Addressing Environmental Injustice: Expanding the Home Toxics Program in Eastern Washtenaw County

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Executive Summary

In partnership with the Home Toxics Center in Washtenaw County, the objective of this study is to identify and analyze potential barriers that may affect participation rates in the Center's Hazardous Waste Drop-Off Program. To achieve this goal, our team has conducted surveys with residents throughout eastern and western Washtenaw County via text banking. Our findings suggest that awareness is a primary barrier amongst respondents, and the Home Toxics Center can increase participation by integrating themselves within the community. Our research results are limited as survey participants are primarily those who identify as white, a homeowner, and/or have a high income level. Future work should aim to build relationships with policymakers, residents, and other stakeholders.

1.0 Introduction

The Home Toxics Center (HTC) serves as Washtenaw County's Household Hazardous Waste (HHW) disposal program. The HTC accepts a variety of household waste, such as batteries, paint, and automotive fluids for safe and proper disposal. By doing this, the HTC aims to safeguard public health and the environment by combatting the harm caused by improper disposal of hazardous waste. If improperly disposed of, hazardous waste can negatively impact soil, water, and air quality causing harm to residents in contaminated areas.

To achieve their mission, the HTC hosts weekly Saturday Home Toxics drop-off collection events from April-November, as well as appointments and walk-ins throughout the year. Since it began in 1995, the HTC has disposed of more than 3.6 million pounds of hazardous waste. Most of this waste, however, comes from residents of western Washtenaw County, where the HTC is located. This is concerning from an environmental justice lens, as it suggests that hazardous waste is likely not being properly disposed of in eastern Washtenaw County, which has a larger percentage of minority residents compared to the western part of the county. The HTC would like to address this problem and understand the barriers of participation among eastern Washtenaw County residents. To help the HTC with this task, we have surveyed residents of both eastern and western Washtenaw County to gauge their familiarity with and need for the Center's services.

2.0 Methods

There are four primary components of the methodology: compilation of residential data, survey development, text banking, and data analysis.

Residential data, covering municipalities Pittsfield Township, Ypsilanti City, Salem, Freedom, and Sylvan Townships, were purchased from Aristotle. To select our municipalities of interest, we analyzed data previously collected by the HTC, selecting areas with high, medium, and low HTC usage per capita, and selecting areas that were not outliers for median household income or distance from HTC. See Appendix B for the analysis of participation rates across municipalities within Washtenaw County. Then, identifying a list of potential data sources, we compared prices of resident information and the included demographic information. We selected a data source with a cost-effective list of Washtenaw County residents within our municipalities of interest.



The survey, executed via Qualtrics, consisted of 5 questions targeting potential barriers to the usage of the HTC. The survey aimed to evaluate barriers that had been considered while also identifying barriers that had not been considered. In coordination with the Center for Socially Engaged Design and Institute for Social Research, we iteratively developed a brief electronic survey with minimal ambiguity and difficulty. See Appendix C for the survey questions. We selected Qualtrics as our survey host due to its trusted reliability and mobile-friendly features that would be feasible to distribute via text banking.

Text banking was conducted via CallHub, a third-party voice and SMS software. Similarly to identifying a data source, we identified potential third-party software for contacting Washtenaw County residents. Price for set-up and use along with reliability and security were considered when selecting a text banking service. See Appendix D for text-banking services considered.

To secure these services, purchases were conducted by the HTC following the submission of funding proposals (see Appendix E).

A statistical analysis was done to understand the demographics of survey respondents and to quantify barriers to use of the HTC. A content analysis was done to understand additional barriers that residents indicated via the optional free-response answer.

3.0 Results

Overall, survey respondents were found to be older, wealthier, whiter, and had a higher rate of home ownership relative to all of Washtenaw County. After considering all levels of awareness of the HTC, awareness of what the HTC accepts as hazardous waste is the most common barrier for all respondents. After considering responses based on demographics, awareness of what the HTC accepts as hazardous waste was the most commonly reported barrier to disposing waste at the HTC across all analyzed groups except for those earning \$50,000 to \$100,000 who reported availability as the most common barrier to disposing waste at the HTC.

To understand how representative the survey sample was of Washtenaw County, the research team evaluated demographic data collected from the survey and compared it to data from the U.S. Census Bureau for Washtenaw County.

Approximately 42% of survey respondents reported being 65 years or older compared to 15% of Washtenaw County residents.

On average, the estimated median household income for survey respondents was around \$100,000 while the median household income for the County is a little less than \$76,000.

For race and ethnicity, nearly 78% of survey respondents described themselves as "White/Caucasian" while census data reports only 74% of the County as white.

Finally, nearly 87% of survey respondents reported being a homeowner compared to 61.5% of Washtenaw County residents.



Refer to **Table F.1** in Appendix F for a detailed demographic comparison between survey respondents and Washtenaw County residents. When reviewing the survey results, consider these demographic differences between the sample and the population.

Insight: Overall, survey respondents were found to be older, wealthier, whiter, and had a higher rate of home ownership relative to all of Washtenaw County.

Respondents were asked to select applicable barriers to their use of the HTC. The options include the following: (1) Transportation; (2) Don't know if I have waste the center would accept; (3) Distance to the HTC; (4) Do not have time to go to the HTC; and (5) Other. Responses to this question were also analyzed based on the level of knowledge of the HTC.

40% of all respondents indicated a lack of awareness of what the HTC accepts as a barrier to the Center's use. Likewise, 50% of respondents who have previously used the HTC indicated that awareness of what is accepted is also a barrier to using the Center's services. Additionally, 30% of respondents who indicated "Other" referenced barriers related to awareness (e.g., hours, appointments). Respondents indicated to have used, have heard of but not used, or have not heard of nor used the HTC. 45% of respondents who have heard of but have never used the HTC indicated distance as the largest barrier. Refer to **Figures F.1** and **F.2** in Appendix F for visual representations of these results.

Insight: After considering all levels of awareness of the HTC, awareness of what the HTC accepts as hazardous waste is the most common barrier for all respondents.

To understand if a particular demographic group faces an awareness barrier more than others, responses to were compared awareness on what is accepted at the HTC to demographic factors, including homeownership status, race/ethnicity, age, and income level. Refer to **Figures F.3-F.6** in Appendix F for visual representations of these results

Non-homeowners only comprised 13% of all survey respondents, nearly 70% of non-homeowners listed awareness of what the HTC accepts as a barrier to use.

For race and ethnicity, POC (people of color) comprised only 19% of the survey yet 70% listed awareness of what the HTC accepts as a barrier to use compared to 40% of white/Caucasian respondents who comprised 81% of the survey.

For age, respondents 45 years or older comprised 87% of the survey, however, both age categories (45 years and older and under 45 years old) listed similar levels of awareness of what the HTC accepts as a barrier to use (40%).

For income level, survey respondents who earn less than \$50,000 annually comprised only 17% of the survey yet listed awareness of what the HTC accepts as the biggest barrier to using its services. Only 20% of survey respondents earning more than \$100,000 annually (comprising 61.5% of the survey) listed awareness of what the HTC accepts as a barrier to use. Interestingly, availability was the most common



barrier for respondents earning \$50,000 - \$100,000 (55%) and the least common barrier for respondents earning less than \$50,000 (10%).

Many survey respondents were aged 65 or older yet there was no "Retired" option when listing income, leading the research team to infer that the "Availability" barrier for respondents making less than \$50,000 may be due to retired individuals who are not earning regular income.

Insight: After considering responses based on demographics, awareness of what the HTC accepts as hazardous waste was the most commonly reported barrier to disposing waste at the HTC across all analyzed groups except for those earning \$50,000 to \$100,000 who reported availability as the most common barrier to disposing waste at the HTC.

To gauge current levels of use and awareness, respondents were first asked if they have heard of the Washtenaw County Home Toxics Center and then if they have ever used the Washtenaw County Home Toxics Center. 59.2% of all respondents said they had never heard of the HTC while 40.8% said they have heard of the HTC. 67.6% of respondents said they have never used the HTC while 32.4% of respondents said they have never used the HTC while 32.4% of respondents said they have never used the HTC. only 12.4% have heard of the Center. Refer to **Figures F.7-F.9** in Appendix F for visual representations of these results. However, there is a clear need for the HTC as across all demographics, 90.7% of people report having waste.

Insight: Most respondents who have not used the HTC have also not heard of the HTC, despite need across all demographics, suggesting that educating more residents about the HTC's services may increase participation in their hazardous waste drop-off programs.

Finally, respondents were asked "Up to how many miles would you be willing to drive to the home toxics center, assuming you go approximately 2-3 times per year?". Respondents were allowed to enter a specific number of miles in a blank response box. Responses were averaged across respondents and then averaged by race and ethnicity to determine if white/Caucasian respondents were willing to travel further than minority respondents and if this accounted for higher participation among white Washtenaw County residents. In these analyses, minority respondents were grouped together due to low response rates.

Overall, for the 39 individuals who answered this question, respondents were willing to travel, on average, 6.17 miles (+/- 2.40) to the HTC. White/Caucasian respondents were willing to travel 8.13 miles (+/- 3.43) whereas minority respondents were willing to travel 5.70 miles (+/- 2.92). Two non-white individuals responded that they would be willing to travel zero miles to the HTC. These responses were included in the team's analysis. Based on the available data, 87% of respondents are willing to travel to the HTC if they are within a 3 mile radius (green circle in **Figure F.11**), 38% are willing to travel if they are within a 13 mile radius (yellow circle in **Figure F.11**) and only 20% are willing to travel if they are within a 13 mile radius (red circle in **Figure F.11**). Refer to **Figures F.10 and F.11** in Appendix F for visual representations of these results. Based on these responses, the HTC is further away than many residents in Washtenaw County are willing to travel. Notably, Ypsilanti falls beyond the distance people of any race or ethnicity are willing to travel. This suggests that distance to the HTC may be a barrier for people in Eastern Washtenaw County. For a map of these results, refer to **Figure F.12** in Appendix F.



Insight: Distance to the HTC is a barrier to participation for using the Center's services. In many locations in the County, the HTC is further away than people are willing to drive (especially areas in Eastern Washtenaw County). Based on survey responses, this may be a more common barrier for minority residents.

See Appendix F for all survey results

4.0 Recommendations

Gabrielle Demott was the summer intern at the Washtenaw County Home Toxics Center. She updated the county's medication take-back program database; distributed information on the proper disposal of medication and sharps to pharmacies, grocery stores, clinics, and sheriff offices across Washtenaw county; researched Freon emissions through scrap metal collection in the county and provided recommendations for reducing/regulating greenhouse gas emissions; and created communication materials for our Graham team to to use with our project. Gabrielle's recommendations for the Home Toxics Waste Center were to present graphs from the survey in a more reader friendly manner, get a larger sample size for the survey, improve outreach and advertising, and to run the survey again to inform more community members about the new location that is opening.

Our recommendations for the Washtenaw County Home Toxics Waste Center are to improve awareness about themselves and decrease the distance required by individuals to drop off their waste. To raise awareness, the Home Toxics Center should distribute physical advertisements, such as placing flyers and/or infographics in grocery stores, hardware stores, coffee shops, and communities of faith. In addition, the Home Toxics Center should use social media advertisements as a way to inform community members about their services. We recommend using multiple social media platforms, such as Facebook, Twitter, and Instagram to reach a variety of age ranges. For example, Twitter is already used by many city government officials to share information and many people look on Twitter to find information about news in their area. Another way to promote the Home Toxics Center's services to areas of the county that are not using the services is by partnering with student organizations at Eastern Michigan University and their student housing office. We also think it is important to teach children and families about things that can be toxic around the home and where they can drop these objects off, therefore we recommend partnering with local school districts to create educational programs.

One of the biggest reasons that individuals were not using the Home Toxics Center is because of its location being far away from many people in the county. Some strategies we recommend to make the waste dropoff services as accessible as possible include hosting collection drives at non-Home Toxic Center sites and opening a new site in the future near Pittsfield or Ypsilanti City. Good locations to host collection drives would be Hope Community Church, Second Baptist Church, Ypsilanti Food Co-op, Ypsilanti Community High School, and Saline High School.

5.0 Conclusions

Our findings suggest that the Home Toxics Center can increase participation through integrating themselves within the community. Our research is limited provided survey participants are primarily those



who identify as white, a homeowner, or a high income level. Future work should aim to build relationships with policymakers, residents, and other stakeholders.

Awareness of the Home Toxics Center and the type of wastes it accepts is a large contributor to the lack of use amongst our respondents. Approximately half of the survey respondents have never used nor heard of the Home Toxics Center. More than three-fourths of these respondents reported having waste that is accepted when given a list of items accepted. While there is a household hazardous waste to be disposed of, awareness of what is accepted at the HTC was the most reported barrier to its use.

Our study is limited by the skewed demographics of our survey participants. Majority of our participants listed they were above 40 years old, identified as white, had a higher than average income, and owned a home. This is not representative of all Washtenaw County residents. With few respondents outside of these demographics, the data may or may not closely represent the county.

With our findings, we suggest connecting with members of the community, from policymakers to residents. This approach addresses various levels of the community to foster awareness throughout. Connecting with policymakers will keep the Home Toxics Center up to date on environmental policy for and beyond waste disposal. Communicating with hardware stores, auto shops, etc., creates a direct line of communication to consumers on the way to dispose of materials after use. Interaction with residents keeps communities informed on how household hazardous waste can impact their health and surrounding environment.

Acknowledgements

A special thanks to Will Garcia of the Home Toxics Center for guidance and support during our research. We also highlight Theo Eggermont of the Home Toxics Center for assisting with funding our project. Further thanks to Elizabeth LaPorte and Maaike Wielenga of the Graham Sustainability Institute for developing this partnership and organizing the Graham Scholars Program.



Appendix A: Client - The Washtenaw County Home Toxics Center

Organization name:	Home Toxics Center
Website:	https://www.washtenaw.org/287/Home-Toxics-Paint-Oil-Pesticides-More
Contact Name:	Will Garcia
Contact email:	garciaw@washtenaw.org
Phone number:	734-222-3890
Address:	705 N Zeeb Road, Ann Arbor, MI 48103



Appendix B: Residential Data

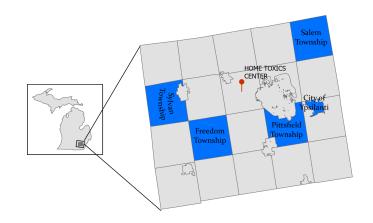
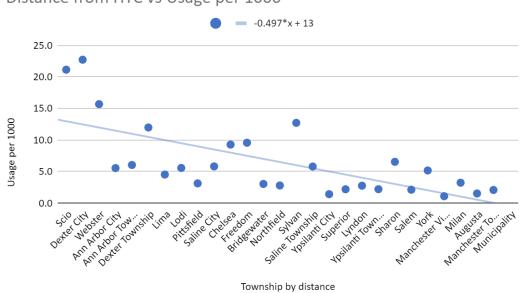


Figure B1. Five municipalities were selected for surveying Washtenaw County Residents.



Distance from HTC vs Usage per 1000

Figure B2. Previous hometoxic usage data for usage by township and its distance.





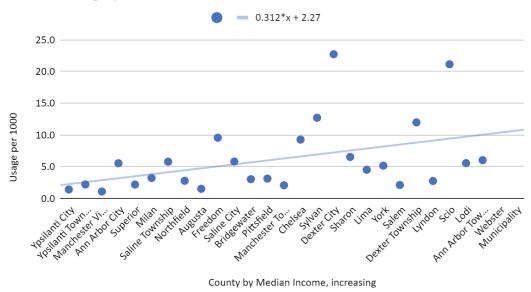


Figure B3. Previous hometoxic usage data for usage by township and its median household income.

We requested the data for 10,000 randomly selected residents in each of Pittsfield and City of Ypsilanti in addition to all of the data for Salem, Freedom, and Sylvan Townships. The following quotes were received from the data services:

Table B1. Aristotle most cost effective data	a service including demographic information.
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Service	Demographic Data Included?	Cost (\$)
Aristotle	Y	550
I360	Υ	600
L2	Υ	1,000
Parental Political Consulting	Ν	400



Appendix C: Survey

The following survey was delivered via Qualtrics, where some responses led to further advancement in the survey:

Have you used the Washtenaw County Home Toxics Center? Yes (move to question 5) No

Have you heard of the Washtenaw County Home Toxics Center? Yes No (Skip to question 4)

Have you ever had waste you think the Home Toxics Center would accept? Yes No

Common household items The Home Toxics Center accepts include paints, cleaning products, automotive fluids, batteries, and nail polish/remover. Knowing this, do you think you have or have had waste the HTC would accept? Yes

No

Which of the following factors affect your personal ability/ willingness to dispose of waste at the Home Toxics Center (select all that apply)

- Transportation: Y/N
 - $\circ~$ Yes: Do you have regular access to a car? Y/N
- Unaware of what waste the center accepts: Y/N
- Distance to the Home Toxic Center: Y/N
 - Y: Up to how many miles would you be willing to drive to the home toxics center, assuming you go approximately 2-3 times per year
- Lack of time to go to the HTC: Y/N
- Other (please explain any other factors that affect your participation with the Home Toxics Center)



Appendix D: Text-Banking Services

We initially selected ThruTalk as our text banking service due to costs. In our initial funding proposal, we requested funds needed to complete the project using this service. However, the expected time required to complete the set-up of the service did not align with our timeline to complete the project. For this reason, we elected to use CallHub for our text banking service. A new funding proposal was needed to secure funds to complete the project.



Appendix E: Funding Proposals

The funding proposal below was the first submitted to purchase residential data and a text-banking service.

Executive Summary

The Graham Sustainability Scholars, in partnership with the Home Toxics Center of Washtenaw County, are requesting \$1,200 from Theo Eggermont, the Public Works Director, to fund a data collection research project that aims to identify barriers affecting participation in Center's hazardous waste drop-off program. To gain a broader understanding of what factors may be limiting participation throughout the county, we plan to survey residents from both high and low-usage areas, including Freedom, Sylvan, Pittsfield, Ypsilanti City, and Salem.

The Graham Sustainability Scholars are an interdisciplinary team of five University of Michigan third-year undergraduate students. We are working with the Home Toxics Center to identify and analyze existing barriers (e.g., transportation, education) preventing eastern Washtenaw County residents from participating in the Home Toxics Center disposal program. We have created a short survey using Qualtrics that will be sent to residents via text and also used to conduct phone banking interviews. Information about the Home Toxics Center and the disposal program will be included in the survey in an effort to increase residents' awareness about the Center. Finally, the team will analyze and summarize the survey findings by the end of April 2022 and provide socially-engaged recommendations for how to improve participation amongst these residents.

Most of our expenses stem from the cost of residential contacts as well as using phone and text banking services. First, we plan to spend \$550 to purchase county resident names and phone numbers from the Washtenaw County municipalities mentioned above. To determine this cost, we contacted four different data companies (Aristotle, L2, i360, and Practical Political Consulting) and chose the provider that was able to supply all the necessary data at the most competitive price. Aristotle will charge \$550 (a discounted student rate) for over 25,000 contacts, which they will pull from the National Voter File. Two other companies were more expensive (approximately \$1,000 and \$600) and the third company was cheaper (\$400) but would only provide landline phone numbers, which we felt would skew the data.

Second, we plan to spend roughly \$440 for phone and text banking services. Because we are trying to contact a significant number of residents, phone banking services are especially useful since they can use predictive dialers to allow us to continually call people. Text banking will also be useful to include a wider set of demographics in our sample since some individuals prefer to text rather than speak on the phone. Again, after researching several services, we have decided to use ThruTalk. After a one-time set up fee of \$100, this provider charges \$0.08 for every message sent via text (but allows unlimited incoming messages). For calling, ThruTalk charges \$0.055 per dial. Knowing many people may not answer a call or text, we anticipate contacting roughly 5,000 residents in order to gather a representative sample of the county.

In preparation for unexpected charges or costs, we are budgeting approximately 20% for overhead, which would total \$210. These unexpected charges may include but are not limited to the cost to contact more residents than previously expected or purchase additional data that may help with the research process. The cost of data, phone/text banking services, and overhead totals \$1,200.

All unused funds after the completion of this project will be dispensed in a manner subject to the approval of the Washtenaw County Public Works Division, which, at the Division's request, can include returning the funds to the Division or using the funds for education and outreach initiatives to promote equitable participation at the Home Toxics Center.

With usage data previously provided by the Home Toxics Center, we already recognize a few factors that are currently affecting peoples' participation in the drop-off program. For instance, HTC data showed us that decreased distance and higher median household income were correlated with higher usage of the Center's services. Our goal is to further investigate other factors skewing participation, including car ownership, length of homeownership, education, race, and age. Additionally, we plan to



engage meaningfully and consciously with the community through discussions and qualitative surveying in order to effectively identify barriers to access.

Ideally, this research project will help the Home Toxics Center understand why certain residents are not using the disposal program as well as identify strategies that could increase usage in these populations. By disposing of hazardous waste properly, residents can help reduce pollution and energy use as well as protect their own bodies from harmful toxins associated with improper disposal. We hope this collaboration will have a significant impact on Washtenaw County both in the short-term by helping improve the health of residents and the environment and in the long-term by promoting a more sustainable, equitable future for the local community.

The funding proposal presented below was the second submitted to secure additional funding to continue the text banking campaign.

Summary

The Graham Sustainability Scholars student team is requesting \$600 in additional funds to complete surveying to understand barriers affecting residents' participation in the Home Toxics Center Hazardous Waste Program.

The team was initially granted \$1600 in order to purchase resident contact information as well as phone and text banking software. However, due to a software change, the price per contact is higher than initially budgeted for, and thus more funding is needed in order to contact a sufficient number of residents.

Purchasing Details

Originally, we planned to use the phone banking software ThruTalk, however, their funding structure required a contract. After having been granted the initial funding, we learned of the logistical hurdles associated with contracts, so we switched to using CallHub instead. CallHub's pricing structure is different from ThruTalk's in that they charge \$0.034 per 160 characters whereas ThruTalk charges roughly \$0.03 per message.

To conduct this survey, we send an initial text to the sample population of residents containing some background information and the survey link, which costs \$0.064 per contact. Some residents have inquiries or request additional assistance, which requires additional correspondence, which costs slightly more. We found the average cost per contact to be \$0.066.

So far, we have texted 7,860 residents and have received 201 complete survey responses. After purchasing these texts, as well as resident contact information, we have \$120.93 of the initial funding remaining.

Given our estimate of \$0.066 per contact, with our remaining funds, we will be able to message 1,832 people, leading to an expected 46 more survey responses. However, we have identified that in order to adequately understand resident needs, we require at least 500 survey responses. Due to budgetary and time constraints, the team has decided to use all remaining funds for text banking. With the current response rate, we need an additional \$579.93 in order to message these remaining contacts and more fully understand the needs of Washtenaw County.



Appendix F: Survey Results

Demographic	Categories	Survey Sample	Washtenaw County
Size (# of individuals)		280	369,390
Homeowner status			
	Owner	86.83%	61.50%
	Renter	13.17%	38.50%
Age			
	Under 65 years old	58.18%	84.90%
	65 years and older	41.82%	15.109
Gender			
	Male	46.15%	49.70%
	Female	51.65%	50.30%
Education Level			
	No degree	0.00%	4.0%
	High school	2.82%	15.09
	Some college	10.33%	24.09
	Bachelor's	34.74%	27.09
	Post-grad	42.25%	30.09
Race/Ethnicity			
	Asian/Pacific Islander	6.42%	9.30%
	Black/African American	6.42%	12.20%
	Hispanic/Latino	2.29%	5.20%
	Native American/Alaska Native	0.46%	0.40%
	White/Caucasian	77.98%	74.309
	Biracial/Multiracial	2.29%	3.809
Native Language			
	English	91.38%	85.0%
	Spanish	1.15%	3.0%
	Indo-European	1.72%	5.09
	Asian Islander	0.57%	6.09
	Other	5.17%	2.09
		0.57%	6.09
		5.17%	2.09
Median household income from 201	.6-		
2020 (2020 dollars)		\$100,000 (estimate)	\$ 75,730.00

 Table F1. Survey Respondents vs. County Resident Demographics



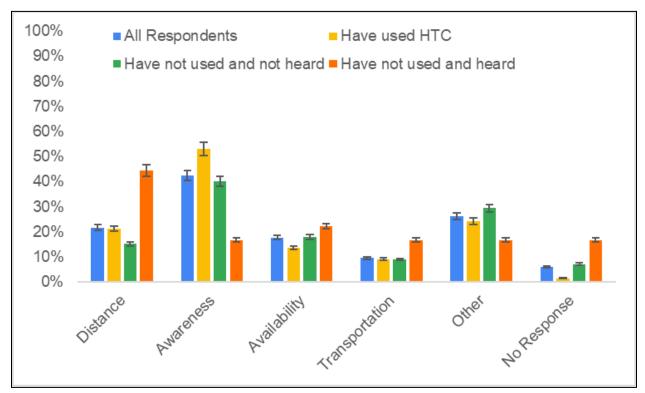


Figure F1. Responses to "Which of the following factors affect your personal ability/ willingness to dispose of waste at the Home Toxics Center (select all that apply)"

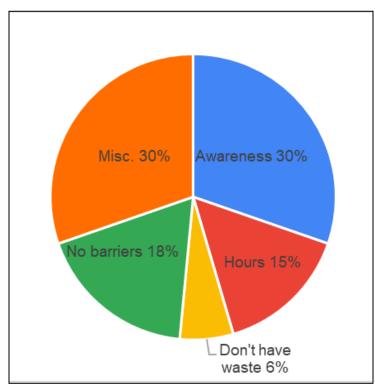


Figure F2. Responses to "Other" for Table F.1



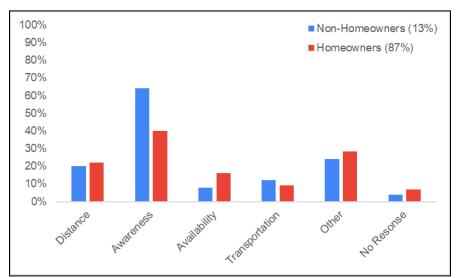


Figure F3. Factors affecting personal ability/willingness to dispose of waste at the Home Toxics Center based on homeownership status

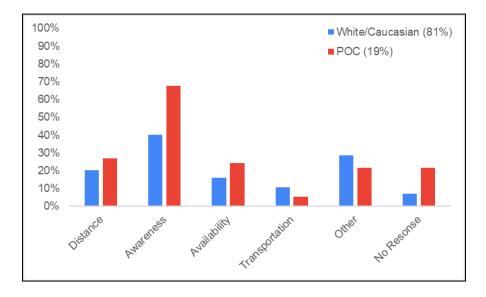


Figure F4. Factors affecting personal ability/willingness to dispose of waste at the Home Toxics Center based on race/ethnicity



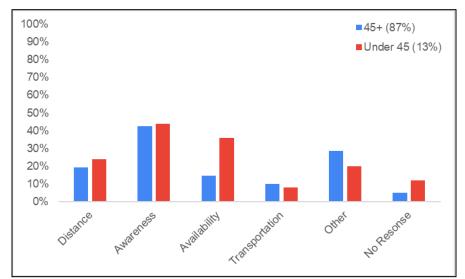


Figure F5. Factors affecting personal ability/willingness to dispose of waste at the Home Toxics Center based on age

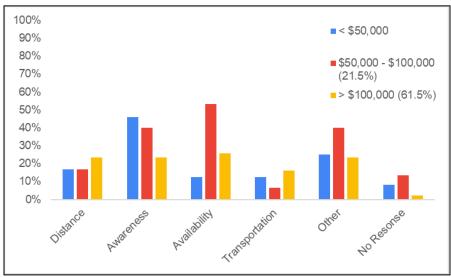


Figure F6. Factors affecting personal ability/willingness to dispose of waste at the Home Toxics Center based on income level



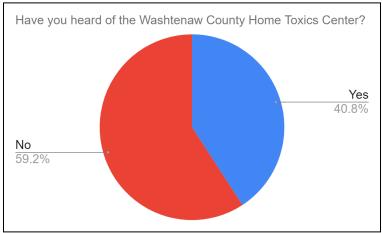


Figure F7. Responses to "Have you heard of the Washtenaw County Home Toxics Center?"

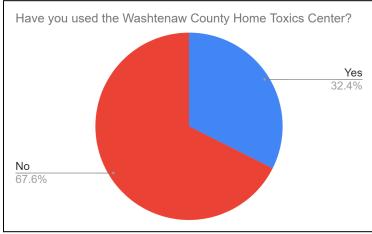


Figure F8. Responses to "Have you used the Washtenaw County Home Toxics Center?"

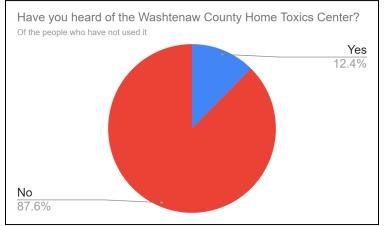


Figure F9. HTC Use for respondents who have heard of the HTC



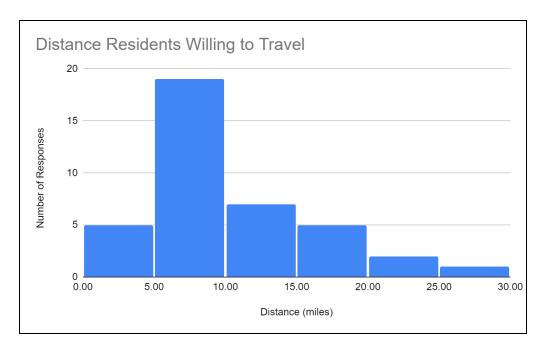
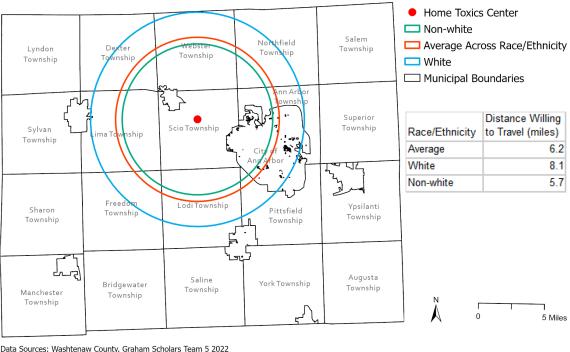


Figure F10. Maximum distance (miles) respondents will travel to the HTC



Figure F11. Radius map for Washtenaw County based on maximum distance respondents are willing to drive to the HTC





Distance Willing to Travel to HTC Based on Race/Ethnicity

Data Sources: Washtenaw County, Graham Scholars Team 5 2022 Spatial Reference: NAD83 Michigan State Plane Map Layout: Marlana Peek, 2022

Figure F12. Map of Distance Willing to Travel to HTC Based on Race/Ethnicity

