



# Integrated Resource Plan for Manufactured Home Power Outages in Arizona

## Summary

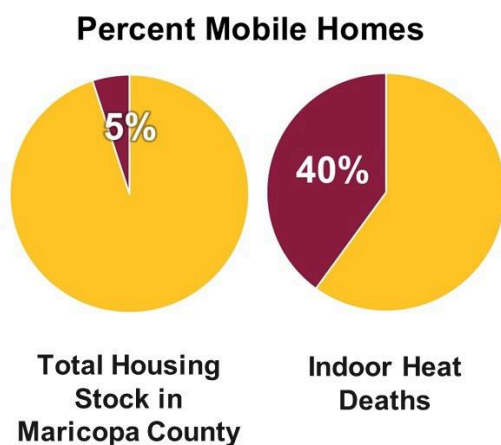
The summer of 2023 was the hottest on record in the Phoenix, Arizona, metro area. Temperatures stayed over 110 degrees for 54 straight days; the average daily temperature was 102.7 F (36.1 C) in July, and the average daily temperature was 98.8 F (37.1 C) in August. On a hot summer weekend in July, an unexpected power outage occurred at a mobile home community in Mesa, Arizona, and some residents lost power for nearly 24 hours (Partlow et al., 2023).

Luckily, there was some communication between the housing management staff and the residents through the neighborhood Facebook group. Even though SRP supplies electricity for all the residents at the mobile home park year-round, the residents living in the newer homes paid the park management team for electricity. Therefore, the responsibility to restore power for the residents is divided between the park owner, landlord, and/or manager to restore power for those specific houses. The utility company handles electricity for the older section of the mobile homes, and any additional updates were sent to them separately. Due to park management's inability to get a high-voltage electrician to visit the site on a Sunday, hundreds of residents aged 55+ experienced extreme heat conditions until the next day. Including some who use wheelchairs and cannot drive themselves and residents who cannot use their continuous positive airway pressure (CPAP) machine. Several of these community members went to the emergency room with heat-related illnesses or injuries from falling in the dark. Others left to stay with family or friends nearby, and then a handful stayed at their homes and spent the night in sweltering conditions (Partlow et al., 2023). Due to the length of time of the outage, any food or medication in the freezers or refrigerators spoiled.

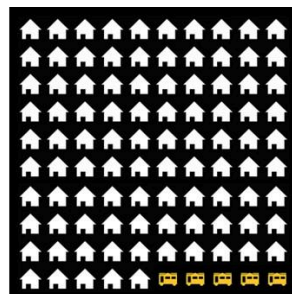
## Executive Summary

From 2012 to 2015, Arizona had approximately 100 heat-related deaths annually. In 2022, Arizona had 671 deaths, almost seven times greater than a decade earlier (Executive Order 23-16). Data from the Maricopa County Public Health Department over various years reported that even though 91% of mobile home residents have air conditioning units, these residents are twice as likely to suffer from heat-related deaths in trailers. Among indoor deaths with AC present, 29% were not functioning, 32% were not on because there was no electricity, and 24% were not in use, often because residents self-shut-off due to the cost of electricity (Maricopa et al. Department, 2019). Based on the 2023 Executive Order on Extreme Heat Planning and Preparedness, functioning air conditioning can become a matter of life and death during excessive heat.

This research aims to collect emergency preparedness data around Arizona to zero in on gaps in heat adoption decision-making and promote structural governance to enforce synchronized deployment of services specifically for residents living in mobile and manufactured housing communities (MMHC). We built upon the Greater Phoenix Heat Action Planning Guide (2019), which emphasized the following strategic themes to integrate urban heat solutions: advocate and educate, improve comfort/ability to cope, improve safety, and build capacity. Our ASU Knowledge Exchange of Resilience (KER) team is engaging through those same strategies in light of the particular circumstances faced by manufactured home residents on how we can bring all actors involved towards solutions: from park managers, park owners, homeowners, stakeholders, AAMHO board members, electric companies /entities, universities, community centers or city, to



**Despite that 5% of housing is mobile homes, trailer residents make up about 40% of indoor heat related deaths**



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county and state officials. ASU KER's second strategy for building community resilience involves collecting and sharing data, analytics, models, and visualizations that structure and organize conversations around responses and solutions (A Knowledge Exchange Playbook to Build Resilience, 2021).

Mobile homes in Maricopa County comprise 5.2% of the total housing stock; 686 mobile home parks throughout the Phoenix Metropolitan Area. A cluster located in the Mesa area totals 92,031 mobile homes in Maricopa County (Heat et al. for Mobile Homes, 2021). This document supplies a package of heat-resilient solutions to MMHC, owners, landlords, and residents for a power outage during and after the event. Findings include recommendations for a collective effort in structuring a Heat Action Plan amongst city departments, utility companies, mobile home residents, AAMHO board members, and any other local ambassadors to prevent deaths in the event of a power outage, specifically during extreme temperature months (May-August). We intend to start mobilizing action to prepare and pivot toward responses to prevent heat-related deaths followed by power outages during the summer. Highlighting the gash in communication between park managers, owners, and landlords with the utility companies is crucial. Consequently, the selected platform for exchanging knowledge with the residents promptly must be addressed beforehand.

## Background

The U.S. The Department of Homeland Security (D.H.S.) launched Ready.gov in February 2003 as a national public service campaign designed to educate and empower Americans to prepare for and respond to various crises and emergencies (Mason et al., 2023). The campaign asks the public to do four things: (1) to stay informed about the types of emergencies that could occur and appropriate responses, (2) to make a family emergency plan, (3) to build an emergency supply kit, (4) to be involved in community preparedness (Mason et al., 2023). Before the public can stay informed, a system must be strategically implemented and communicated to ensure heat safety.

Under the Arizona Mobile Homes-Parks Residential Landlord and Tenant Act (A.R.S. Title 33 Chapter 11), mobile home park landlords are required (among other things) to "maintain in good and safe working order and condition all swimming pool, shower, bathhouse, electrical, plumbing and sanitary facilities" and to "furnish outlets for electric, water and sewer services" (Reuters, 2022). Also, in section A, there is enforcement for the landlord to comply with the requirements of all applicable city, county, and state codes materially affecting health and safety (Reuters, 2022). However, there currently

needs to be guidelines or accountability processes to prepare for the consequences of power outages in Mobile Home Parks.

Phoenix, Tempe, and Mesa have different emergency responses for power outages and specific utility service providers with their own S.O.P. for handling an emergency. Mobile Home landlords, park owners, or managers have unique action plans for power outages and align them with the city emergency response. Then, alert city police departments or recovery teams also select the form of communication to send updates to their residents. Is it feasible for community members to have access to this information beforehand with proper recommendations on where to go if assistance with travel will be accessible, whom to call, or what platform to use when awaiting notifications if ever in this situation? Heat will apply more pressure for an expedited and effective response for all actors in the event of a power outage. It is critical for the public but especially important for mobile homeowners; consequently, this is a public health emergency and environmental justice issue.

Heat Action Plans (H.A.P.s) (Guardaro, 2023) are policy tools public health and emergency management agencies use to address the public health impacts of an increasingly warming environment. Additionally, H.A.P.s could examine holistically to measure the effect of a coordinated response and synergies with other heat policy tools and how H.A.P.s are an important path to increase climate resilience. (Guardaro, 2023). There is undeniable urgency to include proper steps when power outages occur; we have tried to uncover a blueprint for what attainable actions should take place in the event of a power outage during extreme heat.

The House Bill 2381: Mobile Home Parks Residential Landlord and Tenant Act establishes the law governing the rental of mobile home spaces, rights, and obligations of landlords and tenants. Additionally, the governor approved the bill on March 30, 2023, intending to encourage landlords and tenants to maintain and improve the quality of mobile housing.

The Energy Emergency Leadership Act (H.R. 3277), upon request of a State, local, or tribal government or energy sector entity and in consultation with other federal agencies, the Secretary of Energy should ensure that the Department of Energy Organization Act is performing in coordination with relevant agencies. However, the act has yet to be passed; it was introduced on May 24, 2023; it is a step toward supporting Resilience and improving emergency preparedness. As we proposed in the Mobile Home Solution Guide, the most successful heat mitigation process will happen via collective decision-making. This briefing is an example of obtaining a package of solutions to approach the complexities of mobile home power outages.

An emergency power outage plan is in place for the City of Phoenix. In a reported electrical power outage, a power company or repair crew must arrive at the location to survey the damage to establish an estimated repair time. The utility company operation center receives a notification of the time of repair. Then, the supervisor in each center is the point of contact for the deployment services, which entails a direct ring-down line to both A.P.S. and S.R.P. operation centers.

The undeveloped resources to fully support these vulnerable communities cause more complexities depending on whether the utility entity is the primary point of contact or if it is the park management team. Soils et al. (2023) explain that mobile home residents are highly vulnerable to heat due to their housing conditions, resulting in elevated exposure and low heat resilience. The high density of mobile home parks, lack of vegetation, poor construction of dwellings, socio-demographic features, and not being eligible for utility and financial assistance are disproportionately affected by heat (Mobile et al., 2023). According to the AAMHO - Community Partner Report, many older mobile homes need better insulation. Some owners tend to have lower incomes or are senior citizens on fixed incomes, all factors that make mobile homeowners more vulnerable to heat than people living in any other type of housing.

At the Annual Summer Preparedness Meeting hosted by the Arizona Corporation Commission in 2022, A.P.S., T.E.P., UNS, S.R.P., and AEPCO presented their deliverables, and all companies stated they handled the demand in 2022. However, the future beyond this summer is due to various factors such as supply chain issues, railroad delays in the solar industry, which extends the delivery of projects for developers, wildfires threatening critical transmission, and drought conditions.

The agency of community and local knowledge, including residents of parks in K.E.R.'s work since 2018 (Phillips, Guardaro, 2022; Solís et al., 2022; Phillips et al., 2019; Varfalameyeva et al., 2021; Sailor et al., 2022; Varfalameyeva, 2020; Solís et al., 2021). Charley et al. (2023) YouthMappers collaborative research could also assist electrical companies and local officials. They are innovatively working together to migrate neighborhoods to the closest shelter or cooling centers during a power outage. The mapping exercises developed tangible data from mobile home residents and local leaders to participate in problem-solving conversations (Charley et al., 2023). There is sufficient evidence to use it for a Heat Action Plan (H.A.P.), to combine the data with National Weather Service forecasts, heat-health data from heat-related emergency department visits, information on cooling center use, utility infrastructure and police/fire department calls (Guardaro, 2023).

The efforts of K.E.R. and AAMHO advocating for mobile home park residents can impact future adaptation or remediation within local development and become a model

for resiliency planning. This briefing is adding to our resiliency planning framework for mobile home park residents and the response efficiency during home power outages.

## Key Findings

The key findings presented in this document are based on a comprehensive series of community consultations conducted since 2018, including the latest "listening session," reflecting a deep understanding of Master-Metered Mobile Home Communities (MMHC) cultivated through ongoing engagement with diverse community stakeholders. During this session, participants delved into discussions aimed at crucial information for improving utility assistance to master-meter mobile homes, emphasizing the need to extend support effectively. Topics ranged from awareness, application, and approval rates for assistance programs to exploring submetering companies' involvement and considering utility assistance for rent payments for mobile home (MH) residents. The session addressed reaching individuals in need, understanding the role of out-of-state LLCs in owning mobile home parks, and disparities in rent and profit distribution, drawing inspiration from the City of Phoenix's approach. Financially, there was a focus on expanding LIHEAP eligibility and outreach, with suggestions ranging from funding for rent, utilities, lot, and services to \$100/mo for rent assistance. Innovative ideas such as Minisplits, solar communities, and park-wide heat managers were explored as participants envisioned ideal solutions with widespread awareness, streamlined resource access, and automatic utility assistance. The importance of recognizing heat as a health hazard by FEMA and involving ACC and AAMHO in discussions was highlighted, aiming to foster a community mindset and eliminate stigmas surrounding mobile homes for proper recognition and support.

Based on our background literature review and in light of consultations with community residents and AAMHO, park residents generally know who the park manager is and how to contact them during the work week. However, residents do not always know how to contact the park manager during the weekend or after hours.

- If security is present in the park, the residents could contact him to reach out to the manager.
  - Sometimes, the park manager is the same person as the owner, especially in smaller parks, but only sometimes in larger parks.
  - The park manager is responsible for dealing with emergencies and communicating essential information.
- 1) When any power outage lasting longer than two (2) hours happens in a mobile home park during extreme heat, managers/owners should communicate via

email/cell phones or working corded landlines to inform residents/caretakers of how long the outage may last and of where to go to cooling centers in or nearby the park so residents can be safe.

- 2) If a mobile home park has outsourced some of the management of power supply either to park owners/managers or a third party, such entities should have the resources readily available to get power restored at their end or to repair electrical lines/poles, at their end to get power fixed quickly.
  - The entity doing the outsourcing services should provide the same level of emergency services as the local power company. Outsourcing should not mean residents go without power longer than if they were being serviced directly by the power company.
- 3) Unfortunately, many shelters and evacuation centers do not permit pets, so identifying and communicating which facilities do will be beneficial- to avoid the displacement of owners.

## Best Practice Recommendations

Ultimately, the goal is for Arizona to implement processes to become fully equipped at the state, city, and municipal levels with the proper guidelines to distribute the overwhelming load of emergency preparedness, particularly for MMHC. For instance, each actor has unique recommendations for specific duties to limit cascading failures during power outages, as suggested below:

### Park owners, landlords and park managers Recommendations

**Park owners, landlords, and park managers** provide a printed copy of the Heat Action Plan (HAP) with the option to have a virtual copy sent via email in multiple languages, English and Spanish, for parks with families speaking diverse languages. Hence, their residents know what to do and whom to contact in a power outage.

## Heat Action Plan (HAP) **BEFORE** a power outage:

Step 1: MMHC park owners should keep a confidential list of year-round residents with contact information to use only in emergencies to inform residents about power outages and what steps to take to remain safe. This confidential list should be available to the head of any park residents' group so they can coordinate help with transportation and sharing information.

Step 2: Develop and distribute among residents a Power Outage Emergency Immediate Plan for Power Outages that will include information on heat stroke to show residents how to tell if medical help is needed and tips on preparing for an extended power outage.

Step 3: Improve emergency preparedness and the safety of our community as extreme heat temperatures increase.

Step 4: Arrange for welfare checks every 2-4 hours and who is responsible between neighbor ambassadors, park landlords, or park owners. During a heat wave, the check-in frequency should be increased significantly for those residents using durable medical equipment.

- Collaborate with park resident groups to see who lives closest to these vulnerable neighbors and if they have proper emergency kits with batteries and secondary placement options if a power outage occurs.

Step 5: Prepare working freezers (powered by generators, if needed) to temporarily store frozen food and medications that may require refrigeration.

Step 6: Determine a communication channel (i.e., Facebook, WhatsApp, Livesafe, Discord, Whova, Telegram, Microsoft Teams, Beekeeper, Outlook, Slack) all community members will have access to ensure proper information on updates, recovery teams' arrival, or allow residents to disclose any accidents or medical emergencies.

Step 7: Provide residents with a list of local emergency housing/hotels. If possible, managers should negotiate with local hotels to offer an "Emergency Rate" for residents ahead of time and communicate this list to residents to keep on hand.

Step 8: Have a list of high-voltage electricians available for emergencies (i.e., on weekends or after hours).

Step 9: List cooling centers near the mobile home park.



## **During the event of a power outage:**

Step 1: Inform residents by sending a message to their cellular devices through text message, and they receive updated information so they can know how long a power outage may last and take appropriate action to be safe.

Step 2: Arrange for welfare checks every 2 hours.

Step 3: Emergency transportation for those who need it should be arranged and discussed with these residents and identified on a list before any power outages.

Step 4: Allow pools to remain open if they have power for filtration 24/7 until all residents have control. Park shower rooms that have the ability should be left accessible 24/7.

Step 5: Provide residents access to working freezers (powered by generators, if needed) to temporarily store frozen food and refrigerators/coolers for medications that may require refrigeration. If this is not possible, residents should have access to ice outside the park to save their food and meds.

Step 6: Arrange cold water supply and distribution for residents, going door to door if needed.

## **After the power has been restored:**

Step 1: Inform residents that power is back on and safe in home.

Step 2: Arrange for welfare checks to ensure that all residents are safe.

Step 3: Arrange an emergency transportation for the residents who need it to come back home from temporary cooling shelter.

Step 4: Organize your emergency plan items and actions to be ready for next time.

Step 5: Reflect on what could've been done differently for better preparation.

# Resident Recommendations

## Before the event of a power outage:

Step 1: Put all emergency numbers – power company, manager’s office and after-hours emergency numbers, caretaker, doctor, park security, neighbors, etc. – where you can find them easily.

Step 2: Know what communication methods your park manager will use to give important safety information to you.

Step 3: Prepare a recovery package with flashlights, bottled water, a digital instant-read thermometer to check temps of the freezer and food, save foods that don’t require cooking on hand. extra batteries and flashlights on hand and portable battery chargers for electronics, especially for cell phones. Keep medical records and equipment handy, charged, alternative battery available, and make sure neighbors and park managers are aware you rely on it.

Step 4: Familiarize yourself with signs of heat stroke/illness and drink plenty of water.

Step 5: Designate a cool place where you can stay if the outage lasts more than a few hours (i.e Hotels nearby, friends or family, public cooling centers).

Step 6: Plan ahead with your neighbors to check on each other in case someone needs help. Let each other know when you are gone for an extended period of time and how to reach you in an outage. Hire a caretaker.

Step 7: Prepare an emergency plan for your pets during a power outage; nearby pet hotels, friends or family to care for pets, etc. since some shelters don’t take animals.

Step 8: If you don’t have a car or drive, make an emergency transportation plan. Some areas have a 211 Transportation Hotline, e.g. Mesa’s is 1-855-345-6432. Communicate to the park manager/landlords if they're open to assisting with transportation during a power outage.

## **During the event of a power outage:**

Step 1: Depending on the temperature and updates on the time frame of the outage decide if going to a shelter, hotel, or cooling center is necessary.

Step 2: Alert landlord or park owner about their power and if they're leaving.

Step 3: Also contact the neighbor ambassador or undergo neighborhood check in with the community.

Step 4. Follow your emergency plan.

## **After the event of a power outage:**

Step 1: Inform manager or park landlord power is back on and safe in home.

Step 2: Check in on next door neighbors.

Step 3: Organize your emergency plan items to be ready for next time.

Step 4: Reflect on what could've been done differently for better preparation.

## **Ongoing Sets of Solutions**

The efforts of the partnership between KER and AAMHO advocating for mobile home park residents can impact future adaptation or remediation within local development and become a model for resiliency planning. Therefore, the mapping exercises used by YouthMappers at ASU's collaborative research and the agency of community and local knowledge developed tangible data from mobile home residents and local leaders to participate in problem-solving conversations (Charley et al., 2023). We suggest inviting or requiring electrical companies and local officials to join these conversations and work collectively with the Mapswipe data to migrate neighborhoods to the closest shelter or cooling centers during a power outage.

Since cities are spatially heterogeneous, outdoor microclimate differences due to vegetation, street orientation, and building material may have real consequences for temperatures experienced by an individual. (Cadenasso et al. 2007; Dousset et al. 2011; Middel et al. 2014). For example, Turner et al. (2022) mentioned that all cities have hazard plans, which are likely to include EHE framing, but fewer cities have

resilience plans, including disparity framing. Kuras et al. collected individually experienced temperatures (IET) data during a heat wave period (July 17-20, 2013) and a reference period (July 20-23, 2013) with ThermoChron iButtons that measured the air temperatures surrounding individuals as they performed daily duties—the study period suggested that understanding IETs for the population at large may lead to innovative advances in heat health intervention and mitigation strategies.

This briefing adds to their resiliency planning framework for mobile home park residents, specifically in response to home power outages. Particularly emphasizing alignment with decisions related to dimensions and solution sets that act upon financial and socio-economic vulnerability and the ability to afford solutions that reduce exposure or risk (Solis et al., 2023) in addition to their broad concept of decision-making, which includes a household-level of resources, state-level policymakers, and a spectrum of actors (Solis et al., 2023). Depending on electrical companies' turnaround time, the suggested emergency plan must address all levels and include an array of actors, such as nearby cooling centers or shelters. Above all, we continue our commitment to knowledge exchange and developing solutions and decision-making tools to increase the heat resilience of mobile home residents.

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