

Flood Awareness for City of Austin Residents

Travis L. Maher

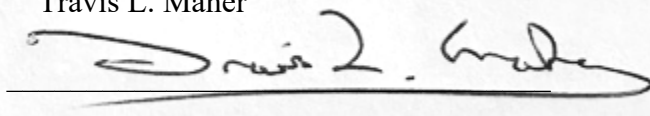
Austin Fire Department, Austin, Texas

Certification Statement

I hereby certify that this submission constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions or writings of another.

Print name: Travis L. Maher

Sign name: _____

A handwritten signature in black ink, appearing to read "Travis L. Maher", written over a horizontal line.

Date: 10/20/19

Flood Awareness for City of Austin Residents

Abstract

The problem is that the Austin Fire Department continues to make swift water rescue calls during localized flooding events, which jeopardizes the lives of both City of Austin residents and responders. The City of Austin and surrounding Travis County, Texas, historically have been in the middle of what has been known as flash-flood alley. Flooding, even more specifically flash flooding with high velocity water has been the major weather-related incident dealt with in this region. The purpose of this project is to identify mitigation strategies to prevent swift water rescue calls and free up emergency services to respond to other calls during localized flooding events.

This project has utilized the descriptive research method. The researched was based on six questions as the main guide. The questions begin by defining the areas most prone to flooding and the resources there for rescue. The questions then move into how other Texas fire departments as well as the state address flash flooding. And then the questions close with ascertaining public flood awareness programs in the U.S. and their effectiveness as well as recommendations for handling the volume of swift water rescue calls in flood prone areas of Austin.

The procedures included a ten-question online survey. The results (559 survey responses) demonstrated to an effective degree that messaging can be effectively communicated and unsafe behavior by the public can be changed. To achieve these goals the recommendations were for local and regional study to occur on how best to facilitate the communication of information for behavioral change. The plans that are developed must then be fully supported by organizations that embrace them culturally and in entirety.

Table of Contents

Introduction.....5

Background and Significance.....6

Literature Review.....10

Procedures.....16

Results.....17

Discussion.....30

Recommendations.....34

Appendix A: Survey Results.....39

Introduction

The problem is that the Austin Fire Department continues to make swift water rescue calls during localized flooding events, which jeopardizes the lives of both City of Austin residents and responders. The City of Austin and the surrounding Travis County are in an extremely high risk area of the state that commonly contends with flash flooding and the associated water rescues. These city-wide and sometimes larger flood events occur on the average twice a year. During that time the emergency response system is taxed at or near capacity. The purpose of this project is to identify mitigation strategies to prevent swift water rescue calls and free up emergency services to respond to other calls during localized flooding events. Descriptive research was used as this project's research approach.

There were six research questions developed to guide this applied research project. They are as follows:

1. What areas in the City of Austin are most prone to localized flooding?
2. What AFD resources are allocated to these areas for swift water rescue calls during localized flooding over the last three to five years?
3. How do other fire departments in flood prone areas of Texas address flash flooding (e.g., tactics, companies, public outreach and awareness)?
4. What are local and state officials doing to address flash flooding?
5. What are current public flood awareness programs in the U.S. and what is their effectiveness?
6. What are the recommendations for addressing the volume of swift water rescue calls in the most flood prone areas of the City of Austin?

Background and Significance

The central Texas region, also known as the Hill Country, is a broad area of Texas that has unique characteristics that contribute directly to the focus of this applied research project's problem. The problem is that the Austin Fire Department (AFD) continues to make swift water rescue calls during localized flooding events, which jeopardizes the lives of both City of Austin residents and responders by drawing resources in response to calls that can be mitigated and perhaps eliminated through increasing community diligence and sound decision making.

This region, made up of steep grades, canyons, and bluffs is mainly lined with rock. These geomorphic features, when combined with large quantities of rainfall over a short period of time, make for a deadly combination for both civilians in the area and responders. However, as fast as these water rise, they usually subside just as quickly. Leveraging this phenomenon may be the key to saving lives both directly from water rescues and indirectly from any other emergency that occurs during the same time period as these flash floods.

The Austin Fire Department is a large metropolitan all hazards response organization staffed with 1,181 firefighters and 113 civilians (Austin Fire Department [AFD], 2018). The Emergency Services Division is made up of 47 fire stations that include 45 engine companies, 16 truck companies, and four rescue companies. Operations offers an all hazards response that includes fire suppression, medical response, special rescue, hazardous materials mitigation, and wildland firefighting (AFD, 2018).

The special operations mission response is carried out by four rescue companies, five engine companies, and one Battalion Chief, all assigned to Battalion 6. Battalion 6 is a true functional battalion present throughout the other seven battalions in the City of Austin. All 138 Battalion 6 personnel are trained in 13 different disciplines to provide an all hazards response.

These companies also carry out the same firefighting and medical mission to which all AFD companies respond. Each of the five stations within Battalion 6 have a host of auxiliary equipment to facilitate the all hazards response capability. This equipment includes swift water boats, trailers and tow platforms; hazmat response vehicles and trailers; an incident support unit; and structural collapse equipment trailers.

The special operations battalion responds in the City of Austin and parts of Travis County, and it provides assistance when requested in the ten-county Capital Area Council of Governments (CAPCOG) region (AFD, 2018). Regional responses, specifically water rescue calls, dispatch resources several counties away from the City of Austin.

The above combined operations and special operations numbers are important for this reason: flash flood events in the City of Austin, Travis County, and the CAPCOG region compete for response resources. Water rescues during these events occur at such a pace that they often times encompass most of the fire department's response capability. This in turn stresses the system for the capacity to respond to the normal emergency calls for response that still occur regardless of current weather events in and around the region.

Historically, this region typically experiences an average of two mid-scale flood events annually, as reflected in National Fire Incident Reporting System (NFIRS) data (Water Rescue Data, CY2015-CY2019). These events potentially have the ability to affect the entire community as well as all first responders, both directly and indirectly. Direct effects involve residents needing rescue and responders who must perform said rescues. Indirect effects involve residents requesting all other emergency services not relating to ongoing flood event, and responders required to backfill deployed special operations units to support the continuity of service.

As the population in the area grows, this issue will only worsen. The impact of this issue on the department and its finite resources will continue to move toward depletion of resources during these critical response times.

During the second year of the National Fire Academy's Executive Fire Officer course, which focused on Community Risk Reduction, students studied and discussed the concept of the five Es. The five Es are as follows:

1. Engineering
2. Enforcement
3. Education
4. Emergency Response
5. Economic Incentives

Each of these five Es can be applied to and utilized to reduce the problem that jeopardizes the lives of residents and responders in the City of Austin during localized flooding events.

Engineering. Engineering is utilized to build better bridges and roadways that can sustain higher volumes of water runoff during torrential rains. Engineering can also be applied to water runoff systems to better contain and direct flood waters away from roadways and housing.

Enforcement. Enforcement can be used in such ways as in the consideration of fining drivers who intentionally drive around barriers and signage for their own rescues. Law enforcement could also be engaged to fine drivers who breaking the law regardless of whether or not the crime results in a rescue. Both of these avenues would have to be initiated with sound laws and regulations, along with collaborative efforts and communication between law enforcement agencies, fire agencies and city government. This specific initiative would require a

wide array of methods to socialize the initiative among the public and responders who serve them.

Education. Education, which will be the main focus for this researcher's project, is focusing the public's attention on the problem at hand: their need of rescue from flood waters as well as the secondary issue maintaining the same level of service for all of the non-water related emergencies during a flood event. Secondly, the project focuses on introducing potential solutions to change public behaviors that put community members in harm's way during a flood event.

Emergency Response. The project also attempts to indirectly facilitate a more efficient, effective use of finite emergency response resources during a regional flood event. By focusing on community risk reduction on the forefront of a potential flood event, the department can better utilize response resources during the actual event to address event response as well as day-to-day call volume.

Economic Incentives. Incentives can be utilized to persuade individuals and business into helping with the solution, including tax breaks and/or reductions. These would be granted for such things as education programs administered to their employees, posting of signage on their properties, and other positive activities that contribute to community risk reduction. These incentives can also be applied to individuals as well.

All of the Es can be used individually or collectively to help drive a solution or change a behavior that is both costly and dangerous to a community. In almost all instances, avoiding a dangerous situation, especially one that will require rescue, is much less costly from both a budgetary standpoint as well as asset/resource utilization standpoint.

The problem of AFD continuing to make swift water rescue calls during localized flooding events, which jeopardizes the lives of both City of Austin community members and responders, is most closely linked with the second goal of the U. S. Fire Administration. Goal number two reads: Ready the nation's fire and Emergency Medical Services for all hazards. By taking a non-traditional, global view of this problem, the Austin Fire Department will be reviewing ways to greatly reduce the impact of localized flood events on response capability and resources. Focusing on education and behavioral change can potential reduce the demand on department resource response to water rescue during flash flood events. By diverting smaller amounts of budgetary monies on the front end to education and public awareness, the Austin Fire Department may be able to avoid or reduce the amount of larger budgetary commitments of adding personnel (more expensive, highly trained personnel) and associated equipment costs for special operations rescue during a flood event. This in turn would theoretically facilitate companies' readiness and availability for response to the daily call volume that continues regardless of weather patterns.

Literature Review

Flooding is a natural, recurring disaster that continues to plague the residents of the City of Austin, Travis County, and the Central Texas region. Flooding from rains following Hurricanes Katrina, Rita, Ike, and Harvey are only the most recent large tropical storms that have impacted thousands of lives and cost billions in response and recovery efforts, some of which are still being carried out to this day. While not all disasters related to floods can be avoided, public education and outreach may be one cost effective mitigation effort that can significantly impact community risk reduction of water rescues resulting from flash flooding.

According to the official City of Austin website, approximately 75% of flood related deaths in Texas happen in vehicles ("If You Must Drive...", n.d.). In other words, only 25% of flood related deaths in Texas do not involve someone either intentionally or unknowingly driving into flood waters. Between 2010-2018, there have been 212 flood related fatalities in the State of Texas alone ("NWS Flood Fatality Statistics," 2019), of which 159 deaths were the result of vehicles in floodwaters.

Flooding as a community risk is multifaceted in that numerous reasons contribute to its occurrence. An article on radio station KUT's website suggests that the frequency of flooding in the Central Texas region will increase (Buschele, 2018). The National Oceanic and Atmosphere Administration released "Atlas 14," a flood analysis that uses nearly 60 years of historical data to predict future weather patterns (Buschele, 2018). Atlas 14 states Central Texas should anticipate more frequent and severe flooding in the future, a trend that scientists attribute to increasing atmospheric temperatures.

Per a recent article in Insurance Journal, rains caused flooding in northern, central and west Texas that resulted in seven water rescues in Merkel, Texas, and led to at least fatality in Austin, Texas, on Wednesday, May 8, 2019. The man's body was recovered in Lady Bird Lake approximately one-half hour after he was swept away (Lozano, 2019).

In that same article in Insurance Journal, Mr. Lozano also refers to a Texas Pacifico transportation railroad track was washed out near Mertzon, Texas. This occurred during the same May 2019 timeframe as the above death and rescues. "Scientists say climate change is responsible for more intense and frequent extreme weather such as storms, droughts, floods and fires, but without extensive study they cannot directly link a single weather event to the changing climate" (Lozano, 2019).

However, just because the frequency and severity of flooding are increasing does not mean the associated fatalities must increase in alignment with the historical ratio. Flood related deaths continue to plague the central Texas area. According to the Austin American Statesman, a woman died after she was swept away in flood waters along the Blanco River just outside of Blanco, Texas. Her death was the fourth connected to the same storm. The 74-year-old woman and a friend were in their vehicle when the vehicle was swept away in flood waters. The friend was located and rescued near where the car was washed away, and the 74-year-old fatality victim was recovered hours later downstream (Sechler, 2019). During this same time frame, the Austin American Statesman also reported that rescue teams responded to eighteen calls for water rescues in the City of Austin and the surrounding Travis County (Sechler, 2019).

As reported by Texas Storm Chasers, three to six inches of rain that fell in the early morning hours of May 4, 2019, in Travis and northern Hays counties caused dozens if not hundreds of low water crossings to become impassable. As rains continued to fall, nightfall approached and conditions only became more dangerous with visibility deteriorating. “Please avoid driving this evening if at all possible, in Travis County – including Austin.” (Reimer, 2019) was the message being broadcasted by Texas Storm Chasers. Texas Storm Chasers also reported that numerous water rescues were underway due to people driving into high, moving water.

NFIRS statistics between 2015 through 2019 for the Austin Fire Department revealed 48 % of the 2015 water rescue responses for the Austin Fire Department came from just two incidents: the Memorial Day floods and the Halloween floods (Water Rescue Data, CY2015-CY2019), of which 19 of 75 water rescue incidents occurred during the Memorial Day floods (Water Rescue Data, CY2015-CY2019). In other words, 25% of the total water rescue incidents

that occurred in 2015 were the result of a single flood incident (Water Rescue Data, CY2015-CY2019).

Seventeen of 75 water rescue incidents occurred over a two-day period, October 30-31, 2015 (Water Rescue Data, CY2015-CY2019), became what the community referred to as the 2015 Halloween floods. The Halloween flood water rescue incidents represented 23% of the total water rescue incidents for 2015 (Water Rescue Data, CY2015-CY2019).

The 2016 NFIRS data reflected somewhat similar data as 2015. Of the 38 total water rescue incidents, 39% were the result of two high rainfall periods (Water Rescue Data, CY2015-CY2019). The first occurred between May 26-30, 2016, with 10 of 38 water responses for 26% of the total water calls that year (Water Rescue Data, CY2015-CY2019). The second period was from August 16-20, 2016, which reflected four of 38 water response incidents for 13% of total water response incidents in 2016 (Water Rescue Data, CY2015-CY2019).

Data for 2017 is less consistent. Only four of 31 water related calls were clustered and occurred between June 3-5, 2017 (Water Rescue Data, CY2015-CY2019). Similarly, there were no major water response events in 2018.

However, current data for 2019 demonstrates a return to higher numbers of water rescues resulting from localized flooding. With data only available through early July 2019, 11 of 25 water calls occurred in a single 24-hour period on May 3, 2019 (Water Rescue Data, CY2015-CY2019). This represents 44% of the total water rescue response calls for 2019 only six months into the year.

Trending statistics support that the severity of storms, when they occur, demands a tremendous amount of resources over a short amount of time. It is during these times when residents, first responders, and emergency response systems seem to be taxed the most and are

most vulnerable. In a paper written for the National Fire Academy's Executive Fire Officer program, author Chris Riley addresses several flood and weather-related challenges in his community of Portsmouth, Virginia. Riley specifically states, "No matter the cause, global warming, solar events affecting weather, or the coincidental chances of increased winds, weather fronts or tidal fluctuations, rising waters are posing more of a risk to the City of Portsmouth's' citizens and emergency personnel." (Riley, 2017, p. 5). Their problem is that both residents and responders are placed at a higher risk of preventable injury and medical incidents during severe weather and that they have a growing flood problem in the mid-Atlantic region (Riley, 2017). Capt. Riley goes on to highlight these increases in weather related incidents by including the most recent storms affecting their area: Isabel, Floyd, and Mathew. The problems caused by these storms were exacerbated with the lack of appropriate reporting for said incidents (Riley, 2017).

Riley goes on to discuss that their specific problems have been researched by both private and government groups. "Virginia's Department of Emergency Management (VDEM) sees flood problems as 'one of the major threats facing Virginia annually.' ("Threats," 2016, para. 1)" (Riley, 2017, p. 12). To deal with this recognized flooding problem, the Virginia Department of Emergency Management states that residents' preparation could be bolstered by notifications from weather radios, local TV, and local alert systems. These are some of the ways that they help combat and reduce the risk of flood water events – through notification.

Riley writes that the first step in reducing risks associated with this is public education, which is closely followed by the need for preplanning by the responsible departments. The National Institute for Occupational Safety and Health (NIOSH) specifies that having established policies and procedures is very important (Riley, 2017). First responders knowing on the front-

end expectations and responsibilities only goes to make extra-emergency situations somewhat more manageable, which in turn only goes to increase the positive outcomes for both those in need and those professionals there to help.

Branson, Missouri, experiences some of the same difficulties as Portsmouth, Virginia. “Severe weather patterns are increasing in the Branson area resulting in a higher frequency of flash flood occurrences.” (Novak, 2018, p. 3). In the past 15 years, Branson Fire has responded to 13 swift water incidents with 11 of those in the last two years (Novak, 2018). Novak cites information from the National Research Council (2013), which states that over the last several decades, extreme weather is on the rise and contributing to loss of life and property damage (Novak, 2018).

Novak also addresses human interaction and the urban interface. Roads crossing waterways, whether low water crossings, culverts or bridges are all taxed with stormwater runoff. These issues are exacerbated by the geography, specifically the Ozark Mountains. With low water crossings being the most affordable option, all of these factors contribute to a dangerous urban interface during extreme weather that includes rainwater (Novak, 2018).

Novak also discusses the public’s gross underestimation of flood risk as per the National Research Council, 2013. “Flood danger taken too lightly may be due to only being able to recall significant events rather than more frequent less damaging incidents leading to an underestimate of what flood damage can occur.” (Novak, 2018, p. 17). Human behavior worsens these dangerous weather situations.

In conclusion the literature researched for this project supports that flooding and the weather systems that result in flooding are on the rise both from a frequency and a severity standpoint. Because of the rise of these incidents, residents continue to put themselves in harm’s

way. As a result, first responders continue to risk their lives to save these residents. The challenge is what can be done on the front end, before the flooding event and these rescue incidents occur to keep civilians informed and educated to the point where they modify behavior to mitigate the frequency of water rescues during weather incidents. Hence the risk to first responders will be lessened and their skills and services can be better utilized for services and situations that cannot be avoided by education and/or public information.

Procedures

In order to gather input and opinions on the public perception of flooding and the associated risks, a survey was crafted with ten questions. The survey was written using the online survey service, Survey Monkey. The survey was then distributed to first responders, family and friends of first responders, and community members with little to no emergency response history. The survey received 559 responses.

Invitations for the survey were sent to 386 of the researcher's personal contacts as well as all employees of the Austin Fire Department, which includes 1,181 uniformed members and 113 civilians for a total of 1,294 from the Austin Fire Department. With these numbers alone, the response rate is 33.27%. There is however additional information.

In the invitation email sent out for the survey, there was an additional request that all survey responders also forward the survey link to three additional friends, family, co-workers, etc. in an effort to maximize and diversify the civilian response. If multiplying the survey recipients by four (which would be the initial recipient's response along with three more responders), then the total number who potentially received the survey link increases to 6,720 people. The response ratio for 559 responses from 6,720 is 8.32%.

A reasonable assumption is that the true response rate falls somewhere between 33.27% and 8.32%. The substantial range constitutes a major limitation of the research procedures, specifically the request to those surveyed to forward the survey to three more acquaintances. While the additional people surveyed was an overall positive, the exact number to whom the survey was sent remains unknown. This in turn makes it difficult to determine the exact response ratio. However, at the time the survey closed, 559 responses were captured for analysis and represented a diverse community not limited to the emergency response field.

Results

The following are the results from a ten-question survey on flood awareness. **Question 1: Do you believe the average Central Texas resident is educated on flood awareness?** This question ascertained if the public perceives a lack of flood awareness education. Only approximately 21% of responders believed the average Central Texas residents is educated in flood awareness. The majority of survey responders (79%) answered residents are not educated in flood awareness.

Q1 Do you believe the average Central Texas resident is educated on flood awareness?

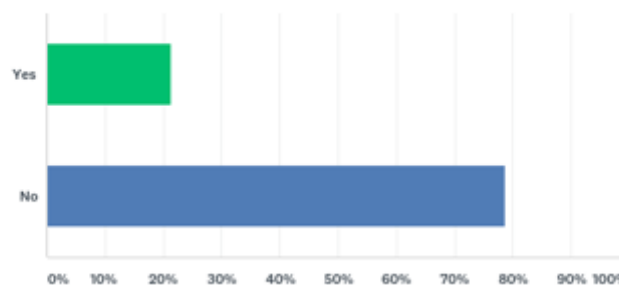


Figure 1. The majority of survey responders do not believe the average Central Texas resident is educated on flood awareness.

Question 2: What option do you believe would most effectively reduce loss of life as a result of flooding? Survey responders had five answer options: 1) Public service messages;

2) Gates/barricades at low water crossings; 3) Flashing signage; 4) School education; 5) Other (please specify). This question collected feedback on what actions make a difference in saving lives due to flooding. Over 45% of survey responders chose gates/barricades at low water crossings. This beat out the next choice by over double, which was flashing signage mandating no crossing when water is over the roadway/bridge, which was selected by 21.43% of survey responders. School education programs ranked the third choice, selected by 16.79% of survey responders. Public service messages came in at 9.11% as the second to last choice, and Other was the last choice with only 6.96% selecting it.

Q2 What option do you believe would most effectively reduce loss of life as a result of flooding?

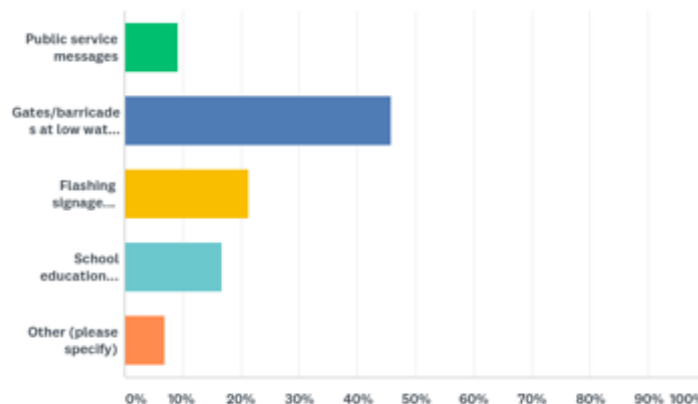


Figure 2. The majority of survey responders selected gates/barricades as the most effective means to reduce loss of life as a result of flooding.

If choosing other, the survey requested responders provide additional detail. Within the “Other” category, there were 39 responses. Of those responses, remaining situationally aware of surroundings, a combination of some of the above options, serving fines to those breaking the law, updated road designs, all of the above, and social media were the most frequent suggestions

that accompanied the “Other” answer selection. “All of the above” was the most frequent detail in 15 of the 39 occurrences of the “Other” selection.

Question 3: How have you modified your behavior to mitigate the dangers of flooding? (Select all that apply). Survey responders had six options: 1) Restricted travel (stayed home or in one place); 2) Modified route; 3) Identified road closures; 4) Observed barricades; 5) Waited for water to subside; 6) Found higher ground. This question was designed to target which behavior modifications residents would most readily choose for themselves. “Modified route” was chosen 407 times or 72.68% of the time. “Restricted travel (staying home or in one place)” was chosen 386 times or 68.93% of the time. “Observed barricades” was chosen 364 times or 65.00% of the time. “Identified road closures” was chosen 260 times or 46.43% of the time. “Waited for water to subside” was chosen 243 times or 43.39% of the time, and lastly “Found higher ground” was chosen 124 times or 22.34% of the time.

Q3 How have you modified your behavior to mitigate the dangers of flooding? (Select all that apply)

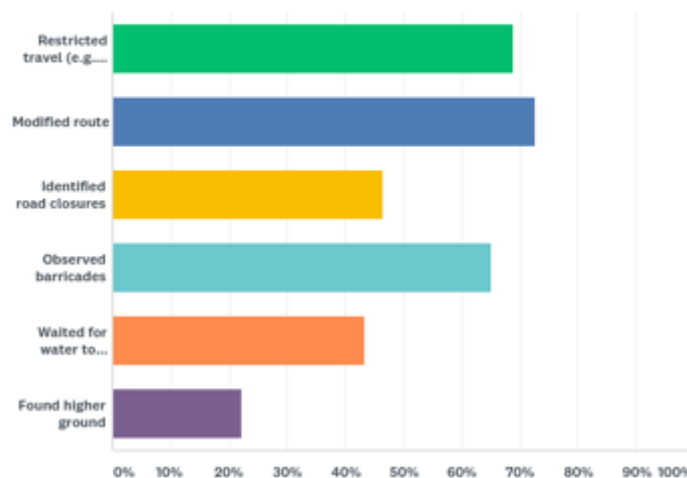


Figure 3. “Modified route,” “Restricted travel,” and “Observance of barricades” were the most commonly selected behavior modification to mitigate the dangers of flooding.

Question 4: Have you seen or heard public service announcements about the dangers of flooding in your community? Survey responders were given the answer options of “Yes” or “No.” This question is intended to begin to measure the effectiveness of public safety announcements. Over 88% responded in the affirmative. Nearly 12% responded in the negative.

Q4 Have you seen or heard public service announcements about the dangers of flooding in your community?

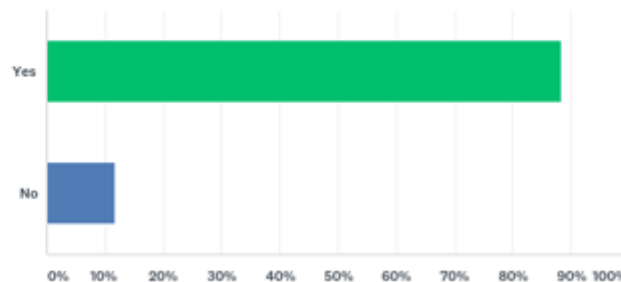


Figure 4. An overwhelming majority of survey responders confirmed they had seen or heard public service announcements about the dangers of flooding in their communities.

Question 5: Are public service messages effective at changing dangerous behaviors? Survey responders were given the answer options of “Yes” or “No.” Again, this question goes to more accurately measure the effectiveness of public safety measures, specifically on changing dangerous behaviors. Approximately 58% (285 responses) responded yes., while 31% (151 responses) responded no. While this disparity is not quite as dramatic as in question 4, responses to both questions lean towards positive public response to public service messaging.

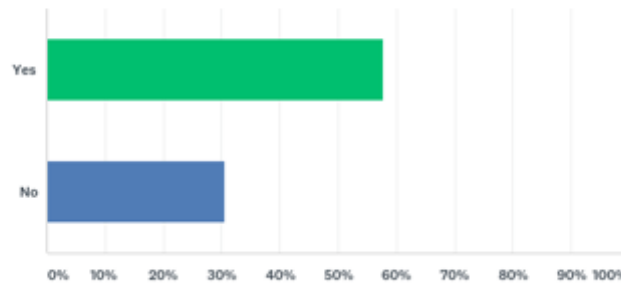
Q5 Are public service messages effective at changing dangerous behaviors?

Figure 5. The majority of survey responders answered “Yes” to the question about whether or not public service announcements are effective at changing dangerous behavior.

Question 6: Describe why you believe public service messages are not effective at changing dangerous behavior. The question was written open ended so as to gather as many reasons possible as to why the survey responder believed that public service messaging does not work in order to better drive the solution and its implementation. Of the 559 total responses, there were 201 responses to this question, all of which are captured in the Appendix. Of those responses, what follows are a sample of the responses received:

- Many no longer watch regular tv or listen to radio
- People do not pay attention to them
- People never think the worst will happen to them
- “It won’t happen to me” mentality [quotation marks added for clarity]
- Because people are creatures of habit and will take the same road regardless of conditions
- People do not want to be inconvenienced
- Same message over and over, its [sic] natural not to pay attention
- Without an awareness of the power of moving water, people do not pay attention

Question 7: Where have you seen or heard public service announcements about the dangers of flooding? (Check all that apply) Answers consisted of the following: 1) Radio (includes internet and satellite radio); 2) Website (excluding social media); 3) Email; 4) Television; 5) Podcast; 6) Social media; 7) Text; 8) Voicemail. This question was intended to discern where public service messages are heard and or recognized the most. Television was selected most often with 422 selections or 87.19% of the time. Radio was the next choice most commonly selected with 375 selections or 77.48% of the time. These were followed by social media with 221 selections or 45.66% of the time. Next was a Website (excluding social media), which was selected 134 times or 27.69%. Text followed with 108 selections or 22.31% of the time. Email was selected 61 times or 12.60%. Voicemail was selected 20 times or 4.13%. And finally, podcast was selected three times or 0.62%. Of those polled, the three highest ranking media were television, radio (including internet and satellite radio) and social media.

Q7 Where have you seen or heard public service announcements about the dangers of flooding? (Check all that apply)

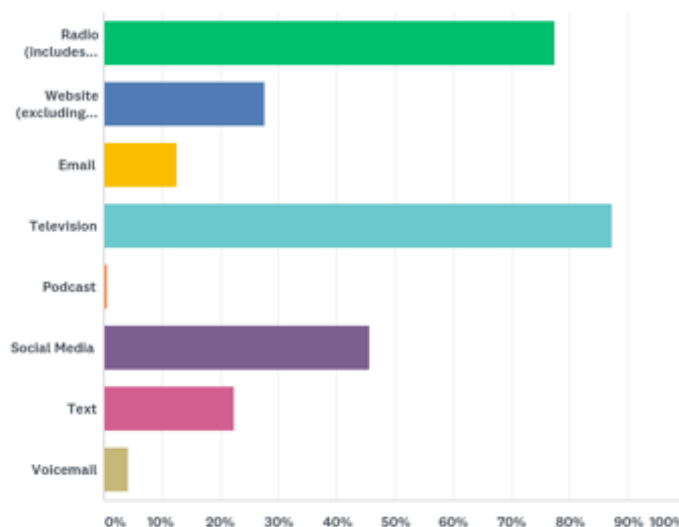


Figure 6. The majority of survey responders selected radio and television as the means by which they received public service announcements.

Question 8: What would be the most effective medium for you to receive public service messages about the dangers of flooding? (Select the option you prefer the most) Answer options consisted of the following: 1) Radio (includes intranet and satellite radio); 2) Website (excluding social media); 3) Social Media; 4) Email; 5) Television; 6) Text; 7) Voicemail; 8) Podcast. This question was designed to delve even deeper and discover the exact medium those surveyed prefer today for public service messages. Text was selected the most at a rate of 240 times or 43.64%. Then, social media 119 times or 21.64%. Next was radio (includes internet radio and satellite radio) with 84 selections or 15.27%. Closely followed by television with 83 picks or 15.09%. Email and website (excluding social media) each with 10 selections or 1.82%. Voicemail had four selections or 0.73%. Podcast came in last with 0 selections or 0%. This brings an interesting incongruity when compared to Question 7. While those polled recognize they have seen or heard the most public safety announcements on television, when asked what medium they prefer (Question 8), “Text” was selected the most often.

Q8 What would be the most effective medium for you to receive public service messages about the dangers of flooding? (Select the option you prefer the most)

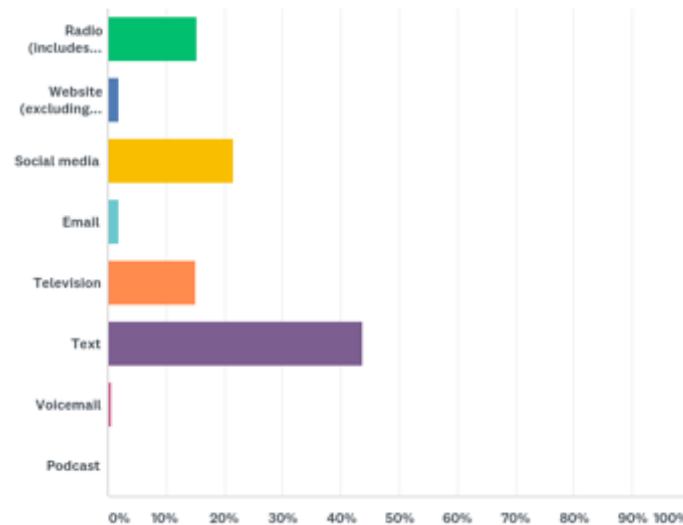


Figure 7. The majority of survey responders selected “Text” as the most effective medium to receive public service messages about the dangers of flooding.

Question 9: What is the most effective way for you to learn and retain public service messages? (Select the one option that is most effective for you). Answer options consisted of the following: 1) Real life stories; 2) Numbers, facts and figures; 3) Jingles or catch phrases; 4) Step-by-step instructions; 5) Other (please specify). “Real life stories” was selected by the significant majority of responders for a total of 274 times representing 49.82% of responders. Jingles or catch phrases was next with 87 selections or 15.82%. Step by step instructions followed closely with 83 selections or 15.09%. Lastly is Other (please specify) received 12 selections for 2.18% of total responses. In the Other (please specify) category, the 12 responses ranged from instructions for specific geographical areas, maps, enforcement, bill boards along highways, animated videos, TV news to real life stories.

Q9 What is the most effective way for you to learn and retain public service messages?
(Select the one option that is most effective for you)

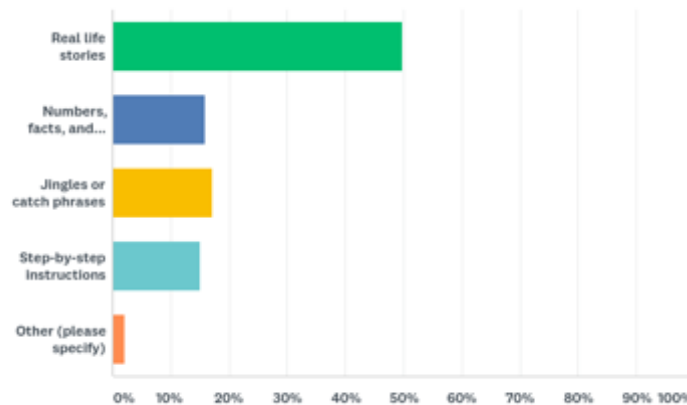


Figure 8. The majority of responders selected “Real life stories” as the most effective way to learn and retain public service messages.

Question 10: Which option do you believe is the best way to fund flood risk reduction efforts? Answer options consisted of the following: 1) Tax increases; 2) Fee/ticket for those rescued; 3) Donations; 4) Grants; 5) Other (please specify). To conclude the survey, the last question was intended to discover how survey responders best think flood risk reduction initiatives should be funded. Often this aspect of new programs is not addressed until later in the development. Grants was selected most often with 249 selections, which represented 45.27% of responses. Next was Fee/ticket for those rescued with 180 selections or 32.73% of responses. Then Tax increases with 54 selections or 9.82% of responses. Following tax increases is Other (please specify) with 42 selections or 7.64% of responses with a wide array of content. All of these comments are included in the Appendix. Donations received only 25 selections representing 4.55% of responses.

Q10 Which option do you believe is the best way to fund flood risk reduction efforts?

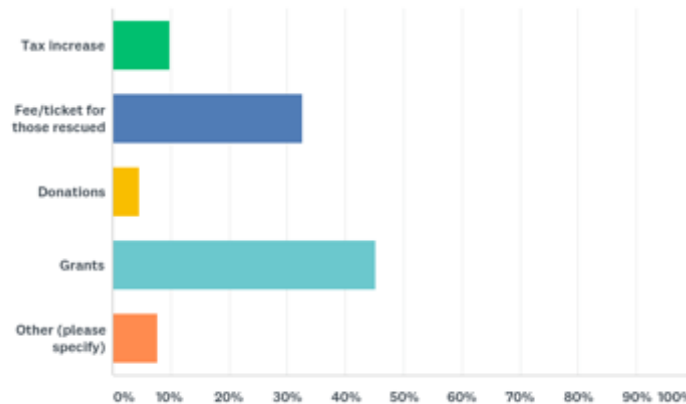


Figure 9. “Grants” and “Fees/ticket for those rescued” were the most commonly selected options for funding flood risk reduction efforts.

There were six research questions developed for this project. What follows are each question and their associated answers and research.

Question 1: What areas in the City of Austin are most prone to localized flooding?

The City of Austin has several areas prone to localized flooding. Most of these areas coincide with or are along local creeks to include Boggy, Onion and Slaughter Creeks in southwest Austin. Barton Creek and its tributaries are in west Austin. Shoal and Waller Creeks run into the central and downtown areas of Austin. Walnut, Wells Branch, and Harris Branch Creeks are in north Austin. And Onion Creek is also problematic in east Austin. The most flood prone areas are central and east Austin. However, there are low water crossings and low-lying roads throughout Austin and Travis County that are all problematic during flooding. With respect to this issue, the flood prone areas are almost in all parts of the City of Austin.

Question 2: What AFD resources are allocated to these areas for swift water rescue calls during localized flooding over the last three to five years? The Austin Fire Department has 45 engine companies, 13 truck companies and four rescue companies staffed with four

personnel each, 24/7. This is important because every uniformed member receives swift water training to the operations level in the cadet academy. Then they receive periodic swift water continuing education throughout their career.

The Austin Fire Department Special Operations Battalion (Battalion 6) currently has 138 members assigned, all of which are trained to the swift water technician level, and 52 of those are boat operators for still water and/or swift water. Battalion 6 also has eight Zodiac swift water inflatable rescue boats, 10 rafts, and two personal water crafts. All of these resources are spread throughout the city. This is by design as all parts of the city have flood prone areas and historically when it does flood most of Battalion 6 is engaged with a large portion of the operations fire companies engaged as well.

Question 3: How do other fire departments in flood prone areas of Texas address flash flooding? Dallas Fire/Rescue has six stations that have flat water (non-swift water) response capabilities. Three of these stations are equipped with Zodiac 380 inflatable rescue boats, while the other three have Zodiac 380s as well as Rescue One connector boats. All six of these stations require two trained boat operators on duty every shift. These stations are strategically located in Dallas near lakes (C. Abney, personal communication, October 2, 2019).

Dallas Fire/Rescue (DFR) will have two swift water rescue stations. Station 34 currently is equipped with two Zodiac 420 inflatable rescue boats, two NRS (river) rafts and is staffed with 10 swift water technician trained personnel daily. Station 30, coming online December 1, 2019, will have one Zodiac 420, one NRS (river) raft, and six swift water technicians daily. DFR also has the ability to stand up additional six-person swift water teams during periods of severe weather (C. Abney, personal communication, October 2, 2019). The water rescue response for the San Antonio Fire Department (SAFD) comes from two Special Operations stations, Station

11 and Station 51. Station 11 is staffed with 10 personnel daily, all of whom are trained to the swift water technician level. Station 11 is equipped with five Zodiac 420 inflatable rescue boats and one river (NRS) raft (R. Baring, personal communication, October 2, 2019). SAFD Station 51 is also staffed with 10 personnel daily, all of whom are trained to the swift water technician level. Station 51 is equipped with three Zodiac 420 inflatable rescue boats (R. Baring, personal communication, October 2, 2019). In all, SAFD carries a total of 66 personnel to staff these two stations., all of whom are trained to the same level (R. Baring, personal communication, October 2, 2019).

The Houston Fire Department (HFD) has two districts that handle water events depending on the type of emergency: swift water versus flood water. District 11, the Special Operations District, is composed of three rescue companies throughout the city and responds to swift water rescues. This district is made up of 60 personnel in total, all of whom are trained to the swift water technician level. Each of these three companies is equipped with three Zodiac 420 inflatable rescue boats, four jet skis, two towing platforms and one Achilles inflatable rescue boat (B. Moreno, personal communication, October 2, 2019). HFD responds to flood water rescue events utilizing District 14. District 14 includes an 80-personnel water strike team that is equipped with 19 flat bottom boats and nine high water vehicles.

Question 4: What are local and state officials doing to address flash flooding? Local officials are addressing flash flooding using a myriad of strategies. The first thing local officials are doing is supporting budgetarily the water rescue response mission of AFD. AFD has a capable response element that is well staffed, trained and equipped. This capability is located throughout the city to respond in a timely fashion to wherever flooding or the need for water rescue occurs. While this program has been successful, it is continuously reviewed and updated

to stay in touch with the ever-changing needs of the residents and visitors of and to the City of Austin.

Through its Watershed Protection Department, the City of Austin also manages 130 rain or creek level gauges, flashing lights or automated barricades at 15 low water crossings, gauge adjusted radar rainfall, cameras at low water crossings and predictive modeling mapping (City of Austin Watershed Protection Department, 2019). The state of Texas also supports the Turn Around, Don't Drown initiative in several ways, one of which is on the Texas Department of Transportation's website where weather alerts, road closures and flood safety information is displayed (<https://www.txdot.gov/inside-txdot/media-center/statewide-news/14-2016.html>).

Question 5: What are current public flood awareness programs in the U.S. and what is their effectiveness? The most recognizable and probably most well-known flood awareness program is the Turn Around Don't Drown program founded by the National Weather Service (NWS) warning coordination meteorologist Hector Guerrero in 2004. While working in the NWS office in Brownsville, Texas, Guerrero chose the phrase after brainstorming with firefighters from Harlingen, Texas. Guerrero, the NWS Southern Region Headquarters, the Texas Division of Emergency Management, the Federal Alliance for Safe Homes and the City of Fort Worth Fire Department partnered together and launched the program in 2003. This phrase was trademarked by the National Oceanic and Atmospheric Administration (NOAA) and launched nationally in 2004 (<https://www.weather.gov/news/140207-turn>).

As for the effectiveness of this public service campaign, "Since then, hundreds of permanent Turn Around Don't Drown signs have been established along roadways prone to flooding across the U.S. and the slogan has become an often repeated catchphrase in the media,

classrooms, and even the home. In addition to the NWS education materials, NWS partners also distribute resources bearing the phrase.” (<https://www.weather.gov/news/140207-turn>).

Question 6: What are the recommendations for addressing the volume of swift water rescue calls in the most flood prone areas of the City of Austin? The first recommendation is to maintain support for the current water rescue resources in AFD. When comparing the AFD response model to that of Dallas Fire/Rescue, the San Antonio Fire Department, and the Houston Fire Department, the AFD model is extremely competitive if not more robust, as substantiated for a community in the heart of flash flood alley.

The second recommendation would be to build off of the success of the Turn Around, Don't Drown public awareness campaign. It has been proven that this ad campaign with its educational tenants has saved lives. This researcher believes opportunities need to be pursued to continue to elicit the interest of the general public and to garner wholesale change in dangerous behavior that has historically led to flood-related deaths. Educating the public on what to be aware of and what not to do is an inexpensive endeavor when compared to the potential lives that can be saved through simple avoidance. And, with avoidance the cost savings gained by resources not responding to as many water rescues, not to mention the in-service gains of fire and emergency services being available for the normal routine calls that continue during flooding.

Discussion

The first survey question establishes the perceived need for flood awareness education. The question reads: Do you believe the average Central Texas resident is educated in flood awareness? An overwhelming 78.57% of those surveyed believe the average resident is NOT educated. This directly coincides with information on the City of Austin's website stating that

75% of flood related deaths in Texas occur in vehicles ("If You Must Drive...", n.d.). If these drivers could be educated on flood awareness, simply changing their own behavior could drastically lower the number of flood related deaths, and in turn leave valuable emergency response resources available for other emergencies.

Question 4 of the survey asks have you seen or heard public service announcements about the dangers of flooding in your community? Again, there was an overwhelming response with 88.27 responding in the affirmative. This is proof that public service messages are seen and heard. Further proof that public service messages have positive effects can be found within the Turn Around, Don't Drown campaign. This messaging has been around and in use for over 16 years. Second of all it has a wide base of partnership that supports it: National Weather Service, the Texas Division of Emergency Management, the Federal Alliance for Sale of Homes, the City of Fort Worth (TX) Fire Department and the National Oceanic and Atmospheric Administration (who trademarked this phrase) to name a few. This consortium has supported this to the point that the media now uses it freely and often as the catch phrase for flood awareness. It is also in education materials that distributed by the National Weather Service.

Question 5 asked those who participated if public service messages are effective at changing dangerous behaviors. Nearly 58% of survey participants responded that they do indeed affect changing behaviors. This corresponds directly with the longstanding and effective usage of the Turn Around, Don't Drown campaign. Again, as mentioned above this mantra has served well for over 16 years and is still going strong. It has effectively drawn together organizations from the local, state and federal levels forging partnerships still in use today. This overall coalition has led the way in public service announcements and public education programs across the state of Texas. "In an effort to renew the "Turn Around Don't Drown" trademark, the NWS

Hydrologic Services Division provided documentation to the Patent and Trademark Office in fall of 2013 to show that, “Turn Around Don’t Drown” is actively used in print and as a public education campaign.” (<https://www.weather.gov/news/140207-turn>).

Question 7 asked those surveyed where they saw or heard public service announcements about the dangers of flooding. The top three chosen from the choices given were television at 87.19%, radio at 77.48%, and social media with 45.66%. Of these, this researcher believes the social media numbers to be of the most interest. Social media is skyrocketing in use everywhere. “Social media, local television and radio channels are resources that fire and emergency resources can use to disseminate information preceding weather and flood events, during the events, and recovery information that follows the event.” (Riley, 2017). While Captain Riley agrees on the top three sources of the survey, social media is the newest of these media. And with its growth and use it can be logically concluded that this medium in particular will be the one to watch and experiment with for alerting the public to vital emergency messaging.

Finally Question 8 asked what would be the most effective medium for survey responders to receive public service messages about the dangers of flooding? Of the choices, text messaging was chosen the most at 43.64%. The next closest was social media at 21.64%. Interestingly, both of these choices necessitate mobile access to the internet in order to be utilized effectively in real time. Although text messaging is simple and easy for the end user, it would require emergency management and/or first responder agencies to access a registered list of mobile phone numbers, which may require registration from the public.

With social media, these agencies can simply post messages and information to various social media sites, and the information is immediately accessible to followers. The

effectiveness of this option with the massive increase in social media usage seems ideal for broadcasting public service announcements.

This author's interpretation of these results are as follows: if emergency management agencies and first responder agencies can continue to tap into the resources to which residents are already routinely visiting on their own, then intended audience is captured. It is then up to *effective communication*, namely real-life stories/personal narratives per the survey results, to change life endangering behaviors. If the public will change their own behavior with some guidance and education, emergency response resources are and will remain available for other incidents that perhaps cannot be avoided quite so easily. At the least it should reduce the current burden to emergency response systems during these events. Secondary to this and no less important, first responders themselves will be less exposed to these high-risk incidents simply because the public has chosen not to put themselves into these situations that require rescue assistance.

As a final note, the researcher would like to expand on the above-mentioned term *effective communication* and how it relates to the public as well as the organizational implications for AFD's Public Information Officer (PIO) and staff. Effective communication will require continuous monitoring and measurement. Specifically, ongoing monitoring and research into technological advancements and how current generations use these technologies will inform how AFD and the PIO effectively communicate with the public. This will be a constant and consistent process to ensure efforts maintain their relevance and align with change.

The final recommendation on the continuity and evolution of effective communication processes is to maintain focus on organizational implications. A major implication and priority for any department and its Chief is budget. These community risk

reduction efforts will require funding, potentially for a small team (depending on community size) to research and remain current on technological advancements and trends. The team will need to be able to craft effective and timely announcements and information prior to (when possible), during, and post incidents.

Another organizational implication is the need for the entire organization to support public safety messaging, including the need for members to publicize and advocate for not only the messages but the media in which the messages are broadcast. This will most likely be a cultural shift for most organizations. But if the membership is shown how effective these initiatives are and the potential cost and asset savings that can be incurred, their support will follow suit.

Recommendations

The overall recommendation based on the research conducted is that an organization must discover how best and most effectively to communicate public service education and announcements in their local area. Then the organization must commit financially and organizationally to educate, alert, and change behaviors the public demonstrates that requires rescue and/or medical attention during flood events.

Specifically, local history, surveys, and demographic information must be gathered and organized on how best to reach local residents. In the Austin/Travis county area, initial qualitative research indicates television, radio, and cell phones (text and social media). With this information a plan has to be developed to educate the public on the specific local flood dangers and behaviors to avoid during flooding. Real-life stories that discourage dangerous behavior and/or encourage desired behavior must be identified and broadcast for justification and buy-in.

A second plan must be developed for communicating information just prior to and during a flood incident. This is where a call to action (or request for inaction) would be disseminated. Ask the public to put to use the information and training that they have received. Reinforce that this will not only save their lives and those of their families but it will also reduce the dangers faced by first responders. By doing this, more resources will be available for response during times when response systems traditionally are taxed the most.

These recommendations require two things to be successful: budgetary support and an organization's cultural support. Appropriate funds must be earmarked for this endeavor. Overall this potentially will be an overall cost savings, not an added expense. But the risk is that the overall cost savings most likely will not show itself initially. Reasonable funding must be provided for research, development, media and for appropriately trained personnel to carry out this initiative. Cost savings will be demonstrated through reduced call volume and/or resource requests during the flood disaster incidents. The community or response area's rate of population growth may nullify the ability to measure true cost savings. AFD may only achieve a slower rate of growth for the department's special operation's needs, which would be an indirect cost savings.

The second item needed for success is the department's cultural support, which could potentially be more difficult to secure than budgetary resources. The Chief of the department must be an advocate for these initiatives and socialize their importance. That attitude and support must be echoed throughout the Department's chain of command. It must become part of the culture. Secondly, civilian personnel must support and be educated on these initiatives as well. Even they (managers, accountants, public information, etc.) must know the ins and outs of these programs so they can speak to them and support them whether they are out

in public on personal business or in front of the city council and/or Mayor. Full support has to come from the entire organization culturally.

Lastly, education for new hires and cadets (if you are a fire service organization) would be a bottom up approach to organizational enhancement. Adding flood awareness and prevention strategies to new employee orientation to employers' risk mitigation module is one option to stimulate cultural change in a consistent way. This effort, too, would require long range commitment as it would be several years before the benefits are measurable.

References

- Austin Fire Department. (2018). *Annual Report 2018*. Retrieved from <http://www.austintexas.gov/sites/default/files/files/Fire/Reports/AnnualReport-2018.pdf>
- Buschele, M. (2018). Texas Flood Risk is likely greater than Federal Study suggests. Retrieved from <https://www.kut.org/post/texas-flood-risk-likely-greater-federal-study-suggests>
- City of Austin Watershed Protection Department. (2019). Flood early warning system. Retrieved from <http://www.austintexas.gov/department/flood-early-warning-system>
- If You Must Drive... (n.d.). Retrieved from <http://www.austintexas.gov/department/flood-safety>
- Lozano, J. A. (2019). Flash Flooding in Texas leaves 1 dead in Austin. Retrieved from <https://www.insurancejournal.com/news/southcentral/2019/05/10/526116.htm>
- National Weather Service: <https://www.weather.gov/news/140207-turn>
- Novak, M. (2018). *Strategies to reduce the Number of Vehicles entering flooded Roadways in Branson, Missouri*. Emmitsburg, MD: National Fire Academy.
- NWS Preliminary US Flood Fatality Statistics. (2019). Retrieved July 31, 2019, from https://www.weather.gov/images/arx/floodeaths/2018_total.png
- Reimer, D. (2019). Significant Flooding ongoing in Travis. Hays Counties (including Austin). Retrieved from <https://texasstormchasers.com/2019/05/significant-flooding-ongoing-in-travis-hays-counties-including-austin/>
- Riley, C. M. (2017). *Risk Reduction for Flood Water Events*. Emmitsburg, MD: National Emergency Training Center Library.
- Sechler, B. (2019). Body of woman swept away by Blanco River flooding recovered. Retrieved from <https://www.statesman.com/news/20190505/body-of-woman-swept-away-by-blanco-river-flooding-recovered>

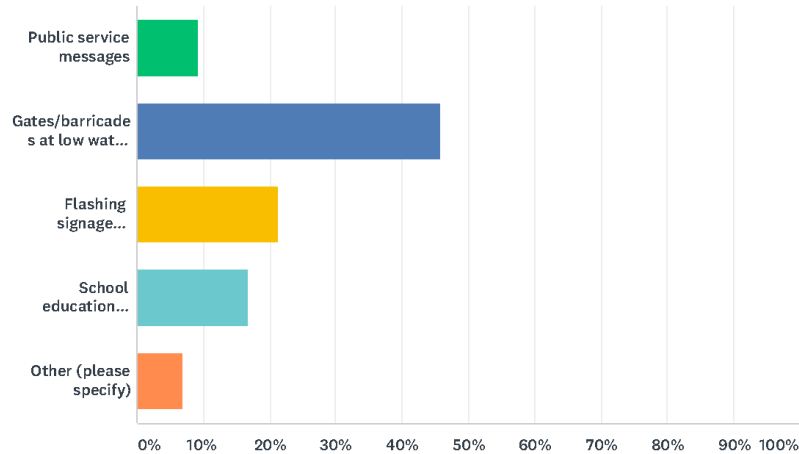
Water Rescue Data - CY2015-CY2019 [NFIRS data]. (CY2015-CY2019). Unpublished instrument. Austin, TX: Austin Fire Department.

Appendix A: Survey Results

Flood Risk Reduction

Q2 What option do you believe would most effectively reduce loss of life as a result of flooding?

Answered: 560 Skipped: 0



ANSWER CHOICES	RESPONSES	
Public service messages	9.11%	51
Gates/barricades at low water crossings	45.71%	256
Flashing signage mandating no crossing when water is over the roadway/bridge	21.43%	120
School education programs on flood awareness for young drivers	16.79%	94
Other (please specify)	6.96%	39
TOTAL		560

#	OTHER (PLEASE SPECIFY)	DATE
1	common sense not to drive into high, swift water at low water crossings during flooding. Paying attention to news alerts. Not driving around barricades.	8/25/2019 2:58 PM
2	Combination of public message and school educational programs.	8/25/2019 9:44 AM
3	I think public service message showing a before and after of roadways with the no water, then water over the roadway with a car being swept away. If there's a legal way to do this - the fear of injury and death is a huge motivator.	8/24/2019 11:37 AM
4	If I could have picked all 4 answers I would have. All 4 would be an improvement for the general public.	8/23/2019 9:17 AM
5	Fines and flashing signage	8/23/2019 8:18 AM
6	None. The public is too stupid	8/23/2019 6:26 AM
7	Police or public service at low water crossings. Folks are going to try to cross regardless of barriers unless someone personally forbids it	8/23/2019 6:13 AM
8	Design roads to eliminate flooding on the roadway. People can't be trusted to do the right thing.	8/23/2019 5:25 AM
9	All of the above combined notifications and education	8/23/2019 5:21 AM

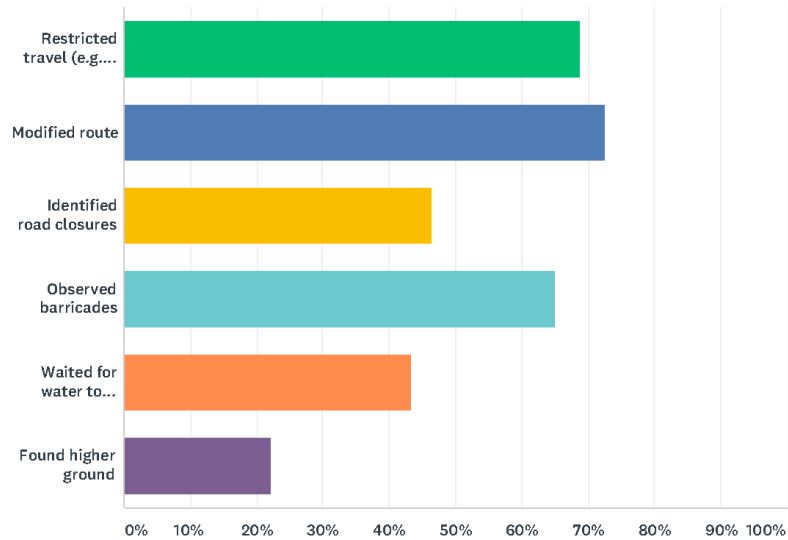
Flood Risk Reduction

10	Start a public awareness program including fining people that drive around barricades	8/23/2019 5:06 AM
11	arrest and ticket people who cross barricades. People need to see here is punishment	8/23/2019 4:04 AM
12	I don't have a good answer	8/22/2019 2:41 PM
13	Proper enforcement of zoning and building codes.	8/22/2019 7:41 AM
14	Combination of all of the above.	8/21/2019 10:23 AM
15	All of the above	8/21/2019 1:46 AM
16	All of the above items	8/19/2019 9:17 AM
17	Flashing signage may be ok, but if there's not a permanent type of gate or barricade at those low water crossings that get blocked/closed due to danger, people are still going to just go around thinking they can make it.	8/19/2019 5:48 AM
18	Both B & C	8/19/2019 5:05 AM
19	All of the Above	8/19/2019 3:15 AM
20	all of the above	8/19/2019 2:49 AM
21	MORE PUBLIC AWARENESS, SHOW MORE STATISTICS ON DEATH TO WAKE PEOPLE UP.	8/19/2019 2:28 AM
22	Flashing signage combined with gates barricades	8/19/2019 1:32 AM
23	Combination of education programs and public service messages with real life examples	8/18/2019 8:40 AM
24	All of the above	8/18/2019 5:55 AM
25	I think all of the above would help but education would probably be at least the top of my list & not just for young drivers..... I think bringing it to the classroom & the presentation be age appropriate.....how many times have we heard about someone life being saved because the young child learned how to dial 911 in an emergency & learned about giving resuscitation on a t.v. program or in school, etc.	8/18/2019 5:26 AM
26	Something similar to amber alerts, when warnings are appropriate.	8/18/2019 5:18 AM
27	Social media	8/17/2019 10:35 PM
28	Social media awareness	8/17/2019 5:49 PM
29	All of the above	8/17/2019 1:07 PM
30	all of the above	8/17/2019 1:06 PM
31	All of the above	8/17/2019 6:10 AM
32	Fine them a large sum of money if they tried to cross when warnings were posted.	8/16/2019 11:13 AM
33	You can't fix stupid!	8/16/2019 7:14 AM
34	All the above are some what effective, hitting their pocket books (tickets) for their rescue should be reinforced	8/16/2019 6:01 AM
35	I don't know that anything will help. I feel the issue with the mentality of the public. We already have signs and barricades.	8/15/2019 4:20 PM
36	programs for schools and general public/use Library	8/15/2019 2:49 PM
37	All of these measures	8/15/2019 10:02 AM
38	A combination of education, advanced warning signage and barriers.	8/15/2019 9:06 AM
39	All of the above	8/10/2019 3:34 PM

Flood Risk Reduction

Q3 How have you modified your behavior to mitigate the dangers of flooding? (Select all that apply)

Answered: 560 Skipped: 0



ANSWER CHOICES	RESPONSES	
Restricted travel (e.g. stayed home or in one place)	68.93%	386
Modified route	72.68%	407
Identified road closures	46.43%	260
Observed barricades	65.00%	364
Waited for water to subside	43.39%	243
Found higher ground	22.14%	124
Total Respondents: 560		

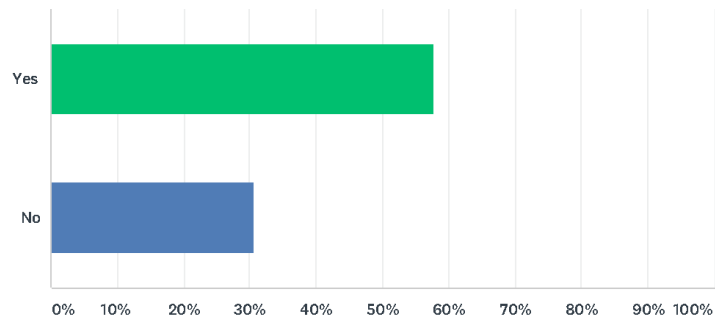
#	OTHER (PLEASE SPECIFY)	DATE
1	Never drive through flooded roads	8/28/2019 4:11 PM
2	watching the news, checking a weather app on the phone, plus the emergency messaes that get broadcast to a phone	8/25/2019 7:27 AM
3	avoid low water crossings on route	8/24/2019 7:57 AM
4	no , im usually responded to the incident	8/23/2019 8:18 AM
5	I check Drivetexas.org	8/20/2019 6:33 AM
6	Education and training in flood situations	8/19/2019 3:00 AM
7	All the above	8/17/2019 10:35 PM
8	Social media	8/17/2019 7:21 AM

Flood Risk Reduction		
9	I am in public safety so all apply	8/16/2019 6:01 AM

Flood Risk Reduction

Q5 Are public service messages effective at changing dangerous behaviors?

Answered: 493 Skipped: 67



ANSWER CHOICES	RESPONSES	
Yes	57.81%	285
No	30.63%	151
TOTAL		493

#	OTHER (PLEASE SPECIFY)	DATE
1	Do not know, but, can only hope that people listen.	9/16/2019 2:23 PM
2	Yes only to a small degree.	9/10/2019 12:57 PM
3	I'm not sure about other people. For me they are - "Don't let you dog swim in Town lake". I haven't seen dogs swimming in town lake.	9/1/2019 3:49 AM
4	Somewhat. Some people pay attention but not everyone.	8/31/2019 5:15 AM
5	I would say for some but blocking the road is most effective	8/26/2019 11:56 AM
6	Sometimes people just dont listen	8/26/2019 9:47 AM
7	Possibly, but not significantly	8/26/2019 7:58 AM
8	As long as the TV continues to work. Most do not have weather radios	8/26/2019 3:38 AM
9	it depends on how the message is received by the individual. Some yes some no.	8/25/2019 9:22 PM
10	I don't think so. People have to make a conscious choice to behave safely. PS messages provide information and awareness - people have to act appropriately.	8/25/2019 2:59 PM
11	For some. But not all.	8/25/2019 12:06 PM
12	To some degree, education is key, must continue to inform.	8/25/2019 9:45 AM
13	if people will listen	8/24/2019 4:17 PM
14	they help me	8/24/2019 11:37 AM
15	individual based. some yes some no. That is why we still respond to vehicle in high water.	8/24/2019 8:45 AM
16	I think they are effective for a large percentage of the population. There will never be just one source that notifies everyone. But, the more sources we can use, the better. Everything from public notifications on social media, news agencies, twitter, websites, AND onsite barricades - all should be utilized.	8/24/2019 8:08 AM

Flood Risk Reduction

17	not always, but it's a good form to start educating public	8/24/2019 7:59 AM
18	Cant say	8/24/2019 7:27 AM
19	Minimally.	8/23/2019 9:15 PM
20	I don't know	8/23/2019 5:00 PM
21	In some cases, but to be honest there are a lot of idiots/careless people in the world who think they're above natural disasters.	8/23/2019 11:47 AM
22	Yes and no. People might hear the announcement but discount the info thinking they "it wont happen to them"	8/23/2019 9:18 AM
23	I don't know. You still see plenty of people on the news who opted to do stupid things	8/23/2019 9:11 AM
24	Depends on level of intelligence of those receiving the message.	8/23/2019 7:33 AM
25	Everyone knows turn around, don't drown but this does not define high water or relay how quickly conditions change.	8/23/2019 7:31 AM
26	If they show real footage	8/23/2019 7:18 AM
27	Not always. Personal experience is best.	8/23/2019 6:36 AM
28	Don't know.	8/23/2019 6:13 AM
29	Yes but only a small percentage.	8/23/2019 5:33 AM
30	Somewhat effective	8/23/2019 5:30 AM
31	Some people will never listen, but I believe the majority of people will when they see the potential consequences of ignoring warnings	8/23/2019 5:18 AM
32	I know some people ignore warnings whether they see the messages or not.	8/23/2019 5:08 AM
33	If the rules are not enforced people just ignore them	8/23/2019 5:06 AM
34	For some Yes, for others nothing will help!	8/23/2019 4:52 AM
35	I'm not sure	8/23/2019 4:47 AM
36	People are dumb. Public service messages are effective however there's always that small population who don't seem to care	8/23/2019 4:47 AM
37	For some contentious people, but they are a bit generic in that they don't typically state where the road is dangerous just that it could be and with the mentality of "it won't happen to me" risk is not actually avoided	8/23/2019 4:40 AM
38	Depends on the audience on the channel of the public service message. Text, television, social network, etc.	8/23/2019 4:37 AM
39	Yes it makes people aware, but my feeling is that everyone feels the warnings aren't really applicable to them or the circumstances when they are presented with a situation	8/23/2019 4:28 AM
40	I believe it depends on the outlet. Social media vs. newspapers	8/23/2019 4:15 AM
41	This isn't a yes or no I think a large portion of citizens are so involved in their life they don't pay attention to the info	8/23/2019 4:06 AM
42	A push warning to phones like amber alert would be better	8/23/2019 3:58 AM
43	I think stupid is going to do stupid	8/23/2019 3:58 AM
44	Central Texas has so many new residents not from this region. I meet these folks daily and they are ignorant that flash floods have always been a threat in South Central Texas due to topography and the increased amount of impervious cover. Flash flood public education should be as prominent and persistent as smoke alarm education	8/23/2019 3:53 AM
45	somewhat	8/23/2019 3:45 AM
46	you dont always know if they reach the intended target	8/23/2019 3:20 AM
47	sure, sometimes. But obviously not enough...hence this survey	8/22/2019 2:42 PM
48	Alerting is a benefit, but alerting and specifying alternate routes for commuters will increase safety.	8/22/2019 7:42 AM

Flood Risk Reduction

49	I'd say yes to 80%	8/21/2019 10:24 AM
50	Don't know. I hope so.	8/21/2019 8:21 AM
51	For the most part but I believe that people are so pre-occupied they are not paying attention	8/19/2019 1:20 PM
52	Yes, if you can get the message to the public. Difficult given the various medium of communication (radio, TV, streaming, social media, etc.)	8/19/2019 6:52 AM
53	They can be but it seems like no matter what message gets out, people will still not listen	8/19/2019 5:49 AM
54	It's hard to determine. You'd have to identify that dangerous behavior has NOT taken place, and then investigate the reason why it hadn't.	8/19/2019 3:53 AM
55	Not sure. But I think they are good idea.	8/19/2019 3:11 AM
56	Only with the population that adheres to them.	8/19/2019 3:09 AM
57	Difficult to quantify. At the very least they do hurt and probably make a positive difference. If I had to answer yes or no, I would say "yes".	8/19/2019 3:02 AM
58	For some of the population, not everyone	8/19/2019 2:55 AM
59	I DONT THINK PEOPLE REALIZE THAT IT COULD HAPPEN TO THEM	8/19/2019 2:29 AM
60	Provided the populace understands the dangers.	8/18/2019 12:01 PM
61	& news stories on t.v.	8/18/2019 5:27 AM
62	People don't understand the power of water and how fast they can get in trouble.	8/18/2019 5:24 AM
63	To a certain extent. People still have the "it doesn't apply to me" attitude.	8/18/2019 4:30 AM
64	Generally yes but unfortunately some will always disregard barriers	8/18/2019 12:57 AM
65	Only in the population that listens to broadcast radio and news.	8/17/2019 4:29 PM
66	I think many folks either tune it out with all the distractions of today's world or simply don't believe it applies to them or their situation	8/17/2019 11:03 AM
67	Yes but people also have to take responsibility into their own hands . We are in such a hurry these days that people take risks.	8/17/2019 10:55 AM
68	I'm not sure...I listen to them but I'm not sure everyone does	8/17/2019 10:28 AM
69	depends on individual and frequency	8/17/2019 10:04 AM
70	Somewhat. They are effective but need to be reinforced with some "real life" examples. These can be retelling of things that happened to real people, possibly their neighbors. This might help the message resonate with them if they KNOW people who were impacted.	8/17/2019 8:37 AM
71	Not all of the public pays attention to service messages	8/17/2019 6:56 AM
72	If one person changes then it's effective. Maybe not efficient but effective	8/17/2019 6:41 AM
73	For most of the public	8/16/2019 11:13 AM
74	I believe that some, not all, people will do whatever they want to do. Whether they are aware of the risks or not.	8/16/2019 9:12 AM
75	Not sure. I listen to them but I can't speak for the rest of the population.	8/16/2019 7:06 AM
76	ongoing ongoing ongoing constant education	8/16/2019 6:02 AM
77	Sometimes	8/16/2019 5:45 AM
78	sometimes. People will do stupid stuff	8/15/2019 5:11 PM
79	Messages plus education, are persons fined if they cross barriers and then need assistance	8/15/2019 2:50 PM
80	I'd say they are effective for 79% of the people. The others don't think the rules apply to them.	8/15/2019 11:07 AM
81	Only effective to those who heed the warnings	8/15/2019 11:00 AM
82	People with limited experience in icing water do not heed warnings	8/15/2019 10:49 AM
83	unsure	8/15/2019 9:56 AM
84	Hopefully	8/15/2019 9:33 AM

Flood Risk Reduction

85	Civilians that do not realize the power of moving water do not take heed and proceed without thinking of actual risks.	8/15/2019 9:11 AM
86	For some people, it not everyone	8/15/2019 9:10 AM
87	marginally effective, unless tied to a real story	8/15/2019 9:09 AM
88	Doesn't seem to be. Data doesn't support it.	8/15/2019 9:09 AM
89	How ever the messages must include very specific routes to avoid and the consequences of driving through the areas.	8/15/2019 9:08 AM
90	I believe they can be bit human behavior has shown me different.	8/15/2019 9:07 AM
91	Yes if they have already been taught or explained the "why" behind the messages then they can serve as a reminder. Otherwise, most people will probably think it doesn't really pertain to them or that they are above the message.	8/15/2019 8:55 AM

Flood Risk Reduction

Q6 Describe why you believe public service messages are not effective at changing dangerous behavior.

Answered: 201 Skipped: 359

#	RESPONSES	DATE
1	People surf channels and change them on commercials.	9/21/2019 8:21 AM
2	It is like quit smoking campaigns. You have to wonder if more people know about the Chantix turkey than the commercials running for 'Turn Around. Don't Drown.' Maybe a more impactful message that involves kids at schools who will share this with their parents.	9/16/2019 2:25 PM
3	The average person does not pay attention to warnings until it affects that individual or someone close to him/her.	9/16/2019 9:35 AM
4	Only a small % people pay attention to PSA and this type of person isn't the type to take risk.	9/10/2019 5:50 AM
5	ive seen several service messages on tv but it doesn't seem to working very much. I think a young inexperienced driver shown the the dangers of a little of flood water would make a difference.	9/5/2019 3:12 AM
6	Most often fail to point out that moving and passing a barricade indicating "road closed due to high water" is illegal (misdemeanor) and that if a person ignores a warning sign and needs to be rescued, they will bear full cost of rescue which is not covered by insurance. Most messages are too polite, need to strike home and assure the danger and cost is understood.	9/3/2019 5:57 AM
7	They are too common, creating complacency and dismissal. They also do not effectively reach the targeted population	9/2/2019 4:13 PM
8	With new technology, many people do not watch regular TV channels or listen to the radio. They watch movies and Netflix or their own song play list. The majority of the younger generation does not watch local news. The message does not get out.	9/2/2019 10:47 AM
9	I think they reinforce good behaviors that are already being demonstrated. For example, even with PSAs (and a law against it), texting while driving is a very common problem.	9/1/2019 9:11 AM
10	people don't pay attention to them	8/31/2019 7:36 AM
11	Too many people disregard them and think they know best.	8/31/2019 5:15 AM
12	Enforcement is needed to curb stupidity	8/31/2019 3:45 AM
13	People never think the worst will happen to them.	8/30/2019 11:07 AM
14	People don't believe bad things could happen to them or they believe that they can overcome the problem.	8/29/2019 2:03 PM
15	You can't fix stupid!!	8/29/2019 10:57 AM
16	They do not seem to influence members of public prone to risky behavior. Hence drivers continue to drive around barricades or across flooded bridges.	8/29/2019 7:38 AM
17	I think that there are some people who just do not/will not listen to them (just like they ignore barricades).	8/29/2019 6:18 AM
18	People don't always refer back to that information when it's time for the to make a decision.	8/28/2019 4:13 AM
19	We are all familiar with the "Turn Around Don't Drown" campaign. The problem I see is that drivers don't realize the water is covering a lot of the road until too late -- when they are already in it. It's not that the driver sees the water over the road, thinks about it, then makes a decision to cross through because he thinks he can probably make it.	8/27/2019 10:35 AM
20	I believe that we naturally have a built in defense mechanism of "it won't happen to me", so public service messages are often ignored.	8/27/2019 7:58 AM
21	Public Service messages in their current form (TV, Radio, some social media) are easily ignored, especially by younger people who are inundated with electronic stimulation for 10+ hours per day. I believe these messages could be tweaked to make them more memorable (make them an ad they have to watch before seeing a video on YouTube or FaceBook).	8/27/2019 5:46 AM

Flood Risk Reduction

22	people don't pay attention...They tend to have a "that can't happen to me" attitude.	8/27/2019 4:58 AM
23	People do not take it seriously	8/26/2019 11:56 AM
24	They are like commercials. Most people turn them out unless it is one that is clever or runs for a long period of time.	8/26/2019 11:29 AM
25	Sometimes people dont listen and think the water is not that high or their car can make it if they go fast. They just dont want to take the extra time to find another way or to wait	8/26/2019 9:48 AM
26	Significant flooding is not a common occurrence in Central Texas. Public Service announcements are not targeted - they air when the air - so it's not top of mind when an event does happen.	8/26/2019 8:01 AM
27	People do not heed the message.	8/26/2019 7:48 AM
28	As a 911 call taker for the fire department for 11 years, every flood event we routinely get people swept away in the same locations that have no flashing lights and barricades. Public service messages fail because people are creatures of habit and they think they take that road everyday and a little water on the roadway isn't going to make a difference.	8/26/2019 3:45 AM
29	They work well for pre-warning. Once the signal is affected or the electricity goes off, it is not helpful.	8/26/2019 3:39 AM
30	People in general do not want to be inconvenienced about having to change their wants with regard to public safety. If they want to get from point A to point B, they'll cross that low water crossing because it "... won't happen to them."	8/26/2019 2:51 AM
31	people don't pay attention to them and are often self centered about the routes they take ("I {cant/don't know how to} go another way)	8/26/2019 2:28 AM
32	People are gonna do what they want to do, despite being warned. If they want to get somewhere, safety is a low priority. They just want to get there. Physically blocking low water crossings, or closing parking close to rivers seems more effective because it eliminates convenience and it physically blocks their vehicle from being able to cross flood areas.	8/26/2019 2:26 AM
33	I still hear about deaths where a driver tries to cross a low water crossing.	8/26/2019 1:24 AM
34	People inherently adopt the "It won't happen to me" mentality and they continue to take risks. Messages have to have a personal component. Put a face and name to tragedy much like we do in Aviation with aircraft accidents.	8/25/2019 9:25 PM
35	Apathy, can't happen to me attitude. New residents in community every day. Public Service messages would have to be constant and then they would be ignored. Not enough enforcement with stiffer penalties for going around a barricade.	8/25/2019 3:11 PM
36	People have to make conscious choices to act appropriately/safely. It's just like anti-smoking messages - people are going to smoke despite the known dangers. PS messages can inform, but that is it. People have to want to NOT drive around a barricade and then call 911 for help when they are sitting on top of their vehicle, if they are lucky and didn't get swept away. Smart people with common sense benefit from public safety messages. Barricades at low water crossings have to guarantee that vehicles can't drive through or around them to stop those that don't care to protect themselves.	8/25/2019 3:04 PM
37	The fancy slogans do not work. We need more actual footage of people getting saved and the dangers of the act itself.	8/25/2019 12:09 PM
38	Messages do not fully illustrate how water easily moves vehicles.	8/25/2019 7:57 AM
39	stupid/ wreckless people don't heed wisdom, therefore the message falls on deaf ears?	8/25/2019 7:53 AM
40	I feel a lot of people just hear them over and over and they become a voice in the background due to the infrequency most people interact with the actual issue.	8/25/2019 7:41 AM
41	They don't go on all media at the same time so people have the chance of skipping the channel broadcasting by accident or intentionally	8/24/2019 4:20 PM
42	People only hear what they want to hear - they have "It won't/can't happen to me" mentality, then blame others when they don't follow directions.	8/24/2019 2:39 PM
43	Because it's a me world out there and no one cares bc they know someone will come and get them.	8/24/2019 9:04 AM
44	Same message over and over again, it is natural to not pay attention.	8/24/2019 8:46 AM

Flood Risk Reduction

45	As mentioned earlier, I believe there is some positive outcome to public service messages. Local (onsite) obstructions need to be utilized in case people forget or didn't hear the public service announcements. Not to mention visitors who may not be aware of the low water crossings within their route - lack of familiarity with the area.	8/24/2019 8:10 AM
46	Everyone knows the term "turn around don't drown" but people still drive through flood waters. If people think they can make it they will try.	8/24/2019 7:55 AM
47	Some do not hear or see it, some have gotten lucky in the past and it reinforced bad behavior so it is ignored.	8/24/2019 7:28 AM
48	They are not truly considered. And people don't think it's dangerous until it's too late.	8/23/2019 9:16 PM
49	The average citizen in our country is not very intelligent.	8/23/2019 6:23 PM
50	People are impatient, and don't believe anything bad will happen to them. Also past behaviors, which did not end with poor outcomes, enforces the belief that they are safe when they are not.	8/23/2019 5:02 PM
51	The message says turn around, don't drown, but there isn't follow up to answer the question of how to find a different route that doesn't have low water crossings. Sounds like Google could add that as a different layer after traffic. Also, the effort and money spent to educate, respond, train etc. could fund fixing the low water crossing to raising it above the flood plain	8/23/2019 11:57 AM
52	Easily ignored	8/23/2019 11:48 AM
53	I think they can be, and believe they should still exist.	8/23/2019 11:48 AM
54	People think they know more than the professionals posting warning	8/23/2019 10:19 AM
55	They dont take the message seriously	8/23/2019 9:18 AM
56	I don't think it's the fault of the communication. There are always going to be people who do stupid things	8/23/2019 9:13 AM
57	Personal belief is that people ignore the messages. I have no hard data to back that up, other than the evidence that every year there are multitudes of public service messages delivered and every year there are multiple fatalities due to drivers ignoring barricades. It is possible there would be more fatalities without the messages, however.	8/23/2019 8:15 AM
58	Overall, people do not understand the force of just a few inches of fast-moving water and the fact that it can sweep your car away. As a result, many proceed through low-water crossings or circumvent road barricades. This seems to be an occurrence every year.	8/23/2019 8:06 AM
59	Not enough people are media savvy. They don't pay attention to tv, radio or printed media. Internet, yes. And they have cell phones and are on them constantly. So have the carriers push flash flood and flood warnings to the users.	8/23/2019 7:55 AM
60	People in this culture think they know better, law enforcement doesn't enforce reckless driving, etc. People are generally self serving as well	8/23/2019 7:42 AM
61	Everyone knows "turn around, don't drown" but this does not define high water in layperson's terms or illustrate how quickly conditions change. A visual of low water immediately changing to deep water that submerges a car or water pictured as a big hammer might be more effective.	8/23/2019 7:34 AM
62	People don't believe it'll happen to them.	8/23/2019 7:33 AM
63	They aren't specific enough. Just because it's flooding in Travis county doesn't mean my area is affected at all. That being said if I was planning to travel and I got an alert I would check online for road closures.	8/23/2019 7:23 AM
64	Drunk driving is still very prevalent despite drink drive go to jail, plus many more slogans, signs, and commercials. It's in our culture, as I typed this response I literally had someone say "I just did it the other day". I believe that can be applied to many other types of dangers.	8/23/2019 7:09 AM
65	Some behavior is only changed after experiencing an event. Or having someone close to you experience an event. The thought of "this could never happen to me" is first in a lot of people's heads.	8/23/2019 6:37 AM
66	The general public simply does not listen to them and they think they know better.	8/23/2019 6:25 AM
67	I don't think people ever take into consideration the risk of flood waters, but that's more of a human thing , rather than a messaging issue	8/23/2019 6:24 AM
68	No opinion	8/23/2019 6:13 AM

Flood Risk Reduction

69	I believe people believe "it won't happen to me".	8/23/2019 5:52 AM
70	People just do what they are used to doing no matter what. There will always be the one or two people that get stuck in a flood	8/23/2019 5:49 AM
71	Humans' innate selfishness and ego overcome education and lead to dangerous behaviors.	8/23/2019 5:31 AM
72	The segment of the population that ignores them is likely the same group that will engage in risk taking behavior. People who might be ignorant of dangers will change behavior. Those who are willing to engage in dangerous behavior will ignore the message.	8/23/2019 5:25 AM
73	Do not take minor flooding seriously	8/23/2019 5:23 AM
74	They probably work for most people but we always hear of someone driving around barricades.	8/23/2019 5:09 AM
75	in one ear and out the other.	8/23/2019 5:07 AM
76	There are too many instances that a PSA is heard, but the listener is not impacted. PSA that cried wolf...	8/23/2019 5:05 AM
77	Human nature. I do not believe people will alter their behavior based on a PSA. I feel a physical barrier completely blocking access to a flooded roadway is the only way that people will comply.	8/23/2019 4:58 AM
78	Especially with SUVs and Trucks being so common in Texas, people mistakingly equate the size and weight and road height of vehicle to safety and stability... And then cross even when signs and lights are present. I believe an effort to educate the science behind the power of moving water, and the little surface of tires actually "holding" vehicles to the ground.	8/23/2019 4:55 AM
79	People don't think it will effect them.	8/23/2019 4:53 AM
80	It seems that someone always drives around a flood barrier during a flash flood, regardless of how many messages go out over the year.	8/23/2019 4:49 AM
81	They are however a small percentage of the population are too dumb to care	8/23/2019 4:48 AM
82	Again, depends on the audience. Some folks may ignore it like an Amber Alert or not actively watch television because they utilize more the apps like netflix, hulu, amazon prime where you don't get alerted. I personally don't read some alerts on my phone like an Amber Alert; I quickly ignore them to shut off the sound and continue about my day. Some people just have the mentality as it won't affect them or impact them if they do receive a public service message.	8/23/2019 4:48 AM
83	not specific enough to location; It won't happen to me mentality	8/23/2019 4:40 AM
84	They do not stop a person from driving across a dangerous area, they make you aware of danger, but the rain falling down does that also, people are creatures of habit, so they are going to drive the same path over and over again unless physically prevented by a barrier.	8/23/2019 4:35 AM
85	Most people ignore them or think it doesn't apply to them.	8/23/2019 4:24 AM
86	Very few people pay attention to anything other than their phones	8/23/2019 4:22 AM
87	I think they are effective, as long as they reach as many people as possible. Can't just limit messages to one or two outlets. People are on twitter more than they are on kxan.com	8/23/2019 4:16 AM
88	1) The hazard is only discussed when the weather conditions are indicative of a flash flooding event. 2) The public is generally ignorant of hydraulic energy of moving water. The Central Texas fire service should consider creating a simple but effective public education tool like people standing in moving water illustrating the energy of moving water. 3) In the Austin Metropolitan Service Area, we have many residents with < 3 years of living in this area and don't understand that when they leave their subdivision, the conditions and flood controls will change if they travel outside of Austin. Many people do not know that Travis County enforces flood plain rules. Hays County doesn't enforce the flood plain rules. My point is enforcement is not uniform in this region since Texas doesn't adopt a state wide building code. 4) Home buyers not from this area or time zone are ignorant of flood plane rules. Living on the river means they are in a flood plane and they rely on their insurance to cover the property loss. They don't understand that Austin FD (or any other responders) have limited resources and we may be unable to rescue you.	8/23/2019 4:15 AM
89	Because people are ignorant	8/23/2019 4:10 AM
90	Same answer as previous ? I believe society still overlooks the warnings. Most likely reached by same system as amber alerts	8/23/2019 4:10 AM
91	People do not take the information to heart. They don't think it applies to them.	8/23/2019 4:05 AM

Flood Risk Reduction

92	People don't care or realize the real danger	8/23/2019 4:04 AM
93	Because there are people out there that don't care and see a public service as a dare... You cant help idiots who don't care.	8/23/2019 4:01 AM
94	Because people don't take them seriously or chose to ignore them.	8/23/2019 3:45 AM
95	People don't think it will happen to them.	8/23/2019 3:34 AM
96	There will always be those that go around barricades and go tubing during a flood.	8/23/2019 3:34 AM
97	They are not very stern more like suggestions.	8/23/2019 3:33 AM
98	doesn't always hit the intended target. we should ask those who get swept away if they ever hear the messages	8/23/2019 3:20 AM
99	People don't follow the guidelines of the messages.	8/23/2019 1:14 AM
100	You can change some behavior but not all. A public service message is good, but that is just one part.	8/22/2019 2:59 PM
101	I believe they mostly fall on "deaf ears"	8/22/2019 2:56 PM
102	Because the people who need to observe/learn/heed the instruction do not pay attention/think it doesnt apply to them/that they can "outsmart" nature	8/22/2019 2:38 PM
103	People don't think it will effect them	8/22/2019 2:06 PM
104	People tend to ignore public safety messages for the most part. This is proven because "turn around, don't drown" has been around long enough for everyone to know that saying. Yet people still attempt to cross flooded low-water crossings all the time.	8/22/2019 2:05 PM
105	People have become callous due to information overload.	8/22/2019 10:07 AM
106	Most persons are or have tendencies to avoid government; simply put they don't like being told not to proceed through an area that they have used continuously. Don't like change.	8/22/2019 7:44 AM
107	They do not effectively relay the danger to the traveling public	8/21/2019 10:26 AM
108	I think people ignore the warnings	8/21/2019 8:22 AM
109	The Turn Around Don't Drown campaign is a great message. It's on radio, TV, and signs. Yet, people still drive into flood waters and drown all the time.	8/20/2019 2:50 PM
110	Most drivers are too impatient to have to wait or be rerouted.	8/20/2019 2:21 PM
111	It becomes background noise when heard over-and-over	8/20/2019 6:34 AM
112	In today's times people are so busy with life they hear the messages but they don't hear the messages. We have to figure out a way to get their attention so they will adjust their behavior.	8/19/2019 1:22 PM
113	Typically the messages lack significant loss visuals. Messages could include victim impact statements (maybe someone who needed assistance)	8/19/2019 11:54 AM
114	Not all receive the messages or just don't care	8/19/2019 11:52 AM
115	We are told to not do a lot of things DONT smoke dont drink and drive - its proven ineffective	8/19/2019 10:25 AM
116	People do not listen to the messages, and continue to drive around barricades thinking that does not apply to them, the same with the low water crossings, that is why the message needs to get out to all the schools and other education locations.	8/19/2019 7:23 AM
117	It is difficult to get the message out to the public. Various mediums (radio, tv, streaming services, social media, etc.) and transient population with only cell phones - no landline - makes it impossible to send out reverse 911 messages (even to cell phones if you rely on a system where the user has to sign up for the service).	8/19/2019 7:08 AM
118	People ignore them because they don't think it can happen to them.	8/19/2019 6:05 AM
119	People don't watch/listen/learn, "It won't happen to me mentality,"	8/19/2019 3:57 AM

Flood Risk Reduction

120	Many people choose to use their own judgement on water crossings. They contemplate the message they have heard and make a decision to adhere to or ignore it. Sometimes their ability to read water conditions isn't sufficient to make a safe decision. Experience of successfully crossing a flood point may build confidence for the next time. In addition, experience successfully crossing puddles (even deep puddles) or other flood water can build false confidence. Most people can't identify the hazard of the water energy ($KE = .5 \times \text{mass} \times \text{velocity squared}$) and force (ALC/T) as the flood water changes to moving water. In addition, the change in the ease of movement as water begins to float a vehicle can make a sudden change in its ability to push a vehicle off a road. Finally, people can't see the road and often run into a ditch causing submersion. Short answer-overconfidence and ignorance.	8/19/2019 3:47 AM
121	People believe they know better and think their plans are more important than getting to their destination safely.	8/19/2019 3:32 AM
122	Most people listen but do not hear. Until you actually see the water over the road, you do not believe that it is bad enough to close the road	8/19/2019 3:22 AM
123	I didn't say they weren't effective. I think that for a lot of people they are but I think there are still many people that just don't realize how strong water can be. People love water and don't usually associate it with anything dangerous.	8/19/2019 3:15 AM
124	I think they can be effective in some instances, but I think that they only reach a small portion of the population.	8/19/2019 3:07 AM
125	Have you seen the movie "Idiocracy". I feel PSM's are insufficient and engineering solutions are required. Given a choice, many people make the wrong decision.	8/19/2019 3:06 AM
126	They can educate but ultimately it is the persons decision	8/19/2019 2:55 AM
127	Newscasters preach turn around don't drown, but there are people out there that just don't have common sense, or must have the mindset that It can't happen to me.	8/19/2019 2:34 AM
128	TXDOT has had an active campaign for years, yet there are still drivers going through flooded areas	8/19/2019 2:30 AM
129	IT NEEDS TO SHOW MORE STATISTICS ON THE DANGERS OF DEATH, MAYBE THAT WOULD HELP	8/19/2019 2:29 AM
130	Individuals continue to try and cross low water areas when they are flooding. If they were effective, AFD/EMS/APD would see a decrease in rescues. Does the data show a decrease in rescues? Home developments is resulting in areas flooding, where people did not live before.	8/19/2019 2:16 AM
131	No one pays attention and do not think about it until it actually involves them. I will never happen to me.	8/19/2019 1:37 AM
132	Public apathy	8/19/2019 1:33 AM
133	Not enough direction, traffic laws should be upgraded for those crossing known flooding zone or barriers # deterrent.	8/18/2019 5:12 PM
134	Most people hear them but don't think it applies to them and they underestimate the seriousness of the message	8/18/2019 12:32 PM
135	I don't think that people really realize the power of water. Unless they have seen it's catastrophic effects, I think that they don't respect how dangerous flooding can be.	8/18/2019 9:48 AM
136	Because people are in a hurry and they believe that they will be able to make it even when it's obviously dangerous. Most have a hard time believing it will happen until it affects them directly	8/18/2019 8:41 AM
137	People don't remember them, unless they are announced at the time of the flood event occurring.	8/18/2019 7:38 AM
138	People are going to do what they think they can get away with.	8/18/2019 6:35 AM
139	They seem to be ignored or tuned out by the public.	8/18/2019 6:33 AM
140	The general public hear the message but don't pay attention. They think it won't happen to them.	8/18/2019 5:26 AM
141	No one listens!	8/18/2019 2:46 AM
142	I dont think people listen unless the message is relatable.	8/18/2019 1:36 AM
143	People still disregard them however overall I think they do work.	8/18/2019 12:58 AM

Flood Risk Reduction

144	I feel like the messages are only heard or seen by people who watch or listen to broadcast radio or television. If these were pushed out more over social media and internet radio. They would reach more people.	8/17/2019 4:31 PM
145	Most people ignore them	8/17/2019 2:24 PM
146	PSAs can easily be missed for many reasons, such as an auditory learning or hearing disability or limited access to a radio or television. People often will make a conscious decision to ignore a public service message as well.	8/17/2019 2:12 PM
147	Because people don't pay attention to them	8/17/2019 1:35 PM
148	It's not effective because the message would be played over and over again and people would just ignore it.	8/17/2019 1:27 PM
149	not enough folks hear or pay sufficient attention to the routine messages	8/17/2019 1:07 PM
150	The phrase "Turn Around, Don't Drown" is more prevalent than Smokey the Bears "Don't play with matches" and yet still, citizens continue to drive through low water crossings.	8/17/2019 11:31 AM
151	As mentioned in previous question	8/17/2019 11:03 AM
152	People don't listen. They don't think they will be victims.	8/17/2019 10:55 AM
153	I think they are effective but it also takes individual responsibility.	8/17/2019 10:55 AM
154	Because some people don't get the public service messages before traveling. And some don't understand the risks.	8/17/2019 10:34 AM
155	I feel like not everyone listens to the dangers	8/17/2019 10:29 AM
156	People either ignore them or hear them but never apply the message to they previous experiences to understand the effects	8/17/2019 10:17 AM
157	frequency and apathy	8/17/2019 10:07 AM
158	People are stupid, it's job security in my line of work.	8/17/2019 8:40 AM
159	In general I do not believe people understand what power, even 2 inches of flood water has. Or, what it the inside of a flooded home, or car looks like. Perhaps more graphic images of those things (respectfully done) would help them see.	8/17/2019 8:39 AM
160	Macho. And. Driver removed from road conditions by sophisticated vehicles and loose reality around them	8/17/2019 8:35 AM
161	People don't want to be inconvenienced by closed or flooded water crossings and try to go through anyway	8/17/2019 8:05 AM
162	People don't believe bad situations will happen to them.	8/17/2019 7:58 AM
163	People heed warnings when it's convenient	8/17/2019 7:39 AM
164	Not all the public pays attention to service messages	8/17/2019 6:57 AM
165	To brief and explain the true force of water	8/17/2019 6:35 AM
166	it does not do anything	8/17/2019 6:13 AM
167	Complacency, you are close to home and that gives you a safe feeling when you get into your neighborhood.	8/17/2019 6:12 AM
168	They are only affective when people pay attention to them. That is when they are in the middle of the flood which means they are paying attention.	8/17/2019 5:34 AM
169	Apathy and most people stream their TV, meaning no local commercials	8/17/2019 4:58 AM
170	Some people think they are different and that it does not apply to them	8/16/2019 11:14 AM
171	People tend to not believe the dangers until it happens to them.	8/16/2019 11:10 AM
172	people think it wont really happen to them; they are smarter and braver	8/16/2019 9:31 AM
173	I believe that some people will modify behaviour based on these messages. But the majority will assess risk on their own.	8/16/2019 9:13 AM
174	The public become immune to the over notification provided by local and media outlets. The over cautious notifications cause a disregard for the true life threatening situations.	8/16/2019 8:37 AM

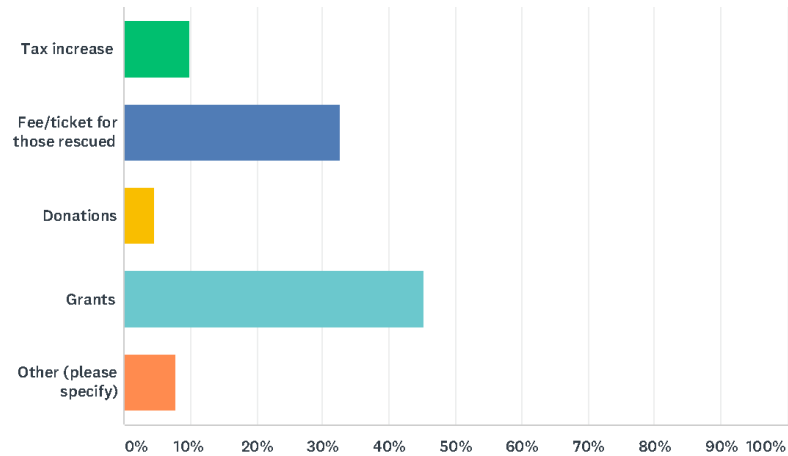
Flood Risk Reduction

175	Because people think they don't apply to them. Many people are just plain ignorant.	8/16/2019 7:15 AM
176	I don't know that everyone listens to them.	8/16/2019 7:07 AM
177	for the most part, if people have plans they are not likely to modify them just because of public service messages.	8/16/2019 6:00 AM
178	Because there are people who think the messages do not apply to them.	8/16/2019 5:25 AM
179	I think they do for some people but not the majority. People think they are invincible and that it "wont really effect them".	8/16/2019 3:29 AM
180	Not heard by everyone	8/16/2019 2:10 AM
181	People believe that it will not happen to them.	8/15/2019 5:11 PM
182	The mentality of the individuals seems to think that it doesn't relate to them. I don't understand why... dumbing down of the human race?	8/15/2019 4:21 PM
183	Sorry I do believe public serve messages are effective along with education in schools and at the library for others	8/15/2019 2:53 PM
184	People don't use common sense anymore, there bullet proof in there mind	8/15/2019 2:46 PM
185	Like other signs and messages, people ignore them. They believe they know better or that there trip is more important.	8/15/2019 2:26 PM
186	People do not pay attention to them.	8/15/2019 1:14 PM
187	People just do not pay attention and soon forget what they heard and just do what they want to thinking nothing will happen to them	8/15/2019 12:04 PM
188	Despite all the notices and announcements you still have people driving around barricades and drowning. I think people who do this are not the type who would respond to these notices. Especially in Texas, their "Trucks" can go anyplace any time.	8/15/2019 11:34 AM
189	There is a percentage of the population that don't think it applies to them or think they could do what others can't.	8/15/2019 11:08 AM
190	They're only effective to those see or hear the message and heed the warnings	8/15/2019 11:04 AM
191	Civilians do not heed warnings	8/15/2019 10:50 AM
192	I don't think most people listen to them	8/15/2019 10:09 AM
193	if the research proves that it would probably be because they announcements are dull and repetitive	8/15/2019 9:56 AM
194	Sometimes people disregard road closures however, PSAs are probably productive	8/15/2019 9:35 AM
195	People feel like bad things won't happen to them, until it does. It's unfortunate but some folks just won't listen.	8/15/2019 9:34 AM
196	People treat them like any other commercial	8/15/2019 9:18 AM
197	Without an awareness of the power of moving water, people do not pay attention	8/15/2019 9:12 AM
198	Some people just don't pay attention	8/15/2019 9:10 AM
199	Flood water rescue responses in Texas has risen drastically over the last decade.	8/15/2019 9:09 AM
200	It's a message that I believe is muted by those that have lived in the area for a while and those new. That's my opinion.	8/15/2019 9:08 AM
201	Most people don't obey the announcement	8/15/2019 8:54 AM

Flood Risk Reduction

Q10 Which option do you believe is the best way to fund flood risk reduction efforts?

Answered: 550 Skipped: 10



ANSWER CHOICES	RESPONSES
Tax increase	9.82% 54
Fee/ticket for those rescued	32.73% 180
Donations	4.55% 25
Grants	45.27% 249
Other (please specify)	7.64% 42
TOTAL	550

#	OTHER (PLEASE SPECIFY)	DATE
1	Re-allocation of already budgeted resources	8/27/2019 2:43 PM
2	Reallocation of funds from the city budget. There is plenty of money available to fund or increase funds to these initiatives; they just need to be made a priority over art in public places.	8/27/2019 5:48 AM
3	TEDM budget	8/25/2019 9:28 PM
4	im not sure on this ,	8/25/2019 7:28 AM
5	Not sure it is something that needs to be funded. The news outlets report on it.	8/25/2019 5:29 AM
6	Grants and ask the rescued their story and get it on film.	8/24/2019 11:38 AM
7	combination of public and private efforts. Govt. is there the protection of its citizens. Build better infrastructure using tax or toll roads. Mandate through code that all new and existing development reduce flooding risk through new and modified bridge/low water crossings into existing and new neighborhoods. Similar to wildfire with multiple exit routes	8/23/2019 12:00 PM
8	Traffic alerts ie Waze, fine construction companies that block drains during flooding	8/23/2019 11:25 AM
9	Don't know.	8/23/2019 8:07 AM

Flood Risk Reduction

10	Not enough information to evaluate options.	8/23/2019 7:36 AM
11	I don't feel I have enough information to answer this question.	8/23/2019 7:25 AM
12	Fee if the rescued disregarded obvious preventives. But this won't fund completely.	8/23/2019 5:39 AM
13	re allocate existing tax revenue	8/23/2019 5:27 AM
14	Stop putting concrete and buildings everywhere. Water has no place to go!	8/23/2019 5:05 AM
15	Reallocation from other programs and budget cuts on OT.	8/23/2019 4:54 AM
16	Multi pronged; should be fee to those who take unnecessary risk and also some grants/dontations... I feel like it is largely something people can avoid so it's okay to charge a fee to those who act dumb	8/23/2019 4:43 AM
17	Escrow account funded by yearly fee to insurance industry, with added prohibitions against passing cost on to customers.	8/23/2019 3:56 AM
18	Extra tax on those living in flood plain because they are most likely the ones needing rescue	8/23/2019 3:44 AM
19	reallocate general tax fund	8/23/2019 3:37 AM
20	Don't think we'd need a tax increase to fund railroad-style arms to block low water crossings.	8/23/2019 3:34 AM
21	I'm not sure	8/22/2019 3:01 PM
22	A combination of tax increase, fee/ticket for those rescued and most importantly having the issue mitigated by the land developer during the platting process; though the cost is going to be passed down to the parcel buyer the new buyer will be alerted of the hazards associated with that purchase.	8/22/2019 7:47 AM
23	Legislatively funded, combination of fees, grants, and tax money. None of the funding sources alone can sustain efforts.	8/21/2019 6:46 AM
24	Combination of both FEMA grants and tax increases. Just like how the tax increase on tobacco products is utilized for law enforcement training.	8/20/2019 2:53 PM
25	Use taxes pay for the cost of rescues from lthe year or 2 before by way of local county / city taxes.	8/19/2019 6:27 AM
26	I really have no idea of the best way to accomplish this.	8/19/2019 5:53 AM
27	Thru DPS & highway funding	8/18/2019 5:32 AM
28	all of the above	8/17/2019 1:10 PM
29	Government spending	8/17/2019 12:20 PM
30	Municipal and county infrastructure improvement and master plan	8/17/2019 10:09 AM
31	Fee for public that reside in flood prone areas	8/17/2019 7:01 AM
32	Reallocation of tax dollars	8/17/2019 6:13 AM
33	Combination tax increase, grant and fee/ticket (for people with blatant disregard)	8/16/2019 9:15 AM
34	Make flood insurance in flood zones a little more affordable	8/16/2019 7:02 AM
35	Reduce waste	8/16/2019 2:11 AM
36	Charge the people who can't pay attention and drive on the water	8/15/2019 2:47 PM
37	vehicle license fees	8/15/2019 11:35 AM
38	Should be covered in governmental budgets with the support of the media	8/15/2019 11:09 AM
39	Fees and grants	8/15/2019 10:03 AM
40	yikes, redirection of existing emergency funds from sunset projects	8/15/2019 9:58 AM
41	Fees assessed to penalties from motorist who avoid safer driving (barracades) habits	8/15/2019 9:11 AM
42	Not sure.	8/15/2019 9:11 AM