A Report on

Emergency Communications and Their Utilization

- This survey was conducted to address the requirements in Senate Bill 1 (87th Legislature) that were incorporated into Rider X, page III-262, the General Appropriations Act (87th Legislature).
- The survey covered calendar years 2017-2021.
- The State Auditor's Office contacted 8,628 entities and received 1,032 responses.

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State Auditor

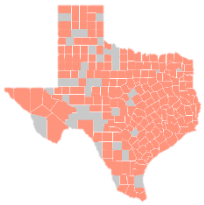
This survey on emergency communications collected information and other feedback from Texas (1) counties, (2) municipalities, (3) independent school districts, (4) special purpose districts, (5) other local government entities, and (6) utility providers. The survey addressed the following topics related to the emergency management communications:

- The entities' current emergency communications capacities.
- The actual usage of emergency communications by local government entities and utility providers from January 1, 2017, through December 31, 2021.
- Gaps in emergency communications capacity.

This survey was conducted in accordance with Rider X, page III-262, the General Appropriations Act (87th Legislature).

Survey respondents indicated that equipment upgrades, infrastructure improvements, and additional funding would help improve emergency communication with their constituents (see Entity Feedback on Page 17).

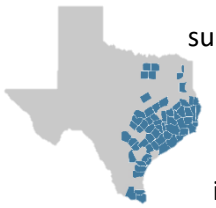
EMERGENCY COMMUNICATIONS



This chapter summarizes the results about entities' overall emergency communications capabilities, methods, and gaps in that communication. Overall, respondents were located in 217 counties across the state.

Chapter 1 | p. 6

HURRICANE HARVEY



This chapter summarizes the key survey responses related to entities' emergency communication usage during Hurricane Harvey. Overall, 207 entities responded that they issued emergency communication during Hurricane Harvey.

Chapter 2 | p. 21

For more information about this study, contact the Audit Manager, Hillary Eckford, or Lisa Collier, State Auditor, at 512-936-9500.

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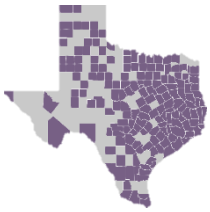
HURRICANE IMELDA

This chapter summarizes the key survey responses related to entities' emergency communication usage during Hurricane Imelda. Overall, 108 entities responded that they issued emergency communications during Hurricane Imelda.

Chapter 3 | p. 37

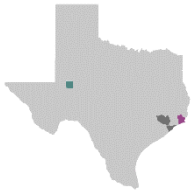
WINTER STORM URI



This chapter summarizes the key survey results related to entities' emergency communication usage during Winter Storm Uri. Overall, 529 entities responded that they issued emergency communication during Winter Storm Uri.

Chapter 4 | p. 52

OTHER EMERGENCIES



Chapter 5 summarizes key survey results related to entities' emergency communication usage during the other three emergencies named in Rider X. The survey did not receive a significant number responses for these three emergencies.

Odessa Shooting | p. 69

The Intercontinental Terminals Company Deer Park Fire | p. 70

The Texas Petrochemicals Group Port Neches Plant Fire | p. 72

Supplemental Report

For the full comprehensive survey data, see *A Supplemental Report on Emergency Communications and Their Utilization* on the State Auditor's Office's website (SAO Report No. 23-303) and an interactive dashboard at https://sao.texas.gov/Reports/DataVisualizations/23-007Interactive.html.

Acknowledgements

The State Auditor's Office appreciates Texas Emergency Management Council's collaboration with developing survey questions, identifying survey recipients, and providing information regarding disaster processes, terminology, and the presentation of survey results.

Additionally, the State Auditor's Office appreciates the assistance and cooperation provided by the Texas State School Safety Center, the Texas Education Agency, the Office of the Comptroller of Public Accounts, the Railroad Commission, the Commission on Environmental Quality, and the Public Utility Commission of Texas.

The State Auditor's Office also thanks the counties, independent school districts, municipalities, special purpose districts, and utility providers that completed the survey.

Background Information

Survey Information

Surveys Completed. Auditors contacted 8,628 entities throughout Texas via email or a postcard (with a link/QR code) to ask them to complete an online survey related to emergency communications. Auditors received 1,032 responses (see Figure 1 for a breakdown of the responses).

Figure 1

Surveys Completed

Entity Type	Total Responses	Entities Surveyed[a]	Response Rate
Counties	52	254	20.5%
Municipalities	131	1,040	12.6%
Independent school districts	336	1,210	27.8%
Special purpose districts	323	2,051	15.7%
Utilities	190	4,073[b]	4.7%
Totals	**1,032**	**8,628**	**12.0%**

[a] Surveys were sent via email to 4,737 entities (all counties, municipalities, independent school districts, special purpose districts, and some utility providers). Postcards were sent to 3,891 electric utility providers that lacked email addresses and to all public water systems identified.

[b] Of these 4,073 surveys, 182 were sent via email (27 received; 14.8 percent response rate), and 3,891 were sent via postcard (163 received; 4.2 percent response rate).

Surveys Analysis and Presentation. Because the survey was sent to a variety of different entities, those entities might use different terminology for similar things. For example:

- Counties and municipalities might prepare "emergency management plans" or "emergency operations plans," whereas independent school districts might prepare "multi-hazard emergency operations plans."
- The different entities have different ways to refer to the people in their jurisdictions:
  - Counties and municipalities have constituents.

- Independent school districts have students, parents, and staff.
- Utilities have customers.

Those terms were customized in the online survey to each entity type. For the reader's ease, as well as for consistency, this report will generally refer to "emergency management plans" and "constituents" even though individual entities may have received a question with other terms.

For some questions for which there were differences in how the types of entities handled an emergency situation, the different entity types will be denoted by the following colored labels:

Counties

Independent school districts

Municipalities

Special purpose districts (see text box)

Utilities (see text box)

Entity Types

Special purpose districts provide a variety of services including water conservation, toll roads, hospitals, libraries, utilities, and fire control efforts.

Utilities for this report refers to:

- Public water systems,
- Gas distribution utilities, and
- Electric utilities, including investor-owned providers, transmission and distribution providers, municipality-owned providers, and cooperatives.

Sources: The Office of the Comptroller of Public Accounts, the Railroad Commission, the Commission on Environmental Quality, and the Public Utility Commission of Texas.

In addition, the specific questions for the six disasters discussed in this report are denoted by the following colors:

HURRICANE HARVEY
Chapter 2, p. 21

HURRICANE IMELDA
Chapter 3, p. 37

WINTER STORM URI
Chapter 4, p. 52

ODESSA SHOOTING
Chapter 5, p. 69

INTERCONTINENTAL TERMINALS COMPANY DEER PARK FIRE
Chapter 5, p. 70

TEXAS PETROCHEMICALS GROUP PORT NECHES PLANT FIRE
Chapter 5, p. 72

Chapter 1
Emergency Communications

This chapter summarizes survey responses related to the following topics:

- Emergency management planning.
- Communication methods.
- Gaps in communication.
- Disaster communications during 2017 through 2021.
- Entity feedback.

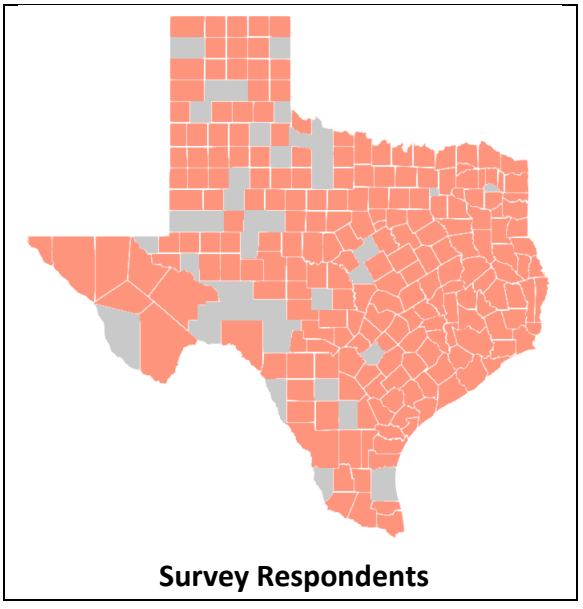
This chapter presents a snapshot of selected results.

Overall, 1,032 entities responded to the survey. Those respondents, represented in the map in Figure 2, were located in 217 counties across the state. The county with the most respondents was Harris County, with 97 responses.

The respondents consisted of:

- 52 counties,
- 336 independent school districts,
- 131 municipalities,
- 323 special purpose districts, and
- 190 utilities.

Figure 2

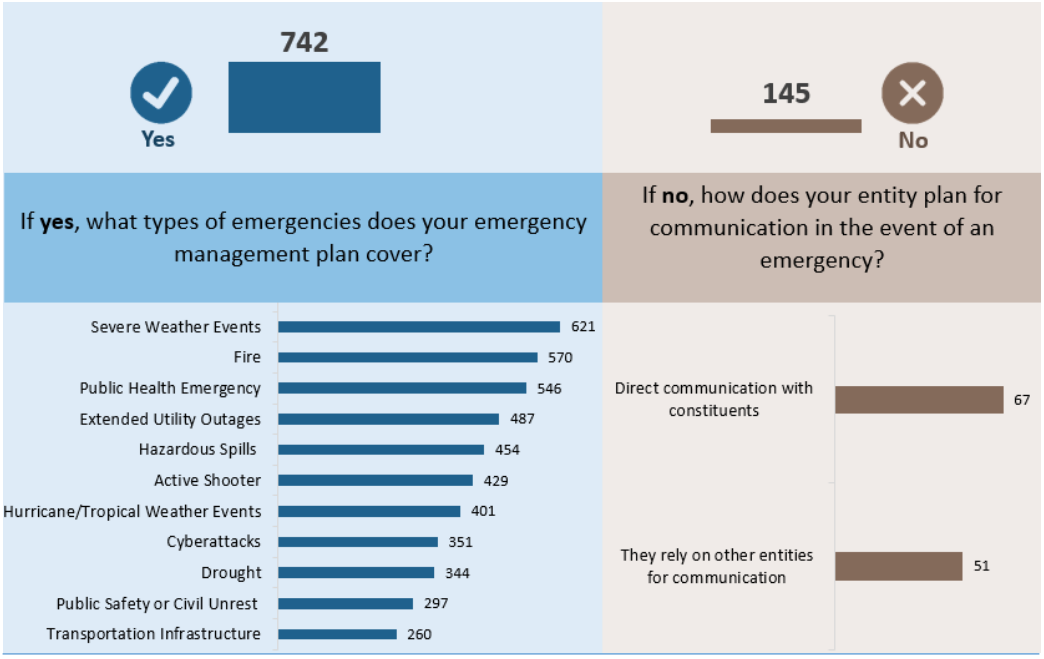


Survey Respondents

Emergency Management Planning

Does your entity have a documented emergency management plan that includes information about how to communicate with constituents in the event of an emergency?

Figure 3



Note: The *Severe Weather Events category* includes winter storms, flash flood watches/warnings, and tornado watches/warnings. Transportation Infrastructure includes items such as road closures.

As Figure 3 shows, 84 percent of the respondents had a documented emergency management plan, with the most common types of emergencies included in those plans being (1) severe weather events, (2) fire, and (3) public health emergencies.

Entities that did not have a plan indicated they communicated directly with constituents (53 percent) or relied on other entities (41 percent) for that communication.[1]

[1] The remaining 6 percent of respondents that did not have a documented communications plan did not provide additional information.

Of the respondents to the question presented in Figure 3:

98 percent of counties that responded indicated they had a documented emergency management plan, for which the Texas Division of Emergency Management publishes resources (see text box).

98 percent of independent school districts that responded indicated they had a documented emergency management plan, which is required by the Texas Education Code (see text box).

Special purpose districts that responded were least likely to have a documented emergency management plan with 56 percent indicating they had a documented plan.

Emergency Management Planning

The Texas Division of Emergency Management published the *State of Texas Emergency Management Basic Plan*, emergency support function annexes, and a *Local Emergency Management Planning Guide* to assist local governments with emergency planning.

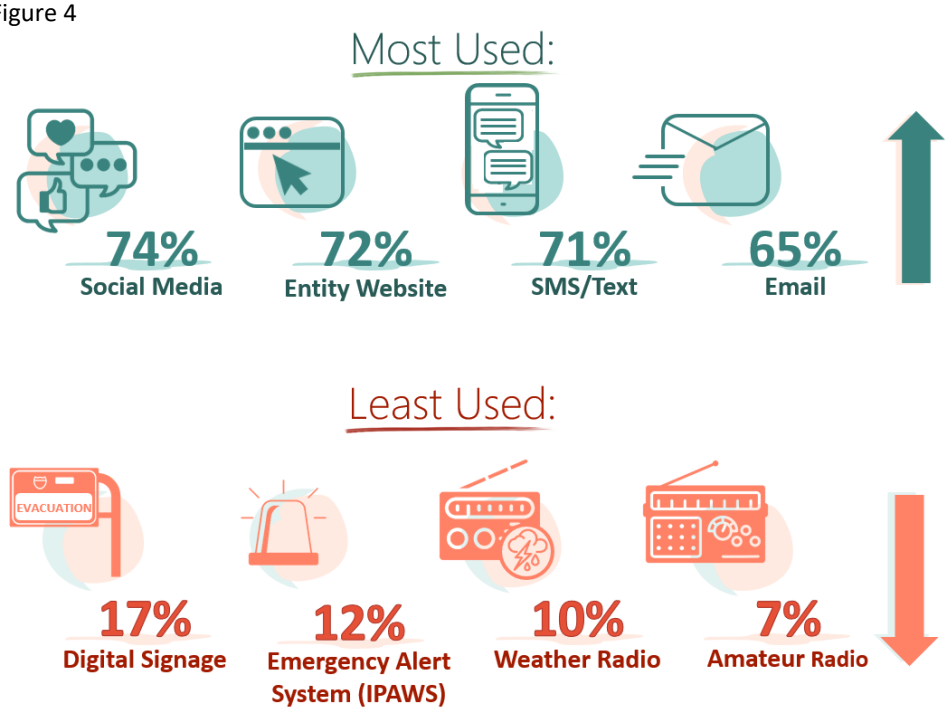
Texas Education Code, Section 37.108 required independent school districts to have multi-hazard emergency operations plans.

Sources: Texas Division of Emergency Management and the Texas Education Code.

Communication Methods

What emergency communication method(s) does your entity use to communicate with constituents?

Figure 4



While most entity types used the common communication methods presented in Figure 4, some entities used other methods as well. Specifically:

Counties – While it was one of the least-used methods selected overall, an Emergency Alert System or Wireless Emergency Alerts (IPAWS) was used by 60 percent of counties that responded (see text box).

Independent school districts – While also not commonly used by other entities, other web-based apps were used to communicate with constituents by 35 percent of school districts that responded.

Utilities – Of the utilities that responded, 29 percent indicated they used physical signage to communicate with constituents.

Emergency Alert System (IPAWS)

The Integrated Public Alert and Warning System (IPAWS) is the Federal Emergency Management Agency's (FEMA) national system that local entities can use to alert their constituents through mobile phones using Wireless Emergency Alerts, through radio and television via the Emergency Alert System, and on the National Oceanic and Atmospheric Administration's Weather Radio.

Source: FEMA.

Which of your emergency communication methods measure the percentage of constituents reached?

Figure 5

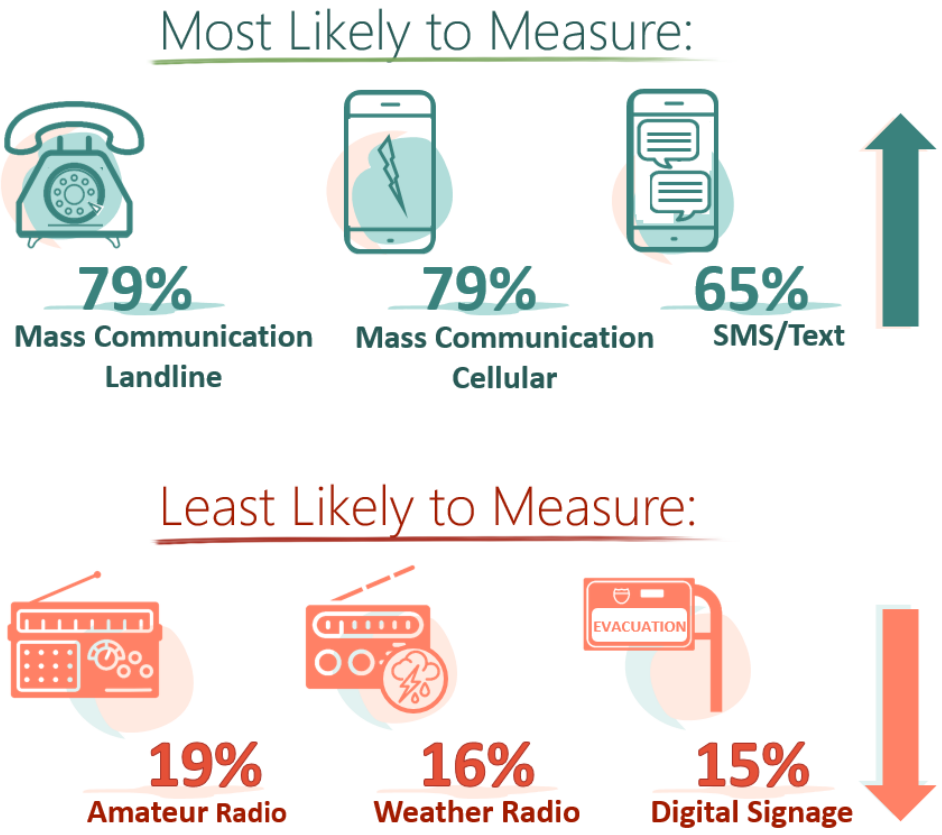


Figure 6

Does your entity use an emergency notification system or tools[a] to communicate with constituents?

Response	Number of Responses	Percent
Yes [b]	616	69%
No	271	31%
Total Responses	**887**	**100%**

[a] Emergency notification systems or tools are hardware or software that provide mechanisms, such as means of communication, to help manage emergency situations.

[b] The most common tools noted in the responses were School Messenger (73), Blackboard (55), Code Red (47), Remind (41), Apptegy (25), Everbridge (24), Skyward (18), Raptor (17), Reverse 911 (13), Offcinco (12), and Parent Square (11). The remaining systems or tools received less than 10 responses each.

Independent school districts were the entity type most likely to have an emergency management system or tool (92 percent).

Counties were the second-most-likely entity type to have an emergency notification system or tool (84 percent).

Does your entity have a backup process in place if your emergency notification system or tools are inoperable (for example, if cell towers are inoperable, power is out for an extended period, internet service is unavailable, etc.)?

Figure 7

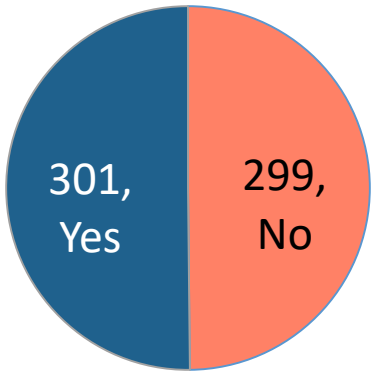


Figure 8

What redundancies/backups have your entity implemented for times when the chosen communication method is unavailable or ineffective?

Method	Responses	Percent
Two-way radio	86	17%
Physical signage	78	16%
Have no backups	64	13%
Route notification	48	10%
Traditional media	46	9%
Mass notification cellular	42	8%
Mass notification landline	36	7%
Social media	36	7%
Public address speakers/sirens	34	7%
Other web-based apps	33	7%
Rely on other entities	29	6%
Word of mouth	29	6%

Counties – Two-way radio, public address speakers/sirens, route notification, and word of mouth were the most used backup communication methods.

Independent school districts – Two-way radio, traditional media, other web-based apps, and social media were the most used backup communication methods.

Municipalities – Two-way radio, public address speakers/sirens, and rely on other entities were the most used backup communication methods.

Utilities – Physical signage, route notification, traditional media, and mass notification cellular were the most used backup communication methods.

Special purpose districts – The most common response was having no backup (39 responses). For those with backups, the most used backup communication methods were route notification and relying on other entities.

How are contacts signed up to receive notifications from the different emergency communication methods?

Opt In. The *Opt In* method was the most common way for entities to sign up constituents to receive emergency communications (see text box for descriptions of the signup options). Entities indicated that they sign up constituents to receive emergency communication through:

- The entity's website (76 percent).
- Social media (72 percent).
- At registration (26 percent), especially for independent school districts, special purpose districts, and utilities.
- Readiness/preparedness events (19 percent), especially for counties and municipalities.
- Tradition media sources such as:
  - Television news (18 percent).
  - Radio broadcasts (12 percent).
- Informational materials/flyers (6 percent).

Automatically Included. The *Automatically Included* method was the second-most common communication option selected by respondents for including constituents to receive emergency communications. Entities indicated that they automatically sign up constituents to receive future emergency communications:

- When constituents register for services, such as school registration or utility hookup (62 percent).
- By identifying all applicable constituents (6 percent).
- Through route notifications (such as door to door visits) (5 percent).

Communication Signup Options

Opt In - These notifications require the constituent to sign up to receive messages.

Automatically Included - These notifications are emergency communications sent to everyone affected by the emergency. For example, all people within the radius of a cell tower might have an alert pushed to their phones.

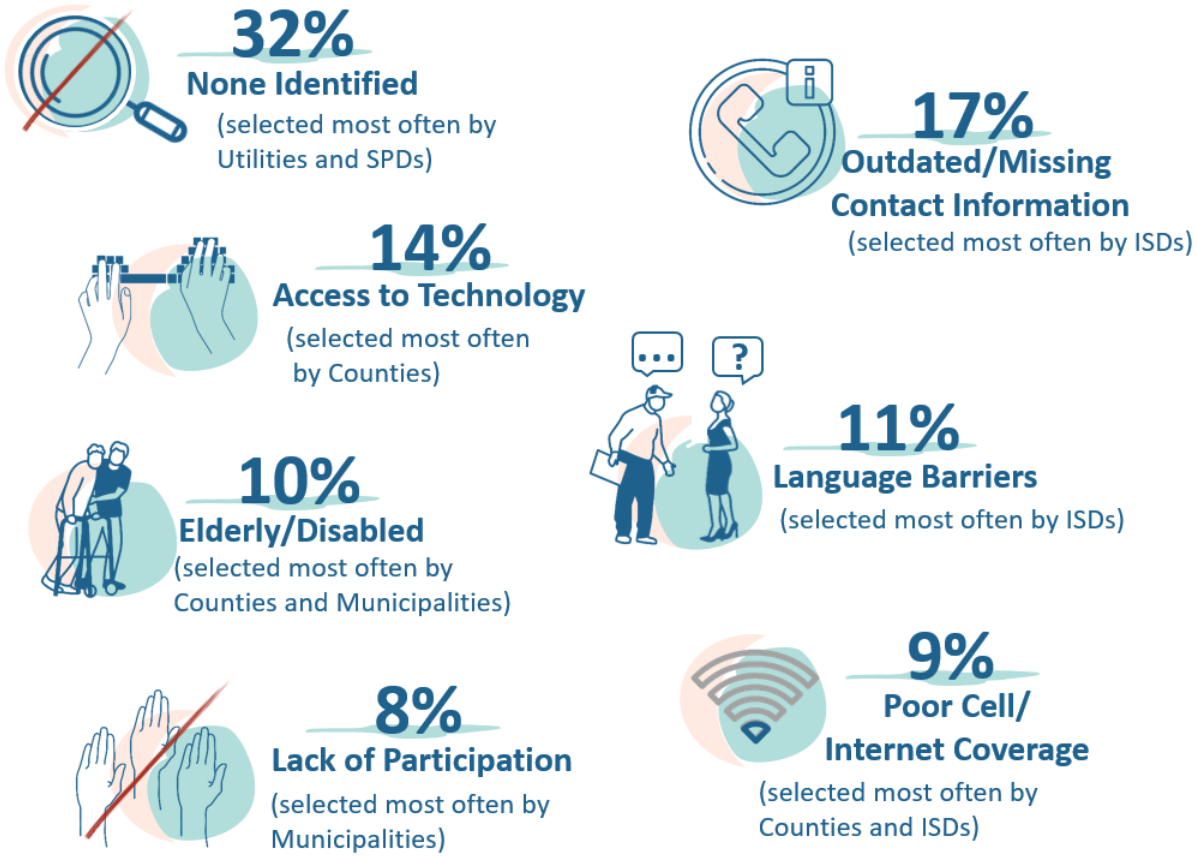
Opt Out - These notifications require the constituent to choose *not* to receive the messages (otherwise, they are automatically signed up to receive messages).

Opt Out. *Opt Out* is not a common method used by entities. The most commonly used method for opting out was SMS/text, which 37 entities stated they used opt out for signing up contacts to receive notifications.

Gaps in Communication

What gaps has your entity identified in your emergency communication methods, including who is not being reached (e.g., groups or classes that are not effectively reached, having accessible notifications, language and information barriers, etc.)?

Figure 9



Note: In Figure 9, independent school districts are abbreviated as ISDs and special purpose districts are abbreviated as SPDs.

Disaster Communications During 2017 through 2021

Figure 10

During calendar years 2017 through 2021, please select types of disasters for which your entity sent emergency communications to its constituents?

Disasters	Responses	Percent
Severe weather events	623	79%
Extended utility outages	475	60%
Public health emergency	326	41%
Hurricane or other tropical weather events	247	31%
Drought	133	17%
Fire	126	16%
Transportation infrastructure	84	11%
Public safety or civil unrest	75	9%
Hazardous spill	41	5%
Cyber attacks	28	4%

From 2017 through 2021, severe weather events, which includes winter storms, flash flood watches or warnings, and tornado watches or warnings, were the type of disaster for which entities of all types most commonly sent out emergency communications.

Counties also commonly reported a public health emergency during that time period (which coincided with the COVID-19 pandemic) with 80 percent indicating they had issued communications for that type of emergency.

Independent school districts also commonly reported a public health emergency during that time period with 66 percent indicating they had issued communications for that type of emergency.

Nearly all utilities (94 percent) reported they issued emergency communications for extended utility outages during that time period.

Figure 11

During calendar years 2017 – 2021, how often did your entity issue an emergency communication for those events selected in Figure 10?

Response	Was not utilized	1 - 2 times	3 - 5 times	6 - 10 times	11 - 20 times	More than 20 times
Active shooter	4	12	-	-	-	-
Cyber attacks	4	13	7	1	-	1
Drought	25	74	12	3	1	5
Extended utility outages	9	180	157	29	18	22
Fire	11	54	23	6	5	13
Hurricane or other tropical weather events	5	81	56	69	6	11
Hazardous spill	6	17	6	5	1	-
Public health emergency	6	61	59	39	30	83
Public safety or civil unrest	3	18	10	8	3	4
Severe weather events	10	135	156	142	47	58
Transportation infrastructure	4	18	22	15	7	6
Other	19	33	17	18	2	11

Counties reported they issued communications *most* frequently for severe weather events (80 percent) and public health emergencies (68 percent) during calendar years 2017 through 2021.

Counties reported that they issued communications *least* frequently for active shooter (7 percent) and cyberattacks (9 percent) during calendar years 2017 through 2021.

Independent school districts reported they issued communications *most* frequently for severe weather events (81 percent), extended utility outages (56 percent), and public health emergencies (51 percent) during calendar years 2017 through 2021.

Independent school districts reported they issued communications *least* frequently for drought (0 percent) and active shooters (1 percent) during calendar years 2017 through 2021.

Municipalities reported they issued communications *most* frequently for severe weather events (64 percent) during calendar years 2017 through 2021.

Municipalities reported they issued communications *least* frequently for active shooters (2 percent) and public safety or civil unrest (3 percent) during calendar years 2017 through 2021.

Special purpose districts reported they issued communications *most* frequently for severe weather events (60 percent) during calendar years 2017 through 2021.

Special purpose districts reported they issued communications *least* frequently for public safety or civil unrest (1 percent) and cyberattacks or active shooter (2 percent) during calendar years 2017 through 2021.

Utilities reported they issued communications *most* frequently for severe weather events (74 percent) and extended utility outages (72 percent) during calendar years 2017 through 2021.

Utilities reported they issued communications *least* frequently for active shooters (0 percent) and public safety or civil unrest (1 percent) during calendar years 2017 through 2021.

Figure 12

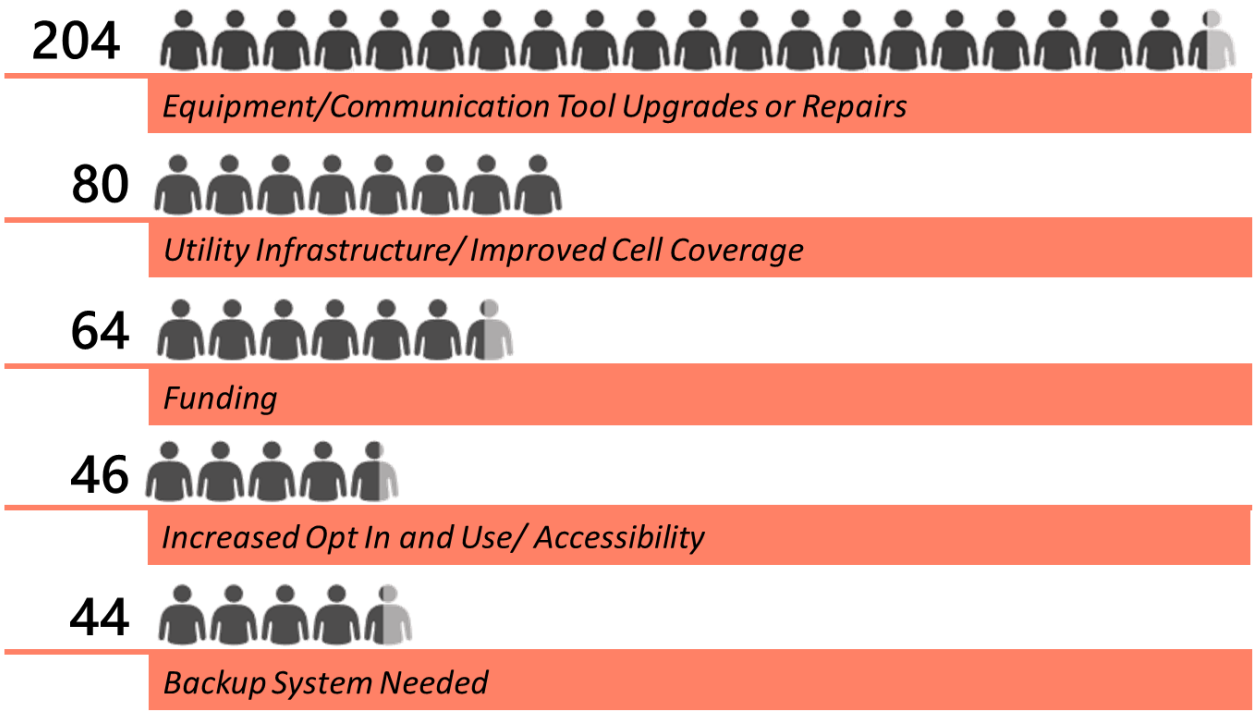
Please select the specific disasters in which your entity issued emergency communication.

Disasters	Responses	Percent [a]
Hurricane Harvey (August 2017)	207	24%
Hurricane Imelda (September 2019)	108	13%
Winter Storm Uri (February 2021)	529	62%
Odessa Shooting (August 31, 2019)	1	0%
The Intercontinental Terminals Company Deer Park Fire (March 17, 2019)	10	1%
The Texas Petrochemicals Group Port Neches Plant Fire (November 27, 2019)	1	0%
None of the above	258	30%

[a] Entities could select multiple disasters so the percentages will not total to 100 percent.

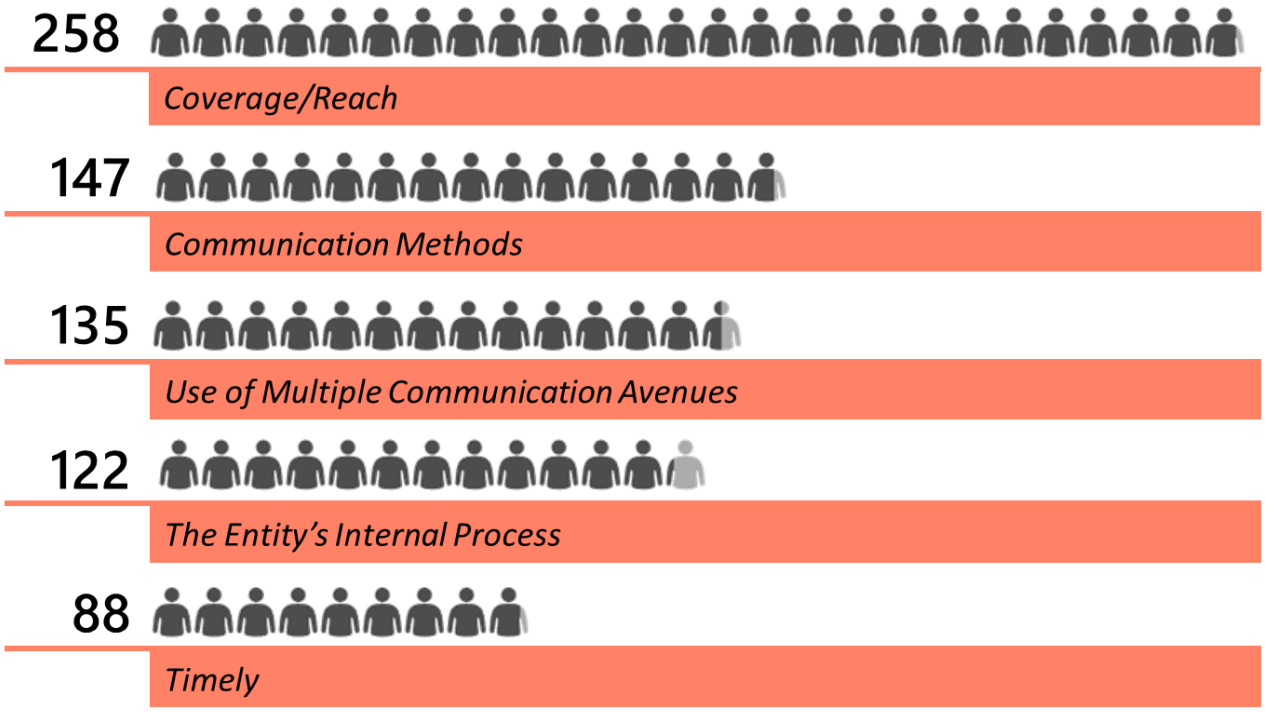
Entity Feedback

What additional resources or tools would help improve emergency communication with your entity's constituents?



For the *Equipment/Communication Tool Upgrades or Repairs* in the chart above, entities most often specified other web-based apps, two-way radio, public address speakers/sirens, mass notification landline, and SMS/text.

In what ways do you think your entity's emergency communications system is working effectively?



For *Communication Methods* in the chart above, entities most often specified social media, other web-based apps, SMS/text, email, the entity's website, and traditional media.

In what ways do you think your entity's emergency communications system could be improved?

For the *Need for New Communication Tools or Upgrades* in the chart above, entities most often specified better/upgraded technology, other web-based apps, two-way radio, public address speakers/sirens, and SMS/text.

Is there any other information that you would like the Texas Emergency Management Council and the State Auditor's Office to know about your entity's use of emergency communications between in 2017 and 2021?

Chapter 2
Hurricane Harvey

This chapter summarizes survey responses related to the following topics specific to Hurricane Harvey (see text box for details about the disaster):

- Emergency communication timelines.
- Communication methods.
- Gaps in communications.

This chapter summarizes selected information from the surveys for Hurricane Harvey.

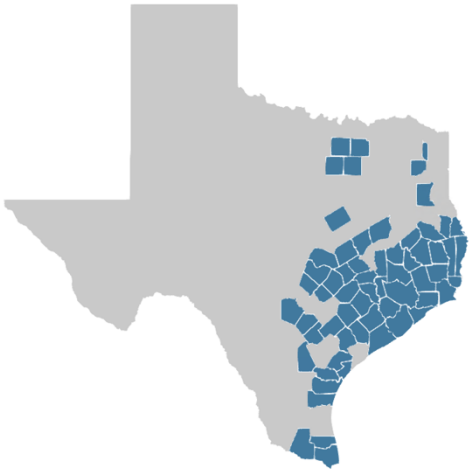
Hurricane Harvey

Hurricane Harvey was a Category 4 hurricane that made landfall in Texas in August 2017. Statewide, Harvey resulted in at least 82 fatalities, the largest number from a land-falling hurricane in Texas since 1919.

Sources: The National Hurricane Center and the Department of State Health Services.

Overall, 207 entities responded that they issued emergency communications during Hurricane Harvey. Those respondents, represented in the map in Figure 13, were located in 62 counties across the state. The county with the most respondents was Harris County, with 41 responses.

Figure 13



Survey Respondents

The respondents consisted of:

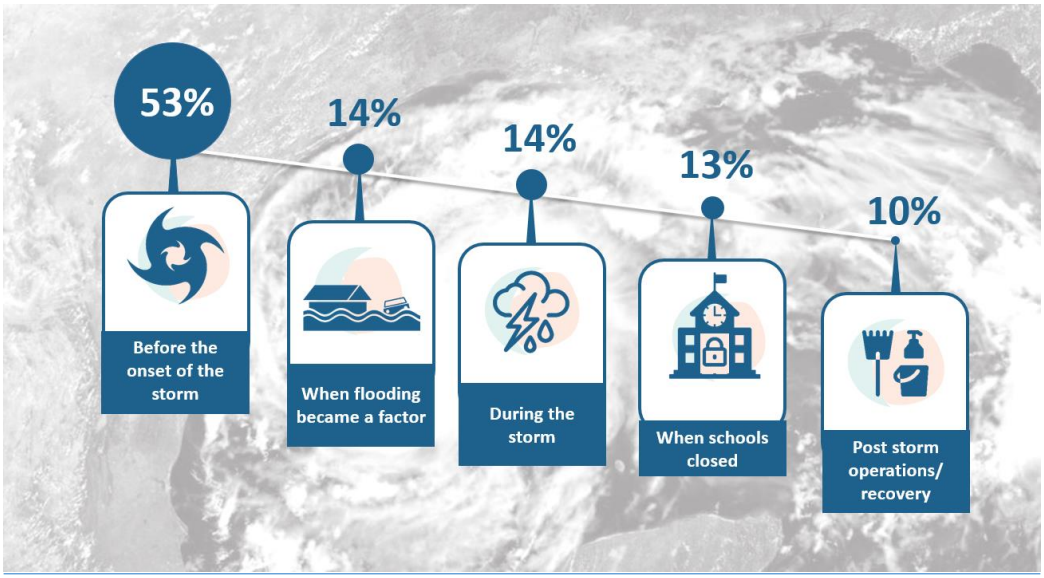
- 14 counties.
- 73 independent school districts.
- 23 municipalities.
- 31 special purpose districts.
- 66 utilities.

Unless otherwise noted, the percentages presented in this chapter are based on the number of entities from the list above who responded to that question.

Emergency Communication Timelines

Please describe the points at which your entity decided to issue an official emergency communication.

Figure 14



Note: Based on 184 responses. An entity's response could be included in multiple categories, which is why the percentages do not total to 100 percent.

Most (84 percent) of the utilities notified their customers before the onset of Hurricane Harvey.

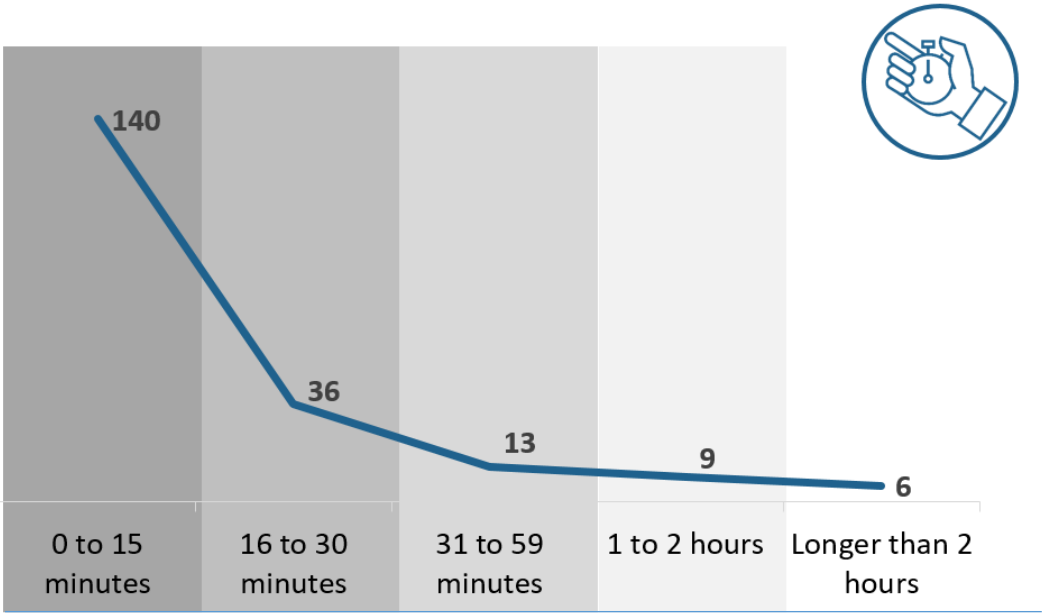
Counties most frequently notified constituents before the onset of the storm (42 percent) and during the storm (42 percent). In addition, 33 percent of the counties issued emergency communications when flooding became a factor.

Independent school districts were responsible for all of the school closure notifications issued by respondents; 38 percent of the independent school districts issued emergency communications related to school closures.

Some (16 percent) of the special purpose districts affected by Hurricane Harvey issued no official emergency communication.

Once your entity decided to issue emergency communications, how long did it take to deploy the alert?

Figure 15



Note: Based on 204 responses.

For all entities, 69 percent issued communications within 15 minutes of deciding to issue emergency communications, and 86 percent issued communications within 30 minutes.

Of the utilities, 86 percent notified their customers within 15 minutes, the most by that metric of any entity type.

Of the independent school districts, 93 percent issued communications within 30 minutes, the most by that metric of any entity type.

Of the special purpose districts, 16 percent took 1 hour or longer to deploy an alert after deciding to issue emergency communications, the most by that metric of any entity type.

Figure 16

How would you rate the timeliness of emergency communications that were issued by your entity?

Response	Number of Responses	Percent
Excellent	92	46%
Good	60	30%
Satisfactory	38	19%
Fair	11	5%
Poor	1	0%
Total Reponses	**202**	**100%**

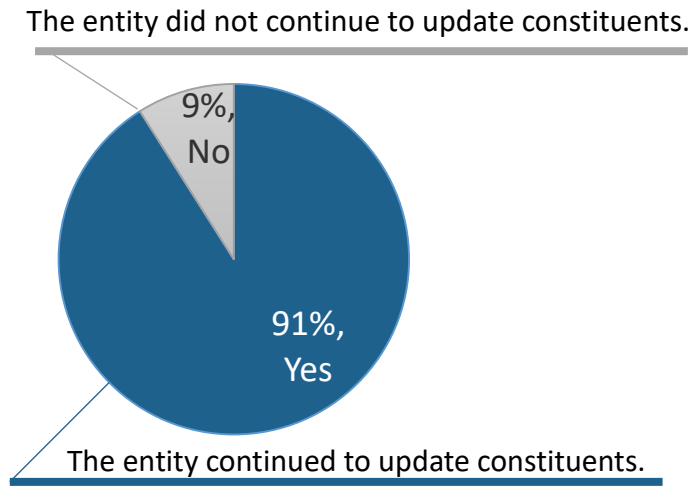
For all entities, 95 percent rated the timeliness of their emergency communications at least "Satisfactory."

Of the utilities, 78 percent rated the timeliness of their emergency communication "Excellent," the most of any entity type.

Of the counties, 85 percent rated the timeliness of their emergency communication either "Good" or "Satisfactory." Only 7 percent of counties rated their timeliness as "Excellent," the least of any entity type.

Did your entity continue issuing emergency communications to update constituents as new information came in?

Figure 17



Note: Based on 203 responses.

Figure 18

For follow-up communications sent for Hurricane Harvey, how would you rate the timeliness of emergency communications that were issued by your entity?

Response	Number of Responses	Percent
Excellent	90	49%
Good	52	29%
Satisfactory	30	16%
Fair	9	5%
Poor	1	1%
Total Responses	**182**	**100%**

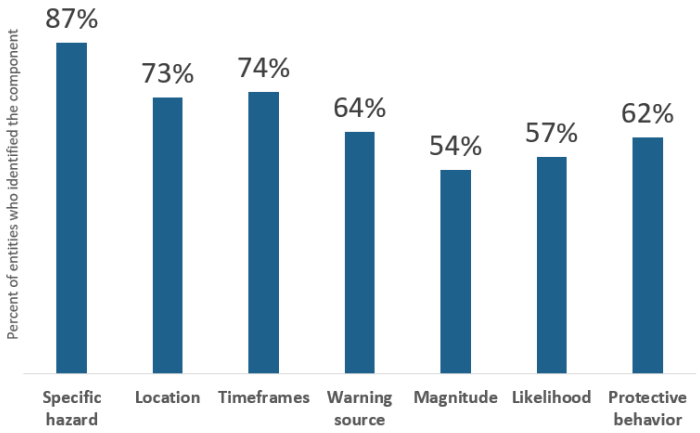
For all entities, 94 percent rated the timeliness of their follow-up emergency communication at least "Satisfactory."

Of the utilities, 83 percent rated the timeliness of their follow-up emergency communication "Excellent," the most of any entity type. All utilities that responded rated the timeliness of their emergency communication at least "Satisfactory."

Of the independent school districts, 97 percent rated the timeliness of their follow-up emergency communication at least "Satisfactory," the second most of any entity type.

Which of the following components described below were included in the official emergency communication?

Figure 19



39% of entities surveyed who issued emergency communication for Hurricane Harvey included all seven components recommended by the Office of the Governor.

Note: Based on 199 responses.

The Office of the Governor published guidance, a list of resources, and applicable state laws related to emergency management. Included in that are seven components that are supposed to be in each alert, notification, or warning issued (see Figure 20).

Figure 20

Emergency Management Resources from Office of the Governor

Each alert, notification, or warning should contain:

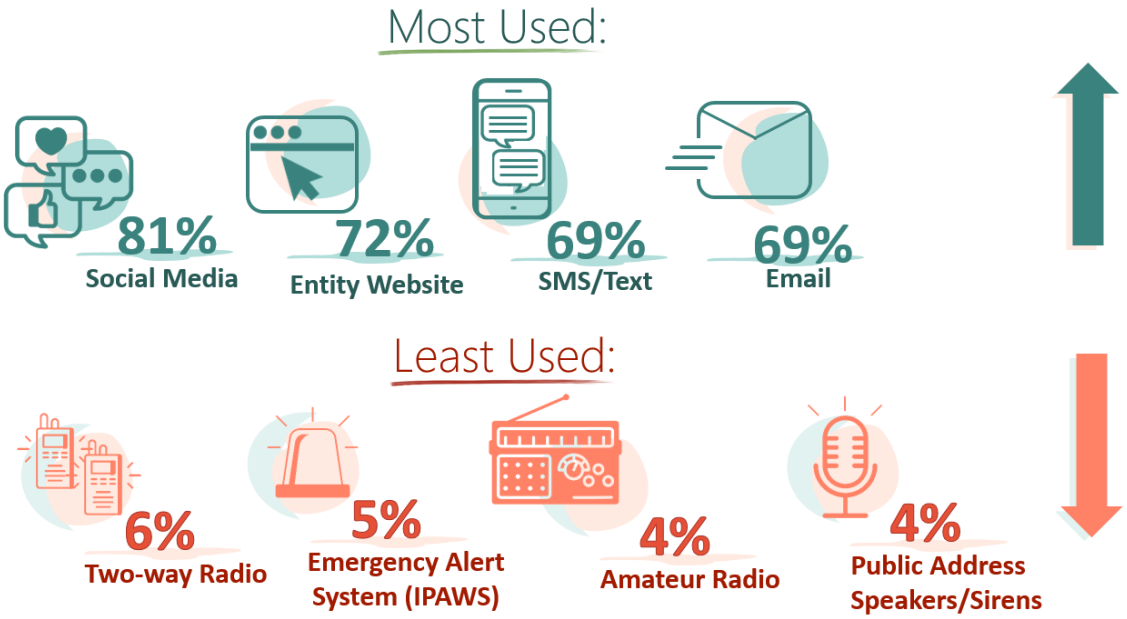
- **Specific Hazard** - What kind of hazard is threatening? What are the potential risks for the community?
- **Location** - Where will the impacts occur? Describe the location so that those without local knowledge can understand their risk.
- **Timeframes** - When will it arrive at various locations? How long will the impacts last?
- **Warning Source** - Who is issuing the warning? Identify an official source with public credibility.
- **Magnitude** - What impact is expected and how bad is it likely to get?
- **Likelihood** - How probable is occurrence of the impact?
- **Protective Behavior** - What protective actions should people take and when? If evacuation is called for, where should people go and what should they take with them?

Source: The Office of the Governor.

Communications Methods

What emergency communication method(s) did your entity use to communicate with constituents for Hurricane Harvey?

Figure 21



Note: Based on 201 responses.

Social media was the most common emergency communication method for all entity types.

Of all entities, 25 percent stated they used word of mouth as a communication method for Hurricane Harvey.

Independent school districts used mass notification cellular (72 percent), mass notification landline (70 percent), and traditional media (69 percent), more than any entity type for all three methods.

Counties used mass notification cellular (71 percent), mass communication landline (71 percent), and traditional media (50 percent) more than any other entity type besides independent school districts.

Figure 22

How effective were each of the following emergency communication method(s) in communicating with constituents for Hurricane Harvey? [a]

The *most effective* communication methods	The *least effective* communication methods
SMS/text	Amateur radio
Email	Route notification
Social media	Public address speakers/sirens
Emergency alert system (IPAWS)	Word of mouth
Other web-based apps	Digital signage

[a] Based on 203 responses.

Counties reported that social media, mass notification cellular, and mass notification landline were the most effective communication methods for Hurricane Harvey.

Independent school districts reported that social media, SMS/text, and email were the most effective communication methods for Hurricane Harvey. Those methods also were the ones most likely to receive an "Extremely Effective" rating from independent school district respondents.

Municipalities reported that social media, mass notification cellular, and mass notification landline were the most effective communication methods for Hurricane Harvey.

Special purpose districts reported that the entity's website, email, and social media were the most effective communication methods for Hurricane Harvey.

Utilities reported that social media, the entity's website, email, and SMS/text were the most effective communication methods for Hurricane Harvey.

Figure 23

Please indicate the percentage of constituents reached using the following communication methods.

Response	0%	1-20%	21-40%	41-60%	61-80%	81-100%	Unknown
Mass notification landline	1	6	7	7	19	19	15
Mass notification cellular	1	4	7	6	18	24	14
SMS/text	-	3	5	7	20	23	14
Traditional media	-	-	-	2	6	5	6
Social media	-	1	8	12	14	11	18
Email	-	3	9	7	17	16	9
Entity website	-	3	10	9	5	5	11
Other web-based apps	-	-	1	-	3	3	4
Two-way radio	1	-	2	-	-	1	2
Weather radio	-	-	-	-	-	-	-
Amateur radio	-	-	1	-	-	-	-
Emergency alert system (IPAWS)	-	2	-	-	1	-	2
Public address speakers/sirens	-	-	-	-	-	-	-
Digital signage	-	-	-	1	1	-	-
Route notification	-	6	1	1	1	-	1
Word of mouth	-	1	2	4	2	3	1
Other	-	-	-	-	-	1	1

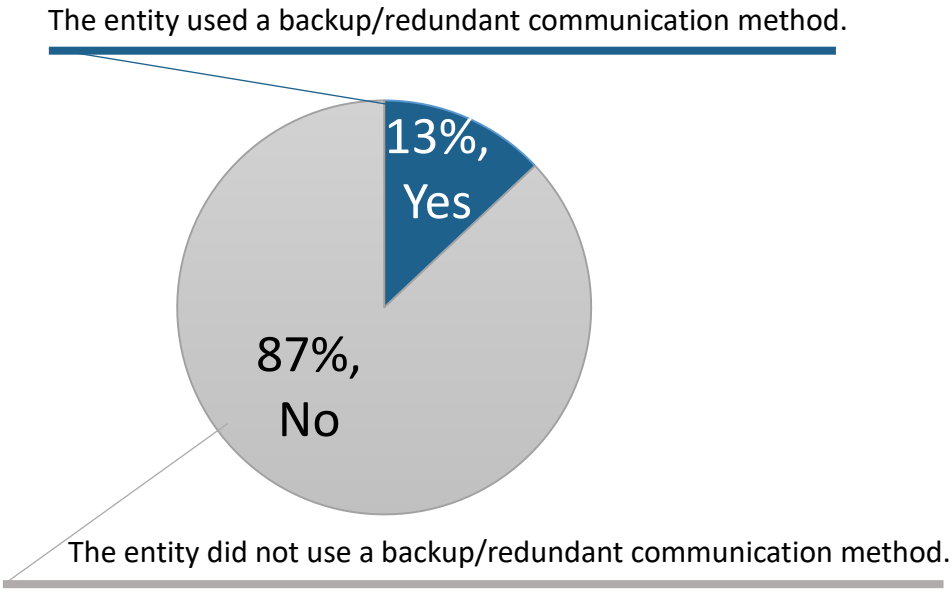
The communication methods that reached a high percentage of constituents for Hurricane Harvey were:

- Mass notification cellular was used by counties, independent school districts, municipalities, and utilities to reach a high percentage of constituents.
- Mass notification landline was used by counties, municipalities, and special purpose districts to reach a high percentage of constituents.

- SMS/text and email was used by independent school districts, special purpose districts, and utilities to reach a high percentage of constituents.
- Social media was used by municipalities to reach a high percentage of constituents.

Did your entity have to use a backup/redundant method of emergency communication due to your primary communication methods not being available or effective?

Figure 24

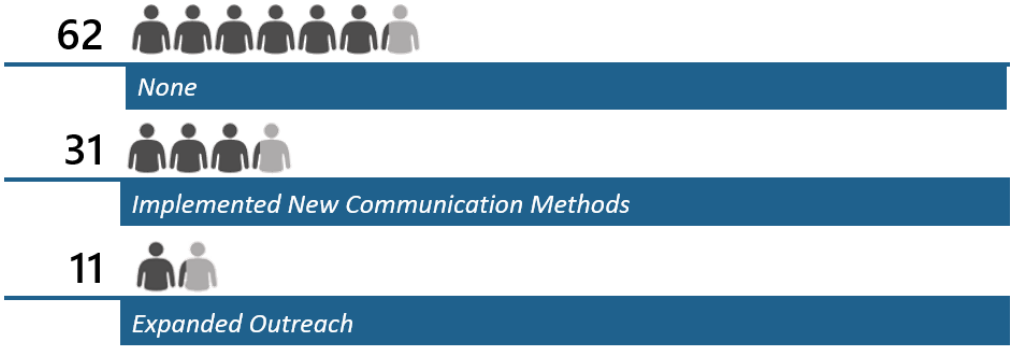


Note: Based on 201 responses.

Municipalities were the most likely to have used a backup communication method, with 22 percent having to employ one for Hurricane Harvey.

Utilities were the least likely to have used a backup communication method, with only 3 percent reporting they had to employ one for Hurricane Harvey.

What changes, if any, has your entity made to your emergency communications due to Hurricane Harvey?



For the *Implemented New Communications Methods* in the chart above, entities most often specified other web-based apps, two-way radio, and SMS/text.

Gaps in Communication

Figure 25

What languages are commonly used to communicate in your jurisdiction?

Language	Total Responses	Percent[a]
English	199	100%
Spanish	139	70%
Vietnamese	9	5%
Chinese	3	2%
Arabic	3	2%
Hindi	2	1%
American Sign Language	2	1%

[a] Based on 200 responses. Percentages are rounded to the nearest whole number and do not total to 100 percent because the entities could select multiple languages.

For Hurricane Harvey, in which languages did you issue emergency communication?

For Hurricane Harvey, entities reported that they issued communications in[2]:

- English
- Spanish
- Vietnamese
- Chinese
- Arabic

English

English was overwhelmingly the most common language in which communications were issued. Of the 199 entities that reported English was spoken in their jurisdiction, 195 (98 percent) issued emergency communications in English using at least one communication method. The most commonly used methods for issuing communications in English are listed in Figure 26.

Figure 26

Most Common Methods for Emergency Communications in English

Communication Method	Number of Respondents
Social media	154
Entity website	139
Email	135
SMS/text	133
Mass notification cellular	83

Nearly all communication methods were utilized to issue emergency communications in English from counties, municipalities, independent school districts, and special purpose districts.

[2] Three entities indicated that they used their entity website to offer translation services that included the languages listed, as well as Hindi, German, and French.

Spanish

Spanish was the second-most commonly used language for emergency communications. Of the 139 entities that reported Spanish was spoken in their jurisdiction, 120 (86 percent) issued emergency communications in Spanish using at least one communication method. The most commonly used methods for issuing communications in Spanish are listed in Figure 27.

Figure 27

Most Common Methods for Emergency Communications in Spanish

Communication Method	Number of Respondents
Email	85
SMS/text	84
Social media	83
Entity website	40
Mass notification landline	39

Vietnamese

Vietnamese was the third-most commonly used language for emergency communications. Of the 9 entities that reported Vietnamese as being spoken in their jurisdiction, 3 (33 percent) issued emergency communications in Vietnamese using at least one communication method. The most commonly used methods for issuing communications in Vietnamese are listed in Figure 28.

Figure 28

Most Common Methods for Emergency Communications in Vietnamese

Communication Method	Number of Respondents
Entity website	3
Mass notification landline	1
Mass notification cellular	1
SMS/text	1
Email	1
Word of mouth	1

Vietnamese was used to communicate only by counties and independent school districts.

Chinese

Of the 3 entities that reported Chinese was spoken in their jurisdiction, 2 (67 percent) issued emergency communications in Chinese using at least one communication method. The most commonly used methods for issuing communications in Chinese are listed in Figure 29.

Figure 29

Most Common Methods for Emergency Communications in Chinese

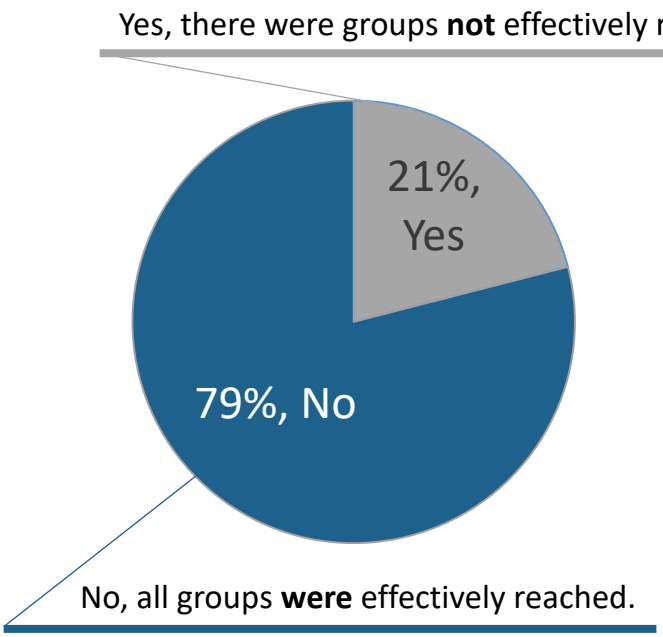
Communication Method	Number of Respondents
Entity website	2
Mass notification landline	1
Mass notification cellular	1
Social media	1

Arabic

One entity reported that it used its entity website to issue emergency communications in Arabic.

For Hurricane Harvey, were there certain groups of constituents who were not effectively reached by your communication systems/methods or who had information barriers that precluded effective communication?

Figure 30



Note: Based on 199 responses.

Respondents who indicated there were certain groups of constituents who were not effectively reached by the emergency communications were asked to elaborate on which groups of constituents were affected and how. Their responses are summarized below.

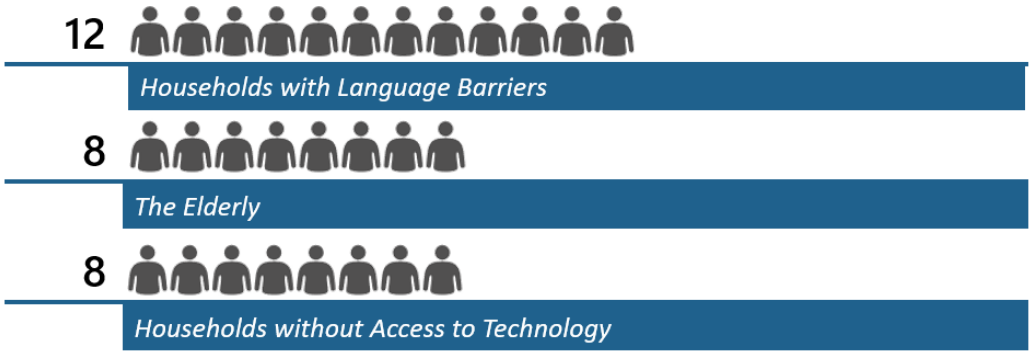


Figure 31

Please explain any changes, if any, that your entity has made since Hurricane Harvey to help reduce/address gaps in emergency communications.

Response	Number of Responses
No changes	87
Implemented new/improved communication methods	15
Expanded outreach	8
Updated contact records	7
Implemented language translation services	7

Chapter 3
Hurricane Imelda

This chapter summarizes survey responses related to the following topics specific to Hurricane Imelda (see text box for details about the disaster):

- Emergency communication timelines.
- Communication methods.
- Gaps in communications.

This chapter summarizes selected information from the surveys for Hurricane Imelda.

Overall, 108 entities responded that they issued emergency communications during Hurricane Imelda. Those respondents, represented in the map in Figure 32, were located in 39 different counties across the state. The county with the most respondents was Harris County, with 25 responses.

The respondents consisted of:

- 5 counties.
- 36 independent school districts.
- 5 municipalities.
- 13 special purpose districts.
- 49 utilities.

Unless otherwise noted, the percentages presented in this chapter are based on the number of entities from the list above that responded to that question.

Hurricane Imelda

Tropical Storm Imelda, the fourth-wettest tropical cyclone in Texas since 1940, made landfall near Freeport in September 2019. Imelda produced widespread rainfall amounts greater than 30 inches across several counties.

The flooding resulted in 5 deaths, an estimated 5,100 flooded homes, and many impassable roadways.

Source: The National Hurricane Center.

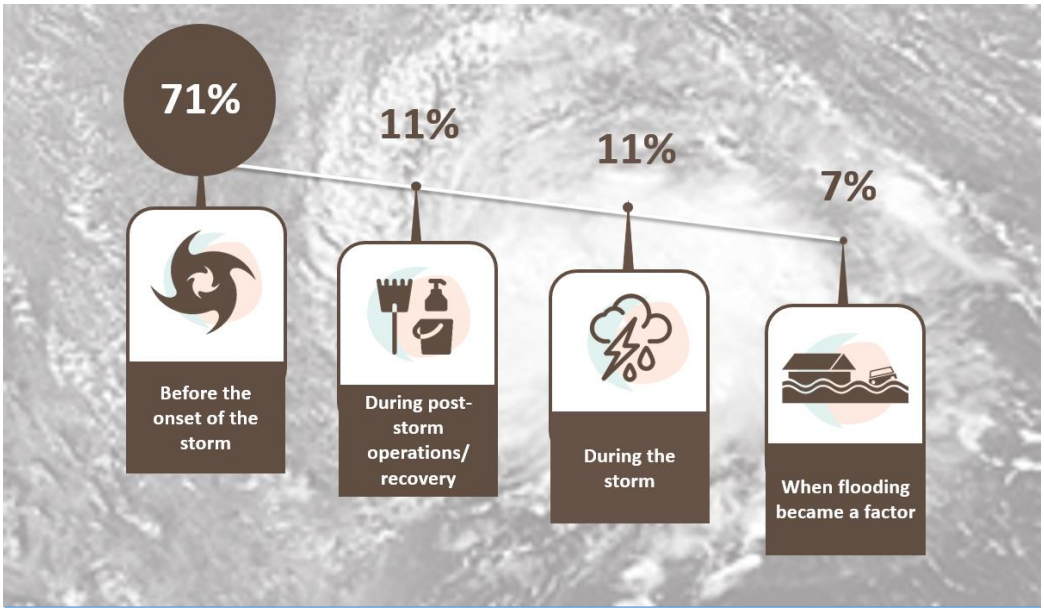
Figure 32

Survey Respondents

Emergency Communication Timelines

Please describe the points at which your entity decided to issue an official emergency communication.

Figure 33



Note: Based on 95 responses. An entity's response could be included in multiple categories, which is why the percentages do not total to 100 percent.

Most (71 percent) of the entities indicated they communicated with constituents before the onset of Hurricane Imelda, the highest percentage of any of the disasters included in this survey.

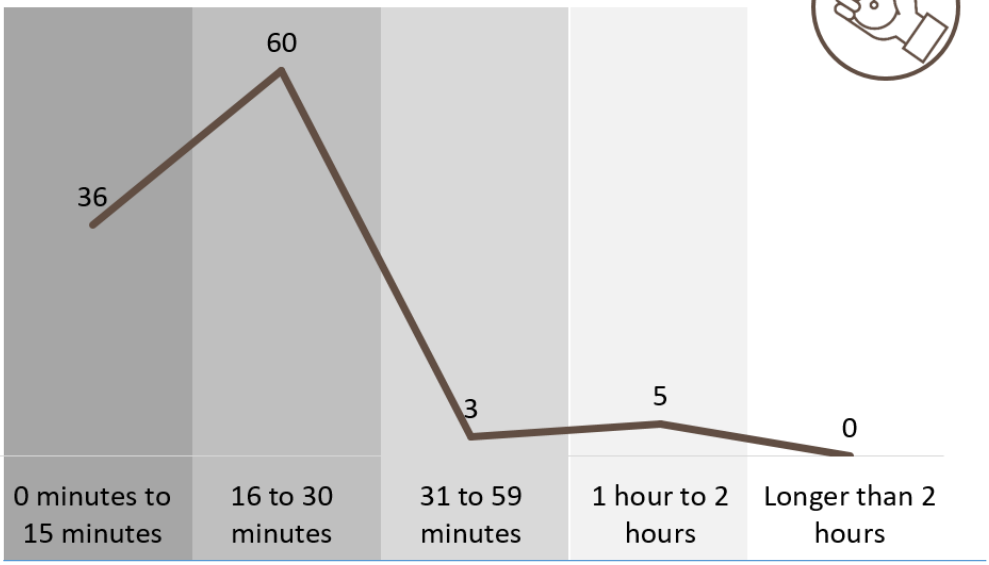
Nearly all (96 percent) utilities notified their customers before the onset of Hurricane Imelda.

Three-quarters (75 percent) of municipalities issued communications before Hurricane Imelda began. They also made up the largest share that issued communications when evacuations were ordered (25 percent).

Counties most frequently notified constituents before and after Hurricane Imelda (50 percent).

Once your entity decided to issue emergency communications, how long did it take to deploy the alert?

Figure 34



Note: Based on 104 responses.

Of all respondents, 35 percent issued communications within 15 minutes of deciding to issue emergency communications, and 92 percent issued communication within 30 minutes.

One county, one municipality, and three special purpose districts took 1 hour or longer to deploy an alert after deciding to issue emergency communications.

All 48 utilities that issued communications for Hurricane Imelda deployed the message within 30 minutes of deciding to issue emergency communications.

All 35 independent school districts that issued communications for Hurricane Imelda deployed the message within 30 minutes of deciding to issue emergency communications.

Figure 35

How would you rate the timeliness of emergency communications that were issued by your entity?

Response	Number of Responses	Percent
Excellent	21	20%
Good	69	66%
Satisfactory	12	12%
Fair	2	2%
Poor	-	0%
Total Responses	**104**	**100%**

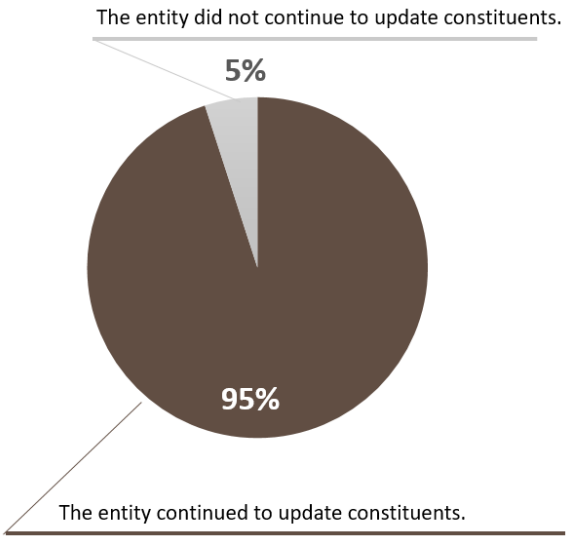
Of all entities, 86 percent rated the timeliness of their emergency communications at least "Good."

All 48 utilities rated the timeliness of their emergency communications for Hurricane Imelda "Excellent" or "Good."

All five municipalities rated the timeliness of their emergency communications for Hurricane Imelda "Good."

Did your entity continue issuing emergency communications to update constituents as new information came in?

Figure 36



Note: Based on 104 responses.

Figure 37

For follow-up communications sent for Hurricane Imelda, how would you rate the timeliness of emergency communications that were issued by your entity?

Response	Number of Responses	Response Rate[a]
Excellent	18	18%
Good	66	67%
Satisfactory	13	13%
Fair	1	1%
Poor	-	0%
Total Responses	**98**	**100%**

[a] Percentages are rounded to the nearest whole number and do not total to 100 percent.

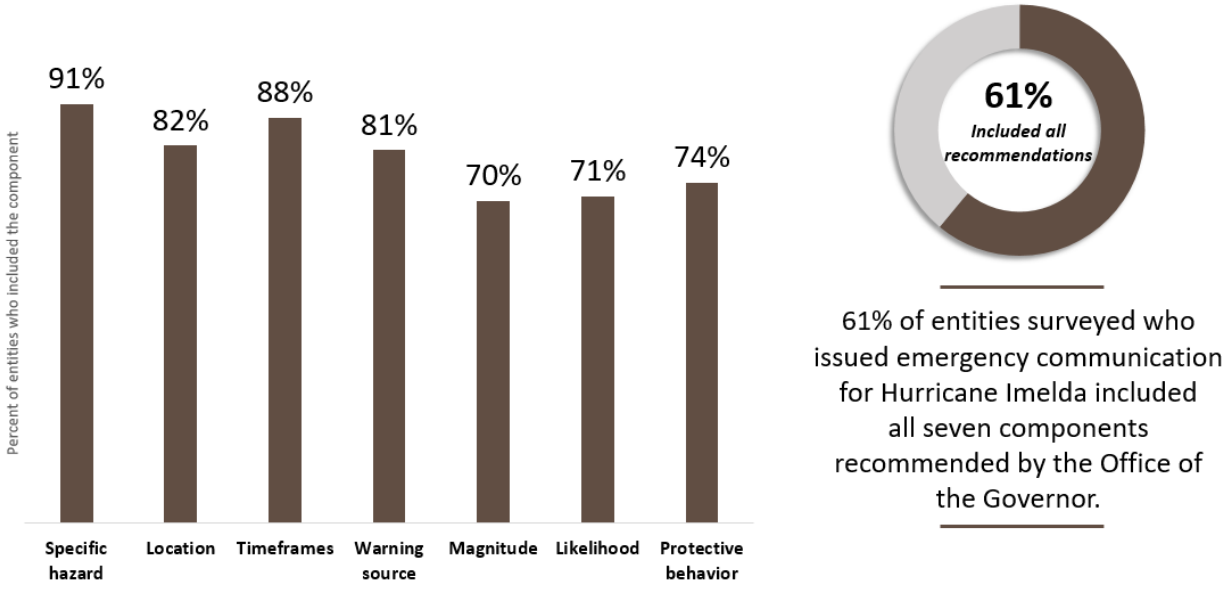
Of all entities, 98 percent rated the timeliness of their follow-up emergency communications at least "Satisfactory."

All 47 utilities that continued to issue follow-up communications rated the timeliness of their emergency communications "Excellent" or "Good."

All four municipalities that continued to issue follow-up communications rated the timeliness of their emergency communications "Good."

Which of the following components described below were included in the official emergency communication?

Figure 38



Note: Based on 104 responses

Nearly all (98 percent) utilities that issued communications for Hurricane Imelda stated they included all seven components recommended by the Office of the Governor (see Figure 39 for more information about those components).

The Office of the Governor published guidance, a list of resources, and applicable state laws related to emergency management. Included in that are seven components that are supposed to be in each alert, notification, or warning issued, which are listed in Figure 39.

Figure 39

Emergency Management Resources from Office of the Governor

Each alert, notification, or warning should contain:

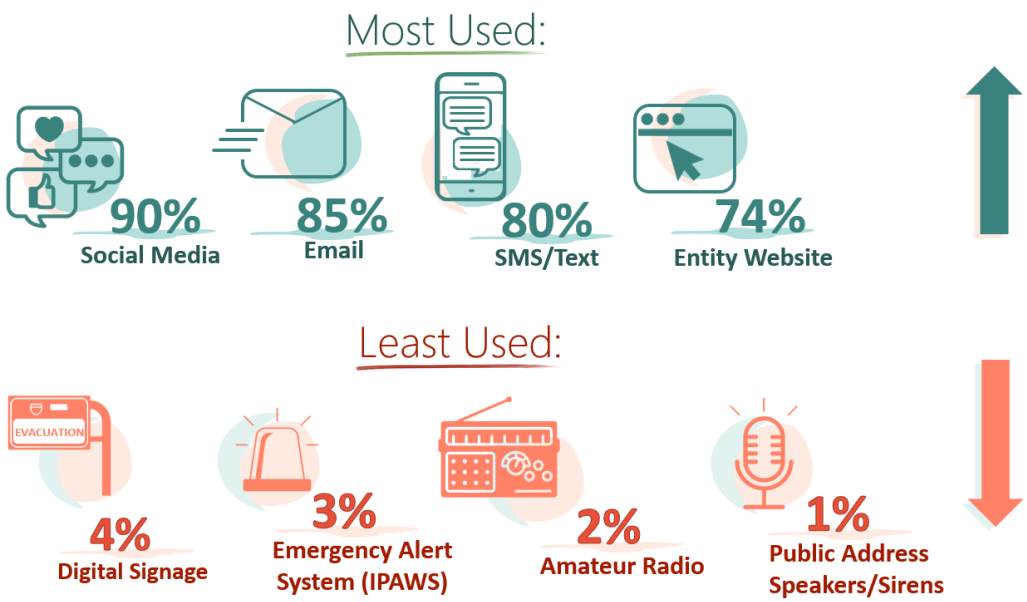
- **Specific Hazard** - What kind of hazard is threatening? What are the potential risks for the community?
- **Location** - Where will the impacts occur? Describe the location so that those without local knowledge can understand their risk.
- **Timeframes** - When will it arrive at various locations? How long will the impacts last?
- **Warning Source** - Who is issuing the warning? Identify an official source with public credibility.
- **Magnitude** - What impact is expected and how bad is it likely to get?
- **Likelihood** - How probable is occurrence of the impact?
- **Protective Behavior** - What protective actions should people take and when? If evacuation is called for, where should people go and what should they take with them?

Source: The Office of the Governor.

Communications Methods

What emergency communication method(s) did your entity use to communicate with constituents for Hurricane Imelda?

Figure 40



Note: Based on 104 responses.

Route notification was used more for Hurricane Imelda than any other disasters in the survey (46 percent of entities that responded).

Figure 41

How effective were each of the following emergency communication method(s) in communicating with constituents for Hurricane Imelda?[a]

The *most effective* communication methods	The *least effective* communication methods
Route notification	Public address speakers/sirens
SMS/text	Amateur radio
Entity website	Weather radio
Social media	Word of mouth
Email	Traditional media

[a] Based on 102 responses.

No entities rated any methods as "Not Effective."

Counties reported that social media and email were the most effective communication methods for Hurricane Imelda. Traditional media was the only method to receive an "Extremely Effective" rating for that disaster.

Independent school districts reported that social media, email, and SMS/text were the most effective communication methods for Hurricane Imelda. These methods, along with traditional media, were the ones most likely to receive an "Extremely Effective" rating from independent school districts.

Municipalities reported that social media, mass notification cellular, mass notification landline, and SMS/text were the most effective communication methods for Hurricane Imelda.

Special purpose districts reported that social media and email were the most effective communication methods for Hurricane Imelda. Weather radio was the only method with an "Extremely Effective" rating.

Utilities reported that SMS/text, social media, the entity's website, and email were the most effective communication methods for Hurricane Imelda.

Figure 42

Please indicate the percentage of constituents reached using the following communication methods.

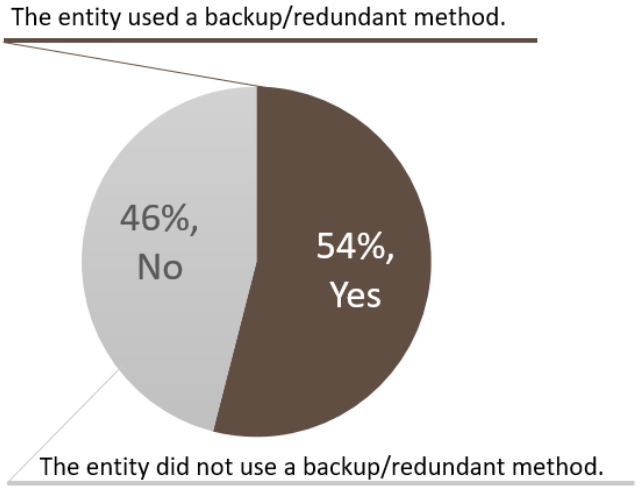
Response	0%	1-20%	21-40%	41-60%	61-80%	81-100%	Unknown
Mass notification landline	1	1	1	3	9	11	2
Mass notification cellular	1	-	2	2	9	14	2
SMS/text	-	-	1	4	9	14	2
Traditional media	-	-	-	1	2	6	2
Social media	-	-	3	8	10	6	6
Email	-	2	1	3	11	12	2
Entity website	-	-	1	6	5	4	3
Other web-based apps	-	-	-	1	4	3	2
Two-way radio	-	-	1	-	-	2	-
Weather radio	-	-	-	-	-	-	-
Amateur radio	-	-	-	-	-	-	-
Emergency alert system (IPAWS)	-	-	-	-	1	1	-
Public address speakers/sirens	-	-	-	-	-	-	-
Digital signage	-	-	-	-	1	-	-
Route notification	-	-	1	-	1	-	-
Word of mouth	-	-	1	-	-	2	-

The communication methods that reached a high percentage of constituents for Hurricane Imelda were:

- Mass notification cellular was used by counties, independent school districts, and municipalities to reach a high percentage of constituents.
- Social media was used by counties, municipalities, and special purpose districts to reach a high percentage of constituents.
- Email was used by independent school districts, special purpose districts, and utilities to reach a high percentage of constituents.
- Mass notification landline was used by counties and municipalities to reach a high percentage of constituents.
- SMS/text was used by independent school districts reach a high percentage of constituents.

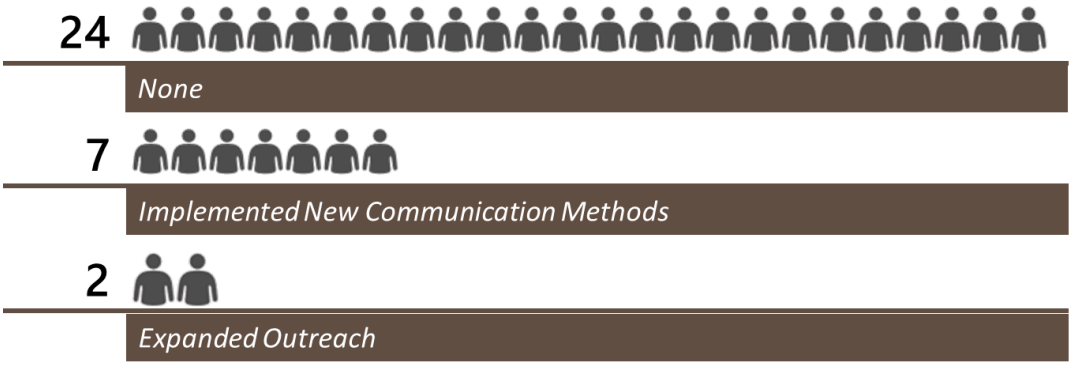
During Hurricane Imelda, did your entity have to use a backup/redundant method of emergency communication due to your primary communication methods not being available or effective?

Figure 43



Note: Based on 102 responses.

What changes, if any, has your entity made to your emergency communications due to Hurricane Imelda?



For the *Implemented New Communications Methods* in the chart above, entities mentioned other web-based apps, emergency alert system (IPAWS), two-way radios, phone trees, and general/non-specific additions.

"None" was the most common response for all entity types.

Gaps in Communication

Figure 44

What languages are commonly used to communicate in your jurisdiction?

Language	Total Responses	Percent [a]
English	103	100%
Spanish	86	83%
Vietnamese	5	5%
Chinese	2	2%
Arabic	2	2%
Hindi	1	1%
American Sign Language	1	1%

[a] Based on 103 responses. Because the entities could select multiple languages, percentages not total to 100 percent. Percentages are rounded to the nearest whole number.

For Hurricane Imelda, in which languages did you issue emergency communication?

For Hurricane Imelda, entities reported that they issued communications in:

- English
- Spanish
- Vietnamese
- Chinese
- Arabic

English

English was overwhelmingly the most common language in which communications were issued. Of the 103 entities that reported English was spoken in their jurisdiction, 101 (98 percent) issued emergency communications in English using at least one communication method. The most commonly used methods for issuing communications in English are listed in Figure 45.

Figure 45

Most Common Methods for Emergency Communications in English

Communication Method	Number of Respondents
Social media	90
Email	85
SMS/text	78
Entity website	75

Spanish

Spanish was the second-most commonly used language for emergency communications. Of the 86 entities that reported Spanish was spoken in the jurisdiction, 77 (90 percent) issued emergency communications in Spanish using at least one communication method. The most commonly used methods for issuing communications in Spanish are listed in Figure 46.

Figure 46

Most Common Methods for Emergency Communications in Spanish

Communication Method	Number of Respondents
Email	67
SMS/text	67
Social media	64
Route notification	46

Vietnamese

Vietnamese was the third most commonly used language for emergency communications. Of the 5 entities that reported Vietnamese as being spoken in the jurisdiction, 2 (40 percent) issued emergency communications in Vietnamese using their entity website.

Chinese

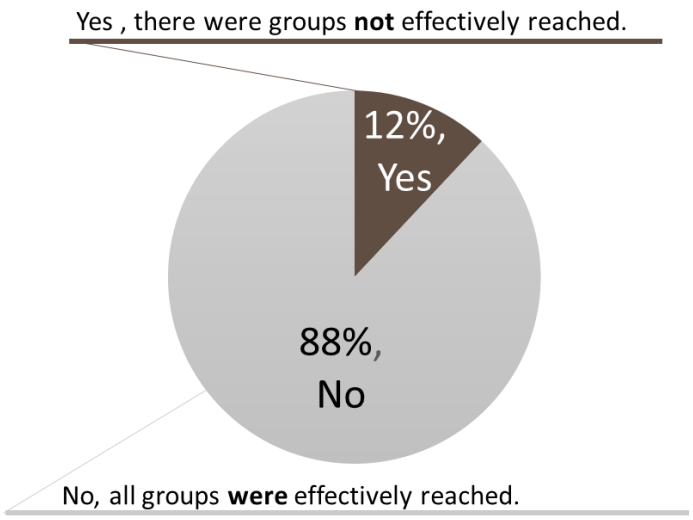
Of the two entities that reported Chinese was spoken in their jurisdiction, one issued emergency communications in Chinese using SMS/text, mass notification landline, and mass notification cellular.

Arabic

Of the two entities that reported Arabic was spoken in their jurisdiction, one issued emergency communications in Arabic using its entity website.

For Hurricane Imelda, were there certain groups of constituents who were not effectively reached by your communication systems/methods or who had information barriers that precluded effective communication?

Figure 47



Note: Based on 102 responses.

Respondents who indicated there were certain groups of constituents who were not effectively reached by the emergency communications were asked to elaborate on which groups of constituents were affected and how. The most commonly indicated groups were those without phone service due to the disaster (3 responses) and households with language barriers (2 responses).

Figure 48

Please explain any changes, if any, that your entity has made since Hurricane Imelda to help reduce/address gaps in emergency communications.

Response	Number of Responses
No changes	15
Implemented new communication methods	5
Updated contact records	3
Improved technology	2
Expanded outreach	2
Increased training	2

Chapter 4
Winter Storm Uri

This chapter summarized survey responses related to the following topics specific to Winter Storm Uri (see text box for details about the disaster):

- Emergency communication timelines.
- Communication methods.
- Gaps in communications.

This chapter summarizes selected information for Winter Storm Uri.

Overall, 529 entities responded that they issued emergency communication during Winter Storm Uri. Those respondents, represented in the map on Figure 49, were located in 174 different counties across the state. The county with the most respondents was Harris County, with 51 responses.

The respondents consisted of:

- 28 counties.
- 241 independent school districts.
- 61 municipalities.
- 79 special purpose districts.
- 120 utilities.

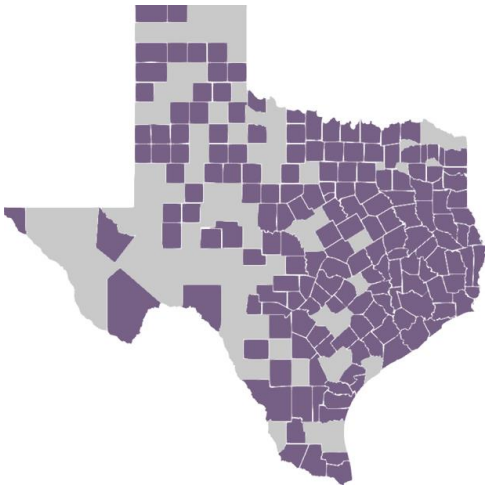
Unless otherwise noted, the percentages presented in this chapter are based on the number of entities from the list above that responded to that question.

Winter Storm Uri

Winter Storm Uri took place in February 2021; the storm contributed to at least 246 deaths and resulted in a loss of power for 69 percent of Texans and disruptions in water service to 49 percent of Texans.

Sources: The Office of the Comptroller of Public Accounts and the Department of State Health Services.

Figure 49

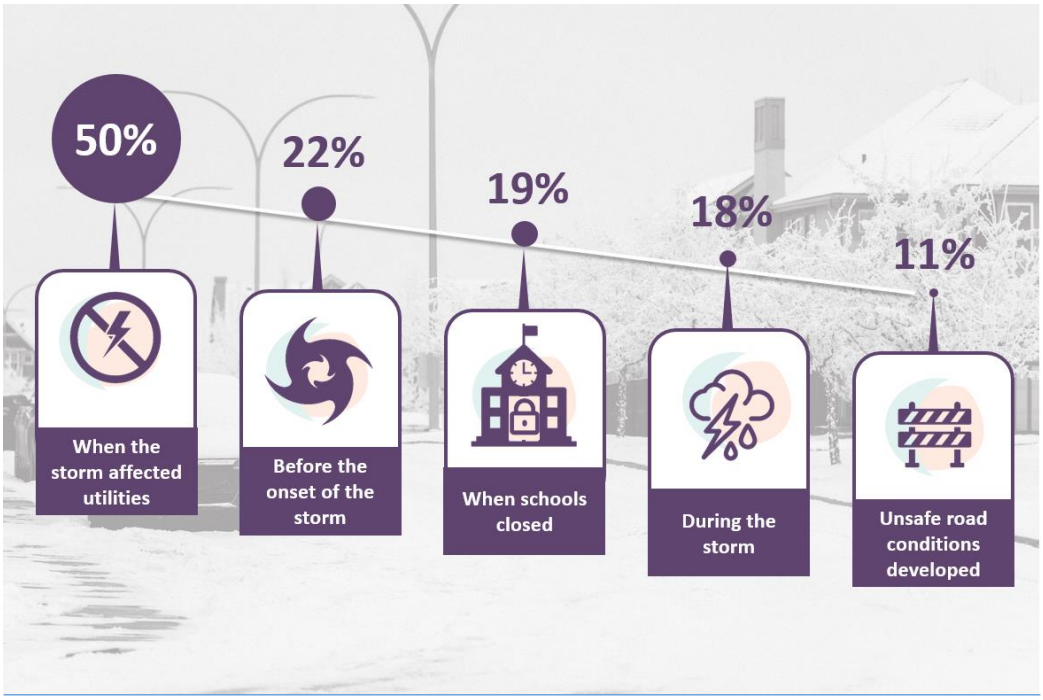


Survey Respondents

Emergency Communication Timelines

Please describe the points at which your entity decided to issue an official emergency communication.

Figure 50



Note: Based on 468 responses.
An entity's response could be included in multiple categories, which is why the percentages do not total to 100 percent.

Half of all the respondents issued communications related to Winter Storm Uri's effects on utilities (75 percent related to loss of power and 54 percent related to disruptions in water service).

Of the utilities, 81 percent notified their customers during extended outages during Winter Storm Uri.

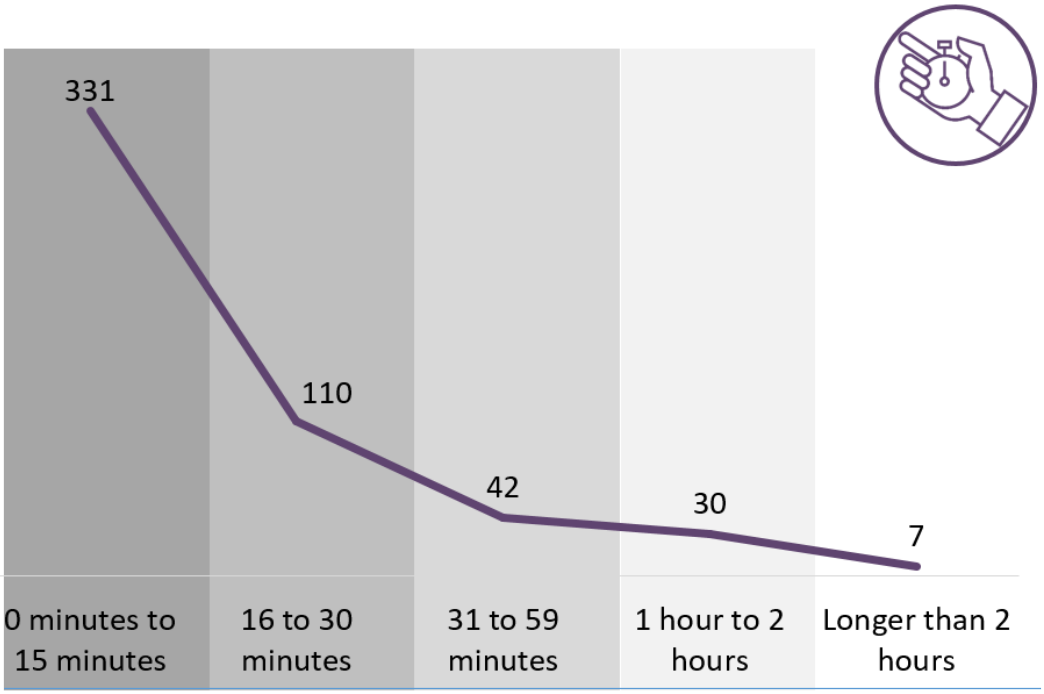
Counties notified their constituents during extended utility outages (57 percent). In addition, 39 percent issued communications before the onset of the storm and 35 percent issued communications during the storm.

60 percent of municipalities notified their customers during extended utility outages during Winter Storm Uri.

41 percent of independent school districts issued emergency communications related to school closures.

Once your entity decided to issue emergency communications, how long did it take to deploy the alert?

Figure 51



Note: Based on 520 responses.

For all entities, 64 percent issued communication within 15 minutes of deciding to issue emergency communications, and 85 percent issued communications within 30 minutes.

Of the independent school districts, 93 percent issued communications within 30 minutes, the quickest of all the entity types.

Of the counties and utilities, at least 85 percent issued communications within 30 minutes, the second quickest behind independent school districts.

Of the special purpose districts, 18 percent took 1 hour or longer to deploy an alert after deciding to issue emergency communication, the most of any entity type.

Figure 52

How would you rate the timeliness of emergency communications that were issued by your entity?

Response	Number of Responses	Percent
Excellent	184	35%
Good	185	36%
Satisfactory	114	22%
Fair	32	6%
Poor	6	1%
Total Responses	**521**	**100%**

More entities (7 percent) rated the timeliness of their emergency communications "Fair" or "Poor" for Winter Storm Uri when compared to the other disasters in the survey.

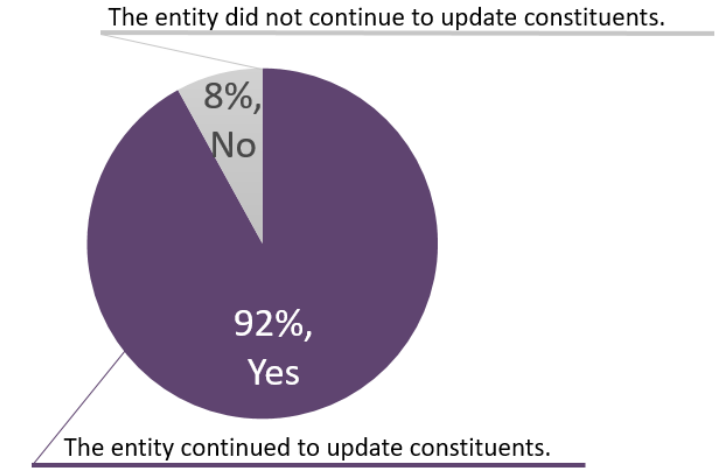
Of all entities, 71 percent rated the timeliness of their emergency communications at least "Good", including:

82 percent of independent school districts rated the timeliness of their emergency communications "Excellent" or "Good."

80 percent of utilities rated the timeliness of their emergency communications "Excellent" or "Good."

Did your entity continue issuing emergency communications to update constituents as new information came in?

Figure 53



Note: Based on 519 responses.

Figure 54

For follow-up communications sent for Winter Storm Uri, how would you rate the timeliness of follow-up information communicated by your entity?

Response	Number of Responses	Percent [a]
Excellent	175	37%
Good	169	36%
Satisfactory	98	21%
Fair	30	6%
Poor	2	0%
Total Responses	**474**	**100%**

[a] Percentages are rounded to the nearest whole number.

Just as with their initial communications, 7 percent rated the timeliness of their emergency communications "Fair" or "Poor" for Winter Storm Uri.

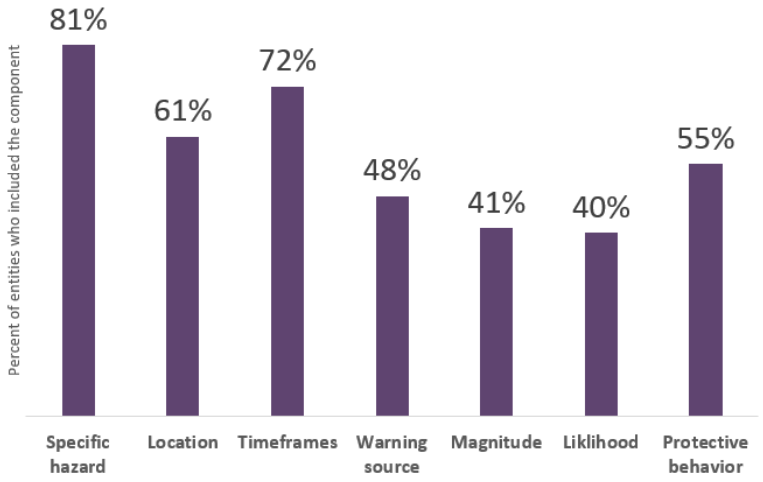
Of all entities, 73 percent rated the timeliness of their emergency communications at least "Good," including:

Of utilities, 87 percent rated the timeliness of their follow-up emergency communications "Excellent" or "Good," 8 percent better than the percentage of counties that assigned those rankings to their initial communications.

Of independent school districts, 82 percent rated the timeliness of their follow-up emergency communications "Excellent" or "Good".

Which of the following components described below were included in the official emergency communications?

Figure 55



23% of entities surveyed who issued emergency communication for Winter Storm Uri included all seven components recommended by the Office of the Governor.

Note: Based on 515 responses.

The Office of the Governor published guidance, a list of resources, and applicable state laws related to emergency management. Included in that are seven components that are supposed to be in each alert, notification, or warning issued (see Figure 56 on the next page).

Forty-eight percent of utilities and 31 percent of independent school districts emergency communication contained all seven components recommended by the Office of the Governor.

Figure 56

Emergency Management Resources from Office of the Governor

Each alert, notification, or warning should contain:

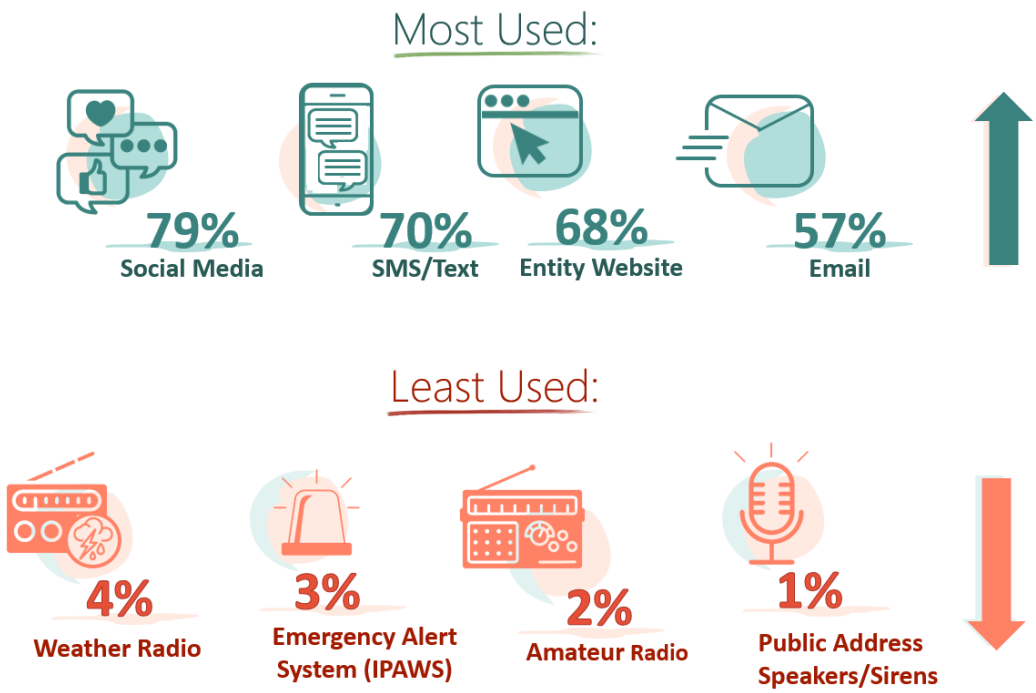
- **Specific Hazard** - What kind of hazard is threatening? What are the potential risks for the community?
- **Location** - Where will the impacts occur? Describe the location so that those without local knowledge can understand their risk.
- **Timeframes** - When will it arrive at various locations? How long will the impacts last?
- **Warning Source** - Who is issuing the warning? Identify an official source with public credibility.
- **Magnitude** - What impact is expected and how bad is it likely to get?
- **Likelihood** - How probable is occurrence of the impact?
- **Protective Behavior** - What protective actions should people take and when? If evacuation is called for, where should people go and what should they take with them?

Source: The Office of the Governor.

Communications Methods

What emergency communication method(s) did your entity use to communicate with constituents for Winter Storm Uri?

Figure 57



Note: Based on 517 responses.

Of all entities, 24 percent stated they used word of mouth as a communication method for Winter Storm Uri.

Independent school districts used social media (86 percent) and SMS/text (82 percent), more than any other entity type.

Counties used mass notification cellular and landline (64 percent each), more than any other entity type.

Figure 58

How effective were each of the following emergency communication method(s) in communicating with constituents for Winter Storm Uri? [a]

The *most effective* communication methods	The *least effective* communication methods
Route notification	Amateur radio
SMS/text	Public address speakers/sirens
Other web-based apps	Digital signage
Social media	Weather radio
Mass notification cellular	Two-way radio

[a] Based on 513 responses.

Counties reported that social media, SMS/text, and mass notification cellular were the most effective communications methods for Winter Storm Uri.

Independent school districts reported that SMS/text, social media, and email were the most effective communications methods for Winter Storm Uri. These methods, as well as mass notification cellular, were the ones most likely to receive an "Extremely Effective" rating from independent school districts. No independent school districts rated any method as "Not Effective."

Municipalities reported that social media, SMS/text, and the entity's website were the most effective communications methods for Winter Storm Uri. Those methods, as well as traditional media and route notification, were the only ones to be rated "Extremely Effective" (by at least six municipalities each).

Special purpose districts reported that social media, the entity's website, and email were the most effective communications methods for Winter Storm Uri. SMS/text received the most "Extremely Effective" ratings (from 8 special purpose districts).

Utilities reported that social media, the entity's website, and SMS/text were the most effective communication methods for Winter Storm Uri.

Figure 59

Please indicate the percentage of constituents reached using the following communication methods.

Response	0%	1-20%	21-40%	41-60%	61-80%	81-100%	Unknown
Mass notification landline	1	13	7	15	38	64	29
Mass notification cellular	1	7	5	18	42	80	28
SMS/text	-	6	12	32	55	97	35
Traditional media	-	2	3	10	13	14	15
Social media	-	12	9	34	49	34	55
Email	-	8	12	27	35	76	25
Entity website	-	14	10	25	21	22	37
Other web-based apps	-	1	1	5	10	14	7
Two-way radio	-	2	2	2	2	3	-
Weather radio	-	1	1	1	2	1	1
Amateur radio	-	-	-	4	1	-	-
Emergency alert system (IPAWS)	-	-	-	3	2	3	1
Public address speakers/sirens	-	-	-	-	1	-	1
Digital signage	-	-	-	1	2	1	-
Route notification	-	5	3	3	5	7	3
Word of mouth	-	3	6	3	8	8	7

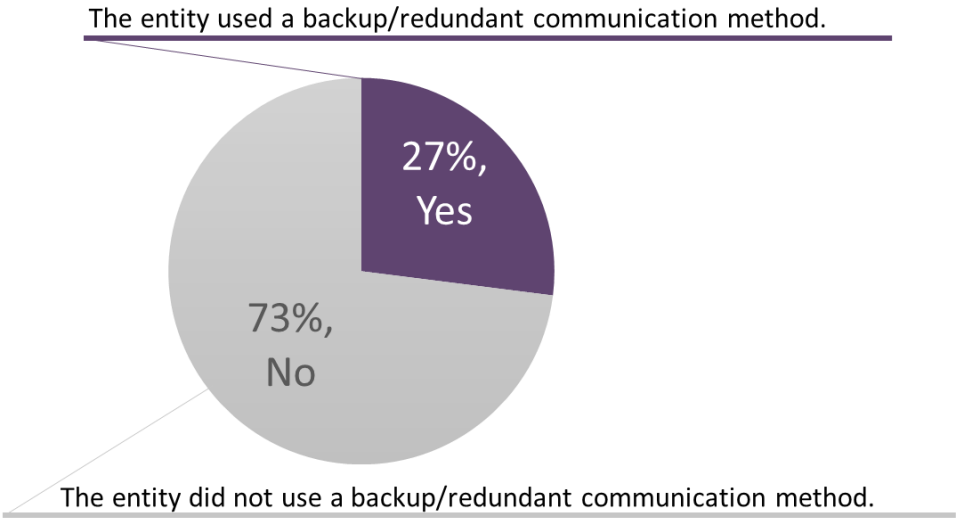
The communication methods that reached the highest percentage of constituents were:

- Mass notification cellular was used by counties, independent school districts, and municipalities to reach a high percentage of constituents for Winter Storm Uri.
- SMS/text was used by counties, independent school districts, municipalities, special purpose districts, and utilities to reach a high percentage of constituents for Winter Storm Uri.
- The entity's website was used by special purpose districts to reach a high percentage of constituents for Winter Storm Uri.

- Email was used by independent school districts, municipalities, special purpose districts, and utilities to reach a high percentage of constituents for Winter Storm Uri.
- Social media was used by counties, municipalities, and utilities to reach a high percentage of constituents for Winter Storm Uri.

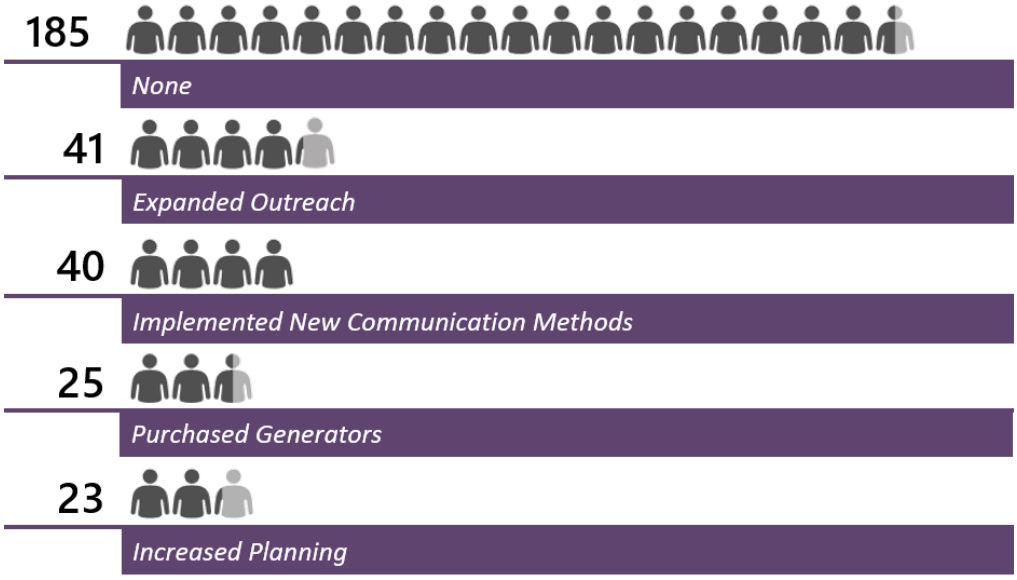
Did your entity have to use a backup/redundant method of emergency communication due to your primary communication methods not being available or effective?

Figure 60



Note: Based on 512 Responses.

What changes, if any, has your entity made to your emergency communications due to Winter Storm Uri?



For the *Implemented New Communications Methods* in the chart above, entities specified other web-based apps, SMS/text, two-way radio, emergency alert system (IPAWS), entity website, phone trees, and mass notification cellular.

Gaps in Communication

What languages are commonly used to communicate in your jurisdiction?

Figure 61

Response	Total Responses[a]	Percent[b]
English	514	100%
Spanish	308	60%
Vietnamese	17	3%
American Sign Language	8	2%
Chinese	6	1%
Hindi	3	1%
Arabic	3	1%
German	1	0%

[a] Two additional respondents indicated that they use website translation services to communicate in numerous languages.

[b] Based on 515 responses. Percentages are rounded to the nearest whole number and do not total to 100 percent because the entities could select multiple languages.

For Winter Storm Uri, in which languages did you issue emergency communication?

For Winter Storm Uri, entities reported that they issued communications in[3]:

- English
- Spanish
- Vietnamese
- Chinese
- American Sign Language
- Arabic
- German

[3] Four entities indicated that they used their entity website to offer translation services that included the languages listed, as well as Hindi and French.

English

English was overwhelmingly the most common language in which communications were issued. Of the 514 entities that reported English was spoken in their jurisdiction, 504 (98 percent) issued emergency communications in English using at least one communication method. The most commonly used methods for issuing communications in English are listed in Figure 62.

Figure 62

Most Common Methods for Emergency Communications in English

Communication Method	Number of Respondents
Social media	391
SMS/text	350
Entity website	330
Email	283
Traditional media	205

Nearly all communication methods were utilized to issue emergency communications in English from counties, municipalities, independent school districts, and special purpose districts.

Spanish

Spanish was the second-most commonly used language for emergency communications. Of the 308 entities that reported Spanish was spoken in their jurisdiction, 251 (81 percent) issued emergency communications in Spanish using at least one communication method. The most commonly used methods for issuing communications in Spanish are listed in Figure 63.

Figure 63

Most Common Methods for Emergency Communications in Spanish

Communication Methods	Number of Respondents
SMS/text	168
Social media	148
Email	134
Entity website	102
Mass notification cellular	88

Vietnamese

Vietnamese was the third-most commonly used language for emergency communications. Of the 17 entities that reported Vietnamese was spoken in their jurisdiction, 7 (41 percent) issued emergency communications in Vietnamese using at least one communication method. The most commonly used methods for issuing communications in Vietnamese are listed in Figure 64.

Figure 64

Most Common Methods for Emergency Communications in Vietnamese

Communication Method	Number of Respondents
Entity Website	5
Mass Notification Landline	2
Social Media	2
Word of Mouth	2

American Sign Language

Of the 8 entities that reported ASL was used in their jurisdiction, (63 percent) issued emergency communications in ASL using at least one communication method. Four of the five (80 percent) entities that issued emergency communications in ASL used traditional media (e.g., television news).

Chinese

Of the 6 entities that reported Chinese was spoken in their jurisdiction, 4 (67 percent) issued emergency communications in Chinese using at least one communication method. The most commonly used methods for issuing communications in Chinese were the entity's website (three responses) and social media (two responses).

Arabic

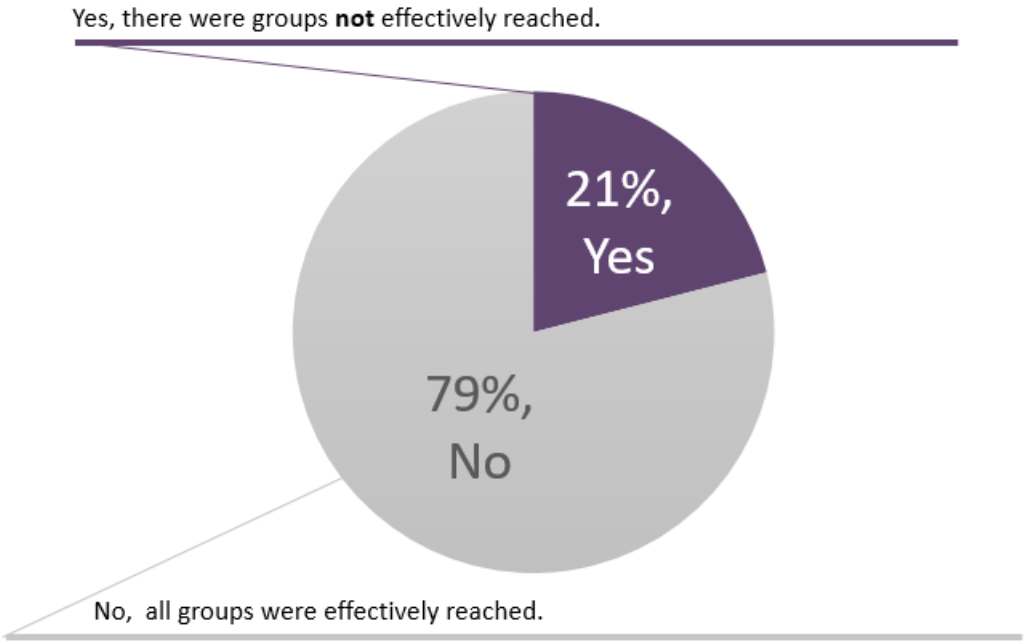
Of the 3 entities that reported Arabic was spoken in their jurisdiction, one (33 percent) issued emergency communications in Arabic using at least one communication method. That entity reported using its entity website and social media to issue emergency communications in Arabic.

German

One entity reported that German was spoken in its jurisdiction and that it used its entity website and SMS/text to issue emergency communications in German.

For Winter Storm Uri, were there certain groups of constituents who were not effectively reached by your communication systems/methods or who had information barriers that precluded effective communication?

Figure 65



Respondents who indicated there were certain groups of constituents who were not effectively reached by the emergency communications were asked to elaborate on which groups of constituents were affected and how. Their responses are summarized below.

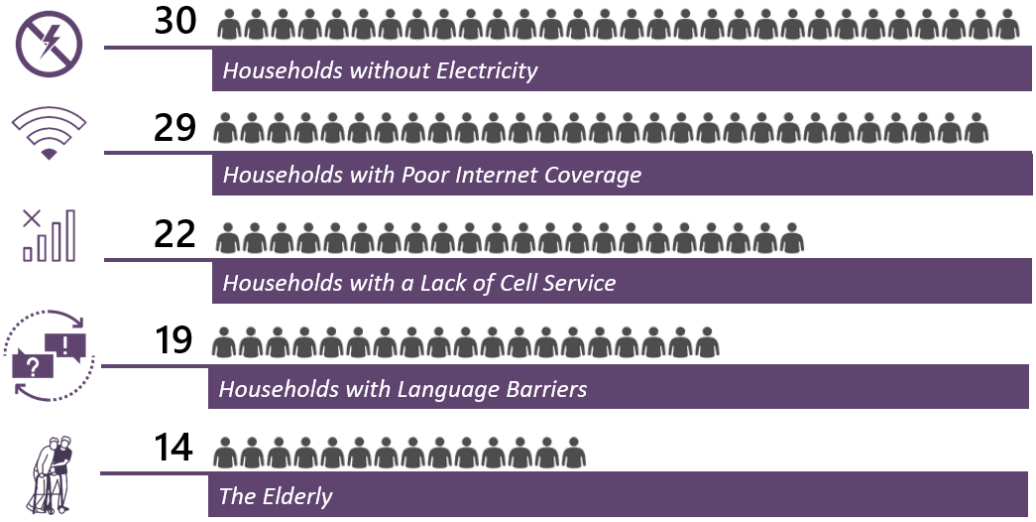


Figure 66

Please explain any changes, if any, that your entity has made since Winter Storm Uri to help reduce/address gaps in emergency communications.

Response	Number of Responses[a]
No changes	133
Expanded outreach	18
Updated contact records	18
Implemented new/improved communication methods	16
Offered language translation services	11
Improved infrastructure	10

Chapter 5
Other Emergencies

The other three emergencies named in Rider X, page III-262, the General Appropriations Act (87th Legislature) – Odessa Shooting, the Intercontinental Terminals Company Deer Park Fire, and the Texas Petrochemicals Group Port Neches Plant Fire – did not receive a significant number of survey responses. The survey responses for each of those emergencies are summarized at a high level below based on the information the entities that responded provided.

Odessa Shooting

Auditors received one response for this disaster (represented in the map in Figure 67).

Odessa Shooting

On August 31, 2019, 8 people were killed (including the perpetrator) and an additional 24 were wounded, in a mass shooting that spanned 24 crime scenes across the cities of Midland and Odessa, Texas.

Source: The Department of Public Safety.

Figure 67

Disaster Response

- The entity reported that it sent out communications within 30 minutes of the shooting and continued to do so as new information came in.
- The entity rated its initial and follow-up communications “Fair.”

Communication Methods

- The entity reported that it sent out communications using:

- The entity reported it used backup/redundant methods for this emergency.
- The entity reported it sent communications in English and Spanish.

Gaps in Communication

- The entity did not identify any gaps in its communications for this disaster and had not made any changes.

The Intercontinental Terminals Company Deer Park Fire

Auditors received 10 responses for this disaster (represented in the map in Figure 68).

Figure 68

The Intercontinental Terminals Company Deer Park Fire

The Intercontinental Terminals Company Deer Park Fire occurred on March 17, 2019, and burned for three days; it temporarily shut down the Houston Ship Channel and led to several shelter-in-place orders in the area due to air quality concerns.

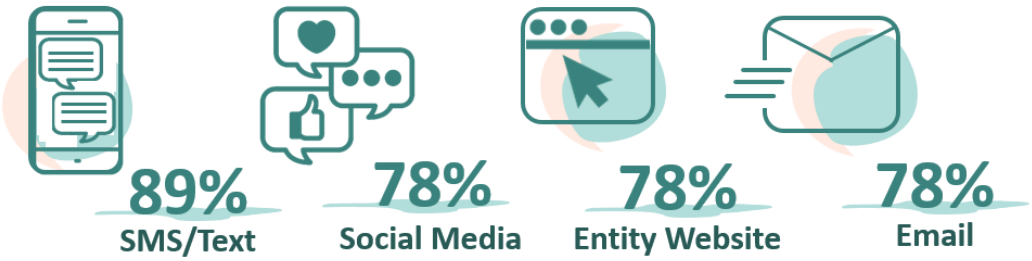
Source: The U.S. Chemical Safety and Hazard Investigation Board.

Disaster Response

- Four entities reported that they issued emergency alerts due to the fire, and two entities reported that they issued emergency alerts due to air quality concerns. Two entities responded that they issued emergency alerts for other reasons. Two entities did not answer.
- Eight entities reported they deployed their initial emergency alert within 30 minutes.
- Seven (78 percent) of the nine entities that responded rated the timeliness of their communications "Good."
- Seven entities continued to issue follow up communications after the initial alert. All seven of those entities rated the timeliness of their follow up communication "Good" or "Excellent."

Communication Methods

- The entities reported that the most commonly used communication methods were:



- The entities reported that all communication methods used were at least "Moderately Effective."
- Entities sent out communications in English, Spanish, Chinese, and Vietnamese.

Gaps in Communication

- The entities reported they did not identify any gaps in their communications for this disaster.

- One entity reported that it added more emergency communications training as a result of the disaster.

The Texas Petrochemicals Group Port Neches Plant Fire

Auditors received one response for this disaster (represented in the map in Figure 69).

The Texas Petrochemicals Group Port Neches Plant Fire

The Texas Petrochemicals Group Port Neches Plant Fire was a series of chemical plant explosions and long burning fire that began on November 27, 2019. The initial explosion injured several people and resulted in the issuance of a mandatory 4-mile radius evacuation order.

Source: The U.S. Chemical Safety and Hazard Investigation Board.

Figure 69

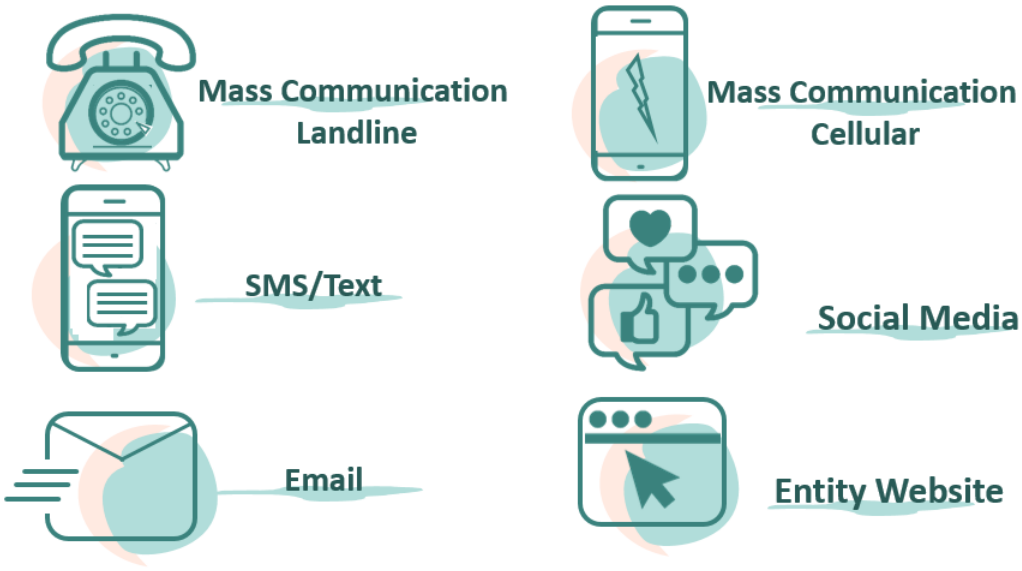
Survey Respondents

Disaster Response

- The entity reported that it deployed an alert within 30 minutes and continued to alert constituents as new information came in.
- The entity rated its initial and follow-up communications "Satisfactory."

Communication Methods

- The entity reported that it sent out communications using:



- The entity reported that these methods were all “Highly Effective” for the disaster.

Gaps in Communication

- The entity did not identify any gaps in its communications for this disaster.

Appendix

Objective, Scope, and Methodology

Objective and Scope

The objective was to examine and report on emergency communication systems and their utilization by Texas counties, municipalities, independent school districts, special purpose districts, other local government entities, and utilities from January 1, 2017, through December 31, 2021 as required by Senate Bill 1 (87th Legislature, Regular Session).

The following members of the State Auditor's staff performed the survey:

- Thomas Andrew Mahoney, CFE, CGAP (Project Manager)
- Alana Montoro (Assistant Project Manager)
- Michael Bennett
- Ava Shahparasti
- Mark Snyder, CFE
- Michelle Ann Duncan Feller, CPA, CIA (Quality Control Reviewer)
- Hillary Eckford, CIA, CFE (Audit Manager)

Survey Methodology

Development of Survey Questions. Auditors developed survey questions to collect information and other feedback on the following topics related to the emergency management communications:

- Entities' current emergency communications capacities.
- Actual usage of emergency communications.
  - This also included information specific to Hurricane Harvey, Hurricane Imelda, the Odessa Shooting, Winter Storm Uri, the International Terminals Company Deer Park Fire, and the Texas Petrochemicals Group Port Neches Plant Fire.
- Gaps in emergency communications capacity.

Auditors received assistance and input on the survey questions from the Texas Division of Emergency Management and the Texas State School Safety Center.

This Report

The information in this report was not subjected to all the tests and confirmations that would be performed in an audit. However, the information in this report was subject to certain quality control procedures to ensure accuracy.

Distribution of Surveys. Surveys were sent out two ways based on the type of contact information that was available for the entity.

- Surveys were sent via email to 4,737 entities (to all the Texas counties, municipalities, independent school districts, special purpose districts, and some utility providers). This survey was open from May 18, 2022, through June 21, 2022.
- Physical postcards with a link and a QR code to access the electronic survey were sent to 3,891 entities (to some electric utility providers that lacked email addresses and all public water systems identified). Postcards were mailed out on May 25, 2022, and the survey remained open through June 21, 2022.

Analysis of Survey Responses. Auditors reviewed the responses in the completed surveys and summarized the responses for each survey question. The survey consisted of several types of survey questions:

- **Multiple choice questions** – entities could select one option from a preset menu of choices.
- **Multiple choice questions with an "Other" option** – entities could select only one option from a preset menu of choices that included an "Other-Specify" option among the preset choices. For survey responses that provided "Other-Specify" answers, the entities were prompted to specify their response in a follow-up question. To analyze the "Other-Specify" responses, auditors grouped similar answers into auditor-determined categories; those that received one or a small number of responses were classified as "Other."
- **Multiple selection questions** – entities could select any/all of the options that applied from a list of preset menu choices.
- **Multiple selection questions with an "Other" option** – entities could select any/all of the options that applied from a list of preset menu choices that included an "Other-Specify" option among the preset choices. For survey responses that provided "Other-Specify" answers, the entities were prompted to specify their response in a follow-up

question. To analyze the "Other-Specify" responses, auditors grouped similar answers into auditor-determined categories; those that received one or a small number of responses were classified as "Other."

- **Ranking** – Responses to some multiple selection questions were ranked based on the number of responses. To summarize and present the answers for this type of question, based on the number and frequency of which each option was selected by survey respondents. Auditors then totaled the weighted counts for each option among all the completed surveys and assigned a final total for each option. The options were then presented in that order.

- **Open-ended questions** – entities could provide written responses to the question. To compile and present the answers for this type of question, auditors summarized the responses and classified similar responses into auditor-determined categories.

Contact Information. Auditors obtained entity contact information from the following sources:

- The Texas Division of Emergency Management provided contact information for Texas counties and municipalities.
- The Texas Education Agency provided contact information for independent school districts through its *Texas Education Directory of School District Information*.
- The Office of the Comptroller of Public Accounts provided contact information for special purpose districts through its Special Purpose District Public Information Database.
- The Commission on Environmental Quality provided contact information for public water systems from its publicly available contact databases.
- The Railroad Commission provided contact information for gas distribution utilities.
- The Public Utility Commission of Texas provided contact information for electric utilities through its publicly available online market directories. This included contacts for investor-owned utilities, transmission and distribution utilities, municipality-owned utilities, and cooperatives.

Copies of this report have been distributed to the following:

Legislative Audit Committee

The Honorable Dan Patrick, Lieutenant Governor, Joint Chair

The Honorable Dade Phelan, Speaker of the House, Joint Chair

The Honorable Joan Huffman, Senate Finance Committee

The Honorable Robert Nichols, Member, Texas Senate

The Honorable Greg Bonnen, House Appropriations Committee

The Honorable Morgan Meyer, House Ways and Means Committee

Office of the Governor

The Honorable Greg Abbott, Governor

Texas Division of Emergency Management

Mr. W. Nim Kidd, Chief of the Texas Division of Emergency Management

Ms. Blair Walsh, Division Chief, Community Relations

Legislative Committees

Members of the legislative committees with oversight responsibilities related to the subject of the report, as required by Rider X, page III-262, the General Appropriations Act (87th Legislature).