

CITY OF MILWAUKEE ALL HAZARD MITIGATION PLAN UPDATE

June 7, 2011



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Southeastern Wisconsin Regional Planning Commission

Plan Preparation Staff

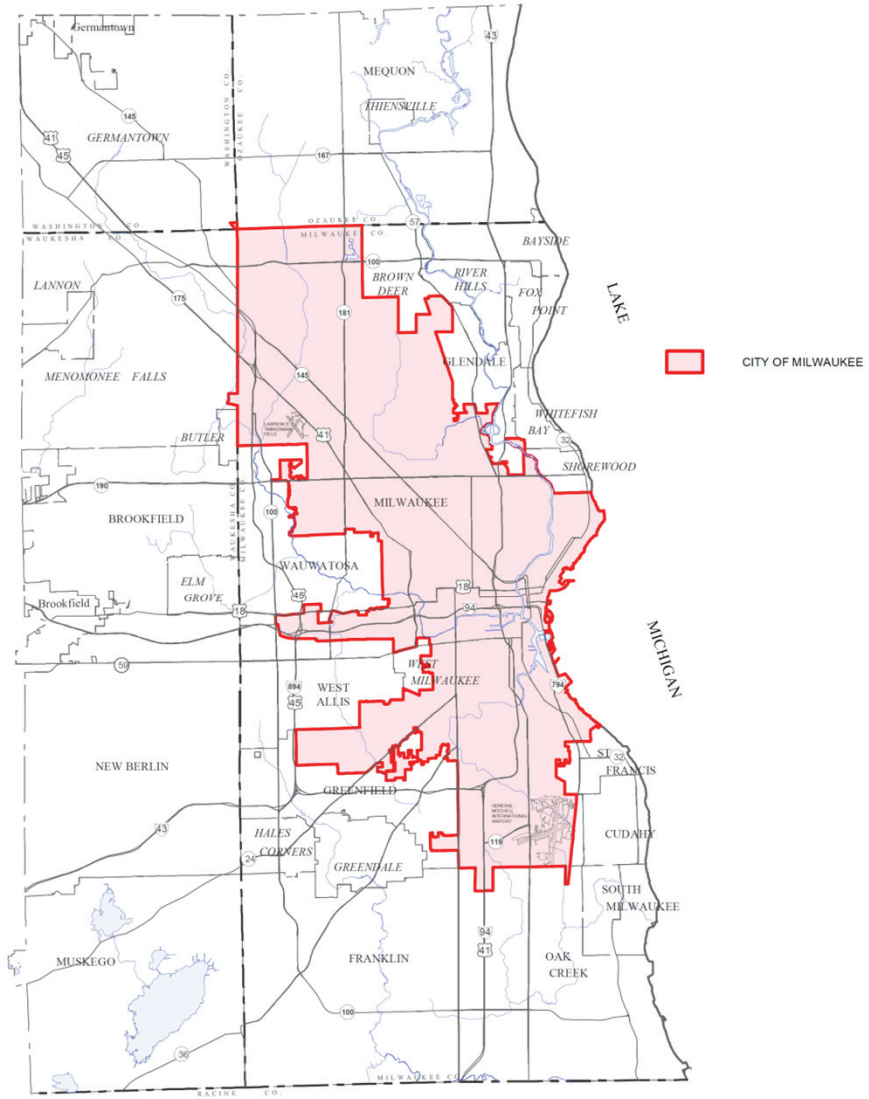
- City of Milwaukee Department of Public Works
- City of Milwaukee Office of Emergency Management and Homeland Security
- Southeastern Wisconsin Regional Planning Commission



Plan Documentation

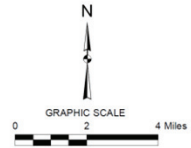
SEWRPC Community Assistance Planning Report
No. 282 (2nd edition), *City of Milwaukee All
Hazards Mitigation Plan Update*

Map I-1
LOCATION OF THE CITY OF MILWAUKEE



CITY OF MILWAUKEE

Source: SEWRPC





Scope and Purpose

(Chapter I)

Set forth the most appropriate, feasible, and effective hazard mitigation strategy for the City of Milwaukee

Maintain eligibility for hazard mitigation funding streams through the Federal Emergency Management Agency (FEMA)



City of Milwaukee All Hazard Mitigation Plan Steering Committee

Oversaw plan updating activities

Comprised of

Departmental staff, appointed officials, agency representatives,
knowledgeable citizens

Police Department, Fire department, City Development department,
Public Works department, County Emergency Management and
Transit departments, MMSD, Health care community

Plan Update Activities

(Described in Chapter I)

Review implementation activities

Update inventories of natural and built features

Review and reevaluate identification of hazards

Update and reevaluate risk analysis

Review and revise mitigation goals

Review and revise mitigation strategies

Update plan implementation and maintenance

Update potential funding sources

Inventory Data

(Chapter II)

Demographic characteristics

Existing and planned land use

Surface water and Lake Michigan shoreline

Transportation and utility systems

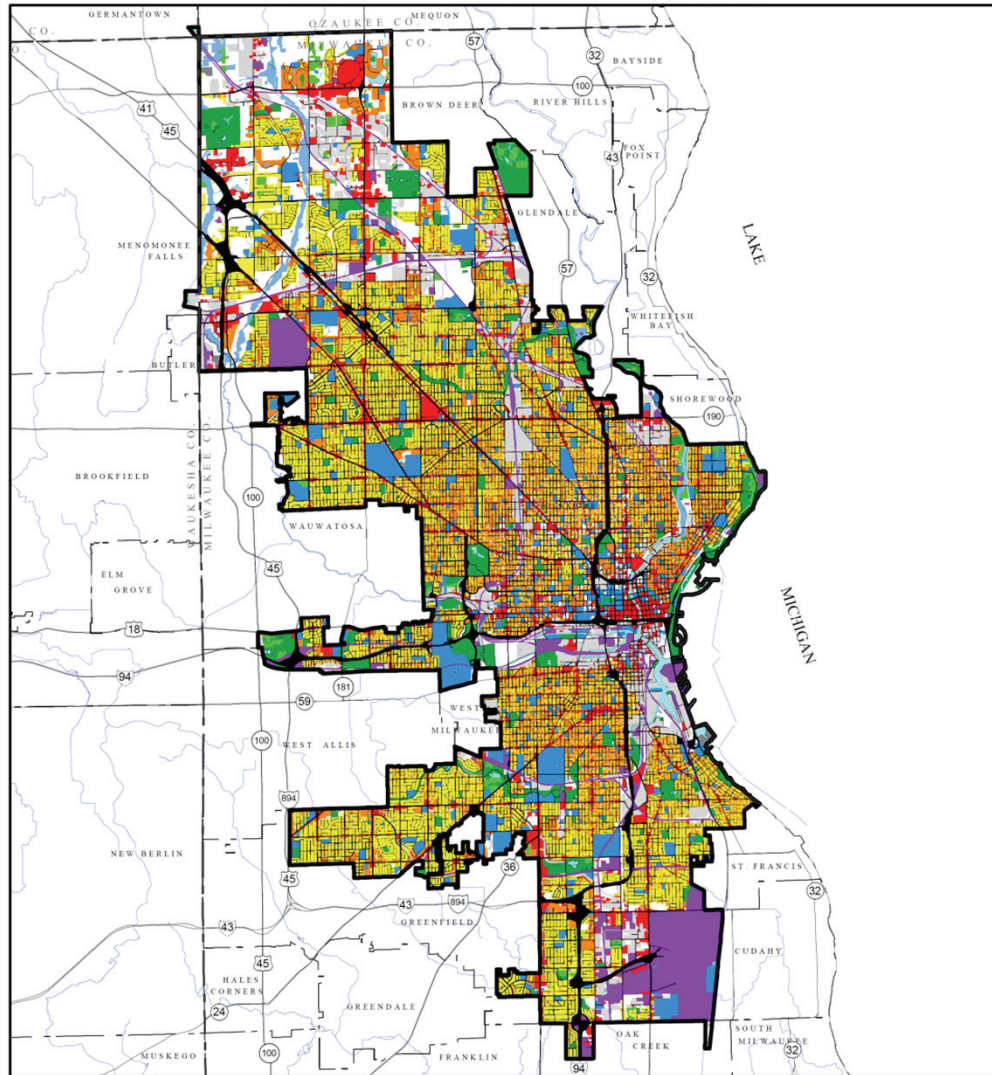
Critical community facilities














Existing regulations and programs



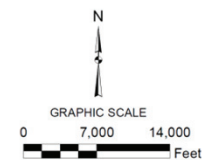
Map II-3

EXISTING LAND USE IN THE CITY OF MILWAUKEE: 2000



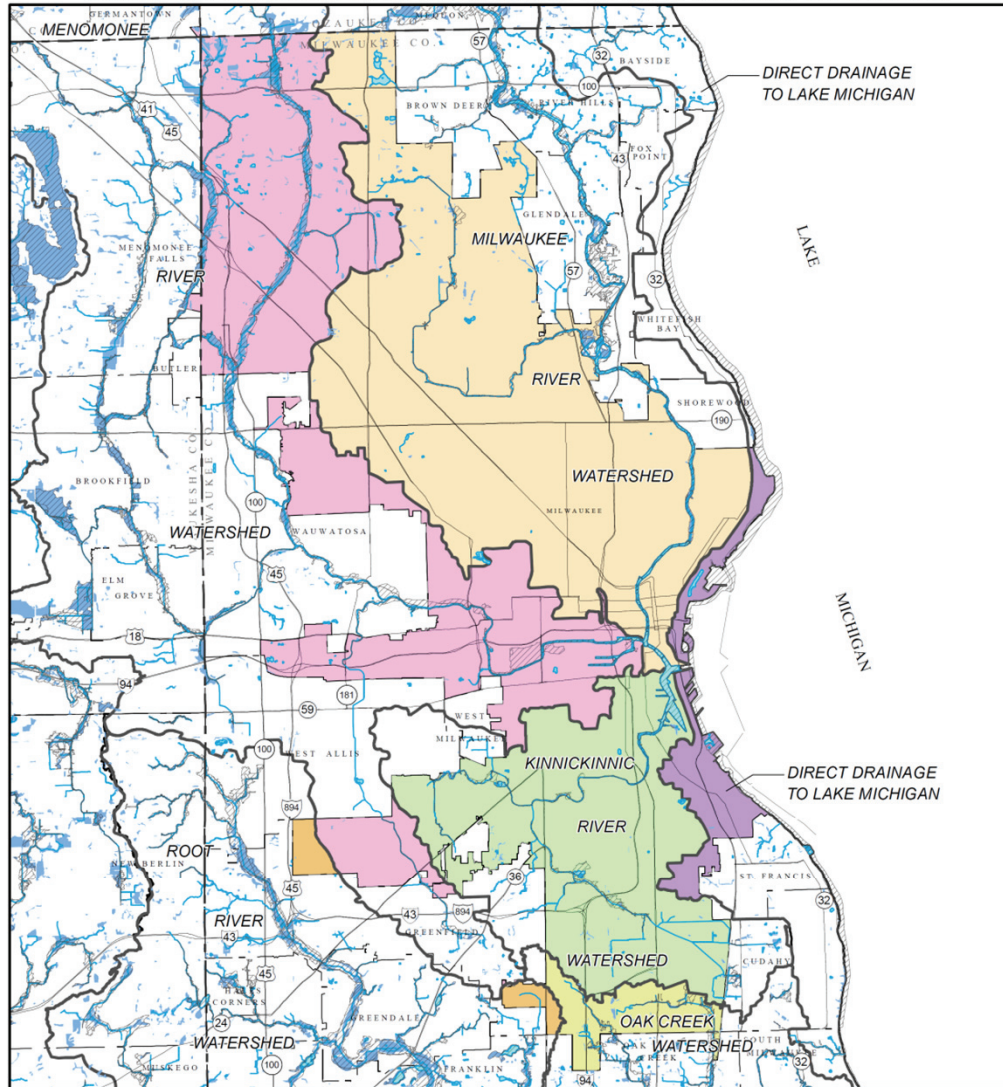
- | | |
|--|--|
|  SINGLE-FAMILY RESIDENTIAL |  GOVERNMENT AND INSTITUTIONAL |
|  MULTI-FAMILY RESIDENTIAL |  RECREATIONAL |
|  COMMERCIAL |  AGRICULTURAL, UNUSED, AND OTHER OPEN LANDS |
|  INDUSTRIAL |  WOODLANDS |
|  EXTRACTIVE AND LANDFILL |  WETLANDS |
|  TRANSPORTATION, COMMUNICATION, AND UTILITIES (OTHER THAN ROADS AND HIGHWAYS) |  SURFACE WATER |
|  ROADS AND HIGHWAYS | |











Source: SEWRPC.

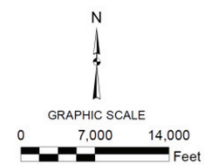


Map II-4

SURFACE WATERS, WETLANDS, AND FLOODPLAINS IN THE CITY OF MILWAUKEE AND ENVIRONS



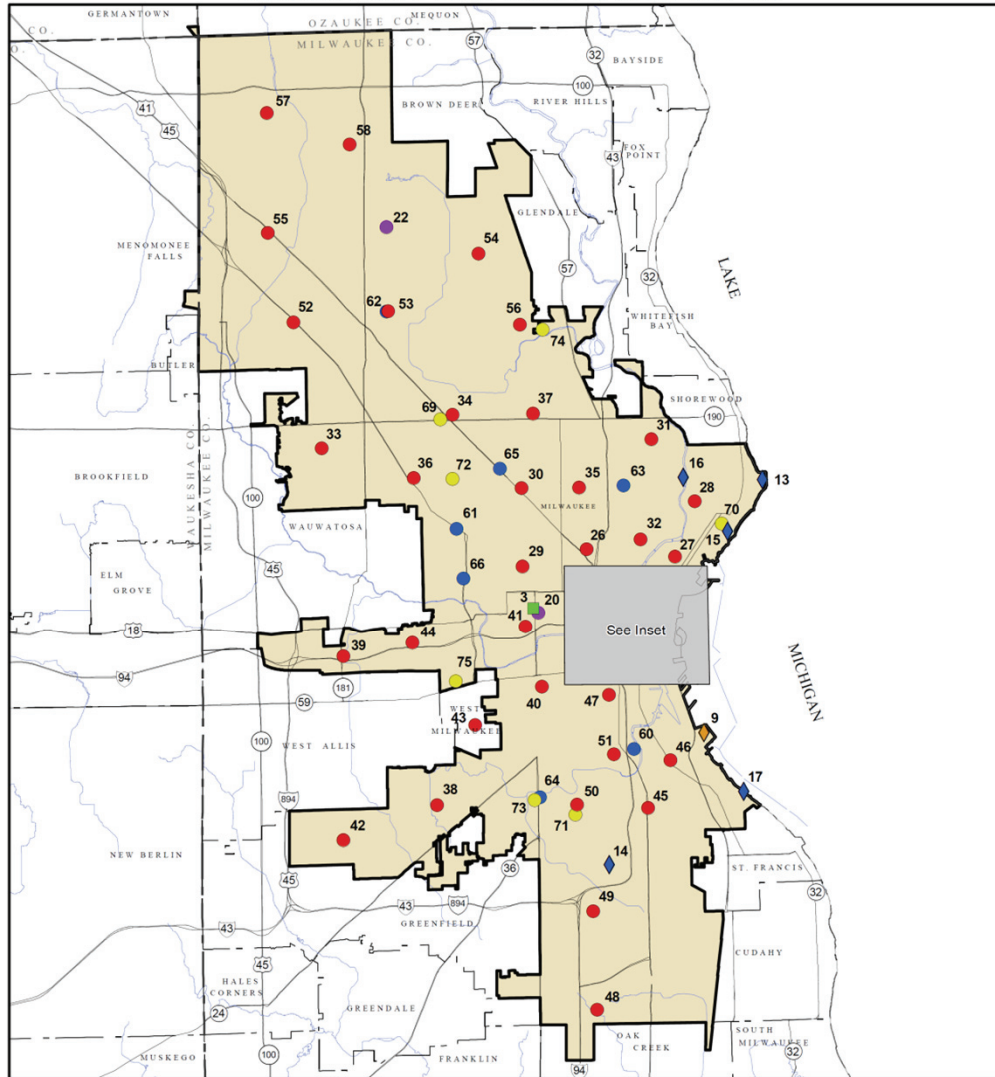
- | | | | | | |
|---|--|---|--|---|--|
|  | PORTION OF THE MILWAUKEE RIVER WATERSHED WITHIN THE CITY OF MILWAUKEE |  | PORTION OF THE ROOT RIVER WATERSHED WITHIN THE CITY OF MILWAUKEE |  | ONE-PERCENT-ANNUAL-PROBABILITY (100-YEAR RECURRENCE INTERVAL) FEMA FLOODPLAINS |
|  | PORTION OF THE MENOMONEE RIVER WATERSHED WITHIN THE CITY OF MILWAUKEE |  | PORTION OF THE OAK CREEK WATERSHED WITHIN THE CITY OF MILWAUKEE |  | SURFACE WATER |
|  | PORTION OF THE KINNICKINNIC RIVER WATERSHED WITHIN THE CITY OF MILWAUKEE |  | PORTION OF THE CITY OF MILWAUKEE THAT DRAINS DIRECTLY TO LAKE MICHIGAN |  | WETLANDS: 2005 |
| | | | |  | MAJOR WATERSHED BOUNDARY |



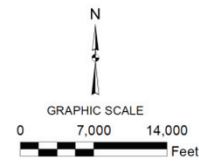
Source: Federal Emergency Management Agency and SEWRPC.

Map II-8

CRITICAL FACILITIES WITHIN THE CITY OF MILWAUKEE: 2010

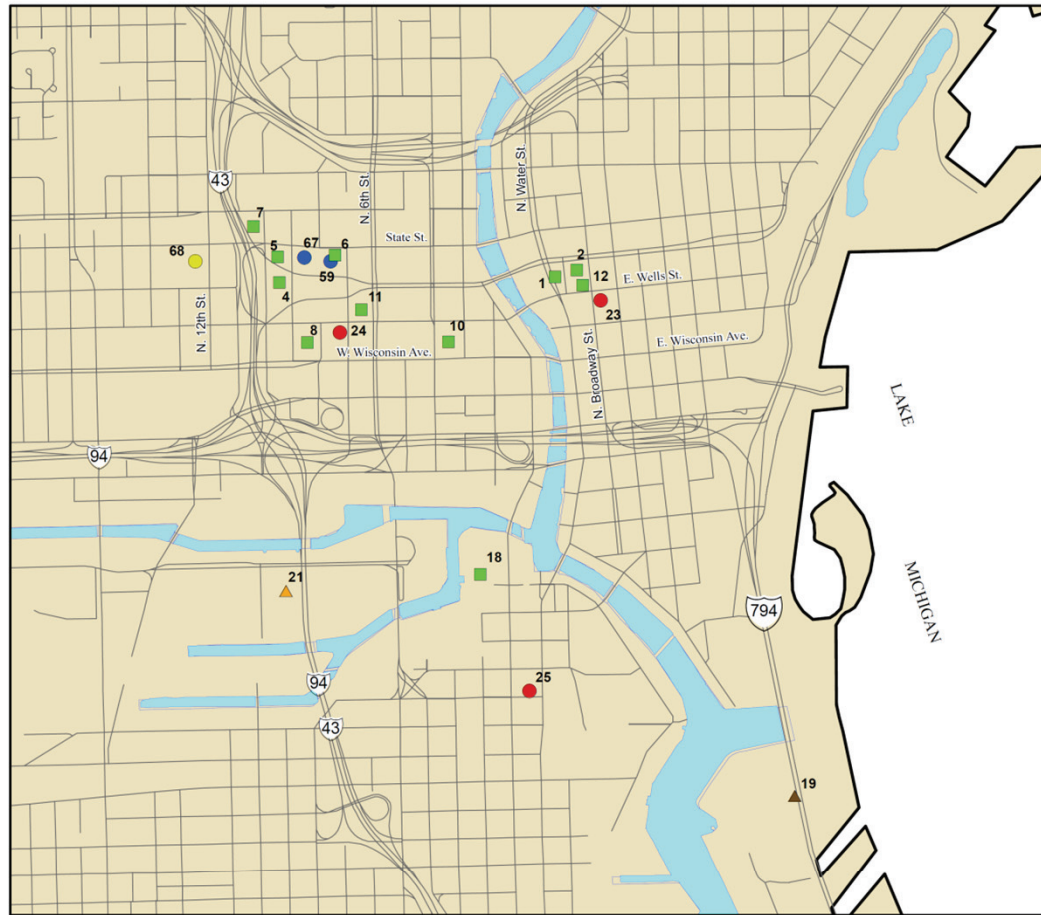


- | | |
|--|--|
| ■ CRITICAL GOVERNMENT FACILITY | ◆ PORT OF MILWAUKEE |
| ● LAW ENFORCEMENT STATION | ● OTHER CRITICAL FACILITIES |
| ● FIRE STATION | CITY OF MILWAUKEE |
| ● HOSPITALS AND MEDICAL CENTERS | 75 CRITICAL FACILITY REFERENCE NUMBER
(SEE APPENDIX B, TABLES B-1 TO B-4) |
| ◆ WATER PURIFICATION PLANTS AND PUMPING STATIONS | |

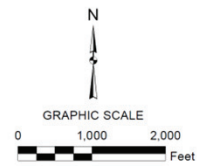


Source: Milwaukee County Automated Mapping and Land Information System (MCAMLIS), City of Milwaukee Master Property File (MPROP), and SEWRPC.

INSET to Map II-8



- CRITICAL GOVERNMENT FACILITY
 - LAW ENFORCEMENT STATION
 - FIRE STATION
 - HOSPITALS AND MEDICAL CENTERS
 - ▲ WASTEWATER TREATMENT PLANT
 - ▲ POWER PLANT
- 24 CRITICAL FACILITY REFERENCE NUMBER
(SEE APPENDIX B, TABLES B-1 TO B-4)



Source: Milwaukee County Automated Mapping and Land Information System (MCAMLIS),
City of Milwaukee Master Property File (MPROP), and SEWRPC.

Hazard Identification

(Chapter III)

Steering Committee Input

From original plan

Hazard and Vulnerability
Assessment Tool

Past Hazard Experience

Frequency of occurrence

Property damages

Fatalities and injuries





Hazard Identification

(Chapter III)

Natural Hazards

Flooding

Thunderstorm, high
wind, hail, lightning

Winter Storms

Tornadoes

Temperature extremes

Coastal erosion

Earthquakes

Hazard Identification

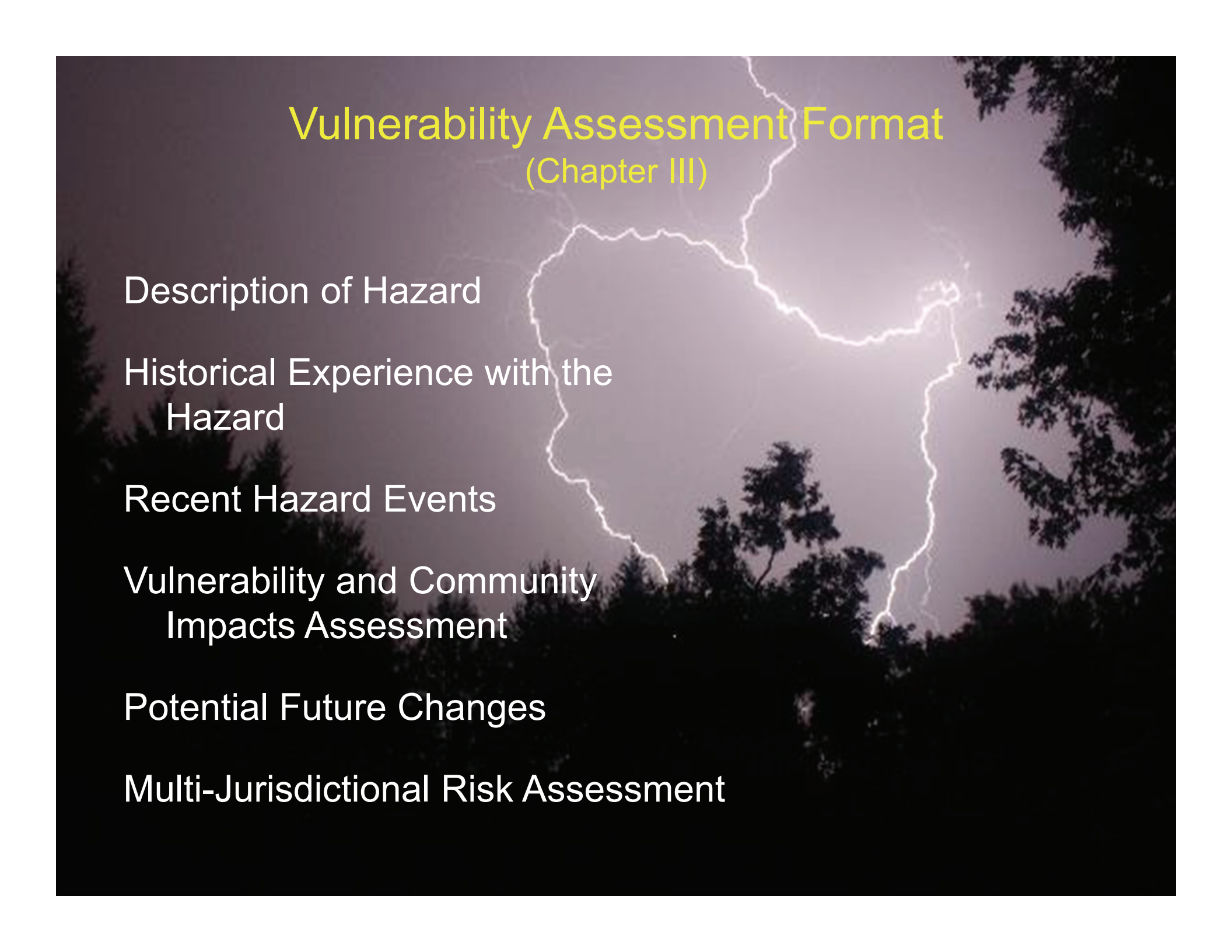
(Chapter III)

Other Hazards

- * Contamination or loss of water supply
- * Hazardous Material incidents



- * Medical/Health Risks
- * Terrorism
- * Major fire or emergency incident



Vulnerability Assessment Format (Chapter III)

Description of Hazard

Historical Experience with the
Hazard

Recent Hazard Events

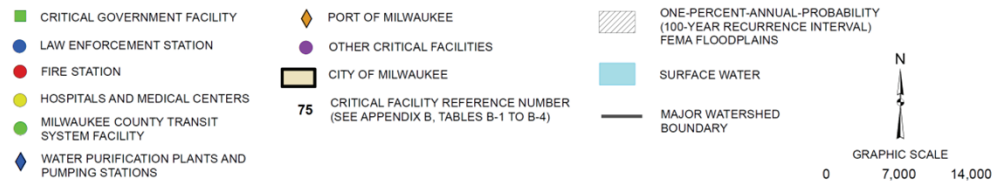
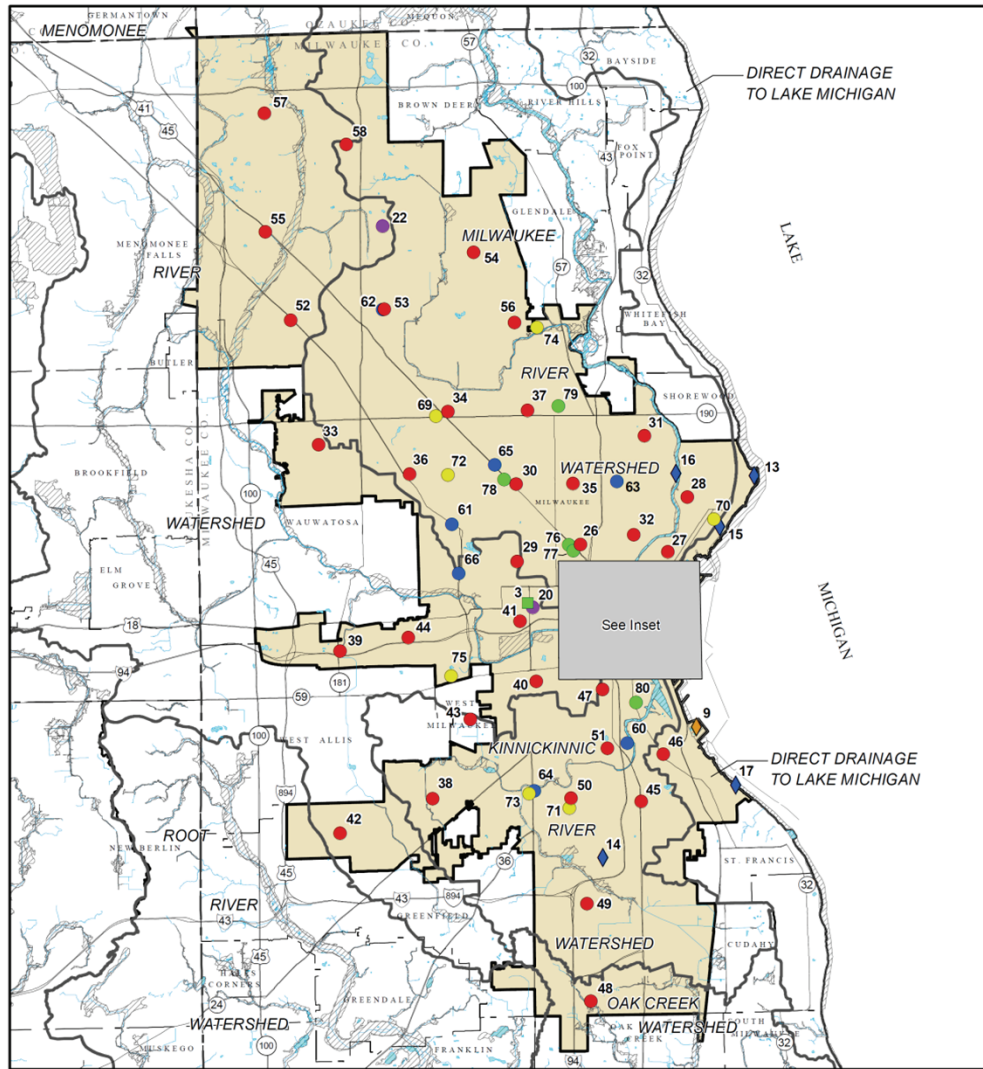
Vulnerability and Community
Impacts Assessment

Potential Future Changes

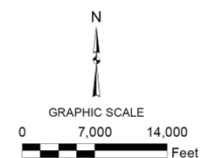
Multi-Jurisdictional Risk Assessment

Map III-1

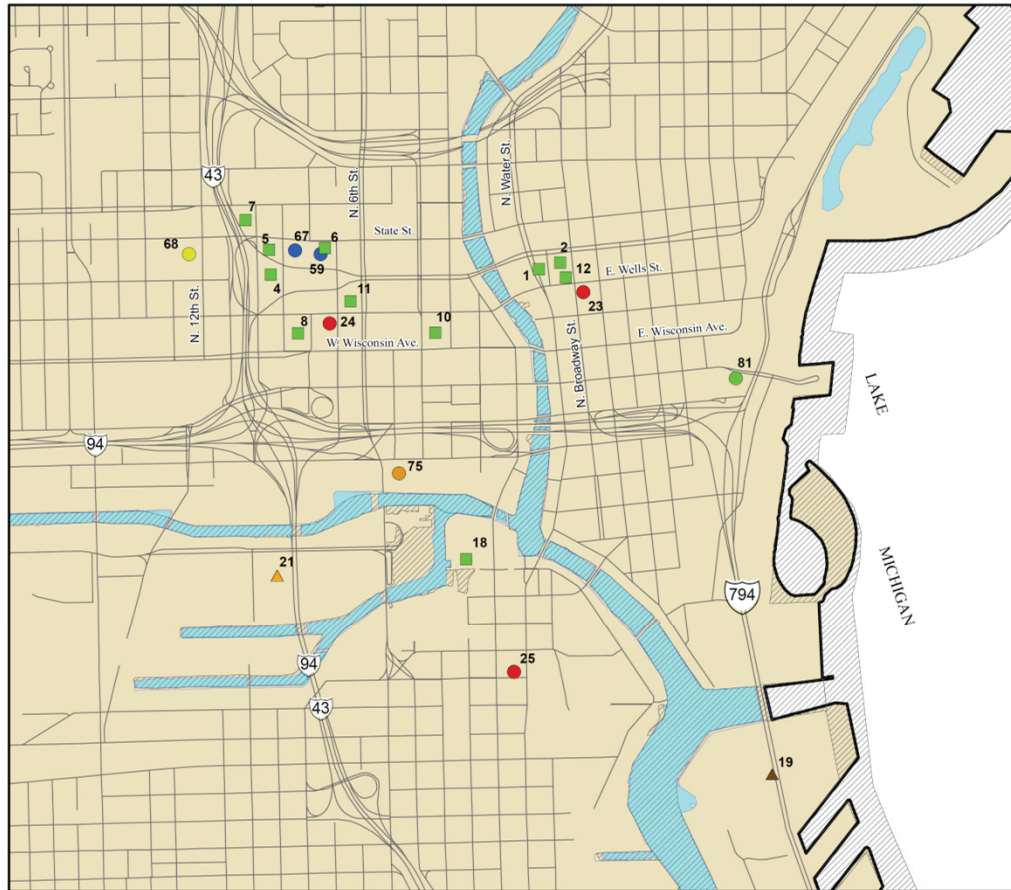
LOCATION OF CRITICAL COMMUNITY FACILITIES IN RELATION TO FLOODPLAINS IN THE CITY OF MILWAUKEE



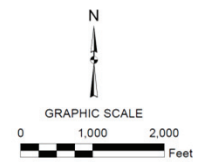
Source: Milwaukee County Automated Mapping and Land Information System (MCAMLIS), City of Milwaukee Master Property File (MPROP), FEMA, and SEWRPC.



INSET to Map III-1



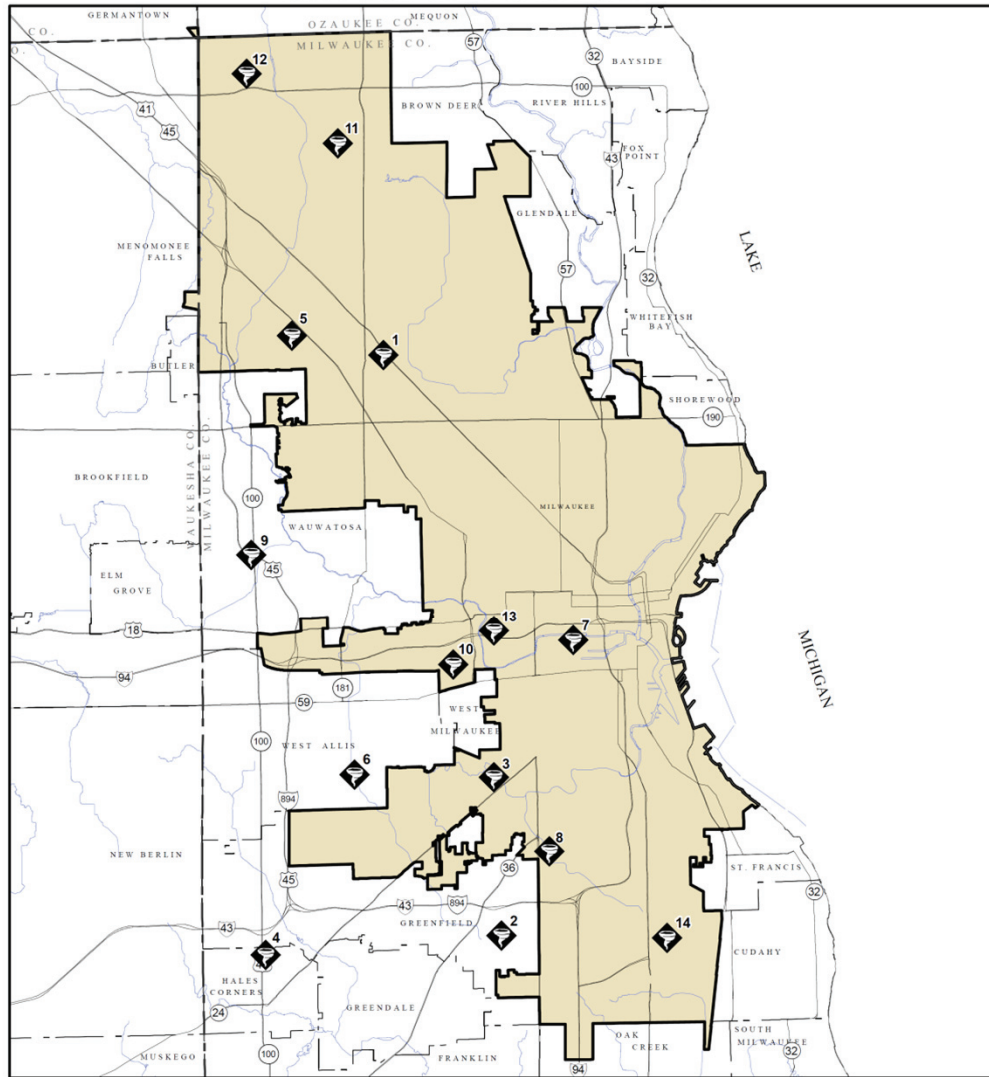
- CRITICAL GOVERNMENT FACILITY
 - LAW ENFORCEMENT STATION
 - FIRE STATION
 - HOSPITALS AND MEDICAL CENTERS
 - MILWAUKEE INTERMODAL STATION
 - MILWAUKEE COUNTY TRANSIT SYSTEM FACILITY
 - ▲ WASTEWATER TREATMENT PLANT
 - ▲ POWER PLANT
- 24 CRITICAL FACILITY REFERENCE NUMBER
(SEE APPENDIX B, TABLES B-1 TO B-4)
 - ONE-PERCENT-ANNUAL-PROBABILITY
(100-YEAR RECURRENCE INTERVAL)
FEMA FLOODPLAINS



Source: Milwaukee County Automated Mapping and Land Information System (MCAMLIS),
City of Milwaukee Master Property File (MPROP), FEMA, and SEWRPC.

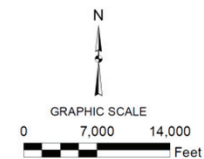
Map III-2

TORNADOES IN THE CITY OF MILWAUKEE: 1950-2010



-  14 REPORTED TORNADO SIGHTING AND REFERENCE NUMBER (SEE TABLE IV-11)
-  CITY OF MILWAUKEE

Source: SEWRPC.



Hazard Mitigation Goals

(Chapter IV)

1. A spatial distribution of the various land uses that minimizes hazards and dangers to health, welfare, and safety as well as further enhancing the economic base of the City, and will result in a compatible arrangement of land uses properly related to the existing and proposed supporting transportation, utility, public safety systems, and public facility systems.
2. A spatial distribution of the various land uses that maintains biodiversity and which will result in the protection and wise use of the natural resources of the City, including its soils, inland lakes and streams, groundwater, wetlands, woodlands, wildlife, and natural areas and critical species habitats.

Hazard Mitigation Goals


(Chapter IV)

3. The provision of facilities necessary to maintain a high quality of fire and police protection and emergency medical services throughout the County.
4. The development of a stormwater management system, floodland management system, and sanitary sewer systems which reduce the exposure of people to drainage- and flooding-related inconvenience and to health and safety hazards and which reduces the exposure of real and personal property to damage through inundation resulting from flooding, inadequate stormwater drainage, or sewerage system capacity.

Hazard Mitigation Goals

(Chapter IV)

5. The identification of high erosion risk Lake Michigan shoreline areas and the development of a coastal erosion management program which reduces the exposure of people and real and personal property to shoreline erosion and bluff recession.
6. The identification and development of programs which complement emergency operations plans from the County and adjacent municipalities, to mitigate the potential exposure to health and safety and the exposure of real and personal property resulting from a broad range of hazards which are unpredictable and not geographically specific in nature.

A photograph of a road under a bridge, viewed from the perspective of someone inside a car. The road is wet and has some debris on it. The bridge structure is visible above and to the sides. The text is overlaid on the image.

Development of Hazard Mitigation Strategies (Chapter V)

Identified alternative strategies

Nonstructural, structural, public information and education

Reviewed current programs

Federal and State, local

Evaluation of alternatives and identification of mitigation actions

Selected and set forth priority mitigation measures

Priority Flood Mitigation Strategies

(Chapter V)

Floodland and wetland zoning and zoning review

Preservation of open and sensitive areas

Purchase, demolition, and removal or floodproofing of 94 structures

Channel cleaning, maintenance, or rehabilitation

Stormwater management planning and regulation

Stormwater management facility maintenance

NFIP map updating

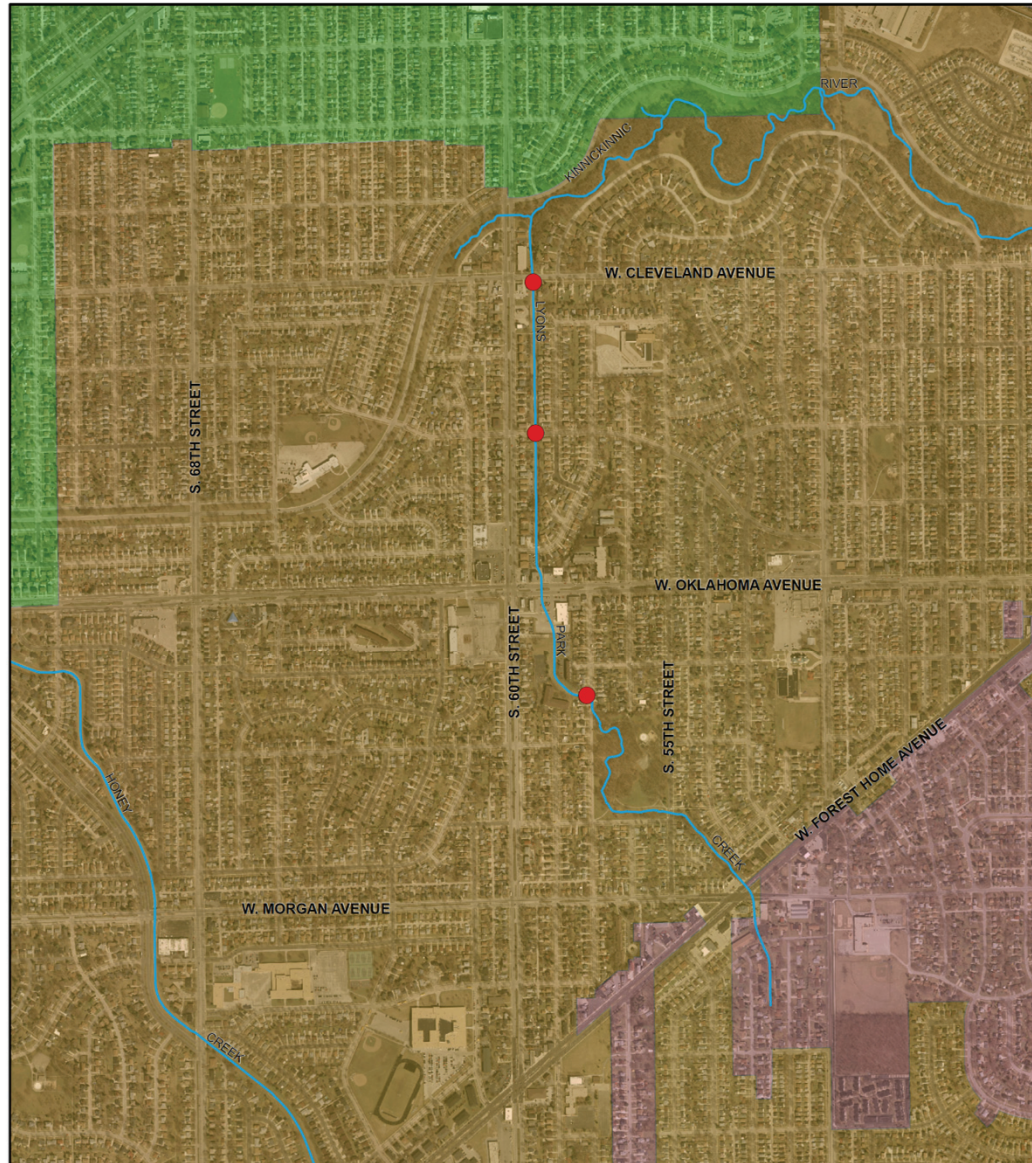
Survey of buildings near flood hazard areas




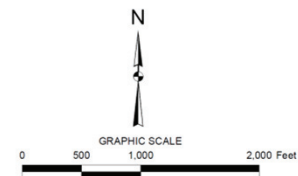
Levee and floodwall construction and improvement

Map V-2

FLOOD CONTROL PLAN FOR LYONS PARK CREEK



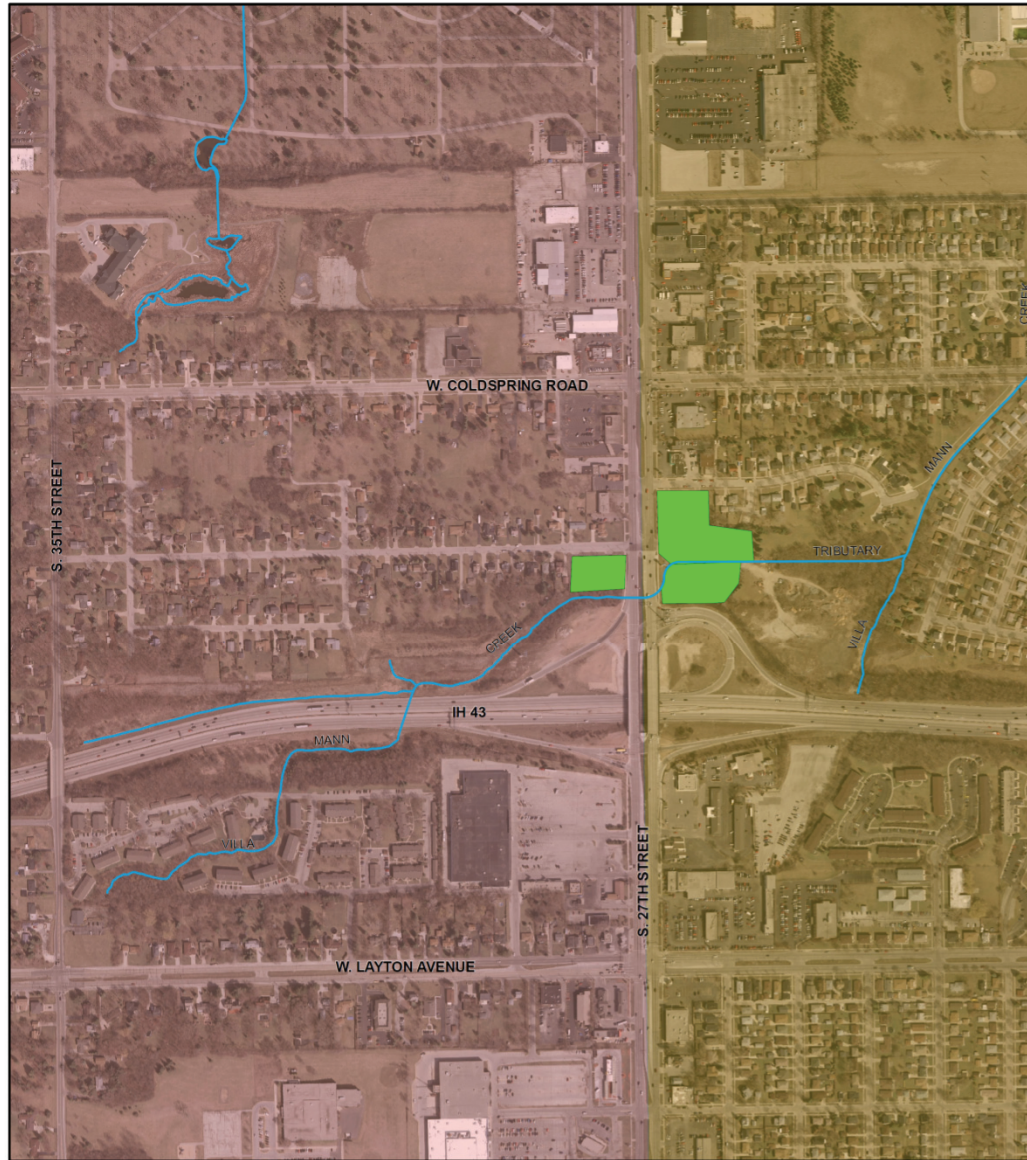
-  CULVERT REPLACEMENT
-  SURFACE WATER
-  CITY OF MILWAUKEE
-  CITY OF WEST ALLIS
-  CITY OF GREENFIELD



Source: Harza Engineering Company and SEWRPC.

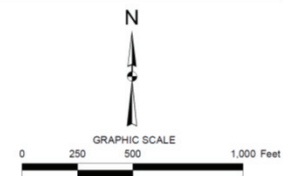
Map V-3

FLOOD CONTROL PLAN FOR VILLA MANN CREEK TRIBUTARY



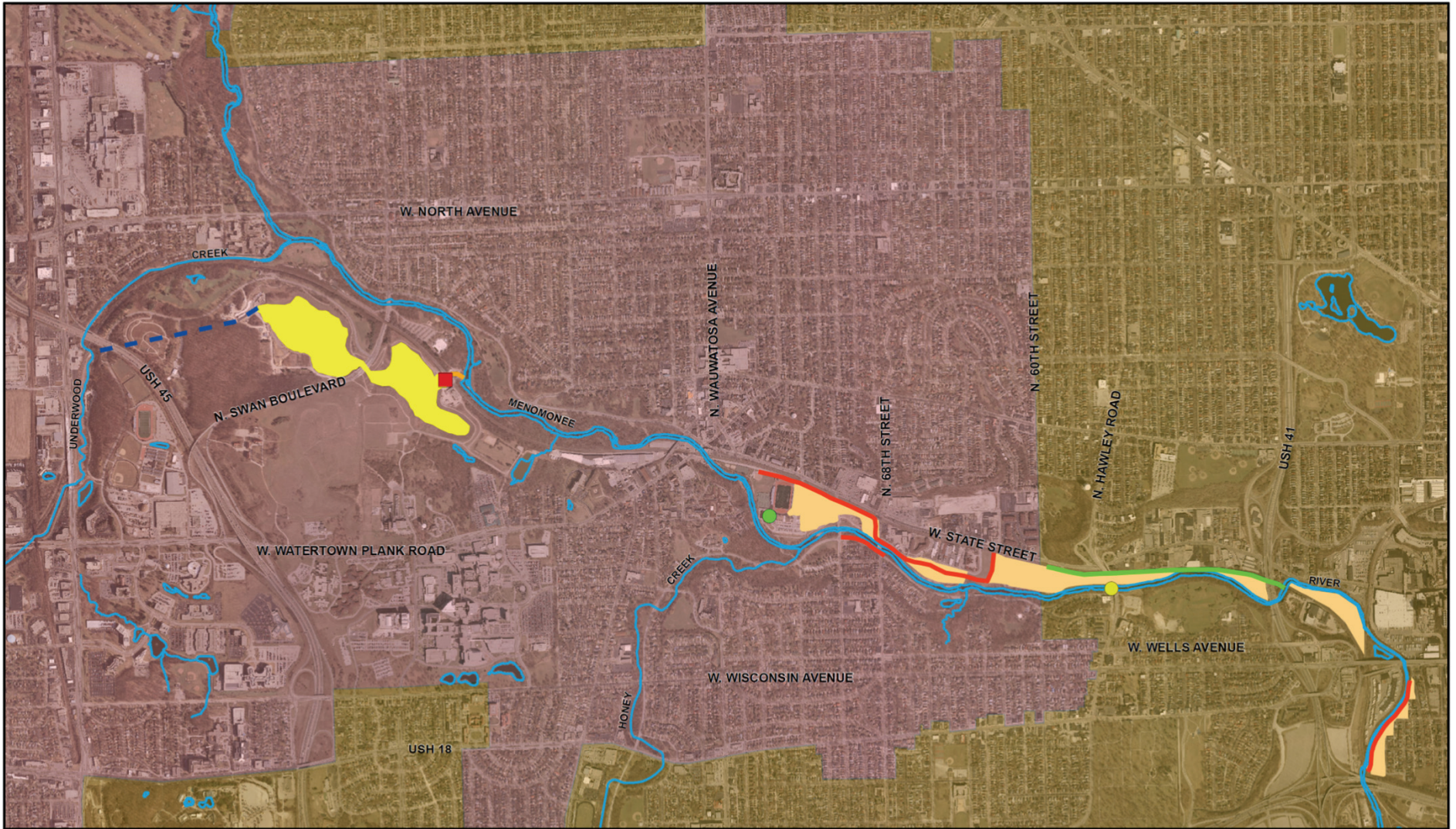
-  FLOODPROOF AREA
-  SURFACE WATER
-  CITY OF MILWAUKEE
-  CITY OF GREENFIELD

Source: SEWRPC.



Map V-4

FLOOD CONTROL FEATURES IMPLEMENTED OR PLANNED FOR THE MEMOMONEE RIVER



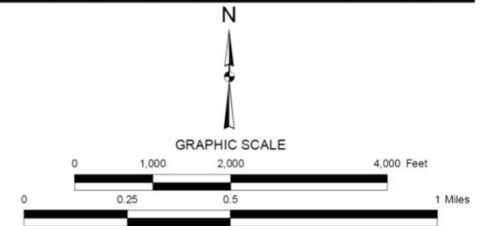
- | | |
|--|--|
| ● STRUCTURE FLOODPROOFING | — LEVEE AND/OR FLOODWALL |
| ACQUISITION AND DEMOLITION AREA | — PROPOSED LEVEE AND/OR FLOODWALL |
| 966 ACRE-FOOT STORAGE BASIN | — OUTFALL CHANNEL |
| ● BRIDGE REMOVAL | — DIVERSION CHANNEL |
| ■ BASIN OUTLET | — SURFACE WATER |



CITY OF MILWAUKEE
CITY OF WAUWATOSA

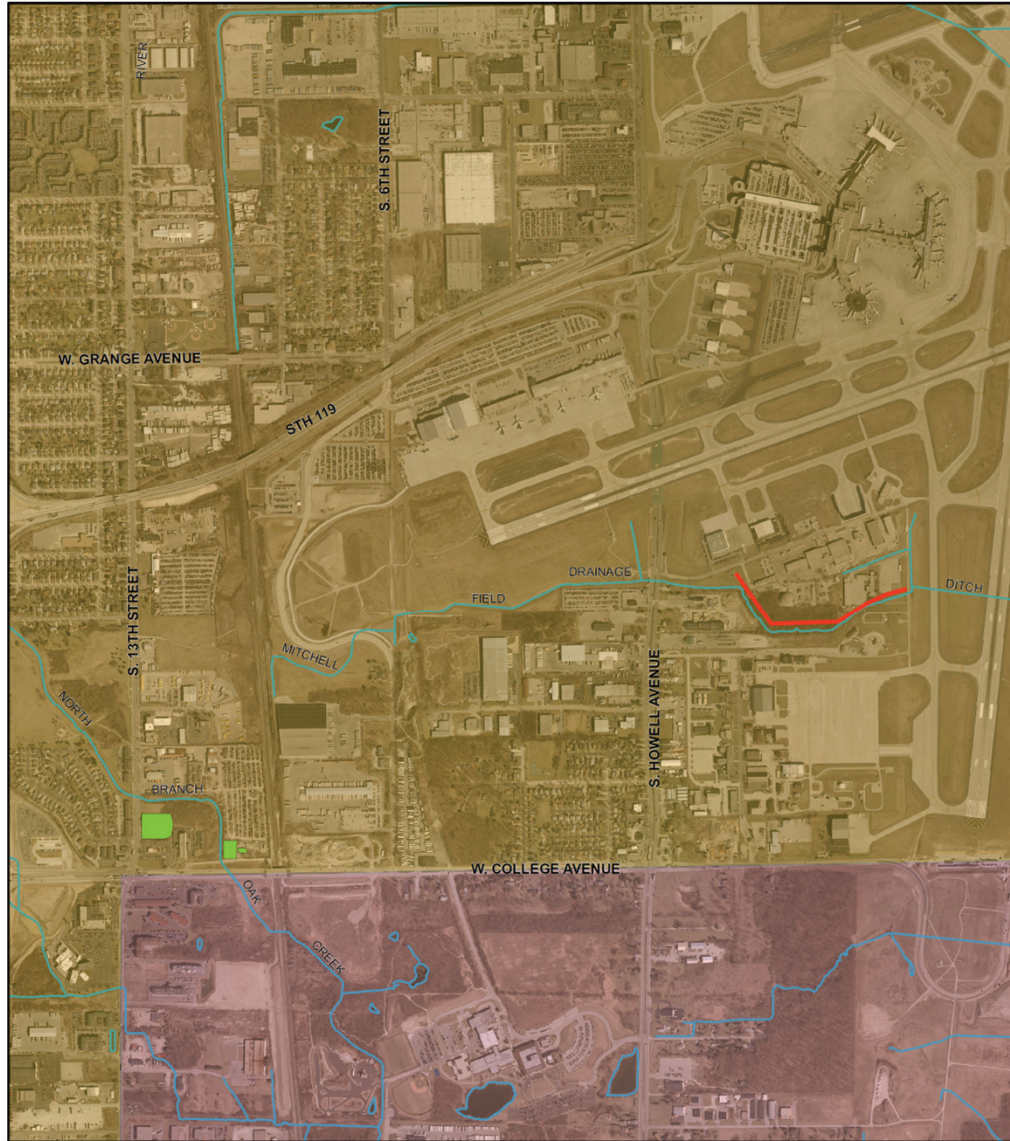
NOTE: The flood control features east of N. 60th Street are proposed in the Western Milwaukee Project portion of the Menomonee River Phase 2 Watercourse Management Plan.

Source: Milwaukee Metropolitan Sewerage District and SEWRPC.

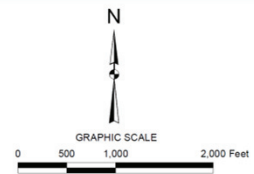


Map V-9

FLOOD CONTROL PLAN FOR THE NORTH BRANCH OF OAK CREEK (PRELIMINARY)
AND THE MITCHELL FIELD DRAINAGE DITCH



-  FLOODPROOFING/ACQUISITION AREAS
-  FLOODWALL
-  SURFACE WATER
-  CITY OF MILWAUKEE
CITY OF OAK CREEK



Source: Milwaukee Metropolitan Sewerage District and SEWRPC.



Priority Mitigation Strategies for Weather-related Hazards

(Chapter V)

Maintain early warning systems

NOAA Weather Radio, EAS broadcasting, HAZCollect, warning sirens

Public information and education

Identify and advertise shelters

Review and enforcement of building code requirements

Continued coordination of local government emergency operations and response plan

Continued implementation of National Incident Management System (NIMS)

Priority Mitigation Strategies for Human-induced Hazards

(Chapter V)



Public information and education

Continued coordination of emergency response

Continued support of training, equipping, planning and preparedness for emergency responders

Continued implementation of NIMS


Priority Ranking of Hazards

Mortality and Injury

Medical and health risks
Temperature extremes
Major fire and emergency incidents
Tornadoes
Thunderstorms, high wind, hail, and lightning
Hazardous material incidents
Winter Storms
Flooding
Contamination or loss of water supply
Terrorism incidents
Coastal erosion
Earthquake

Property Damage

Major fire and emergency incidents
Flooding
Thunderstorms, high wind, hail, and lightning
Tornadoes
Hazardous material Incidents
Winter storms
Coastal erosion
Temperature extremes
Terrorism incidents
Earthquake
Contamination or loss of water supply
Medical and health risks



Plan Implementation (Chapter VI)

For each priority
mitigation strategy

Estimated costs and
benefit

Designated management
agencies

Noted current
implementation
status

Identified potential
funding sources

Plan Adoption (Chapter VI)

The plan will need to be reviewed by the Wisconsin Division of Emergency Management and their comments incorporated.

The plan will need be approved by FEMA

The plan will need to be adopted by:

Milwaukee Common Council



A sunset over a city skyline with water in the foreground. The sky is filled with vibrant colors of orange, red, and purple, reflecting on the water. The city skyline is silhouetted against the bright sun.

Submit Feedback on the Study:

(Up to June 17, 2011)

Comment Sheets

SEWRPC website:

<http://www.sewrpc.org/SEWRPC/communityassistance/ProjectPlanningServices.htm>

Email: jboxhorn@sewrpc.org