

NWS Detroit/Pontiac Mobile and Manufactured Home Safety Campaign

Within the 17 Counties that encompass the NWS Detroit/Pontiac County Warning Area, there are approximately 480 Mobile and Manufactured Home (MH) Parks. These parks range in size from very small (less than 15 sites) to very large (over 600 sites). Looking at these parks combined, there are approximately 105,000 MH sites. Even with an estimated 10 to 15 percent vacancy of MH sites, that still indicates enough residents who live in mobile or manufactured homes in the NWS Detroit/Pontiac forecast area to fill a small city. This does not take into consideration mobile and manufactured homes that are on private property and not located in a park.

MHs are very susceptible to significant damage during tornadoes. In fact, of all the injuries and deaths from tornadoes incurred to people in their homes, most of those injuries and fatalities have been in MHs. While the frequency of strong and violent tornadoes in Michigan is far less than in other states in the US, residents of Michigan are still susceptible to tornadoes. Unfortunately, that came to light in May of 2022 when a rare strong tornado hit the northern Michigan community of Gaylord. The two fatalities and most of the injuries from that tornado occurred in the Nottingham Forest Mobile Home Park. This event sparked an interest among the emergency management community across Southeast Michigan in obtaining more information about MH safety in tornadoes. This mobile and manufactured home packet has been created to help address some of the questions that have arisen since the northern Michigan tornado. In addition to this material, MH safety infographics and a video will be distributed via our social media sites as part of the 2023 Michigan Severe Weather Awareness Week.

Within this packet you will find general MH definitions and safety information. Much of this material was created by National Weather Service offices in Louisiana and Alabama in partnership with structural engineers. Also included is a database of county specific mobile/manufactured home park information. This includes a broad/general category that describes the overall condition of the park. Those that are listed as 'poor' contain many old mobile homes (prior to the 1976 safety changes) and/or are considered to have very high social vulnerability due to high poverty/low income. Those that are listed as 'average' and 'good' have newer homes and in many cases have onsite storm shelters and/or clubhouses.

Basic Mobile Home Facts

Definitions:

Mobile Home - A prefabricated home (manufactured off-site) constructed prior to 1976.

Manufactured Home - A prefabricated home constructed after 1976 in accordance with the HUD manufactured Home Construction and Safety Standards.

Site Built Home - Any home that is not prefabricated (i.e. any home built on site conforming to the local building code).

Modular Home - A prefabricated home designed and constructed to conform to the local building code in effect at the final location of the home.

So what happened in 1976...

In 1974, Congress passed the Federal National Manufactured Housing Construction and Safety Standards Act commonly referred to as the HUD code. The new Hud Codes were put into place on June 5th, 1976. After this date "mobile" homes were now to be referred to as "manufactured" homes due to the changes in construction, design, performance and installation. Homes that meet the post-1976 HUD codes are assigned a HUD tag proving that "to the best of the manufacturers knowledge" the home is built to the HUD requirements. A "data plate" is also placed on the home that can list equipment, wind zone and other information.

HUD's Manufactured Home Construction and Safety Standards and its Model Manufactured Home Installation Standards categorize the United States and many of its territories and protectorates into three wind zones. The entire state of Michigan is in Zone 1, which is designed for the interior of the country not affected by hurricanes. In Zone 1, the homes are designed to generally resist wind speeds of approximately 70 MPH.

Michigan mobile/manufactured home park storm shelters...

Around 1995, the Michigan Manufactured Housing Commission established a rule that all new mobile home communities must have a storm shelter onsite. Those parks that existed prior to 1995 were grandfathered into this rule. As a result, many MH parks established before 1995 do not have storm shelters onsite.

General Statistics:

- There are around 1,060 MH parks in the state of Michigan.
- Around 6% of existing single family homes in Michigan are mobile or manufactured.
- Detroit is one of the top 10 retail markets in the country for manufactured housing.
- 72% of all tornado fatalities occur in homes.
- 54% of housing fatalities occur in Mobile/Manufactured Homes (MH).
- Research has indicated that MH residents are 15-20 times more likely to be killed in a MH compared to a permanent home in the event of a tornado.
- Typically, complete destruction of a MH is expected for wind loads approximately 45% of those expected to destroy a permanent home.

Mobile and Manufactured Housing (MH) Frequently Asked Questions

If you live in a MH, what are the best sheltering options?

- Officially, the NWS, NOAA, and FEMA all suggest that mobile/manufactured housing residents **flee their homes for sturdier shelter**.
 - However, this is not such an easy task for a large number of MH residents due to a number of factors. The following assumptions are often made in this situation.
 - Residents have a car
 - Residents know where sturdier shelter is located
 - Residents actually know WHAT “sturdier” shelter looks like
 - Residents know their own homes geographic location (relative to the storm movement)
 - Community shelter (if one is available) is actually open
 - Whether pets are allowed or not
 - Whether the shelter is at capacity
- Recent research has shown that due to the greater number of MHs being located in rural locations, community shelters are not the solution. **Rather, the retrofitting of existing structures so that they are more resistant to tornadic winds may be more practical.**
 - Typical structural upgrades such as adding tie-downs and anchoring can be done at a fraction of the total cost of a new MH. (under \$2,000)
- **MH resident sheltering best practices:** Have a sheltering plan. Have a place that is of a sturdier structure (preferably a tornado shelter or a relatives/friends home with a basement) to go to and know how long it takes to get there. **The best option is to begin moving toward this sturdier structure or designated tornado shelter when a tornado watch is issued.**

Should you really lay in a ditch vs riding it out in a MH?

Not necessarily, but this is still widely debated. Typically, laying in a ditch or ravine should be a last resort to sheltering from a tornado. This type of protective action is suggested to those outside who cannot make it to adequate shelter. That being said, some groups (e.g. CDC) suggest that MH residents may actually be better off fleeing their homes and lying flat in a ditch or culvert. Other researchers have noticed that vehicles may offer more protection than MHs during tornadoes as well. This is more often the case if you have a newer vehicle equipped with airbags, in which case, you will want to turn the vehicle on so that the airbags can deploy if need be. **Either way, the consensus is that the best course of action is to flee the MH for sturdier protection.**

What causes the most serious injuries/deaths in MH during a tornado?

When the structure is moved off its foundation and starts to tumble/break apart. Modern manufactured homes (built after the 1976 HUD requirements) are actually well built and can withstand lower end tornadoes. However, a common issue is improper, non-existent, or compromised anchoring of the structure to the ground. Once the structure's foundational integrity is compromised, rolling and other movements can cause the home to fall apart. **The key point is the anchoring.**

Is there any advice to give as far as securing a MH that can not be permanently placed (such as a rented lot)?

Here is more detailed information from a structural engineer who specializes in this issue.

<https://www.weather.gov/wrn/ambassador-perspective>

Information on anchoring from FEMA (located in section 7):

https://www.fema.gov/sites/default/files/2020-08/fema_p85.pdf