

Introduction to Heat Tabletop Planning and Coordination

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Extreme heat is one of the leading causes of weather-related illness and death in the United States, causing more fatalities in a typical year than hurricanes, tornadoes, severe storms, and floods ([NWS](#)). Every year in the U.S., it kills over 1,000 people and sends thousands more to the hospital ([CDC](#)). As heat events increase in intensity, frequency, and duration over time, these impacts will increase if action is not taken to understand why heat impacts happen, who is most at risk, and what can be done to reduce risk in the short- and long-term. To become more resilient to these events, communities are striving to prepare for extreme heat's impacts on people, businesses, and industries.

One important tool communities can use to plan for extreme events is a tabletop exercise. A tabletop exercise (hereafter, TTX) is a **collaborative planning tool that simulates emergency situations in an informal environment**. A facilitator guides exercise participants through an emergency scenario from the safety of a conference room to explore their preparedness and response strategies. When applied to extreme heat events, the TTX can empower communities to evaluate their plans and response, identify and remediate gaps, and put the extreme heat event into a climate context for longer-term risk management and mitigation.

In 2023, the National Oceanic and Atmospheric Administration (NOAA), the National Integrated Heat Health Information System (NIHHIS), and partners in Las Vegas, NV; Phoenix, AZ; Miami, FL; and Charleston, SC completed a pilot project called “Building Equitable Resilience to Extreme Heat.” The project supported state and local initiatives designed to reduce the negative impacts of extreme heat events, especially for disproportionately affected populations. One of the key phases of this project was developing and running tabletop exercises, which can empower communities to evaluate current plans and response capacity, identify and remediate gaps, and consider the event in a climate context for longer-term planning. The exercises were developed with a diverse set of participants, including representatives from community-based organizations that are often not directly involved in TTXs. The tabletops utilized existing heat plans and governance, and they helped participants learn about best practices and areas for improvement.

This guide captures the lessons learned from the pilot project, and it is intended to be a foundational resource for other communities interested in developing and hosting their own tabletop exercises. As NOAA continues to work with communities to manage and mitigate the impacts of extreme heat, we may update this document to reflect the latest best practices.

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1. OVERVIEW

Heat TTXs can take six to nine months to plan, execute, and report on.

Planning Phases for a tabletop include:

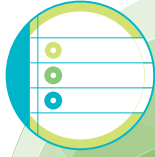
1. Pre-planning [one to two months]
2. Planning the Exercise [three to five months]
 - a. Initial Planning Meeting—Discuss TTX goals, potential scenarios, needs.
 - b. Mid-Planning Meeting—Confirm TTX goals and scenario, elaborate details.
 - c. Final Planning Meeting—Review the final draft of the Situational Manual (SitMan) and confirm TTX logistics.
3. Holding the Exercise [one to two days]
4. After-Action Reporting [one to two months]



*Las Vegas
Tabletop Exercise
in December 2022*

The key documents involved include:

- Planning Documents (such as a contact sheet, planning schedule, logistics)
- The Situation Manual (SitMan), which is developed by the planning team and only shared with participants during the exercise. In some cases, a planning team version with facilitation details is created separately from a participant SitMan which may not contain all details of the exercise.
- Day-of materials including presentation slides, handouts, and facilitation tools/props.
- The After-Action Report (AAR) which summarizes the outcomes of the TTX, gaps identified, and opportunities and actions to address them.



2. PRE-PLANNING FOR TABLETOP EXERCISE

Below are the preliminary steps that the tabletop planners can take to improve their awareness of the current state of heat planning in a region, to familiarize themselves with the key challenges and organizations involved, and to begin to identify themes or targets for the design of the exercise.

1. Learn about Heat and Tabletop Exercises:

- Visit heat.gov to access content on who and what is at risk of heat impacts.
- Visit ready.gov/FEMA to learn more about the general practice of tabletop exercises.

2. Connect with Stakeholders: Discuss the state of heat planning with local stakeholders, including government agencies and community-based and community-serving organizations that serve populations at risk of heat-related illness and death. Their on-the-ground knowledge can help identify specific local heat challenges that may vary from place to place due to differences in culture, climate, governance, policy, and other factors. Additionally, stakeholders can help identify the most critical populations of concern for heat risk, such as older adults, children, people who are unhoused or poorly-housed, low-income communities, and individuals with pre-existing health conditions. See a non-exhaustive list of typical national, state, and local stakeholders to consider meeting with in Appendix I. Representatives from communities most affected by heat (which can vary by location/context) can be included in the planning committee or as exercise participants.

3. Connect with Local Heat Practitioners and Experts:

Local practitioners, experts and organizations involved in climate resilience, emergency management, or public health can provide insights into areas that are most at risk from extreme heat events. These individuals are also key to include in the planning committee or as exercise participants. They will be the planners and actors in the tabletop exercise, setting its goals and receiving its outputs to act on. Appendix I also provides common key practitioner and expert contacts to consider involving in your TTX.



Las Vegas Tabletop Exercise in December 2022

4. Become Familiar with Local Heat Planning Efforts:

Some localities have already developed or started to implement heat emergency response plans and heat action plans, or they cover heat risk in other plans (e.g., resilience or adaptation plans). Organizations in these areas want to use the TTX event to test or refine their existing plans. For communities that do not yet have such plans for heat, TTXs can serve as a launching point to identify what is needed for such a plan. To learn about the types of plans often used by communities, review the [Plan Integration for Resilience Scorecard for Heat](#).

5. Review Heat Exposure and Vulnerability Assessments or Historical and Projected Climate Data:

If available, vulnerability assessments or studies conducted by local or regional authorities—such as urban heat maps—may identify areas that are particularly exposed to extreme heat. Factors such as high population density, inadequate infrastructure, or the presence of populations of concern may create heat risk hotspots within a city or region. If data has been gathered to understand exposure, vulnerability, and the risk of heat impacts across a city, they can be valuable inputs to the TTX design.

FURTHER RESOURCES:

Heat Hazard:

- [Climate at a Glance](#) (Historical climate data from NOAA's National Center for Environmental Information)
- [Urban Heat Maps](#) (The National Integrated Heat Health Information System's Urban Heat Island Mapping Campaigns)
- [Future temperature predictions](#) (climate.gov)

Heat Exposure:

- [Census Population Estimates](#)

Heat Vulnerability:

- [Community Resilience Estimates for Heat](#) (Census)
- [Heat and Health Tracker](#) (The Center for Disease Control & Prevention)

Heat Risk and Impacts:

- [ClimaWATCH](#) (Mathematica)
- [The Fifth National Climate Assessment](#)



3. PLANNING THE EXERCISE

It is crucial for the planning team to be realistic about the timelines involved. Coordinating schedules with a large group of individuals can be challenging. Therefore, it is recommended that those overseeing the exercises allocate a period of six to nine months from the initiation of the planning team to the actual execution of the tabletop exercise. This timeframe allows for sufficient preparation and coordination to ensure a successful and effective exercise.

The organization and planning of heat tabletop exercises can be done with three key planning meetings.

1. During the first planning meeting, the exercise objectives should be developed and defined, potential participants should be identified, and discussion of timelines and venue should begin.
2. During the second meeting, the planning committee should finalize the objectives, the participant list, and logistics (date and location). The Committee should begin to craft the scenario and identify any needed data products.
3. The third meeting focuses on reviewing the scenario, making last-minute adjustments to the agenda and presentations, and coordinating logistics. Additional meetings may be conducted to address specific concerns, which may not require the participation of the entire planning team—the three meetings outlined above should be considered a minimum requirement.

Ideally, with more time for planning, it would be beneficial to schedule regular bi-weekly or monthly meetings for the planning team. These meetings would allow for in-depth discussions, thorough scenario development, and resolution of any concerns specific to the locality before the exercise takes place.

3.1 Actions for the Planning Team

Before the first meeting:

- **Form the Planning Committee:** This committee should consist of six to eight individuals. These people will be responsible for the overall coordination, organization, and execution of the exercise. Recruit, engage, and support diverse participants, including community-based or environmental justice organizations, for the exercise.
- **Develop a Plan for Communicating among the Committee Members:** This can include in-person meetings, conference calls, email lists, or online collaboration platforms. Ensure that everyone on the Committee has the necessary access and resources to participate fully.
- **Develop a Timeline:** Create a timeline that outlines key milestones, deadlines, and deliverables for the planning process. This timeline will help the committee stay organized and on track throughout the preparation stages.

Initial Planning Meeting:

- **Define Objectives and Scope:** Clearly articulate the objectives, scope, and desired outcomes of the TTX. In thinking about objectives, consider the specific aspects of extreme heat that the participants will want to explore. Are particular impacts on infrastructure, public health, or emergency response capabilities areas of concern? Or some combination of these impacts? Are there particular management decisions (e.g., land use policies, cooling center coordination) that are on participants' minds? This will guide the planning committee's efforts and ensure a shared understanding of the exercise's purpose and which participants should be involved.
- **Develop Participants List:** Identify participants for the exercise (see section 2.2). Ensure a diverse range of perspectives are included. Typically, the planning team members do not actively participate in the exercise but act as facilitators, note-takers, and other supporting roles during the exercise.

Mid-Planning Meeting:

- **Develop Exercise Structure:** Collaboratively design the exercise structure, format, and scenarios that align with the objectives. Determine whether the exercise will be a single session or multiple sessions, and whether it will focus on a specific location or cover multiple locations. Discuss the level of detail, duration, and specific topics to be covered during the exercise.
- **Determine Exercise Logistics:** Address logistical considerations such as venue selection (if applicable), scheduling, equipment requirements, and budget. Determine if any external resources or expertise will be needed and plan accordingly. Invite participants to the exercise.

Final Planning Meeting:

- **Finalize the SitMan:** With the planning team, work through a dress rehearsal of the TTX, talking through the scenario and confirming the flow is logical. Confirm the prompts and questions to participants.
- **Finalize Logistics:** Confirm the workshop space, refreshments, speakers, moderators, materials, slides, travel, and any other details needed to complete the TTX.

Ongoing Activities:

- **Regularly Review Progress:** Conduct regular meetings or check-ins to review the progress, address challenges, and ensure the planning process is on track. It is important to foster open communication and encourage feedback from the planning team members to ensure a collaborative and inclusive planning approach.
- **Document Planning Decisions:** Over the course of the exercise development, it may be difficult to get all participants at every meeting. It is important to maintain clear documentation of the planning team's decisions, discussions, and action items. This will serve as a reference point and help ensure consistency and accountability throughout the process. This is also useful in developing the SitMan and any after action reports.
- **Develop Materials for the Exercise:** The SitMan includes the objectives, scenarios, assumptions, and instructions for exercise participants. The planning team will spend considerable time developing this manual in advance of the exercise. Additionally, the planning team will need to develop presentations that include objectives, scenarios, and injects (see text box on the next page).

INJECTS:

Injects are surprise situations that aren't typically included in a SitMan, a specific scenario event that prompts players to implement plans, policies, and procedures. They serve three primary functions:

- 1) Linking simulation to action
- 2) Enhancing exercise experiences for players
- 3) Reflecting on an incident or activity that will prompt players to implement the policy or procedure being evaluated

Source: FEMA

3.2 Form a Planning Committee

The planning team for a tabletop exercise on extreme heat will typically consist of six to eight individuals who will be responsible for the overall development, coordination, and execution of the exercise. The planning committee should identify an exercise coordinator, key stakeholders, and participants responsible for logistics and communications.

- The exercise coordinator (one person) will guide the exercise effectively by ensuring equal participation, managing time and encouraging open dialogue. They should be well-versed in the subject matter and capable of steering discussions towards the exercise objectives. They often have training in TTX facilitation, such as the [FEMA Master Exercise Practitioner Program](#) (MEPP).
- The practitioners and experts (four to six people) involved in the planning committee represent a select subset of the larger group of stakeholders that play a role in heat risk management, planning, and response. They may include representatives from local government agencies, emergency management organizations, public health departments, community organizations, and relevant experts in the field of extreme heat or climate resilience. It is important to consider individuals with diverse backgrounds and perspectives to ensure a focus on equity. For heat TTXs, we recommend:
 1. **A weather and/or climate expert** from a local National Weather Service Weather Forecast Office who can ensure that the scenario represents a realistic event, and who can put the event in a climate context.
 2. **An emergency management expert** who focuses on planning for and responding to emergencies in the community.
 3. **A representative from a community-based/serving organization** who can speak to the lived experience of heat for a population of concern in the community.
 4. **A representative from the city government** who is most accountable for heat action, such as a Chief Heat Officer or Chief Resilience Officer.
 5. A representative who best understands the most devastating heat impacts in the community, such as a **public health official**.

In many cases, the members of the planning team have other colleagues from their offices involved in TTXs as participants. The planning team keeps the exercise confidential, allowing their colleagues to participate without prior knowledge.

- A local person in charge of logistics and communications will take the lead on securing a meeting space, ensuring appropriate A/V equipment and internet access are available, and making arrangements for refreshments.

3.3 Participant List and Attendee Roles

Attendees for the tabletop exercise may fall into four general categories: Participants, Facilitators, Note-takers, and Observers.

Participants or “Players” are attendees who will actively engage with one another during the exercise. Participants will be the primary local stakeholders; these are the individuals who represent the local perspectives, who can speak to their organization’s and community’s agendas and actions, and often have subject matter expertise. The Participant is the primary generator of future collaborations, the source of problem solving, and the voice of the community in these TTXs.

Note-takers are attendees that capture and record the many conversations in real time. Note-takers allow Participants to converse and collaborate with one another freely and organically, and they need to capture both the open-ended conversations, as well as the active brainstorming. Because multiple tabletop groups are conversing simultaneously, note-takers are the archivists for the contributions of their group’s Participants, and the primary attendees responsible for carrying the event forward into reporting. Tabletops work best when there is one Note-taker paired with each Facilitator.

Facilitators are attendees that guide the tabletop groups through their conversations. Often, they are also members of the planning team leading up to the exercise. Facilitators balance their tabletop group’s need to discuss the module content in a free and uninhibited manner with the need to engage constructively with one another. Facilitators keep post-tabletop outcomes in mind, and they prompt discussion on the issues without coloring the discussion or steering the group. Facilitators are critical in navigating their tabletop groups through the SitMan, while also helping steer the conversation toward successful outcomes. As an example, the NOAA TTXs identified one Facilitator for every six to eight participants.

Observers are attendees who do not have a defined role within the TTX. These may be community members who have a desire to gain insights from the tabletop or sponsors who have had a hand in planning the SitMan and therefore are deemed ineligible to participate in the exercise. They may also be visitors from other communities interested in learning how to plan and conduct TTXs.

When issuing invitations to the TTX, collect attendance plans for each day of the workshop separately. Some attendees may only be able to attend part of the TTX (though all should be encouraged to be present for the entire exercise).

3.4 The Situation Manual

A Situation Manual (SitMan) is the primary support document for planning and executing a facilitated exercise. It is typically withheld until the day of the exercise, when it is provided to all participants. The Planning Team should prepare to spend a minimum of four weeks putting together their SitMan.

Typically, the SitMan includes the following components.

- Exercise scope, objectives, and core capabilities
- Exercise assumptions and artificialities
- Instructions for exercise participants
- Exercise structure
- Exercise scenario
- Discussion questions and key issues
- Schedule of events
- List of attendees

The best way to get familiar with a SitMan is to read some that have been used in previous exercises. NOAA Heat TTX SitMans from [Las Vegas](#), [Phoenix](#), [Charleston](#), and [Miami](#) contain elements that may be useful to reference.

- **Weather information**

National Weather Service forecasts and outlooks on the monthly, 14-day, seven-day, and three-day timescales all to test familiarity and responses within the community. Different forecast formats (e.g., probabilistic vs. deterministic information) and variables (e.g., low and high temperatures, heat index) were also shared.

- **Climate information**

Past data to demonstrate the observed frequency, intensity, and duration of heat events; future projections that depict the changes in frequency, intensity, and duration of heat events in the coming decades.

- **Heat impact modeling**

Models that simulate realistic impacts and exposure for the TTX heat event (e.g. morbidity, mortality, health care capacity, energy).

- **Analog events and narratives**

It was often challenging to find quantitative sources of information about potential disruptions to energy, transportation, water, or other infrastructure systems. When impacts cannot be projected from models or quantitative information is not available, it is possible to extrapolate impacts from past observed events (e.g., prior heat waves in the TTX community or similar communities), and in some cases only qualitative descriptions were possible. News articles often capture narrative details of these events and are useful in TTXs.



Las Vegas Tabletop Exercise in December 2022



4. CONDUCTING THE TABLETOP

The following list highlights logistical, “day-of” items for the Planning Committee to consider, prior to conducting the actual TTX:

Event time frame

In general, plan for the exercise to occur over two eight-hour days. This time frame allows for robust discussion for the stakeholders who have likely only met for the first time. Additionally, it respects the attendees’ professional commitments by placing a reasonable limit on their time away from normal duties. TTX activities should flow in a logical sequence. For example, consider:

- Day 1 covering the mid-range lead-up to a heat event (just as it becomes predictable) through the event itself and its immediate consequences.
- Day 2 covering recovery as well as long-term heat risk mitigation and seasonal planning and preparedness.

Event space

Planning teams should aim to have the event space identified and reserved about six weeks ahead of the tabletop exercise. The event space should include a single room for plenary discussion, which is large enough to accommodate the full list of attendees and some extra for working spaces (food, beverages, presenter materials, etc). Breakout rooms also work well for small group discussions. Additionally, the room should be large enough to allow for participants to spread out in facilitated breakout groups or the venue should have other smaller rooms available for separate breakout groups.

- When choosing a space to hold the exercise, consider using a space that is relevant. For example, the NOAA TTX held in Miami was located in the conference room of a public library that was in active use as a cooling center.
- Consider supplemental activities, such as a visit to an Emergency Operations Center or a community cooling or resilience center, if appropriate, to inspire further understanding of heat risk and mitigation actions.

Materials

Many attendees will be meeting each other for the first time. Plan on providing name tags for all attendees to help facilitate introductions. Also plan to provide easels and large pads of papers, as exercises within the TTX will likely require some physical interactivity and reading from afar. Depending on the venue, it is also recommended to provide food and beverages, if possible. This keeps the energy and morale up, as well as retains attendees during lunchtime, which is another great time for stakeholders to continue important discussions and create new relationships. To summarize, include the following materials:

- Easels
- Large notepads and markers
- Stickers for dot voting
- Name tags
- Snacks, beverages and/or lunch

Participant grouping

Consider conducting your exercises with participants assigned to specific tables, each table seating around eight participants. It is preferred to mix up the tables, so that people from the same organization or same sector are not clustered together at the same table. This offers good stakeholder dispersion throughout groups, a good mix of perspectives within each group, and a good balance between facilitating too many groups and not having enough viewpoints within groups.

Icebreaker

To foster a comfortable and engaging environment, consider including an icebreaker activity at the beginning of the tabletop exercises. This helps remove some of the anxiety around speaking with new people who may represent influential organizations and constituents. Participants can also establish a positive rapport and facilitate smoother communication throughout the exercise.

Session flow

Keep things fresh, alternate between plenary presentations, plenary discussions, breakout discussions, and other activities. Refreshments and regular breaks will keep participants engaged. A catered lunch can help keep participants engaging with each other and can save time as compared to disbursing attendees during lunch.

Injects

Injects can be fully baked into an exercise in plenary discussion, but they can also vary by breakout group. They can be planned as a core component to stress test an exercise or they can be kept in your back pocket as an optional facilitation tool.

Interactive technology

Interactive technology like live polling web services can break up plenary presentations and give quieter participants an opportunity to weigh in. They can also be used to prioritize discussion topics for breakout groups or key gaps / actions to explore.

Virtual attendance

It is possible to include virtual participants, but difficult. If virtual participation is necessary, consider assigning a digital experience lead role to somebody in the room who can make sure to speak up if virtual attendees are not able to break into the conversation. Also consider having a virtual breakout group that can have discussions with each other.



Las Vegas Tabletop Exercise in December 2022



5. SYNTHESIZING INFORMATION: *The After Action Report and Other Products*

One or more synthesis documents should be an output of the TTX:

5.1 The After Action Report

Every TTX should generate an After Action Report. This report will capture how the community or “Players” react to the situation, specifically evaluating their performance relative to the stated objective. It is a great source to identify strengths and weaknesses within the current response structure, but it is only valuable if it is used as a tool. Since it is a formal evaluation tool, the report is often not finalized for 60–90 days to ensure all information has been checked and parties have an opportunity to review. Examples of the After Action Reports from [Las Vegas](#), [Phoenix](#), [Charleston](#), and [Miami](#) are available as references.

- **Assign actions to responsible individuals/groups**
Ideally, you invited and involved Players that have positions of authority to take action. However, sometimes the decision-makers cannot be present during an exercise. In many cases, the Players represent large organizations and may not be able to commit to policy or programmatic changes without internal consultation. Therefore, it is important for the TTX planners to follow up on recommended actions that were identified in the TTX and find individuals and organizations that can “own” them.
- **Evaluate your progress**
Identify a person or organization that takes the responsibility of following up after a period of time (e.g., one year) to evaluate what recommendations from the After Action Report have or have not been pursued.
- **Consider running another exercise in the future**
Exercises are not meant to be one-time occurrences. They are practice for real emergencies, an opportunity to build new connections among individuals and groups, and an exploration of innovative solutions. In many of the NOAA tabletops, participants expressed an interest in repeating the exercise, so consider a frequency that might work for your audience.



*Phoenix Tabletop
Exercise in
February 2023*

5.2 Other Workshop Synthesis Products

Given the near-term and longer-term timescale of our heat TTXs, many ideas might be generated that do not fit into the typical After Action Report structure. There are many ways this type of information could be captured and shared, and because there is more flexibility, these synthesis products may be developed less formally and more quickly. Here are a few examples that have proven successful.

- **Organize recommendations topically**
You may design your exercise to include the creation of “tiger teams”, or a group of experts brought together to solve a specific problem. This allows a group to dive deeper into a specific topic area and generate solution ideas. Even if the exercise goes through a prioritization exercise, consider capturing all brainstorming ideas in a single document and identify what organization could lead the action or implementation.
- **Collect and share presentations**
If your exercise included presentations, consider sharing that with a larger audience than the tabletop participants. While sharing the scenario could cause confusion or concern, presentations that showed existing data for the community or climate projections for the region could be shared with a broader audience.
- **Take photos**
Much of the activity at a TTX occurs in small group discussion and writing ideas on paper. Make sure to take photos of these ideas as a way to capture notes from the exercise. Photos of the participants in the room and actively engaged in the exercise are also helpful.
- **Empower people to act**
Exercise participants are people already doing the work, so empower them to act immediately on ideas shared in the meeting. Find ways to share the notes and the results from prioritization activities with participants in the one to three weeks following an exercise. You may consider having a call with any related teams or networks to debrief the key takeaways and turn the ideas into action. This could be particularly helpful if your exercise will be quickly followed by preparation for the heat season.

Appendix I Type of Organization with Examples

FEDERAL	LOCAL GOVERNMENT	NON-PROFIT
<ul style="list-style-type: none"> • NOAA, including National Weather Service Weather Forecast Office Regional Climate Centers, Regional Climate Service Directors, Regional Coordination Teams. [See NOAA in my State & Territory] • FEMA Region • Centers for Disease Control & Prevention, Climate-Ready States & Cities Initiative Grant Recipients • HHS/OSHA Regional Health Department 	<ul style="list-style-type: none"> • Transportation • County department of health • Local emergency management • Local water authority • County social service • County department of environment • City parks and recreation • City headquarters office • County school district • Resilience / climate office • City fire department • Public utilities 	<ul style="list-style-type: none"> • Emergency relief services • Environmental organization • Community development organization • Foundation • Housing advocacy organization
PRIVATE COMPANY	REGIONAL & STATE GOVERNMENT	UNIVERSITY
<ul style="list-style-type: none"> • Local business • Climate services provider • Private utilities • Companies providing cooling spaces • Hotel owners • Brick and mortar retail businesses 	<ul style="list-style-type: none"> • Regional health district • State office of health • State public utilities • State emergency management • State headquarters office • State climate office 	<ul style="list-style-type: none"> • School of public health • Emergency management • School of sustainability / environmental studies

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The Heat Equity Pilot Team:

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