

Citizen Discourse about Climate Gentrification:  
The Complementarities of Online and Onsite Communication

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## Abstract

There is an ongoing debate about communication technologies' impact on neighborhoods. Some scholars claim that people's immersion online undermines civil society. Others argue that technology enables civic involvement through online political talk. Underlying this debate are fears of declining interpersonal communication and civic participation. We extend this literature by examining online and onsite discourse in a local community. Using topic modeling and qualitative methods, we compare online and offline settings over eight months following a disaster and uncover climate gentrification, a contested issue in the realm of disaster recovery. Using quantitative analysis, we found a moderate-to-high correlation across topics, suggesting the settings' complementarity concerning public discourse among citizens. We conclude by reviewing the affordances of offline and onsite environments for public discourse to further understand online-onsite communication.

## **Citizen Discourse about Climate Gentrification:**

### **The Complementarities of Online and Onsite Communication**

The debate over the impact of communication technologies on contemporary neighborhoods continues to challenge scholars. In community research, scholars have found that online conversations about local issues can lead to a greater interest in civic participation (Hampton, 2007; Nam, 2015; Ognyanova et al., 2013). Graham and Hjru (2011) argue that informal, online conversation over time “prepares citizens and the political system at large for political action” (p. 20). In contrast, Ling (2008) states that communication technologies disrupt our sense of space, distracting us from our immediate environment and each other. Turkle (2017) posits that the distractive nature of communication technologies reinforces the decline of democratic freedoms and “leaves citizens poorly equipped to defeat better organized and funded elites in political conflict” (p. 7). Turkle’s (2017) argument poses serious concerns for local governments as finding solutions to multifaceted problems often requires citizen feedback (Kim & Ball-Rokeach, 2006; Putnam, 2000). This dichotomy suggests something different happens when people communicate online versus onsite.

If civil society is declining due to communication technologies, we should expect to see little if any similarity between topics in a town’s online and onsite forums. While studies have observed behavior in online and onsite settings, few have compared archives of the actual discourse in a community’s traditional (e.g., town hall meetings) and nontraditional civic environments (e.g., online neighborhood forums). To resolve this gap, we collected archival data from a community’s online neighborhood forum and town hall meetings to examine public discourse that ensued in the eight months following Hurricane Ida, an extreme weather event that

caused catastrophic flooding and tornado destruction across the eastern region of the United States in 2021 (McKinley et al., 2021; Wood, 2022).

We use topic modeling and qualitative analysis to explore communication topics in online and onsite settings. We use quantitative analysis to correlate the similarity of topics across settings. The findings reveal a moderate-to-high correlation in similarity across topics, suggesting the complementarity of public discourse across online and offline environments. We uncover discourse topics that appear to have begun in online forums that organized the discussants for onsite town hall meetings. In terms of content in both online and onsite, findings show that these settings were used to address long-term and often understudied consequences of disasters such as climate gentrification, which happens when weather-related housing destruction leads to the displacement of low-income residents (Keenan et al., 2018). Results reveal the often competing issues facing citizens, government officials, businesses, and developers as they negotiate tensions between disaster recovery, progress, and preservation that play out in both online and onsite discussions. These findings offer insights for local governments seeking to leverage online public discourse when resolving complex community challenges. This paper begins by reviewing theory and research about civic discourse in both online and onsite forums, describes the community and draws on computational and mixed methods to analyze the similarities and differences between the online and onsite settings. We conclude with a discussion of the findings' contributions to the ongoing debate about online and onsite civic participation, the affordances of online and onsite forums, and the practical implications about climate gentrification.

## Online and Onsite Civic Communication

### Online Neighborhood Forums

Online neighborhood forums (i.e., groups tied to a physical location) have been described as gateways to local resources and relationships (Brint, 2001; Nah et al., 2021; Okhuysen & Bechky, 2009). Sharing the same geographic location can be an axis for commonalities, enabling the creation and maintenance of activities which can strengthen communities (Massa, 2016). Although Turkle (2017) maintains that communication technologies are disintegrating civil society, scholars have found that interactions in online neighborhood forums can foster civic participation (i.e., when an individual or group addresses issues of public concern through civic action; Delli, 2016) through the promotion of everyday political talk (Ognyanova et al., 2013; Wellman et al., 2001). Everyday political talk (i.e., casual conversations about local politics) can prepare residents to become participatory members of their communities (Nam, 2015). These informal conversations often include sensemaking (i.e., the process by which people give meaning to their collective experiences; Weick, 1979), helping individuals to “achieve mutual understanding about the self and each other” (Graham & Hajru, 2011, p.20). In a large, random survey of adults in the United States, Hampton et al. (2009) found that the majority of those who use online neighborhood discussion forums know all or most of their neighbors (60%), talk with neighbors in person at least once a month (79%), and had listened to a neighbor's problems in the previous six months (70%). For nonparticipants in online forums, only 40% knew their neighbors, 61% talked face-to-face, and 40% listened to neighbors' problems (Hampton et al., 2009).

Bennett (2008) conceived of the actualized citizen where traditional expectations of citizenship (e.g., voting, attending town hall meetings) are expanded to include actions that

reflect more personal values (e.g., signing online petitions, sharing political messages).

According to Bennett (2008), the actualized citizen favors loose networks of community action that are often established through weak social ties (e.g., acquaintances) and maintained using information communication technologies (ICTs). Extrapolating from Hampton et al. (2009), actualized citizens are likely to know their neighbors and to discuss local community issues in online forums. To understand the discourse in online and offline settings, we include literature on affordances (Gibson, 1979) which are possibilities for action that describe the relationship between individuals and their perceptions of an environment (Evans et al., 2017; Parchoma, 2014). Adopting an affordance lens can complement theoretical investigations, helping scholars explain how the advantages of various environments (e.g., online forums, town hall meetings) influence human communication (Faraj & Azad, 2012; Leonardi & Vaast, 2017).

Online neighborhood forums enable participants to access continuous conversations about local political information (Hampton & Wellman, 2003). They are often flat structures that contribute to accessibility and allow for horizontal communication flow (i.e., communication between people at the same level in an organization (Fayol, 1949). Participants can enter and exit conversations at will. For example, a community resident may enter the conversation when the issue under discussion is of interest and exit when the direction of the issue changes (Norris, 2004; Warner, 2002). Online neighborhood forums are often hosted on social media platforms that afford visibility (e.g., Facebook, Nextdoor). These high-identity platforms encourage the use of real names (Jaidka et al., 2022) and can promote network-informed associations (e.g., viewing mutual friends; Cirucci, 2015). Viewing mutual friends can provide a sense of familiarity and build trust among Facebook users, an essential factor for civic participation (Jaidka et al., 2022; Warren et al., 2014, 2015).

## **Onsite Town Hall Meetings**

Attending town hall meetings (i.e., gatherings open to all citizens of a town; Field, 2019) is an example of a traditional form of civic participation (e.g., the dutiful citizen; Bennett, 2008). In his extensive ethnographic study, de Tocqueville (1848) asserted that town hall meetings are to liberty to what primary schools are to science; they teach individuals how to be responsible and participate in democracy. Town hall meetings have been described as environments where free speech, inquiry, and community building thrive (Fennelly, 2011). As Field (2019) puts it, "generations of observers have celebrated the local, direct, and immediate nature of the town hall meeting as a particularly American form of democracy" (p. 2). While some romanticize town hall meetings, others question their efficacy, claiming that these spaces are often controlled by bureaucratic organizations or special interest groups (Preer, 1987). In this sense, town hall meetings (and the elected officials in attendance) are not always representative of democratic ideals.

Town hall meetings are not as accessible as online forums, often excluding individuals with constraints (e.g., work obligations, lack of childcare or transportation; Bryson et al., 2012; Fung, 2015). However, scholars have found that attending town hall meetings can enhance feelings of intimacy and trust in organizational leaders by allowing citizens to interact directly with their elected representatives (Carr-West, 2018). Town hall meetings are goal-oriented, which can differ from the more open discussions found in online neighborhood forums (Hampton, 2016). They are organized in a hierarchical fashion, with town officials sitting at desks or tables in front, and community residents facing them as if they were students in a lecture hall. While town hall meetings are set up to be deliberative systems that use discourse as means of problem solving (Townsend & Reiss, 2022), conversations about local politics often occur in

hushed whispers between speakers or before and after meetings (Field, 2019). The introduction of issues not on the official agenda take place during the public discussion portion where individuals can share grievances, opinions, and community-related news (Bryan, 2003). Like online communities, town hall meetings can afford connectivity by introducing weak ties with neighbors who might not have otherwise met (Field, 2019).

### **Online versus Onsite Political Discussion**

Studies observing online and offline communication suggest that online interactions have implications for conversations that take place in-person (Hampton & Wellman, 2003). However, these implications and the mechanisms of offline-online communication are still mostly unresolved or unknown (Gallacher, 2021). While some studies show a correlation between online discussion of political issues and offline mobilization behavior (Bennett & Segerberg, 2013; Enjolras et al., 2012), research so far has focused on large political demonstrations whose participants converge for a specific event. Research on the relationship between online and onsite community politics often focuses on political activity rather than political discussion (see Bond et al., 2012; Conroy et al., 2012, Moeller et al., 2014). Hampton et al. (2017) found that social media use has a negative relationship to deliberation in onsite settings, however, their study used the results of a national probability survey that discussed a specific and contested political event. In a study about urban neighborhoods, Brown (2014) found that debates that originate in conversation online spill into offline settings such as community meetings. However, Brown (2014) relied on interview data, asking interviews participants to “recollect events from the past” (Phillips, 2014, p. 192). Though a powerful narrative tool, the temporality of interviews could alter the disposition of participants when recalling their experiences after traumatic experiences such as an extreme weather event (Teigen & Jensen, 2011). To our knowledge, there are no

studies that compare the political deliberation of a community using their actual discourse (e.g., digital trace data, transcripts) in online and onsite settings. Such a study would uniquely add to the debate about online and onsite civil participation and political discourse. This study is guided by the following research questions (RQs):

RQ1: What are the topics in transcripts of town hall meetings and threads of an online neighborhood forum?

RQ2: How are the topics in transcripts of town hall meetings and threads of an online neighborhood forum similar or dissimilar?

### **Methods**

We designed a mixed-methods study using natural language processing (NLP) as seen in Figure 1. Following Nelson's (2017) computational framework, we used an exploratory design to answer RQ1 which involved iteratively examining a large corpora of text documents and using qualitative methods to describe the results. To answer RQ2, we used a convergent design where the qualitative and quantitative analyses were merged and compared (Creswell & Clark, 2018).

### **Research Context**

This investigation focuses on communication surrounding the devastation of Hurricane Ida, a Category 4 storm that caused catastrophic flooding and tornado destruction, making the hurricane one of the costliest in U.S. history (McKinley et al., 2021; Wood, 2022). After receiving Institutional Review Board approval, we used maps from the National Hurricane Center to compile a list of communities in the path of Hurricane Ida (Chapple et al., 2021; National Hurricane Center, 2022). Next, we searched for these communities on social media sites (e.g., Twitter, Facebook, NextDoor, Reddit) and excluded platforms and locations that did not meet the following criteria: (a) group content is visibly public and does not require site

membership; (b) members are active (e.g., average of 3-5 posts daily); and (c) the site included discussions about community issues related to Hurricane Ida. To validate the last criterion, we searched for relevant keywords (e.g., FEMA, Hurricane Ida) in the online groups that were posted after August 2021, when Hurricane Ida first made landfall.

After an extensive search, we chose a densely populated borough ( $n = 12,000$  residents) in the New York Metropolitan region. According to the U.S. Census Bureau (2019), 46.8% of the borough's most vulnerable neighborhood has 3+ risk factors (e.g., income to poverty ratio, crowding, households without full-time and year-round employment), higher than the national average. These risk factors can impact community resilience (i.e., the capacity of individuals and households to recover from health, social, and economic impacts of a disaster; U.S. Census Bureau, 2019) which has been found to be a factor in civic participation (Waytt et al., 2000; Warren et al., 2014; 2015). The borough's community resilience estimates influenced our decision to choose this location.

### **Data Collection**

Before data collection, we carefully selected a time range that captured discussions about the short-term (e.g., search and rescue, securing shelter) and long-term consequences (e.g., mental health risks, displacement of large groups) of environmental disasters (Crutchfield, 2013; Wright, 1979). To determine the time range, we compared Hurricane Ida to Superstorm Sandy, the last disastrous weather event of similar scale to hit the eastern seaboard. Superstorm Sandy generated \$65 Billion in damages (National Hurricane Center, 2018), comparable to the \$75 Billion in damages from Hurricane Ida when accounting for inflation. Primary recovery (i.e., the amount of time to restore the majority of impacted communities) for Superstorm Sandy took eight months (Versik, 2017). For this reason, we collected data from September 1, 2021, when

Hurricane Ida first made landfall in the Northeast, to May 16, 2022, roughly eight months after the storm.

For Corpus 1, the onsite dataset, we collected the public discussion portion of transcripts from YouTube recordings of Town Hall meetings. To validate the accuracy of the transcripts, a research assistant listened to the original recordings and manually edited errors, generating 67 single-spaced pages of combined transcriptions. For Corpus 2, the online dataset, we used CrowdTangle's application programming interface (API; Meta, 2022) to retrieve posts from the borough's public Facebook Group. We collected 15,021 observations (e.g., posts, comments) for the online corpus. Although we collected observations from a public group, we followed the recommendations of Bruckman (2002) and described quotes or changed minor details to ensure they are undiscoverable as a way to protect the privacy of group members. See Table 1 for descriptive statistics about the two forums (e.g., number of speakers, group members).

## **Analysis**

To discover the latent topics in online and onsite settings, we leveraged topic modeling, an unsupervised natural language processing tool (NLP) that allows researchers to uncover topics in extensive text data (Blei et al., 2003; Choi, 2020). We utilized latent Dirichlet allocation (LDA), one of the most popular algorithms for topic modeling (Paulus & Wise, 2019), and Gensim's LDA implementation for analysis (Gensim, 2015). LDA identifies a set of underlying topics by examining patterns of co-occurring words within collections of documents (Blei et al., 2010). Figure 2, adapted from Paulus and Wise (2019), is an illustrative example of the LDA documentation process we used for this study.

First, we preprocessed both datasets, which included removing punctuation, stop words, symbols, and numbers, and conducting lemmatization (i.e., reducing different forms of a word to

one single form; AUTHOR, 1998, Maier et al., 2018). Preprocessing the online corpus included removing observations that only contained media (e.g., images, videos, graphics, emojis) and no text, reducing our sample to 8,211 observations. For the online corpus, we grouped Facebook posts and corresponding comments into separate documents to capture the topics discussed within a single thread, considering each thread to be a document in the online corpus. For the onsite corpus, documents represented each instance a resident spoke during the public discussion portion of town hall meetings. We trained 30 LDA models for each corpus to determine  $k$  (the appropriate number of topic clusters), relying on coherence scores. As shown in Figure 3, the coherence scores peak at  $k = 18$  for the town hall meetings and  $k = 14$  topics for the online threads. Three members of the research team compared the keywords of LDA Models with similar coherence scores and confirmed that the peak coherence scores were the most interpretable models. For town hall meetings, we randomly sampled 2 documents per topic due to the document's average length (283 words,  $\frac{1}{2}$  page single-spaced). The online corpus had an average of 66 words per observation (e.g., comments, posts). For this reason, we randomly sampled 10 Facebook observations per topic. Three members of the research team thematically analyzed the samples to identify themes. All authors met several times to discuss and agree upon rationales for each topic theme.

We compared topics in online and onsite environments by using the Jaccard similarity coefficient, which measures the similarities and differences between datasets (Jaccard, 1912). The Jaccard similarity coefficient is frequently used in topic modeling (Ammari et al., 2018; Li & Vydiswaran, 2019). We computed the Jaccard scores in Python using the formulas in Figure 4 (Rehurek, 2020). The Jaccard coefficient measures  $J$  (the coefficient) by dividing the size of the intersection in both datasets ( $A \cap B$ ) by the number of unions in either set ( $A \cup B$ ) (Karabiber,

2020) and measures  $d$  (distance) by calculating  $1-J(A,B)$ . The Jaccard coefficient for topics across each of the corpora is represented as a heatmap in Figure 8. Some of the topics were highly similar ( $\sim 0.99$ ), while others registered more moderate similarity scores ( $\sim 0.7$ ).

### **Findings**

This study looked at hyperlocal communication in two contexts, a local Facebook group where residents discussed issues related to town life and the public discussion forum of the community's town hall meetings. Hyperlocal communication in the aftermath of disaster refers to those invisible yet interactional and communicative processes that get taken up by community organizations and citizens to augment institutional response (Harris, 2022). Our research questions explore topics and their similarities in an online neighborhood forum on Facebook and onsite during town hall meetings. This section reports on the results of the Latent Dirichlet Allocation (LDA) model and qualitative and quantitative examinations of the political discourses that occurred in both settings. Findings show that online and onsite discourses focused on climate gentrification, a contested community issue, that was pervasive in both online and onsite communication.

#### **Online and Onsite Communication Topics**

We grouped topics into broad, high-level themes for the online neighborhood forum (social support, recovery, local news) and town hall meetings (infrastructure needs, community needs, citizen feedback). For this reason, topics will be presented in thematic clusters as opposed to numerical order. The findings engage with the topics most relevant to the research context (see Appendix A for additional information for each topic).

### ***Online Neighborhood Forum***

A total of 14 topics emerged from the Latent Dirichlet Allocation (LDA) model for the online corpus as seen in Figure 5. Using thematic analysis, we organized the latent topics into the following themes: (a) social support; (b) recovery; and (c) local news. We labeled the 14 topics as the following: Topic 1 *Mobilizing social capital*, Topic 2 *Local knowledge*, Topic 3 *Covid-19*, Topic 4 *Educational resources*, Topic 5 *Policy and governance*, Topic 6 *Updates on wellbeing*, Topic 7 *Advice giving*, Topic 8 *Opinions of developer and offering solutions*, Topic 9 *Local activities*, Topic 10 *Life-or-death situations*, Topic 11 *Emergency management and assistance*, Topic 12 *Seeking recommendations*, Topic 13 *Announcements and news*, and Topic 14 *Donations*.

**Social Support.** Online forum members actively exchanged social support (e.g., informational support, emotional support). For instance, Topic 2 (local knowledge) represents the sharing of informational support in the form of specialized or common knowledge, particularly about unacceptable living conditions knowledge (e.g., the lack of heat) for some renters. Local knowledge has been found to be a crucial factor in community resilience (Storr & Haeffele-Bach, 2012) which has been linked to civic participation (Warren et al., 2014; 2015). In Topic 3 (Covid-19), users describe the experience of waiting in long lines to obtain booster shots or coming across empty shelves when seeking testing kits. At the time, the United States was experiencing a national coronavirus test shortage (Pietsch, 2021). Users in the online forum attempted to circumvent the shortage by informing one another where they could find test kits. The comments for Topic 3 also revealed concern about the lack of enforcement of mask mandates in K-12 schools.

Informational support also includes Topic 4 (education), which contains comments about educational resources (e.g., free user guides, free tutoring services), and Topic 12 (seeking recommendations) which includes users looking for referrals for local service providers (e.g., contractors, lawyers). Topic 7 (sharing advice) was personal while still focused on information sharing. For example, one user said, "After [community member] died in the flash flooding, her family is urging others to purchase a safety hammer to prevent a similar tragedy from happening." Topic 10 (life-or-death situations) exemplifies emotional support and sensemaking. Users discussed local tragedies (e.g., house explosion, Covid-19) that resulted in the deaths of community members. Some comments can be perceived as controversial by hinting at conspiracy theories (e.g., overcounting of Covid-19 deaths; Aschwanden, 2020). However, the comments showed evidence of concern and empathy for each other, using language such as "I'm sorry to hear" or "deepest condolences."

**Recovery.** We grouped topics about recovering from the storm under long-term and short-term recovery. Short-term recovery included topics that focus on immediate needs such as clothing, shelter, and food. Topics under long-term recovery pertain to long-term needs such as access to safe and affordable housing. Topic 1 (mobilizing social capital) pointed to the immense self-organizing citizens often do after an extreme weather event. In Topic 1, comments mentioned partnerships with community-based organizations (e.g., first responders, churches) and requests for volunteers to support cleanup and donation efforts. Topic 11 (emergency management and assistance) contained comments that relayed information from the Federal Management and Emergency Agency (FEMA), a government department that helps United States citizens mitigate risks (FEMA, 2013). For example, one comment said, "This is the last day to talk to FEMA in person...If you know people who do not have access to this information

online, please call and share this message with them." Topic 13 (donations) was mainly about donations beyond essentials (e.g., shelter, food) such as children's toys. One comment said, "I love that people are helping locate toys and not just donating water and meals for families. Things like this helps to ease trauma for the kids."

Long-term recovery pointed to the lack of policies protecting low-income residents. For instance, one comment in Topic 5 (policy and governance) said, "The push against affordable housing has been going on for decades...the arrogance of the mayor at the last council meeting makes me feel sick." Comments in Topic 5 included discussions of blame assignment that often happens when citizens perceive responsible actors as unwilling to help or when standard explanations for a tragedy have failed (Bucher, 1957). For example, one user commented,

"There is one post claiming that the council was completely surprised by the storm. Another saying that the fault lies in the previous administration. Another screaming about Houston. Others giving the climate change argument a shot. Everyone is deflecting blame. The town has done great things, but preparation for the storm was not one of them."

Long-term recovery included Topic 8 (opinions of developer and offering solutions), which reflected personal opinions (i.e., claims without evidence or sources) and solutions. For example, one participant described a real estate developer as a slumlord (i.e., landlord who receives profits from poorly maintained properties; Merriam-Webster, n.d.). The comment in Topic 8 read, "Pretty soon [developer] will want their name up on the buildings in town. Maybe even a street named after them. Slumlord." The comments also revealed that a real estate developer manages low-income housing buildings that were deemed uninhabitable due to Hurricane Ida. The developer made a special zoning request to demolish low-income buildings and replace them with luxury housing which is evidence of climate gentrification. Referring to the developer as a slumlord also suggests that the online forum facilitates freedom of expression. Action-oriented

comments included filing "a class action lawsuit" or participating in a "free online support group" that is designed for individuals coping with trauma and stress brought on by extreme weather events.

**Local News.** Topic 6 (updates on well-being), Topic 9 (local activities), and Topic 13 (announcements and news) are reminiscent of information often stapled to telephone poles or pinned to community bulletin boards. For example, a post in Topic 9 read, "In April, there will be vendors and food trucks. Meet our horses, pigs, and chickens. Parking fee goes to animal care." Unlike offline bulletin boards, an online neighborhood forum affords connectivity which allows for neighbors to update each other on their wellbeing. For example, in Topic 6, one user wrote, "Update. My keys have been found. Thank you to everyone in the group that tried to help. And a sincere thanks to [group member] for finding my keys!" Online discussions around mundane or everyday topics can still serve a function by helping individuals bridge connections and build social capital.

### ***Town Hall Meetings***

A total of 18 topics surfaced from the LDA model for the town hall corpus. As seen in Figure 6, we organized topics into three high-level themes: (a) infrastructure needs; (b) community needs; and (c) citizen feedback. These themes best represent the public discussion portion of town hall meetings following the flood-related disaster. The 18 LDA topics include: Topic 1 *Town appreciation*, Topic 2 *Homeowner concerns*, Topic 3 *Flood mitigation*, Topic 4 *Unsafe living conditions*, Topic 5 *Raising awareness and urging change*, Topic 6 *Condemning and defending developer*, Topic 7 *Overdevelopment*, Topic 8 *Community-based organizations*, Topic 9 *Future impact of construction*, Topic 10 *Government negligence*, Topic 11 *Public works*, Topic 12 *Overcrowding*, Topic 13 *Storm damages*, Topic 14 *Infrastructure breakdown*, Topic 15

*History of developer*, Topic 16 *Affordable housing*, Topic 17 *Citizen advisory boards*, and Topic 18 *Budget*. As with the online LDA topics, various groupings of these topics reveal the three main themes that were discussed during the onsite town hall meetings.

**Infrastructure Needs.** Topics under this theme concentrate on the management and maintenance of facilities. In Topic 3 (flood mitigation), the public addressed the council for not mitigating property damages by moving the town's emergency vehicles to a higher elevation. For example, a community member said, "There was tremendous property loss that I think could have been mitigated. I would like to see an action report that says how we can do better." Topic 7 (redevelopment) sheds light on the public's lack of confidence in the borough's infrastructure to withstand future environmental disasters. For some citizens, an increase in development means less vegetation to absorb excess rainwater. A community member in Topic 7 said, "They were talking about this in the resolution, about impervious coverage...that water has got to go someplace." Impervious coverage is a human-made surface that resists rainfall (e.g., rooftops, patios, walkways; NOAA, 2020). Similarly, Topic 12 (overcrowding) points out the consequences of high-density housing (i.e., developments with a higher population than average). For example, a member of the public said,

"Rezoning to create more density, in my opinion, is a mistake. We've created tremendous density in this town over the last few years with some wonderful new developments coming in but I feel that we've fulfilled our responsibility. There is actually a very dangerous pattern here... You know that we've got flood zones in the area. We don't need to build structures in flood zones."

This theme also included Topic 14 (infrastructure breakdowns), which was composed of public comments that questioned the town's decision to sell spare emergency vehicles (e.g., rescue boat, reserve fire engine) before the storm. The citizen recommended the town council "have a

consultant come in and look at our organizational structure" to avoid "major bad decisions being made in this town."

**Community Needs.** Residents used the town hall forum to raise awareness of community needs (i.e., issues pertaining to particular groups; Berkowitz, 1982). Topic 4 (unsafe living conditions), Topic 17 (citizen advisory committees), and Topic 18 (community-based organizations) all highlighted the need for collaboration with residents, the council, and nonprofits. For instance, in Topic 4, a resident from one of the town's low-income apartments said that displaced residents struggle to get back on their feet and find affordable housing. The resident urged government officials to bridge communication with the building owners, landlords, and councils. Topic 17 (citizen advisory committees) also called for partnership through citizen advisory boards. According to the U.S. Environmental Protection Agency (2022), citizen committees enable comprehensive interaction by allowing the public to examine community needs and develop alternative solutions over an extended period of time. Topic 8 (community-based organizations) also supports the literature on the role of organizations in post-disaster recovery efforts. In Topic 8, public comments came from residents either representing a nonprofit (e.g., the women's civic league) or applauding a nonprofit for their bravery and assistance during and after the hurricane.

Topic 16 (affordable housing) exposes climate change as an undercurrent to daily life and community needs (e.g. economic growth, affordable housing). In one comment, a resident said,

"I know that back in the 90s, the challenge was the mall and how it decimated downtown. There's been a lot of changes since then, most of them good but the challenge now is managing growth and managing that growth in the context of climate change. I encourage the board to make decisions that make our town resilient to climate change and affordable to residents."

Not all public comments offered solutions. Most residents used the town hall forum to share their concerns and asked for the governing body to address various issues. In Topic 5 (raising awareness and urging change), a long-time resident said, “I live in the most ethnically and economically diverse portion of this town. There are people in my neighborhood who need every dime and dollar that they can get from the federal government, the state government, section 8, which is a program that I’ve wanted in this town a long time ago. We have people with six figure incomes right around the corner. We’re going to lose that...We’re losing our neighborhoods. We’re losing our community.” Similarly, in Topic 2 (homeowner issues), residents shared concerns related to being homeowners (e.g., mail mix-ups, changing neighborhood). One resident said,

Any buildings taller than three stories in a residential area is going to get rid of that neighborhood feel that we have. And I really implore you to consider that, to keep the downtown a downtown and keep our neighborhood feeling and looking like a real neighborhood.

**Citizen Feedback.** This theme includes feedback that ranges from complimentary such as Topic 1 (town appreciation) to critical like Topic 10 (government negligence). While some residents expressed gratitude, others were disappointed with the town’s emergency response (or lack thereof) to Hurricane Ida and actions of local landlords. A resident in Topic 10 explained how elected officials failed to learn from past weather events. The resident said, “We are already aware there was a gross lack of preparedness prior to the storm. To not look back and prepare like we have in the past when we've dealt with flooding...is negligence.” Topic 6 (defense and offense of developer) contained a mix of positive and negative feedback on the real estate developer whose company manages both luxury and low-income properties. Public comments that defended the developer were from the company’s attorney who said, “I represent [apartment complex]...we have members of the fire department, code officials strategizing trying to find the

most effective path to getting residents back to their dwellings...I believe my client has done as much as it possibly could." Interestingly, negative feedback about the developer was not as explicit as the online neighborhood forum.

**RQ2: How are the topics in the online and offline settings similar or dissimilar?**

RQ2 asks about the similarities between topics in online and onsite settings. Figure 7 shows a heat map illustrating the Jaccard similarity scores between topics in the town hall meetings and online neighborhood forums. The cell colors range from blue to dark blue cells, where the darkest shade represent the strongest correlation between topics ( $0.90 \leq J \leq 1$ ) and the orange to dark red cells indicate the weaker correlations ( $0.70 \leq J \leq 0.80$ ) relative to the other topics. Overall, the online neighborhood forum and town hall meeting topics are moderate to highly correlated ( $0.70 \leq J \leq 0.99$ ).

***Online and Onsite Topics with the Strongest Correlation***

In town hall meetings, Topic 8 (community-based organizations) has the most similarity across the spread of topics in the online setting ( $0.89 \leq J \leq 0.99$ ). This finding points to the need for inter-organizational collaboration to solve complex problems post-disaster. Topic 8 shares the highest similarity ( $J \sim .99$ ) with Topic 1 (mobilizing social capital) and Topic 2 (local knowledge) in the online neighborhood forum. The high similarity between Topic 8 and Topic 1 suggests the prevalence of community-based organizations (e.g., organizations serving locally defined needs and services; Yoon & Copeland, 2020) in disaster recovery. The high correlation between Topics 8 and Topic 2 indicates that organizations become part of the communication surrounding local issues (e.g., homelessness, school bullying, renters' rights) in more goal-oriented settings such as town-hall meetings. Topic 13 (announcements and news) in the online neighborhood forum is highly correlated across the spread of town hall topics ( $0.93 \leq J \leq$

0.98) indicating similar announcements related to the town are being shared in both online and offline settings.

In the online neighborhood forum, Topic 8 (opinions of developer and offering solutions) shares the least similarity with Topic 6 (condemning and defending developer,  $J \sim 0.76$ ) and Topic 17 (citizen advisory boards,  $J \sim 0.78$ ) in the town hall meetings. Randomly sampled comments revealed differences in the use of language to describe the developer, a key figure relevant to those three topics. In the online neighborhood forum, members used informal and derogatory language (e.g., slumlord, leach, scum) to describe the developer. In town hall meetings, public members adopted more formal language, referring to the developer by their name or the company's name.

In the online neighborhood forum, Topic 10 (life-or-death scenarios) had lower similarity scores across the spread of town hall topics, with Topic 7 (overdevelopment) being the lowest ( $J \sim 0.76$ ). In the online forum, members reflected on the who, when, and why of local incidents that resulted in death (e.g., house fire, flash flooding, pedestrian-car accident). This finding suggests that individuals communicate in online forums to make sense of traumatic events. In contrast, communication in the town hall meetings raised awareness of life-or-death incidents (e.g., pedestrian-car accidents) and proposed solutions (e.g., more crossing guards), suggesting that the speakers do not use town hall meetings to make sense of their emotions. Topic 3 (Covid-19) in the online neighborhood group was the least correlated across the spread of topics in the town hall meetings, with the weakest being Topic 7 (overdevelopment,  $J \sim 0.70$ ). This finding reveals that community members are discussing concerns related to Covid-19 (e.g., finding test kits, mask mandates) more with each other in an online neighborhood forum than with elected officials in town hall meetings.

## Discussion

The Internet and social media changed our conception of civic participation by creating a networked public sphere (Benkler, 2006; Benkler et al., 2013) that allows all citizens to become participants in public life. This study asked how analogous the public discourse of an online neighborhood forum is to public communication found in the traditional environment of a town hall meeting: What do people talk about in these two environments, and is there a similarity in discourse in online and offline spaces? This study focused on the residents of a low-income community experiencing a loss of affordable housing due to gentrification as they debated the impact of climate gentrification on rebuilding efforts after Hurricane Ida.

### Online versus Onsite

In an age of social media and Internet use, we observed that the ensuing public discourse shares moderate to high similarities in both online and offline forums (Bennett & Segerberg, 2013). Findings reject the argument that civil society is being destroyed by ICTs. Instead, we argue that communication in both settings can help amplify each other, allowing users to engage in collective sensemaking and better understand community issues before addressing the town council. However, communication in both settings can differ in terms of access to social support. This analysis utilized data from Facebook, a high-identity platform where people are more likely to know one another offline (Croom et al., 2016) and where common relationships between the online and offline environments create “alloys” (Putnam, 2020, p. 422), a blended social network where social capital is created and shared in both environments. Despite the ubiquitous presence of social media, our findings show that political communication in this case was taking place both online (e.g., everyday political talk in social media discussions) and in public spaces (e.g., town hall meetings).

Civic participation is pervasive in both online and offline spaces. We found that informal conversations about local politics facilitate civic participation through citizen input. Mediated, online spaces such as social media host informal neighborhood forums that are critical resources for social capital and networking for collective support (Nah et al., 2021; Brint, 2001). At the same time, public spaces such as the town hall meetings offer a formal platform to engage community members and stakeholders in public deliberation (Bennett, 2008; Knobloch et al., 2013). The town hall discourse affords vertical communication, reflecting the institutionalization of this environment. Speakers are allotted only a certain amount of time to make their remarks, which are recorded as part of the official record. For the most part, these remarks are carefully scripted, and are mindful of the hierarchy of government proceedings. Additionally, while speakers were looking for social support, their requests were for institutionalized forms of assistance (e.g., affordable housing). While also visible, the Facebook posts suggests the familiarity and conversation of friends speaking to one another which is evidence of networked-informed association. People are speaking to users that are likely neighbors; discourse is less formal and friendlier in tone. Local news is shared, and the assistance needed includes information about pets, schools, and other topics likely to be discussed among friends. Thus, while the need for social support is apparent in the online and offline groups, community residents appear to access different types of support in each environment.

### **Climate Gentrification**

The topics in this study revealed evidence of climate gentrification and the complexities facing local governments when balancing often competing community needs such as economic growth versus environmental protections. Climate gentrification, a long-term and often understudied consequence of disasters, can occur when extreme weather events and their

aftermath create a scarcity of affordable housing in low-income communities (Davidson et al., 2013; Internal Displacement Monitoring Centre, 2021). Low-income communities are more vulnerable as homes lost to disasters often results in rising housing and rental costs that outpace income growth (The Joint Center for Housing Studies of Harvard, 2021). The ensuing housing crisis becomes a public health concern as access to safe and stable infrastructure is constrained (Johnson et al., 2021; Gibson et al., 2011; Sandel et al., 2018). Housing volatility can encourage opportunistic developers to buy up properties at bargain prices, displacing low-income tenants and replacing them with high-income populations (Keenan et al., 2018).

After finding evidence of climate gentrification, we referenced prior studies that map gentrification across the United States. In Kleiman et al.'s (2018) study using 1990-2000 census data, this borough was marked as at-risk of gentrification. In Chapple et al.'s (2021) study using 2000-2016 census data, the borough was labeled as experiencing ongoing exclusion of low-income households due to an influx of moderate to high-income residents. Our findings suggest an unfortunate bookend to this location's long history of gentrification. Those who were displaced and their supporters expressed concern over climate gentrification at the town hall meeting. However, at the time of this study, the buildings of interest remain desolate as the town continues to negotiate with different stakeholders (e.g., citizens, developer). We did not see evidence that these stakeholder discussions with town leadership occurred online. As such, our findings suggest that although the online and onsite engagement by citizens is complementary, the same cannot be said for the officials who hold positions of power in the local government or the organization-level stakeholders such as local businesses, developers, schools/school boards, etc.

## **Implications**

By establishing a high correlation between community-based organizations across the topics in the online neighborhood forum following Hurricane Ida, this study affirms the critical importance of community-based organizations and nonprofits in recovery and suggests how they are expected to pick up the pieces when government cannot or will not act. In communities where citizens and their government lack sufficient resources, recovery may be dependent on the ability of nonprofits to assist in the absence of government (Harris, 2022). But what if the nonprofits themselves lack the ability to tap into interorganizational resources? Nonprofit organizations that are affected by environmental disasters are able to quickly return to mission-driven work and assist others when they have their own resources and trust that additional resources will be forthcoming (AUTHOR et al., 2022). Those in communities with fewer resources often lack the interorganizational relationships critical to their own recovery, and thus have less capacity for their communities.

## **Limitations and Future Research**

This study poses a few limitations. First, the study explores a specific geographical context, which was an appropriate choice given the recent climate disaster the town underwent. However, future research can explore a comparative study across different geopolitical regions across the United States to assess how the communication in online and offline perpetuate in civic participation and engagement. Secondly, collected data was community centered. In other words, the data captured in the Town Hall meetings did not include responses from the mayor or council members or other public forums such as school board or chamber of commerce meetings, where development that generates climate gentrification is of interest. Future studies can expand the scope of data and include secondary analysis of public political record released

about or to the town by political institutions. Lastly, the study focused on many months of time as a single frame without breaking up the data to consider exogenous factors that impact the aftermath of disasters (AUTHOR et al. 2022; AUTHOR et al. 2021). Therefore, future research should consider meaningful events that define phases of disaster recovery to examine the changes in communication over time.

### **Conclusion**

Climate gentrification is a dire, contested issue that threatens the livelihood of under-resourced and economically challenged communities. Civic participation in response to community issues that directly and unfairly affect the residents is a critical backbone to civil society. Our findings show that communication technology can facilitate community justice where online and onsite participations complement each other, empowering citizen voices. Ultimately, online communication is integrating and encouraging civic participation and ensuring the voices of community members can emerge to combat community issues.

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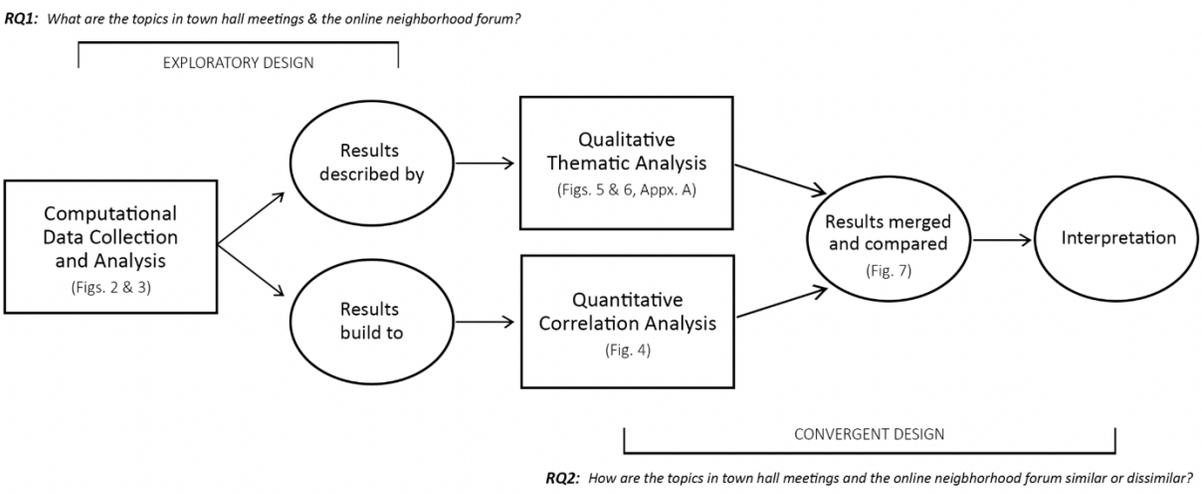
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# Tables and Figures

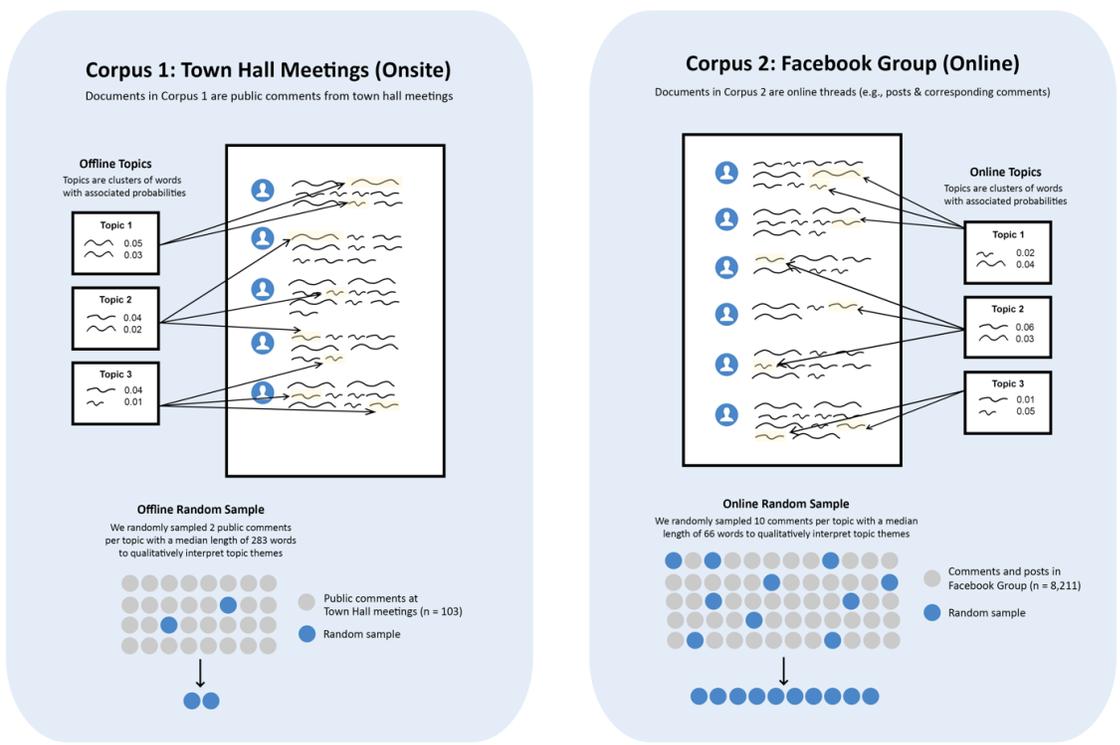
## Figure 1

### Study Design



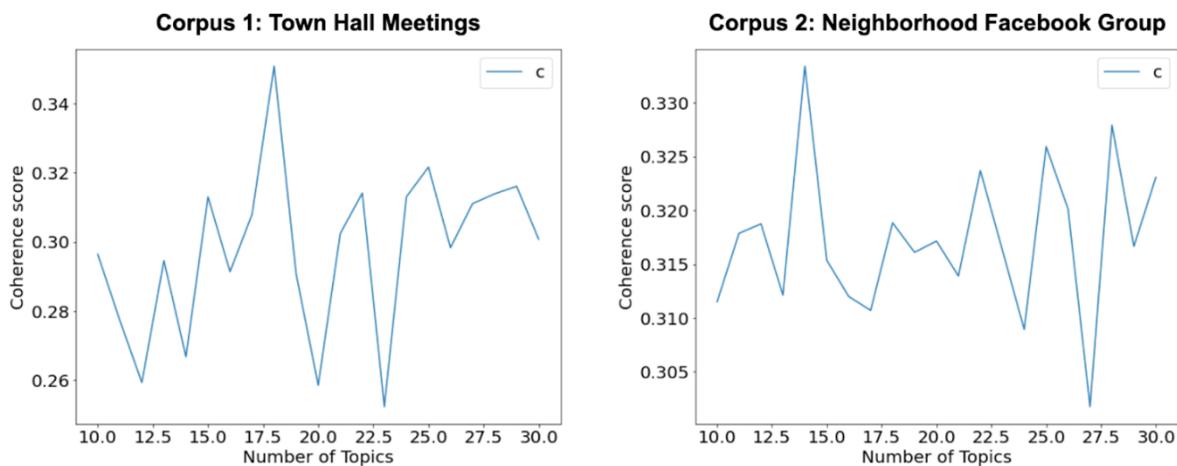
## Figure 2

### Visualization of LDA Process for Study



**Figure 3**

*Coherence Scores of Topic Models*



**Figure 4**

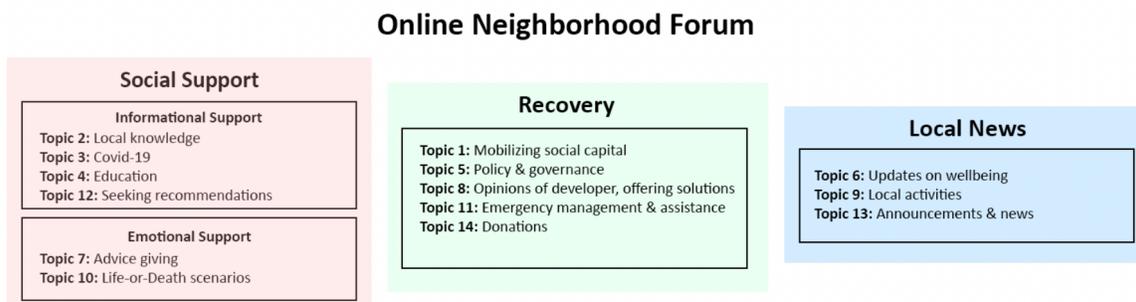
*Jaccard Similarity Coefficient*

$$J(Online, Onsite) = \frac{|Online \cap Onsite|}{|Online \cup Onsite|} = \frac{|Online \cap Onsite|}{|Online| + |Onsite| - |Online \cap Onsite|}$$

$$d(Online, Onsite) = 1 - J(Online, Onsite)$$

**Figure 5**

*Thematic Representation of Online Topics*





**Table 1***Unique Users in Onsite and Offline Settings*

Settings	N (Unique Contributors)
Online Neighborhood Forum	2,463
Town Hall Meetings	51
Both Online Neighborhood Forum and Town Hall Meetings	25

*Note.* Contributors are individuals that either posted or commented in the online neighborhood forum or spoke during the public discussion portion of the town hall meetings during the study timeframe. We do not include total number of people in attendance at town hall meetings or the total number of members in the online neighborhood forum.

## Appendix A

### Town Hall Meetings

Topic #	Topic name	Example quote
1	Town appreciation	<p>"I just want to thank our police department for just what an excellent job they did in helping us out. It was a large event with many moving parts. They really did a fantastic job directing traffic, keeping everyone safe, and making sure that there was a visible presence on the streets downtown.</p> <p>"I'm very grateful for our public works department, the way they came together on a friday evening."</p>
2	Homeowner issues	<p>"Any buildings taller than three stories in a residential area is going to get rid of that neighborhood feel that we have. And I really implore you to consider that, to keep the downtown a downtown and keep our neighborhood feeling and looking like a real neighborhood."</p> <p>"These homeowners had to change addresses to their lenders, you know, their drivers license, all different types of things. So, we do want to try to keep it as close to this as possible for the least amount of change."</p>
3	Flood mitigation	<p>"There was a tremendous property loss that I think could have been mitigated. I would like to see an action report that says how can we do this better. And I think maybe the mayor should get a committee together that would be non-biased, look at the facts and say hey, we could have done this better."</p>
4	Unsafe living conditions	<p>"The [apartment complex] is now requiring non disclosure agreements or NDAs in order for displaced residents to either break their lease, get their security deposits, or even get their rent payment refund for the time they've been displaced...Vulnerable residents in our community are being forced to silence their voice. These concerns affect [town's name] as a whole. If tax money for affordable housing is going to subpar, if not dangerous, accommodations then it is in everyone's best interest to be aware of those issues. Properties requiring NDAs makes it impossible to make issues like this public. We are asking you, the borough council, to step in and help us resolve these issues. How can we even attempt to recover from the devastating effects of hurricane IDA if [apartment complex] actively refuses to speak with us."</p>

Topic #	Topic name	Example quote
5	Raising awareness & urging change	<p>"I live in the most ethnically and economically diverse portion of this town. There are people in my neighborhood who need every dime and dollar that they can get from the federal government, the state government, section 8, which is a program that I've wanted in this town a long time ago. We have people with six figure incomes right around the corner. We're going to lose that [diversity]....I bought my house in 1970. I was the youngest homeowner on the street. Now I'm the oldest, as far as longevity. I've owned that house for 54 years...We're losing our neighborhoods. We're losing our community."</p>
6	Condemning and defending developer	<p>Defending: "I am an attorney with [removed] law firm. I represent [apartment complex]...we have members of the fire department, code officials strategizing trying to find the most effective path to getting residents back to their dwellings...I believe my client has done as much as it possibly could. Thank you to the township and the various departments for working with us and being available. We're happy to answer any questions."</p> <p>Condemning: "I've only been here a few years. Most of the people I know have been here years. They've lived their whole life here. It just seems a little funny to me that [apartment building] took down all their trees. And then, we get our heads handed to us for Hurricane Ida."</p>
7	Overdevelopment	<p>"Don't force people to go through tragic events repeatedly. No matter how much you build up, it will repeat and happen again...Yes, it's great to build for economic purposes. But let's be honest, you're also forgetting [town name]'s core values of family, immigrants, small business owners...when you do this, you're telling them they're not welcome."</p>
8	Community-based organizations	<p>"We'll never be able to say thank you to her and the civic league and all the women that helped. So, just all of the people in this town that came together to help. They didn't find it dangerous to go out and help each other..."</p>

Topic #	Topic name	Example quote
9	Future impact of construction	"Ida was a disaster for this town. We saw a devastation which most people couldn't have imagined. We saw what the combination of a high water table and rapid rainfall could do to the residents. Due to climate change, we'll expect to see much much more...we urge the council to consider mitigations that would increase the level of safety for those looking to live here in the future."
10	Government negligence	"We are already aware there was a gross lack of preparedness prior to the storm. To not look back and prepare like we have in the past when we've dealt with flooding from even the initial predicted amounts of rain, is negligence. So now, as always, the community came together in the aftermath. Some who lost everything and had nothing to give but their time. I took part in the community cleanup on..."
11	Public Works	"The question I have is about the curbside replacement program...I don't know the reason for ripping up all of the sidewalk areas they've destroyed the street..."
12	Overcrowding	"Rezoning to create more density in my opinion is a mistake. We've created tremendous density in this town in the last few years with some wonderful new developments coming in but I feel that we've fulfilled our responsibility. There is actually a very dangerous pattern here. Let's just take our time and not think about things that may embarrass us in the future. You know that we've got flood zones in the area. We don't need to build structures in flood zones..."
13	Storm Damages	"[Removed] has been keeping me informed of my other request regarding the losses from the storm. Do we have a full accounting? Do we have an inventory now? I'm not interested in the de minimis value."
Topic #	Topic name	Example quote

- 14            Infrastructure  
                 breakdown
- "We didn't do anything right. It was a lot of damage and we didn't learn anything from it. And I don't even understand how that is acceptable...we had a perfectly good boat that was given to us by emergency management and it was sold. I don't know who recommended it to be sold but it was sold. It was a perfectly good boat, it would have lasted forever. It was a boston whale. Public service donated that boat to us. Then we had a perfectly good reserve fire engine. Nothing wrong with it that was sold before Ida. And then we lost a fire engine in the flood. We had to go out and buy a used one from somebody else. I think there are major bad decisions being made in this town...we should have a consultant come in and look at our organizational structure."
- 15            History of developer
- "If you think that they are going to be constructing all these buildings right away, that is not going to happen. You're going to find one building done and rented—probably not the affordable housing building—and the rest is just going to sit there for who knows how many years."
- 16            Affordable housing
- "I know that back in the 90s, the challenge was the mall and how it decimated downtown. There's been a lot of changes since then most of them good but the challenge now is managing growth and managing that growth in the context of climate change. I encourage the board to make decisions that make [town name] resilient to climate change and affordable to residents..."
- 17            Citizen advisory board
- "I would like, when a redevelopment committee is pulled together, that it actually represents the people. It would be really nice if they represented the diversity of this community."
- 18            Budget
- "The [community-based organization] has spent a sizable portion of their budget on strategic planning and public arts planning because we recognize that arts is certainly an economic driver..."

## Online Neighborhood Forum

Topic #	Topic name	Example quote
1	Mobilizing social capital	<p>"Please drop off all further donations to the fire department. The first responders will be bringing it in multiple trips. We appreciate all the donations."</p> <p>"Can anyone spare a few hours? We need some help organizing the clothing donations to make it easier for people to find the items they need."</p>
2	Local knowledge	<p>"Know your rights as renter. You are entitled to livable conditions which include a reasonable temperature. I had the same problem a couple years ago at my apartment..."</p> <p>"This is nothing new. No heat, too much heat, and then they replace the air conditioning unit with an old one that doesn't work. You know the slumlords own the same luxury apartments all over town..."</p>
3	Covid-19	<p>"Covid tests are free so it shouldn't matter. I would contact the county's health department if you have more questions."</p>
4	Educational resources	<p>"Does anyone have a lead on who has covid tests in stock?"</p> <p>"It's historic preservation month. Check out these how-to guides if you need guidance on preserving a building...#historicbuildings #howto"</p>
5	Policy and governance	<p>"If you're looking for a tutor, the national honor society offers free peer tutoring. Email [removed] at the high school and she can assign a tutor..."</p> <p>"There is one post claiming that the council was completely surprised by the storm. Another saying that the fault lies in the previous administration. Another screaming about Houston. Others giving the climate change argument a shot. Everyone is deflecting blame when there is uncontroverted evidence that the town has done great things the last few years but preparation for the storm was not one of them."</p>
Topic #	Topic name	Example quote

6	Updates on wellbeing	<p>"Update. My keys have been found. Thank you to everyone in the group that tried to help me find my keys. And a sincere thanks to [group member] for finding my keys!"</p> <p>"Yes, we are lucky to be staying at my mom's. My daughter has loved everything everyone has given her—she is the happiest little girl. My husband is still taking it badly...I have come to terms with it by helping neighbors..."</p>
7	Advice giving	<p>"Remember to always vet your contractors by asking for their license and insurance."</p> <p>"After [removed] died in the flash flooding, her family is urging others to purchase a safety hammer to prevent a similar tragedy from happening."</p>
8	Opinions of landlord/developer and solutions	<p>Opinions: "Pretty soon [landlord/developer] will want their name up on the buildings in town. Maybe even a street named after them. Slumlord."</p> <p>Opinions: "Just look at their background. The company has a reputation for not paying contractors...even though they have more money then you can imagine. They will always out lawyer the little guy."</p> <p>Solutions: "Register for a free online support group designed to bring awareness to our inner resilience in times of extreme uncertainty. This group is open to anyone interested in completing the disaster recovery workbook in a communal setting. This is a supportive community that provides tools to help with coping from trauma and stress brought on by recent disasters. Meets once a week."</p> <p>Solutions: "This situation is terrible. I am hoping that the residents file a class action lawsuit against the management company."</p>

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Topic #	Topic name	Example quote
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