

**COOK COUNTY
MULTI-JURISDICTIONAL
HAZARD MITIGATION PLAN
VOLUME 2 - Municipal Annexes**

Phoenix Annex

FINAL

July 2019

Prepared for:



Cook County
Department of Homeland Security and Emergency Management
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Hazard Mitigation Point of Contact

Primary Point of Contact	Alternate Point of Contact
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Jurisdiction Profile

The following is a summary of key information about the jurisdiction and its history:

- **Date of Incorporation:** 1990
- **Current Population:** 1,925 as of 2018 U.S. Census population estimate.
- **Population Growth:** Phoenix was populated primarily by Dutch and Polish residents in its earlier development phase. African-American families first moved into the village in 1915. By 1930 there were 3,033 residents. At the 2010 Census, however, there were 1,964 residents of Phoenix which was an -8.5% decrease since 2000. From 2010 to 2016 there has been a slight decrease of just less than 1 percent.
- **Location and Description:** The Village of Phoenix is located in Southern Cook County approximately 19 miles from Chicago. Adjacent suburbs include: Riverdale to the north, South Holland to the east and south, and Harvey to the west. According to the U.S. Census, the Village of Phoenix has a total land area of .45 square miles.
- **Brief History:** The development of Phoenix is closely tied to its larger neighbor, Harvey. Harvey was established as an industrial city with no saloons. Many of its early factories were located between the Illinois Central Railroad and Harvey's eastern boundary at Halsted Street. One local businessman, William McLatchy, owned a large tract of land in an unincorporated area outside of Harvey. Soon, five saloons had opened in the area and a small housing subdivision known as Phenix Park was constructed during the 1890s. City leaders in Harvey, seeing businesses just outside of their boundaries selling alcohol to local workers, sought to annex Phenix Park and render it "dry" or free of alcohol-related establishments. The residents of Phenix Park wanted to retain local control of their affairs as an independent village. On August 29, 1900, an election was held to determine the future status of the area. A total of 56 votes were cast with 38 (67.9%) voting in favor of incorporation and 18 (32.1%) against. Despite legal challenges from Harvey, the result was upheld. After incorporation, the name Phenix Park was changed to Phoenix. By 1910, the village had a population of 500, with most residents being of either Dutch or Polish ancestry. Industry in Harvey and the railroads provided a strong employment base for Phoenix residents. By 1930, the village was home to 3,033 people. New housing was constructed to accommodate this growth. The population in 1960 was 4,203. In 1960, the municipal administration of Phoenix voted to de-annex the predominantly White portion of the village into Harvey. The exchange occurred in 1962 and with it, Phoenix lost one-third of its population as well as 60% of its tax base.
- **Climate:** Phoenix averages 36 inches of rain and 33 inches of snowfall per year. The average number of days with any measurable precipitation is 109 and, on average, there are 186 sunny days per year in Phoenix. The July high is around 83 degrees and the January low is 11 degrees. The comfort index, which is based on humidity during the hot months, is a 46 out of 100, where higher is more comfortable.
- **Governing Body Format:** The Village of Phoenix is governed by a Mayor and six (6) trustees. This body of Government will assume the responsibility for the adoption and implementation of this

plan. Phoenix operates 3 Village departments: Police Department, Fire Department, and Clerk's Office.

- **Development Trends:** Anticipated development levels for the Village of Phoenix are low. There has been a decrease in population and will most likely remain low. The Village of Phoenix has a strip mall located at 503 E. 153rd Street. The Village's newest Development is Sterling Lumber located on 151st Street. The City of Phoenix is trying to get an extension on their tax increment financing district from 2019 to 2031 under a proposal led by Senator Napoleon Harris III (D-Harvey). "Phoenix still needs time to recover from the economic hardships that hit the area," Harris said. "From the loss of industry to the recession, there's a long road ahead for rebuilding the city, and this measure assists with that process." TIF districts are important for cities and towns going through economic trouble. They help attract private investment and bring new businesses to help with economic expansion. The TIF was created in 1996 and is set to expire at the end of 2019.

Capability Assessment

The assessment of the jurisdiction’s legal and regulatory capabilities is presented in the *Legal and Regulatory Capability Table* below. The assessment of the jurisdiction’s fiscal capabilities is presented in the *Fiscal Capability Table* below. The assessment of the jurisdiction’s administrative and technical capabilities is presented in the *Administrative and Technical Capability Table* below. Information on the community’s National Flood Insurance Program (NFIP) compliance is presented in the *National Flood Insurance Program Compliance Table* below. Classifications under various community mitigation programs are presented in the *Community Classifications Table* below.

TABLE: LEGAL AND REGULATORY CAPABILITY					
	Local Authority	State or Federal Prohibitions	Other Jurisdictional Authority	State Mandated	Comments
Codes, Ordinances & Requirements					
Building Code	Yes	No	No	Yes	Ch. 22 Art I–X (2008)
Zonings	Yes	No	No	Yes	Ch. 106 (9/30/1959)
Subdivisions	No	No	No	No	
Stormwater Management	No	No	Yes	Yes	State regulates industrial activity from Construction sites 1 acre or larger under section 402 CWA. MWRD
Post Disaster Recovery	No	No	No	No	
Real Estate Disclosure	Yes	No	Yes	Yes	(765 ILCS 77/) Residential Real Property Disclosure Act. Ch. 50 Art II/ Div. 5 (1985)
Growth Management	No	No	No	No	
Site Plan Review	Yes	No	No	No	Ch. 42, Ast II Sec 42-23

Public Health and Safety	No	No	Yes	Yes	Cook County Board of Health.
Environmental Protection	No	No	No	No	
Planning Documents					
General or Comprehensive Plan	No	No	No	No	
<i>Is the plan equipped to provide linkage to this mitigation plan?</i>					N/A
Floodplain or Basin Plan	Yes	No	Yes	No	FEMA, Ch. 42, Art II
Stormwater Plan	No	No	Yes	No	Regional stormwater impacts are managed by MWRD. The Village lies within the Little Calumet River watershed planning area of MWRD's comprehensive Stormwater Master Planning Program. MWRD
Capital Improvement Plan	No	No	No	No	
<i>What types of capital facilities does the plan address?</i>					N/A
<i>How often is the plan revised/updated?</i>					N/A
Habitat Conservation Plan	No	No	No	No	
Economic Development Plan	No	No	Yes	No	The Economic Development Commission is charged with reviewing all economic development related programs and incentives including tax

					incentives offered through the Cook County 6b program.
Shoreline Management Plan	No	No	No	No	
Response/Recovery Planning					
Comprehensive Emergency Management Plan	No	No	Yes	Yes	Cook County DHSEM
Threat and Hazard Identification and Risk Assessment	No	No	Yes	No	Cook County DHSEM Preparing THIRA
Terrorism Plan	No	No	Yes	Yes	Cook County DHSEM
Post-Disaster Recovery Plan	No	No	No	No	
Continuity of Operations Plan	Yes	No	Yes	No	Cook County DHSEM
Public Health Plans	No	No	Yes	No	Cook County DPH

TABLE: FISCAL CAPABILITY

Financial Resources	Accessible or Eligible to Use?
Community Development Block Grants	Yes
Capital Improvements Project Funding	No
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	Yes
Incur Debt through General Obligation Bonds	No
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State Sponsored Grant Programs	Yes

Development Impact Fees for Homebuyers or Developers	No
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TABLE: ADMINISTRATIVE AND TECHNICAL CAPABILITY		
Staff/Personnel Resources	Available?	Department/Agency/Position
Planners or engineers with knowledge of land development and land management practices	Yes	Public works and Robinson Engineering/ Consultant
Engineers or professionals trained in building or infrastructure construction practices	Yes	Robinson Engineering/ Consultant
Planners or engineers with an understanding of natural hazards	Yes	Robinson Engineering/ Consultant
Staff with training in benefit/cost analysis	No	
Surveyors	Yes	Robinson Engineering/ Consultant
Personnel skilled or trained in GIS applications	Yes	Cook County GIS Consortium
Scientist familiar with natural hazards in local area	No	
Emergency manager	Yes	Fire Chief/Police Chief/Village Administrator
Grant writers	Yes	Robinson Engineering/ Consultant

TABLE: NATIONAL FLOOD INSURANCE PROGRAM COMPLIANCE	
What department is responsible for floodplain management in your jurisdiction?	Public works
Who is your jurisdiction’s floodplain administrator? (department/position)	None
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date of adoption of your flood damage prevention ordinance?	7/11/2011
When was the most recent Community Assistance Visit or Community Assistance Contact?	Have not had a Community Assistance Visit
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? If so, please state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? (If no, please state why)	Yes/ FEMA 2008/ FLOOD MAPS

Does your floodplain management staff need any assistance or training to support its floodplain management program? If so, what type of assistance/training is needed?	Yes
Does your jurisdiction participate in the Community Rating System (CRS)? If so, is your jurisdiction seeking to improve its CRS Classification? If not, is your jurisdiction interested in joining the CRS program?	No; Undecided

TABLE: COMMUNITY CLASSIFICATIONS			
	Participating?	Classification	Date Classified
Community Rating System	No	N/A	N/A
Building Code Effectiveness Grading Schedule	Yes	Unknown	Unknown
Public Protection/ISO	Yes	Unknown	Unknown
StormReady	Yes	Gold (Countywide)	2014
Tree City USA	No	N/A	N/A

Jurisdiction-Specific Natural Hazard Event

The information provided below was solicited from the jurisdiction and supported by NOAA and other relevant data sources.

The *Natural Hazard Events Table* lists all past occurrences of natural hazards within the jurisdiction. Repetitive flood loss records are as follows:

- Number of FEMA-Identified Repetitive Loss Properties: 4
- Number of FEMA-Identified Severe Repetitive Loss Properties: 0
- Number of Repetitive Flood Loss/Severe Repetitive Loss Properties That Have Been Mitigated: 0

TABLE: NATURAL HAZARD EVENTS			
Type of Event	FEMA Disaster Number (if applicable)	Date	Preliminary Damage Assessment
Flash Flood	-	7/29/2016	-
Severe Weather	-	6/30/2014	-
Severe Storms, Straight-Line Winds and Flooding	DR-4116	4/26/2013	Debris, Miscellaneous, Response, Flooding, Severe Storm. Efforts were made to combat the rising waters caused by floods that flowed above 3 feet into homes, basements and down streets. More than seven inches of rain fell in Phoenix. Costs of additional equipment, overtime to staff, and bringing in other professional resources were over approximately \$750,000. Citizen input included questions on infrastructure capacity to mitigate flood in the future. Questions arose regarding how residents could obtain help from FEMA. Preliminary damage estimates – not known; Insurance Claims – not known.
Severe Winter Storm and Snowstorm	DR-1960	1/31/2011	Damage assessment included the need for emergency protective measures, including snow assistance, for a continuous 48-hour period. Damage included significant debris, the need for additional, emergency services related to the disaster, and

			<p>repairing or replacing damaged public facilities, such as roads, utilities and recreation areas. Storm cleanup severely strained the Village budget. Unplanned amounts (over \$500,000) for additional salt, over time for public works and public safety staff. Securing additional staff and professional contractors were needed during this period as well. Snow melting led to flooding issues shortly thereafter which caused significant problems because of current infrastructure not having capacity. Previous floods brought much wear and tear on public infrastructure, and this incident caused additional, unforeseen problems. The storm caused serious social disruption and caused great hardship to several senior citizen communities. Phoenix is part of a regional emergency response plan. Property damage estimates – not known. Insurance Claims – not known.</p>
<p>Severe Storms and Flooding</p>	<p>DR-1935</p>	<p>7/19/2010</p>	<p>Significant flood damage to homes and businesses. Fallen debris required additional cleanup efforts. Severely damaged homes required significant rehabilitation. Loss of personal property conveyed. Village spent over \$500,000 for staff overtime regarding public safety and public works. Equipment maintenance and contractor resources were required as well. Citizen input conveyed concerns on capacity of current public infrastructure –and when the infrastructure will be able to handle severe flooding issues. The storm caused serious social disruption and caused great negative to qualify of life for a long period of time. Insurance Claims not known; preliminary damage estimates – not known. Phoenix is part of a regional emergency response plan.</p>

<p>Severe Storms and Flooding</p>	<p>DR-1800</p>	<p>9/13/2008</p>	<p>Significant flood damage to homes and businesses. Fallen debris required additional cleanup efforts. Severely damaged homes required significant rehabilitation. Loss of personal property conveyed. Village spent over \$500,000 for staff overtime regarding public safety and public works. Equipment maintenance and contractor resources were required as well. Citizen input conveyed concerns on capacity of current public infrastructure –and when the infrastructure will be able to handle severe flooding issues. The storm caused serious social disruption and caused great negative to quality of life for a long period of time. Insurance Claims not known; preliminary damage estimates – not known. Phoenix is part of a regional emergency response plan.</p>
<p>Severe Storms and Flooding</p>	<p>DR-1729</p>	<p>8/20/2007</p>	<p>Severe damage to properties due to flooding and debris. The storm caused serious social disruption and caused great hardship to quality of life for a long period of time. Village spent over \$200,000 on staff overtime public works and public safety, equipment, and contractors to ensure capacity to deal with aftermath of storm. Citizen input involves infrastructure capacity and when capacity will be enhanced to deal with flood issues. Insurance claims – not known. Phoenix is part of a regional emergency response plan. Property damage estimates – not known; insurance claims data – not known.</p>
<p>Flooding</p>	<p>DR-1188</p>	<p>8/6/1997</p>	<p>Severe flood problems were a result of overflows of water that submerged dry land within the Village. The ground was saturated where the water either could not run off or could not run off quickly enough to stop</p>

			<p>accumulating. This was a result of strong rains. In addition, some of the flooding occurred on impermeable surfaces, such as concrete and paving, and could not rapidly dissipate into the ground. Therefore, there are systematic negative impacts on the community each time it floods due to sewer pipes, toilets and sinks into buildings, seepage through building walls and floors; the accumulation of water on property and in public right-of-ways. This leads to a negative impact on quality of life. It costs the Village over \$500,000 each time a natural disaster occurs - costs for overtime public safety staff, overtime public works and building staff, etc.; purchase of new equipment or repairing old; costs additional contractors; and more. Preliminary damage estimates not known. Insurance claims not known. Citizen input involves questions regarding the capacity of current public infrastructure; and when the capacity to handle flooding issues will be resolved.</p>
<p>Flooding</p>	<p>DR-1129</p>	<p>7/17/1996</p>	<p>Severe flood problems were a result of overflows of water that submerged dry land within the Village. The ground was saturated where the water either could not run off or could not run off quickly enough to stop accumulating. This was a result of strong rains. In addition, some of the flooding occurred on impermeable surfaces, such as concrete and paving, and could not rapidly dissipate into the ground. Therefore, there are systematic negative impacts on the community each time it floods due to sewer pipes, toilets and sinks into buildings, seepage through building walls and floors; the accumulation of water on property and in public right-of-ways. This leads to a negative</p>

			<p>impact on quality of life. It costs the Village over \$500,000 each time a natural disaster occurs – costs for overtime public safety staff, overtime public works and building staff, etc.; purchase of new equipment or repairing old; costs additional contractors; and more. Preliminary damage estimates not known. Insurance claims not known. Citizen input involves questions regarding the capacity of current public infrastructure; and when the capacity to handle flooding issues will be resolved.</p>
<p>Flooding, Severe Storms</p>	<p>DR-997</p>	<p>4/13/1993</p>	<p>The event included an unusual force of heavy rain fall and exceptionally strong winds with violent outbreaks of thunder and lightning. Severe flood problems were a result of overflows of water that submerged dry land within the Village. The ground was saturated where the water either could not run off or could not run off quickly enough to stop accumulating. This was a result of strong rains. In addition, some of the flooding occurred on impermeable surfaces, such as concrete and paving, and could not rapidly dissipate into the ground. Therefore, there are systematic negative impacts on the community each time it floods due to sewer pipes, toilets and sinks into buildings, seepage through building walls and floors; the accumulation of water on property and in public right-of-ways. This leads to a negative impact on quality of life. It costs the Village over \$500,000 each time a natural disaster occurs - costs for overtime public safety staff, overtime public works and building staff, etc.; purchase of new equipment or repairing old; costs additional contractors; and more. Preliminary damage estimates not known.</p>

			Insurance claims not known. Citizen input involves questions regarding the capacity of current public infrastructure; and when the capacity to handle flooding issues will be resolved.
Severe Storms, Flooding	DR-798	8/13/1987	The event included an unusual force of heavy rain fall and exceptionally strong winds with violent outbreaks of thunder and lightning. Severe flood problems were a result of overflows of water that submerged dry land within the Village. The ground was saturated where the water either could not run off or could not run off quickly enough to stop accumulating. This was a result of strong rains. In addition, some of the flooding occurred on impermeable surfaces, such as concrete and paving, and could not rapidly dissipate into the ground. Therefore, there are systematic negative impacts on the community each time it floods due to sewer pipes, toilets and sinks into buildings, seepage through building walls and floors; the accumulation of water on property and in public right-of-ways. This leads to a negative impact on quality of life. It costs the Village over \$500,000 each time a natural disaster occurs – costs for overtime public safety staff, overtime public works and building staff, etc.; purchase of new equipment or repairing old; costs additional contractors; and more. Preliminary damage estimates not known. Insurance claims not known. Citizen input involves questions regarding the capacity of current public infrastructure; and when the capacity to handle flooding issues will be resolved.
Severe Storm, Flooding	DR-776	9/21/1986	The event included an unusual force of heavy rain fall and exceptionally

			<p>strong winds with violent outbreaks of thunder and lightning. Severe flood problems were a result of overflows of water that submerged dry land within the Village. The ground was saturated where the water either could not run off or could not run off quickly enough to stop accumulating. This was a result of strong rains. In addition, some of the flooding occurred on impermeable surfaces, such as concrete and paving, and could not rapidly dissipate into the ground. Therefore, there are systematic negative impacts on the community each time it floods due to sewer pipes, toilets and sinks into buildings, seepage through building walls and floors; the accumulation of water on property and in public right-of-ways. This leads to a negative impact on quality of life. It costs the Village over \$500,000 each time a natural disaster occurs - costs for overtime public safety staff, overtime public works and building staff, etc.; purchase of new equipment or repairing old; costs additional contractors; and more. Preliminary damage estimates not known. Insurance claims not known. Citizen input involves questions regarding the capacity of current public infrastructure; and when the capacity to handle flooding issues will be resolved.</p>
<p>Severe Storms, Flooding, Tornadoes</p>	<p>DR-509</p>	<p>6/18/1976</p>	<p>The event of high winds was a violent occurrence with an unusual force of heavy rain fall and exceptionally strong winds with violent outbreaks of thunder and lightning. Severe flood problems were a result of overflows of water that submerged dry land within the Village. The ground was saturated where the water either could not <u>run off</u> or could not run off quickly enough to stop accumulating.</p>

			<p>This was a result of strong rains. In addition, some of the flooding occurred on impermeable surfaces, such as <u>concrete</u> and paving, and could not rapidly dissipate into the ground. Therefore, there are systematic negative impacts on the community each time it floods due to sewer pipes, toilets and sinks into buildings, seepage through building walls and floors; the accumulation of water on property and in public right-of-ways. This leads to a negative impact on quality of life. It costs the Village over \$500,000 each time a natural disaster occurs - costs for overtime public safety staff, overtime public works and building staff, etc.; purchase of new equipment or repairing old; costs additional contractors; and more. Preliminary damage estimates not known. Insurance claims not known. Citizen input involves questions regarding the capacity of current public infrastructure; and when the capacity to handle flooding issues will be resolved</p>
<p>Severe Storm, Flooding</p>	<p>DR-373</p>	<p>4/26/1973</p>	<p>The event included an unusual force of heavy rain fall and exceptionally strong winds with violent outbreaks of thunder and lightning. Severe flood problems were a result of overflows of water that submerged dry land within the Village. The ground was saturated where the water either could not <u>run off</u> or could not run off quickly enough to stop accumulating. This was a result of strong rains. In addition, some of the flooding occurred on impermeable surfaces, such as <u>concrete</u> and paving, and could not rapidly dissipate into the ground. Therefore, there are systematic negative impacts on the community each time it floods due to sewer pipes, toilets and sinks into</p>

			<p>buildings, seepage through building walls and floors; the accumulation of water on property and in public right-of-ways. This leads to a negative impact on quality of life. It costs the Village over \$500,000 each time a natural disaster occurs - costs for overtime public safety staff, overtime public works and building staff, etc.; purchase of new equipment or repairing old; costs additional contractors; and more. Preliminary damage estimates not known. Insurance claims not known. Citizen input involves questions regarding the capacity of current public infrastructure; and when the capacity to handle flooding issues will be resolved.</p>
<p>Severe Storms, Flooding</p>	<p>DR-351</p>	<p>9/4/1972</p>	<p>The event included an unusual force of heavy rain fall and exceptionally strong winds with violent outbreaks of thunder and lightning. Severe flood problems were a result of overflows of water that submerged dry land within the Village. The ground was saturated where the water either could not <u>run off</u> or could not run off quickly enough to stop accumulating. This was a result of strong rains. In addition, some of the flooding occurred on impermeable surfaces, such as <u>concrete</u> and paving, and could not rapidly dissipate into the ground. Therefore, there are systematic negative impacts on the community each time it floods due to sewer pipes, toilets and sinks into buildings, seepage through building walls and floors; the accumulation of water on property and in public right-of-ways. This leads to a negative impact on quality of life. It costs the Village over \$500,000 each time a natural disaster occurs - costs for overtime public safety staff, overtime public works and building staff, etc.;</p>

			purchase of new equipment or repairing old; costs additional contractors; and more. Preliminary damage estimates not known. Insurance claims not known. Citizen input involves questions regarding the capacity of current public infrastructure; and when the capacity to handle flooding issues will be resolved.
Tornadoes	DR-227	4/25/1967	Tornadoes with heavy rains and strong winds caused much damage within the Phoenix community. However, the extent of natural disaster damage is not always clear. However, what is clear - this event was a violent occurrence that exhausted a negative impact on quality of life and the economy. No preliminary damage estimates available. No insurance claims data available. When flooding is not the primary issue, very little citizen input in this regard

Hazard Risk Ranking

The *Hazard Risk Ranking Table* below presents the ranking of the hazards of concern. Hazard area extent and location maps are included at the end of this chapter. These maps are based on the best available data at the time of the preparation of this plan, and are considered to be adequate for planning purposes.

TABLE: HAZARD RISK RANKING		
Rank	Hazard Type	Risk Rating Score (Probability x Impact)
1	Flood	54
2	Severe Weather	54
3	Severe Winter	54
4	Tornado	54
5	Earthquake	30
6	Drought	2
7	Dam Failure	0

Mitigation Strategies and Actions

The heart of the mitigation plan is the mitigation strategy, which serves as the long-term blueprint for reducing the potential losses identified in the risk assessment. The mitigation strategy describes how the community will accomplish the overall purpose, or mission, of the planning process. In this section, mitigation actions/projects were updated/amended, identified, evaluated, and prioritized. This section is organized as follows:

- New Mitigation Actions - New actions identified during this 2019 update process
- Ongoing Mitigation Actions - Ongoing actions with no definitive end or that are still in progress. During the 2019 update, these "ongoing" mitigation actions and projects were modified and/or amended, as needed.
- Completed Mitigation Actions - An archive of all identified and completed projects, including completed actions since 2014.

The *Hazard Mitigation Action Plan Matrix Table* below lists the actions that make up the jurisdiction’s hazard mitigation plan. The *Mitigation Strategy Priority Schedule Table* identifies the priority for each action.

TABLE: HAZARD MITIGATION ACTION PLAN MATRIX						
Status	Hazards Mitigated	Objectives Met	Lead Agencies	Estimated Cost	Sources of Funding	Timeline/Projected Completion Date (a)
<p>Action P7.1—IMPROVE PUBLIC INFRASTRUCTURE regarding mitigation of floods and other hazards with specific concentrations on water/sewer infrastructure projects. Some other mitigation efforts include: sewer lining and smoke testing for combined sewer overflow; street reconstruction/drainage; new sidewalk design/construction to include better drainage; elevated tank raising; water main replacements for sustainability; elevated tank painting for better sustainability; sanitary sewer cleaning; utility upgrades/efficiency regarding public street lights; local roads and bridge assessments to ensure sustainability. Basic premise is to increase resilience of infrastructure and critical facilities which also includes the establishment of public rain gardens as well.</p>						
Ongoing	All	1, 2, 3, 7, 9, 12	Phoenix	\$10,000,000; High	Some Local Government Resources, Seeking Cook County, State, and Federal Grants	Long-term

Action P7.2—STRENGTHEN BUILDING AND ZONING CODES – impacts of natural hazards on future land uses; integrate hazard mitigation policies; strengthen land-use planning efforts; reduce natural hazard risk and vulnerability to potentially isolated populations.

Ongoing	All	2, 4, 10, 12	Phoenix	Low	Some Local Government Resources, Cook County	Short-term
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Action P7.3—72-HOUR SELF SUFFICIENCY – increase Phoenix capacity to handle hazards and related crisis within its own government immediately and strengthen intergovernmental agreements and cooperation during and after hazards as well. Specifics increasing local capacity through all phases of emergency management; increase resilience; improve systems that provide early warnings; establish new partnerships and strengthen existing partnerships.

Ongoing	All	1, 2, 5, 8	Phoenix	\$50,000; Medium	Local Government Resources, Cook County, State, and Federal Grants	Short-term
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Action P7.4—ENHANCE TORNADO WARNING PROTOCOL – help minimize disruption of Phoenix government operations; Improve early warning systems and emergency response communications; enhance partnerships regarding warning protocol.

Ongoing	All	1, 5, 8	Phoenix	\$100,000; Medium	Local Government Resources, Cook County, State, and Federal Grants	Short-term
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Action P7.5—PROVIDE SHELTER FACILITIES - working alongside early warning program; established partnerships with other governments and communities; reduce loss of injury/save lives.

Ongoing	All	5, 8, 12	Phoenix, and Township	\$500,000; High	Local Government Resources, Cook County, State, and Federal Grants. Foundation Grants	Long-term
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Action P7.6 —DEVELOP EVACUATION PLAN - working alongside early warning program; established partnerships with other governments and communities; reduce loss of injury/save lives.						
Ongoing	All	5, 8, 12	Phoenix, and Township	\$100,000; Medium	Local Government Resources, Cook County, State, and Federal Grants. Foundation Grants	Short-term
Action P7.7 —DEVELOP POST-DISASTER RECOVERY PLAN - utilizing resilience of critical facilities; development, improvements, and protection of early warning and post warning systems; utilizing good data; establishment of good partnerships with neighboring communities and other governments; encouragement of natural environment mitigation efforts						
Ongoing	All	2, 5, 6, 8, 13	Phoenix and Township	\$100,000; Medium	Local Government Resources, Cook County, State, and Federal Grants. Foundation Grants	Short-term
Action P7.8 —DEVELOP PUBLIC EDUCATION PROGRAMS – Although it would be most helpful to have all planning programs in place prior to outreach and education, its crucial to involve residents and businesses with what keeps them safe. Outreach and education include posting information on Village Website; discussions about private rain gardens; keeping your home safe with proactive measures. Education programs will involve village hazard mitigation policies; early warning systems; utilizing the best data available and technologies to educate public; partnership identifications with other governments, agencies, and communities and where to seek help while in a disaster; education about codes and land use within the area; and encourage residents and businesses as to when and how to mitigate hazards regarding their own properties.						
Ongoing	All	4, 5, 6, 8, 10, 11, 13	Phoenix	\$150,000	Local Government Resources, Cook County, State, and Federal Grants, Foundation, and Education Grants	Short-term

Action P7.9 —Where appropriate, support retrofitting, purchase, or relocation of structures in hazard-prone areas to prevent future structure damage. Give priority to properties with exposure to repetitive losses.						
Ongoing	All	7, 13	Phoenix	High	FEMA Hazard Mitigation Grants	Long-term(depending on funding)
Action P7.10 —Continue to support the countywide actions identified in this plan.						
Ongoing	All	All	Phoenix	Low	General Fund	Short- and Long-term
Action P7.11 —Actively participate in the plan maintenance strategy identified in this plan.						
Ongoing	All	3, 4, 6	DHSEM, Phoenix	Low	General Fund	Short-term
Action P7.12 —Consider participation in incentive-based programs such as the Community Rating System, Tree City, and StormReady.						
Ongoing	All	3, 4, 5, 6, 7, 9, 10, 11, 13	Phoenix	Low	General Fund	Long-term
Action P7.13 —Maintain good standing under the National Flood Insurance Program by implementing programs that meet or exceed the minimum NFIP requirements. Such programs include enforcing an adopted flood damage prevention ordinance, participating in floodplain mapping updates, and providing public assistance and information on floodplain requirements and impacts.						
Ongoing	Flooding	4, 6, 9	Phoenix	Low	General Fund	Short-term and ongoing
Action P7.14 —Where feasible, implement a program to record high water marks following high-water events.						
Ongoing	Flooding, Severe Weather	3, 6, 9	Phoenix	Medium	General Fund, FEMA Grant Funds(Public Assistance)	Long-term
Action P7.15 —Integrate the hazard mitigation plan into other plans, programs, or resources that dictate land use or redevelopment.						
Ongoing	All	3, 4, 6, 10, 13	Engineering Division, Economic Development, Community Development, Public Affairs, and Public Works Departments	Low	General Fund	Short-term

Action P7.16—Consider the development and implementation of a Capital Improvements Program (CIP) to increase the Village’s regulatory, financial and technical capability to implement mitigation actions.

Ongoing	All	1, 2, 7	Public Works	High	CIP component of general fund (if implemented)	Long-term
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Action P7.17—Storm Sewer Assessment

New	Flood, Ice Storm	1, 2, 3, 4, 10	DPW	\$150,000; High	No funding available	12-16 mo. post award
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(a) Ongoing indicates continuation of an action that is already in place. Short-term indicates implementation within five years. Long-term indicates implementation after five years.

TABLE: MITIGATION STRATEGY PRIORITY SCHEDULE

Action Number	Number of Objectives Met	Benefits	Costs	Do Benefits Equal or Exceed Costs?	Is Project Grant-Eligible?	Can Project Be Funded Under Existing Programs/Budgets?	Priority (a)
1	6	High	High	Yes	Yes	No	Medium
2	4	Medium	Low	Yes	No	Yes	High
3	4	High	Medium	Yes	No	Yes	High
4	3	High	Medium	Yes	Yes	Yes	High
5	3	High	High	Yes	Yes	No	Medium
6	3	High	Medium	Yes	Yes	Yes	High
7	6	Medium	Medium	Yes	Yes	No	Medium
8	2	High	High	Yes	Yes	No	Medium
9	13	Medium	Low	Yes	No	Yes	High
10	3	Medium	Low	Yes	Yes	Yes	High
11	9	Medium	Low	Yes	No	Yes	Medium
12	3	Medium	Low	Yes	No	Yes	High
13	3	Medium	Medium	Yes	Yes	No	Medium

14	5	Medium	Low	Yes	No	Yes	High
15	3	High	High	Yes	No	No	Medium
16	2	High	High	Yes	Yes	No	Medium
17	5	High	High	Yes	Yes	No	High

(a) See Chapter 1 for explanation of priorities.

New Mitigation Actions

The following are new mitigation actions created during the 2019 update.

Action P7.17

Mitigation Action	Storm Sewer Assessment
Year Initiated	2019
Applicable Jurisdiction	Village of Phoenix
Lead Agency/Organization	DPW
Supporting Agencies/Organizations	FD
Applicable Goal	<ul style="list-style-type: none"> • Develop and implement sustainable, cost-effective, and environmentally sound risk-reduction (mitigation) projects. • Protect the lives, health, safety, and property of the citizens of Cook County from the impacts of natural hazards. • Protect public services and critical facilities, including infrastructure, from loss of use during natural hazard events. • Involve stakeholders to enhance the local capacity to mitigate, prepare for, and respond to the impacts of natural hazards. • Develop, promote, and integrate mitigation action plans. • Promote public understanding of and support for hazard mitigation.
Applicable Objective	<ul style="list-style-type: none"> • Eliminate or minimize disruption of local government operations caused by natural hazards through all phases of emergency management. • Increase the resilience of (or protect and maintain) infrastructure and critical facilities. • Consider the impacts of natural hazards on future land uses in the planning area, including possible impacts from climate change. • Integrate hazard mitigation policies into land use plans in the planning area. • Strengthen codes and land use planning and their enforcement, so that new construction or redevelopment can avoid or withstand the impacts of natural hazards.
Potential Funding Source	No funding available
Estimated Cost	\$150,000

Benefits (loss avoided)	Known system failures / need to determine capacity and extent of failures to continue to provide water to residents and to mitigate flooding
Projected Completion Date	12-16 mo post award
Priority and Level of Importance (Low, Medium, High)	High Priority
Benefit Analysis (Low, Medium, High)	High—Project will provide an immediate reduction of risk exposure for life and property.
Cost Analysis (Low, Medium, High)	High—Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).
Actual Completion Date	

Recommended Mitigation Action/Implementation Plan and Project Description	
Action/Implementation Plan and Project Description:	Need an engineering study to determine capacity and structural integrity of villages storm sewer lines

Mitigation Action and Project Maintenance		
Year	Status	Comments
2019	New	
2020		
2021		
2022		
2023		

Mitigated Hazards	
	All Hazards
	Dam/Levee Failure
	Drought
	Earthquake
X	Flood
	Extreme Heat
	Lightning
	Hail
	Fog
	High Wind
	Snow
	Blizzard

	Extreme Cold
X	Ice Storms
	Tornado
	Epidemic or pandemic
	Nuclear Power Plant Incident
	Widespread Power Outage
	Coastal Erosion
	Secondary Impacts from Mass Influx of Evacuees
	Hazardous Materials Incident

Ongoing Mitigation Actions

The following are ongoing actions with no definitive end or that are still in progress. During the 2019 update, these "ongoing" mitigation actions and projects were modified and/or amended, as needed.

Action P7.1

TABLE: ACTION PLAN MATRIX						
Status	Hazards Mitigated	Objectives Met	Lead Agencies	Estimated Cost	Sources of Funding	Timeline/Projected Completion Date (a)
<p>Action P7.1—IMPROVE PUBLIC INFRASTRUCTURE regarding mitigation of floods and other hazards with specific concentrations on water/sewer infrastructure projects. Some other mitigation efforts include: sewer lining and smoke testing for combined sewer overflow; street reconstruction/drainage; new sidewalk design/construction to include better drainage; elevated tank raising; water main replacements for sustainability; elevated tank painting for better sustainability; sanitary sewer cleaning; utility upgrades/efficiency regarding public street lights; local roads and bridge assessments to ensure sustainability. Basic premise is to increase resilience of infrastructure and critical facilities which also includes the establishment of public rain gardens as well.</p>						
Ongoing	All	1, 2, 3, 7, 9, 12	Phoenix	\$10,000,000; High	Some Local Government Resources, Seeking Cook County, State, and Federal Grants	Long-term
<p>(a) Ongoing indicates continuation of an action that is already in place. Short-term indicates implementation within five years. Long-term indicates implementation after five years.</p>						

Action P7.2

TABLE: ACTION PLAN MATRIX						
Status	Hazards Mitigated	Objectives Met	Lead Agencies	Estimated Cost	Sources of Funding	Timeline/Projected Completion Date (a)
<p>Action P7.2—STRENGTHEN BUILDING AND ZONING CODES – impacts of natural hazards on future land uses; integrate hazard mitigation policies; strengthen land-use planning efforts; reduce natural hazard risk and vulnerability to potentially isolated populations.</p>						
Ongoing	All	2, 4, 10, 12	Phoenix	Low	Some Local Government Resources, Cook County	Short-term

(a) Ongoing indicates continuation of an action that is already in place. Short-term indicates implementation within five years. Long-term indicates implementation after five years.

Action P7.3

TABLE: ACTION PLAN MATRIX						
Status	Hazards Mitigated	Objectives Met	Lead Agencies	Estimated Cost	Sources of Funding	Timeline/Projected Completion Date (a)
Action P7.3 —72-HOUR SELF SUFFICIENCY – increase Phoenix capacity to handle hazards and related crisis within its own government immediately and strengthen intergovernmental agreements and cooperation during and after hazards as well. Specifics increasing local capacity through all phases of emergency management; increase resilience; improve systems that provide early warnings; establish new partnerships and strengthen existing partnerships.						
Ongoing	All	1, 2, 5, 8	Phoenix	\$50,000; Medium	Local Government Resources, Cook County, State, and Federal Grants	Short-term
(a) Ongoing indicates continuation of an action that is already in place. Short-term indicates implementation within five years. Long-term indicates implementation after five years.						

Action P7.4

TABLE: ACTION PLAN MATRIX						
Status	Hazards Mitigated	Objectives Met	Lead Agencies	Estimated Cost	Sources of Funding	Timeline/Projected Completion Date (a)
Action P7.4 —ENHANCE TORNADO WARNING PROTOCOL – help minimize disruption of Phoenix government operations; Improve early warning systems and emergency response communications; enhance partnerships regarding warning protocol.						
Ongoing	All	1, 5, 8	Phoenix	\$100,000; Medium	Local Government Resources, Cook County, State, and Federal Grants	Short-term
(a) Ongoing indicates continuation of an action that is already in place. Short-term indicates implementation within five years. Long-term indicates implementation after five years.						

Action P7.5

TABLE: ACTION PLAN MATRIX						
Status	Hazards Mitigated	Objectives Met	Lead Agencies	Estimated Cost	Sources of Funding	Timeline/Projected Completion Date (a)
Action P7.5 —PROVIDE SHELTER FACILITIES - working alongside early warning program; established partnerships with other governments and communities; reduce loss of injury/save lives.						
Ongoing	All	5, 8, 12	Phoenix, and Township	\$500,000; High	Local Government Resources, Cook County, State, and Federal Grants. Foundation Grants	Long-term
(a) Ongoing indicates continuation of an action that is already in place. Short-term indicates implementation within five years. Long-term indicates implementation after five years.						

Action P7.6

TABLE: ACTION PLAN MATRIX						
Status	Hazards Mitigated	Objectives Met	Lead Agencies	Estimated Cost	Sources of Funding	Timeline/Projected Completion Date (a)
Action P7.6 —DEVELOP EVACUATION PLAN - working alongside early warning program; established partnerships with other governments and communities; reduce loss of injury/save lives.						
Ongoing	All	5, 8, 12	Phoenix, and Township	\$100,000; Medium	Local Government Resources, Cook County, State, and Federal Grants. Foundation Grants	Short-term
(a) Ongoing indicates continuation of an action that is already in place. Short-term indicates implementation within five years. Long-term indicates implementation after five years.						

Action P7.7

TABLE: ACTION PLAN MATRIX						
Status	Hazards Mitigated	Objectives Met	Lead Agencies	Estimated Cost	Sources of Funding	Timeline/Projected Completion Date (a)
<p>Action P7.7—DEVELOP POST-DISASTER RECOVERY PLAN - utilizing resilience of critical facilities; development, improvements, and protection of early warning and post warning systems; utilizing good data; establishment of good partnerships with neighboring communities and other governments; encouragement of natural environment mitigation efforts</p>						
Ongoing	All	2, 5, 6, 8, 13	Phoenix and Township	\$100,000; Medium	Local Government Resources, Cook County, State, and Federal Grants. Foundation Grants	Short-term
<p>(a) Ongoing indicates continuation of an action that is already in place. Short-term indicates implementation within five years. Long-term indicates implementation after five years.</p>						

Action P7.8

TABLE: ACTION PLAN MATRIX						
Status	Hazards Mitigated	Objectives Met	Lead Agencies	Estimated Cost	Sources of Funding	Timeline/Projected Completion Date (a)
<p>Action P7.8—DEVELOP PUBLIC EDUCATION PROGRAMS – Although it would be most helpful to have all planning programs in place prior to outreach and education, its crucial to involve residents and businesses with what keeps them safe. Outreach and education include posting information on Village Website; discussions about private rain gardens; keeping your home safe with proactive measures. Education programs will involve village hazard mitigation policies; early warning systems; utilizing the best data available and technologies to educate public; partnership identifications with other governments, agencies, and communities and where to seek help while in a disaster; education about codes and land use within the area; and encourage residents and businesses as to when and how to mitigate hazards regarding their own properties.</p>						
Ongoing	All	4, 5, 6, 8, 10, 11, 13	Phoenix	\$150,000	Local Government Resources, Cook County,	Short-term

					State, and Federal Grants, Foundation, and Education Grants	
<p>(a) Ongoing indicates continuation of an action that is already in place. Short-term indicates implementation within five years. Long-term indicates implementation after five years.</p>						

Action P7.9

TABLE: ACTION PLAN MATRIX						
Status	Hazards Mitigated	Objectives Met	Lead Agencies	Estimated Cost	Sources of Funding	Timeline/Projected Completion Date (a)
Action P7.9 —Where appropriate, support retrofitting, purchase, or relocation of structures in hazard-prone areas to prevent future structure damage. Give priority to properties with exposure to repetitive losses.						
Ongoing	All	7, 13	Phoenix	High	FEMA Hazard Mitigation Grants	Long-term(depending on funding)
(a) Ongoing indicates continuation of an action that is already in place. Short-term indicates implementation within five years. Long-term indicates implementation after five years.						

Action P7.10

TABLE: ACTION PLAN MATRIX						
Status	Hazards Mitigated	Objectives Met	Lead Agencies	Estimated Cost	Sources of Funding	Timeline/Projected Completion Date (a)
Action P7.10 —Continue to support the countywide actions identified in this plan.						
Ongoing	All	All	Phoenix	Low	General Fund	Short- and Long-term
(a) Ongoing indicates continuation of an action that is already in place. Short-term indicates implementation within five years. Long-term indicates implementation after five years.						

Action P7.11

TABLE: ACTION PLAN MATRIX						
Status	Hazards Mitigated	Objectives Met	Lead Agencies	Estimated Cost	Sources of Funding	Timeline/Projected Completion Date (a)
Action P7.11 —Actively participate in the plan maintenance strategy identified in this plan.						
Ongoing	All	3, 4, 6	DHSEM, Phoenix	Low	General Fund	Short-term
(a) Ongoing indicates continuation of an action that is already in place. Short-term indicates implementation within five years. Long-term indicates implementation after five years.						

Action P7.12

TABLE: ACTION PLAN MATRIX						
Status	Hazards Mitigated	Objectives Met	Lead Agencies	Estimated Cost	Sources of Funding	Timeline/Projected Completion Date (a)
Action P7.12 —Consider participation in incentive-based programs such as the Community Rating System, Tree City, and StormReady.						
Ongoing	All	3, 4, 5, 6, 7, 9, 10, 11, 13	Phoenix	Low	General Fund	Long-term
(a) Ongoing indicates continuation of an action that is already in place. Short-term indicates implementation within five years. Long-term indicates implementation after five years.						

Action P7.13

TABLE: ACTION PLAN MATRIX						
Status	Hazards Mitigated	Objectives Met	Lead Agencies	Estimated Cost	Sources of Funding	Timeline/Projected Completion Date (a)
Action P7.13 —Maintain good standing under the National Flood Insurance Program by implementing programs that meet or exceed the minimum NFIP requirements. Such programs include enforcing an adopted flood damage prevention ordinance, participating in floodplain mapping updates, and providing public assistance and information on floodplain requirements and impacts.						
Ongoing	Flooding	4, 6, 9	Phoenix	Low	General Fund	Short-term and ongoing
(a) Ongoing indicates continuation of an action that is already in place. Short-term indicates implementation within five years. Long-term indicates implementation after five years.						

Action P7.14

TABLE: ACTION PLAN MATRIX						
Status	Hazards Mitigated	Objectives Met	Lead Agencies	Estimated Cost	Sources of Funding	Timeline/Projected Completion Date (a)
Action P7.14 —Where feasible, implement a program to record high water marks following high-water events.						
Ongoing	Flooding, Severe Weather	3, 6, 9	Phoenix	Medium	General Fund, FEMA Grant Funds(Public Assistance)	Long-term
(a) Ongoing indicates continuation of an action that is already in place. Short-term indicates implementation within five years. Long-term indicates implementation after five years.						

Action P7.15

TABLE: ACTION PLAN MATRIX						
Status	Hazards Mitigated	Objectives Met	Lead Agencies	Estimated Cost	Sources of Funding	Timeline/Projected Completion Date (a)
Action P7.15 —Integrate the hazard mitigation plan into other plans, programs, or resources that dictate land use or redevelopment.						
Ongoing	All	3, 4, 6, 10, 13	Engineering Division, Economic Development, Community Development, Public Affairs, and Public Works Departments	Low	General Fund	Short-term
(a) Ongoing indicates continuation of an action that is already in place. Short-term indicates implementation within five years. Long-term indicates implementation after five years.						

Action P7.16

TABLE: ACTION PLAN MATRIX						
Status	Hazards Mitigated	Objectives Met	Lead Agencies	Estimated Cost	Sources of Funding	Timeline/Projected Completion Date (a)
Action P7.16 —Consider the development and implementation of a Capital Improvements Program (CIP) to increase the Village’s regulatory, financial and technical capability to implement mitigation actions.						
Ongoing	All	1, 2, 7	Public Works	High	CIP component of general fund (if implemented)	Long-term
(a) Ongoing indicates continuation of an action that is already in place. Short-term indicates implementation within five years. Long-term indicates implementation after five years.						

Completed Mitigation Actions

Phoenix has no completed actions at this time.

Future Needs to Better Understand Risk/Vulnerability

Disasters often follow natural hazards, but a disaster’s severity depends on the impact a hazard has on both society and the environment. There is a need for better understanding and training about how the scale of a disaster impact depends on the choices we make for our lives and for our environment - including how we grow our food, where and how we build our homes, what kind of government we have, how our financial system works, and even what we teach in schools. More understanding is needed, overall, as to how each decision and action makes us more vulnerable to disasters - or more resilient to them.

Additional Comments

Regarding the needs of the Village of Phoenix, improved public infrastructure that would help to mitigate floods and alleviate severe weather hazards would assist greatly with improving quality of life during and after natural hazard events. This is with the understanding that all planning and construction programs will be sustainable and energy efficient. In addition, the Village is looking forward to implementing educational outreach programs regarding hazard mitigation and improving public safety. The Village will implement public works measures to complement hazard mitigation programming as well.

HAZUS-MH Risk Assessment Results

PHOENIX EXISTING CONDITIONS	
2010 Population	1,964
Total Assessed Value of Structures and Contents	\$906,219,071
Area in 100-Year Floodplain	0.00 acres
Area in 500-Year Floodplain	0.20 acres
Number of Critical Facilities	5

HAZARD EXPOSURE IN PHOENIX						
	Number Exposed		Value Exposed to Hazard		Total	% of Total Assessed Value Exposed
	Population	Buildings	Structure	Contents		
Dam Failure						
Buffalo Creek	0	0	\$0	\$0	\$0	0.00%
U. Salt Cr. #2	0	0	\$0	\$0	\$0	0.00%
Touhy	0	0	\$0	\$0	\$0	0.00%
U. Salt Cr. #3	0	0	\$0	\$0	\$0	0.00%
U. Salt Cr. #4	0	0	\$0	\$0	\$0	0.00%
Flood						
100-Year	0	0	\$0	\$0	\$0	0.00%

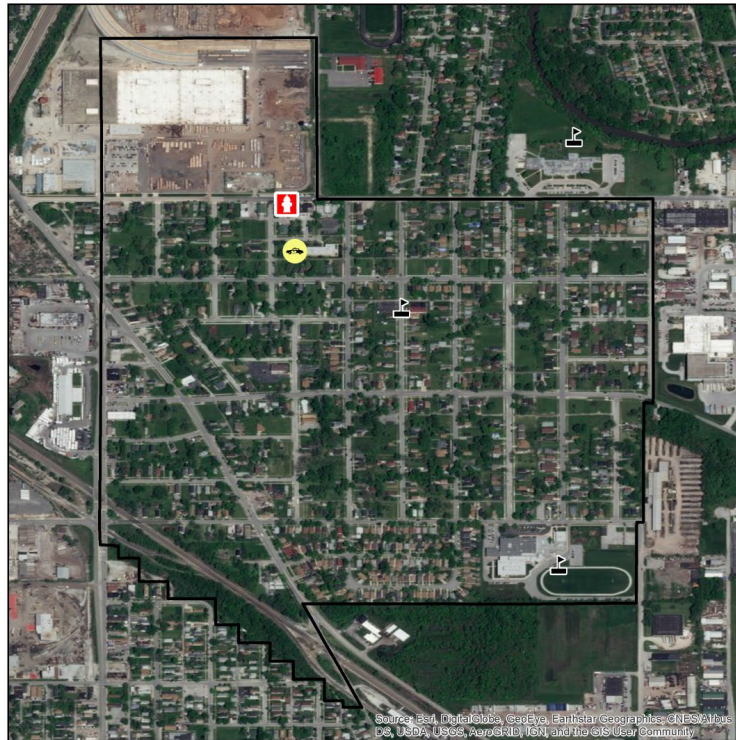
500-Year	0	0	\$0	\$0	\$0	0.00%
Tornado						
100-Year	—	—	\$349,805,243	\$302,086,971	\$651,892,215	71.94%
500-Year	—	—	\$484,291,718	\$412,265,845	\$896,557,564	98.93%

ESTIMATED PROPERTY DAMAGE VALUES IN PHOENIX

	Estimated Damage Associated with Hazard			% of Total Assessed Value Damaged
	Building	Contents	Total	
Dam Failure				
Buffalo Creek	\$0	\$0	\$0	0.00%
U. Salt Cr. #2	\$0	\$0	\$0	0.00%
Touhy	\$0	\$0	\$0	0.00%
U. Salt Cr. #3	\$0	\$0	\$0	0.00%
U. Salt Cr. #4	\$0	\$0	\$0	0.00%
Earthquake				
1909 Historical Event	\$5,936,859	\$1,846,926	\$7,783,785	0.86%
Flood				
10-Year	\$0	\$0	\$0	0.00%
100-Year	\$0	\$0	\$0	0.00%
500-Year	\$0	\$0	\$0	0.00%

Tornado				
100-Year	\$34,980,524	\$30,208,697	\$65,189,221	7.19%
500-Year	\$70,706,591	\$60,190,813	\$130,897,404	14.44%

Hazard Mapping



VILLAGE OF PHOENIX

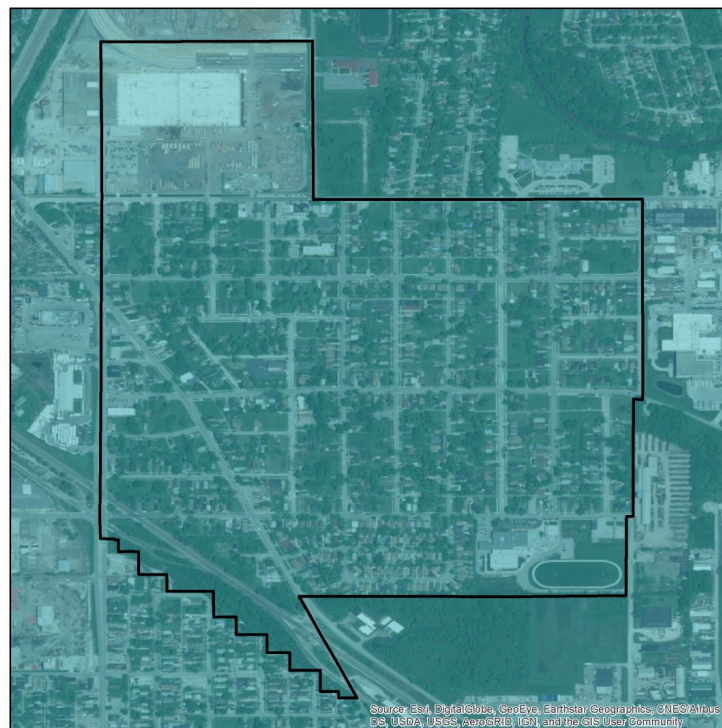
CRITICAL INFRASTRUCTURE

- Oil Facilities
- Transit Centers
- Military Facilities
- Police Stations
- Fire Stations
- Hazardous Waste
- Airports
- Hospitals
- Highway Bridges
- Warming Centers
- Cooling Centers
- Schools
- Railroad Stations

Base Map Data Sources:
Cook County, ESRI



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



VILLAGE OF PHOENIX

PEAK GROUND ACCELERATION FOR A 100 YEAR EARTHQUAKE EVENT

Mercalli Scale, Potential Shaking
II-III Weak

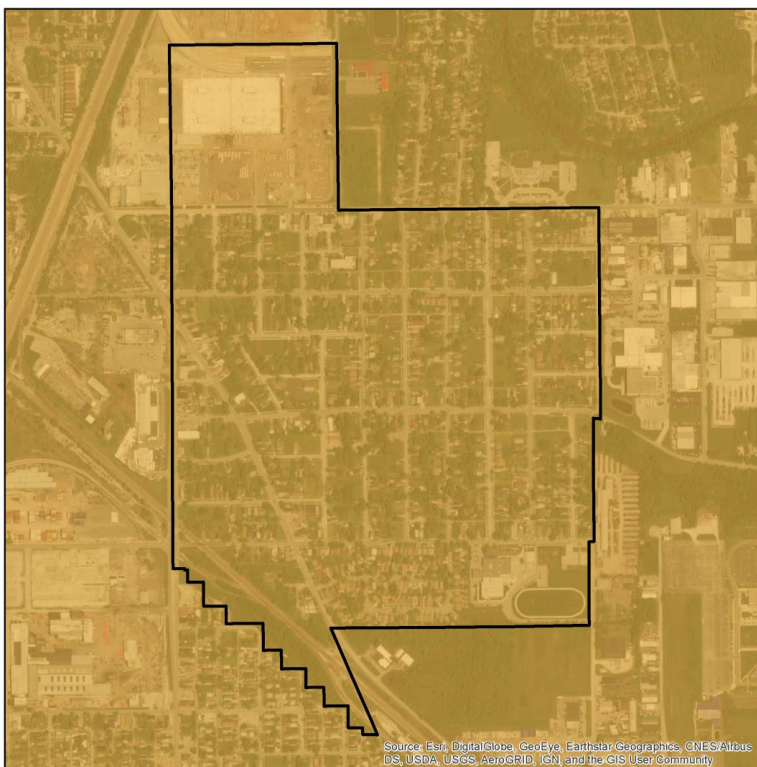
Data provided by the USGS Earthquake Hazards Program and Cook County.

Probabilistic seismic-hazard maps were prepared for the conterminous United States for 2014 portraying peak horizontal acceleration and horizontal spectral response acceleration for 0.2- and 1.0-second periods with probabilities of exceedance of 10 percent in 50 years and 2 percent in 50 years. All of the maps were prepared by combining the hazard derived from spatially smoothed historical seismicity with the hazard from fault-specific sources. The acceleration values contoured are the random horizontal component. The reference site condition is firm rock, defined as having an average shear-wave velocity of 760 m/s in the top 30 meters corresponding to the boundary between NEHRP (National Earthquake Hazards Reduction Program) site classes B and C.

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



VILLAGE OF PHOENIX

NATIONAL EARTHQUAKE HAZARD REDUCTION PROGRAM (NEHRP) SOIL CLASSIFICATION

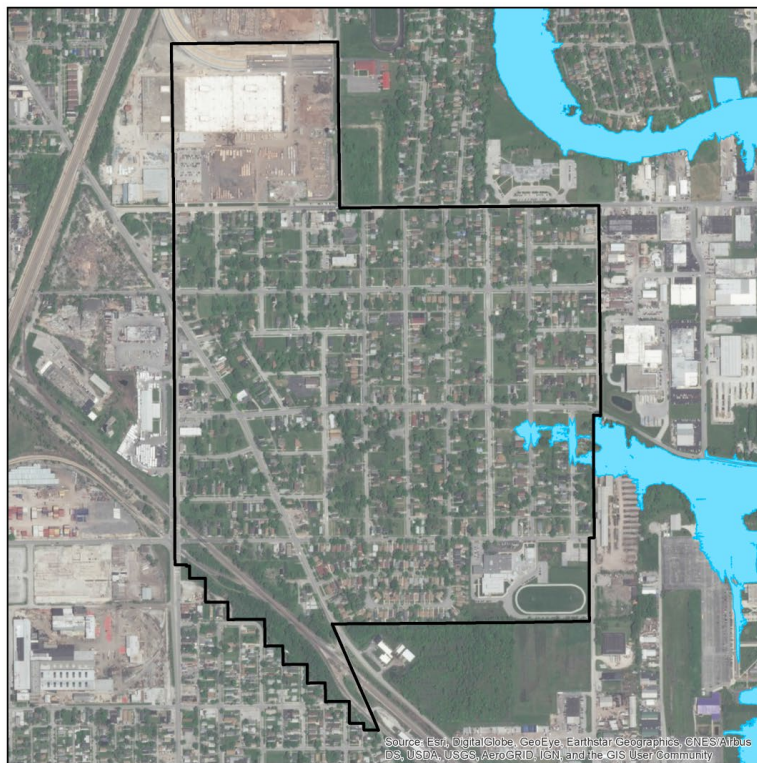
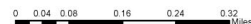
TYPE

- C - Very Dense Soil, Soft Rock
- D - Stiff Soil
- F - Site Specific Evaluation

Data provided by the Illinois State Geological Survey and Cook County

The Central United States Earthquake Consortium (CUSEC) State Geologists produced a regional Soil Site Class map (NEHRP Soil Profile Type Map), a Liquefaction Susceptibility Map and a Soil Response Map for the 8 states to be used in the FEMA New Madrid Catastrophic Planning Initiative Phase II work. The USGS Geologic Investigation Series I-2789 Map of Surficial Deposits and Materials in the Eastern and Central United States (East of 102 degrees West Longitude) by David S. Fullerton, Charles A. Bush and Jean N. Pennell (2003) was the base map used for this work. Each State Geological Survey produced its own state map version of the Soil Site Class and Liquefaction Susceptibility maps. The procedures outlined in the NEHRP provisions (Building Seismic Safety Council, 2004) and the 2000 International Building Codes (International Code Council, 2002) were followed to produce the soil site class maps. CUSEC State Geologists used the entire column of soils material down to bedrock and did not include any bedrock in the calculation of the average shear wave velocity for the column, since it is the soil column and the difference in shear wave velocity of the soils in comparison to the bedrock which influences much of the amplification.

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VILLAGE OF PHOENIX

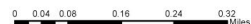
COOK COUNTY MWRDGC 100-YEAR INUNDATION AREA

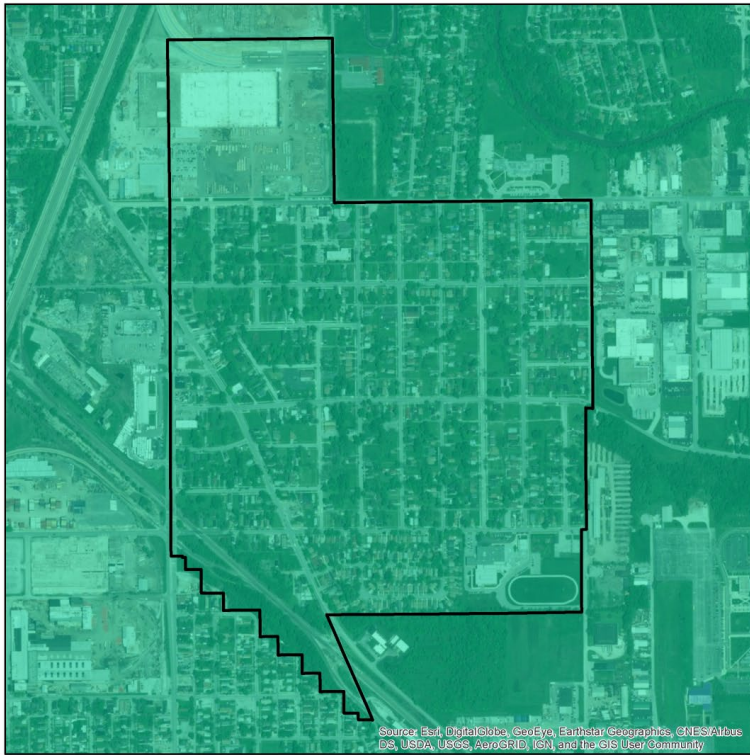
- 100-year Inundation Area

MWRDGC Data provided by Metropolitan Water Reclamation District of Greater Chicago and Cook County.

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DISCLAIMER: The Cook County MWRDGC 100-year Inundation Map is provided to show general flood risk information regarding floodplains and inundation areas. This map is not regulatory. Official FEMA Flood Insurance Study information and regulatory maps can be obtained from <http://www.fema.gov>.

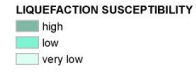




Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

VILLAGE OF PHOENIX

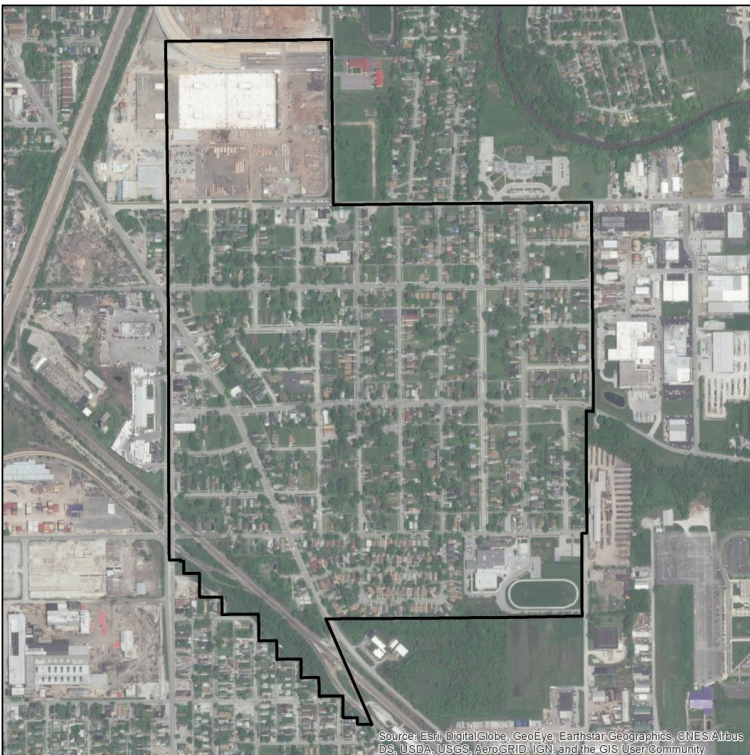
LIQUEFACTION SUSCEPTIBILITY



Data provided by the Illinois State Geological Survey and Cook County.

The Central United States Earthquake Consortium (CUSEC) State Geologists produced a regional Soil Site Class map (NEHRP Soil Profile Type Map), a Liquefaction Susceptibility Map and a Soil Response Map for the 8 states to be used in the FEMA New Madrid Catastrophic Planning Initiative Phase II work. The USGS Geologic Investigation Series I-2789 Map of Surficial Deposits and Materials in the Eastern and Central United States (East of 102 degrees West Longitude) by David S. Fullerton, Charles A. Bada and Jean N. Pennell (2003) was the base map used for this work. Each State Geological Survey produced its own state map version of the Soil Site Class and Liquefaction Susceptibility maps. The procedures outlined in the NEHRP provisions (Building Seismic Safety Council, 2004) and the 2003 International Building Codes (International Code Council, 2002) were followed to produce the soil site class maps. CUSEC State Geologists used the entire column of soils material down to bedrock and did not include any bedrock in the calculation of the average shear wave velocity for the column, since it is the soil column and the difference in shear wave velocity of the soils in comparison to the bedrock which influences much of the amplification.

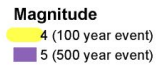
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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

VILLAGE OF PHOENIX

100- AND 500- YEAR TORNADO EVENTS



Historic tornado data provided by NOAA/NWS showing the initial points and paths of all F4 and F5 events observed from 1950 to 2017.

