator, recurring meetings, programs, etc.)?
- 11a. What are the barriers to reducing how much electricity and gas your household uses?
- 11b. On a scale of 1 to 5, (1 = very unlikely 5 = very likely), if these barriers didn't exist, how likely is it that your energy consumption would be lower?
- 12a. What are the barriers to reducing the amount of water your household uses?
- 12b. On a scale of 1 to 5, (1 = very unlikely 5 = very likely), if these barriers didn't exist, how likely is it that your water consumption would be lower?
- 13a. What are the barriers to reducing the amount of garbage your household throws away?
- 13b. On a scale of 1 to 5, (1 = very unlikely 5 = very likely), if these barriers didn't exist, how likely is it that the amount of landfill waste produced by your household would be lower?
- 13c. On a scale of 1 to 5, (1 = very unlikely 5 = very likely), if you were provided a compost bin, how likely is it that you would use it?
- 14a. How do you typically commute to work? (Public transit, walk, drive a vehicle, bike, other)
- 14b. How do you typically commute around town? (Public transit, walk, drive a vehicle, bike, other)
- 14c. What factors impact the methods of transportation that you use? (Availability of car or bike, proximity, etc.)
- 14d. If you drive a personal vehicle, what would encourage you to switch to a method with lower GHG emissions?

Interest and Behavior Change

15. On a scale of 1 to 5 (1=very disinterested, 5=very interested), what level of interest do you have in knowing your electric, gas, and water usage?
16. On a scale of 1 to 5 (1=very disinterested, 5=very interested), what level of interest do you have in implementing energy efficiency and energy saving behaviors? For example: keeping doors and windows closed when AC or heat is on, replacing incandescent light bulbs with LED ones, unplugging things when not in use, or turning off lights
- 17a. On a scale of 1 to 5 (1=very disinterested, 5=very interested) how interested would you be in knowing your water and energy use compared to your neighbors? (Through a building-wide competition, an app, a notification in the mail telling you about your consumption compared to others, for example)
- 17b. On a scale of 1 to 5 (1=very unlikely, 5=very likely) if you know your neighbors are paying attention to and achieving reductions by using less water and energy, how likely would you be to do the same?
- 18a. What motivates you to care about your impact on your neighbors?
- 18b. What motivates you to care about your impact on your community?
- 18c. What motivates you to care about your impact on the environment?
19. Do you think there is a lot of food waste being produced in your building/community?
- 20a. What do you think would incentivize you individually to make reductions in energy and water consumption and solid waste produced? (A competition, cash incentives, recognition, food, parties, light bulbs, workshops, educational sessions, etc.)
- 20b. What do you think would incentivize other tenants in your building to make reductions together in energy and water consumption and solid waste produced? (A competition with other buildings, cash incentives, food, recognition, parties, free light bulbs, educational sessions, workshops, etc.)
- 20c. Is this something you would participate in?
- 20d. What do you think is the minimum amount of a gift card required to motivate people to be engaged?
- 20e. On a scale of 1 to 5 (1=not effective at all, 5=very effective), How effective do you think recognizing people for their efforts would be in changing tenant behavior to reduce water and energy consumption?
- 21a. If [AAHC] was to bring in a sustainability expert and hold a workshop on ways to lower your energy and water bills, do you think people would attend?
- 21b. Why or why not?
- 21c. What is the best way to get people to attend that workshop?

22. What sustainability products, services or features would you like to have access to or have at your residence if you do not already? (e.g., ability to opt into powering your home with clean energy, compost if not already available, a smart thermostat, weatherization, etc.)
- 23a. If these services were offered, which would you utilize? [*insert services*, e.g. composting, recycling, move out waste help, workshops]
- 23b. Why did you respond yes to the ones you did? [Only ask if context not given previously]
- 23c. What would change your mind about the services you said no to or maybe to? [Only ask if context not given previously]
24. On a scale of 1 to 5, (1 = very unlikely 5 = very likely), how likely do you think it is that people in your building would get involved with a sustainability program rolled out by [AAHC]?
25. On a scale of 1 to 5, (1=Very unwilling, 5=very willing), if your landlord was prioritizing sustainability and energy efficiency of your residence, how willing would you be to collaborate with them to reduce water and energy consumption and material waste?
26. As a percentage split with your landlord (e.g. 50/50, 35/65), what level of effort or cost would you be willing to put toward improving the sustainability and energy efficiency of your residence?
27. Would a “sustainability cheat sheet” with tips and ways to save energy and water be helpful after you move in?
28. How could your landlord help in providing more sustainability resources?
29. Responsibility for managing the energy consumed in a multitenant space is often balanced between tenants and owners and reducing energy and water consumption and material waste requires collaboration. How do you think landlords and tenants can better work together to make reductions in waste, emissions, and consumption?
- 30a. Do you compost?
- 30b. If yes, do you compost on your own (e.g., have a compost pile) or do you utilize city composting?
- 30c. If no, on a scale of 1 to 5 (1=not likely at all, 5=very likely) if bins were provided to your residence and picked up weekly with your other recycling and landfill waste, how likely is it that you would separate your food waste and utilize the city’s composting program?
31. What other ways would you be interested in engaging in or learning more about to reduce your environmental impact?

Low-Income Housing Service Provider Tenant Engagement Interview Template:

Provide Background & Goals

- 1a. Include who you are, your research goals
- 1b. **Example:** *I am an intern working on a project with Ann Arbor 2030 District – a partnership of Property Owners, Managers, Developers, Tenants, and Professional and Community Stakeholders who are all working to reduce existing building energy consumption, water use and transportation emissions 50% by 2030. I am conducting interviews with tenants to continue shaping an engagement toolkit. The toolkit will assist building owners in finding ways to engage tenants and collaborate with tenants to reduce energy use, water use, transportation emissions, and material waste.*

Interviewee Information

1. What is your role within [AAHC]?
2. How long have you worked for your organization?

Communication

- 3a. How do you typically engage and communicate with tenants?
- 3b. Do you think this method of distributing information is effective?
- 3c. What methods of distributing information have **not** worked in the past?
4. How do you think tenants would best receive information on reducing GHG emissions, water and energy use, and solid waste?
5. If [AAHC] were to roll out a new program, what is the best way to communicate that to your tenants (possibly through resident council, bulletin postings, meetings, mail, onsite management if your building has that)
6. What do you find to be the biggest challenges in communicating with tenants?

Current Efforts and Barriers

7. What sustainability or energy efficiency products, programs, resources, or goals already exist on your property that you know of?
- 8a. What are the barriers to reducing tenant energy consumption?
- 8b. On a scale of 1 to 5, (1 = very unlikely 5 = very likely), if these barriers didn't exist, how likely is it that tenant energy consumption would be lower?
- 9a. What are the barriers to reducing tenant water consumption?
- 9b. On a scale of 1 to 5, (1 = very unlikely 5 = very likely), if these barriers didn't exist, how likely is it that tenant water consumption would be lower?

- 10a. What are the barriers to reducing tenant waste production?
- 10b. On a scale of 1 to 5, (1 = very unlikely 5 = very likely), if these barriers didn't exist, how likely is it that the amount of landfill waste produced by your site would be lower?

Interest and Behavior Change

11. On a scale of 1 to 5 (1=very disinterested, 5=very interested), what level of interest do you think your tenants would have in implementing energy efficiency, water saving, and waste reducing behaviors?
- 12a. What do you think would encourage tenants to reduce energy, water or material waste?
- 12b. What has worked in the past when encouraging tenants to engage in any type of behavior change?
- 12c. What has not worked in the past when encouraging tenants to engage in any type of behavior change?
- 13a. What do you think motivates residents to care about their impact on their neighbors?
- 13b. What do you think motivates residents to care about their impact on their community?
- 13c. What do you think motivates residents to care about their impact on the environment?
- 14a. What kind of things would incentivize individual tenants or tenants working together at your site to make reductions in energy and water consumption and waste generation? (Competition, cash incentives, food, parties, educational sessions, etc.)
- 14b. What do you think is the minimum amount of incentive required for action is?
15. What sustainability products, services or features would you like to have access to or have at your property if you do not already? (e.g., ability to opt into powering your home with clean energy, compost if not already available, a smart thermostat, weatherization, etc.)

Off-Campus Student Housing Tenant Engagement Interview Template:

Tips:

- 1a. Do not skip questions
- 1b. Be sure you receive a number answer for Likert scale questions

Provide Background & Goals

- 2a. Include who you are, your research goals
- 2b. **Example:** *I am an intern working on a project with Ann Arbor 2030 District – a partnership of Property Owners, Managers, Developers, Tenants, and Professional and Community Stakeholders who are all working to reduce existing building energy consumption, water use*

and transportation emissions by 50% by 2030. I am conducting interviews with tenants to continue shaping an engagement toolkit. The toolkit will assist building owners in finding ways to engage tenants and collaborate with tenants to reduce energy use, water use, transportation emissions, and material waste.

Participant Information

- 3a. Are you a student at UM?
- 3b. If yes, what is your academic major and minor?
- 3c. If not, are you affiliated with UM?
4. What programs are you involved in, sustainability or otherwise e.g., clubs, honor societies, etc.?
- 5a. Are you familiar with Planet Blue Leaders or Planet Blue Ambassadors at the University of Michigan?
- 5b. If yes, on a scale of 1 to 5, 1 = not at all interested, 5 = extremely interested, how interested are you in being a Planet Blue Ambassador or Leader?
- 5c. If no, briefly describe the program and ask 5d.
- Planet Blue Ambassadors is a 101-level training course for staff, students, and faculty on how we can be more environmentally conscious. Includes volunteer opportunities, e-newsletters, tips, a network of people and other resources.
 - Planet Blue Student Leaders are fellowship positions; they are paid employees (freshman to seniors) who are working on ways to get their peers excited about sustainability. 16 PBSLs are hired all over diverse range of colleges and degrees and they complete a project focused on behavior change
- 5d. With this information, on a scale of 1 to 5, 1 = not at all interested, 5 = extremely interested, how interested are you in being a Planet Blue Ambassador or Leader?
- 6a. What is the length of your lease?
- 6b. How long have you lived there?
- 6c. Do you plan to renew your lease at this same residence?
- 7a. What factors did you use when deciding to live at this location? (Cost, friends, proximity to campus, utilities costs, timing/availability, etc.)
- 7b. On a scale of 1 to 5, 1 = not important at all, 5 = very important, when renewing a lease, how important is it to you that your landlord prioritizes the environmental impact, sustainability and energy efficiency of your space? For example, a landlord who is prioritizing savings on utility bills and providing feedback on how much energy and water you are using or saving.

- 7c. If you have previously lived outside of Ann Arbor, MI, how has living in AA changed your perception of the environmental impact, sustainability and energy efficiency of your residence, if at all?
8. On a scale of 1 to 5, 1 = none, 5 = expert, how would you describe your current knowledge of environmental sustainability as it relates to housing?
- 9a. How are utilities handled/paid for at your residence?
- 9b. Are you financially responsible for your utilities or do you receive assistance from family members?
- 10a. If you are responsible for paying utilities, do you know about the DTE Insight app?
- 10b. If yes, do you use the DTE Insight app?
- 10c. If yes, has it affected your behavior? How so?
- 10d. If no, briefly tell them about it and move on. (The DTE Insight app gives you information to understand how your home uses energy. You can find out more at <https://www.newlook.dteenergy.com/>)

Communication

11. How does your landlord typically communicate with you? (Phone, email, text, mail, other)
- 12a. How do you prefer your landlord to communicate with you? (Phone, email, text, mail, other)
- 12b. If your landlord were to implement a program to help you save on your utilities, what would be the most effective way to get you involved? (Incentives, frequent communication, events, etc.)
- 12c. How do you determine what emails from your landlord are important versus not important?
13. On a scale of 1 to 5, (1=not willing at all, 5=very willing), If your landlord were prioritizing sustainability and energy efficiency of your residence, how willing would you be to collaborate with them to reduce water and energy consumption and material waste?
- 14a. Would you attend environmental sustainability focused community meetings organized by your landlord to reduce transportation emissions, energy and water use, and waste in your community?
- 14b. Why or why not?
- 14c. If not, how would you prefer to receive this information rather than via meetings? (Videos, emails, etc.)

Current Efforts and Barriers

- 15a. What sustainability and energy efficiency **goals or efforts** exist in your building/at your residence that you are aware of?
- 15b. What **resources** does your building/residence or landlord (Oxford or owner) have dedicated to sustainability that you know of (e.g., a coordinator, recurring meetings, programs, etc.)?
- 16a. What sustainability or energy efficiency resources would you like to have in your building/at your residence? (e.g., ability to opt into powering your home with clean energy, compost if not already available, a smart thermostat, weatherization, etc.)
- 16b. Do you feel landlord should be fully responsible for providing these resources, or should the effort be split with tenants?
- 16c. Can you elaborate on your response?
17. If energy data were available to you, how do you think the information would impact your housing decision? (For example, you could see how expensive utilities have been on average in the past)
- 18a. If these services were offered, which would you utilize?: [*insert services*, e.g., composting, recycling, move out waste help, workshops]
- 18b. Why did you respond yes to the ones you did? [Only ask if context not given previously]
- 18c. What would change your mind about the services you said no to or maybe to? [Only ask if context not given previously]
- 19a. Do you compost?
- 19b. If yes, do you compost on your own (e.g., have a compost pile) or do you utilize city composting?
- 19c. If no, on a scale of 1 to 5 (1=not likely at all, 5=very likely) if bins were provided to your residence and picked up weekly with your other recycling and landfill waste, how likely is it that you would separate your food waste and utilize the city's composting program?
- 20a. What are the barriers to reducing the amount of gas and electricity your household uses? (Roommates, leaving things plugged in, natural light, landlord communication, etc.)
- 20b. On a scale of 1 to 5, (1=not likely at all, 5=very likely), if these barriers didn't exist, how likely is it that your energy consumption would be lower?
- 20c. What are the barriers to reducing the amount of water your household uses? (e.g., water pressure, leaky faucets)
- 20d. On a scale of 1 to 5, (1=not likely at all, 5=very likely), if these barriers didn't exist, how likely is it that your water consumption would be lower?
- 20e. What are the barriers to reducing the amount of garbage your household throws away?

- 20f. On a scale of 1 to 5, (1=not likely at all, 5=very likely), if these barriers didn't exist, how likely is it that your waste production would be lower?
21. On a scale of 1 to 5, (1=not confident at all, 5=very confident), How confident are you that if you brought up a sustainability or energy efficiency issue with your landlord, that they would be willing to address it?
- 22a. In your living situation and communication with your landlord, is it clear who is responsible for updating or fixing things related to energy and water waste such as energy efficient light bulbs, leaky faucets, or drafty windows and doors?
- 22b. What could be included in the lease structure to create a win-win situation for both you and your landlord to reduce energy and water consumption and waste? (Incentives, a reward program, walkthroughs to observe leaky faucets, running toilets, exchanging incandescent bulbs for LED bulbs, improving insulation, smart thermostats, transparency on utilities, feedback on energy and water usage, outlining who is responsible for what to take care of the property for both landlord and tenant, etc.)
- 23a. How do you typically travel around town? (Public transit, walk, drive a vehicle, bike, other)
- 23b. What factors impact your method of transportation? (Availability of car or bike, proximity, etc.)
- 23c. If you drive a personal vehicle, what would encourage you to switch to a method with lower emissions?

Interest and Behavior Change

- 24a. Have you ever used a carbon footprint calculator?
- 24b. If yes, please describe how your behavior changed after learning about your carbon footprint.
25. On a scale of 1 to 5 (1=very disinterested, 5=very interested), what level of interest do you have in implementing sustainable behaviors?
- 26a. What motivates you to care about your impact on the environment?
- 26b. What motivates you to care about your impact on your neighbors?
- 26c. What motivates you to care about your impact on your community?
- 27a. What sort of incentives would work to change your or other tenants' consumption and waste behaviors? (Recognition, money, food, etc.)
- 27b. Do you think tenant recognition from your landlord would be more effective on a personal level (e.g., they send the tenant an email directly) or in a more public way (e.g., a newsletter to all the management company's residents)?

- 27c. (On a scale of 1 to 5) How effective do you think recognizing people for their efforts would be in changing tenant behavior to reduce water and energy consumption?
- 28a. Responsibility for managing the energy consumed in a multitenant space is often balanced between tenants and owners and reducing energy and water consumption and material waste requires collaboration. How do you think landlords and tenants can better work together to make reductions in waste, emissions, and consumption?
- 28b. As a percentage split with your landlord (e.g., 50/50, 35/65), what level of effort or cost would you be willing to put toward improving the sustainability and energy efficiency of your residence?
- 29a. Would a “sustainability cheat sheet” be helpful when you’re looking for housing? (For example, a cheat sheet that told you what to look for in a rental to keep utility costs down like double-paned windows, or energy efficient lighting, etc.)
- 29b. Would a “sustainability cheat sheet” with tips and ways to save energy and water be helpful after you move in?
30. In the move-in and move-out process, what other types of services, information, programs, etc. do you think would be successful in getting people to reduce their waste?
- 31a. On a scale of 1 to 5 (1=very unlikely, 5=very likely), how likely would you be to read information from Oxford with tips to save energy and water and reduce waste?
- 31b. What would increase this likelihood?
32. On a scale of 1 to 5 (1=very disinterested, 5=very interested), how interested would you be in competing with other buildings to reduce emissions and energy, water, and material waste?
- 33a. What resources would be helpful for you to be able to reduce your energy and water consumption and waste production? (Educational videos, transparency in bills, etc.)
- 33b. How could your landlord help in providing more resources?
- 33c. Are there any other ways you would like to add that you are interested in engaging in or learning more about to reduce your environmental impact?

Commercial Tenant Engagement Interview Template (not used in this research):

Background & Goals

1. Overview of AA 2030 District organization, interviewer and project
2. Overview of goals: looking at how we can best learn from and engage tenants to reduce water and energy consumption and material waste production
3. Note: please answer these questions as an individual, not as a representative of your company

Communication

- 4a. Do you communicate with your landlord? (If yes → ask b and c. If no, move to 5)
- 4b. How do you typically engage and communicate with your landlord? (Phone, email, text, mail, other)
- 4c. How do you prefer your landlord to communicate with you? (Phone, email, text, mail, other)
- 5. If your landlord were to implement a program to help you save on your utilities, what method of distributing information about the program would be most effective in getting you involved?

Current Efforts and Barriers

- 6a. What sustainability initiatives exist in your organization?
- 6b. What sustainability and energy efficiency goals or efforts exist in your building that you know of?
- 6c. If none that you know of, would you like to know more about sustainability efforts in your building?
- 7. What sustainability or energy efficiency resources would you like to have in your building?
- 8a. If these services were offered, which would you utilize?
- 8b. Composting, recycling bins, move out waste help, access to where information on where you can reuse/sell/etc. during move out, zero waste events, workshops on how to reduce waste at events (Yes, no, maybe)
- 8c. Why did you respond yes to the ones you did?
- 8d. What would change your mind about the services you said no to or maybe to?
- 9. If your company offered electric vehicle charging stations at the office, how would this impact your decision when you choose your next car?
- 10a. What resources do you need to be able to reduce your energy and water consumption and waste generation at work? (Training videos, etc.)
- 10b. How could your landlord or employer help in providing more resources on sustainability?
- 11a. When looking for a job, does a company's sustainability goals or initiatives impact who you decide to work for? If yes, how so?
- 11b. When looking for a job, how does a company's physical workspace sustainability impact who you decide to work for? (For example, it offers cleaner modes of transportation, bright natural workspace lighting, outdoor workspaces, etc.)

- 12a. What are the barriers to reducing your energy consumption in the office? (Lighting, other tenant use, communication, etc.)
- 12b. What are the barriers to reducing your water consumption in the office? (Water pressure/leaky faucets, running toilets)
- 12c. What are the barriers to reducing your waste generation in the office?
- 12d. What kind of education and resources on sustainability from your landlord or management company would be helpful?
- 13a. Are you aware of A2Zero goals?
- 13b. (If not, give a brief description)

Interest and Behavior Change

- 14a. What level of interest do you have in implementing energy efficiency and saving behaviors? (Very disinterested, somewhat disinterested, neither interested nor disinterested, somewhat interested, very interested)
- 14b. Would you attend environmental sustainability focused building meetings organized by your landlord with the goal of reducing transportation emissions, energy and water use, and waste in your building?
- 14c. Why or why not?
- 14d. If not, how would you prefer to receive this information, rather than meetings? (Videos, emails, etc.)
- 15a. How do you typically commute to work? (Public transit, walk, drive a vehicle, bike, work from home, other)
- 15b. What factors impact your method of transportation? (Availability of car or bike, proximity, time, expense, etc.)
- 15c. If you drive a personal vehicle, what would encourage you to switch to a method with lower emissions, such as biking or public transit?
- 16a. How would you describe your current knowledge of environmental sustainability as it relates to office space? (On a scale of 1 to 5, 1 = none, 5 = expert)
- 16b. What does sustainability mean to you in the context of your workspace?
- 16c. How important is sustainability to you? (Not important at all, somewhat unimportant, neither unimportant nor important, somewhat important, very important)
- 17a. Earlier I asked about sustainability goals in your building. Now I'll ask if your organization has any company-wide corporate sustainability goals or initiatives?
- 17b. If yes, are you involved in them? If not, why not?

- 17c. How do you think your organization could get more people involved in their sustainability efforts?
- 17d. If not, does your organization have plans to implement sustainability efforts that you know of?
- 18a. What motivates you to care about your impact on the environment?
- 18b. What motivates you to care about your impact on your community?
- 18c. What sort of incentives do you think would work to change your consumption and waste behaviors? (Recognition, cash, certifications, etc.)
- 18d. The responsibility for managing the energy consumed in a multitenant space is often balanced between tenants and owners and reducing energy and water consumption and material waste requires collaboration. How do you think landlords and tenants can better work together to make reductions in waste, emissions, and consumption?
- 18e. How effective do you think recognition would be in changing tenant behavior to reduce water and energy consumption in your building? (For example, your office displaying a plaque for reaching certain levels of reductions for other tenants to see)
19. Would you be interested in participating in a friendly competition with other buildings or other tenants within the building to reduce emissions and energy, water, and material waste?
- 20a. What other sustainability solutions would you like to see in your organization or office space?
- 20b. What do you think is needed to implement these solutions?
21. How interested do you think your office would be in partnering with your landlord to implement sustainability changes? (Very disinterested, somewhat disinterested, neither interested nor disinterested, somewhat interested, very interested)
22. If your landlord were prioritizing sustainability and energy efficiency of your workspace, how willing would you be to collaborate with them to reduce water and energy consumption and material waste? (Very unwilling, somewhat unwilling, neither unwilling nor willing, somewhat willing, very willing)

Next Steps & Tenants to Interview

23. Are you aware of any other people in your organization that would be interested in talking with me?

Appendix C – Institutional Review Board Application Approval Documentation

4/8/22, 6:23 PM

Print: HUM00203286 - Ann Arbor 2030 District Tenant Engagement Toolkit Research



Date: Friday, April 8, 2022 6:23:07 PM

Print

Close

View: Submission Summary

Submission Summary

New Application Submission Description

Study Title: Ann Arbor 2030 District Tenant Engagement Toolkit Research

Supporting Documents or Link to Forms:

Supporting documentation for internal sponsor - Sch for Environ and Sustain [Jump to 02.](#)

[Sponsor Information](#)

10-1. Informed consent documents [Jump to 10-1. Informed Consent](#)

Exemption 2 - Additional Documents [Jump to Exemption 2](#)

Associated Proposals (PAFs):

Outstanding Contingencies:

Type	Description	Date Created	Date Completed	Is Review Required
Other	The following key personnel on this study have not completed the PEERRS Human Subjects training requirement: Kacey Eis (PI)	8/9/2021	8/13/2021	
Change to Application Materials	Please provide a brief description of the recruitment, consent process, and how you will manage compensation for participants. Submitting an informed consent is not required but you may wish to do so and the IRB can look at it and offer suggestions.	8/13/2021	8/17/2021	
Change to Application Materials	Study Functions - This question refers to all the activities that are necessary to conduct your UM research study. Please also select recruitment and storage.	8/13/2021	8/17/2021	
Change to Application Materials	A PAF is needed only for external funding that is routed through ORSP. Please uncheck 2.1 if there is no External funding.	8/13/2021	8/17/2021	
Change to Application Materials	Please change the Ann Arbor Housing commission, MAVD and Oxford Co to "not engaged". These sites would be engaged if they are involved in conducting the research, consenting, interacting with participants or having access to identifiable data.	8/13/2021	8/17/2021	

Type	Description	Date Created	Date Completed	Is Review Required
	<p>Suggestions: 1) Include the HUM# for your study. 2) Indicate what you will do with the recordings. 3) Please remove: "If you have any questions or concerns regarding your rights as a subject in this study, you may contact the Institutional Review Board (IRB) for Human Participants at 607-255-5138 or access their website at http://www.irb.cornell.edu. You may also report your concerns or complaints anonymously through Ethicspoint online at www.hotline.cornell.edu or by calling toll free at 1-866-293-3077. Ethicspoint is an independent organization that serves as a liaison between the University and the person bringing the complaint so that anonymity can be ensured." And add: "The University of Michigan Institutional Review Board Health Sciences and Behavioral Sciences has determined that this study is exempt from IRB oversight."</p>	8/17/2021	8/18/2021	

Staff Notes

Study Description

eResearch ID:	HUM00203286	IRB:	Health Sciences and Behavioral Sciences
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Current Study State: Exempt Approved - Initial **Application Type:** Exempt Human Subject Research

Study Team Members:

Study Team Member	Study Team Role	Appointment Dept	Appt Selection Complete	Student	Friend Account	Accepted Role?	COI Review Required	Edit Rights	PEERs Human Subjects?
Kacey Eis	PI	SEAS Ctr for Sustain Systems	Yes	yes	No	N/A	no	yes	yes
Geoffrey Lewis	Faculty Advisor	SEAS Ctr for Sustain Systems	Yes	no	No	Yes	no	yes	yes

Sponsors:

Has PAF not yet been initiated?:No

Related PAFs:

ID	Title	PI	Direct Sponsor	Prime Sponsor	State	Has SUBKs?	Related Awards
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There are no items to display

Related AWDs:

Award ID	Title	PI	Direct Sponsor	Prime Sponsor	State	Has SUBKs?	Project Period	Awarded PAFs
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There are no items to display

Related UFAs:

UFA ID	Title	PI	State	Category	Start Date	End Date
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There are no items to display

Internal Sponsors:

Internal Sponsor/Support	Department	Other Description	Sponsor Type	Support Type
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	Internal Department Sponsor/Support	Other Description	Sponsor Type	Support Type
View	Sch for Environ and Sustain		UM Institutional - Department, Pilot Grant Program, or other Institutional funding source	Both Financial and Non-financial

UM Oversight:

Required Core Committees:

IRB HSBS

Required Ancillary Committees:

There are no items to display

Risk-Benefit Assessment:

Indirect Benefit Description:

Benefits and Risk Detail:

Name	Date Modified	Risk Level	Have Direct Benefits	Direct Benefits	Foreseeable Risks
There are no items to display					
Special Considerations:		Vulnerable Subjects:		Other Considerations:	
Subject Payment					

Informed Consent Type:

Adult

Adult Consent Type with Signature

There are no items to display

Adult Consent Type without Signature

There are no items to display

Adult Consent Type Waiver of Informed Consent

There are no items to display

Adult Consent Type Other

There are no items to display

Children

Child Consent Type with Signature

There are no items to display

Consent Type Short

There are no items to display

Child Consent Type Waiver

There are no items to display

Child Consent Type Other

There are no items to display

Parent

Parental Consent Type with Signature

There are no items to display

Parent Consent Type without Signature

There are no items to display

Parent Consent Type Waiver

There are no items to display

Parent Consent Type Other

There are no items to display

Consent Documents:

Name	Version
 exempt_consent_template_AA2030Engmnt Toolkit.doc(0.02)	0.02

Study Abstract:

Building upon the work completed with Ann Arbor 2030 District in the past, including projects that established the water use, energy use, and transportation emission baselines, this project will produce an engagement toolkit to be used by property owners. Semi-structured interviews will be conducted with multifamily and commercial building tenants to develop an engagement toolkit. In alignment with A2Zero goals, the toolkit will assist multifamily and commercial building owners in finding productive ways to engage tenants to reduce energy use, water use, transportation emissions, and material waste. A group of pilot interviews will be conducted with an engaged group of tenants to try out the interview questions and methods, followed by more interviews with a larger sample and finalized interview script.

The general approach will be to work with community stakeholders to design and implement semi-structured interviews with District member commercial and multifamily building tenants, conduct a qualitative analysis of interview results, develop an engagement toolkit including a broadly applicable set of tools for new District members to effectively engage building tenants in achieving reductions (specific tools not yet defined – part of the analysis will be to determine what the tools are), pilot test the interview script, incorporate necessary changes, conduct interviews, document process and results, and finally produce a final report and toolkit.

Submission Administrative Information

Minutes of Previous Discussion(s):

Time of Modification Time of Vote Meeting Motion Yes Votes No Votes

There are no items to display

Review Type:

Exempt

Known Conflicted Core Committee Members:

First Name Last Name

There are no items to display

Appendix D – Spreadsheet Analysis Model

The Google Sheet Interview Analysis template can be found at:

https://docs.google.com/spreadsheets/d/1d-ar3VERQJfvwsKio_6OmfZygXxJXUInTaxHwpi45og/edit?usp=sharing

Appendix E – Toolkit

The toolkit is in the form of a Google folder, to be “owned” and distributed as needed by Jan Culbertson of the Ann Arbor 2030 District. It includes:

1. Instructions for how to administer the interviews and perform the analysis;
2. Interview scripts for the low-income housing, commercial, and off-campus student housing tenants;
3. An associated template Google Sheets spreadsheet model;
4. The final presentation of this research, recorded on Wednesday, April 27, 2022;
5. And this final report.

If you would like to access the toolkit, please reach out to the Ann Arbor 2030 District at annarbor@2030districts.org.