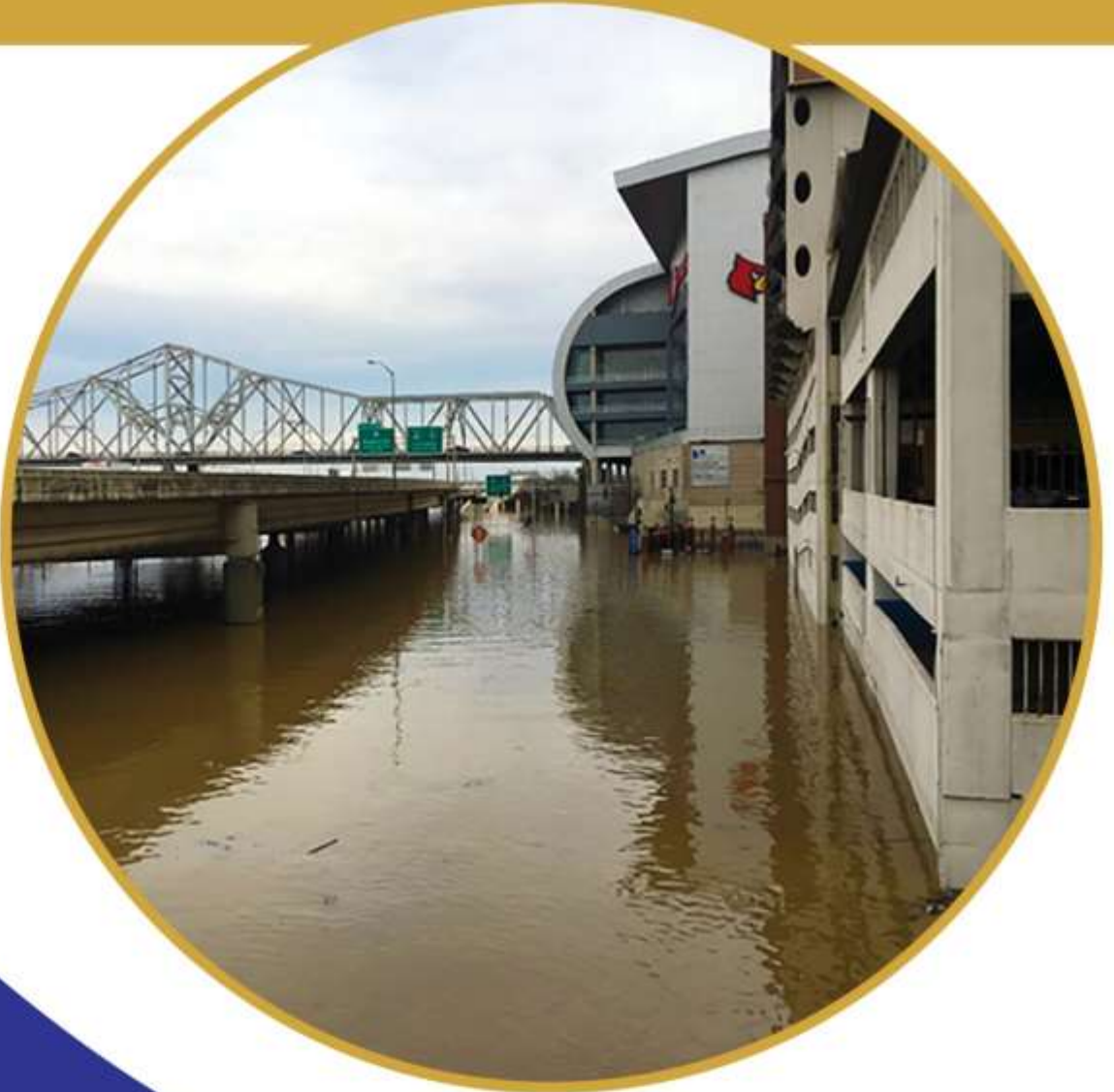


2022 Louisville Metro Hazard Mitigation Plan



**Update of 2016 Plan
Mitigation Strategies**



AECOM

ALL HAZARDS			
Action No.	Type of Activity or Project	Status	Notes/Comments
1.1	Develop risk assessment of publicly owned buildings, essential facilities, and transportation: <ol style="list-style-type: none"> 1. Review Evacuation Plans for Central downtown government Public Buildings. 2. Disseminate Safe Room locations. 3. Develop/Revise Emergency Action Plans (EAP), as needed 	Complete	Project was led by Facilities and OSHA. Evacuation plans have been updated. Emergency Actions Plans have been incorporated into building operations.
1.2	Develop risk assessment with best available building data. Collect additional enhanced building data: <ol style="list-style-type: none"> 1. Year built, especially structures older than 1980 2. Type of foundation, building construction type, number of stories 	Removed	Building data related to age of construction is maintained by PVA. However, no risk assessment has been completed based on building age. Collecting enhanced data is not planned.
1.3	Historical Structures Survey coordinated by Metro PDS, PVA, and LOJIC: <ol style="list-style-type: none"> 1. Inventory of public buildings review data for accuracy and completeness 	Remove	LOJIC role is to store and share data and factoring it into models and maps for future actions. Currently there is no inventory of historic structure in place. Data from partners is constantly being generated and warehoused in the LOJIC platform. There may be other databases at LLL agencies that have not yet been incorporated into LOJIC; however, there are no known plans to review historical structure data for accuracy and completeness.
1.4	Mitigate public transportation, public buildings and utility infrastructure: <ol style="list-style-type: none"> 1. Develop a strategy and program to retrofit structures at-risk from hazard events (wind loads, seismic shock, flooding, etc. utilizing results of the risk assessment. 	Remove	Major effort that did not receive funding. No longer a planned activity.
1.5	Prepare for special needs at-risk groups during disaster. Develop Special needs preparedness program: <ol style="list-style-type: none"> 1. Develop "Special needs registry" 2. Promote campaign to self-identify if special needs in household 3. Build a Special needs database to help plan for response activities and shelters and evacuation. Use www.disability.gov as resource 	Ongoing	Initial efforts completed with other agency support, specifically, Office of Sustainability. Carry over into 2022 Plan.
1.6	Data collection for hospital patient discharge data	Remove	Not completed due to budget concerns.

ALL HAZARDS			
Action No.	Type of Activity or Project	Status	Notes/Comments
	<p>Emergency Department patient discharge data for preparedness epidemiologist for six syndromes:</p> <ol style="list-style-type: none"> 1. Cardiac (chest pain), 2. G.I. (vomiting, diarrhea), 3. Neurological (seizures, paralysis), 4. Respiratory (difficulty breathing, symptoms of asthma), 5. Psych (mental status change, emotional instability) and 6. Other: Infectious Disease <p>Will require purchase of telecomm/software to facilitate sharing of hospital data to MPH</p>		
1.7	<p>Health Impact Assessment “tool” to develop projects:</p> <ol style="list-style-type: none"> 1. For evaluation of proposed development projects in connection with the potential ramifications to the health and wellness of stakeholders. 	Ongoing	Efforts being led by Center for Health Equity within Health and Wellness. Health impact assessment reports are produced regularly. Carry over into 2022 Plan.
1.8	<p>Community health education “clearinghouse:”</p> <ol style="list-style-type: none"> 1. Promotion potentially partnering with others to serve as a “clearinghouse” 2. Will help people find proper resources for such things as health screenings, existing education or outreach programs, etc. 3. Public Health currently working to develop a list of resources. Developing strategy to better promote a coordinated service. 	Ongoing	Community Health Equity also leading this effort. Carry over into 2022 Plan.
1.9	<p>Increase training for WebEOC:</p> <ol style="list-style-type: none"> 1. Increase training for more people to use Web EOC. 2. Set a schedule 3. Develop list of potential candidates. 	Ongoing	Louisville Metro uses the State WebEOC license and provides “just-in-time” training to stakeholders as they need access to the platform. Carry over into 2022 Plan.
1.10	<p>Develop inventory of barricades and signage that can be used during hazard events and develop system for deployment.</p>	Complete	A complete inventory has been conducted. LLL police also have emergency supply contracts for various barricades with local businesses.
1.11	<p>Install emergency generators in JCPS facilities:</p> <ol style="list-style-type: none"> 1. Acquire emergency generators to completely supply electrical power for all shelters both for the school system and the community. 	Ongoing	Generators have been installed in Jefferson County schools; however, some City of Louisville schools still are waiting for their units. Generators are typically added as part of major HVAC projects. Approximately 75% of all LLL schools have generators. Generator

ALL HAZARDS			
Action No.	Type of Activity or Project	Status	Notes/Comments
	2. Begin project by prioritizing facilities to receive generators.		testing and assessments are done as needed; however, there is no formal program. Carry over into 2022 Plan.
1.12	Oxygen generators in ambulances for EMS: 1. Generators for EMS to charge life-saving equipment, e.g., oxygen	Complete	Covered under a grant funded generator program.
1.13	Emergency preparedness training for public schools: 1. Provide funding for professional development for administrators for Mitigation, Preparedness, Response and Recovery through JCPS' Safety Procedures Manual training. 2. Additional FEMA Introduction to Incident Command for Schools course would also be administered. 3. Promote self-preparedness. 4. Partner w/ KyEM for instructors and materials	Complete	Schools administrators go through online safety and compliance training that helps them plan for and respond to disasters. Incident Command System (ICS) 100 training is provided to administrators as well. Training is updated annually to reflect changes in best practices. Cabinet level members also get COOP training. Schools operate under a National Incident management System (NIMS) protocol to include dedicated incident management teams. Finally, within the school system, a dedicated incident command channel has been reserved within the larger LLL radio system.
1.14	Emergency communication for public school buses during disaster: 1. To enhance communication systems through 2-way radio system compatible with MetroSafe including radios for buses.	Complete	Upgraded radio capabilities for buses. There are 15 bus compounds and there are 15 separate bus channels. Capability now exists to communicate directly to each bus. This was District funded. Drivers also have personal cell phones that can serve as backup communications.
1.15	Emergency supply kits for public schools: 1. Basic emergency supply kit for schools and medical/medicine storage – to have minimal storage for medicines and records for school.	Ongoing	It is each schools responsibility to store secure and maintain their own emergency kits. Recommendations are provided, but it is up to each principal to get what they believe is needed. Carry over into 2022 Plan
1.16	During emergency hazard event response: 1. Portable water purification systems	Complete	Responsibility for securing potable water after a disaster has transferred from Health and Wellness to ES. ES works directly with KyEM to secure potable water. If an emergency required water, it would ultimately come through ES and KyEM.
1.17	Community Hazard Assessment and Mitigation Planning System (CHAMPS) implementation and training for Louisville Metro emergency management staff.	Ongoing	LLL ES staff have been trained on CHAMPS use. Louisville Metro has not taken active engagement in platform. As program matures, it may be brought back to life. Carry over into 2022 Plan

ALL HAZARDS			
Action No.	Type of Activity or Project	Status	Notes/Comments
1.18	Increase business partnerships and the creation of COOP planning.	Complete	LLL COOP plan was developed and delivered in 2018.
1.19	Public education and standard public statements for all hazards: <ol style="list-style-type: none"> 1. Promote use of early warning systems in multiple languages for standard outreach materials 2. Utilize recording by MetroCall 311 to disseminate brief information on hazards. 3. Use Greater Louisville TV (GLTV) for awareness messages. 4. Utilize News media for public education and event notification 5. Promote better personal planning/public education for disaster preparedness 6. Utilize LEPC "Fact Sheets" for educational and public outreach to ensure consistent message for ARC, Health Dept., EMA, LG&E, Dept. of Education, 7. Partner with known disability advocacy organizations to target preparedness messages and threat alerts to vulnerable populations (hearing impaired, visually impaired, homeless, linguistically isolated, etc..) 	Ongoing	<p>Public education and outreach are pillars of the LLL ES department. LLL ES will continue to work with partners such as the National Weather Service, where notification capabilities have increased with automatic alert technologies.</p> <p>ES also completed walkthroughs on request for public facilities. Public information and community engagement is handled through 311. New platforms include posting on 311 page related to preparedness.</p> <p>Moving forward, ES and various partners continue to believe that public education and outreach are important aspects of hazard mitigation activities. Fully integrated IPAWS is one example of continuous improvement. Carry over into 2022 Plan</p>
1.20	Increase registration for LENS/CodeRed	Ongoing	<p>LENS/Code Red has been replaced by Rave Mobile Safety for automatic signups. ES and other agencies go to public events to promote sign-up. Also use smart 911 and app to push out notifications.</p> <p>ES and the NWS will continue efforts to sign up and activate LLL residents.</p>
1.21	Utilize JCPS weather stations being installed on 15-20 schools as part of University of Louisville study on urban heat island to get real-time data, including temp, dew point, precipitation, winds, and barometric pressure.	Ongoing	University of Louisville is in the process of completing a study on Urban Heat Aspects. Advanced Planning also published a recent study on heat management. NWS is the main source of data for these reports and works with MSD on rain gauge monitoring.
1.22	Re-establish bi-annual hazard mitigation stakeholders and implementers, update funding and progress, coordinate with Silver Jackets.	Ongoing	Multiple meetings focused on mitigation between ES and MSD. This is an ongoing process. Meeting cadence typically increases in both pre-and post-

ALL HAZARDS			
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			disaster environments. MSD regularly interfaces with the Silver Jackets.
1.23	Botanica, Waterfront Botanical Garden - 23 acre water retention project including utilizing runoff for irrigation. Educational component includes air, water, and waste sustainability projects. Projects sits on river, Beargrass Creek, and is an old city landfill. Site will be planted with trees - lots of trees.	Remove	Project has not been initiated. Replaced by larger mitigation effort discussed in Flood section.
1.24	Vulnerability assessment web application and training. Develop web application (ARCGIS Online) for vulnerability assessment maps and provide training for public agencies in how to use the maps for their programs and projects	Complete	ES produced an Interactive Vulnerability Map. Training was shelved due to Covid. Also completed RWAP Office of Infrastructure Protection (not public).

FLOOD			
Action No	Type of Activity or Project	Status	Comments
2.1	Update Floodplain Ordinance: 1. Create Floodplain Ordinance Workgroup to review existing ordinance and propose changes to improve safety and resiliency, as well as improve ordinance administration.	Ongoing	Created Floodplain Ordinance Workgroup to review existing ordinance and propose changes to improve safety and resiliency, as well as improve ordinance administration. Revised Floodplain Ordinance was adopted 8/25/2017. Ordinance will be updated as needed in future. Carry over into 2022 Plan
2.2	Flood studies for mitigation: Update flood models in areas with known flooding issues and problematic modeling, including the 10-year flood interval, including: 1. Greasy Ditch 2. Buechel Branch 3. Brooklawn Tributary	Ongoing	Greasy Ditch Phase 1 completed in 2017, Phase 2 completed in 2018, Phase 3 (Snider Branch LOMR) submitted to FEMA and under review Buechel Branch completed with 50/50 funding with USACE in 2019. Carry over to 2022 Plan.
2.3	Mitigation: project to protect existing buildings and infrastructure: Target at-risk public and private buildings from flood for mitigation/retrofit 1. Inventory public buildings at-risk (also, see All Hazards # 4 & 5) 2. Develop a plan for mitigation for public property. 3. Develop a plan for mitigation for private property.	Complete	Completed a three step process: 1. Inventory public buildings at-risk 2. Developed a plan for mitigation for public property. 3. Develop a plan Inventory of government buildings has been completed."
2.4	Future floodplain buyouts throughout the county: 1. Identify repetitive loss, severe repetitive loss candidates, and other floodprone properties 2. Prepare grant applications as funds become available	Ongoing	MSD continues to work on existing buyouts, including buyouts that were approved in 2021. Nine additional buyouts are under review by FEMA. MSD continues to identify repetitive loss, severe repetitive loss candidates, and other Floodprone properties for acquisition and prepare grant applications as funds become available.
2.5	Acquisitions in Western Louisville CSSA Area. Continue acquisition projects approved by FEMA in Maple Street, Belquin, Algonquin, Wewoka West Park, and Linwood areas. Continue to look for additional potential areas, if needed and if funds become available.	Ongoing	MSD continues to work on existing buyouts. Carry over to 2022 Plan.
2.6	Place flood elevation markers or other signage along floodprone roads and parking areas. Focus on roads that are frequently overtopped to demonstrate to drivers/pedestrians how deep the water is:	Ongoing	Metro Public Works has placed signs at 34 railroad viaduct locations which have historically flooded during rain events. MSD is working toward permits to allow the installation of level devices in viaduct stations to allow MSD to work

FLOOD			
Action No	Type of Activity or Project	Status	Comments
	<ol style="list-style-type: none"> 1. Complete an inventory of current sign locations 2. Develop strategy for other at-risk areas 3. Post signs 		with Public Works for notification of high water. MSD has completed an inventory of current sign locations and is developing a strategy for other at-risk areas prior to postings. Carry of to 2022 Plan.
2.7	Review and update flood related emergency preparedness and response plans Review and update flood plans including evacuation of at-risk populations including seniors and disabled: <ol style="list-style-type: none"> 1. Complete an inventory 2. Review Plans 3. Update Plans 	Ongoing	Working with health facilities and long term care facilities on preparedness and response plans. Many are complete but some are still outstanding. Carry over to 2022 Plan. .
2.8	LaCleda Basin – Proposed flood control basin located near end of W. Indian Trail and Greasy Ditch	Remove	Ongoing process covered under Action 2.19.
2.9	Tin Dor Way Basin - proposed flood control basin in Fairdale near Tin Dor Way If flood control basin is not feasible, then develop strategy for possible buyouts	Remove	Ongoing process covered under Action 2.19.
2.10	Flood Pump Stations <ol style="list-style-type: none"> 1. Rehab, replace and update flood pump stations 2. Inventory and verify emergency generators and backup. Apply for grants where needed. 	Ongoing	MSD continually looks to inspect, rehab, replace and update flood pump stations as needed. MSD also conducts annual inventories and verifies emergency generators and backup power systems for operational readiness. Pump stations with major pump repairs or rehabilitation are either repaired via long-term capital improvement funds, or through emergency work orders. Carry over to 2022 Plan.
2.11	Metro Parks reviewing its buildings for flood damage mitigation <ol style="list-style-type: none"> 1. Reviewing backflow prevention devices, floor drains, sump pumps, gutters and downspouts, and sheet runoff diversion. Develop inventory. 2. Mitigation projects identified in this review will be placed on repair schedule 3. Accomplished as funds permit over the next five years. 	Complete	Project completed with available funding. Additional actions will always be addressed as needed.

FLOOD			
Action No	Type of Activity or Project	Status	Comments
2.12	<p>Establish and coordinate tree programs and partnerships to increase tree canopy, parkway areas.</p> <p>Metro Parks and MSD are expanding the tree canopy in the metropolitan area as part of the plant 10,000 trees campaign.</p> <ol style="list-style-type: none"> 1. Metro Parks will continue over the next five years to replace trees along parkways and in landscaped park areas as needed to retain tree canopy cover in the metropolitan area. 	Ongoing	Metro Parks and MSD are expanding the tree canopy in the metropolitan area as part of the plant 10,000 trees campaign. Metro Parks will continue over the next five years to replace trees along parkways and in landscaped park areas as needed to retain tree canopy cover in the metropolitan area. Metro Parks and MSD both plan to continue planting trees, including 2,000 trees from Metro Parks Urban Forestry and 1,000 trees from MSD each year. Carry over to 2022 Plan.
2.13	<p>Public outreach about basement flooding:</p> <ol style="list-style-type: none"> 1. Education of the public from keeping critical items out of basements – computers, books, important files etc... 2. Target the audience on regulatory floodplain or MSD customer service requests rather than just the FEMA floodplains 	Ongoing	Annual letters sent in December 2021. Other advertising continues on a regular basis. Education of the public from keeping critical items out of basements (computers, books, important files etc.), is a constant process. Carry over to 2022 Plan.
2.14	<p>Public outreach: evaluate ways to get message to a targeted audience.</p> <p>Message is to better educate the public regarding floodprone areas including flood insurance and plumbing modification programs</p>	Ongoing	MSD produces an annual Program for Public Information plan that includes information about outreach efforts being made in Louisville Metro related to flood and water quality topics. These efforts continue year-after-year. Carry over to 2022 Plan.
2.16	<p>Increase coordination of flood warning using NWS chat rooms.</p> <p>NWS Chat Rooms are set up to coordinate with staff in an official capacity. Several chat rooms exist, and NWS can set up additional ones if needed. Chat Rooms already include USGS, Corp, media, & EMS and can be made available to other agencies.</p>	Ongoing	<p>NWS Chat rooms are used primarily with media partners (mainly TV stations). NWS also uses twitter and auto generated retweets.</p> <p>As flood issues arise, comments are made in the chat rooms that are monitored by NWS. The amount of chat increases significantly as severe weather events arise. Carry over to 2022 Plan.</p>
2.17	Construct additional rain gages and stream gages on un-gaged streams to be used for warning, forecast flooding.	Complete	Existing rain gauges are being maintained by MSD. Additional gauge installations are not needed at this time.
2.18	<p>Elevation of floodprone properties along the Ohio River:</p> <ol style="list-style-type: none"> 1. Phase 1 - Determine if elevation is feasible and cost effective for existing floodprone homes. 2. Phase 2 - If feasible, elevate homes to at least one foot above the local regulatory floodplain elevation 	Ongoing	Elevation is not a focus at this time; however, can remain a strategy as things may change in the future. Carry over to 2022 Plan.

FLOOD			
Action No	Type of Activity or Project	Status	Comments
2.19	Drainage improvement projects to reduce structural flooding, such as upsizing culverts, constructing detention basins, and widening channels: 1. Phase 1 - Complete studies for areas with structural flooding concerns 2. Phase 2 - Construct cost effective projects determined to be feasible in studies	Ongoing	Phase 1 was completed in 2017 as studies for areas with structural flooding concerns were completed. The second phase (to construct cost effective projects determined to be feasible in studies) is currently on hold. Carry over to 2022 Plan
2.20	Beargrass Creek Stream Restoration and Beargrass Creek Greenway. Flood Risk Reduction through stream restoration and ecosystem services.	Complete	Major capital improvement project completed in 2020.

DAM AND LEVEE FAILURE			
Action No.	Type of Activity or Project	Status	Comment
3.1	<p>Risk Assessment: develop a dam & levee risk assessment with best available data.</p> <p>Phase 1: Verify GIS locations for existing dams. Develop data inventory of all dams within Louisville Metro area. Steps:</p> <ol style="list-style-type: none"> 1. Collect data from KDOW for locations and assessment of the State-Owned dams. 2. Perform research in the State Dam Safety Program records, which requires an "Open Records" request to the KDOW. 3. Research records and locations of dams within metro boundaries. 4. From research, collect other important data, e.g. current EOPs, dam materials, past inspections, violations, etc. 5. Collect inventory of dam locations and geo-code. 6. Verify which Class C dams have an EOP. <p>* FEMA grant submitted in 2016 by Metro</p>	Ongoing	USACE has completed their Semi-Quantitative Risk Assessment(SQRA) on MSD flood protection system/levees. Additional actions are planned.
3.2	<p>Risk Assessment: develop a dam & levee risk assessment with best available data.</p> <p>Phase 2: Perform Risk Assessments on Class B and C Dams, Class C High-Hazard Dams:</p> <ol style="list-style-type: none"> 1. Verify all Class C dams have and maintain an EOP (tied to above action item results). 2. Verify downstream warning system, public notice, etc. are included in EOP. <p>Class B, Moderate/Significant Risk Dams:</p> <ol style="list-style-type: none"> 1. Assess Class B dams for any downstream construction that might raise dam classification 	Ongoing	<p>A new template has been developed for dam EOPs. EOP's for all high-hazard dams are now in place and MSD is responsible for completion on those owned by the agency. Additional items have not been completed</p> <p>Projects for installing level sensors on MSD-owned high hazard dams and the Willowbrook flood protection area are in progress. These should provide real-time warning through MSD's SCADA system of any sudden change in water elevations.</p>
3.3	<p>Mitigation: develop EOP for Class C dams:</p> <ol style="list-style-type: none"> 1. Develop EOPs for dams without plans 2. Update existing EOPs 3. Add NWS notification for alerts via weather radios 	Complete	EOPs were developed for MSD-owned dams. Private dams are not addressed. Remaining items are on hold.
3.4	<p>Mitigation: post a sign/landmark on dams with classification type (A, B, or C).</p> <p>Signs to include:</p> <ol style="list-style-type: none"> 1. Contact numbers 2. Name of dam 3. Maximum water impoundment <p>* Project dependent upon dam inventory (Phase 1)</p>	Complete	<p>MSD dams are now identified by:</p> <ol style="list-style-type: none"> 1. Contact numbers 2. Name of dam 3. Maximum water impoundment <p>Many dams are privately owned and therefore cannot be forced to place signs on their property</p>

DAM AND LEVEE FAILURE			
Action No.	Type of Activity or Project	Status	Comment
3.5	Mitigation: removal or replace unsafe dams. Once inspections are complete, the list of unsafe dams will determine next steps for repair and/or removal of dams. An unsafe dam would move to a Priority A project for immediate action. <i>* Project dependent upon dam inventory and assessment (Phases 1 & 2)</i>	Ongoing	As dams are determined to be unsafe during annual inspections, they are addressed through emergency or planned actions. An unsafe dam would move to an immediate action priority. Dam inspections will continue as scheduled. Focus is primarily on the Ohio River Flood Protection System and large pump stations (i.e. Beargrass Creek). USACE annual inspections are also ongoing and their five-year inspections are more detailed. MSD participates with USACE inspections. Carry over to 2022 Plan
3.6	Risk assessment and mitigation: 1. Place a benchmark or similar point on dams to determine if movement is occurring. 2. Benchmark placement should coincide with inspection and data development.	Remove	For public-owned dams, this is not being done.
3.7	Consider requiring EOPs for Class B dams: 1. Class B dams have at-risk structures below the levee, therefore should require an emergency plan. 2. Partner with KY DOW Dam Safety Program for requirements and regulations	Remove	Requires regulatory action. This has not occurred.
3.8	Mitigation: evaluate damage to levee and flood protection system: Primarily Ohio River Flood Protection System and large pump stations (i.e. Beargrass Creek). Corps annual inspection is ongoing. Five-year inspection is more detailed	Ongoing	MSD and USACE are continuously monitoring flood protection systems for damage and structural integrity. Formal inspections take place annually and more intense inspections take place every five years. These are regulatory driven. Carry over to 2022 Plan
3.9	Mitigation: develop better local dam construction and inspections criteria. In order of the following: 1. Develop inspection and construction criteria to review existing dams 2. Begin periodic dam Inspection to develop reports. Metro Parks has a plan in place and performs regular inspections.	Ongoing	Dam construction is a highly regulated activity. Construction regulations are maintained at the state level and are reviewed on an as needed basis. Carry over to 2022 Plan.
3.10	Metro Parks remedial work on their dams. Remedial work needs to be completed on some dams: 1. Maintenance and inspection needed 2. Coordinate with MSD	Ongoing	Metro Parks has authority to inspect and repair dams under their control. This is done through contracted maintenance agreements.
3.11	Increase public awareness:	Ongoing	Public outreach activities are ongoing. Carry over to 2022 Plan

DAM AND LEVEE FAILURE			
Action No.	Type of Activity or Project	Status	Comment
	Signage of the flood protection system history and assets, indicate allowed/prohibited activities		
3.12	Inspect and assess ash ponds to ensure they are safe.	Complete	Ash Ponds have been removed
3.13	Install 24-hour high hazard dam monitoring and warning system for those in inundation areas.	Ongoing	MSD is moving forward with design and construction of level sensors/monitoring equipment on High Hazard dams under their control. Carry over to 2022 Plan
3.14	Conduct catastrophic flood/levee failure planning study.	Complete	This project was completed under the Regional Resiliency Assessment Program (R-RAP) by DHS and through the intermediate breach study by the USACE under the Flood Plain Management Assistance Program (Phase I). FEMA's evacuation consultant is currently developing a concept of operations plan (Phase II). Once this plan has been reviewed and approved the actual evacuation plan will be developed. FEMA requested a standard form 424 relating to the grant award under DR-4428. The award of the grant is expected soon. This will allow the contracting of a consultant to bring all the parts that have been developed together, write the actual plan, exercise it and finalize it.

METEOROLOGIC			
Action No.	Type of Activity or Project	Status	Comments
4.1	Find location and build tornado shelters/safe rooms for Minors Lane neighborhood <ol style="list-style-type: none"> 1. Tornado shelter/safe room for Minors Lane Neighborhood property. Minors Lane school is being opened for the community during severe storm warnings for 2 manufactured home parks. A separate 24-hour available independent shelter is desperately needed. This would give immediate access to the community. 2. Research location at manufactured home parks, JCPS, and/or UPS property 	Ongoing	Metro ES review facilities as requested; however, Covid made visiting locations difficult. Minors Lane is just part of larger program. The researching of safe rooms is a continual process that will continue into the future. Carry over to 2022 Plan
4.2	Promote safe rooms/tornado shelter for new construction <ol style="list-style-type: none"> 1. Encourage new construction to include a safe room. Tax incentive for property tax for constructing tornado safety room in house 2. Require all new manufactured home parks to build a safe room. Tornado Shelters for manufactured homes. 3. ARC work with the BIA to build safe rooms. 	Ongoing	Nothing has moved on this. This is a big ask and requires regulatory changes to building codes. Carry over to 2022 Plan
4.3	Increase awareness of outages during an event <ol style="list-style-type: none"> 1. Outbound calls from LG&E re: outages 2. Mapping on websites 	Complete	An LG&E outage map is updated in near real-time to reflect the most up-to-date information available on outages in your area, including estimated restoration time and the cause of an outage, if known.
4.4	Promote & distribute weather radios	Ongoing	NWS constantly establishing partnerships with media and retail establishments. Took break with covid but getting back out again. This is a major initiative for NWS and will be carried over to 2022 plan.
4.5	Public outreach on retrofitting, mitigation, education and wind-driven building techniques <ol style="list-style-type: none"> 1. Develop standardized message and program for how to make a home wind resistant 2. Partner with KY Weather Preparedness Committee (KWPC) that applied for a grant to buy FLASH (Federal Alliance for Safe Homes) cards 	Ongoing	KWPC meetings still take place. Unknown on progress. Metro ES has major focus on outreach, therefore this project should be included in the 2022 Plan.

METEOROLOGIC			
Action No.	Type of Activity or Project	Status	Comments
4.6	<p>Expand snow routes outreach</p> <p>LOJIC maps showing snow routes (live routes) should be more accessible/better advertised e.g., radio and media links, Metro TV.</p> <ol style="list-style-type: none">1. Outreach to public/ advertise, maybe use Mayor's Media office.2. Show GPS, real-time Expand Operation Snow & Transportation planning3. Staggered release plan to ease traffic before snow storms, esp. downtown	Ongoing	<p>Ongoing process. This capability has come a long way since 2014. Outreach related to storms and events can now be found at https://www.lojic.org/snow-map</p> <p>Public works provides info and LOJIC maps are used for public info. Social media also is being used to promote maps. Although this activity is up and running, it is constantly being improved. Carry over to 2022 Plan.</p>

GEOLOGIC			
Action No.	Type of Activity or Project	Status	Comments
5.1	Public outreach strategy to specific geologic hazard areas: 1. Develop standard outreach for areas at-risk according to risk assessment 2. Disseminate to targeted areas and to partner website, media, Metro Council districts ...	Ongoing	Various outreach activities are being implemented to educate the public about geologic hazards. Mainly these actions are being carried out by KGS. These actions will continue and even increase as Covid concerns abate. Carry over to 2022 Plan
5.2	Develop an Earthquake Risk Assessment with best available building data. Collect All Enhanced Building Data. A major research project: 1. Year built, especially structures older than 1980 2. Type of foundation, building construction type, number of stories * tied to All Hazards public building inventory project.	Ongoing	Not completed based on year built. PVA is the best source for this information. Data on "year built" is tough, as data is incomplete. This is a project that might be useful in future years and should be carried over to 2022 Plan.
5.3	Earthquake risk assessment: research the existing collected data and incorporate inventory into LOGIC. PDS completed collecting public historical data. Next steps: 1. Historical Structures Survey. 2. Inventory of public buildings: review data for accuracy and completeness. 3. Incorporate data into LOJIC Metro Planning Design Services (PDS) and Property Valuation Administration (PVA) will work with LOJIC to coordinate the inventory.	Remove	This has not been initiated.
5.4	Earthquake mitigation: target critical and essential public buildings for mitigation or retrofit:* 1. Develop a standard method for structural soundness and asset tie-downs (i.e. heavy bookcases, equipment). Utilize proven success strategy and methods from JCPS 2. Will require evaluation of each public building <i>*Dependent on completion of inventory and assessment. See All Hazards #1, 2, & 5.</i>	Remove	This has not been initiated
5.5	Earthquake education and outreach to schools: 1. Education in schools: K- 12 / colleges / universities 2. Emphasize take the information home	Ongoing	The JCPS system participates in annual Great ShakeOut events. Take links and include in email to principals for communication to student families. Training is done on request. This

GEOLOGIC			
Action No.	Type of Activity or Project	Status	Comments
	3. Use National Earth Science Education Standard for kindergarten - 12 http://www.uky.edu/KGS/education/edustand.htm 4. Utilize JCPS & KY EQ drill as standard.		activity will continue into the coming years. Carry over to 2022 Plan.
5.6	Karst/sinkhole risk assessment. Data collection to inventory sinkholes 1. Dye tracing by KDOW to detect sinkholes. Partner with KGS. 2. Will require coordination and meetings with KGS, KDOW, and MSD to determine next steps and to build a schedule	Ongoing	Actions 5.6, 5.7, and 5.8 are all related and have been initiated by KGS for locations throughout Kentucky. This is being done by "District" and the KIPDA District has not yet been mapped. However, KGS is operating a reporting website that is collecting data needed to effectively map occurrences. Carry over to 2022 Plan
5.7	Karst/Sinkhole risk assessment. Data collection to inventory sinkholes. Using high-resolution aerial imagery and geophysics to assess high-hazard areas for incipient cover collapse sinkholes. 1. Develop strategy to phase project or as one larger project to accommodate funds and time. Could be a Phased 1 to 4 yr project. LOJIC to be recipient of the resulting digital data, and a central repository for the report	Ongoing	See Action 5.6
5.8	Karst/Sinkhole Risk Assessment. Project to collect standardized info to protect existing, new and future buildings and infrastructure: 1. Need a central local agency or avenue to report and receive info for karst/sinkhole locations indicated on development plans per new karst regulations. 2. Need a central local agency or avenue to report and receive info for karst/sinkhole damages and events 3. Develop SOP or Policy Development 4. Store loss inventory, esp. for roads, buildings and utilities	Ongoing	See Action 5.6
5.9	Karst/sinkhole public outreach/education/warning: 1. Develop strategy for outreach/warning 2. Post warnings and barriers be posted around sinkholes on public lands 3. Develop Signage	Ongoing	KGS is partnering with numerous agencies to initiate outreach and public education activities. This includes conducting various educational days. Carry over to 2022 Plan

GEOLOGIC			
Action No.	Type of Activity or Project	Status	Comments
5.10	Certification process for regulations in development code for karst/sinkhole: 1. Training Program, as needed	Remove	Not being considered.
5.11	Karst/sinkhole mitigation: repairs to public lands and facilities: 1. Parks 2. Government owned	Remove	Repairs are done on an as needed basis. This cannot be scoped or planned.
5.12	Landslide risk assessment. Project to collect info to protect existing, new and future buildings/infrastructure from landslides: 1. KGS can be a central local agency or avenue to report and receive info for landslide, including damages and events. 2. Develop method to partner and receive info Research what has been looked at in the past. LiDAR will assist with this element.	Ongoing	This is a long-term effort. Currently KGS has completed a landslide survey for five counties within the state. Jefferson County has not yet been included; however, as funding becomes available, additional counties will be assessed. Carry over to 2022 Plan.
5.13	Landslide mitigation: Regulations Project to enforce current regulations and protect infrastructure: 1. Enforce Binding Elements 2. Limit clearing of vegetation on high-risk slopes 3. Ensure BMPs for drainage	Ongoing	KGS was listed as the lead agency; however, they are not tasked with enforcement powers. That said, they do generate various mitigation strategies associated with landslides to protect infrastructure. These strategies are typically not “local” and can apply to various locations throughout the state.
5.14	Landslide mitigation: reforestation Project to repairs and reforestation to public lands and facilities: 1. 10,000 tree initiative Repairs to: 1. Parks 2. Government owned	Remove	Addressed under Actions 2.12 and 6.11.

OTHER HAZARDS			
Action No.	Type of Activity or Project	Status	Comments
6.1	Promote public education for hazmat activities and sheltering in place: 1.Promote sheltering-in-place 2.Promote education of hazmat activities 3.Utilize print, Metro-TV, and other media.	Ongoing	Prior to Covid, hazmat outreach activities were common. Various agency representatives attended public events and promoted hazmat best practices. As Covid restrictions are being relaxed, public engagement and speaking are being done on request. During hazmat incidents, the responding fire department has Incident Command on releases and their PIO is the first to brief the population. During larger events, other agency PIOs become involved as part of the Unified Command. Carry over to 2022 Plan
6.2	Develop HazMat Public Education/Awareness/Training for business community: 1.Encourage companies with chemicals to consider the effects of natural hazards on their stock of hazardous materials and negative impact on employees and/or public.	Ongoing	The LLL hazmat ordinance has been passed and there are excellent capabilities between Police, Health, MSD, Fire, ES and Air Pollution Control District. All work together to promote hazmat transport, use, storage and releases and all have their own outreach and public education programs. Carry over to 2022 Plan
6.3	HazMat outreach to individuals and Small Businesses. Promote Spill Plans to individuals and small businesses that have hazmat, but aren't required by law to have a spill plan. Outreach to: 1.Encourage storing materials in a safe manner above flood potential or anchoring tanks etc. 2.Make available "industry best practices" for handling haz-mat. For small companies, KOSHAs education and training division could be a good resource.	Ongoing	Metro ES has partnered with KyEM on various initiatives. However, these are no longer active. Likely will return once additional funding becomes available. Carry over to 2022 Plan
6.4	HazMat Risk Assessment. Develop methodology and system for collecting and categorizing hazardous materials by location, type, quantity, and potential consequences. Data to be managed by Metro EMA and continually updated for inclusion in hazard mitigation plan risk assessment and emergency planning.	Ongoing	Metro EMA staff continue to work with LLL hazmat handlers to report spill and release activities and provide information on use, storage and transport. APCD partially funds Metro ES staff to review emergency plans. Carry over to 2022 Plan.
6.5	Develop method for collecting drought data: 1.Information on historic data 2.Estimates for losses 3.Dates of occurrences	Ongoing	NWS working with Drought Early Warning System (DEWS). NWS regularly puts out bulletins on potential droughts as they come up. Carry over to 2022 Plan

OTHER HAZARDS			
Action No.	Type of Activity or Project	Status	Comments
6.6	Drought mitigation: drought damage and outreach/education. When drought occurs, outreach and education to keep the public informed should include: 1.Foundation cracking outreach: Promote public awareness, soil shrinkage can lead to cracking in foundations – solutions are to water the lawn and the foundation 2.Drought leads to fire hazards, including wildfire	Remove	Other drought programs took precedent over this activity.
6.7	Extreme heat public outreach & education. Coordinate with non-traditional agencies for community outreach.	Ongoing	NWS sends out email blasts to partners to warn of future extreme heat and cold events. There is a move to get wind chill values raised which is a mitigation strategy for 2022. NWS does not pull any triggers for opening shelters. Just provides email blasts on hourly basis so decisions can be made. Carry over to 2022 Plan.
6.8	Extreme heat public outreach and education promoting National NWS campaign: 1.Propose Louisville be a test bed to promote child heat safety in vehicles. 2.Advisory Committee promote via partnerships.	Ongoing	Various public outreach efforts are underway. This is a long-term strategy. Carry over to 2022 Plan
6.9	Extreme heat public outreach and education: 1.Animals and sheltering during a disaster. 2.Develop ideas for public service piece on MetroTV and other media outlets.	Ongoing	NWS just completed a Pediatric Vehicle Heatstroke study and is in the process of socializing with various LLL partners. Animal strategies are in development. Carry over to 2022 Plan.
6.10	Extreme heat mitigation: Policies Louisville Metro region adopt policies incentivizing or requiring minimum albedo levels at the time of routine roof, street, and parking lot resurfacing and for all new development.	Ongoing	Louisville Metro's Office of Sustainability conducted comprehensive heat management assessment as one component of a broader effort to enhance livability, health, and sustainability in the Louisville Metro region. This report assessed the extent to which Louisville Metro is warming due to urban development and deforestation, estimate the extent to which rising temperatures are impacting public health, and present a series of neighborhood- based recommendations for moderating this pace of warming. Carry over to 2022 Plan
6.11	Extreme heat mitigation: Cooling Louisville Metro region set tree planting and green roofing goals by district, enhance tree cover through a public tree planting program,	Ongoing	In 2021, LLL produced its first Tree Canopy Report using the USDA Tree Canopy Assessment protocols. This report is helping LLL better understand

OTHER HAZARDS			
Action No.	Type of Activity or Project	Status	Comments
	and protect existing canopy through the adoption of a comprehensive tree protection ordinance.		its green infrastructure through tree canopy mapping and analytics. When integrated with other data, such as land use or demographic variables, this assessment can provide vital information to help LLL and its residents chart a cooler future. Carry over to 2022 Plan
6.12	Extreme heat mitigation: Energy Incentivize or require increased energy efficiency for both public and privately owned buildings.	Remove	This is being conducted at the federal level through the Bipartisan Infrastructure Law.
6.13	Extreme heat mitigation: Greening Cool materials and greening strategies be implemented in concert at the neighborhood level, and that energy efficiency programs be continued and expanded for the Louisville Metro region as a whole.	Ongoing	This is happening as part of an overall program to reduce ambient air temperatures. This includes tree canopy programs, ozone reduction regulations, and other cooling activities. This is an ongoing activities that will be carried over in 2022.
6.14	Wildfire public outreach & education: public awareness and outreach 1.Increase public awareness during drought about wildfire potential 2.Wildfire early warning (Red Flag) education and outreach 3.Increase public awareness and enforcement of no burn regulations 4.Develop standardized reporting system	Ongoing	Not a real depth of wildland firefighting equipment. Division of Forestry is likely going to be needed to address a large scale forest fire. Lots of access roads into forests so it's easier to combat when they occur. Timber stays moist. Not a lot of "long camps" There is a social media program to update residents of Red Flag days. Red flag days are no burn days. Forest fires are reported through National Fire Incident Report System.
6.15	Wildfire mitigation: cleanup of damaged trees: Partner with Metro Parks and Public Works	Remove	There has been no movement on this activity
6.16	Wildfire Mitigation: acquisitions: Acquire and deed restrict forested land (E.g. Jefferson Memorial Forest, greenways, and parks)	Remove	There have been no acquisitions related specifically to fire related mitigation.
6.17	Wildfire mitigation: fire suppression Project to develop strategies for fire suppression: 1.Target wildfire at-risk areas 2.Promote Best Management Practices (BMPs) 3.Delineation of non-wooded areas susceptible to wildfire	Ongoing	LLL has clearly defined high risk areas as it pertains to wildfires. The county has also implemented a requirement that firefighters attend a wildfire training class (150-hours) to obtain wildfire certification. This training incorporates best practices. County fire also has mutual aid agreements with other county departments to provide support as needed. Finally, the LLL area has local agreements with counties and

OTHER HAZARDS			
Action No.	Type of Activity or Project	Status	Comments
			cities. As new best practices or technologies become available, they will be incorporated into local planning. Because of this, this strategy will be carried over into the 2022 Plan.
6.18	Wildfire outreach: coordination Coordinate among emergency response groups about standard for reporting grass, wild fire, etc. Action to involve coordinated outreach among Fire Dept's, MetroSafe, and any other emergency response group as needed to increase awareness of the event tracking/reporting tools/processes currently used.	Complete	Location reporting is difficult for wildfires. Louisville and County Fire have access to a contractor for 24/7 drone support to pinpoint locations via GPS. Also have capabilities to Police Department air units thought mutual aid.). With this information, LLL can inform the public of fire status and locations to avoid.