

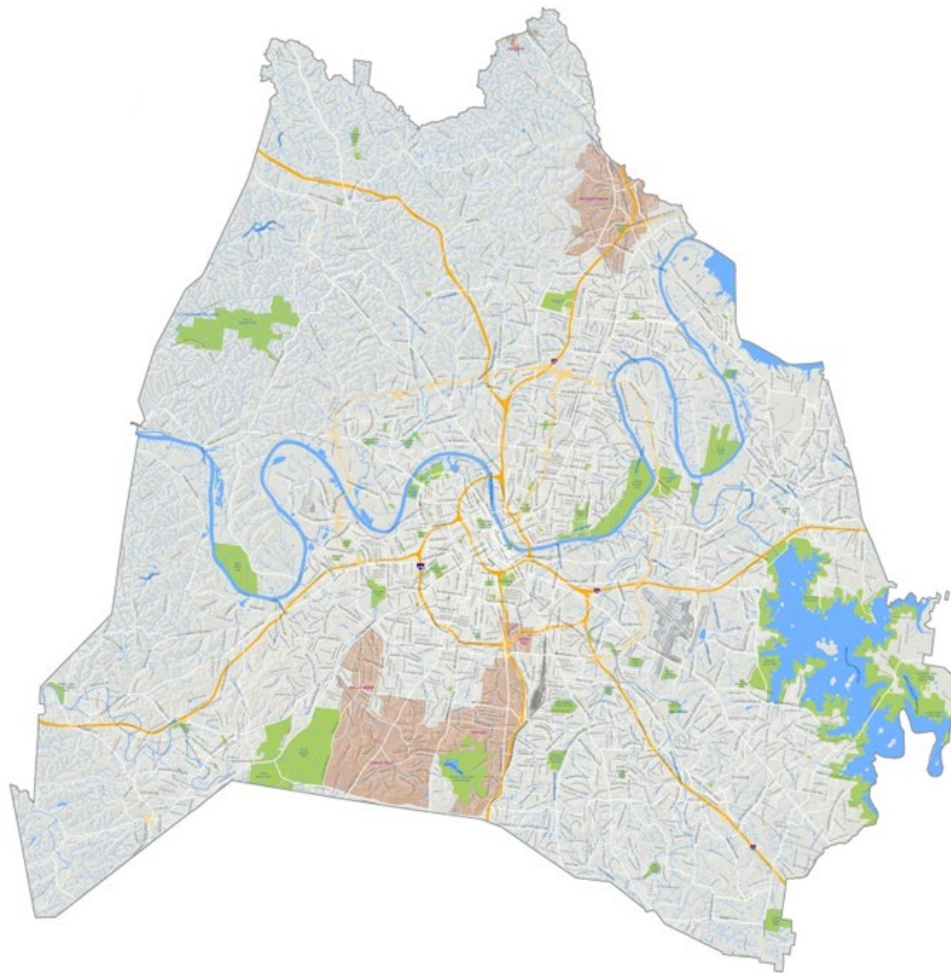
NASHVILLE – DAVIDSON COUNTY TN



Hazard Identification and Risk Assessment (HIRA)

October 2025

FINAL



METROPOLITAN GOVERNMENT OF NASHVILLE & DAVIDSON COUNTY
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This report was developed by the Nashville TN Office of Emergency Management (OEM) in coordination with the Nashville-Davidson County Multi-Hazard Mitigation Community Planning Team (CPT). OEM facilitated data collection, stakeholder engagement, and integration of CPT feedback throughout the planning process to ensure the document reflects the collective priorities and perspectives of participating agencies and community partners. For questions, please contact the Office of Emergency Management in Nashville, TN, 615-862-8530.

Executive Summary

Over the past decade, Metro Nashville's hazard priorities have evolved to reflect changing environmental conditions, technological dependencies, and lessons learned from both local and global events. While the county's core natural hazards have remained consistent, new and emerging threats, particularly in public health and cybersecurity, illustrate a need for a more comprehensive approach to resilience and continuity of operations. This 2025 assessment includes a new hazard, Cybersecurity, which concentrates on Metro Nashville's cybersecurity, and not the individual general public's cybersecurity risk.

Flooding, tornadoes, and winter storms have consistently ranked as Davidson County's top three hazards across all assessment years. These hazards continue to represent the most frequent and damaging events for Metro Nashville and Davidson County, driven by the region's geography, severe weather patterns, and recurring seasonal impacts. Their persistence in the top tier underscores the continued need for investment in flood mitigation, infrastructure hardening, and public preparedness and resiliency.

Extreme temperatures (heat and cold) have steadily risen in importance since at least 2012, now ranking fourth in 2025. This trend underscores the growing recognition of climate variability and its health, energy, and equity implications. Similarly, drought, while fluctuating in rank, remains a recurring environmental concern linked to seasonal variability and resource management.

Thunderstorms have remained within the top tier of hazards, reflecting the high frequency of damaging wind, lightning, and hail events that impact infrastructure, utilities, and community lifelines.

The introduction of cybersecurity as a new hazard in 2025 marks a pivotal expansion of Metro Nashville's risk framework. This hazard specifically pertains to threats targeting government systems, data, and critical technology infrastructure, rather than the general public, but its inclusion demonstrates Metro's proactive approach to protecting digital operations essential for continuity of government.

Manmade and technological threats, including terrorism, have remained mid-tier concerns throughout the planning cycles, acknowledging persistent but low probability risks to public safety and critical infrastructure.

Communicable diseases, which ranked lower in earlier assessments, rose sharply since 2023, following the impacts of the COVID-19 pandemic. By 2025, the hazard remains in the top five, underscoring an enduring commitment to integrate public health preparedness into hazard mitigation. This shift highlights stronger coordination among emergency management, public health, and community partners to address infectious disease threats.

Hazardous materials incidents, wildfires, landslides, dam and levee failures, and earthquakes have remained in the lower tier, reflecting their more localized or less frequent impacts. Their continued inclusion ensures readiness for low probability, high consequence events that could disrupt critical infrastructure or community safety.

Besides the Coronavirus that surfaced in late 2019-2020, many incidents transpired since the assessments in 2012, this includes, but is not limited to:

- Tornadoes
- Derecho
- High wind events
- Civil Unrest and similar
- Droughts
- Major Flooding incidents
- Bombing downtown
- Winter storms

Lastly, another possible contributing factor to the changes in this HIRA could relate to the large population and building increases that have transpired over the past several years throughout Davidson County and the region, causing the Impact & Vulnerability scores to change.

Summary of Key Trends

- **Persistent Core Risks:** Flooding, tornadoes and winter storms have dominated all assessment cycles.
- **Climate Awareness:** Extreme temperatures and drought have gained prominence, reflecting changing environmental conditions.
- **Public Health Integration:** Communicable diseases have emerged as a major community hazard since 2020.
- **Digital Era Preparedness:** Cybersecurity added in 2025 represents a modern, continuity focused hazard category.
- **Whole Community Resilience:** The 2025 update demonstrates Nashville-Davidson County's comprehensive approach to safeguarding residents, tourists, operations, and essential services across physical, environmental, and digital domains.

Methodology

The risk assessment process provides information that allows a community to better understand its potential risk and associated vulnerability to natural and man-made hazards. This information provides the framework for a community to develop and prioritize mitigation strategies and to implement plans to help reduce both the risk and vulnerability from future hazard events. The risk assessment for Metropolitan Nashville-Davidson County followed methodology from the Federal Emergency Management Agency (FEMA) and the Emergency Management Accreditation Program (EMAP). This assessment process was conducted by the Nashville-Davidson County Multi-Hazard Mitigation Community Planning Team (CPT) and select subject matter experts.

The agencies that took part in this 2025 HIRA process included:

- City of Belle Meade
- City of Berry Hill
- City of Goodlettsville
- City of Oak Hill
- Metro Codes
- Metro ITS - GIS
- Metro Planning
- Metro Police
- Metro Public Health
- Metro Schools
- Metro Water
- Nashville Dept of Transportation
- Nashville Electric Service
- Nashville Fire
- Nashville Office of Emergency Management
- National Weather Service
- TN Geological Survey
- Trevecca University

Hazards identified:

- Communicable Diseases
- Cybersecurity
- Dam & Levee Failure
- Drought
- Earthquake
- Extreme Temperatures: Heat/Cold
- Flooding
- Hazardous Materials
- Landslide/Sinkhole
- Manmade – Technological/Terrorism
- Thunderstorm
- Tornado
- Wildfire
- Winter Storm

Risk was calculated using the formula: $RISK = (IMPACT + VULNERABILITY) \times LIKELIHOOD$

Risk is measured by a combination of impact, vulnerability and likelihood scores.

The impact and vulnerability scores were given the below 11 parameters resulting from a hazard event:

- Geographic Extent
- Duration of the Event
- Environment
- Health Effects
- Displacement and Suffering
- Economy
- Infrastructure
- Transportation
- Critical Services
- Confidence in Government
- Cascading Effects

For each hazard identified, each participating agency gave a score for each of the above parameters, and then all the scores were added together to get an overall total Impact and Vulnerability Assessment Score.

Weighted scores were conducted where extra counts were given for the following lead agencies and associated hazards: National Weather Service for all weather-related hazards, Public Health for Communicable Diseases, TN Geological Survey for Earthquakes & Landslides/sinkholes, Nashville Electric Service for Earthquakes, Police for Man-made –Technological/Terrorism, Fire for Hazardous Materials and Wildfire, and a newly added hazard with Metro ITS for Cybersecurity.

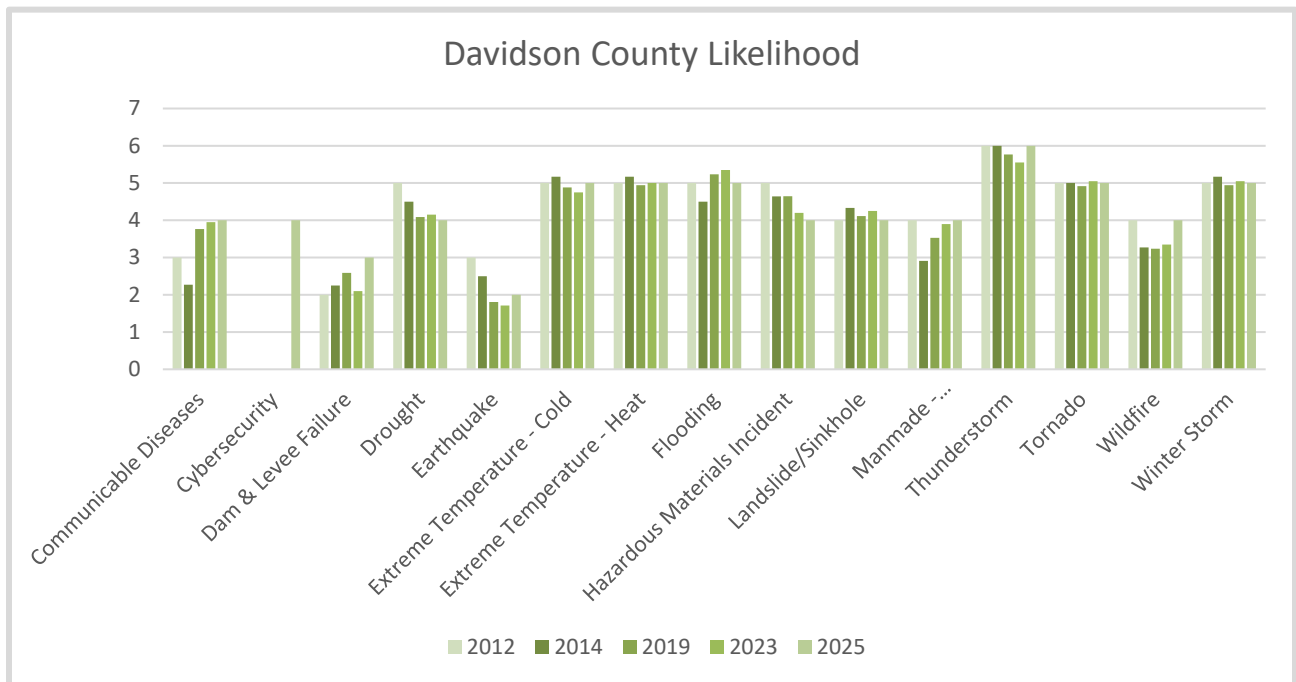
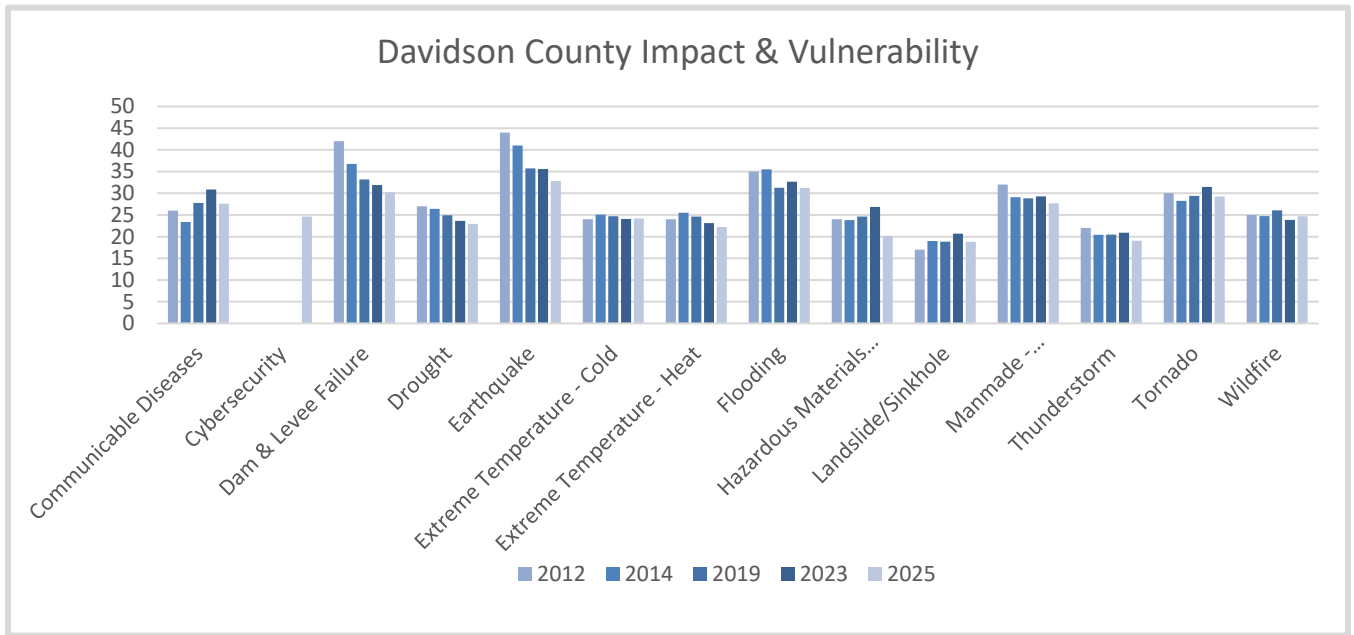
2025 Hazard Risk Scoring

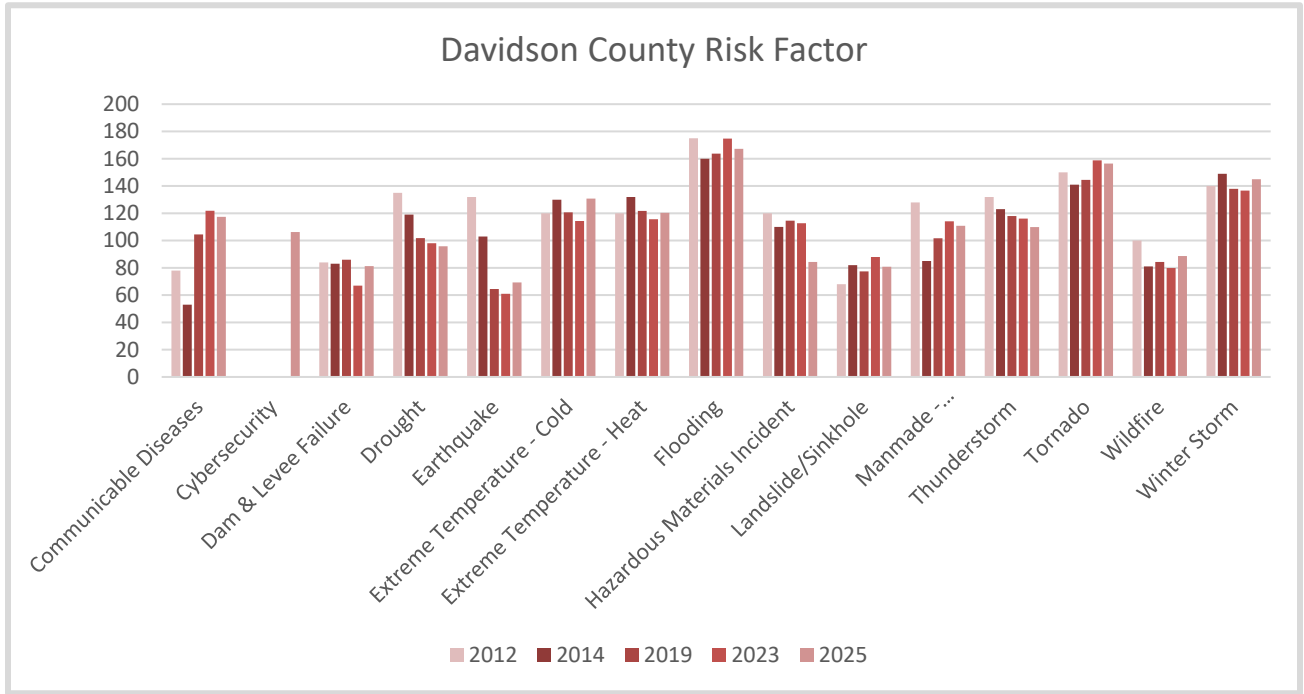
This section summarizes the results of the 2025 hazard risk scoring process. It presents the relative rankings of hazards based on current data and identifies those that pose the greatest overall risk to Nashville-Davidson County. The overview notes changes in risk levels since previous assessments, illustrating evolving community exposure and preparedness priorities.

DAVIDSON COUNTY-TN HAZARD RISK SCORING				
	2025	2023	2019	2012
1.	Flooding	Flooding	Flooding	Flooding
2.	Tornado	Tornado	Tornado	Tornado
3.	Winter Storm	Winter Storm	Winter Storm	Winter Storm
4.	Extreme Temperatures (Heat/Cold)	Communicable Diseases	Extreme Temperatures (Heat/Cold)	Drought
5.	Communicable Diseases	Thunderstorm	Thunderstorm	<i>Earthquake (tie for 5th)</i>
6.	Manmade – Technological/Terrorism	Extreme Temperatures (Heat/Cold)	Hazardous Materials Incident	<i>Thunderstorm (tie for 5th)</i>
7.	Thunderstorm	Manmade – Technological/Terrorism	Communicable Diseases	Manmade – Technological/Terrorism
8.	Cybersecurity	Hazardous Materials Incident	Drought	<i>Hazardous Materials Incident (tie for 8th)</i>
9.	Drought	Drought	Manmade – Technological/Terrorism	<i>Extreme Temperatures (Cold) (tie for 8th)</i>
10.	Wildfire	Landslide/Sinkhole	Dam & Levee Failure	<i>Extreme Temperatures (Heat) (tie for 8th)</i>
11.	Hazardous Materials Incident	Wildfire	Wildfire	Wildfire
12.	Dam & Levee Failure	Dam & Levee Failure	Landslide/Sinkhole	Dam & Levee Failure
13.	Landslide/Sinkhole	Earthquake	Earthquake	Communicable Diseases
14.	Earthquake			Landslide/Sinkhole

Between 2012 and 2025, Nashville-Davidson County's top hazards have remained consistent in their natural hazard foundation: flooding, tornadoes, and winter storms. However, the overall risk profile has broadened to reflect a more complex, interconnected environment. Extreme temperatures have risen in priority possibly due to increasing climate variability, while communicable diseases emerged as a top five hazard following the COVID-19 pandemic. Most notably, cybersecurity appears for the first time this year, 2025, representing a new era of digital risk and the growing importance of protecting government systems and critical data. Compared to 2012, Nashville-Davidson County's hazard landscape reflects both continuity in core weather related threats, and a significant modernization of risk awareness to include public health and digital infrastructure resilience.

The graphs below illustrate how each hazard's Impact, Vulnerability, Likelihood, and the Overall Risk Factor have shifted across the years, showing changes in both the severity and frequency of risks to Nashville-Davidson County.





Scoring Data & Analysis

This section presents detailed data supporting the 2025 hazard rankings. It includes tables illustrating the CPT combined Impact, Vulnerability, Likelihood and Risk Factor scores for each hazard. The analysis interprets notable trends in the data, such as rising risks associated with extreme temperatures and public health hazards and provides context for mitigation planning and resource allocation.

OVERALL Impact & Vulnerability Assessment Scores 2025	Geographical Extent	Duration	Environment	Health Effects	Displacement	Economy	Built Environment	Transportation	Critical Services	Confidence in Govt	Cascading Effects	
Hazard	1	2	3	4	5	6	7	8	9	10	11	Total
Communicable Diseases	4	4	1	3	2	3	1	2	2	3	2	27.63
Cybersecurity	3	3	1	1	2	3	1	2	3	3	3	24.63
Dam & Levee Failure	3	3	3	2	3	2	3	3	2	3	3	30.25
Drought	4	4	3	1	1	2	1	1	1	1	2	22.94
Earthquake	4	3	3	3	3	3	3	3	3	3	3	32.83
Extreme Temperature - Cold	4	3	2	2	2	2	2	2	2	2	2	24.18
Extreme Temperature - Heat	4	3	2	2	2	2	2	1	1	1	2	22.24
Flooding	3	3	3	2	3	3	3	3	3	2	3	31.24
Hazardous Materials Incident	2	2	3	2	2	1	2	2	2	2	2	20.13
Landslide/Sinkhole	1	2	3	2	2	2	2	2	1	1	1	18.82
Manmade - Technological/Terrorism	3	3	2	2	2	2	2	2	2	3	3	27.71
Thunderstorm	4	2	2	2	2	1	2	2	1	1	1	19.06
Tornado	3	2	3	2	3	3	3	3	3	2	2	29.24
Wildfire	3	2	3	2	2	2	3	2	2	2	2	24.71
Winter Storm	4	3	2	2	2	2	2	3	3	2	2	27.10

OVERALL Total Risk Scores for Davidson County 2025			
Hazard	Impact & Vulnerability	x Likelihood	= Risk Factor
Flooding	31.2	5	167.2
Tornado	29.2	5	156.5
Winter Storm	27.1	5	145.0
Extreme Temperature - Cold	24.2	5	130.8
Extreme Temperature - Heat	22.2	5	120.3
Communicable Diseases	27.6	4	117.4
Manmade - Technological/Terrorism	27.7	4	110.8
Thunderstorm	19.1	6	109.9
Cybersecurity	24.6	4	106.2
Drought	22.9	4	95.8
Wildfire	24.7	4	88.7
Hazardous Materials Incident	20.1	4	84.3
Dam & Levee Failure	30.3	3	81.3
Landslide/Sinkhole	18.8	4	80.8
Earthquake	32.8	2	69.3

Scoring Parameters

This section defines the scoring parameters and criteria applied in the 2025 assessment. It describes the numeric ranges and qualitative scales used to evaluate each hazard and clarifies what constitutes low, moderate and high scores across categories. Clear definitions for Impact, Vulnerability, likelihood and Risk Factor ensure that the assessment process is transparent, repeatable and comparable in future assessments. These parameters have not changed since at least 2012.

Impact & Vulnerability Parameters						
Parameter	Definition	1	2	3	4	5
Geographic Extent	Size of the affected area. Includes areas not damaged but strongly affected by the incidents. For example, areas backed up by a transportation accident.	Single site. One or two blocks.	Single site. Multiple blocks.	Community (downtown, Berry Hill)	City-wide	Regional. (Winter Storms.)
Duration	How long does the acute crisis part of the disaster last?	Less than 24 hours	1-3 days	4-7 days	7-30 days	30+ days
Environment	How damaging is the disaster for the natural environment?	No damage/ temporary minor damage	Degradation of ecosystem that will repair itself	Degradation of ecosystem that requires intervention	Functional loss of ecosystem, but restoration is possible	Permanent loss of ecosystem
Health Effects (Deaths and Injuries)	How dangerous is the disaster for the natural environment?	No deaths or injuries	1-10 deaths and/or 1-100 injuries	11-50 deaths and/or 101-500 injuries	51-500 deaths and/or 501-1500 injuries	Over 501 deaths and/or 1501 injuries
Displacement and Suffering	How likely is the hazard to negatively impact the exposed population in terms of displacement, personal property loss and increased indebtedness?	No displaced people	Vulnerable populations begin to have problems with food, water, access to shelter.	Vulnerable populations having serious difficulties. General population starting to have problems.	251-1000 people displaced. 5-30% of population facing acute shortages.	1000+ displaced people. More than 30% of population facing acute shortages of basic supplies and access to services.
Economy	How does the hazard affect the local economy?	No measurable impacts	No impacts to overall economy but isolated businesses experience hardship.	Entire sectors experience loss of revenue and capital.	Core sectors of economy are affected and unable to generate revenue. Capital losses between 1- 10%	Physical losses equal to 10% to assess value. Loss of ability to generate revenue.
Built Environment (Property, Facilities, Infrastructure)	How does the hazard affect buildings and physical infrastructure? (Includes utilities)	No effects.	1-10 structures uninhabitable (red tagged). Up to 25% loss of one utility.	11-250 structures red tagged. Multiple utilities affected up to 25%.	251-1000 structures red tagged. Multiple utilities affected 25-50%.	1000+ structures red tagged. At least two major utilities degraded at least 50%.
Transportation	How does the hazard affect the ability of residents and workers to access the resources they need?	No effects on mobility	All critical services accessible, but delays reaching work or non-essential services	One critical service inaccessible. Degradation of at least one mode. Major corridors open, but minor streets degraded or impassible.	Many critical services inaccessible. One major mode inoperable. One major corridor inoperable.	Most critical services inaccessible. Multiple modes inoperable. Most high-volume corridors are impassible.
Critical Services (Continuity of Operations and Responders)	How likely is the hazard to reduce the ability of government and business to provide critical services? (Medical, Public Safety, Social, Financial, etc.)	No impairment on critical services	Temporary degradation of 1 critical service	Temporary degradation of multiple critical services. Long term degradation of 1 critical service	Temporary degradation of most critical services. Long term degradation of multiple services.	Unable to deliver most critical services.
Confidence in Government	Would the public's confidence in government be shaken?	No	(Not used)	Somewhat	(Not used)	Yes

<i>Cascading Effects</i>	How severe and complex will the secondary effects be?	Hazard extremely unlikely to cause secondary hazards. If they occur, would have minor effect.	Secondary hazards may occur, but are likely to be minor compared to primary hazard	Secondary hazards occur that extend the impact of the disaster and hamper response, but are not disasters in their own right.	Secondary effects generated that significantly increase the magnitude of the disaster. Secondary impacts would likely be considered disasters if they occurred by themselves.	Secondary effects generated and rival or exceed primary hazard. Secondary impacts would definitely be disasters in their own right.
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Hazard Likelihood Parameters		
Measure of likelihood	Return period in years	Rank
Frequent or very likely	Every 1-3 years	6
Moderate or likely	Every 3-10 years	5
Occasional, slight chance	Every 10-30 years	4
Unlikely, improbable	Every 30-100 years	3
Highly unlikely, rare event	Every 100-200 years	2
Very rare event	Every 200-300 years	1
METHODOLOGY EXPLANATION		
FREQUENT OR VERY LIKELY	Frequent or very likely to occur events usually have a high number of recorded incidents or anecdotal evidence. <i>(For example, an area that is subject to flooding every year or so)</i>	
MODERATE OR LIKELY	Moderate or likely to occur hazards also have a historical record but occur with a frequency of 3-10 years. <i>(For example, an area that faces an infectious disease outbreak every few years)</i>	
OCCASIONAL OR SLIGHT CHANCE	Occasional or slight chance means events are those that occur infrequently. There may be little recorded historical evidence and a return interval of 10-30 years. <i>(For example, a rail accident where dangerous chemicals are released)</i>	
UNLIKELY OR IMPROBABLE	Unlikely or improbable refers to hazards that are not expected to occur more frequently than once every 30-100 years. There may be no historical incidents in the community. <i>(For example, a plane crash with total loss of life)</i>	
HIGHLY UNLIKELY OR RARE	Highly unlikely or rare events are extremely unlikely and have a return period of 100-200 years. <i>(For example, a one-hundred-year flood)</i>	
VERY RARE EVENTS	Very rare events may happen every 200+ years. <i>(For example, a large earthquake)</i>	

Next Steps

The completion of this HIRA provides the foundation for the Nashville-Davidson County Multi-Hazard Mitigation Plan. Building on the identified hazards, vulnerabilities and community assets at risk, the next step is to translate this analysis into actionable mitigation strategies. The CPT will use the HIRA findings to prioritize hazards by level of risk, evaluate potential impacts on critical facilities and populations, and guide the development of targeted mitigation actions.

These actions will form the core of the Mitigation Strategy within the Hazard Mitigation Plan, ensuring that recommended projects, policies and programs directly address the community's highest risks while aligning with broader goals such as resilience and sustainability. The integration of the HIRA results into the Mitigation Strategy will also support cost effective decision making, strengthen local capacity, and position the jurisdictions to maximize available funding opportunities for implementation.

Conclusion

This Hazard Identification and Risk Assessment provides a comprehensive understanding of the hazards facing Nashville-Davidson County. It serves as a foundation for informed decision making, strategic planning, and coordinated actions across agencies and partners. Together with the Multi-Hazard Mitigation Plan, this assessment supports a safer, more resilient community.

The Nashville-Davidson County Multi-Hazard Mitigation Plan can be found online at the Nashville OEM website: www.nashville.gov/oem.