Background
The Federal Alliance for Safe Homes (FLASH®) surveyed consumers during January 2021 to measure consumer awareness and understanding of tornado weather, safety, and protection. The survey identified significant opportunities to increase consumer safety through improved knowledge of meteorological terms, safe and unsafe behaviors during tornadoes, and information about safe rooms, and storm shelters.

Methodology
Each survey sampled 500 respondents in Alabama, Georgia, Kansas, Louisiana, Missouri, Mississippi, North Carolina, Ohio, Oklahoma, South Carolina, Tennessee, and Texas.

Survey One provided clear findings on several topics, while revealing opportunities for further investigation for several others in Survey Two. Several topics returned nearly identical results for identical questions, further validating the findings. Not all questions were repeated on both surveys.

The overall findings provide the basis for the new FLASH #TornadoStrong outreach campaign, emphasizing key messages that drive tornado safety behavior and consumer choices regarding awareness, preparation, and sheltering.
Understanding the Difference Between Tornado Watch and Tornado Warning

**Survey One**

Q1  
Do you know the difference between a tornado warning and a tornado watch?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>92.2%</td>
<td>7.80%</td>
</tr>
</tbody>
</table>

This question was asked more precisely in Survey Two to verify the high level of confidence reported.

**Survey Two**

Q1  
The National Weather Service weather alert “tornadoes are possible in and near your area” indicates which of the following?

<table>
<thead>
<tr>
<th>TORNADO WATCH</th>
<th>TORNADO WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>50%</td>
<td>50%</td>
</tr>
</tbody>
</table>

Q2  
The National Weather Service weather alert “a tornado has been sighted or indicated by weather radar” indicates which of the following?

<table>
<thead>
<tr>
<th>TORNADO WATCH</th>
<th>TORNADO WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>34.2%</td>
<td>65.8%</td>
</tr>
</tbody>
</table>

While respondents in Survey One were confident that they knew the difference between a tornado watch and a tornado warning, when provided specific definitions in Survey Two, half incorrectly identified a watch, and one-third incorrectly identified a warning.

The definition of “tornado watch” appears to be the most confusing at 50% accuracy, and “tornado warning” was better understood at 65.8% accuracy. Neither of the answers on Survey Two validate the original 92.2% confidence level found in Survey One.
Receiving Tornado Alerts, Watches, and Warnings

**Survey One**

**Q3**

How do you receive tornado alerts, watches, or warnings?

- **No Routine Way:** 1.1%
- **Friends or Family:** 15.5%
- **TV or Radio News:** 28.4%
- **Smart Phone App:** 29.5%
- **NOAA Weather Radio:** 10.4%
- **Social Media:** 16.2%

Both surveys conveyed nearly identical findings that the majority of respondents received severe weather alerts from smartphone apps or TV/radio news channels. The increase in smartphone app use reflects a consistent upward trend.

**Survey Two**

**Q3**

How do you receive tornado alerts, watches, or warnings?

- **No Routine Way:** 1.8%
- **Friends or Family:** 14%
- **TV or Radio News:** 29.2%
- **Smart Phone App:** 28.3%
- **NOAA Weather Radio:** 10.4%
- **Social Media:** 16.2%
Knowing What to Do Under Tornado Threat

The surveys paired two sets of slightly different questions and provided for open-ended responses.

**Survey One**

Q4. Do you know what to do if a tornado threatens?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>93%</td>
<td>7%</td>
</tr>
</tbody>
</table>

Q5. Please select the steps that you would take if a tornado threatened.

- Stay away from windows, doors, and outside walls: 28.2%
- Go to a safe room, basement, or storm cellar: 29.7%
- Get to a small interior room on the lowest level: 24.7%
- If outdoors, do not get under an overpass or bridge: 17.3%
- Keep an eye on the sky: 33.6%
- Open your windows: 11.8%
- Monitor your NOAA weather radio, alerting app, and local media: 54.6%

**Survey Two**

Q4. Please select the precautions you would take if you came under a tornado watch.

- Keep an eye on the sky: 33.6%
- Monitor your NOAA weather radio, alerting app, and local media: 54.6%
- Open your windows: 11.8%
Respondents reported high levels of confidence in their understanding of protective actions to take during a tornado watch or warning. More detailed questions supported those higher levels of understanding, although a small percentage reported interest in opening or cracking windows when under “watch” conditions.

While minimal (11.8% and 4.6%), the support for opening windows indicates a need for continued education. Cracking or opening windows allows wind pressurization inside a home that leads to building damage and often complete destruction.
Most respondents underestimated the frequency of tornadoes nationwide and likelihood that they could threaten an area. According to the NOAA Storm Prediction Center, 88% of the counties in the lower U.S. were under a tornado watch at some point between 2015 and 2020.
**Understanding the Difference Between Safe Spaces and Safe Rooms**

**Survey One**

**Q7**
Do you have a tornado safe room or shelter either in your home, garage, or yard?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>57.2%</td>
<td>42.8%</td>
</tr>
</tbody>
</table>

**Survey Two**

**Q7**
Do you have a tornado safe room constructed consistent with FEMA guidance or a shelter tested and approved to meet the International Code Council 500 standard?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>35.4%</td>
<td>64.6%</td>
</tr>
</tbody>
</table>

Respondents were confused by the difference between generic “safe rooms, spaces, or shelters” and FEMA safe rooms and shelters that meet the national technical criteria and standards. When asked if they had a safe room or shelter, 57.2% responded positively on Survey One. That same response dropped to 35.4% on Survey Two, which included the specific technical criteria language. While it’s unclear why respondents answered differently, the finding suggests the need for more promotion of FEMA criteria when building a safe room or purchasing a tested and approved shelter that meets ICC 500.
Are you aware that a tornado safe room constructed consistent with FEMA guidance or a shelter tested and approved to meet the International Code Council 500 standard can provide near-absolute protection in tornadoes up to 250 miles-per-hour?

**Survey Two**

**Q8**

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>51.2%</td>
<td>48.8%</td>
</tr>
</tbody>
</table>

Only half of respondents reported awareness of the most effective life safety protection options. This question appeared on Survey Two only.
Survey One

Q9

How much do you believe a certified/tested and approved tornado safe room costs?

- More than $10,000: 17.8%
- Between $5,000 and $10,000: 30.6%
- Between $3,000 and $5,000: 33.4%
- Less than $3,000: 18.2%

More than 44% of respondents overestimated the actual cost of safe rooms during new construction when they are most affordable. Many affordable shelter options are available for purchase and installation at and below $3,000.

Survey Two

Q9

How much does a tornado safe room constructed consistent with FEMA guidance or a shelter tested and approved to meet the International Code Council 500 standard typically cost?

- More than $10,000: 14.2%
- Between $5,000 and $10,000: 30.2%
- Between $3,000 and $5,000: 41.2%
- Less than $3,000: 14.4%
Understanding the Affordability of Tornado-Resilient Home Construction

Survey One

Q10 Did you know that single-family homes can be affordably built to withstand most tornadoes?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>54.4%</td>
<td>45.6%</td>
</tr>
</tbody>
</table>

Survey Two

Q10 Are you aware that single-family homes can be affordably built to withstand most tornadoes?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>55.8%</td>
<td>44.2%</td>
</tr>
</tbody>
</table>

Nearly half (45.6% and 44.2%) of respondents thought that tornado-resistant homes were unaffordable. In fact, $1,000 in additional metal connectors installed from a home’s roof to its foundation could upgrade a house to withstand wind uplift pressure from an EF-0 to an EF-2 tornado.