Project Report

Attitudes and Trust in Leveraging Integrated Sociotechnical Systems for Enhancing Community Adaptive Capacity: Phase III

Anticipated Willingness to Share Resources in a Disaster Scenario: The Role of Attitudinal Variables

Prepared for **Teaching Old Models New Tricks (TOMNET) Transportation Center**

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16. Abstract

Current work in the area of resource sharing for disaster response and recovery assumes a top- down, centralized perspective. This study addresses a gap in knowledge about how resources might be shared among community members when a centralized supply of resources is not available, as might occur in a large-scale event such as a Cascadia Subduction Zone earthquake. In the case of such a disaster, community members' willingness to share resources with one another could contribute to the relative success or failure of communities to be locally self-sufficient if required. This research draws upon data gathered from a community-scale sample survey set in the Pacific Northwest, a region in which earthquakes are a certain, though largely unpredictable, hazard. In order to better understand the potential for resource sharing among community members in the event of an earthquake, we analyze three attitudinal variables related to both actual disaster preparedness and anticipated willingness to share: level of concern about disasters, place attachment, and trust. Our findings reveal a negative association between level of concern and actual disaster preparedness, while willingness to share is most strongly influenced by trust. Additional observed relationships between trust, place attachment, and community social network size suggest a need for further research in this area. Better understanding willingness to share and available resources at the community level can help to inform both grassroots efforts and more formal disaster preparedness organizations regarding targeted interventions for improving disaster preparedness.

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EXECUTIVE SUMMARY

Current work in the area of resource sharing for disaster response and recovery assumes a top-down, centralized perspective. This study addresses a gap in knowledge about how resources might be shared among community members when a centralized supply of resources is not available, as might occur in a large-scale event such as a Cascadia Subduction Zone earthquake. In the case of such a disaster, community members' willingness to share resources with one another could contribute to the relative success or failure of communities to be locally self-sufficient if required. This research draws upon data gathered from a community-scale sample survey set in the Pacific Northwest, a region in which earthquakes are a certain, though largely unpredictable, hazard. In order to better understand the potential for resource sharing among community members in the event of an earthquake, we analyze three attitudinal variables related to both actual disaster preparedness and anticipated willingness to share: level of concern about disasters, place attachment, and trust. Our findings reveal a negative association between level of concern and actual disaster preparedness, while willingness to share is most strongly influenced by trust. Additional observed relationships between trust, place attachment, and community social network size suggest a need for further research in this area. Better understanding willingness to share and available resources at the community level can help to inform both grassroots efforts and more formal disaster preparedness organizations regarding targeted interventions for improving disaster preparedness.

INTRODUCTION

In a disaster response and recovery context, most of the current work on resource sharing assumes a top-down, centralized approach to resource allocation. There is a gap in knowledge in terms of how to share resources among community members when resources are not at a centralized location, but at community members' private locations, such as homes. In this context, community members' willingness to share becomes an important factor for exploration. Willingness to share becomes especially relevant given the isolating effects of many types of disasters on communities and the subsequent need for localized self-sufficiency. It is also important given the diversity and potential complementarity among households in terms of the resources they possess.

In this study, the authors address this knowledge gap. We specifically explore the role that attitudinal factors play in anticipated willingness to share resources, and we compare willingness to share transportation resources with that of other resources needed to meet people's everyday essential needs. We focus on attitudes that relate to disaster preparedness (level of concern about disasters), community social relationships (trust), and relationship to place (place attachment) in order to better understand what kinds of community-scale interventions could help to support disaster preparedness in specific contexts. This research builds upon a previous pilot project investigating willingness to share and social ties in the same study community (1).

Using data gathered from a community-scale sample survey, we aim to better understand context-specific needs so as to help inform community-based disaster preparedness efforts. Our motivation for working at the community scale is driven in large part by the anticipation of a large seismic event in the Pacific Northwest. In the case of such an event, communities will likely be on their own for an extended period of time with limited ability to carry out everyday activities, and they may need to rely on local resources for meeting basic needs. The community scale is also relevant because many government-led disaster preparedness campaigns target the individual or household level and do not address preparedness actions that people might take collectively to prepare their community for disaster.

We look specifically at the findings related to transportation resources. Society relies upon a functional and resilient transportation systems to support the ability of individuals to meet their everyday needs. The uncertain and unpredictable impacts of disasters can leave the transportation infrastructures that supports basic societal functions damaged or non-functioning (2), and transportation systems are vulnerable to a range of disaster types, including natural hazards, technological failures, and terrorism (3). If the road network and public transit are compromised in the event of a disaster, community members could play an important role in supporting collective mobility at the local scale.

Clear gaps exist in the understanding of social behavioral responses to resource scarcity in a disaster scenario, including resource-sharing within communities (4). This study contributes to advancing this exploration by focusing in more detail on anticipated willingness to share specific types of disaster resources. The findings can be applied practically by disaster preparedness planners and community-based organizations seeking to prioritize the distribution or development of disaster preparedness resources within community settings, as we discuss further in our conclusions.

Research questions

The overarching research goal for this study is to better understand the ways in which the attitudes of individual community members relate to their potential actions in response to a disaster.

Specifically, we seek to understand how respondent attitudes about social trust and attachment to place influence household disaster preparedness. We also explore how those attitudes shape respondents' willingness to share different types of preparedness resources, including transportation, with others in their immediate community in a disaster scenario. For the purposes of this study, we define community by identity and physical geography. The community described in this study is a well-defined Seattle neighborhood in which residents have a clear sense of neighborhood identity and extent of neighborhood boundaries.

In sum, the overarching research question and sub-questions are as follows:

- How are attitudinal factors associated with disaster concern, community social relationships, and place attachment associated with disaster preparedness?
- What attitudinal factors affect actual household preparedness with different types of resources?
- What attitudinal factors affect respondents' anticipated willingness to share different types of resources with others in their community in a disaster scenario?
- How does willingness to share transportation resources compare to other types of resources?

LITERATURE REVIEW
Willingness to share in a disaster scenario

In a disaster scenario, people are likely to have limited access to – and a limited supply of – resources needed to carry out essential everyday activities. These resources range from items that provide sustenance, like food and water, to items that enable transportation and communication. In this study, we examine specifically the differences of community members' willingness to share various items needed to carry out essential everyday activities and the role that strength of social ties plays in that willingness to share. While the sharing of resources among non-profit and disaster response organizations has received much attention (5 – 8), there is little to no mainstream urban planning research that addresses willingness to share in the context of resources needed for disaster preparedness from the perspective of community members.

In one study of interagency cooperation during disasters, researchers found communication and trust building to be critical pre-work for the support of effective decision making and sharing of resources (9). In another study of interactions between organizations, researchers found that resource sharing across organizations can help to support coordination, and that organizations with complementary resources are both more interdependent and more willing to share resources (10). In a commercial context, willingness to share personal items (e.g., as part of the sharing economy) decreases as social distance increases (11). Although the same might be true of individuals in disaster situations, it is possible that different behavior patterns might occur given the uniqueness and unpredictability of the situation. In a study of people's anticipated post-disaster social behaviors and expected survival adaptations in New Zealand, researchers employed a simulated scenario, finding that as time passed after a simulated disaster, people anticipated being less likely to offer assistance to or share resources with others and more likely to ask for help or to lie about their personal level of resources (12).

In a qualitative study of disaster preparedness among aging populations in Australia, Blakemore and Bevis found that older people tend to be willing to share both experience and resources in disaster scenarios, highlighting their role as critical community assets (13). While this study identified willingness to share as a theme of discussion relevant to disaster preparedness

research, it did not present empirical findings specific to the topic of resource sharing. Researchers comparing patterns of resource sharing in tsunami-affected Indian communities found that sharing networks comprising kin were not as successful as those that were more corporate in nature (non-kin) (14), suggesting that willingness to share might be enhanced by the presence of more broadly-defined networks beyond the family or household.

The concept of willingness to share has also surfaced in a developing area of research in transportation planning involving the assessment of the potential of the sharing economy to provide temporary shelter and/or transportation options in the case of a large-scale disaster (15, 16). Although the sharing economy has the potential to supplement some public resources in the case of a disaster, many vulnerable groups still have challenges procuring basic resources like transportation and shelter (17).

Place attachment and disaster preparedness

Individual households contribute to community resilience through the construction of social relationships that enable the sharing of information and resources. Place attachment, or the emotional and cognitive experience linking people to places, has been shown to motivate participation in cooperative efforts to improve one's community (18), to build connections between individuals within a community (19), and to enhance social trust (20). Social trust also plays a key role in the ability of communities to undertake collective, adaptive action (21, 22).

Place attachment can be predicted by socio-demographic factors such as length of residence, education, and home ownership (23), and it can be influenced by qualities of place like land value, community relationships, and available job opportunities (24). In a wide-ranging literature review, Bonaiuto et al. determined that relatively little is understood regarding the ways in which place attachment affects disaster risk perception and coping, and they suggest that it should play a more prominent role in disaster preparedness (25).

Level of place attachment may vary based on community context. A pair of studies focused on communities living in areas at risk from wildfire in Australia suggest that there may be somewhat of an urban/rural divide regarding place attachment. One study of fire-risk-prone communities demonstrated that rural residents generally have a higher level of place attachment than do urban residents (23). The other study found place attachment to be a motivator for mitigation and preparation in rural communities, but less so in urban ones (26).

In addition to having an influence on disaster perception and coping, individuals' place attachment can also be affected by the experience of disaster. A study of rural Chinese residents found a complex and somewhat negative association between place attachment and hazard risk perception, suggesting that greater fear of disaster reduces dependence on place (27). A study of flood-prone communities in Canada found that the experience of flooding had differing effects on place attachment (28), and another study found that loss resulting from disasters was associated with changes in level of place attachment (29).

Many researchers have uncovered evidence that supports the inclusion of place attachment as a consideration in the study of disaster preparedness and response as well as in the formulation of disaster mitigation strategies. Researchers exploring the effects of disaster risk on wildfire-prone communities in British Columbia, Canada argue that the role of place is a critical aspect of the disaster recovery process as well as an important baseline factor in the construction of social capital and community disaster resilience (30). In a study of displaced residents post-Hurricane Katrina, Chamlee-Wright and Storr found that place attachment can play a strong role in residents returning to an area they have evacuated post-disaster, but essential resources (such as schools and grocery

stores) must be available in the community, and community members must have a sense of how they can contribute to post-disaster community recovery (31).

A study of the dynamics of community disaster resilience in Christchurch suggests that understanding place attachment and social relationships at a variety of scales can be helpful for identifying opportunities for both disaster preparedness and recovery (32). Furthermore, research on high-disaster-risk communities in the Philippines found that place attachment supports stronger relationships within communities and suggests promise for the development of disaster risk reduction strategies that leverage collective action (33).

REGIONAL DISASTER PREPAREDNESS CONTEXT AND STUDY SITE
The research project was conducted in the Pacific Northwest, where a variety of hazard types, including flooding, sea level rise, wildfires, and earthquakes capture the attention of disaster preparedness organizations and researchers. This study focuses specifically on seismic hazards – in particular, the potential of a magnitude 9.0 Cascadia Subduction Zone (CSZ) megathrust earthquake as described in the attention-grabbing New Yorker article, "The Really Big One: Earthquake Preparedness in The Pacific Northwest" (34). Anticipated to occur along a 1,000-mile fault that stretches from Vancouver Island south to northern California where the Juan de Fuca and North American tectonic plates meet, such an earthquake would devastate communities throughout the Pacific Northwest and cause a series of cascading failures, including tsunamis and widespread damage to buildings and infrastructure (35, 36). The disaster science community anticipates there is a 10%-14% chance of a magnitude 9.0 CSZ earthquake occurring within the next 50 years, and earthquakes have been identified by Seattle's Office of Emergency Management as the area's riskiest hazard (37, 38).

Study site: Laurelhurst
Laurelhurst is a highly educated and relatively wealthy urban neighborhood of approximately 4,160 residents in northeast Seattle. Located adjacent to the University of Washington campus, Laurelhurst is served by the University of Washington Medical Center as well as Seattle Children's Hospital, a nationally renowned pediatric care facility. Although the neighborhood is primarily residential, some small businesses and University Village, an upscale lifestyle shopping center, are located nearby. In part because of its somewhat peripheral location and lack of mixed-use development, Laurelhurst is not well-served by transit. Most areas of Laurelhurst are located within a mile or two of the Husky Stadium light rail station at the University of Washington, but because it is separated from the neighborhood by a number of institutional uses, it is not a walkable destination for those living in the community. Its geography as a small peninsula on the shores of Lake Washington, with liquefactable soils to its west and northeast, exacerbates its potential isolation in an earthquake.

Figure 1: Study neighborhood location

Laurelhurst is home to a grassroots disaster preparedness organization called Laurelhurst Emergency Action Plan (LEAP). Although originally organized in response to increasing concern about the potential impacts of an earthquake, LEAP has expanded its mandate to address a broader range of hazard concerns within the local community and regularly hosts educational community workshops focusing on disaster preparedness skills and knowledge topics, from putting together an emergency preparedness kit to stopping a bleeding victim from hemorrhaging. One of LEAP's primary goals is to organize the entire Laurelhurst neighborhood into approximately 20-household clusters, each with a "cluster captain" who can lead the cluster's disaster preparedness efforts by building interpersonal connectivity and trust within the cluster.

Although Laurelhurst is not socio-economically representative of Seattle neighborhoods (see Table 1), its potential for isolation in a major earthquake is typical of neighborhoods in Seattle, a city of many hills separated by waterbodies and filled wetlands. Data and findings from this community help to illustrate one local profile regarding attitudes and disaster preparedness relevant to neighborhood scale self-reliance and intra-household mutual aid. Moreover, additional in-progress studies will enable a comparison between different types of communities ranging on spectra of socioeconomic status and urban to rural. Our goal in carrying out this research at the community level is to look beyond one-size-fits-all approaches to disaster preparedness to better understand how unique community context and social factors might shape community response in a disaster scenario.

Table 1: Laurelhurst community demographics

	Survey sample	City of Seattle (39)
Age (median)	57.0*	35.5
Ethnicity		
White	86.4%	68.0%
Black or African American	0.4%	7.0%
Asian	5.4%	15.1%
Latinx	1.6%	6.6%
American Indian/Alaska Native	0.0%	0.6%
Other or mixed	4.7%	2.6%
No answer	1.2%	
Gender female	49.8	49.6%
Household size (mean)	2.6	2.1
Annual HH income		
Less than $25,000	5.0%	15.0%
$25,000 - $49,999	3.1%	15.2%
$50,000 - $74,999	7.4%	14.4%
$75,000 - $99,999	7.8%	11.6%
$100,000 - $149,999	14.0%	17.8%
$150,000 or more	51.9%	26.0%
No answer	10.8%	

* survey included adults only

METHODS
Community engagement
The research team participated in several LEAP meetings throughout 2017 and 2018 and attended a series of disaster preparedness workshops and trainings sponsored by LEAP and held within the Laurelhurst community. In November of 2018, the research team and LEAP co-hosted a public workshop at the Laurelhurst Community Center, creating a forum for neighborhood stakeholders to discuss, via participatory group activities, the qualities that contribute to a resilient community. The purpose of the workshop was twofold: 1) to help LEAP recruit new members by spreading the word about the community emergency preparedness work they are doing; and 2) to build a better understanding of the unique community values and assets that might contribute to strengthening community resilience in Laurelhurst. The workshop was attended by 15 community members. Workshop activities included asset mapping exercises, which provided valuable background information regarding what unique resources within the local community might be useful in the case of a disaster.

All of these activities helped to inform the development of a community resilience sample survey that was conducted in the fall of 2019. The authors worked closely with LEAP and local agency partners to refine and test the survey.

Sample survey

The community resilience sample survey was designed to gather information about relationships between neighborhood social connectedness, attitudes (such as trust and willingness to share), and community-level disaster preparedness. Exploratory in its nature, the survey instrument elicits information from community members not only about how they might be prepared for a disaster materially, but also about how their attitudes and social connections might contribute to preparedness at both the household and community scales.

The survey instrument was developed with the help of feedback from members of the City of Seattle's Office of Emergency Management, the Northwest Healthcare Response Network, Washington State's Emergency Management Division, and the University of Washington Medical Center, as well as being reviewed by members of LEAP. Some questions from a previous City of Seattle survey on disaster preparedness were adapted to be used as part of the survey instrument, and survey items also draw on previous research on trust and place attachment, as noted below.

A pilot version of the survey was pre-tested with members of LEAP before being distributed to 200 Laurelhurst residents during April of 2018. Some adjustments were made to the survey based on the pilot, and the full survey was deployed to 733 Laurelhurst households in October of 2018. Survey recipients were first provided with information on how to access a digital version of the survey online, and one reminder was mailed regarding the online survey. Those who did not complete the online survey were sent a paper copy in a third mailing. Respondents were offered a $5 gift card for completing the questionnaire. An adapted version of Dillman's "Tailored Design Method" was used to guide the research team's survey outreach and communication (40).

We received 145 responses to the online survey and 112 responses from respondents who filled out the paper booklet (a total of 257 responses). Thirty of the mailings were returned as undeliverable. Accounting for 19 surveys that were deemed incomplete, the total number of complete surveys as 238, resulting in a 32.5% response rate.

The survey comprised 34 items, which were a mix of multiple selection and open-ended questions that took respondents approximately 20 minutes to complete. The survey is organized into four modules: 1) Disaster preparedness, 2) Access to health care, 3) Community and attitudes, and 4) Demographics. This study deals with data gathered primarily from the disaster preparedness and community and attitudes modules. We specifically analyze the association of three independent attitudinal variables (*level of concern, social trust,* and *place attachment*) with two dependent variables (*willingness to share* and *actual preparedness*). Based on connections suggested in the literature, we also assess the relationship of the respondent's local *social network size* to these variables. Descriptive statistics for these key variables are included in Table 2.

Table 2: Descriptive statistics for key variables

	N	Minimum	Maximum	Mean	Std. Deviation
level of concern	238	8	40	24.71	7.049
actual preparedness	238	7	30	20.31	5.013
willingness to share	238	0	30	20.10	6.271
network size	238	0	259	31.39	38.550
trust	238	3	14	10.51	1.800
place attachment	238	4	20	14.06	3.564
Valid N (listwise)	238				

Module 1 (Disaster preparedness) asked respondents to indicate their *actual preparedness* with

different types of essential items, including water, food, medications, transportation, communication, first aid supplies, extra clothing, sanitation, power, and shelter. Preparedness was measured based on the number of days respondents could be self-sufficient with each item ("0 days" to "7+ days"). They were also asked to indicate their *level of concern* about their ability to complete essential everyday activities in the case of a disaster, including cooking, bathing, staying healthy, staying warm/dry, staying safe, communicating with family and friends, and using transportation to get around.

Another section of this module asked respondents about their *willingness to share* the different kinds of resources identified in the earlier preparedness question with others in their community based on the type of relationship people had with the potential recipient ("family or close friend," "acquaintance," or "stranger"). We recognize that this question would likely be subject to social desirability bias, so we included in the question prompt a number of reasons why people might be unwilling to share ("perhaps you feel others should be better [1]prepared" or "you feel you need to keep those items for you and your family") and asked respondents to provide an honest answer. We did find that respondents felt differently about sharing different kinds of items, indicating that they did not feel the need to answer that they would unconditionally share all of the items with anyone who needed them.

Module 3 (Community and attitudes) focused on neighborhood social connections as well as attitudes about *social trust* and degree of *place attachment*. This module asked respondents to indicate their neighborhood *social network size* (family, friends, and acquaintances), and it included a place attachment scale adapted from Fornara et al. (41) as well as a social trust scale created using three questions about trust from the General Social Survey (42). The latter two items were measured using a five-point Likert scale ranging from "strongly agree" to "strongly disagree." Half of the scale items were adapted to a negative form of the question to encourage respondents to carefully consider all items.

ANALYSIS & FINDINGS

For the questions that were evaluated using Likert or other scales (e.g., willingness to share), we summed the individual responses for each item to create a continuous scale variable. We then evaluated the strength of association between the variables using Pearson's correlation coefficient (see Table 3). We use the interpretation scale adopted by Dancey and Reidy in which Pearson's r indicates a weak association at 0.1-0.3, a moderate association at 0.4-0.6, a strong association at 0.7-0.9, and a perfect association at 1.0 (43).

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[1] For level of concern, respondents were asked to rank, on a 5-point Likert scale ranging from "not at all concerned" to "extremely concerned" their level of concern about their ability to carry out eight everyday activities in the case of a disaster. For actual preparedness, respondents were asked to estimate for how long they were prepared to be on their own with ten disaster preparedness items (from "0 days" to "7+ days"). For willingness to share, participants were asked to indicate with whom they would be willing to share the same ten kinds of resources on a scale of "0=nobody" to "3 = anyone in need." For trust and place attachment, respondents were asked to indicate how strongly they agreed with items on a 5-point Likert scale from "strongly agree" to "strongly disagree."

Table 3: Correlations among key variables (Pearson's r)

	level of concern	actual preparedness	willingness to share	network size	trust	place attachment
level of concern						
Pearson correlation	---	**-.460****	-.102	-.036	-.076	-.089
Sig. (2-tailed)		.000	.115	.578	.242	.170
actual preparedness						
Pearson correlation		---	.052	.065	.026	.044
Sig. (2-tailed)			.426	.317	.686	.502
willingness to share						
Pearson correlation			---	.033	**.296****	.097
Sig. (2-tailed)				.618	.000	.134
network size						
Pearson correlation				---	.085	**.437****
Sig. (2-tailed)					.191	.000
trust						
Pearson correlation					---	**.251****
Sig. (2-tailed)						.000
place attachment						
Pearson correlation						---
Sig. (2-tailed)						
N = 238 **Correlation is significant at the 0.01 level (2-tailed)						

Factors affecting disaster preparedness

We found that level of concern about disasters did have a statistically significant association with actual preparedness, and that association was both moderate and negative (-.460). In fact, it was the strongest association we observed among the variables of interest. From this analysis, we cannot know whether there is causality, but we interpret this to mean that those who are more concerned about disaster feel they are less prepared for it. It is also possible that people are less worried because they are more prepared. We did anticipate the possibility of question order bias with this pair of questions and asked about level of concern first so that respondents' answers regarding level of concern would be less likely to be influenced by their stated level of preparedness.

Attitudes and willingness to share

We found that of the three attitudinal variables (*level of concern*, *trust*, and *place attachment*), only trust had a statistically significant, though weak, association with willingness to share (.296). We interpret this to indicate that people are more willing to share disaster preparedness items when they trust others around them and perhaps feel their actions may be reciprocated in some way. Neither place attachment nor level of concern had a statistically significant association with willingness to share. Level of actual preparedness also did not have a statistically significant association with willingness to share, suggesting that willingness to share has more to do with one's personal attitudes than with the amount of resources one might have available to share. We did also find a statistically significant positive association between trust and place attachment, suggesting that place attachment may play an indirect role in willingness to share that could be further explored using other statistical methods.

Level of concern, preparedness, and anticipated willingness to share transportation resources

Comparing respondents' concern about being able to use transportation resources to get around in an earthquake scenario with other essential activities, we found that the level of concern about transportation was the lowest of all activities (see Figure 3). This may be because people think they will be able to walk, ride a bicycle, or even drive in the case of an earthquake. There is great uncertainty regarding what modes of transportation would be feasible to use after a large earthquake, which might also be a contributing factor to the low level of concern. Respondents may also feel that relative to the other activities, transportation will be less essential if the entire region is affected and travel becomes difficult in general.
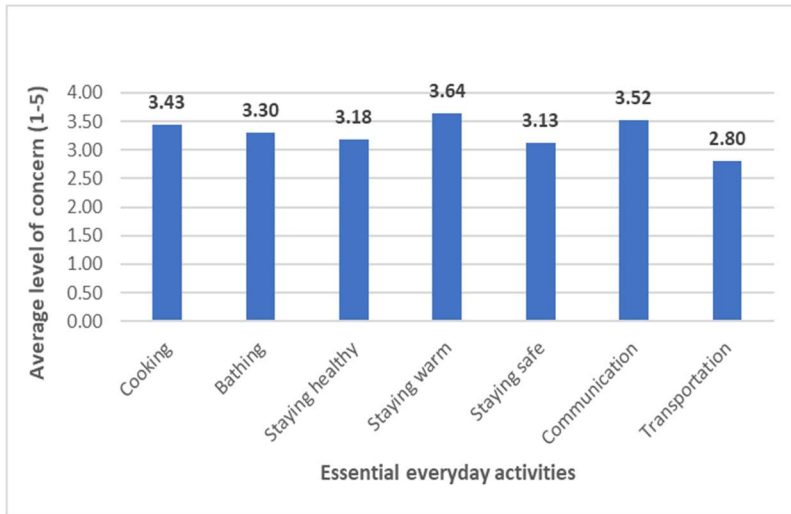

Figure 2: Average level of concern about completing everyday activities in an earthquake scenario
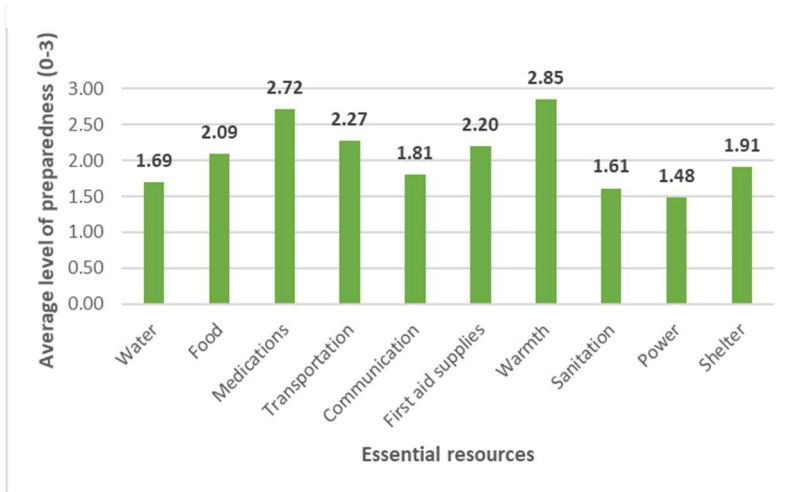

Figure 3: Average level of preparedness with essential resources

When asked how long they were prepared with a range of essential resources, respondents indicated that they felt more prepared with transportation than with most other resources (see Figure 4), which aligns with the findings regarding level of concern. People indicated being more prepared only with "warmth," which is understandable because most people have extra clothes and warm blankets, and these are not consumable resources. People also indicated being more prepared with medications, which is likely because they fill prescriptions for several weeks' worth of medication at a time.
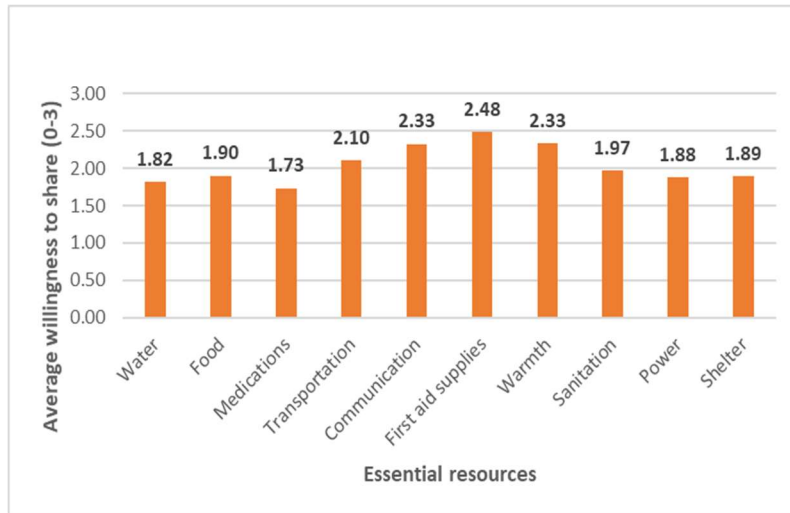

Figure 4: Average willingness to share essential resources

Compared to other essential resources, willingness to share transportation ranked fourth out of the ten items in the survey (see Figure 5). Respondents indicated they were more willing to share warmth, communication resources, and first aid supplies than transportation. They were more willing to share transportation than water, food, medications, sanitation resources, power, or shelter. These findings suggest that while people are somewhat willing to share transportation, they may have some reasons for not wanting to share it with anyone in need, perhaps anticipation of needing to spend a long period of time in a vehicle with a stranger or a lesser degree of trust in others regarding sharing this specific resource.

DISCUSSION AND CONCLUSIONS

Willingness to share essential resources in disaster scenario is a relatively unexplored topic (12), and better understanding the factors that influence decision making about sharing resources with others can help to lay the groundwork for future research on this topic. Practically, understanding which resources people are more or less willing to share and with whom could help to inform the disaster preparedness efforts of both community organizations and disaster preparedness planners.

In this study, we found that level of concern about being able to carry out everyday activities was negatively associated with actual disaster preparedness in terms of self-sufficiency with essential resources. This likely reflects the feeling that those who are less prepared are more concerned because they are less prepared, and possibly that those who are more prepared are less concerned because they are more prepared. One actionable response to this might be targeted education within the community about how they can best be prepared for a disaster in terms of both skills and resources.

We also found that greater willingness to share was associated with higher levels of trust, suggesting that a community with more trusting relationships will be more willing to share resources with one another in the event of a disaster. Furthermore, willingness to share was not

associated with levels of actual preparedness with specific resources. Potential actions responding to these findings might include framing community-building activities as disaster preparedness actions and emphasizing the importance of knowing one's neighbors as part of disaster preparedness educational activities.

Regarding transportation, our findings suggest that people within the study community were less concerned about being able to get around after a disaster than they were about being able to complete a range of other essential daily tasks. Respondents indicated that they felt more prepared with transportation than with most other resources, and, while people are somewhat willing to share transportation, they may not necessarily be willing to share it with people with whom they do not already have an established social relationship. The anticipated use of, and willingness to share, transportation resources post-disaster is an area of study that should be examined in more detail.

There are several limitations to the study. One is that, while we gain an in-depth understanding of a specific place by focusing on the community scale, the findings from the study are not necessarily applicable to a broad range of communities. The research team is currently addressing this potential shortcoming by collecting data from two additional Washington State communities that differ from Laurelhurst in terms of both socioeconomic status and degree of urban-ness. This further exploration will provide the basis for comparative analysis and, we anticipate, a more nuanced set of findings.

Another important limitation to note is that we have asked people about their *anticipated* sharing behavior in a hypothetical disaster scenario. There are many uncertainties associated with both aspects of this question. We do not know exactly what will happen in the case of a disaster, and people cannot necessarily make an accurate prediction about how they will behave in such an uncertain scenario. We also recognize the potential for social desirability bias regarding the willingness to share question. We attempted to address this by carefully framing the questions so that respondents would feel comfortable providing an honest answer. Our finding that people stated different willingness to share for different kinds of resources does suggest that respondents carefully considered each resource and that there are at least some reliable *relative* differences in willingness to share depending on the resource in question, which can help to inform prioritization of resource readiness as well as disaster preparedness education.

Finally, next steps include implementing the sample survey described in this paper in two additional communities to support a comparative analysis. The authors also plan to do further multivariate data analysis in order to better understand the potential directionality of the relationships among the willingness to share, trust, place attachment, and disaster preparedness variables. We believe the findings from this study can be used to help support targeted disaster preparedness activities in the study community and suggest that in the broader context preparedness considerations should focus more on building trusting social relationships within communities

REFERENCES

Aldrich, D. P., and M. A. Meyer. Social capital and community resilience. *American Behavioral Scientist,* Vol. 59, No. 2, 2015, pp. 254-269.

Anton, C. E., and C. Lawrence. Home is where the heart is: The effect of place of residence on place attachment and community participation. *Journal of Environmental Psychology*, Vol. 40, 2014, pp. 451-461.

Anton, C. E., and C. Lawrence. Does place attachment predict wildfire mitigation and preparedness? A comparison of wildland–urban interface and rural communities. *Environmental Management,* Vol. 57, No. 1, 2016, pp. 148-162.

Atwater, B. F., A. R. Nelson, J. J. Clague, G. A. Carver, D.K Yamaguchi, P. T. Bobrowsky, J. Bourgeois, M. E. Darienzo, W. C. Grant, E. Hemphill-Haley, H. M. Kelsey, G. C. Jacoby, S. P. Nishenko, S. P. Palmer, C. D. Peterson, and M. A. Reinhart. Summary of coastal geologic evidence for past great earthquakes at the Cascadia Subduction Zone, *Earthquake Spectra,* Vol. 11, 1995, pp. 1–18.

Bonaiuto, M., S. Alves, S. De Dominicis, and I. Petruccelli. Place attachment and natural hazard risk: Research review and agenda. *Journal of Environmental Psychology*, Vol. 48, 2016, pp. 33-53.

Cascadia Region Earthquake Workgroup. *Cascadia subduction zone earthquakes: A magnitude 9.0 earthquake scenario.* Oregon Department of Geology and Mineral Industries; 2013 [cited 2020 July 27]. 23p. Available from: https://www.dnr.wa.gov/publications/ger_ic116_csz_scenario_update.pdf

Chamlee-Wright, E., and V. H. Storr. "There's no place like New Orleans": sense of place and community recovery in the Ninth Ward after Hurricane Katrina. *Journal of Urban Affairs*, Vol. 31, No. 5, 2009, pp. 615-634.

Chandi, M., C. Mishra, and R. Arthur. Sharing mechanisms in corporate groups may be more resilient to natural disasters than kin groups in the Nicobar Islands. *Human ecology,* Vol. 43, No. 5, 2015, pp. 709-720.

Cox, R. S., and K. M. E. Perry. Like a fish out of water: Reconsidering disaster recovery and the role of place and social capital in community disaster resilience. *American Journal of Community Psychology*, Vol. 48, Nos. 3-4, 2011, p. 395-411.

Dancey, C. P., and J. Reidy, J. Statistics without maths for psychology. Pearson education, 2007.

Dillman, D. A. *Mail and Internet surveys: The tailored design method--2007 Update with new Internet, visual, and mixed-mode guide*. John Wiley & Sons, Inc., Hoboken, 2007.

Earle, T. C., and G. Cvetkovich. *Social trust: Toward a cosmopolitan society*. Westport, Conn.: Greenwood Publishing Group, 1995.

Faturechi, R., and E. Miller-Hooks. Measuring the performance of transportation infrastructure systems in disasters: A comprehensive review. *Journal of Infrastructure Systems*, Vol. 21, No. 1, 2014, pp. 04014025-1 - 04014025-15.

Fornara, F., M. Bonaiuto, and M. Bonnes. Cross-validation of abbreviated perceived residential environment quality (PREQ) and neighborhood attachment (NA)indicators. *Environment and Behavior,* Vol. 42, No. 2, 2010, pp. 171-196.

Kapucu, N., and V. Garayev. Collaborative decision-making in emergency and disaster management. *International Journal of Public Administration*, Vol. 34, No. 6, 2011, pp. 366-375.

Haney, T. J. Move out or dig in? Risk awareness and mobility plans in disaster-affected

communities. *Journal of Contingencies and Crisis Management*, Vol. 27, No. 3, 2019, pp. 224-236.

Hossain, L., and M. Kuti. Disaster response preparedness coordination through social networks. *Disasters*, Vol. 34, No. 3, 2010, pp. 755-786.

Howard, A., T. Blakemore, and M. Bevis. Older people as assets in disaster preparedness, response and recovery: lessons from regional Australia. *Ageing & Society*, Vol. 37, No. 3, 2017, pp. 517-536.

Idziorek, K., C. Chen, and D. B. Abramson. Integrating Social Factors into Transportation-Focused Disaster Preparedness Research. Presented at the 99th Annual Meeting of the Transportation Research Board, Washington, D.C., 2020.

Jamali, M., A. Nejat, R. Hooper, A. Greer, and S. B. Binder. Post-disaster place attachment: A qualitative study of place attachment in the wake of the 2013 Moore tornado. *Journal of Emergency Management*, Vol. 16, No. 5, 2018, pp. 289-310.

Macagba, S. F. A., J. C. Eligue, and S. Marie. Exploring Social Construct of Place Attachment among Settlers in Disaster-prone Areas. *International Journal of Sciences: Basic and Applied Research*, Vol. 41, No. 1, 2018, pp. 220-233.

Manzo, L., and D. Perkins. Finding common ground: The importance of place attachment to community participation and planning. *Journal of Planning Literature*, Vol. 20, No. 4, 2006, pp. 335-350.

National Opinion Research Center. *The General Social Survey.* 2016 [cited 2019 December 5]. Available from https://gss.norc.org/

Payton, M., D. Fulton, and D. Anderson. Influence of Place Attachment and Trust on Civic Action: A Study at Sherburne National Wildlife Refuge. *Society & Natural Resources*, Vol. 18, No. 6, 2005, pp. 511-528.

Pazirandeh, A., and A. Maghsoudi. Improved coordination during disaster relief operations through sharing of resources. *Journal of the Operational Research Society*, Vol. 69, No. 8, 2018, pp. 1227-1241.

Peng, L., L. Lin, S. Liu, and D. Xu. Interaction between risk perception and sense of place in disaster-prone mountain areas: A case study in China's Three Gorges Reservoir area. *Natural Hazards*, Vol. 85, No. 2, 2017, pp. 777-792.

Petersen, M. D. , C. H. Cramer, and A. D. Frankel. Simulations of seismic hazard for the Pacific Northwest of the United States from earthquakes associated with the Cascadia subduction zone, *Pure and Applied Geophysics* Vol. 159, 2002, pp. 2147–2168.

Ruiz, C., and B. Hernández. Emotions and coping strategies during an episode of volcanic activity and their relations to place attachment. *Journal of Environmental Psychology*, Vol. 38, 2014, pp. 279-287.

Schreiner, N., D. Pick, and P. Kenning, P. To share or not to share? Explaining willingness to share in the context of social distance. *Journal of Consumer Behaviour*, Vol. 17, No. 4, 2018, pp. 366-378.

Schultz, K. "The really big one." *The New Yorker*. Vol. 20, 2015.

Seattle Office of Emergency Management. *Seattle Hazard Identification and Vulnerability Analysis*; 2019 [cited 2020 July 27]. Available from: https://www.seattle.gov/Documents/Departments/Emergency/PlansOEM/SHIVA/SHIVAv7.0.pdf

Setiawan E. Can resource sharing improve disaster response effectiveness? Evidence from West Sumatra earthquake. *Proceedings of the International Conference on Industrial Engineering*

& Operations Management, 2016.

Soltani-Sobh, A., K. Heaslip, P. Scarlatos, and E. Kaisar. Reliability based pre-positioning of recovery centers for resilient transportation infrastructure. *International Journal of Disaster Risk Reduction,* Vol. 19, 2016, pp. 324-333.

Stefaniak, A., M. Bilewicz, and M. Lewicka. The merits of teaching local history: Increased place attachment enhances civic engagement and social trust. *Journal of environmental psychology.* Vol. 51, 2017, pp. 217-25.

Thomas, J. A., and K. Mora. Community resilience, latent resources and resource scarcity after an earthquake: Is society really three meals away from anarchy?. *Natural Hazards*, Vol. 74, No. 2, 2014, pp. 477-490.

United States Census Bureau. American Community Survey Narrative Profiles: 2014 – 2018 ACS 5-Year Narrative Profile, Seattle City, Washington. 2018 [cited 2020 July 27]. Available from: https://www.census.gov/acs/www/data/data-tables-and-tools/narrative-profiles/2018/report.php?geotype=place&state=53&place=63000

Wong, S., J. Walker, and S. Shaheen. Bridging troubled water: Evacuations and the sharing economy, Presented at the 97th Annual Meeting of the Transportation Research Board, Washington, D.C., 2018.

Wong, S., and S. Shaheen. *Leveraging the Sharing Economy to Expand Shelter and Transportation Resources in California Evacuations*. University of California Institute of Transportation Studies Policy Brief. 2019 [June 2019, December 10, 2019]. Available from https://escholarship.org/uc/item/6pw2w52b.

Wong, S. D., J. C. Broader, and S. A. Shaheen. Can sharing economy platforms increase social equity for vulnerable populations in disaster response and relief? A Case Study of the 2017 and 2018 California Wildfires. *Transportation Research Interdisciplinary Perspectives*, Vol. 5, 2020, 100131.

Winstanley, A., M. Hepi, and D. Wood. Resilience? Contested meanings and experiences in post-disaster Christchurch, New Zealand. *Kōtuitui: New Zealand Journal of Social Sciences Online,* Vol. 10, No. 2, 2015, pp. 126-134.

W

Section 1: Disaster preparedness

In this section, we ask some questions about disaster preparedness, including how you would get supplies or other items you might need in the case of an emergency (such as an earthquake).

1. If you were to lose electricity for a week or more due to a disaster (such as an earthquake), how concerned would you be about being able to do the following things?

	Not at all concerned	Slightly concerned	Somewhat concerned	Moderately concerned	Extremely concerned
Cooking	☐	☐	☐	☐	☐
Bathing/washing	☐	☐	☐	☐	☐
Staying healthy	☐	☐	☐	☐	☐
Staying dry and warm (in winter)	☐	☐	☐	☐	☐
Staying cool (in summer)	☐	☐	☐	☐	☐
Staying safe and secure	☐	☐	☐	☐	☐
Communicating with family and friends	☐	☐	☐	☐	☐
Getting around (transportation)	☐	☐	☐	☐	☐
Other (please describe) _____	☐	☐	☐	☐	☐

2. **In the past year, from where have you heard about disaster preparedness?** *Please select all that apply.*
    ☐ Newspaper
    ☐ Billboards/bus billboards
    ☐ Radio
    ☐ TV
    ☐ Social media (Facebook, Twitter, etc.)
    ☐ Website
    ☐ Friends/family
    ☐ City presentations
    ☐ Community groups
    ☐ Children's school
    ☐ Employer
    ☐ None, I have not recently heard about disaster preparedness
    ☐ Other (please specify) _____

3. **For each item listed below, please tell us for how long your household is prepared to be _on its own_ in the case of a disaster.**

	0 days	1-3 days	4-6 days	7+ days	Don't know
Drinking water	☐	☐	☐	☐	☐
Non-perishable food	☐	☐	☐	☐	☐
Medications	☐	☐	☐	☐	☐
Transportation	☐	☐	☐	☐	☐
Communication (phone, Wi-Fi, AM/FM radio, etc.)	☐	☐	☐	☐	☐
First aid supplies	☐	☐	☐	☐	☐
Warmth (clothes, blankets, shoes, etc.)	☐	☐	☐	☐	☐
Sanitation (toilet facilities)	☐	☐	☐	☐	☐
Power (extra batteries, generator, etc.)	☐	☐	☐	☐	☐
Shelter (tent or alternative shelter if needed)	☐	☐	☐	☐	☐
Other (please explain) _____	☐	☐	☐	☐	☐

4. **In the past month, how many neighbors have you talked to about disaster preparedness?**

_____ neighbors

5. **If you <u>did not have</u> the items listed below, where do you think you would go to get them in the case of a disaster (such as an earthquake)?**

Drinking water _____

Non-perishable food _____

Medications _____

Shelter _____

Communication (phone, Wi-Fi, AM/FM radio, etc.) _____

First aid supplies _____

Warmth (clothes, blankets, etc.) _____

Sanitation (toilet facilities) _____

Power (extra batteries, generator, etc.) _____

Transportation _____

Other (please describe) _____

6. There are many reasons why you might not want to share some of your own resources with neighbors. For example, you may need them for yourself or your family, or perhaps you think your neighbors should have been more prepared themselves, or that others who have more than you should be the ones to share. So, honestly speaking, in the case of a large-scale disaster (such as an earthquake), and assuming you had a one-week supply of the items listed below, *with whom would you be willing to share the following kinds of resources?*

	Nobody	Family and close friends only	Family, close friends and acquaintances	Anyone in need (including strangers)
Drinking water	☐	☐	☐	☐
Non-perishable food	☐	☐	☐	☐
First aid supplies	☐	☐	☐	☐
Medications	☐	☐	☐	☐
Communication (phone, Wi-Fi, AM/FM radio, etc.)	☐	☐	☐	☐
Transportation	☐	☐	☐	☐
Warmth (clothes, blankets, shoes, etc.)	☐	☐	☐	☐
Sanitation (toilet facilities)	☐	☐	☐	☐
Power (extra batteries, generator, etc.)	☐	☐	☐	☐
Shelter	☐	☐	☐	☐
Other (please describe _____	☐	☐	☐	☐

7. **Which of the following skills do you have?** *Check all that apply.*

☐ First aid/CPR   ☐ Disaster feeding
☐ Childcare specialist   ☐ HAM radio operations
☐ Search and rescue   ☐ Plumber/carpenter/electrician
☐ Crisis counseling/psychologist ☐ Firefighting
☐ Damage assessment   ☐ Other (describe): _____

8. **In case of a disaster (such as an earthquake), which of the below do you have?** *Check all that apply.*

☐ A household evacuation plan
☐ Copies of important documents stored separately from originals
☐ A family/household meeting place in case you are separated
☐ A family/household communication plan in case cell phone service is not available
☐ Access to a land line phone
☐ Earthquake insurance
☐ Homeowner or renters' insurance
☐ Other (please describe) _____

Section 2: Access to health care

In this section, we ask some questions about how you normally access health care services using different means of <u>transportation</u> and <u>communication</u>. We also ask about where you would go for emergency medical care if needed.

9. **How many miles (from your home) do you travel to get to your…** *Please round to the nearest mile.*

    primary health care provider/s? _____

    pharmacy?   _____

10. **What means of transportation do you use to get to your health care provider/s for medical appointments or other health care services?** *Please check all that apply.*

    ☐ personal automobile
    ☐ public transit (bus and/or light rail)
    ☐ ride-hailing service (Uber, Lyft, etc.)
    ☐ car-sharing service (ZipCar, ReachNow, etc.)
    ☐ carpool or ride from a friend
    ☐ bicycle
    ☐ walk
    ☐ other (please describe) _____

11. **What means of communication do you use to contact and/or communicate with your health care provider/s?** *Please check all that apply.*

    ☐ phone
    ☐ email
    ☐ online/website
    ☐ social media (Facebook, WhatsApp, etc.)
    ☐ other (please describe) _____

12. **Where would you go if you or a member of your household needed emergency medical care on a "normal" day?** *Please provide the name of the hospital, clinic or other medical provider you think you would go to if needed.*

    _____

13. **Where would you go if you or a member of your household needed emergency medical care during or immediately after a disaster (such as an earthquake)?** *Please provide the name of the hospital, clinic or other medical provider you think you would go to if needed.*

    _____

W

Section 3: Your neighborhood

In this section, we ask some questions about how well you know people in the Laurelhurst neighborhood. We also ask some questions regarding your feelings about your neighborhood and your involvement in neighborhood activities.

Please use the map below to answer questions 14 & 15 on the next page.

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14. **In which area of the map do you live?** *Please select the letter marking the area in which you live.*

☐ A   ☐ D   ☐ G

☐ B   ☐ E   ☐ I don't live in any of the areas marked on the map

☐ C   ☐ F

15. **For the different areas marked on the map (A–G), please tell us how many close, trusted friends/family members and how many acquaintances (people you know on a first-name basis) you have who live in each area.** *Count each person in one category only – either family/friend OR acquaintance.*

	Number of close, trusted friends or family members	*Number of acquaintances*			*Number of close, trusted friends or family members*	*Number of acquaintances*
Area A				**Area E**		
Area B				**Area F**		
Area C				**Area G**		
Area D						

16. **In the past month, how many hours did you spend participating in community, civic, recreational or social activities with other people who live in Laurelhurst?** _____ hours

17. **Please indicate how much you agree or disagree with the statements below:**

	Strongly agree	*Agree*	*No opinion*	*Disagree*	*Strongly disagree*
In general, you can trust people.	☐	☐	☐	☐	☐
Nowadays, you can't rely on anybody.	☐	☐	☐	☐	☐
It's better to be cautious before trusting strangers.	☐	☐	☐	☐	☐
I feel Laurelhurst is a part of me.	☐	☐	☐	☐	☐
I do not feel integrated into the Laurelhurst neighborhood.	☐	☐	☐	☐	☐
Laurelhurst is the ideal neighborhood for me.	☐	☐	☐	☐	☐
It would be very easy for me to move away from Laurelhurst.	☐	☐	☐	☐	☐

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Section 4: Background information

This section asks some questions about you and your household. The answers you provide will help us to project the information from this small study sample to a larger population.

18. **On average, how many days per week do you...**
    One week = 7 days. If you work from home, or if you take classes online instead of traveling to school, please enter "0."

    travel to work? _____ *(days)*

    travel to school to take classes? _____ *(days)*

19. **How far do you travel to get to...**
    If you do not travel to get to work or school, please answer "0."

    work? _____ *(miles)*

    school (to take classes)? _____ *(miles)*

20. **How many people live in your household (including yourself)?** *By "household" we mean "people who live together and share at least some financial resources." Roommates are usually not considered members of the same household.*

    Number of children 0 – 5 years old _____

    Number of children 6 – 17 years old _____

    Number of adults 18 – 64 years old _____

    Number of adults 65+ years old _____

21. **How many people in your household drive (including you)?** _____ people

22. **How many vehicles does your household have?** _____ vehicles

23. **How many bicycles does your household have?** _____ bicycles

24. **How many people in your household have physical or mental conditions which prevent or limit them from...**

Driving? _____

Taking public transit? _____

Walking? _____

Riding a bicycle? _____

25. **Which best describes the type of dwelling unit in which you currently live?**

☐ stand-alone house

☐ attached home/townhouse

☐ condo/apartment

☐ other (please describe) _____

26. **Do you rent or own your house/condo/apartment?**

☐ Rent

☐ Own

☐ Provided by somebody else (e.g., relative/employer)

27. **What languages are spoken in your household?** _____

28. **For how many years have you lived in...** *Please round to the nearest whole number.*

Your current home? _____

Laurelhurst? _____

Seattle? _____

The Pacific Northwest? _____

29. **In what year were you born?** _____ *(e.g. 1975)*

30. **Knowing more about where you live will help us to put your disaster preparedness choices and options in context. Please provide the closest intersection to your home location:**

Street 1: _____

Street 2: _____

31. **What is your gender identity?**

- ☐ Female
- ☐ Male
- ☐ Other
- ☐ Prefer not to answer

32. **Which of the following social media tools do you use MOST often – on a daily basis or several times a week – _to obtain news about events affecting your community_?** *Please check all that apply.*

- ☐ Facebook
- ☐ Instagram
- ☐ Twitter
- ☐ NextDoor
- ☐ Other (please explain) _____
- ☐ I do not use social media very often or at all.

33. **What is your educational background?** *Check only the highest level attained.*

- ☐ Some grade/high school
- ☐ Completed high school or GED
- ☐ Some college/technical school
- ☐ Completed bachelor's degree/s
- ☐ Some graduate school
- ☐ Completed graduate degree/s

34. **Please select the category that contains your annual household income before taxes.**

- ☐ less than $25,000
- ☐ $25,000 to $49,999
- ☐ $50,000 to $74,999
- ☐ $75,000 to $99,999
- ☐ $100,000 to $149,999
- ☐ $150,000 or more

35. **Please tell us about your familiarity and involvement with LEAP (Laurelhurst Earthquake Action Preparedness).** *Check all that apply.*

- ☐ I am an active member of LEAP and attend LEAP meetings.
- ☐ I have participated in several LEAP activities.
- ☐ I have participated in one or two LEAP activities.
- ☐ I have heard of LEAP, but I have never participated in any of their activities.
- ☐ I had never heard of LEAP before participating in this study.

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Contact information

If you are willing to be contacted further about this topic, please provide the following information. _We will only use this information for the purposes you authorize._

You may contact me for the following purposes: *Check all that apply.*

☐ To send me a $5 Amazon gift credit for completing the questionnaire *(you must include your email below)*

☐ If you have any questions about this study

☐ For a follow-up interview

☐ To send me a report of the study results

How would you prefer to be contacted? *Please provide all that apply:*

Telephone   _____

Email address   _____

Mailing address   _____

                     _____

                     _____

We would value any additional comments you may have about the content of this questionnaire. Please write them in the space below, and/or attach another page.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Thank you for your participation!

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