

# Louisville Metro

## Natural Hazards Mitigation Plan



### 2006 PROGRESS REPORT

SEPTEMBER 2006

#### EXECUTIVE SUMMARY

The Disaster Mitigation Act of 2000 is intended to facilitate cooperation between state and local authorities as it encourages and rewards local, tribal, and state pre-disaster planning and promotes sustainability as a strategy for disaster resistance. This enhanced planning network better enables local and state governments to articulate their needs for mitigation, resulting in faster allocation of funding, and more effective risk reduction projects.

Under the leadership of the Louisville Metro Emergency Management Agency (EMA), Louisville/Jefferson County Metropolitan Sewer District (MSD), and the Louisville and Jefferson County Information Consortium (LOJIC), the Louisville Metro Natural Hazards Plan was adopted in May 2005. The Plan describes the method and schedule of monitoring, evaluating, and updating the Mitigation Plan within a five-year cycle. The full Louisville Metro Natural Hazards Mitigation Plan is available to the public on-line at <http://www.louisvilleky.gov/EMA/All+Hazards+Plan.htm>.

#### Natural Hazards Planning & the Disaster Mitigation Act of 2000 DMA 2000

Due to the Disaster Mitigation Act of 2000, local communities are required to address natural hazards in their community. The Act focuses on “pre-disaster mitigation” rather than “post-disaster responses” and requires a Natural Hazards Mitigation Plan to be submitted to FEMA and the State and be adopted by the local governing body.

To ensure commitment and consensus, Louisville Metro’s planning process continues to rely on stakeholder involvement and participation as the main source of guidance. During May 2004, an Advisory Committee began serving as stakeholders and partners in planning efforts to address the federal Disaster Mitigation Act of 2000. Over 30 members participate on the Advisory Committee and represent hazard-related agencies, government, businesses, neighborhoods, and citizens.

Due to Louisville’s climate, geology, and geographic setting, the Metro area is vulnerable to 12 natural hazards that threaten life and property. The Risk Matrix provides a qualitative assessment of the 12 natural hazards that could occur in Louisville Metro. Flooding consistently ranks as the number one natural hazard in the Metro area due to 11 major stream systems and approximately 790 stream miles. The elevation in Louisville Metro ranges from 383 to 902 feet above sea level and estimations show that 15% of the area is in the floodplain.

The Mitigation Action Plan responds to the risk assessment with projects and activities to mitigate the 12 hazards. The result of the Mitigation Action Plan is a proactive, community mitigation program to help local agencies, residents, and businesses to be better prepared to prevent and/or reduce losses from a hazard. Existing mitigation programs, such as the basement Backflow Prevention Program, USACE/MSD partnership for flood protection projects, and Project DRI are outlined in the Mitigation Strategy section of the Plan are on-going mitigation actions that are not detailed in the Action Plan.

The first annual Progress Report outlines the status of the five-year Action Plan and describes projects and activities undertaken by various agencies and organizations. The Action Plan recommends mitigation projects that can be integrated into job descriptions, comprehensive plans, capital improvement plans, zoning and building codes, and other planning tools. Included in the Action Plan are both an implementation timeline and the funding sources to implement the projects. Every project or activity in the Action Plan also lists a lead agency or personnel responsible for carrying out the actions, as well as proposed partners.

RISK MATRIX	
SEVERE RISK HAZARDS	Flooding Severe Thunderstorms
HIGH RISK HAZARDS	Hailstorm Tornado
MODERATE RISK HAZARDS	Earthquake Severe Winter Storms
LIMITED RISK HAZARDS	Dam Failure Extreme Heat Karst/Sinkhole Landslides Wildfire
LOW RISK HAZARDS	Drought

The Advisory Committee continues to meet on a quarterly basis. Since the Plan was adopted in 2005, the Advisory Committee has met four times and heard updates on projects such as the Map Modernization program, the Floodplain Ordinance, grant opportunities with Kentucky Emergency Management, and the flood hazard information portal.

In August 2005, after Hurricane Katrina hit the Gulf Coast, Advisory Committee members approached the local mitigation plan with new eyes and developed an overall goal to change the Action Plan. Consequently, the Advisory Committee met in subcommittees and revised the five-year Action Plan. The first effort was to simplify the prioritization of projects, which led to revising or merging actions and adding new projects. The revised Action Plan is streamlined and outlined in three separate Action Plans (Severe, High, and Moderate Hazard Risks).

A major focus of the Action Plan is to update the Risk Assessments for several hazards. During the Risk Assessment phase of developing the Plan, “best available data” was used for the Risk Assessments. However, better data and an enhanced inventory of structures and infrastructure will provide a more realistic determination of the vulnerability to the 12 hazards. Enhanced data ranges from locations, age, and structural characteristics of public buildings and dams and levees to detailed soils data and standardizing damage occurrence logs from local agencies.

2006 sample mitigation actions include:

- ▶ Target public buildings for mitigation regarding each relevant hazard
- ▶ Flood: Ensuring uniformity in maintaining repetitive loss information, enforcing floodplain regulations, and identifying candidates for acquisition/buyouts.
- ▶ Dam and Levee: Develop a dam and levee risk assessment to determine vulnerability of downstream development. Place benchmarks on dams to determine movement and for public outreach.
- ▶ Karst and Landslide: Propose regulations for karst and landslide areas in the Development Code.
- ▶ All Hazards: Develop training for Metro Council and government staff.
- ▶ Earthquake: Collect enhanced soils data for the downtown urban area to determine potential liquefaction.
- ▶ Wind/Storm Driven: Proposed regulations for hurricane clips in the state Kentucky Residential Code may be adopted by end of 2006. The Weather-Spotter program is enhanced and includes Jefferson County Public Schools bus drivers.

The revised five-year Action Plan is presented as the success story for the 2006 Progress Report. The progress report will be distributed to the media, hazard-related agencies, made available to the public, and posted on EMA and MSD websites.

## Frequently Used Natural Hazards Mitigation Acronyms

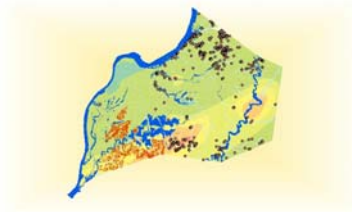
The following acronyms are commonly used throughout the Louisville Metro Natural Hazards Mitigation Plan and Five-Year Action Plan.

Partners in the Louisville Metro Natural Hazards Mitigation Plan's Advisory Committee are listed in bold (for a complete list of partners, see the 2006 Progress Report)

ARC	American Red Cross	KTC	Kentucky Transportation Cabinet
BFE	Base Flood Elevation	KYDOW	Kentucky Division of Water
CFR	Code of Federal Regulations	KYEM	Division of KY Emergency Management
CRS	Community Rating System program	KWPC	Kentucky Weather Preparedness Committee
CTP	Cooperative Technical Partners	LEPC	Local Emergency Preparedness Committee
DFIRM	Digital Flood Insurance Rate Map	L G & E	Louisville Gas and Electric
DMA	Disaster Mitigation Act of 2000	LOJIC	Louisville & Jefferson County Information Consortium
EMA	<b>Louisville Metro Emergency Management Agency</b>	LOPC	Louisville Olmstead Park Conservancy
EMS	<b>Louisville Metro Emergency Medical Service</b>	LWC	<b>Louisville Water Company</b>
EOC	Emergency Operations Center	IPL	<b>Louisville Metro Dept of Inspections, Permit, License</b>
EOP	Emergency Operations Plan	MSD	<b>Louisville &amp; Jefferson County Metropolitan Sewer District</b>
EPA	Environmental Protection Agency	NCDC	National Climatic Data Center
FEMA	Federal Emergency Management Agency	NFIP	National Flood Insurance Program
FIA	Federal Insurance Administration	NOB	Normal Operating Budget
FIRM	Flood Insurance Rate Map	NRCS	<b>Natural Resources Conservation Service</b>
FIS	Flood Insurance Study	NWS	<b>National Weather Service</b>
FMA	Flood Mitigation Assistance program	PDM	Pre-Disaster Mitigation
FPMP	Floodplain Management Plan	PDS	<b>Louisville Metro Planning Design Service</b>
FWEEPs	Flood Warning and Emergency Evacuation Plans	PVA	<b>Jefferson County Property Valuation Administrator</b>
GIS	Geographic Information System	PW	<b>Louisville Metro Public Works</b>
GLAR	<b>Greater Louisville Board of Realtors</b>	RFC	<b>Repetitive Flood Claim</b>
GLI	<b>Greater Louisville Inc</b>	TARC	Transit Authority of River City
GLTV	Greater Louisville television station	USACE	<b>U. S. Army Corp of Engineers</b>
HBAL	Home Builders of Louisville	USGS	<b>U. S. Geological Survey</b>
HMGP	Hazard Mitigation Grant Program	U of L	<b>University of Louisville, Center for Hazards Research (CHR)</b>
HR	Louisville Metro Human Relations		
ICC	Increased Cost of Compliance for flood insurance		
JCPS	<b>Jefferson County Public Schools</b>		
KGS	Kentucky Geological Survey		
KIPDA	<b>Kentuckiana Regional Planning &amp; Development Agency</b>		

# Louisville Metro

## Natural Hazards Mitigation Plan



### 2006 PROGRESS REPORT

SEPTEMBER 2006

#### BACKGROUND

In an unprecedented effort to plan for the natural hazards inherent to Louisville Metro, the Louisville Metro Emergency Management Agency (EMA) and the Louisville Jefferson County Metropolitan Sewer District (MSD) collaborated with Louisville and Jefferson County Information Consortium (LOJIC) to develop a plan to mitigate Louisville's risks to natural disasters.

Due to Louisville's climate, geology, and geographic setting, the Metro area is vulnerable to 12 natural hazards that threaten life and property. Building on LOJIC's GIS data and mapping capabilities, Louisville Metro designed a comprehensive mitigation plan for the 12 hazards, including risk assessments and a mitigation strategy.

Adopted in May 2005, the Louisville Metro Natural Hazards Mitigation Plan profiles, maps, and assesses the risk for 12 hazards possible in our community. In addition, the Plan outlines a five-year mitigation strategy for projects and actions that address protecting lives, infrastructure, and the economy in Louisville Metro. As part of the maintenance procedures of the Plan, EMA, MSD, and LOJIC agreed to continue support and commitment.

The full Louisville Metro Natural Hazards Mitigation Plan is available to the public on-line at <http://www.louisvilleky.gov/EMA/All+Hazards+Plan.htm>

The 2006 Progress Report was submitted to Mayor Jerry Abramson and Louisville Metro Council's Public Health and Safety Committee in September. By October 1, 2006, the Progress Report will be submitted to FEMA and the Kentucky State Hazard Mitigation Office and, subsequently, will be released to the media, posted on MSD and EMA websites, and sent to local hazard-related agencies.



## STAKEHOLDERS

During 2004 -05, an Advisory Committee served as stakeholders and partners in planning efforts to address the natural hazards in Louisville Metro. Today, over 30 members continue to participate on the Advisory Committee and represent hazard-related agencies, government, businesses, neighborhoods, and citizens who oversee the process and ensure actions are incorporated in their representative agencies for hazard mitigation.

### Louisville Metro Natural Hazards Mitigation Advisory Committee

American Red Cross  
Downtown Development  
Citizens  
Environmental Businesses  
Greater Louisville Board of Realtors  
Greater Louisville Inc  
Jefferson County Property Valuation Administrator (PVA)  
Jefferson County Public Schools (JCPS)  
Kentucky Division of Water (KyDOW)  
Kentucky Division of Emergency Management (KyEM)  
Kentucky Emergency Response Commission  
KIPDA, Area Development District  
L G & E  
LOJIC  
Louisville & Jefferson County Metropolitan Sewer District (MSD)  
Louisville Metro Council  
Louisville Metro Development Authority

Louisville Metro Emergency Management Agency (EMA)  
Louisville Metro Emergency Medical Service (EMS)  
Louisville Metro Fire & Rescue  
Louisville Metro Health Department  
Louisville Metro Dept of Inspections, Permit, License (IPL)  
Louisville Metro Parks  
Louisville Metro Planning Commission  
Louisville Metro Police Dept  
Louisville Metro Public Works  
Louisville Water Co (LWC)  
MetroCall  
National Weather Service (NWS)  
Natural Resources Conservation Service (NRCS)  
Suburban Fire Districts  
University of Louisville  
US Army Corps of Engineers (USACE)  
US Geological Survey (USGS)

## MITIGATION STRATEGY

Louisville Metro's Plan includes a mitigation strategy that provides a blueprint for reducing the potential losses identified in the risk assessments. The Advisory Committee designed and developed the Mitigation Strategy during a tier of meetings and based their strategy on seven mitigation goals and objectives.

As part of the mitigation strategy, the Advisory Committee developed a five-year Action Plan for each of the 12 hazards. Proposed activities recommend mitigation projects that can be integrated into job descriptions and implemented through existing programs and other planning tools. For project funding, the activities are cost effective, environmentally sound, and technically feasible. The five-year action plan also names a Lead Implementer for each project and lists the contact person who will be able to report to the committee during the annual update.

### Louisville Metro Hazard Mitigation Goals

- Goal 1—Minimize the loss of life and injuries that could be caused by natural hazards.
- Goal 2—Facilitate a sustainable economy by protecting agriculture, business, and other economic activities from natural hazards.
- Goal 3—Facilitate the strengthening of public emergency services, its infrastructure, facilities, equipment, and personnel to natural hazards.
- Goal 4—Develop a community-wide mitigation effort by building stronger partnerships between government, businesses, and the general public.
- Goal 5—Increase public and private understanding of natural hazard mitigation through the promotion of mitigation education and awareness of natural hazards.
- Goal 6—Enhance existing or design new policies and technical capabilities that will reduce the effects of natural hazards.
- Goal 7—Enhance existing technical and GIS data and capabilities that will reduce the effects of natural hazards.

## 2006 REVISIONS AND UPDATES

In August 2005, after Hurricane Katrina hit the Gulf Coast, Advisory Committee members approached the local mitigation plan with new eyes. Consequently, during two following meetings, the Advisory Committee brainstormed ideas and methods for changing the Action Plan to be more realistic and viable.

The first reorganization was to group several weather-related hazards into a wind/storm-driven category. The wind/storm driven hazards are: Tornado, Winter Storm, Thunderstorm, Hailstorm, and Lightning.

Further, to develop comprehensive projects for each hazard type, the hazards were re-categorized as following:

### Severe Risk Hazards:

Flood  
Dam & Levee Failure

### High Risk Hazards:

All Hazards  
Wind/Storm Driven

### Moderate Risk Hazards:

Earthquake  
Karst/Sinkhole  
Landslide  
Drought  
Extreme Heat  
Wildfire

The Advisory Committee also changed the Prioritization Matrix to reflect more realistic mitigation priorities (see chart). The revised prioritization method permitted the Advisory Committee the opportunity to streamline and merge projects with a priority assignment of A, B, or C (High, Medium and Low).

Given the Advisory Committee's collaboration and partnership, the revised five-year Action Plan is the first success story of the Plan.

Following is the 2006 Progress Report for three Action Plans: Severe, High, and Moderate Hazards. The progress report outlines projects and activities that have updates since the May 2005 adoption of the Plan. Following the report is the revised Five-Year Mitigation Action Plan.

PRIORITIZATION MATRIX		
Priority	Focus	Description of Mitigation
A High	Most significant hazards	<b>Permanently eliminate or reduce across a wide area</b> Priority A projects or activities permanently eliminate damages or have a high probability of systematically reducing damages or deaths and injuries across a wide area from one or more of Louisville Metro's most significant hazards.
B Medium	Any hazards	<b>Alert and educate the public</b> Priority B projects, or activities, help alert the public to the approach of a threat from any of Louisville Metro's hazards, or educate the public about the need for disaster preparedness and mitigation.
C Low	Less significant hazards	<b>Permanently or significantly reduce in a specified or limited area</b> Priority C projects, or activities, permanently or significantly reduce the probability of damages, deaths and injuries in a specified or limited area from one of Louisville Metro's less significant hazards.

# Severe Risk Hazards

## Flood and Dam and Levee Failure

### 2006 Progress Report

**Summary:** In total, the Severe Hazard Risk subcommittee identified nineteen (19) activities in the revised Action Plan for two severe risk hazards. Eight (8) activities are related to the Flood hazard and eleven (11) for the Dam and Levee Failure hazard.

The following highlights progress on the higher priority activities and revisions to the Action Plan:

#### **Flood Hazard Action Plan Activities**

1. *Floodplain Regulations* – On August 25, 2005 the Louisville Metro Council adopted revised floodplain regulations. The revisions were recommended in the Floodplain Management Plan and the Natural Hazards Action Plan. Key changes include:
  - ▶ Basing the calculation for Substantial Improvement and Substantial Damage on the cost over a cumulative 10-year period, and
  - ▶ Allowing for payment of a fee in lieu of providing floodplain storage compensation for development in the Ohio River floodplain. Fees will be used for mitigation projects, such as acquisition of floodprone properties.The ordinance is also scheduled to be revised again in late 2006 in order to officially adopt the new DFIRM (see next project), which will become official in December 2006.
2. *Map Modernization and DFIRM* – MSD using a FEMA grant has completed the update of floodplain mapping for Louisville Metro. The comment and review period has been completed and the maps are scheduled to be officially adopted by FEMA and the Louisville Metro Council (as mentioned above) and be in effect on December 5, 2006. The revised maps include both the FEMA floodplain (BFE based on existing hydrology) as well as the Local Regulatory floodplain (based on fully developed hydrology), which is used for local floodplain permitting.
3. *Map Repetitive Loss properties* – This activity was completed in December 2005. Properties mapped were based on NFIP insurance claims and then expanded to include vulnerable areas based on the concentration of flood insurance claims.
4. *Identify candidates for acquisition/buyouts* – MSD has developed a current list of candidate properties which is updated periodically. To date 46 homes have been purchased and demolished, 5 vacant lots have been acquired and one home has been elevated. A grant application for Repetitive Flood Claims (RFC) funding has been submitted to FEMA for 3 properties in the Ohio River floodplain and it appears that approval of funding for at least 2 of those properties is forthcoming.
5. *Flood Warning and Emergency Evacuation Plans (FWEET)*- It was determined by USACE that there are no existing FWEETs for Metro Louisville. After evaluation by the committee, it was decided that due to the nature of flooding in the area, the existing flood protection system and ongoing flood protection projects, that FWEETs are not needed at this time. This project has been removed from further consideration.
6. *Flood Hazard Information Portal* - A website has been completed and is running online at [www.loukyhazards.org](http://www.loukyhazards.org) with flood hazard information including the new DFIRMs. Later phases of the portal will expand the system to other hazards.
7. *Ongoing MSD/USACE Flood Control Projects* – Work is continuing on construction of the Pond Creek and Beargrass Creek flood protection projects. In July 2006, it was announced that an additional \$5 million in Federal funding was being made available for these projects as well as a new Southwest Flood Damage Prevention Study which will look at possible solutions to flooding in the Combined Sewer Area, and for sanitary sewer rehabilitation in the Buechel, Hikes Point, and Highgate Springs neighborhoods.

Remove project from consideration:

*Aganza Basin* – This project was for construction of an 860 acre-feet flood storage basin in the Pond Creek Watershed and an application for a PDM grant was submitted to the state and FEMA. However, the basin is located in an area which is proposed to be developed as part of major redevelopment project related to the Louisville International Airport expansion. MSD is negotiating with the Regional Airport Authority to sell the site. The Aganza project will not be pursued; however, MSD and the Airport are reviewing possible replacement sites for further mitigation of flood storage as well as wetlands.

#### **Dam and Levee Failure Hazard Activities**

1. *High Hazard Class C Dams* – Work is ongoing to review and update, if necessary, the Emergency Operations Plans for publicly owned Class C dams, however, additional funding or grants will be needed to complete this work.
2. *Evaluate the existing Ohio River levee and flood protection system* – This work is ongoing with funding estimated to be \$2.2 million/year and at least \$38 million total for rehabilitation of the flood protection system including the pump stations.
3. *Develop dam risk assessment* – Phase 1 is to verify GIS locations of dams based on the State of Kentucky database. Early in 2006, the Louisville Metro Parks Department completed the inventory of dams in the park system and began an inspection program. Data will be provided to LOJIC to update the GIS database.
4. *Removal of unsafe dams* – this activity will have an “A” priority, but the schedule is dependent on completion of detailed inspections and evaluations which may be several years from completion. Therefore, the schedule for this activity was changed to 2012.

The revised five-year Action Plans for Floods and Dam and Levee Failure are at the end of the Progress Report.

# High Risk Hazards

## All Hazards, and Wind/Storm Driven Hazards

### 2006 Progress Report

**Summary:** The High Risk Hazards include a category for All Hazards and another group for Wind/Storm Driven hazards that include Tornado, Winter Storm, Thunderstorm, Hailstorm, and Lightning. In total, the High Risk Hazards subcommittee identified seventeen (17) activities in the revised Action Plan; seven (7) are related to All Hazards and ten (10) for the Wind/Storm Driven Hazards.

A major change in the Action Plan overall was to identify the need for a comprehensive inventory of public buildings and building value so that a more realistic risk assessment can be run to determine true vulnerability for many of the geographic-bound hazards. Attaining this data is a major effort. Therefore, rather than state the need for data and building inventory in every hazard it is listed in the All Hazards section.

Another change in the All Hazards Action Plan is the merging of several public information and outreach recommendations and activities from other hazard's Action Plans.

The following highlights progress on the higher priority activities and revisions to the High Risk Mitigation Action Plan:

#### **All Hazards Action Plan Activities**

1. *Develop Cellular phone service emergency warnings.* Project is to develop capability for sending mass text messages for emergency warnings by researching the other communities who have already implemented. EMA performed research and determined the service would be cost-prohibitive for EMA to provide service at this time. However, follow-up is recommended in 2008 to assess if costs of equipment may be less expensive.
2. *Develop a standard message and education strategy for pre-disaster messages.* Two updates on projects for Highway and Severe Weather Notification:
  - ▶ Advisory radio station (1610 AM) to broadcast messages to notify of traffic, emergencies, evacuation, and other public information. EMA to place five new transmission towers for 1610 AM radio by end of 2006.
  - ▶ TRIMARC disseminates Tornado Warnings via NWS and issues severe weather warnings by announcing drivers to tune to 530 AM radio, as of August 2006. All tornado warnings and severe thunderstorm warnings with GTE (greater than estimated) 70 mph and hail GTE 1 inch for all counties adjoining and including Jefferson County is issued a Severe Weather Alert and told to tune to 530 AM radio on the TRIMARC signs.

#### **TWO NEW PROJECTS**

##### *Outreach to Metro Government and Public Agencies*

Develop a program/training as a part of Metro Government for employees/staff for "Orientation" and require Metro employees and all public agencies to attend. Program to include an approximate 15-minute video that outlines "All-Hazards Preparedness Plan (Family Plan)". Video also to be available on-line to reach a wider audience, such as Metro TV, GLTV (Channel 25).

##### *Develop Emergency Action Plans for Public Buildings*

Develop and review Evacuation Plans for Central downtown government Public Buildings and Disseminate Safe Room locations. Projects will depend on the completion of the Risk Assessment of publicly owned buildings and essential facilities.

### **Wind-Driven Hazards Action Plan Activities**

1. *Require Hurricane Clips in regulations.* Require hurricane clips through the State Building Code – which is currently not required. If approved by Legislative Research Commission (LRC), the new KY Residential Code will have provisions that will require connectors that resist uplift of not less than 175 pounds on roof trusses & rafters. Approval expected by the end of 2006.
2. *Research Minimum shingle type in codes/regulations.* IPL completed the research and reported that local codes currently meet the national standard.
3. *Tree trimming and power line maintenance: Develop Pro-Active plans before severe weather.* LG&E is pro-active in their powerline maintenance program and Metro Parks has a program in place too for tree trimming. In addition, LG&E developed a Preventive Tree Maintenance Outreach to property owners that was mailed in the September 2006 bill stuffer/insert.
4. *Re-evaluate Outdoor Warning Sirens: Review number, locations, and capabilities of warning sirens to ensure adequate coverage.* EMA performed the siren assessment in 2005. As part of the assessment, EMA determined that battery back-ups are needed for all Outdoor Warning Sirens. A Federal Grant application for \$1.1 million to upgrade all Outdoor Warning Sirens with Battery Back-up was not funded.

During 2005 – 2006, four (4) new Sirens were installed for a total of 118 sirens countywide. The siren coverage represents 89% of the Louisville Metro population and 66% of total land mass or acreage. Three (3) additional sirens are scheduled for installation by end of 2006; which should raise population coverage to approximately 92%.

5. *Outdoor Warning Sirens as a requirement for new subdivisions.* EMA is currently working with the code development group for proposed regulations regarding placement of Outdoor Warning Sirens in all new subdivisions. By the end of 2006, Metro Council may vote on this requirement, which will require a local building code revision.
6. *Promote & Distribute Weather Radios.* Two efforts were made in 2006 to promote weather radios as following:
  - ▶ NWS sold NOAA weather radios at the Kentucky State Fair (August 2006)
  - ▶ Kroger, Midland Radio, and WAVE-3 TV partnered to sell Midland NOAA Weather Radios for a discounted \$29.99 at Kroger during August and September 2006
7. *Map historical tornado paths.* NWS's new Interactive website shows the path of historical tornadoes
8. *Loss of Power.* Two projects undertaken in 2006 follow:
  - ▶ Increase outreach through ARC and JCPS during power outages
  - ▶ Promote wire-down safety
9. *Expand Weather Spotter Program.* NWS expanded the Weather Spotter Program to a "brand-new show" which will be updated again in late 2006. NWS trained 1000 school bus drivers and hundreds of weather spotters across the countywide area.

The revised five-year Action Plans for All Hazards and Wind/Storm Driven hazards are at the end of the Progress Report.

# Moderate Risk Hazards

## Earthquake, Karst/Sinkhole, Landslide, Drought, Extreme Heat, and Wildfire

### 2006 Progress Report

**Summary:** The Moderate Risk Hazards subcommittee streamlined and merged projects in the Action Plans. In general, the subcommittee recommended:

- ▶ Earthquake projects depend on collection of additional soils, fault lines, and building data in order to perform a risk assessment to show the vulnerability of the downtown urban area.
- ▶ Extreme Heat is a weather condition that is appropriately handled by EMA and the Health Dept. during extreme heat events. As a result, no additional actions or activities are recommended and the Advisory Committee approved removing Extreme Heat from the Action Plan.

The following highlights progress on the higher priority activities and revisions to the Action Plan:

- ▶ Karst/Sinkhole and Landslide regulations for the Development Code are in process; PDS formed a group to recommend revisions to the Development Code, however, to-date there are no recommendations.

#### **Karst/Sinkhole Hazard Action Plan Activities**

1. *Develop a sinkhole risk assessment with best available data.* During 2005 – 06, Metro Parks and LOPC completed a Sinkhole inventory for the park system. By the end of 2006, Metro Parks is scheduled to submit spatial data to LOJIC for incorporation into GIS layers.
2. *Repairs to public park lands and facilities.* Repairs are currently in place for Iroquois & Cherokee Parks due to work by Metro Parks, MSD & LOPC. Metro Parks funded at \$125K.

#### **Landslide Hazard Action Plan Activities**

1. *Develop regulations in Development Code for landslide areas with high-risk slopes.* To limit future development, citizens in the Kenwood Hill neighborhood (near Iroquois Park) have been working with their Metro Council representative and the Metro Planning Commission for a “downzoning” for the area that has fragile terrain, steep slopes, and unstable soils. During 2006, the Planning Commission endorsed the downzoning plan. Final re-zoning of the area will be determined by vote of the Metro Council.

The revised five-year Action Plans for Earthquake, Karst/Sinkhole, Landslide, Drought, and Wildfire are at the end of the Progress Report.

# Severe Risk Hazards

## Five-Year Action Plan

### 2006 REVISED FLOOD ACTION PLAN

Hazard	Type of Activity or Project	Lead Implementer & Contact Person	Other Proposed Partners	Proposed Schedule	Funding/ Budget Considerations	Performance Measure	Priority	Matches Goals 1 - 7
Flood	<b>Mitigation: Regulations to protect existing, new and future buildings/ infrastructure</b> <ul style="list-style-type: none"> <li>▶ Enforce Floodplain Ordinance Regulations</li> <li>▶ Especially for repetitive loss areas</li> </ul>	MSD (Randy Stambaugh)	EMA	Ongoing	NOB	Reduce repetitive loss	A	2, 7
Flood	<b>Risk Assessment: Map Repetitive Loss properties</b> <ul style="list-style-type: none"> <li>▶ Use NFIP insurance claims as basis</li> <li>▶ Expand repetitive loss sites to vulnerable "area"</li> <li>▶ Submit maps/ documentation to LOJIC</li> </ul>	LOJIC (Curt Bynum)  MSD (Randy Stambaugh)	MSD	Finished in 12/07	NOB	Map	A	1
Flood	<b>Mitigation: Project to protect existing, new and future buildings/infrastructure: Woodland Manor Basin</b> Project involves the construction of a 38 acre-foot basin at the confluence of Fishpool Creek and Southern Ditch in the Pond Creek Watershed. The basin would benefit local roads and residential properties in the Woodland Manor area that are particularly susceptible to frequent flood damage.	MSD (Randy Stambaugh)		If funded, Start in Jan '07  Finish in Jan '08	PDM grant application is being reviewed by state, FEMA region, and National Review Committee	Basin	B	1
Flood	<b>Risk Assessment: Develop a flood risk assessment with best available data.</b>  <b>Collect Building first floor elevations</b> <ul style="list-style-type: none"> <li>▶ Use data to model at-risk structures</li> <li>▶ Cost could be significant depending on the # of elevations</li> <li>▶ Corps of Engineers data should be mined</li> </ul>	MSD (Justin Gray)	LOJIC  Corp of Engineers (Mitch Laird)	Start in Jan '07  Finish in '10	Potential new budget item or grant funding	Completed elevations	B	1, 7

Hazard	Type of Activity or Project	Lead Implementer & Contact Person	Other Proposed Partners	Proposed Schedule	Funding/ Budget Considerations	Performance Measure	Priority	Matches Goals 1 - 7
Flood	<p><b>Mitigation:</b>  <b>Project to protect existing buildings and infrastructure:</b></p> <p><b>Target at-risk public buildings from flood for mitigation/retrofit</b></p> <ol style="list-style-type: none"> <li>Inventory public buildings at risk</li> <li>Develop a plan for mitigation</li> </ol>	<p>MSD (Justin Gray)</p> <p>LOJIC (Curt Bynum)</p>	<p>Metro PW</p> <p>Metro Facilities</p> <p>JCPS</p> <p>Libraries</p> <p>Metro Facilities Mgmt</p>	<p>Start: Jan '07</p> <p>End: June 2007</p>	<p>NOB for inventory and strategy</p> <p>Grants for retrofit</p>	<p>Inventory Strategy</p> <p># of buildings protected</p>	B	1
Flood	<p><b>Risk Assessment:</b></p> <p><b>Review and update High Water Emergency Plans</b></p>	<p>MSD (Randy Stambaugh)</p>	<p>Corp of Engineers</p> <p>EMA</p> <p>NWS</p> <p>Mayor's Office</p> <p>Metro PW</p>	<p>Start 2008</p> <p>End 2010</p>	<p>NOB</p>	<p>Plans in place</p>	B	1
Flood	<p><b>Risk Assessment:</b></p> <p><b>Develop a flood risk assessment with best available data.</b></p> <p><b>Review Flood Warning Gauges and effectiveness:</b> USGS proposes a web-based project to feed an early warning program. Project would include developing flood tracking charts/ flows interactive and use of flood inundation mapping. Gauges could be phased.</p>	<p>USGS (Mike Griffin)</p>	<p>EMA</p> <p>MSD</p> <p>NWS</p>	<p>Dependent on Grant funding</p>	<p>Estimate \$200K to begin project</p> <p>Need grant funding.</p> <p>Gauges could be phased.</p>	<p># of gauges</p>	B	1
Flood	<p><b>Mitigation:</b></p> <p><b>Develop program for Non-profit retrofitting</b></p> <p>Investigate non-profit/humanitarian home building entities for low-income floodproofing /retrofitting projects in a floodprone area.</p>	<p>All Hazard Committee</p>	<p>Corporate sponsors</p> <p>All agencies</p> <p>JCPS</p> <p>Habitat for Humanity</p>	<p>2009</p>	<p>Dependent on donations or grant</p>	<p># of building protected</p>	B	5

Note: "NOB" indicates an internal agency effort via Normal Operating Budget resources

## 2006 REVISED DAM AND LEVEE FAILURE ACTION PLAN

Hazard	Type of Activity or Project	Lead Implementer & Contact Person	Other Proposed Partners	Proposed Schedule	Funding/ Budget Considerations	Performance Measure	Priority	Matches Goals 1 - 7
Dam & Levee Failure	<p><b>Risk Assessment</b>  <b>PHASE 2: Perform risk assessments on Class B and C dams</b></p> <p><b>Class C, High-Hazard Dams</b></p> <ul style="list-style-type: none"> <li>▶ Assess that all Class C dams have and maintain an Emergency Operations Plan (EOP) (tied to above action item results)</li> <li>▶ Verify downstream warning system, public notice, etc. are included in EOP.</li> </ul> <p><b>Class B, Moderate/Significant Risk Dams</b></p> <ul style="list-style-type: none"> <li>▶ Assess Class B dams for any downstream construction that might raise dam classification</li> </ul>	<p>MSD (Justin Gray)</p> <p>Metro Parks (Mark Dutrow)</p>	<p>KY DOW            Dam Owners            LOJIC            Corp of Engineers</p>	<p>Start – late '07</p> <p>Finish – Jan' 09</p>	<p>Potential new budget item or grant funding</p>	<p>EOP inventory and dam reclassification</p>	A	1, 2
Dam & Levee Failure	<p><b>Mitigation:</b>  <b>Develop Emergency Operations Plans (EOPs) for Class C dams without plans</b></p>	<p>MSD (Justin Gray)</p> <p>Metro Parks (Mark Dutrow)</p> <p>KYDOW (Carey Johnson)</p>	<p>Private dam owners            EMA</p>	<p>Start – Jan '08</p> <p>Finish – Jan '10</p>	<p>NOB</p> <p>Potential new budget item or grant funding</p>	<p>EOP completion for all Class C dams within the County</p>	A	1,2
Dam & Levee Failure	<p><b>Mitigation:</b>  <b>Develop better local dam construction and inspections criteria.</b>            In order of the following:</p> <ol style="list-style-type: none"> <li>1. Develop inspection and construction criteria to review existing dams – adopt in Land Development Code</li> <li>2. Begin periodic dam Inspection to develop reports</li> </ol>	<p>Metro Parks (Mark Dutrow)</p> <p>MSD (Randy Stambaugh)</p>	<p>KYDOW            Dam owner            EMA            Corp of Engineers            PDS</p>	<p>Start – Jan '07</p> <p>Finish – Dec' 07</p>	<p>Potential new budget item or grant funding</p>	<p>- Inspection criteria and updated classifications            - Adopted in Land Development Code</p>	A	2, 3, 4, 7
Dam & Levee Failure	<p><b>Mitigation:</b>  <b>Evaluate damage to levee and flood protection system:</b>            Primarily Ohio River Flood Protection System and large pump stations (i.e. Beargrass Creek)</p>	<p>MSD (Justin Gray)</p>	<p>Corps of Engineers            LG&amp;E</p>	<p>Ongoing with no end date</p>	<p>MSD funded; estimated at \$2.2 million/yr. (\$38 million Total Est. Cost)</p>	<p># of facilities evaluated and rehabilitated</p>	A	1
Dam & Levee Failure	<p><b>Risk Assessment: Develop a dam &amp; levee risk assessment with best available data</b></p> <p><b>PHASE 1: Verify GIS locations for existing state</b></p>	<p>MSD (Justin Gray)</p> <p>LOJIC (Curt Bynum)</p>	<p>KY DOW Dam Safety Program            MSD            NRCS            Metro/Suburban Fire Districts</p>	<p>Start - May '07</p> <p>Finish – Unknown</p>	<p>Potential new budget item or grant funding</p>	<p>GIS locations and inventory database</p>	B	1,2,7

Hazard	Type of Activity or Project	Lead Implementer & Contact Person	Other Proposed Partners	Proposed Schedule	Funding/ Budget Considerations	Performance Measure	Priority	Matches Goals 1 - 7
	<p><b>dams</b> Develop data inventory of all dams within Louisville Metro area. Steps:</p> <ul style="list-style-type: none"> <li>▶ Perform research in the State Dam Safety Program records, which requires an Open Records" request to the KYDOW.</li> <li>▶ Research records and locations of dams within metro boundaries</li> <li>▶ From research, collect other important data, e.g. current EOPs, emergency operations plans (EOPs), dam materials, past inspections, violations, etc...</li> <li>▶ Collect inventory of dam locations and geo-code</li> <li>▶ Verify which Class C dams have an Emergency Operations Plan (EOP)</li> </ul> <p><b>2006 Update:</b> Metro Parks completed a dam inventory for the park system. Next Step is for Metro Parks to submit data to LOJIC.</p>		Metro Parks – Mark Dutrow					
Dam & Levee Failure	<p><b>Risk Assessment: Develop a dam &amp; levee risk assessment with best available data</b></p> <p><b>Develop Dam inundation models for Class C dams</b> Models will provide the at-risk locations of properties downstream, required warning times.</p>	MSD (Justin Gray) LOJIC (Curt Bynum)	Corp of Engineers KY DOW LOJIC	Start – Jan '08  Finish – Jan '10	Potential new budget item or grant funding	Inundation Models and Mapping	B	1, 2, 7
Dam & Levee Failure	<p><b>Risk Assessment and Mitigation: Place a benchmark or similar point on dams to determine if movement is occurring</b></p> <p>Benchmark placement should coincide with inspection and data development</p>	Metro Parks (Mark Dutrow) MSD (Justin Gray)	KYDOW Dam owner  EMA Corp of Engineers PDS LOJIC	Start – July '07 Finish – Ongoing resurveying	Potential new budget item or grant funding	# of dams with benchmarks and signs installed	B	2, 3
Dam & Levee Failure	<p><b>Mitigation: Consider requiring EOP for Class B dams</b></p> <ul style="list-style-type: none"> <li>▶ Class B dams have at-risk structures below the levee, therefore should require an emergency plan.</li> <li>▶ Partner with KY DOW Dam Safety Program for requirements and regulations</li> </ul>	KY DOW Dam Safety Program	MSD Metro Parks Dam owner LOJIC	2010	NOB	EOPs	C	1

Hazard	Type of Activity or Project	Lead Implementer & Contact Person	Other Proposed Partners	Proposed Schedule	Funding/ Budget Considerations	Performance Measure	Priority	Matches Goals 1 - 7
Dam & Levee Failure	<b>Mitigation:</b> Develop a local dam permitting process For dams that do not fit the state's definition of a dam. Adopt process in codes.	Metro Parks (Mark Dutrow) MSD (Justin Gray)	KYDOW EMA PDS IPL	2008	Potential new budget item or grant funding	Permit process	C	1, 2, 3, 4, 7
Dam & Levee Failure	<b>Mitigation:</b> Post a sign/landmark on dams with classification type (A, B, or C). * Signs to include: ▶ Contact numbers ▶ Name of dam ▶ Maximum water impoundment  <i>* Project dependent upon dam inventory (Phase 1)</i>	Metro Parks (Mark Dutrow) MSD (Justin Gray)	KYDOW Dam owner EMA Corp of Engineers LOJIC	Dependent upon dam inventory (Phase 1)	Potential new budget item or grant funding	# of dams with signs /landmarks installed	C	2, 3, 5
Dam & Levee Failure	<b>Mitigation:</b> 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 &amp; 2)</i>	KY DOW Dam Safety Program	NRCS Dam owner LOJIC MSD Metro Parks	2012  Dependent upon dam inventory and assessment (Phases 1 & 2)	Metro Parks MSD Capital Projects NRCS	# of dams removed or repaired	A	1, 2, 3

Note: "NOB" indicates an internal agency effort via Normal Operating Budget resources

# High Risk Hazards

## Five-Year Action Plan

### 2006 Revised All Hazards Action Plan

Hazard	Type of Activity or Project	Lead Implementer & Contact Person	Other Proposed Partners	Proposed Schedule	Funding/ Budget Considerations	Performance Measure	Priority	Matches Goals 1 - 7
All Hazards	<p><b>Risk Assessment: Collect Additional Enhanced Data for Publicly owned buildings and essential facilities</b></p> <p><b>PHASE 1: update Inventory for critical or essential facilities</b> Inventory Data to reside in LOJIC system:</p> <ul style="list-style-type: none"> <li>▶ Develop a central spatial database of all publicly owned buildings and facilities.</li> <li>▶ Collect and Assemble building values for critical or essential facilities. Data to reside in LOJIC system. For example:               <ul style="list-style-type: none"> <li><input type="checkbox"/> Public facilities</li> <li><input type="checkbox"/> Hospitals</li> <li><input type="checkbox"/> Parochial and private schools</li> <li><input type="checkbox"/> Non-profits</li> <li><input type="checkbox"/> Local, state, and federal</li> </ul> </li> </ul>	PVA  LOJIC (Curt Bynum)	Metro Facilities KY Educ. Dept. KY Div. Health Care U.S. agencies LOJIC		Resources needed  NOB	Collected data  Spatial database	A	7
All Hazards	<p><b>PHASE 2: Risk assessment: Perform a Risk Assessment of Publicly owned buildings and essential facilities</b></p> <p><b>Mitigation:</b></p> <ul style="list-style-type: none"> <li>▶ Develop a strategy and program to retrofit structures at-risk. Target structures that may need protection for each hazard.</li> </ul> <p><b>Mitigation: Develop Emergency Action Plans:</b></p> <ul style="list-style-type: none"> <li>▶ Develop Evacuation Plans</li> <li>▶ Disseminate Safe Room locations</li> </ul>	Metro Facilities Mgmt	PVA LOJIC IPL JCPS	Depends on Phase 1  2007	NOB  Resources needed  Request from general funding	# of buildings assessed	B	2, 7
All Hazards	<p><b>Mitigation:</b></p> <p><b>Outreach to Metro Government and Public Agencies</b> Develop a program/training for employees/staff of Louisville Metro Government and other public agencies</p>	Louisville Metro Health Dept (Paul Freibert)	JCPS GLTV Metro HR ARC	2007	Resources needed  Request from general funding	<ul style="list-style-type: none"> <li>▶ Production of Videos</li> <li>▶ SOP for Metro orientation</li> </ul>	B	1, 2, 4, & 5

Hazard	Type of Activity or Project	Lead Implementer & Contact Person	Other Proposed Partners	Proposed Schedule	Funding/ Budget Considerations	Performance Measure	Priority	Matches Goals 1 - 7
	<ol style="list-style-type: none"> <li>1. Produce an approx 15-minute video that outlines "All-Hazards Preparedness Plan (Family Plan)"</li> <li>2. Request video to be a part of Metro Government "Orientation". Require Metro employees and all public agencies to attend.</li> <li>3. Video also to be available on-line to reach a wider audience, such as Metro TV = GLTV (Channel 25)</li> </ol>		LEPC		LEPC funding	▶ Partnership with GLTV for regular airing of video		
All Hazards	<p><b>Mitigation:</b>  <b>Develop Cellular phone service emergency warnings</b></p> <ul style="list-style-type: none"> <li>▶ Send out mass text messages for emergency warnings</li> <li>▶ Research other communities who have already implemented – <b>completed</b>. 2005 Research shows it is cost-prohibitive at this time for EMA to provide service. Local news stations are providing weather warnings as a private service. Revisit project in 2008 when equipment could be less expensive.</li> </ul>	EMA (Jim McKinney)	Cell Companies LEPC MetroSafe	2005 – 2008	TBD	Percentage of cell coverage	B	1
All Hazards	<p><b>Mitigation:</b>  <b>Develop an "All Hazards Information Portal"</b></p> <ol style="list-style-type: none"> <li>1. For educational and public outreach: <ul style="list-style-type: none"> <li>▶ Develop Standardized Seasonal "Fact Sheets"</li> <li>▶ Message to be consistent for ARC, Health Dept., EMA, LGE, Dept. of Educ, etc...</li> <li>▶ Develop a seasonal section for teachers and citizens</li> </ul> </li> <li>2. Storing hazard occurrences and damage data on a "portal". Track and share data on hazard occurrences and damage costs <ul style="list-style-type: none"> <li>▶ Metro Call could help drive data collection and promote information</li> <li>▶ Database and upload function for agency use from All Hazard portal</li> </ul> </li> </ol>	MSD (Randy Stambaugh)  EMA (Jim McKinney)	ARC Health Dept. EMA LGE JCPS Metro Call LOJIC NWS KyEM KyDOW	2006 - 2007	Seeking funding for a Grant through FEMA Map Modernization funding	Operating portal	B	3, 4, 6 & 7
All Hazards	<p><b>Mitigation:</b>  <b>Public education &amp; standard public statements for All Hazards</b></p> <ol style="list-style-type: none"> <li>1. Highway and severe weather notification: Advisory radio station (1610 AM) to broadcast messages to</li> </ol>	EMA (Jim McKinney)  NWS (John Gordon)	ARC JCPS NWS EMA MetroCall Metro & Suburban Fire	2006 - 2009	NOB	Standard Message	B	4, 5

Hazard	Type of Activity or Project	Lead Implementer & Contact Person	Other Proposed Partners	Proposed Schedule	Funding/ Budget Considerations	Performance Measure	Priority	Matches Goals 1 - 7
	<p>notify of traffic, emergencies, evacuation and other public information. Broadcast messages and severe weather notification:</p> <p><b>2006 Update:</b> EMA to place five new transmission towers for 1610 AM radio by end of 2006</p> <p>2. Highway and severe weather notification: TRIMARC disseminates Tornado Warnings via NWS and issues severe weather warnings by announcing drivers to tune to 530AM radio, as of August 2006.</p> <p>3. Promote:</p> <ul style="list-style-type: none"> <li>▶ Availability of hazard insurance, e.g., flood, earthquake, etc...</li> <li>▶ Monthly focus on All Hazards</li> <li>▶ Utilize recording by MetroCall to disseminate brief information on hazards</li> <li>▶ Research and distribute new KY EM resources produced by the state Earthquake program</li> <li>▶ Use Greater Louisville TV (GLTV) for awareness messages</li> <li>▶ Utilize various agency websites</li> </ul>	<p>KY EM (Steve Ogelsby, EQ director)</p> <p>Metro Call (Marilyn Givan)</p>	<p>KYEM Area 6 Health Dept MSD USGS Metro Police Corps of Engineers LG &amp; E LWC</p>					
All Hazards	<p><b>Mitigation:</b> <b>Public Outreach on retrofitting, mitigation, education and wind-driven building techniques</b></p> <ul style="list-style-type: none"> <li>▶ Standardize message and program for how to make a home wind resistant</li> <li>▶ Promote existing website <a href="#">Blueprint for Success Flash.org</a></li> <li>▶ Partner with KY Weather Preparedness Committee (KWPC) that applied for a grant to buy FLASH cards</li> <li>▶ Promote the existing national FLASH program</li> <li>▶ Promote "Turn around and don't drown"(NWS video).</li> <li>▶ To avoid flooding, include message for No Dumping of Debris in ditches.</li> </ul>	<p>NWS (John Gordon)</p> <p>ARC (Keith Alvey)</p> <p>EMA Jim McKinney</p> <p>KyEM (Camille Crain)</p>	<p>HBAL NWS ARC EMA All hazards portal KWPC IPL</p>	2007	NOB	<p>Partnerships</p> <p>Completed outreach</p>	C	1, 5

Note: "NOB" indicates an internal agency effort via Normal Operating Budget resources

**2006 Revised Wind/Storm Driven Hazards Action Plan:  
Tornado, Winter Storms, Thunderstorms, Hailstorms, and Lightning**

Hazard	Type of Activity or Project	Lead Implementer & Contact Person	Other Proposed Partners	Proposed Schedule	Funding/ Budget Considerations	Performance Measure	Priority	Matches Goals 1 - 7
Wind/Storm Driven Hazards	<p><b>Mitigation: Require Hurricane Clips</b></p> <ol style="list-style-type: none"> <li>1. Require hurricane clips through the State Building Code – currently not required.</li> <li>2. Code Plus issue – market HBAL for hurricane clips and safe houses</li> </ol> <p><b>2006 Update:</b> If approved by LRC, the new KY Residential Code will have provisions that will require connectors that resist uplift of not less than 175 pounds on roof trusses &amp; rafters</p>	IPL (Robert Kirchdorfer)	HBAL NWS EMA ARC IPL KYEM KWPC LOJIC	2006	NOB	Adopted in State Residential Code	A	1, 2, 5
Wind/Storm Driven Hazards	<p><b>Mitigation: Tree trimming and power line maintenance</b></p> <p><b>Develop Pro-Active plans before severe weather</b></p> <p><b>2006 Update:</b></p> <ul style="list-style-type: none"> <li>▶ LG&amp; E has developed a trim cycle for trees near power lines.</li> <li>▶ Preventive Tree Maintenance Outreach to property owners also provided in LG&amp;E bill stuffers (September 2006).</li> </ul>	LG & E (Keith McBride)	Metro Parks Metro PW Metro Call	On-going	Primarily LG&E funded; supported by Parks and Public Works maintenance	Reduction in average annual power outages	A	5, 6
Wind/Storm Driven Hazards:	<p><b>Risk Assessment:</b></p> <p><b>Re-evaluate Outdoor Warning Sirens: Review number, locations, and capabilities of warning sirens to ensure adequate coverage.</b></p> <p><b>2006 Update: seven new sirens totaling 118 Sirens.</b> Four (4) Sirens have been installed and represent coverage of 89% of the Metro population and 66% of total land mass or acreage. By end of 2006, three (3) additional sirens are scheduled for installation; which will raise population coverage to approximately 92%.</p> <p>-A 1.1 million Federal Grant application to upgrade all Outdoor Warning Sirens with Battery Back-up was not funded.</p>	EMA (Jim McKinney)	LEPC	2005	EMA Capital Budget \$145K	Report and Percentage of coverage	B	1, 3, 5

Hazard	Type of Activity or Project	Lead Implementer & Contact Person	Other Proposed Partners	Proposed Schedule	Funding/ Budget Considerations	Performance Measure	Priority	Matches Goals 1 - 7
Wind/Storm Driven Hazards	<p><b>Mitigation: Outdoor Warning Sirens --- a requirement for new subdivisions</b></p> <p>EMA is currently working with the development group to make Sirens a requirement for all new subdivisions.</p> <p><b>2006 Update:</b> Metro Council to vote on this during 2006 which requires a local building code revision</p>	EMA (Jim McKinney)	PDS HBAL Developers LOJIC MSD	2006	NOB	Adopt in Land Development Code	B	1, 3, 5, 6
Wind/Storm Driven Hazards	<p><b>Mitigation: Promote &amp; Distribute Weather Radios</b></p> <ol style="list-style-type: none"> <li>American Red Cross to develop a grant w/ packet to the radio/corporate sponsors</li> <li>Partner with the Home Builders Association to develop a program for pre-Built in weather radios in new houses <ul style="list-style-type: none"> <li>Identify the safest spot in the house</li> <li>Develop an outreach pkg for new homeowner</li> </ul> </li> </ol> <p><b>2006 Update:</b></p> <ul style="list-style-type: none"> <li>Discount radios sold at the State Fair by NWS (August 2006)</li> <li>Kroger, Midland Radio, and WAVE-3 TV partnered to sell all hazard weather radios for \$30</li> </ul>	ARC (Keith Alvey)  NWS (John Gordon & Mike Callahan)	NWS EMA Corporate sponsors HBAL Kroger	2006	Approx \$10K Requires funding Grants	<ol style="list-style-type: none"> <li>Approved grant</li> <li># of radios</li> <li>Commitment from homebuilders to install</li> </ol>	B	1, 5
Wind/Storm Driven Hazards	<p><b>Risk Assessment: Map historical tornado paths</b></p> <p>NWS Interactive website shows the path of historical tornadoes</p>	NWS (John Gordon)	LOJIC	2006	NOB	Map	B	5, 7
Wind/Storm Driven Hazards	<p><b>Mitigation: Develop a grant for "severe storm trailers" for the Fire Department to take to schools</b></p>	Suburban Fire District (Joe Johnson)	JCPS	2007	Grant	Purchase of trailer	B	5

Hazard	Type of Activity or Project	Lead Implementer & Contact Person	Other Proposed Partners	Proposed Schedule	Funding/ Budget Considerations	Performance Measure	Priority	Matches Goals 1 - 7
Wind/Storm Driven Hazards	<p><b>Mitigation: Loss of Power-</b></p> <ul style="list-style-type: none"> <li>▶ Promote wire-down safety.</li> <li>▶ Increase outreach through ARC and JCPS during power outages</li> </ul>	LG & E (Keith McBride)	ARC Public Health IPL EMA JCPS Metro PW Metro Police Metro & Suburban Fire Districts All Hazards Portal NWS	2005 - 2006	NOB	Reduction in average annual power outages	B	1, 5, 7
Wind/Storm Driven Hazards	<p><b>Mitigation: Promote Safe Rooms</b></p> <ol style="list-style-type: none"> <li>1. Encourage all new construction to include a safe room</li> <li>2. American Red Cross (ARC) work with the HBAL to build safe rooms</li> <li>3. <b>NEW PROJECT:</b> Distribute brochures: NWS will update brochure by April 2007 for KY and IN.</li> </ol>	ARC (Keith Alvey)  NWS (John Gordon)	Insurance Co. HBAL EMA NWS	2006 - 2008	Safe rooms cost approx \$5K Grants	# of safe rooms	C	1, 2, 3 & 5
Wind/Storm Driven Hazards	<p><b>Mitigation: Expand Weather Spotter Program</b></p> <p>NWS expanded the current Weather Spotter Program to a "brand-new show".</p> <p><b>2006 Update:</b> 1000 JCPS bus drivers have been trained, including hundred of citizens. A revised program is expected in late 2006.</p>	NWS (John Gordon)	EMA ARC Metro Police Metro & Suburban Fire Districts TARC JCPS	2005	NOB	# of spotters	C	1, 5

*Note: "NOB" indicates an internal agency effort via Normal Operating Budget resources*

# Moderate Risk Hazards

## Five-Year Action Plan

### 2006 Revised Earthquake Action Plan

Hazard	Type of Activity or Project	Lead Implementer & Contact Person	Other Proposed Partners	Proposed Schedule	Funding/ Budget Considerations	Performance Measure	Priority	Matches Goals 1 - 7
Earthquake	<p><b>Risk Assessment:</b> Develop an earthquake risk assessment with best available building data</p> <p><b>Collect Additional Enhanced Building Data.</b> A major research project:</p> <ul style="list-style-type: none"> <li>▪ Year built, especially structures older than 1980</li> <li>▪ Type of foundation and building construction type</li> </ul>	TBD* special project required	LOJIC Fire Inspections Metro Police Metro Facilities Health Dept. Local Hospitals PVA	Begin 2007 End 2008	Resources needed  Request from state or federal funding or grant	Collected data	A	7
Earthquake	<p><b>Risk Assessment:</b> Research the existing collected data and incorporate inventory into LOJIC PDS completed collecting historical data. Next steps:</p> <ol style="list-style-type: none"> <li>1. Historical Structures Survey: incorporate data into LOJIC</li> <li>2. Inventory of public buildings: review data for accuracy and completeness.</li> <li>3. Incorporate data into LOJIC</li> </ol>	LOJIC (Curt Bynum)	PVA LOJIC PDS	2006	NOB	Layers in LOJIC	A	7
Earthquake	<p><b>Mitigation: Target critical/essential public buildings for mitigation or retrofit*</b></p> <ul style="list-style-type: none"> <li>▶ Develop a standard method for structural soundness and asset tie-downs (i.e. heavy bookcases, equipment).</li> <li>▶ Utilize proven success strategy and methods from JCPS</li> <li>▶ Will require evaluation of each public building</li> </ul> <p><i>*Dependent on completion of inventory and assessment</i></p>	Metro Facilities Mgmt	Metro PW LOJIC JCPS Libraries	2008 – 2010 Dependent on completion of inventory and assessment	TBD  Need grant funding	# of buildings retrofitted	B	1, 2

Hazard	Type of Activity or Project	Lead Implementer & Contact Person	Other Proposed Partners	Proposed Schedule	Funding/ Budget Considerations	Performance Measure	Priority	Matches Goals 1 - 7
Earthquake	<p><b>Risk Assessment:</b> Develop an earthquake risk assessment with best available soils data</p> <p>Collect enhanced soils data to determine liquefaction for downtown</p> <ul style="list-style-type: none"> <li>▶ LOJIC has core county soils data</li> <li>▶ Need additional soils data, esp. for downtown/urban area</li> </ul>	NRCS (Kurt Mason)	USGS KGS LOJIC Corp of Engineers Local geotechnical, architectural & building firms	2008	Resources needed  Request from general funding	Collected soils data	C	7
Earthquake	<p><b>Risk Assessment:</b> Develop an earthquake risk assessment with best available fault-line data</p> <p>KGS to establish and publish location of existing fault lines</p>	KGS	LOJIC	2008	NOB	Locations	C	1, 7
Earthquake	<p><b>Risk Assessment:</b> <b>Inventory Hospital underground wells</b></p> <ul style="list-style-type: none"> <li>▶ Data is with Metro Public Health</li> <li>▶ Contact Bill Wetter for transfer of data</li> <li>▶ Place data into LOJIC</li> </ul>	Public Health (Bill Wetter)	Metro Public Health Local Hospitals LOJIC	2006	NOB	Locations	C	1, 7

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## 2006 Revised Karst and Sinkhole Action Plan

Hazard	Type of Activity or Project	Lead Implementer & Contact Person	Other Proposed Partners	Proposed Schedule	Funding/ Budget Considerations	Performance Measure	Priority	Matches Goals 1 - 7
Karst/ Sinkholes	<p><b>Mitigation: Develop regulations in Development Code for karst/sinkhole</b></p> <p><b>Mapping based on census tracts at risk from karst is complete. Next steps:</b></p> <ul style="list-style-type: none"> <li>▶ Develop local codes for karst regulations</li> <li>▶ Incorporate into MIDAS</li> <li>▶ Publish Karst potential model (DIT)</li> </ul>	Metro Planning Design Services has a special focus group to evaluate	Planning Commission IPL NRCS KGS LOJIC	2007	NOB  Request from general funding	Adopted in Land Development Code	A	5, 6, & 7
Karst/ Sinkholes	<p><b>Risk Assessment:</b></p> <p><b>Project to collect info to protect existing, new and future buildings/infrastructure</b></p> <ul style="list-style-type: none"> <li>▶ Need a central local agency or avenue to report and receive info for karst/sinkhole, including damages and events</li> <li>▶ Research what has been looked at in the past</li> </ul>	Metro Planning Design Services has a special focus group to evaluate	Planning Commission Metro PW Metro Parks LOPC MSD NRCS KGS LOJIC IPL	2008 - 2009	NOB  Request from general funding	<ul style="list-style-type: none"> <li>▶ Review agency in place</li> <li>▶ Adopted in Land Development Code</li> </ul>	B	5, 6, 7
Karst/ Sinkholes	<p><b>Mitigation:</b></p> <p><b>Repairs to public park lands and facilities</b></p> <p>Currently in place for Iroquois &amp; Cherokee Parks</p>	Metro Parks (Marty Storch)	MSD KYDOW LOPC LOJIC	2005 – 2006	Metro Parks funded – currently \$125K for Iroquois	Acreage of lands repaired	B	2
Karst/ Sinkholes	<p><b>Risk Assessment: Develop a sinkhole risk assessment with best available data</b></p> <p><b>Dye-Tracing in sinkholes</b></p> <ul style="list-style-type: none"> <li>▶ Partner with Kentucky Geological Survey (KGS) for data collection</li> <li>▶ Conduct dye-tracing to assess critical sinkholes and subsurface ground water impacts</li> </ul>	Metro Planning  MSD  KGS	Metro Parks LOJIC	2010	Resources needed  Mainly funded by KGS/PDS/MSD  Request from general funding	Inventory and analysis	C	2, 6 & 7
Karst/ Sinkholes	<p><b>Risk Assessment:</b></p> <p><b>Develop a sinkhole risk assessment with best available data.</b></p> <p><b>2006 Update:</b> Metro Parks and LOPC completed Sinkhole inventory in the park system. Metro Parks to submit spatial data to LOJIC for incorporation into GIS layers by end of 2006.</p>	Metro Parks (Mark Dutrow)	LOPC LOJIC	2006	NOB	Inventory in LOJIC	C	7

Note: "NOB" indicates an internal agency effort via Normal Operating Budget resources

## 2006 Revised Landslide Action Plan

Hazard	Type of Activity or Project	Lead Implementer & Contact Person	Other Proposed Partners	Proposed Schedule	Funding/ Budget Considerations	Performance Measure	Priority	Matches Goals 1 - 7
Landslide	<p><b>Mitigation:</b>  <b>Develop regulations in Development Code for landslide areas with high-risk slopes</b></p> <p>Mapping based on census tracts at risk from landslide is complete. Next Steps:</p> <ul style="list-style-type: none"> <li>▶ Tighten Model – which is Parcel based. Need the data defined by parcel, rather than census block</li> <li>▶ Incorporate into MIDAS</li> <li>▶ Landslide Potential Model 'DIT'</li> </ul>	Metro PDS has a special focus group to evaluate	IPL Planning Commission NRCS KGS LOJIC	Complete in 2008 - 2009	Not funded  Request from general funding	Adopted in Land Development Code	A	2, 3, 7
Landslide	<p><b>Risk Assessment:</b>  <b>Project to collect info to protect existing, new and future buildings/infrastructure</b></p> <ul style="list-style-type: none"> <li>▶ Need a central local agency or avenue to report and receive info for landslide, including damages and events</li> <li>▶ Research what has been looked at in the past</li> </ul>	Metro PDS  IPL	Metro Parks LOPC MSD NRCS KGS LOJIC Planning Commission Metro PW	2007	NOB	Review agency in place	A	2, 4, 6, 7
Landslide	<p><b>Risk Assessment:</b>  <b>Develop a landslide risk assessment with best available data</b></p> <p>Research and develop enhanced soils data in areas at-risk from landslide</p>	NRCS (Kurt Mason)	Metro PW Metro PDS Metro Parks LOJIC IPL KGS USGS	2007	Resources needed  Request from general funding	Data collected and strategy in place	A	6
Landslide	<p><b>Mitigation: Project to enforce current regulations and protect infrastructure:</b></p> <ul style="list-style-type: none"> <li>▶ Enforce Binding Elements</li> <li>▶ Limit clearing of vegetation on high-risk slopes</li> </ul> <p><b>Risk Assessment:</b></p> <ul style="list-style-type: none"> <li>▶ Develop building data info</li> <li>▶ Develop a strategy to target areas for outreach</li> </ul>	Metro Facilities	PVA LOJIC IPL	On-going	Resources needed  Request from general funding	Data collected and strategy in place	A	2, 7

Hazard	Type of Activity or Project	Lead Implementer & Contact Person	Other Proposed Partners	Proposed Schedule	Funding/ Budget Considerations	Performance Measure	Priority	Matches Goals 1 - 7
Landslide	<p><b>Mitigation:</b> Repairs and reforestation to public lands and facilities.</p> <p>Currently in place for Iroquois &amp; Cherokee Parks</p>	Metro Parks (Marty Storch)	MSD KYDOW LOPC LOJIC	On-going	Metro Parks funded – currently \$125K for Iroquois	Acreage of lands repaired	B	2, 4, 5

### 2006 Revised Drought Action Plan

Hazard	Type of Activity or Project	Lead Implementer & Contact Person	Other Proposed Partners	Proposed Schedule	Funding/ Budget Considerations	Performance Measure	Priority	Matches Goals 1 - 7
Drought	<p><b>Mitigation:</b> Drought damage and education –</p> <p>WHEN Drought occurs, Outreach and education should include</p> <ul style="list-style-type: none"> <li>▶ How do we keep the public informed</li> <li>▶ Agricultural extension could help keep track of this information</li> <li>▶ Foundation cracking outreach: Promote public awareness, soil shrinkage can lead to cracking in foundations – solutions are to water the lawn and the foundation</li> </ul>	<p>EMA (Jim McKinney)</p> <p>Public Health (Bill Wetter)</p>	<p>NRCS</p> <p>Metro Call</p> <p>LWC</p> <p>All Hazard Portal</p> <p>LEPC</p>	When Drought Occurs	TBD	Information gathered & Information Disseminated	B	4, 7

## 2006 Revised Wildfire Action Plan

Hazard	Type of Activity or Project	Lead Implementer & Contact Person	Other Proposed Partners	Proposed Schedule	Funding/ Budget Considerations	Performance Measure	Priority	Matches Goals 1 - 7
Wildfire	<b>Mitigation:</b> <b>Acquire and deed restrict forested land</b> e.g. Jefferson Memorial Forest, greenways, and parks	Metro Parks (Marty Storch)	MSD Louisville Metro New and future Fund LOJIC	Ongoing	NOB Capital budget Acquisition depends on Grants	Acres purchased/ acquired	C	1
Wildfire	<b>Risk Assessment:</b> <b>Develop a wildfire risk assessment with best available data</b> <ul style="list-style-type: none"> <li>▶ Collect national fire data</li> <li>▶ Map areas a-risk</li> </ul> <b>Mitigation:</b> <b>Develop strategy for fire suppression</b> <ul style="list-style-type: none"> <li>▶ Target wildfire census tracts</li> <li>▶ Promote Best Management practices (BMPs)</li> </ul>	Metro Fire (Al Tronzo)  Suburban Fire (Joe Johnson)	EMA LOJIC	2007	NOB	Strategy & Implementation plan	C	1, 5
Wildfire	<b>Risk Assessment:</b> <b>Develop a wildfire risk assessment with best available data</b>  <b>Develop standard for reporting grass, wild fire, etc....</b> Metro and Suburban Fire Depts. do not report fires in a standardized log or style.  Currently logs and reports are not standardized, therefore, tracking the various type of fire is not possible	Metro Fire (Al Tronzo)  Suburban Fire (Joe Johnson)	EMA	2007	NOB	Consistent reporting	C	1, 2, 3

*Note: "NOB" indicates an internal agency effort via Normal Operating Budget resources*