CITY OF AUBURN
How Prepared are Auburn Residents for an Emergency?

○ ○ ○ ○ ○ ○ ○ ○ ○

University of Washington ○ School of Public Health

Health and Human Services 570: Emergency Preparedness

Instructor: Amy Hagopian, MHA, PhD, Health Services and Global Health

Report Author: Emily Brown

Spring 2017

SPECIAL THANKS TO:

○ ○ ○ ○ ○ ○ ○ ○

First and foremost, we would like to thank those who participated in our project and gave their time to speak with us and share their perspectives. This project would not have been possible without their participation in our surveys and interviews. We are extremely grateful to all of those who contributed. We would also like to extend our sincerest gratitude to the City of Auburn Emergency Management team for its strong support and insightful guidance throughout the life of this project. Their expertise and experience helped ensure effective and meaningful data collection.

The dedicated work of fellow team members Gina Megson and Caroline Johnson was integral in the development, implementation, and success of this project.

We would also like to thank Dr. Amy Hagopian, the instructor for Leadership, Planning and Advocacy Skills, for her direction, encouragement, and input throughout the process, and for granting us the hands-on learning opportunity through the Livable City Year project.

HOW PREPARED ARE AUBURN RESIDENTS FOR AN EMERGENCY?

ABOUT LIVABLE CITY YEAR

The UW Livable City Year program (LCY) is an initiative that enables local governments to tap into the talents and energy of the University of Washington to address local sustainability and livability goals. LCY links UW courses and students with a Washington city or regional government for an entire academic year, partnering to work on projects identified by the community. LCY helps cities reach their goals for livability in an affordable way while providing opportunities for students to learn through real-life problem solving. LCY has partnered with the City of Auburn for the 2016-2017 academic year, the inaugural year of the program.

The UW's Livable City Year program is led by faculty directors Branden Born with the Department of Urban Design and Planning, and Jennifer Otten with the School of Public Health, in collaboration with UW Sustainability, Urban@UW and the Association of Washington Cities, and with foundational support from the College of Built Environments and Undergraduate Academic Affairs. For more information contact the program at uwlcy@uw.edu.

LIVABLE CITY YEAR: ONE YEAR. ONE CITY. DOZENS OF
UW FACULTY AND HUNDREDS OF STUDENTS, WORKING
TOGETHER TO CATALYZE LIVABILITY.

LCY.UW.EDU

ABOUT THE CITY OF AUBURN

The City of Auburn is well-positioned to take advantage of many of the opportunities in the Puget Sound region. Centrally located between Seattle and Tacoma, Auburn is home to more than 77,000 residents. It is the land of two rivers (White & Green), spread across two counties (King & Pierce), and home to the Muckleshoot Indian Tribe.

Auburn was founded in 1891 and has retained an historic downtown while also welcoming new, modern development. Known for its family-friendly, small-town feel, Auburn was initially an agricultural community, the city saw growth due to its location on railroad lines and, more recently, became a manufacturing and distribution center. Auburn is situated near the major north-south and east-west regional transportation routes, with two railroads and close proximity to the Ports of Seattle and Tacoma.

Auburn has more than two dozen elementary, middle and high schools, and is also home to Green River College, which is known for its strong international education programs. The city is one hour away from Mt. Rainier, and has many outdoor recreational opportunities.

The mission of the City of Auburn is to preserve and enhance the quality of life for all citizens of Auburn, providing public safety, human services, infrastructure, recreation and cultural services, public information services, planning, and economic development.
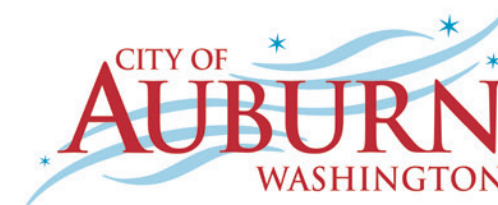
WWW.AUBURNWA.GOV

01 EXECUTIVE SUMMARY

The meteorological and geological systems of the Puget Sound region present risks to critical systems and infrastructures. Emergency preparedness is important for communities' ability to safely endure major weather, geologic, or system failure events. Accordingly, the City of Auburn Emergency Management team is interested in residents' understanding of the natural and human-made disaster risks they face, how well prepared residents are for such disasters, and how the city could better communicate with its residents to address any gaps in residents' knowledge or preparedness. Graduate students in a class within the University of Washington's (UW) Department of Health Services were tasked with assessing emergency preparedness in the city and providing recommendations for improving residents' level of preparedness. Knowing which communication strategies the city should adopt to ensure residents are better informed is key for emergency preparedness. A situation analysis was conducted to inform interventions that ensure individuals and neighborhoods are prepared to take care of themselves, their families, and their neighbors after a disastrous event.

Our methodology consisted of a multi-pronged approach, including in-person and online surveys and stakeholder interviews. These qualitative methods use the voice of the community as the key source of information for research. Although the level of preparedness varied across individuals surveyed, common themes regarding the steps people take to prepare and preferred communication strategies for receiving emergency preparedness information emerged.
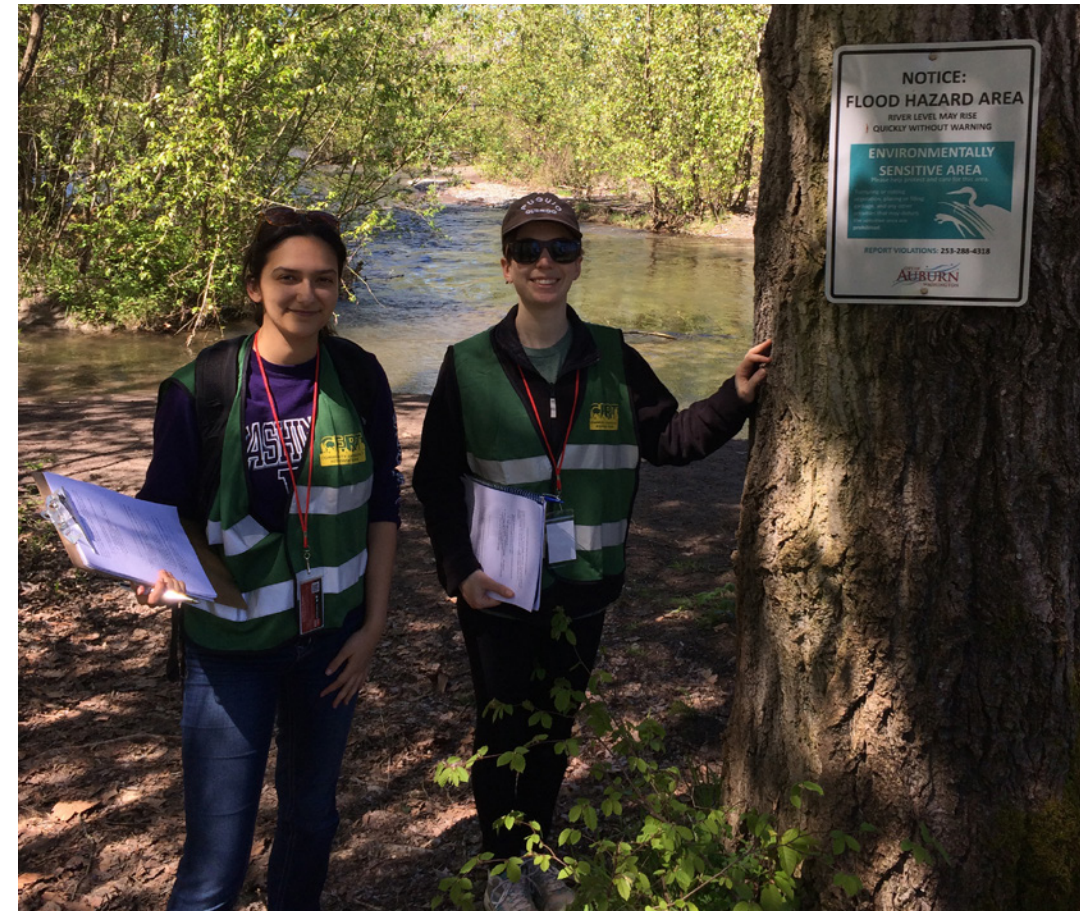
One of the most salient findings was frequent overestimation of household preparedness. This finding has important implications for emergency preparedness education and how to help households understand what adequate preparation means. We asked respondents to tell us what disaster risks they think the city would most likely encounter. Participants' top responses were well-aligned with the risks Auburn Emergency Management lists as the most pressing, such as a winter storm, earthquake, or flood. Additionally, our research revealed that residents prefer written communication over other methods and outlets. However, a key finding from stakeholder interviews is that in-person communication is most effective. Although these views seem to oppose one another, we concluded that the most effective way to communicate emergency preparedness information is to use well-prepared residents and trained experts to bring printed resources to people and explain in person what it means to be truly prepared and address any gaps in knowledge. The potential of this mixed-method approach was corroborated by interviewed stakeholders, who emphasized that preparedness should be implemented at a neighborhood level and that the most effective community efforts rely on interpersonal communication. A dynamic, community-centered approach will help Auburn Emergency Management create strategies that empower households to take care of each other, their neighbors, and fellow community members in the event of an emergency.

FIGURE 1

Students investigate White River, which poses flood risk.

Credit: Emily Brown

02 INTRODUCTION

This project was part of a skills-based course in the UW School of Public Health's Department of Health Services. Three students were assigned to this project and tasked with conducting a situation analysis of emergency preparedness among Auburn residents, including residents' level of understanding of the natural and human-made risks the city faces, and steps residents have taken to prepare their households for emergencies. The city does not have a centralized program for preparing neighborhoods and thus there is a lack of information on what steps, if any, residents have taken to prepare. Through an appraisal of current readiness, the city may better understand where gaps in knowledge and preparedness exist so employees can strategize where to focus resources to improve emergency preparedness outreach, programs, and policies.

We collaborated with the City of Auburn Emergency Management staff to better understand the preparedness challenges in Auburn, collect contextual and historical information regarding relevant risks, become aware of what the city is currently doing to bolster citywide preparedness, and recognize the city's priorities for expected information goals. With disasters serving as an ongoing potential threat to the social and economic health of the city, it is important to impress upon residents the importance of preparing now for emergency situations that are often unpredictable and can carry detrimental consequences.

03 METHODS

Our methodology consisted of two main components: a survey and stakeholder interviews. The survey embodied a mixed methods approach with quantitative and qualitative characteristics. Stakeholder interviews were purely qualitative. To gather background information on the current situation of civic preparedness, we visited Auburn Emergency Management at the beginning of the project. The Emergency Management (EM) team provided a tour of the on-site Emergency Operations Center, where emergency management operations are coordinated if the city is struck by a disaster. The site visit also included an informal presentation by the EM team of the disaster risks Auburn faces and the challenges in managing these risks, especially in the absence of household preparedness. This site visit was crucial in laying the foundation for building an effective assessment, one that would be useful and meaningful for the city and its residents.

Background information to develop meaningful survey questions was informed by literature reviews and expert knowledge from the Emergency Management Department. The survey was piloted in the University District in Seattle, WA at various bus stops and a barber shop – these places were chosen because people were waiting and provided a captive audience. Feedback from University District participants we surveyed was considered and the survey was revised to improve clarity. Once these edits were made, the survey was sent to the EM team for final approval and to ensure questions being asked were still addressing the original research questions:

- Do residents know the disaster risks they face?

Credit: Amy Hagopian   Credit: City of Auburn

- What steps have residents taken to prepare for emergencies?

- How can the city better communicate to reach residents to ensure they are prepared?

Surveys were conducted in person on three separate days in Auburn. The EM team provided project team members with vests, clipboards, and name tags to increase recognition and approachability while surveying around town. Surveys were conducted in various public spaces in different Auburn neighborhoods to collect a representative sample. These public places included dog parks, Grocery Outlet, bus stops at the transit center, coffee shops, sporting events, and playgrounds. These locations were chosen since they are where people pass time and thus may be willing to spare a few minutes to participate in the survey. Sites were selected to attract a range of people and families, allowing for a more diverse sample.

Participants had to be at least 18 years of age and either live or work in Auburn to participate in the survey. A project team member fluent in Spanish translated the surveys in person when needed. The survey was also disseminated online through Catalyst, a survey tool used by the UW. The online survey was translated into Spanish and vetted and verified by a native Spanish speaker to ensure the translations and their context were accurate for online dissemination. A link to the online survey and

FIGURE 8

Surveying outside Grocery Outlet in South Auburn.

Credit: Caroline Johnson

a short description of the survey and project was sent to various neighborhood and community groups to increase survey reach. The link to the survey was also posted to social media pages relevant to Auburn, including City of Auburn Facebook pages and NextDoor, a private social network for neighborhood communities. Seventy-five surveys were collected in person while 60 were collected online, for a total of 135 surveys. The survey can be found in Appendix A.

Survey data were analyzed using Microsoft Excel. The overarching goals of data analysis were to assess awareness of the disaster risks Auburn faces and to compare respondents' level of preparedness. Disasters were defined as when an emergency overwhelms local resources. Preparedness levels were scored according to how residents answered question 3, parts A-G, which asked participants to assess how long they would be prepared to live without assistance in an emergency, and to list specific components of their preparedness, such as having nonperishable food items stored away or practicing a household emergency plan. These responses were coded so that answers could be sorted into categories. The codes were then used to define preparedness classifications among participants: very prepared, somewhat prepared, and not prepared. Respondents were then grouped into one of the three preparedness categories based on their self-reported preparedness, specifically how many days they said they would be prepared to live without assistance in an emergency situation. The self-reported preparedness categories were broken down as follows: very prepared (7 or more days), somewhat prepared (3-6 days), and not prepared (less than 3 days).

Next, project team members went through the data to reclassify respondents into their "true" preparedness category based on the presence of critical criteria (i.e., codes) that are necessary for someone to be truly prepared if disaster strikes. These critical criteria were verified by Auburn's Emergency Manager, whose expertise in emergency management was integral in defining "true" preparedness. The

FIGURE 9

Surveying at the Les Grove Park playground.

Credit: Caroline Beightol

percentage of respondents that fell into each of the three categories based on self-reported preparedness was compared to the percentage of respondents in each category based on true preparedness. Cross-referencing these categories revealed discrepancies between the level of preparedness people self-report and true preparedness.

Furthermore, the true preparedness categories were analyzed to reveal whether there are associations between levels of preparedness and the following: (1) location (which neighborhood the participant resides in), (2) whether there are children in the household, and (3) whether the respondent had experienced a previous emergency in which they lost power or running water for more than one day. The purpose of conducting this associative analysis was to help reveal where, and for which populations, emergency preparedness outreach resources should be focused. In addition, preparedness categories were analyzed to reveal associations with certain communication preferences. In other words, which communication outlets (e.g., post mail, email, or fliers) would Auburn's most prepared and least prepared subgroups seek out to learn more about emergency preparedness? This question was asked of all survey participants and answers were coded for analysis. The results of this analysis will inform Auburn Emergency Management on which communication outlets to use to share emergency preparedness information, especially with Auburn's least prepared subgroup.

The second method used was conducting interviews with stakeholders to add a qualitative component to data analysis. The intention of these interviews was to elicit more in-depth information on household preparedness from the perspective of community stakeholders. Stakeholders were identified through connections made from a previous Auburn LCY project that worked to compile community profiles of Auburn's diverse neighborhoods. An interview guide was generated with the intent of gathering a more detailed and well-rounded perspective of the community's preparedness, why households might not be as prepared as they should be, the multi-level consequences of a lack of preparedness, and ideas to improve communication strategies about preparedness based on what the stakeholders know to work for them, their families and friends, and their neighbors. One interview was conducted over the phone while the other was conducted in person in Auburn. Stakeholders interviews were analyzed for identification of major themes and classification of key takeaways within these themes to present findings in a qualitative manner.

Key findings were developed into a list of actionable items provided to Auburn EM for their use in future programming and outreach.

04 INTERPRETATION OF RESULTS

We conducted a literature review to understand criteria that define emergencies and disasters, what plans are currently in place to prepare the city, and what curriculum is currently used to educate residents on emergency preparedness. The project team reviewed the City of Auburn Comprehensive Emergency Management Plan, the King County Emergency Management Regional Hazard Mitigation Plan Update, and Auburn Emergency Management's "Disaster Preparedness" PowerPoint to garner a greater understanding of emergency management plans and best practices, the various components of preparedness, and what the city's current emergency preparedness curriculum entails. How natural disasters unfold reveals an interplay between the physical event, human development patterns, societal adaptation to the physical environment, and vulnerability (Keim 2016). Assessing disaster preparedness has social implications important to understanding which populations within Auburn are most vulnerable when disaster strikes. Vulnerability attributes include: demographics; education and personal experience; race, language, and ethnicity; and health status (Keim 2016). Thus, it was important that the survey collected data on these attributes, based on what was relevant to the project's scope, to help the EM team target residents who are most vulnerable to the detrimental effects of a disaster and therefore would know where to focus resources. These data were analyzed to understand how preparedness might differ across various demographics and personal experiences, as described in the next section.

Knowing what people believe to be adequate preparedness is a central consideration for emergency management education. For instance, one person may feel that having stored nonperishable food and water is sufficient preparation, while another might regard an emergency kit and plan as necessary to claim adequate preparedness.

Possession of items deemed necessary to qualify as being truly prepared varies among people based on experience and knowledge. Discrepancies between what people consider to be adequate preparedness and a more accurate, or "true", sense of preparedness has important implications for emergency preparedness outreach and education. Auburn EM must emphasize their standardized definition of what being adequately prepared means by ensuring the same definition is repeated throughout all outreach materials so residents can understand the items and knowledge necessary for a satisfactory level of preparedness. The more the same definition is repeated, the greater the chance the message will be ingrained in residents' minds and increase their likelihood of taking action.

In addition to preparing and disseminating various emergency preparedness informational materials, Auburn Emergency Management currently runs a free emergency preparedness training program, Community Emergency Response Team (CERT). CERT is a national program that educates community members about disaster preparedness for hazards that may affect their area as well as trains them in basic disaster response skills, such as light search and rescue, and basic medical assistance (FEMA 2016). CERT volunteers can then help others in their community in the aftermath of a disaster, particularly when first responders might not be available for immediate assistance. This program is beneficial to communities in that it leverages and mobilizes community members to take care of their families and neighbors following a disaster, which has implications for preparedness best practices at the neighborhood level. Auburn Emergency Management also manages CodeRed Auburn, a city-centric version of a national service created by Emergency Communications Network. CodeRed Auburn is a mobile phone app that delivers real-time alerts about emergencies or other events that might affect the community (City of Auburn 2014). Information about these programs and other print preparedness materials, such as a checklist for emergency kits and pet preparedness, were handed out to in-person survey respondents.

FIGURE 10

CERT is a program that trains community members in basic disaster response skills.

Credit: City of Auburn

FIGURE 11

Each of Auburn's neighborhoods were represented in the survey.

05 PRELIMINARY FINDINGS OF AUBURN'S CURRENT EMERGENCY PREPAREDNESS

important implications for how Auburn Emergency Management should approach future emergency preparedness communications and trainings. For instance, the city could tailor some emergency preparedness messages to emphasize the value of learning from past emergency situations to improve future response and recovery.

Survey (In person and online)

The survey collected some demographic information from participants including age, whether there are children (under 18 years old) living in their home, and which neighborhood they live in. As a way of assessing experience with informational preparedness materials, participants were also asked if they had seen, read, or heard information about emergency preparedness from the City of Auburn. Previous experience with emergencies, such as losing power or running water for more than one day due to a major event, was also a component of data collection.

Survey respondent demographics

A total of 135 people in Auburn responded to the survey, both in person and online. Residents from every neighborhood were represented, as shown by the map below. However, neighborhood representation varied, perhaps due to the locations that were chosen to conduct surveys.

A wide range of age groups was also represented. Survey data showed that about half of respondents (47%) live with children in their home, an important population to consider in emergency preparedness. Only 43% of people had ever seen, read, or heard emergency preparedness information provided by the City of Auburn, suggesting that the city's outreach on this important topic has room for improvement. About two thirds (67%) of respondents had previously been in an emergency where they lost power or water for more than one day. This finding has
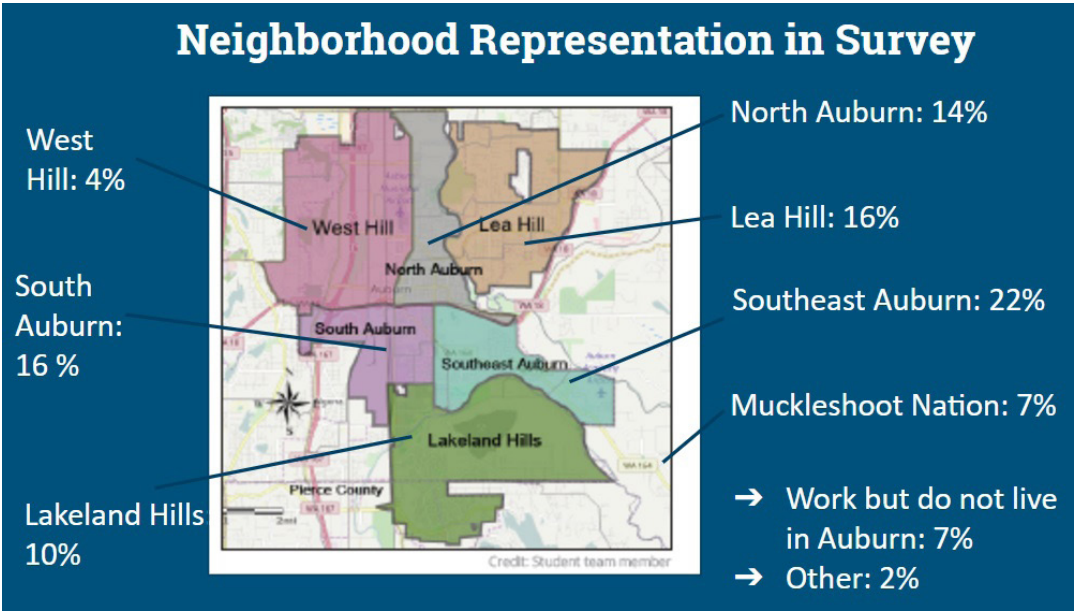
Age Groups		Variables	
18-29	17%	% With Children	47%
30-49	38%	% have seen EM information from Auburn	43%
50-69	32%	% who have been in an emergency before	67%
70+	13%		

FIGURE 12

Survey respondents represented a wide range of ages. (left)

FIGURE 13

This information provides context and background for Auburn. (right)

CodeRed Auburn

The City of Auburn has an emergency alert system through a mobile phone application, CodeRed Auburn. As we conducted surveys, the EM team asked us to mention this app to participants as it presents a centralized mechanism for informing residents of city emergencies. We asked participants if they would consider using the CodeRed Auburn text messaging service. Surprisingly, 13% of respondents already had CodeRed Auburn. More than half (55%) would be interested in signing up, which may result in approximately 68% resident usage rate.

Code Red	Total (%)
Already have it	13%
Would be interested in signing up	55%
Not interested	12%
Need more info to decide	20%

Self-Reported Preparedness

How many days could you live without assistance?	%	Quotations
Less than 3 days	21%	"Have a little food. Not enough water on hand."
3-6 days	25%	"We have food and water bottles, candles, antibacterial wipes, and a change of clothes"
More than 7 days	54%	"We have a generator, ham radios, walkie talkies, lots of food and water, 2 go-bags each, 4-6 weeks of medications - one week in each go-bag."

Credit: Caroline Johnson

FIGURE 14

CodeRed generated high interest among survey respondents. (top)

FIGURE 15

Survey participants' descriptions of their preparedness were classified into one of three preparedness categories. (bottom)

Respondents' self-reported preparedness was reevaluated to reveal how much residents over- or underestimate their preparedness. The table below contains a quantitative categorization of their responses to describing the steps they have taken to prepare. Each term included in this table had been narrowly defined in the data analysis plan. For example:

- Heat included things that keep people warm: propane, blankets, hand warmers.

- Go-bag is any response that said they had a bag or a kit of emergency supplies.

- Light includes flashlights, candles, matches, lanterns, and other sources of light.

- Power includes extra batteries, a generator, hand-crank tools, or another source of electricity.

Notably, 12% of respondents simply declared they were not prepared at all, which not only reveals a need for

Self-reported preparedness

Survey participants were asked to imagine being involved in a major emergency like an earthquake or storm, which could happen in winter or summer, to begin assessing current levels of preparedness. We then asked how long their household could live without electricity or running water, as though they were camping outside. More than half (54%) said they could live for more than seven days. Slightly less than one-fourth (21%) said they could only live for less than three days. This statement was sometimes followed by useful qualitative information, such as an admission that they had nothing prepared for an emergency, or, as they started listing items, realizing they might not have as much on hand as they originally thought.

Another informative part of the survey process involved asking participants a series of short yes or no questions that help assess their readiness to immediately respond in the event of an emergency, as well as precautions they have taken to keep themselves and their families safe.

These questions are outlined in question 3, parts C-G (see Appendix A). As we asked these questions, several participants noted that their answers helped them realize just how unprepared they were, and were thus more motivated to start taking the steps to prepare. This was an unintended consequence of our survey, and may have been a positive effect of surveying. Conversation and questions can impact how people think about their own preparedness, potentially creating a foundation to build a larger discussion of emergency preparedness.

targeted information sharing among this subgroup of residents, but also that information should be targeted through mechanisms that are most useful to that community.

Discrepancies: Self-reported vs. "true" preparedness

Discrepancies emerged between self-reported preparedness and true preparedness, the latter of which is based on classification criteria of the qualitative data. What distinguishes the somewhat prepared classification from the very prepared classification are essential aspects of preparedness, like having an emergency plan and having practiced it, go bags, and radios. Participants' responses were analyzed per these criteria and data revealed that more people claimed to be very prepared compared to our assessment of actual preparedness. This explains the large discrepancies within the somewhat prepared and very prepared groups, indicated in the table below. The implication of these discrepancies is that Auburn residents likely have an incomplete understanding of what truly adequate preparation involves.

Individual respondents were then re-categorized according to their "true" preparedness, as per the analysis described above. Associations were developed to reveal the most effective communication methods for each subgroup. The following figures denote the preferred communication methods for each of the identified subgroups:

Self-Reported Preparedness	Yes
Enough food and water?	86%
Hot water heater strapped to wall?	77%
If you have pets, have you taken them into account in your preparedness plan?	74%
Flashlight by bed?	69%
Sturdy shoes by bed?	58%

FIGURE 16

These questions helped unveil participants' readiness to respond in an emergency.

Classification of Self-Reported vs. "True" Preparedness: Discrepancies

Category	Self-reported preparedness	True preparedness
Not prepared (< 3 days)	21%	27%
Somewhat prepared (3-6 days)	25%	48%
Very prepared (> 7 days)	54%	25%

FIGURE 17

There are clear discrepancies between self-reported and true preparedness, showing that many people overestimate their preparedness.
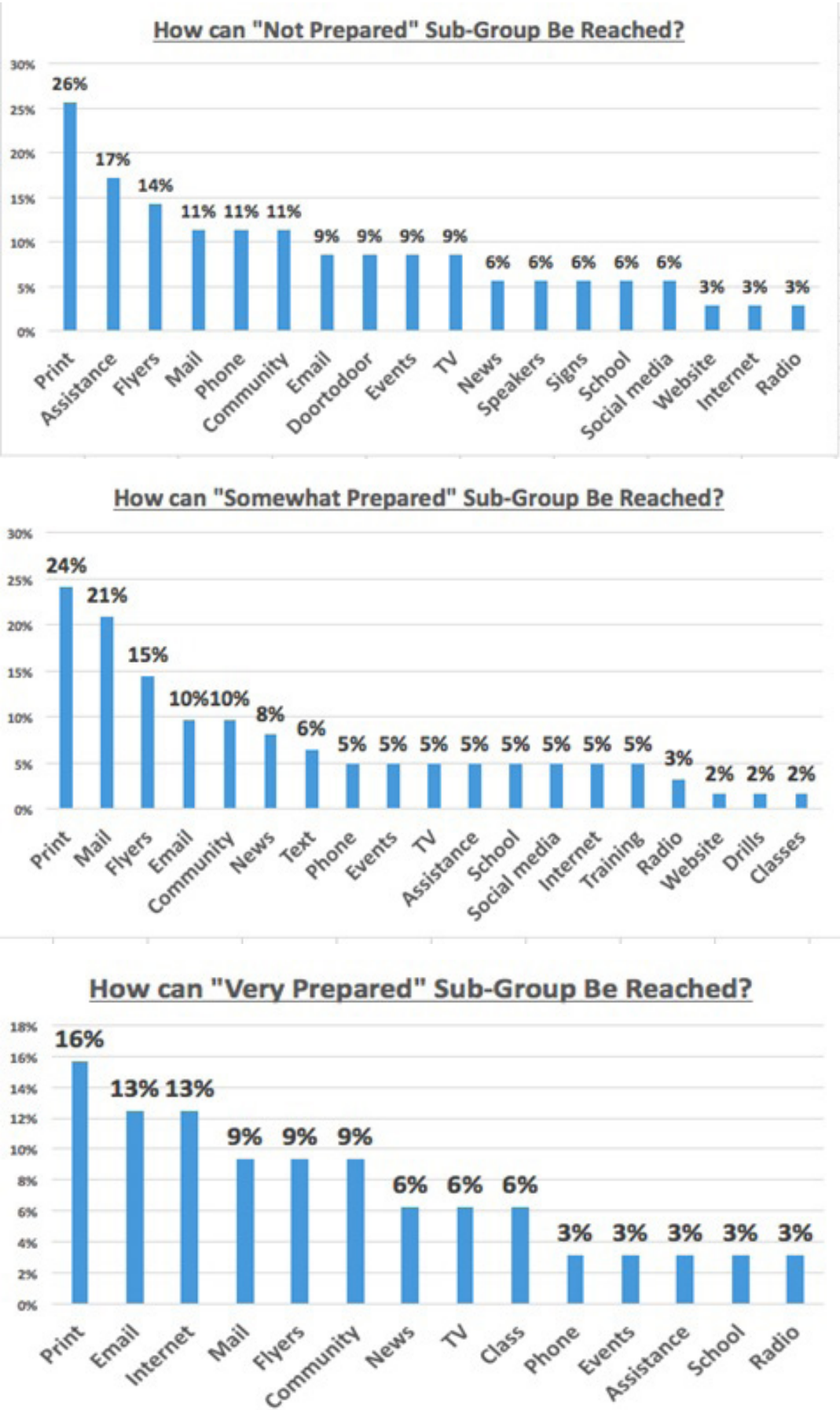
FIGURE 18

A variety of
communication
outlets were
noted, but printed
materials were the
clear winner across
preparedness
subgroups.

How can "Not Prepared" Sub-Group Be Reached?

How can "Somewhat Prepared" Sub-Group Be Reached?

How can "Very Prepared" Sub-Group Be Reached?

Credit: Caroline Johnson

This analysis was conducted with the intention of revealing clear preferences among the subgroups so that the city could tailor their communication strategies accordingly. However, these data show that a diversity of dissemination tactics will be needed to reach all Auburn residents. Relying on only one or two methods will likely miss sections of the population. This issue was confirmed by informal qualitative responses such as: "I would definitely read a mailed brochure about emergency preparedness, but I know others would immediately throw it away," or "I don't use social media but I know most others do." Although printed media appears to be the most preferred communication method across all three subgroups, the city must consider the power of coupling print materials with in-person communication methods.

Associative analyses

Survey data was also analyzed to see if an association exists between a resident's level of preparedness and which neighborhood they live in to reveal potential strategies for resource allocation. Thus, the not prepared, somewhat prepared, and very prepared subgroups were stratified per location to identify which neighborhoods are most and least prepared. Some neighborhoods had low participation rates – West Hill had 6 respondents, and the Muckleshoot Nation had 11 respondents. Consequently, neighborhoods were included for which there were more than 12 survey respondents so that results would not be biased due to the lack of equal representation among the neighborhoods. The following tables show Auburn's most prepared and least prepared subgroups according to the predictor variables: neighborhood, the presence of children in the home, and experience of a previous emergency.

Auburn's "Most Prepared" Sub-Group...	
Variable	**Outcome**
Is most likely to be located in	North Auburn (32%) Lea Hill (31%) Lakeland Hills (31%)
Lives with children	30%
Have experienced a previous emergency (with power and running water loss > 1 day)?	69%

Auburn's "Least Prepared" Sub-Group...	
Variable	**Outcome**
Is most likely to be located in	South Auburn (27%)
Lives with children	58%
Have experienced a previous emergency (with power and running water loss > 1 day)?	63%

Credit: Caroline Johnson

FIGURE 19

Levels of
preparedness did
differ across settings
and whether or not
children lived in the
home. However,
previous experience
in an emergency was
comparable across
the most and least
prepared subgroups.

These associations show that Auburn's most prepared residents tend to live in North Auburn, Lea Hill, and Lakeland Hills, while those who are least prepared tend to be in South Auburn. Interestingly, those who are most prepared are less likely to have children, compared to the least prepared subgroup in which over half (58%) live with children. This is an important finding suggesting that emergency preparedness outreach to the least prepared subgroup should not only consider the unique needs of children in terms of preparing a household, but also tailor messages to be kid-friendly, such as using simplified language, characters, and stories, so that children are also empowered to help prepare their families.

The most prepared subgroup was slightly more likely to have experienced an emergency where they lost power and running water for more than one day. However, previous emergency experience is comparable between the most and

least prepared subgroups. This finding contradicts the expectation that previous experience would motivate households to improve their preparedness levels and take steps to adequately prepare for future emergencies. The lack of motivation for households to prepare despite having experienced the consequences of emergency situations is an important consideration for emergency management programming. Furthermore, understanding why households may not feel prompted to adequately prepare is critical to knowing how to address this issue.

Qualitative Stakeholder Interviews

Two interviews with Auburn stakeholders were completed: the first with an apartment manager and the second with a woman active in community life. Both participants suggested that disaster preparedness is a low priority for many residents because it seems unimportant to everyday life. Consequently, educational efforts should try to lower the effort barrier or impress the importance of preparedness on residents and, more importantly, the consequences of being unprepared in the event of a disaster. They also emphasized the importance of community-level involvement in disaster preparedness activities, as communities must work together when disaster strikes. Auburn EM's attendance at in-person events, such as neighborhood talks, door-to-door visits, or participation in community events would be helpful for increasing the effectiveness of in-person communication.

In their view, stakeholders noted that community events would be strengthened by having neighbors speak about their own experiences with disaster. Residents may be more likely to listen if the communicator is someone they know personally. In addition, one stakeholder believed that visual representations are important. For example, she suggested that using a picture to describe the aftermath of a disaster, rather than a long paragraph, would be quite effective communication. This method, along with having neighbors speak at community events, would "bring home" the reality of disaster to residents. Consideration of who is most vulnerable in an emergency is also a critical component of communication strategies. People with significant disabilities are very vulnerable in a disaster and will need to rely on family members and neighbors in the absence of government help. Likewise, the cost of emergency supplies is a factor for some households. One person mentioned that free emergency supplies or other assistance would be helpful not only for people who cannot afford supplies, but to help decrease effort associated with getting prepared. Both stakeholders mentioned that neighbors should pool resources for these two reasons.

"NOT EVERYONE READS THE NEWSPAPER, BUT THEY MAY LISTEN IF IT'S THEIR NEIGHBOR TALKING. IT HAS TO BE SHORT. PEOPLE DO NOT RESPOND WELL TO A LONG SPEECH. SHOW ME A PICTURE. 'THIS IS WHAT COULD HAPPEN TO THE CITY OF AUBURN IF THE DAM BROKE. AND WHAT ARE YOU GOING TO DO ABOUT IT?' [THE RESIDENTS] HAVE TO TAKE THE INITIATIVE." – INTERVIEWEE

Limitations

Due to the limited sample size from each neighborhood and its sampling strategy, this survey was not intended to be representative for statistical purposes. The project was completed in a short timeframe of ten weeks and a longer sampling period would have likely generated greater participation. We were only able to conduct the surveys in English and Spanish, but respondents mentioned they spoke the following languages in their household: Oromo, French, Russian, Ukrainian, Vietnamese, Micronesian, and Chinese. The diversity of languages spoken in Auburn extends beyond the findings of our survey. It is critical that strategic communication efforts reach all Auburn residents in native languages. The surveying process attempted to locate perspectives from people who are difficult to reach through traditional modes. Regardless, some of the most vulnerable populations may have been missed. Additionally, self-reported preparedness may be over- or underestimated.

06 RECOMMENDATIONS FOR ENHANCED EMERGENCY PREPAREDNESS

Our research reveals that not only are households misinformed about the necessities of adequate preparation, they also lack the motivation to get there. Thus, our recommendations seek to spark a vested interest in emergency management among residents for the good of their families, neighbors, and community. The four recommendations are based on the collected quantitative and qualitative data: (1) engage children with preparedness information in school, (2) facilitate community-level preparedness, (3) continue using a diversity of dissemination methods while emphasizing in-person delivery of print materials, and (4) focus on reaching and understanding the least prepared.

1. Engage children with preparedness information in school

This recommendation is made for three reasons. The first is that households with children under 18 were more likely to be unprepared than households without. The second is that children can motivate their parents or guardians in a unique way. Children can engage their parents with preparedness information when they talk about their day, or show them the printed preparedness information that was handed out in class. Third, public schools serve all of Auburn and would be an effective and equitable way to reach the clear majority.

2. Facilitate community-level preparedness

Our interview participants and several of our survey respondents noted the importance of the community during and after a disaster. Several people noted that neighbors could pool resources and agree to check on each other. This would

be especially helpful for individuals who would be particularly vulnerable to a major disruption in their daily lives, such as those with access and functional needs like chronic illness or limited mobility.

Furthermore, the most popular answers for "How did you learn about [disaster risks]?" were experience and common knowledge. Along with the answer "word of mouth," our findings suggest that, as a whole, Auburn residents do not actively seek disaster preparedness information on their own accord. Integrating preparedness activities into community life can help more residents learn about the risks they face and what they should do to prepare. Residents can also learn from their neighbors who have experienced disasters. Thus, mobilizing community volunteers to "get the word out" would be an effective strategy to reach residents who are not proactive about preparedness.

We recommend the city send a bulletin and directly speak to community and neighborhood organizations that encourages the formation of such preparedness groups. For example, these preparedness groups could become something like a "Disaster Watch," modeled on the Block Watch program – or merged with it – which would build a sense of accountability and cohesion among neighborhoods in terms of engaging residents in emergency preparedness. Additionally, residents who have experienced a disaster and those who have expressed interest in receiving more information from Emergency Management should be encouraged to get involved.

3. Use diverse dissemination methods and emphasize in-person delivery of print materials

Our survey results show that at least one-quarter of Auburn residents would like printed disaster preparedness materials. A specific medium did not emerge as ideal. Thus, we recommend using a variety of media, including, but not limited to, text message, email, web resources, social media, and public service announcements on the news. When possible, visual information should be used to impress the reality of disasters on residents.

Nonetheless, our in-person interviews emphasized the importance of face-to-face communication. These methods include an Emergency Management presence at community events, public talks, and going door-to-door in residential areas. Educating people who have high degrees of contact with the public (e.g. mail carriers, hair salon workers, or members of the service industry) to help promote understanding of civic health issues could be a successful tactic in Auburn. Recent

research has demonstrated that public-government partnerships can help broaden the impact of health awareness messages (Leinberger-Jabar, Kost RG, D'Orazio, Burgess, Khalida, Tsang, Mitchell, Tomasz, de Lencastre, de la Gandara, Evering, Holder, Coller, Tobin 2016). Public stakeholders believed that in-person delivery makes preparedness information more immediately available and could therefore reduce misconceptions regarding natural disasters or public health issues, deepen engagement with communities, and increase awareness. Although it is unrealistic to expect that every resident will take the steps to sufficiently prepare, we believe a variety of messaging techniques emphasizing in-person delivery of information has the potential to promote a more comprehensive approach to emergency preparedness, originating from the neighborhood level.

In-person delivery of print materials would also allow anyone who has experienced a disaster an opportunity to volunteer to share their stories with community members

---

"PEOPLE DON'T EXPECT [DISASTERS]. WE'RE HERE, WE'RE IN TOWN, NOT IN A STATE THAT HAS A WHOLE LOT OF EMERGENCIES. [PEOPLE] SIMPLY DON'T PLAN OR EXPECT THEM. I WOULD SAY QUITE A FEW RESIDENTS FEEL THEY WOULD BE TAKEN CARE OF BY OTHER RESOURCES." - INTERVIEWEE

---

to make consequences legible on a personal level. Residents could ask questions about the information, allowing for immediate clarification of gaps in preparedness knowledge. Such conversations may lessen the time and effort residents need to learn about disaster preparedness. Since preparedness is presumably a low priority in residents' day-to-day activities, these volunteers can organize community-level efforts so that it is easier for households to get prepared, visualize the impact of disasters, and the importance of preparing accordingly.

Although we suggest that Auburn EM utilize disaster visualization tactics to provoke motivation, we are careful to distinguish these tactics from inciting fear among residents as a motivating factor. Accordingly, we recommend emphasizing civic responsibility as a motivational force. Auburn EM should educate and present emergency preparedness information in concurrence with the notion that residents owe it to themselves, their families, and their community to be prepared for the risks inherent to the city's geographic location. Thus, we suggest that emergency management outreach is underscored with a consistent message of the community's shared responsibility to be prepared as a matter of a unified sense of safety. We also suggest that Auburn EM train people that interface with the community regularly to carry emergency preparedness messages, such as what to include in an emergency kit or the importance of having a household emergency plan. This idea is supported by our interview findings suggesting that people respond well to in-person communication. Thus, in-person outreach will increase the reach and impact of key messages by creating the space for broader public conversations around emergency management.

4. Focus on reaching and understanding the least prepared

Focusing resources on reaching and educating the least prepared is critical given that our findings indicate the least prepared households reside in South Auburn and include children under 18. Educational efforts should target South Auburn, particularly families with children. Additionally, city employees or volunteers should seek more information about these households to inform and revise their education program. This could be done through informal small talk with preparedness audiences, a survey, or interviews.

We also suggest Auburn EM holds periodic "emergency kit supply" events at schools, where residents could purchase supplies for their kits. EM staff could choose high-quality supplies and make them available at low cost. The involvement of local employers to provide funds for EM to buy supplies might help lower costs. Such programming would help reduce the effort and cost barrier that may be hindering those who are unprepared from reaching sufficient preparedness.

06 CONCLUSION

Discrepancies between self-reported and true preparedness, as well as a lack of motivation to prepare for disasters, imply the need for focused efforts on emergency management education and its imperative nature. Encouragingly, we found that Auburn residents have a good understanding of disaster risks, and CodeRed Auburn has already reached many individuals. Auburn Emergency Management initially suspected that households overestimate their readiness for a disaster, and the report suggests that there is truly a discrepancy between self-reported and true preparedness levels. Further investigation into how such discrepancies manifest in varying levels of preparation can help reveal when and why deficient preparation is contingent on resource levels, awareness of risk, or uncertainty regarding "true" preparedness.

Furthermore, our findings regarding the most and least prepared subgroups, and the preferred communication methods of each preparedness level, can inform the city's future educational efforts. The city should attempt to identify motivated individuals and groups in the most prepared subgroup and encourage them to facilitate peer-to-peer learning among their less prepared counterparts. For example, because CERT is an existing program, it can serve as a low-barrier option to train the most prepared residents and expand upon their existing knowledge to then share with their community members. Overall, educational efforts should embody a grassroots approach in which the community drives the City of Auburn towards a level of emergency preparedness the community can feel confident in. In this way, emergency preparedness is less about fear-mongering and more about cultivating a sense of civic duty to prepare in a community-driven and respectful way. This approach to preparedness can help with material preparation while also working towards improved cohesion amongst various community members.

Continued surveying on this topic may yield additional useful information. Surveying residents seemed to provoke conversation and awareness about how prepared or unprepared residents were. Respondents appeared to value the opportunity to consider these questions and may then be motivated to become better prepared. For this reason, interactions with the City of Auburn Emergency Management through sustained surveying may generate greater resident interest in CERT classes and other preparedness activities.

Lastly, the four recommendations should be further evaluated once the recommended interventions have been implemented. Follow-up evaluations will likely reveal opportunities to further improve emergency management programming to reach even greater preparedness levels in households. We suggest repeating the survey every couple of years to assess progress over time. Improvements to specific strategies and adjustments to short-term goals should be made when necessary.

running water, as though you were camping outside? _____

b. Can you say more about your household preparedness?

_____
_____

c. Do you have enough food and water for that period of time? Y / N

d. Do you have sturdy shoes by your bed? Y / N

e. Is your hot water heater strapped to the wall? Y / N

f. Is there a flashlight by your bed? Y / N

g. Do you have pets? Y / N

(If yes) Have you taken them into account in your preparedness plan? Y / N

4. Have you seen, heard, or read any information about how to prepare you and your family for an emergency, from the City of Auburn? Y / N

a. Where did you see/hear it? _____

b. What did you learn? _____

5. How could the City of Auburn better reach you and your family to share information about emergency preparedness?

a. _____
_____

b. How about through…

i.   Automated telephone recording Y / N

ii.   Social media Y / N

iii.   Text messages Y / N

iv.   Radio Y / N

v.   Mailings Y / N

vi.   Message boards like at a post office or a cafe Y / N

vii.   Other _____

c. CodeRed is a free phone app that notifies you in case of City emergencies and other situations that may affect you. Would you sign up for CodeRed?

Y / N or   need more information to decide

6. What part of Auburn do you live in?

A APPENDIX

Survey used in person and online

Oral phone or in-person survey, with community members:

Hi there, my name is _____ and I am a University of Washington student doing a survey with the City of Auburn to learn more about people's emergency preparedness. This survey should take about 5 minutes. Your responses will be completely anonymous. Would you like to participate?

1. Have you ever been in an emergency like a storm or earthquake where you lost electricity or running water for more than 1 day?

a. Y / N

b. If yes, were you prepared for it?

i.   Very prepared   Somewhat prepared   Not prepared

2. What disaster risks do you think you face here in Auburn? A disaster is when an emergency overwhelms local resources.

a. Please list the disaster risks in your area:

b. How did you learn about them?

3. Imagine you are in a major emergency like an earthquake or storm, which could happen in winter or summer.

a. How long would your household be prepared to live without electricity or

a. West Hill

b. North Auburn

c. Lea Hill

d. South Auburn

e. Southeast Auburn

f. Lakeland Hills

7. What is your age? _____

8. Do children (under 18) live in your house? Y / N

9. Preferred language(s) in your house

_____

10. Would you like the City of Auburn Emergency Management to provide you with more information about emergency preparedness or local trainings?

a. Y / N

b. If so, please provide info of how you would like to be contacted.

Thank you so much for your participation, this will really help out your city. Have a wonderful day!

Auburn Emergency Preparedness

Hello! We are a group of University of Washington students working on a project with the City of Auburn to learn more about people's emergency preparedness. This survey should take about 3-5 minutes. Your responses will be completely anonymous. Your participation will help the City of Auburn better prepare for emergencies, and will help our student project!

Please participate only if you live or work in Auburn, WA, and if you are over 18 years old.

~~

Saludos, somos un grupo de estudiantes de la Universidad de Washington y estamos desarrollando un proyecto con la Ciudad de Auburn con el fin de aprender sobre la preparación que tienen las personas para casos de emergencias. Esta encuesta debería tomar entre 3-5 minutos. Sus respuestas serán totalmente anónimas. Su participación ayudará a la Ciudad de Auburn a preparar mejor su plan para los casos de emergencias, como también nos ayudará en nuestro proyecto!

Por favor, sólo participe si Ud. vive o trabaja en Auburn, WA y si es mayor de 18 años.

Question 1.
Yes, I agree to participate. / Sí, estoy de acuerdo y deseo participar.

○ In English
○ En Español

Next >>

B APPENDIX

Focus Group Guide

Despite our best efforts in the limited timeframe, we were not able to secure focus groups, which were part of our original methodology plan. However, we provide our focus group guide below for use by the city, EM team, or future researchers on this assessment, if so desired. It can serve as a tool to learning more in-depth information about preparedness from those who live and work in Auburn. (Please note that this guide should be edited to fit the target audience, research questions, and the individuals conducting the focus group, as appropriate.)

Focus Group

We hope to conduct 1-2 small focus groups with school teachers and/or church groups. We think teachers are key informants for what is being taught in schools regarding emergency preparedness, which is a key component of the City's emergency preparedness education. The EM department also mentioned wanting to be better connected with church organizations and these organizations will often have a built-in group from which to conduct a focus group.

Hi there, my name is _____ and I am a University of Washington student working on a project with the City of Auburn to learn more about people's emergency preparedness. This focus group should take about 30 minutes to an hour. Your responses will be completely anonymous and any identifying information will not be used. _____ will be helping conduct this focus group and because we are not recording, _____ will be taking notes. We value everyone's perspective and

want to make sure everyone has a chance to speak. Your participation is entirely voluntary so there is no need to answer any question that you would rather skip. If you need to leave or take a phone call, please feel free to step out at any time. Your participation is so helpful to us for our project and to the City of Auburn, so thank you for being here!

We will pass around some colorful paper so we can identify you that way, and a sign-in sheet with some basic information. Feel free to leave the name and address blank if you wish.

Does anyone have any questions before we begin?

1. We'd like to start by going around the room and having each person introduce themselves (including assigned color), what part of Auburn you're from, or if you're not from Auburn, what brings you here?

2. How many of you have ever been in an emergency like a storm or earthquake where you lost electricity or running water for more than 1 day? (Count out loud)

   a. How many of you felt prepared for it? (Count out loud)

3. What disaster risks do you all think you face here in Auburn? A disaster is when an emergency overwhelms local resources.

   a. How did you learn about them?

4. What do you think would be the consequences of these disasters?

5. Imagine you are in a major emergency like an earthquake or storm, which could happen in winter or summer. Do you have an emergency plan, and, if so, can you please describe it? If not, what do you think your emergency plan should look like?

6. How many of you have pets? How have you taken them into account in your preparedness plan?

7. Have you seen, heard, or read any information about how to prepare you and your family for an emergency, from the City of Auburn?

   a Where did you see/hear it?

   b. What did you learn? Did you think it was useful?

8. How could the City of Auburn better reach you and your family to share information about emergency preparedness? Where would you be likely to see emergency preparedness information?

9. CodeRed is a free phone app that notifies you in case of City emergencies and other situations that may affect you. Would you sign up for CodeRed?

   a. Hand out cards at this time

Does anyone have any further comments or questions?

Alternative ending: We want to be respectful of everyone's time, so we'll end there.

Thank you very much for your participation.

Awareness About Community-Acquired Methicillin-Resistant Staphylo-
coccus Aureus and Hepatitis C Virus Infection." Progress in Community
Health Partnerships: Research, Education, and Action 10.3. 413-23. DOI:
10.1353/cpr.2016.0048

REFERENCES

- City of Auburn Emergency Management Department. "Disaster Pre-
paredness." PowerPoint presented at emergency management trainings
and events, September 2015-present.

- City of Auburn, WA. 2015. "City of Auburn Comprehensive Emergency
Management Plan." Last modified January 2015. Accessed April 5, 2017.
http://www.auburnwa.gov/Assets/Auburn+Global+Assets/AuburnWA/
Docs/EM/2015CEMP.pdf

- City of Auburn, WA. 2014. "CodeRed." Accessed June 4, 2017. http://www.
auburnwa.gov/services/emergency_preparedness/code_red.htm

- FEMA. 2016. "Community Emergency Response Teams." Last modified
August 31. Accessed June 4, 2017. https://www.fema.gov/communi-
ty-emergency-response-teams

- Keim, Mark E. 2016. "Environmental Disasters." In Environmental Health:
From Global to Local, edited by Howard Frumkin, 667-692. San Francis-
co: Jossey-Bass.

- King County Office of Emergency Management. 2015. "King County
Emergency Management Regional Hazard Mitigation Plan Update." Ac-
cessed April 5, 2017. http://www.kingcounty.gov/depts/emergency-man-
agement/emergency-management-professionals/regional-hazard-miti-
gation-plan.aspx

- Leinberger-Jabari, Andrea, Rhonda G. Kost, Brianna Dâ'Orazio, Rhonda
Burgess, Chamanara Khalida, Amanda Tsang, Dennis Mitchell, Alexander
Tomasz, Herminia De Lencastre, Maria Pardos De La Gandara, Teresa
H. Evering, Tameir Holder, Barry S. Coller, and Jonathan N. Tobin. 2016.
"From the Bench to the Barbershop: Community Engagement to Raise
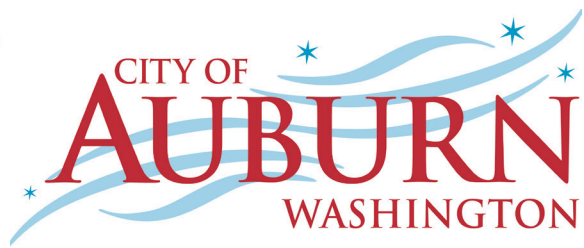
2016 – 2017 LIVABLE CITY YEAR

WWW.LCY.UW.EDU