CITY OF LOCKPORT
CITY COUNCIL MEETING
AGENDA

WEDNESDAY, APRIL 06, 2022 **7:00 PM OR AT THE CONCLUSION OF THE**
CITY HALL, 3RD FLOOR, BOARD ROOM **COMMITTEE OF THE WHOLE MEETING**

A. PLEDGE OF ALLEGIANCE

B. ROLL CALL

C. INTRODUCTION

D. AGENDA PARTICIPATION

(Any person who wishes to speak on a topic that is on the Agenda of the Meeting shall fill out a Speaker Card before the start of the Meeting, either at the City Clerk's Office, or may give to the City Clerk before the start of the Meeting itself, stating name, and topic on the Agenda to be discussed. Speaker Cards are required for each of the items the Speaker wishes to address. The purpose of the Cards is to obtain the spelling of name of the Speaker, contact information, and provide for efficient meeting administration. All Speakers shall comply with these rules, which shall be posted at the Speaker Sign-In desk and rulings of the City Clerk. Speakers shall be called by name to approach the podium by the City Clerk. A time limit of five (5) minutes shall be imposed on each Speaker.)

Illinois Municipalities may adopt a group of assorted Ordinances, Resolutions, Motions, and orders by a single Roll Call Vote called an Omnibus Vote or approval by Consent Agenda. The Omnibus Vote/Consent Agenda Vote shall be taken following the unanimous consent by the City Council as to the items to be included in the vote. There will be no separate discussion on these items unless a Council Member or Citizen so requests. In that event, the item will be removed from the Omnibus Vote/Consent Agenda and considered in its normal sequence on the Agenda

E. CONSENT AGENDA

CL-1. Committee of the Whole Meeting Minutes from March 16, 2022
Suggested Action: Approve the Committee of the Whole Meeting Minutes from March 16, 2022 as presented.

CL-2. Regular City Council Meeting Minutes from March 16, 2022
Suggested Action: Approve the Regular City Council Meeting Minutes from March 16, 2022

as presented.

CA-1. Reappointment to the Lockport Police Pension Board
Suggested Action: Approve Resolution No. 22-026 the reappointment of the City Finance Director, Lisa Heglund, to the Police Pension Board.

CA-2. Reappointments to the International Code Council Board of Appeals
Suggested Action: Approve Resolution No. 22-028 the reappointments of Sue Dufault and Cean Magosky to the International Code Council Board of Appeals for a three year term, term expiring April 30, 2025, and the extension on the current terms for Ray Sugg, Kathryn Ruane, and Lance McCalla to April 30, 2023.

FN-1. Payroll Period Ending March 20, 2022
Suggested Action: Approve the payroll period as presented.

CED-1. Façade and Site Improvement Grant Request for 109 E. 9th Street
Suggested Action: Approve Resolution No. 22-016 the Facade and Site Improvement Grant for the property located at 109 E. 9th Street in the amount of $7,937.03.

PD-1. Will County Countywide All Hazard Mitigation Plan
Suggested Action: Approve Resolution No. 22-024 adopting the 2020 Countywide all Hazard Mitigation Plan.

PW-1. Installation of Emergency Vehicle Preemption Devices at Four Intersections for a Total Cost of $86,798.00
Suggested Action: Approve Resolution No. 22-027 authorizing the installation of Emergency Vehicle Preemption Devices at four intersections.

F. APPROVAL OF MEETING MINUTES (IF NOT APPROVED AS A CONSENT AGENDA ITEM)

G. APPROVAL OF PAYROLL (IF NOT APPROVED AS A CONSENT AGENDA ITEM)

H. REGULAR BUSINESS ACTION ITEMS

FN-1. Bills Through March 29, 2022
Suggested Action: Approve the various bills as presented.

CA-1. Professional Service Agreement with EPI, Environmental Protection Industries for an Amount Not to Exceed $60,000 for Environmental Assessments of 1728 S. State Street and 1801-1821 S. State Street (f/k/a Tessone Properties) from the Downtown TIF Funds
Suggested Action: Approve Resolution No. 22-030 to enter into a professional service agreement with Environmental Protection Industries for an Environmental Assessment Report of properties: 1728 S. State St. and 1801-1821 S. State St. (f/k/a Tessone properites) in the amount not to exceed $60,000.

PW-1. Award 2022 Roadway Resurfacing Project to PT Ferro in the Amount of $3,066,254.07
Suggested Action: Approve Resolution No. 22-034 authorizing the award of the 2022 Resurfacing Project to PT Ferro Construction in the amount of $3,066,254.07.

PW-2. 2022 MS4 Presentation - Municipal Storm Sewer System
Suggested Action: Information Only.

AT-1. Appointment of Alderman Mark Lobes as the City Council Representative for All Step 3 Grievances Governed Under the Agreement with MAP #75 and the City of Lockport
Suggested Action: Approve Resolution No. 22-039 appointing Alderman Lobes to be the Designated Representative for the City Council for All Step 3 Grievance Appeals Covered under the Agreement with Map #75.

I. PUBLIC HEARING

J. PERMANENT COMMITTEES

K. OPEN FLOOR FOR COMMENTS

(Comments will be heard on items that do not appear on the Agenda. The Public Comment portion of the Agenda shall be subject to a twenty (20) minute limitation. A time limit of five (5) minutes shall be imposed on each Speaker.

The purpose of having Public Comments as an Agenda item is to allow any person to make his/her views known to the City Council upon any subject of general or public interest.

Each person wishing to speak during the Public Comment portion of the Agenda must fill out a Public Comment Speaker Card stating name, and the topic about which he/she wishes to speak as well as a sign-in sheet, and give to the City Clerk at the Meeting itself.

The purpose of the Cards is to obtain the spelling of the name of the Speaker, and provide for efficient meeting administration.

The order of speaking shall be based upon the order of sign-in with first person signing-in speaking first and so forth. If the twenty (20) minutes has elapsed before
all Speakers who have signed up are allowed to speak, the City Council may elect to continue the time period.

However, if the City Council elects not to extend the time period those Speakers who signed up but did not speak may if they so choose to be placed on the next Agenda under the Public Comments Section and shall be placed at the top of the Sign-In Sheet in the same order they were in from the previous Sign-In Sheet.

All Speakers shall comply with these rules which shall be posted at the Speaker Sign-In desk and rulings of the City Clerk.)

L. EXECUTIVE SESSION: OPEN MEETINGS EXEMPTIONS

2(c)(1) Appointments, Employment, Compensation, Discipline, Performance or Dismissal of specific Employees.

2(c)(2): Collective negotiating matters between the public body and its employees or their representatives, or deliberations concerning salary schedules for one or more classes of employees.

2(c)(3) Selection of a person to fill a Public Office, including a vacancy in a Public Office.

2(c)(5) Purchase or Lease of real property, including meetings held for the purpose of discussing whether a particular parcel should be acquired.

2(c)(6) The setting of a price for Sale or Lease of property owned by the public body.

2(c)(11) Litigation, when an action against, affecting or on behalf of the particular public body has been filed and is pending before a court or administrative tribunal, or when the public body finds that an action is probable or imminent, in which case the basis for the finding shall be recorded and entered into the minutes of the closed meeting.

2(c)(21) Discussion of minutes of meetings lawfully closed under this Act, whether for purposes of approval by the body of the minutes or semi-annual review of the minutes as mandated by Section 2.06

M. ADJOURNMENT

City Council

Agenda Memorandum

Item # CL-1

To: **Mayor & City Council**

From: **Donna Tadey, Administrative Deputy City Clerk**

Subject: **Committee of the Whole Meeting Minutes from March 16, 2022**

Date: **Wednesday, April 6, 2022**

BACKGROUND/HISTORY

Provided are the Committee of the Whole Meeting Minutes from March 16, 2022.

PROS/CONS/ALTERNATIVES

N/A

RECOMMENDATION

Approve the Committee of the Whole Meeting Minutes as presented.

ATTACHMENTS

Committee of the Whole Meeting Minutes from March 16, 2022

SPECIFIC CITY COUNCIL ACTION REQUIRED

Approve the Committee of the Whole Meeting Minutes from March 16, 2022 as presented.

L O C K P O R T

Mayor
Steven Streit

City Clerk
Kathleen Gentile

Administrator
Ben Benson

Alderman

Matt Kairis - 1st Ward
Karen Kostecki - 1st Ward
Larry Schreiber - 2nd Ward
JR Gillogly - 2nd Ward
Christina Bergbower – 3rd Ward
Renee Saban - 4th Ward
Joanne Bartelsen - 4th Ward
Mark Lobes – At-large

City of Historic Pride
222 E. Ninth Street Lockport, IL 60441-3497

Proceedings of the Committee of the Whole of the City of Lockport, Illinois March 16, 2022

VIDEO IS HEREIN INCORPORATED INTO THE OFFICIAL MINUTES

REGULAR MEETING of the Committee of the Whole of the City of Lockport, Illinois was held on Wednesday, March 16, 2022 in the Board Room, 3rd Floor, of the Central Square Building, 222 E. Ninth Street, Lockport, Illinois. Mayor Steve Streit called the Meeting to order at 7:00 pm.

ROLL CALL

PRESENT: Mayor, Steve Streit
Alderwoman, Renee Saban
Alderman, Mark Lobes
Alderwoman, Christine Bergbower
Alderman, JR Gillogly
Alderman, Larry Schreiber
Alderman, Matt Kairis
Alderwoman, Karen Kostecki
ABSENT: Alderwoman, Joanne Bartelsen
ALSO PRESENT: City Clerk, Kathy Gentile
City Administrator, Ben Benson
Finance Director, Lisa Heglund
City Attorney, Sonni Choi Williams
Director of Public Works, Brent Cann
Director of Community & Economic Development, Lance Thies
Chief of Police, Richard Harang
PRESS: Cathy Wilker, LCTV (Remote)

INVOCATION – Steve Bednarcik, Police Chaplain

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LIAISON'S REPORT

1. Saban – Restaurant Week was very well attended; great feedback from the restaurants.
2. Gillogly
    a. Sidewalk program is in effect- any resident can make a request for repair by April 1. The request can be for any area in the City.
    b. Branch pick-up starts on May 2
    c. Waste Management yard waste pickup begins March 1
    d. Austin Taylor project for Kelvin Grove water main project is underway; 50 homes have been completed; approximately 75 houses remain.
    e. Chief of Police, Richard Harang, updated the Council about the Saturday bar crawl. There were a lot of people in the City; heavy police presence downtown for safety.
3. Bergbower
    a. Waste Management – At Your Door Special Pickup Service – old paint, electronics, etc. and can be booked online (wmatyourdoor.com) or call 800-449-7587. A reminder will be included in April's water bill
    b. Rotary is holding a Pints for Ukraine Event – March 30, 4-9 at Nik and Ivy's
4. Kostecki
    a. Aid to Ukraine Event – collecting medical supplies and personal items starting March 21 thru March 25. Collections will be in the City Gym between the hours of 8-4.

MAYOR'S REPORT

1. Mayor Streit addressed Council to make them aware that, especially now that the restrictions from the pandemic are waning and things are returning to normal, he is open to talking. In the past, individual Council members would reach out, or meet to ask questions and chat about City business. Also, considering that we have new Council members, reach out at any time.

ITEMS RECOMMENDED TO BE PLACED ON THE AGENDA FOR CONSENT OR ACTION AT THE NEXT REGULARLY SCHEDULED CITY COUNCIL MEETING

CA-1. Reappointment to the Lockport Police Pension Board

City Administrator, Ben Benson presented the Staff Report for the reappointments.

DIRECTION: Add to the Consent Agenda for the April 6 City Council Meeting

CA-2. Reappointments to the International Code Council Board of Appeals

City Administrator, Ben Benson presented the Staff Report for the Board reappointments. For consistency, all appointments will be thru April 30 of each term.

DIRECTION: Add to the Consent Agenda for the April 6 City Council Meeting

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CA-3. Consideration for a Lease Transfer from the Lockport Township Park District to the City of Lockport for the Illinois Department of Natural Resources Property Along the I&M Canal in Lockport

City Administrator, Ben Benson presented the Staff Report for the DNR, federally protected properties along the I&M Canal. In the past, the Park District had managed the DNR. The Lease Transfer would move the DNR to the City of Lockport. Several projects would be included in the DNR, including:

- 8th Street Pedestrian Bridge
- City inlets for storm water to the Canal

The Park District has agreed to be a sub-lessee and manage maintenance of some of the properties, under an IGA. A draft agreement will include the details of sub-lessee agreements, costs, license agreements, insurance requirements.

DIRECTION: INFORMATION ONLY

CA-4. Authorize Professional Service Agreement with EPI, Environmental Protection Industries for an Amount Not to Exceed $60,000 for Environmental Assessments of 1728 S. State Street and 1801-1821 S. State Street (f/k/a Tessone Properties) from the Downtown TIF Funds

City Administrator, Ben Benson presented the Staff Report for the Professional services with EPI. The TIF fund had a balance from last year, of approximately $20,000. Recommending a 50% partnership to accomplish the property assessments which will provide the City with valuable information about the environmental situation of the properties and what is required to make them viable for any development.

Discussion among the Council ensued; the results of the assessment, will provide clear direction on next steps for the property. If work is required, the City can then consider applying for specific grants.

The City will require the current owner, and any potential new Buyer, agree that the cost of the study would be a lien on the property, and provide permission to access the property. The study is TIF eligible.

DIRECTION: Add as an Action Item to the Agenda for the April 6 City Council Meeting

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CED-1. Façade and Site Improvement Grant Request for 109 E. 9th Street

Community & Economic Development Director, Lance Thies, presented the Staff Report for the Grant request. 3 bids were obtained. The Applicant is eligible for 50% of the window cost, door cost and removal and install. The additional request from H&A is for an additional door. The building was built in 1899.

DIRECTION: Add to the Consent Agenda for the April 6 City Council Meeting

PW-1. Installation of Emergency Vehicle Preemption Devices at Four Intersections for a Total Cost of $86,798.00

Director of Public Works, Brent Cann, presented the Staff report for the installation of emergency vehicle preemption devices. The devices trigger the intersection to turn green and allow emergency vehicles to proceed thru the intersection. 50/50 cost sharing agreement between the City and the Lockport Township Fire Protection District. The City of Lockport currently has a maintenance agreement with Meade, Inc., and is recommending that the purchase is made thru Meade.

Discussion among the Council regarding the costs. The costs are high, due to covid pricing. This cost was not included in the capital budget and would be an additional cost.

DIRECTION: Add to the Consent Agenda for the April 6 City Council Meeting

PD-1. Request to Adopt Will County Countywide All Hazard Mitigation Plan

Chief of Police, Richard Harang, presented the details regarding the Will County Countywide All Hazard Mitigation Plan. In 2000, the United States Congress passed the Disaster Mitigation Act of 2000, which amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act). As part of this Act, jurisdictions wishing to apply for certain grants must have adopted an All Hazard Mitigation Plan (AHMP) that has been approved by the Federal Emergency Management Agency (FEMA). By participating in this plan, the City would also be eligible for Federal pre-disaster and post-disaster mitigation funds.

DIRECTION: Add to the Consent Agenda for the April 6 City Council Meeting

NEW BUSINESS

1. CED-1. Impact Fees Review and Update - Community & Economic Development Director, Lance Thies, shared the current fees for developers. Council reviewed a comparison of fees with surrounding communities. Review of the increases to developer fees, and the impact of the fees to the new dwellings within the City. City Staff met with local schools to understand registration trends, and projections, to help quantify some of the fees. The

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proposed fees are intended to represent a realistic cost related to offset the impact fees of new homes. The fees are market competitive. The last review of these fees was done in approximately 2006 or 2007. The Council can decide how frequently to review these fees going forward. This item will be brought to a future Committee of the Whole for further discussion.

OPEN FLOOR FOR COMMENTS

1. Stephen Klimczak – Pueblo Point townhomes – damaged mailboxes in the neighborhood. No details on how the mailboxes were damaged. The mailboxes in Pueblo Point are 3-4 multi-unit mailboxes. As a result of the damaged mail boxes, mail delivery was stopped for 16 units. The homeowners have been pleading with the Post Office over 5-6 weeks to resolve the issues, with no response. City Administrator, Ben Benson, will assist.
2. Edwin Desparrois – Victory Leathers - Biker Blessing – seeking Council support to allocate funds for police staff in order to schedule another Biker Blessing in 2023 on State Street. The event charges vendors $50 per table, which is used to help fund police overtime for the event.
    a. The Biker Event in 2021 was not a City sanctioned event, and was intended to help local businesses during the difficult pandemic business shutdown period.
    b. Recommendation that Council creates a policy regarding events, what is required in terms of liability and safety. Create a formula that defines the costs, that will help the event organizers plan to offset the costs.
3. Josh Witkowski – Springfield, Illinois, State Legislative Coordinator of ABATE (A Brotherhood Aimed Towards Education) of Illinois – regarding the Biker Blessing – raised concerns about discrimination against bikers, concerns about restricting specific biker vests.

ADJOURNMENT

MOTION TO ADJOURN THE COMMITTEE OF THE WHOLE MEETING, AT 8:28 pm. MOTION BY BERGBOWER, SECONDED BY LOBES. MOTION PASSED BY VOICE VOTE.

_____

KATHLEEN GENTILE
City Clerk

City Council

Agenda Memorandum

Item # CL-2

To: **Mayor & City Council**

From: **Donna Tadey, Administrative Deputy City Clerk**

Subject: **Regular City Council Meeting Minutes from March 16, 2022**

Date: **Wednesday, April 6, 2022**

BACKGROUND/HISTORY

Provided are the Regular City Council Meeting Minutes from March 16, 2022.

PROS/CONS/ALTERNATIVES

N/A

RECOMMENDATION

Approve the Regular City Council Meeting Minutes as presented.

ATTACHMENTS

Regular City Council Meeting Minutes from March 16, 2022

SPECIFIC CITY COUNCIL ACTION REQUIRED

Approve the Regular City Council Meeting Minutes from March 16, 2022 as presented.

Proceedings of the City Council of the City of Lockport, Illinois
March 16, 2022

VIDEO IS HEREIN INCORPORATED INTO THE OFFICIAL MINUTES

REGULAR MEETING of the City Council of the City of Lockport, Illinois was held on Wednesday, March 16, 2022 in the Board Room, 3rd Floor, of the Central Square Building, 222 E. Ninth Street, Lockport, Illinois. Mayor, Steve Streit, called the Meeting to order at 8:32 p.m.

ROLL CALL

PRESENT: Mayor, Steve Streit
Alderwoman, Renee Saban
Alderman, Mark Lobes
Alderwoman, Christine Bergbower
Alderman, JR Gillogly
Alderman, Larry Schreiber
Alderman, Matt Kairis
Alderwoman, Karen Kostecki
ABSENT: Alderwoman, Joanne Bartelsen
ALSO PRESENT: City Clerk, Kathy Gentile
City Administrator, Ben Benson
Finance Director, Lisa Heglund
City Attorney, Sonni Choi Williams
Director of Public Works, Brent Cann
Director of Community & Economic Development, Lance Thies
Chief of Police, Richard Harang
PRESS: Cathy Wilker, LCTV (Remote)

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APPROVAL OF CONSENT AGENDA ITEMS

MOTION BY LOBES, SECONDED BY SCHREIBER, TO REVIEW CONSENT AGENDA. ROLL VOTE ON THE MOTION:

AYES – SABAN, BERGBOWER, LOBES, GILLOGLY, SCHREIBER, KAIRIS, KOSTECKI
NAYS - NONE
ABSENT – BARTELSEN
ABSTAIN – NONE

7 AYES, 0 NAY, 1 ABSENT, 0 ABSTAIN – MOTION CARRIED

1. CL-1. Committee of the Whole Meeting Minutes from March 2, 2022 Suggested Action: Approve the Committee of the Whole Meeting Minutes from March 2, 2022 as presented.
2. CL-2. Regular City Council Meeting Minutes from March 2, 2022 Suggested Action: Approve the Regular City Council Meeting Minutes from March 2, 2022 2 as presented.
3. PZ-1. Amendment to the Planned Unit Development of Lockport Square to Allow a Self-Storage Facility and an Additional Monument Sign, Amendment to the Preliminary Development Plan and Final Development Plan Review for Self-Storage Facility in Lockport Square, Lot 18/PZC Case #2021-015 Suggested Action: Approve Ordinance No. 22-004 an amendment to the Lockport Square Planned Commercial Development for the purpose to allow a self-storage facility and an additional freestanding sign for property located west of I-355 and south of 159th St. (Life Storage Self-Storage Development Lot 18). Approve Resolution No. 22-025 an amendment to Preliminary Development Plan and Final Development Plan for Self Storage Facility in Lockport Square, Lot 18 (Life Storage Self Storage).
4. FN-1. Bills Through March 8, 2022 Suggested Action: Approve the various bills as presented.
5. FN-2. Payroll Period Ending March 6, 2022 Suggested Action: Approve the payroll period as presented.
6. FN-3. Transfer of Volume Cap in Connection with Private Activity Bond Issues Suggested Action: Approve Ordinance No. 22-003 the transfer of volume cap in connection with private activity bond issues, and related matters.
7. CA-1. Extension of the License Agreement with Midwest SOARRING Foundation for the Use of Office Space at the Metra Station from 2022 to 2025 Suggested Action: Approve Resolution No. 22-010 an extension of a license for Midwest Soarring Foundation for use of a portion of the Lockport Train Station (Metra Station) from 2022 to 2025.
8. CA-2. Reappointments and Appointment to the City of Lockport Heritage and Architecture Commission Suggested Action: Approve Resolution No. 22-023 the Re-Appointments and Appointment to the City of Lockport Heritage and Architecture Commission.
9. PW-1. Purchase of Three (3) New Composite Samplers from Vortex Technologies in the Amount of $19,500.00 Suggested Action: Approve Resolution No. 22-021 authorizing the purchase of three (3) new Composite Samplers.
10. PW-2. Approve Baxter & Woodman Engineering Design, Bidding, & Construction Task Order to Provide Engineering Services for the 2022 Sanitary Sewer Lining in the Amount

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not to exceed $36,500 Suggested Action: Approve Resolution No. 22-022 Baxter & Woodman, Inc. Task Order for 2022 Sanitary Sewer Lining Project engineering related services in the amount of $36,500.00.

11. PW-3. Purchase of Two (2) New Flygt Influent Pumps from Xylem in the Amount of $84,720.12 Suggested Action: Approve Resolution No. 22-020 authorizing the purchase of two (2) new Flygt Influent Pumps.

MOTION BY SABAN, SECONDED BY SCHREIBER, TO APPROVE CONSENT AGENDA. ROLL VOTE ON THE MOTION:

AYES – SABAN, BERGBOWER, LOBES, GILLOGLY, SCHREIBER, KAIRIS, KOSTECKI
NAYS - NONE
ABSENT – BARTELSEN
ABSTAIN – NONE

7 AYES, 0 NAY, 1 ABSENT, 0 ABSTAIN – MOTION CARRIED

REGULAR BUSINESS

PZ-1. Adoption of the City of Lockport Official Zoning Map

MOTION TO APPROVE ORDINANCE NO. 22-005 ADOPTING AND AUTHORIZING THE PUBLICATION OF THE UPDATED CITY OF LOCKPORT OFFICIAL ZONING MAP. MOTION BY LOBES, SECONDED BY SABAN, TO APPROVE CONSENT AGENDA. ROLL VOTE ON THE MOTION:

AYES – SABAN, BERGBOWER, LOBES, GILLOGLY, SCHREIBER, KAIRIS, KOSTECKI
NAYS - NONE
ABSENT – BARTELSEN
ABSTAIN – NONE

7 AYES, 0 NAY, 1 ABSENT, 0 ABSTAIN – MOTION CARRIED

ADJOURNMENT

MOTION BY SCHREIBER, SECONDED BY LOBES, TO ADJOURN THE CITY COUNCIL MEETING, 8:34 PM. MOTION APPROVED BY VOICE VOTE.

_____

KATHLEEN GENTILE
City Clerk

City Council

Agenda Memorandum

Item # CA-1

To: **Mayor & City Council**

From: **Donna Tadey, Administrative Deputy City Clerk**

Subject: **Reappointment to the Lockport Police Pension Board**

Date: **Wednesday, April 6, 2022**

BACKGROUND/HISTORY

City of Lockport Police Pension Board administers the Police Pension Fund and designates the beneficiaries thereof. By State law, the Police Pension Board consists for five (5) members; two members of the board shall be appointed by the Mayor of the City; the third and fourth members of the Board shall be elected from the active participants of the pension fund by such active participants. The fifth member shall be elected by and from the beneficiaries.

Pursuant to Section 32.022 of the City Code, the Board members appointed by the Mayor shall serve for two years each or until their successors are appointed and qualified. City Finance Director, Lisa Heglund, currently serves on the Police Pension Board as one of the two Mayoral appointees with term expiring May 9, 2022. With the staggering of terms of the members, the other Mayoral appointee's term expires the 2nd Monday in May, 2023.

PROS/CONS/ALTERNATIVES

N/A

RECOMMENDATION

Reappoint Lisa Heglund, Finance Director for the City of Lockport as Mayoral appointee to the Lockport Police Pension Board for a two year term. Term expiring May 13, 2024.

ATTACHMENTS

Resolution No. 22-026 Approving the appointment of the City Finance Director to the Police Pension Board

SPECIFIC CITY COUNCIL ACTION REQUIRED

Approve Resolution No. 22-026 the appointment of the City Finance Director, Lisa Heglund, to the Police Pension Board.

RESOLUTION NO. 22-026

A RESOLUTION APPROVING THE APPOINTMENT OF THE CITY FINANCE DIRECTOR, LISA HEGLUND, TO THE POLICE PENSION BOARD

WHEREAS, City of Lockport Police Pension Board administers the Police Pension Fund and designates the beneficiaries thereof; and

WHEREAS, by State law, the Police Pension Board consists of five (5) members; two members of the Board shall be appointed by the Mayor of the city; the third and fourth members of the Board shall be elected from the active participants of the pension fund by such active participants. The fifth member shall be elected by and from the beneficiaries; and

WHEREAS, Pursuant to Section 32.022 of the City Code, the Board members appointed by the Mayor shall serve for two years each or until their successors are appointed and qualified; and

WHEREAS, City Finance Director, Lisa Heglund currently serves on the Police Pension Board as one of the two Mayoral appointees and her term expires May 9, 2022. With the staggering of terms of the members, the other Mayoral appointee's term expires the 2nd Monday in May, 2023; and

WHEREAS, In order to assure compliance with the City Code, the second Mayoral appointee Board member shall serve a two year term beginning on the second Tuesday in May; and

WHEREAS, the Mayor desires to reappoint to the Police Pension Board, City Finance Director, Lisa Heglund, for a two year term beginning May 10, 2022 and expiring May 13, 2024.

NOW, THEREFORE, be it resolved by the Mayor and City Council of the City of Lockport, Will County, Illinois, as follows:

SECTION 1: Approve the reappointment of City Finance Director, Lisa Heglund to the Police Pension Board for a two year term to May 13, 2024.

SECTION 2: This Resolution shall be in full force and effect from and after its passage and approval as provided by law.

PASSED AND APPROVED this _____day of _____, 2022, with:

_____ALDERPERSONS voting aye _____ALDERPERSONS voting nay

_____ALDERPERSONS absent _____ALDERPERSONS abstaining

The MAYOR voting aye _____ voting nay _____ not voting _____

_____SABAN _____BARTELSEN _____ LOBES _____BERGBOWER

_____GILLOGLY _____SCHREIBER _____KAIRIS _____KOSTECKI _____MAYOR

_____ ATTEST: _____

Steve Streit, Mayor Kathleen Gentile, City Clerk

City Council

Agenda Memorandum

Item # CA-2

To: **Mayor & City Council**

From: **Donna Tadey, Administrative Deputy City Clerk**

Subject: **Reappointments to the International Code Council Board of Appeals**

Date: **Wednesday, April 6, 2022**

BACKGROUND/HISTORY

Pursuant to Chapter 152.02, Section 113.1 in order to hear and decide appeals of orders, decisions or determinations made by the Building Official or their designee relative to the application and interpretation of the code, the International Code Council Board of Appeals (ICC) shall act as the Board of Appeals.

Pursuant to Section 113.4 of Chapter 152, the ICC shall consist of five voting members appointed by the Mayor and approved by the City Council, who reside in the city, and two ex-officio, nonvoting members consisting of City Council members appointed by the Mayor. The voting members appointed by the Mayor and approved by City Council shall consist of: three members shall be citizens-at-large; one member shall be a building contractor of have building experience; and, one member shall be a member of the Lockport business community.

Section 113.4.1 as contained in Section 152.02 prescribes current members shall remain on the board until a successor has been appointed. Each successive appointment shall be for a term of three years or until a successor has been appointed.

ICCBA members Sue Dufault and Cean Magosky terms expire on April 1st and both board members have expressed their willingness to continue serving on the ICCBA. Currently, ICCBA Members Ray Suggs, Kathryn Ruane, and Lance McCalla's terms expire on April 1st, 2023 with ICCBA Member Neal Wheeler's term expiring on April 30, 2024. For consistency with other appointed members of the City's various Commissions, and Boards, these board members terms will be extended to April 30th for each respective year.

PROS/CONS/ALTERNATIVES

N/A

RECOMMENDATION

Approve Resolution No. 22-028 for the appointments to the International Code Council Board of Appeals.

ATTACHMENTS

Resolution No. 22-028 Approving the appointments of Sue Dufault and Cean Magosky to the ICCBA

SPECIFIC CITY COUNCIL ACTION REQUIRED

Approve Resolution No. 22-028 the appointments of Sue Dufault and Cean Magosky to the International Code Council Board of Appeals, and the extension on the current terms for Ray Sugg, Kathryn Ruane, and Lance McCalla to April 30, 2023.

RESOLUTION NO. 22-028

A RESOLUTION APPROVING THE APPOINTMENTS OF SUE DUFAULT AND CEAN MAGOSKY TO THE INTERNATIONAL CODE COUNCIL BOARD OF APPEALS

WHEREAS, pursuant to §152.02 of Chapter 152 that added Section 113.4 as an amendment to the 2015 International Building Code, the International Code Council ("ICC") Board of Appeals consists of five voting members appointed by the Mayor and approved by the City Council, who reside in the city, and two ex-officio non-voting members consisting of City Council Members appointed by the Mayor; and

WHEREAS, the voting members appointed by the Mayor and approved by the City Council shall consist of three members being citizens at large; one member being a building contractor or have building experience; and one member shall be a member of the Lockport business community; and

WHEREAS, Section 113.4.1 as contained in §152.02 prescribes each successive appointment shall be for a term of three years or until a successor has been appointed; and

WHEREAS, Sue Dufault and Cean Magosky's current terms on the ICCBA will expire April 1, 2022; and

WHEREAS, the Mayor desires to reappoint Sue Dufault to the ICCBA as the business community liaison member, and Cean Magosky to the ICCBA as a citizen-at-large member to serve until April 30, 2025; and

WHEREAS, the Mayor desires to extend the current terms of Board members, Ray Sugg's term from April 1, 2023 to April 30, 2023, Kathryn Ruane's term from April 1, 2023 to April 30, 2023, and Lance McCalla's term from April 1, 2023 to April 30, 2023.

NOW THEREFORE, be it resolved by the Mayor and City Council of the City of Lockport, Will County, Illinois, as follows:

SECTION 1: Approve the reappointments of Sue Dufault as the business community liaison member, and Cean Magosky as a citizen-at-large member to the International Code Council Board of Appeals for a three year term to April 30, 2025.

SECTION 2: Approve the extension on the current terms for Ray Sugg to April 30, 2023, Kathryn Ruane to April 30, 2023, and Lance McCalla to April 30, 2023.

SECTION 3: This Resolution shall be in full force and effect from and after its passage and approval as provided by law.

PASSED AND APPROVED this_____ day of _____, 2022, with

_____ALDERPERSONS voting aye **_____ALDERPERSONS absent**

_____ALDERPERSONS voting nay **_____ALDERPERSONS abstaining**

The MAYOR voting aye _____voting nay _____not voting _____

_____KOSTECKI _____KAIRIS _____SCHREIBER _____GILLOGLY

_____BERGBOWER _____LOBES _____BARTELSEN _____SABAN

_____MAYOR

_____ ATTEST: _____

Steve Streit, Mayor **Kathleen Gentile, City Clerk**

PAYROLL SUMMARY

For Pay Period March7 - March 20, 2022
Paid on March 25, 2022
Fiscal Year 2022

Department	CURRENT PAY PERIOD[1]				YEAR TO DATE[2]					
	Base Salary		Overtime		Base Salary			Overtime		
	Actual	Budget	Actual	Budget	Actual	Budget	%	Actual	Budget	%
Administration & City Council	21,734.11	25,692.31	-	38.46	$ 131,213.11	$ 154,153.85	85.1%	-	$ 230.77	0.0%
Commuter Lot	105.05	192.31	-	-	$ 535.25	$ 1,153.85	46.4%	-	$ -	n/a
Police	176,797.30	178,819.23	11,299.26	5,769.23	$ 1,010,659.74	$ 1,072,915.38	94.2%	45,910.54	$ 34,615.38	132.6%
Planning	11,855.49	10,884.62	-	38.46	$ 61,529.98	$ 65,307.69	94.2%	-	$ -	n/a
Building	8,888.55	9,615.38	-	38.46	$ 51,305.21	$ 57,692.31	88.9%	-	$ -	n/a
Engineering **	11,702.15	16,038.46	479.91	192.31	$ 67,006.68	$ 96,230.77	69.6%	1,843.34	$ 1,153.85	159.8%
Maintenance	3,163.34	5,269.23	-	38.46	$ 18,302.04	$ 31,615.38	57.9%	-	$ 230.77	0.0%
Street	30,228.53	34,692.31	5,227.16	4,615.38	$ 168,145.07	$ 208,153.85	80.8%	66,391.60	$ 27,692.31	239.7%
ESDA	461.50	480.77	-	-	$ 2,603.08	$ 2,884.62	90.2%	-	$ -	n/a
Special Events***	-	-	-	1,346.15	$ -	$ -	n/a	-	$ 8,076.92	0.0%
Water - Administration	5,521.00	5,846.15	-	38.46	$ 30,510.12	$ 35,076.92	87.0%	-	$ 230.77	0.0%
Water	35,856.63	39,230.77	2,917.38	4,038.46	$ 201,616.77	$ 235,384.62	85.7%	11,923.80	$ 24,230.77	49.2%
Sewer	33,286.82	37,115.38	1,288.07	2,884.62	$ 182,855.89	$ 222,692.31	82.1%	11,613.29	$ 17,307.69	67.1%
TOTALS	**$ 339,600.47**	**363,876.92**	**$ 21,211.78**	**19,038.46**	**$ 1,926,282.94**	**$ 2,183,261.54**	**88.2%**	**$ 137,682.57**	**$ 113,769.23**	**121.0%**

**** NOTE:** Engineering salaries related to Capital Projects construction site observations will be allocated to the costs of the related projects at the end of the year.
***** NOTE:** Special Events line has been added and includes Canal Days

[1] Budgeted figures for the current pay period are calculated by taking the full budgeted line item and dividing by 26.
[2] Year to Date numbers are from 1/1/22 through 3/20/22

City Council

Agenda Memorandum

Item # CED-1

To: **Mayor & City Council**

From: **Lance Thies, Director of Community and Economic Development**

Subject: **Façade and Site Improvement Grant Request for 109 E. 9th Street**

Date: **Wednesday, April 6, 2022**

BACKGROUND/HISTORY

The applicant, Patrick Maier, on behalf of MD Properties LLC, is requesting funds through the City's Façade & Site Improvement Grant Program for the replacement of the business storefront window and entry door for the property located at 109 E. 9th Street.

The current tenant on the main floor is Edward Jones, an investment brokerage, and has been at this location for over 20 years. By replacing the 50 year old window and entry door, the applicant desires to improve the efficiency of the building and make the façade more attractive in coordination with the upcoming streetscape project this summer.

The case was heard by the Heritage & Architecture Commission on February 15, 2022. The Commission approved the project and granted a Certificate of Appropriateness (COA) with conditions that the color of the door be a natural wood and that the glass at 109 E. 9th be ¾ tall with a rectangular trim detail below in the solid wood section, consistent with the architecture and vintage of the building. The applicant had originally only submitted the door for 109 E. 9th Street but the Commission requested that the City Council consider approval of additional grant funds to cover the cost of installing a similar door at 107 E. 9th Street (part of the same building but accesses apartments above) directly adjacent to the 109 E. 9th Street door. Absent that, the 107 door would have remained white with inconsistent paneling when compared to the new wood grain/appearance door that would be installed at 109. City staff agreed with this recommendation and are presenting it for your consideration. The Façade Grant fund has $160,000 budgeted for projects this year. To date, the Council has approved $3,100 in projects leaving a remainder of $156,900. There is only $10,300 in outstanding grants from previous years for projects yet to be completed. City staff believes there is sufficient funding to support the additional small investment.

Three contractor bids for the window and door replacement were received for the project and are as follows (MD Properties would self perform demolition and install):

Windows:		Notes:
TripleGGG	$ 5,400.00	Includes window only cost
Chicago Glass Co of IL:	$ 14,115.00	Includes window + 109 E. 9th Door
Clear View Industries:	$ 9,800.00	Includes window + 109 E. 9th Door
Doors:		
Schaff	$ 3,698.08	109 E. 9th
MD Properties:	$ 1,025.00	Removal of existing & install of new door at 109 E. 9th
Schaff	$ 2,040.49	107 E. 9th
MD Properties:	$ 835.00	Removal of existing & install of new door @ 107 E. 9th

The Façade Grant program allows for a 50% match up to $20,000 per façade and $10,000 for site improvements with a maximum of $50,000 per property (inclusive of architectural fees). For 109 E. 9th Street, the applicant is eligible for $5,061.54 ($10,123.08 * 50%), the maximum amount allowed for façade improvements based on the lowest quote of $5,400.00 (Window) + $3,698.08 (109 E. 9th Door) + $1,025.00 (Removal & install). In addition, based on the request from H/A, and because it was not part of the applicant's request or internal budgeting, staff is requesting $2,875.49 for the door at 107 E. 9th. Total, the approval amount would be $7,937.03.

PROS/CONS/ALTERNATIVES

N/A

RECOMMENDATION

Staff recommends approval of the façade grant request in the amount of $7,937.03. Funds will be released upon completion of the work with required proof of payment.

ATTACHMENTS

Resolution No. 22-016 Approving Facade and Site Improvement Grant for property located 109 E. 9th Street

Façade Grant application

Contractor estimates

Existing picture

SPECIFIC CITY COUNCIL ACTION REQUIRED

Approve Resolution No. 22-016 the Facade and Site Improvement Grant for the property located at 109 E. 9th Street in the amount of $7,937.03.

RESOLUTION NO. 22-016

A RESOLUTION APPROVING THE FAÇADE AND SITE IMPROVEMENT GRANT FOR THE PROPERTY LOCATED AT 109 E. 9th STREET IN THE AMOUNT OF $7,937.03

WHEREAS, Ordinance 20-002 amended the Facade and Site Improvement Grant program for commercially zoned property located within the target area as designated by the City of Lockport funded from general revenues for purposes of control and prevention of blight, dilapidation and deterioration of the visible exterior of buildings, structures and site conditions; and

WHEREAS, the grant is provided to owners and tenants in recognition of the positive impact that individual building and site improvements can have on the overall appearance, quality and vitality of the City; and

WHEREAS, Patrick Maier, on behalf of MD Properties LLC, has submitted application to the City for Façade and Site Improvement Grant funds in the amount of $7,937.03 for the replacement of the storefront window and entry door, and

WHEREAS, the Mayor and City Council of the City of Lockport have determined that the grant application meets the criteria prescribed in Ordinance 20-002 and there is adequate funding to grant the maximum allowed amount under Ordinance 20-002.

NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND CITY COUNCIL OF THE CITY OF LOCKPORT, ILLINOIS, AS FOLLOWS:

SECTION ONE: The façade and site improvement grant application for the property at 109 E. 9th Street shall be granted in the amount of $7,937.03 for the proposed new window and door.

SECTION TWO: This Resolution shall become effective immediately upon passage and approval as provided by law.

PASSED this _____ day of _____, 2022, with

_____ALDERMEN voting aye _____ALDERMEN abstaining

_____ALDERMEN voting nay _____ALDERMEN absent

The MAYOR voting aye _____, voting nay _____, not voting _____

_____ BARTELSEN _____ BERGBOWER _____ GILLOGLY _____ KAIRIS

_____ KOSTECKI _____ LOBES _____ SABAN _____ SCHREIBER

_____ MAYOR **ATTEST:**

_____ _____

Steven Streit, Mayor **Kathleen Gentile, City Clerk**

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JAN 28 2022
City of Lockport
Community Development

EXHIBIT I

GRANT APPLICATION

Date: 1-28-22

Project Address: 109 E 9th Street

Is property located within the Historic District? Yes (If yes, a Certificate of Appropriateness shall be approved by the Heritage & Architecture Commission)

Building Owner: MD Properties LLC Year Purchased: 2020

Store/Company Name: Edward Jones

Name of Tenant: Edward Jones - Ryan Sharp Lease Expiration Date: 2026

Applicant Name: Patrick Maier

Applicant Business Address: PO Box 363 Lockport, IL 60441

Applicant Business Phone: 815-530-1928 Home Phone: _____

PatrickA@homesbyJDT.com

Tenant: Edward Jones - Ryan Sharp

Applicant(s)/Building Owner: MD Properties LLC

Zoning of Property: Commercial

Number of Primary Facades: 1

Total Anticipated Budget: $ 10,000

Total Anticipated Grant Request: $ 5,000

Proposed Improvements (check all that apply):

- ✓ Windows/Exit Doors
- _____ Awnings
- _____ Stairs/Porches/Railings
- _____ Roofs
- _____ Lighting
- _____ Dumpster Enclosure
- _____ Other Eligible Improvement
- _____ Painting (only as part of exterior remodel)
- _____ Signage
- _____ Walls (repair/restoration/rebuilding/tuckpointing)
- _____ Architectural Features
- _____ Landscaping
- _____ Parking Area

Description of Proposed Improvements: New storefront window and business entry door.

I, Patrick Maier, hereby make application to the City of Lockport for a Commercial Façade and Site Improvement Grant Program in the anticipated amount of $_____. I understand that my application must be approved by the City and that it must conform to established design guidelines, as well as, specific design recommendations of the City of Lockport. I have read a copy of the Commercial Façade and Site Improvement Grant Program Agreement. If approved, I understand that all work performed is subject to the provisions of the Grant Agreement, applicable codes and ordinances, required permitting, and inspections.

Applicant Signature — Date: 1-28-22

Building Owner — Date: 1-28-22

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City of Lockport
Community Development

BUDGET

ACTIVITY	ESTIMATED COST
Storefront Renovation - Window/Door(s)	$10,000

Total Anticipated Grant Request $ 5,000

When submitting cost estimates, the City requires submission of at least three (3) itemized quotes. The OWNER(s)/LESSEE(s) may choose the contractor of their choice, however, the City's cost sharing will be based off the least expensive quote.

Architect for the Project (if applicable):

Name: _____

Contact: _____

Address: _____

Phone: _____

Email: _____

Contractor for the Project:

Name: Summit Window Company

Contact: _____

Address: _____

Phone: 708-594-3200

Email: Summitwindow@sbcglobal.net

Upon reimbursement The City of Lockport shall make a check payable to:

Name/Business: MD Properties LLC

Address: PO Box 363 Lockport, IL 60441

SS# or Tax ID# 84-3394705

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MAR 0 8 2022
City of Lockport
Community Development

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Estimate: EST-1

Bill To

Dennis Draper

Estimate Date: 02/22/22

Total: **$5,400.00**

Triple ggg

Gustavo Gudino
gggudinos1245@gmail.com
6426 S Talman Ave Chicago IL 60629
P: 7737868104 (tel:7737868104)
M: 7737868104 (tel:7737868104)

Billed Items

Item	Unit Cost	Quantity	Cost
3 dark bronze aluminium windows 1 inch thermal glass clear	$5,400.00	1	$5,400.00

Bill To

Dennis Draper
109 9 St Lock Port Illinois

Subtotal $5,400.00

Total: $5,400.00 (USD)

Clear View Industries, Inc.

603 E Washington St
Joliet IL 60433
Ph 815-630-5711

Date	Estimate #
1/6/2022	1019

Name / Address
Coldwell Banker Real Estate Group 109 E. 9th Street Lockport IL 60441

P.O. No.	Project

Description	Qty	Total
Furnish and Install: Three (3) Dark Bronze Aluminum Frames With 1" Tempered Low "E" Insulated Glass and One (1) Dark Bronze Door With 1/4" Clear Tempered Glass With Transom Frame and Two (2) Sidelites		9,800.00
Price Based Upon Photos Provided - Price May Vary Upon Onsite Inspection		
COMMENT: A 3.5% processing fee is applied on ALL credit card transactions. All material is guaranteed to be as specified. All work to be completed in a professional workmanlike manner according to specifications submitted - per standard practices. Any alteration or deviation from above specifications involving extra costs will be executed only upon written orders - and will become an extra charge		

Signature of Acceptance: _____

Chicago Glass Company of Illinois
1950 Ruby Street
Melrose Park, IL US
(708) 800-7120
service@chicagoglasscompany.com
www.chicagoglasscompany.com

Estimate 2527

(3)

ADDRESS
Patrick Maier
Md Properties LLC.
109 East 9th St.
Lockport, IL 60441

DATE	TOTAL	EXPIRATION DATE
01/27/2022	$14,115.00	02/27/2022

DATE	ACTIVITY	QTY	RATE	AMOUNT
	Aluminum Storefront Renovation Removal of existing storefront. Fabrication of new 2 x 4 1/2" thermally broken dark bronze or clear anodized aluminum all glass to be 1" clear low E tempered where are required (1) medium style door with 10 inch bottom kick with transom and single side light, three butts per (1)leaf, (1)Threshold, (1) closer , (1) keyed cylinder exterior, (1) thumbturn interior, sealed exterior, no interior work. 120-130 sq ft total	1	14,115.00	14,115.00

Storefront Renovation
(1) Single Door w transom

TOTAL $14,115.00

PAYMENT TERMS
1/2 Down Deposit Required for Materials & COD TERMS Upon Completion.

THANK YOU.

TIME FRAME
Lead Time: 4-6 weeks
Install Time: 1-2 days

Accepted By

Accepted Date

Schaaf Window Co., Inc.
Address: 18445 Thompson Ct

Tinley Park, IL 60477
Phone: 7083420900
Fax: 7083420990
Website: www.schaafwindow.com

Quote

Quote Number: 213 **Date:** 3/4/2022

Customer Information

Name: DENNIS DRAPER
Address:
Phone 1: 815-530-0063
Phone 2:
Fax:
Contact:

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Community Development

(Images are viewed from exterior where applicable)

Item Description		Qty	Price	Extended
Exterior Door Items				
2' 8" x 6' 8" FCM31 Fiber-Classic Mahogany Fiberglass Door - Right Hand Inswing; 2-3/8" Backset - Double Bore (2-1/8" Dia. Bore w/Standard 5-1/2" Spacing) w/Faceplate Lockset Latch Prep w/Standard Strike Prep w/Deadbolt 9206 Kwikset/Schlage J Series – Standard 1´´ x 2-1/4´´ Strike Prep; Set of Standard - Oil Rubbed Bronze Hinges ; Woodgrain Dura-Tech Frame - 4-9/16" Jamb w/Dura-Tech Woodgrain Brickmould Exterior Trim (Applied) w/(1)Oil Rubbed Bronze Adjustable Security Strike Plate (for Lockset only); Bronze Compression Weatherstrip; Tru-Defense Composite Adj. w/Dark Cap - Bronze Sill ; PREFINISH: Stain Door Panel Interior & Exterior DRIFTWOOD ; Stain Frame Interior and Exterior (and Exterior Trim) DRIFTWOOD; R.O. = 34-1/4" x 82"		1	2,040.49	$2,040.49
3' 0" x 6' 8" FCM32-LE Fiber-Classic Mahogany Fiberglass Door w/Low E Glass - Right Hand Inswing; 2-3/4" Backset - Double Bore (2-1/8" Dia. Bore w/Standard 5-1/2" Spacing) w/Faceplate Lockset Latch Prep w/Standard Strike Prep w/Deadbolt 9206 Kwikset/Schlage J Series – Standard 1´´ x 2-1/4´´ Strike Prep; Set of Standard - Oil Rubbed Bronze Hinges ; Single Sidelite (Left/Lock Side) 12" Wide FCM12101SL-LE w/Low E Glass (No Stile Lines); Woodgrain Dura-Tech Frame (Continuous Head/Sill w/Wide Mull Post) - 4-9/16" Jamb w/Dura-Tech Woodgrain Brickmould Exterior Trim (Applied) w/(1)Oil Rubbed Bronze Adjustable Strike Plate (for Lockset only); Bronze Compression Weatherstrip; Tru-Defense Composite Adj. w/Dark Cap - Bronze Sill (Continuous); PREFINISH: Stain Door & Sidelite Panels Interior & Exterior DRIFTWOOD ; Stain Frame Interior and Exterior (and Exterior Trim) DRIFTWOOD; R.O. = 51-3/4" x 82"		1	3,698.08	$3,698.08

Order Sub Total:	**$5,738.57**
Tax:	**$444.74**
Order Total:	**$6,183.31**

Distributed by: PALMER DONAVIN

Version #: 1.24-O
Version Date: 2/28/2022

MD Properties, LLC
PO Box 363
Lockport, IL 60441
drdrapercc@yahoo.com

RECEIVED
MAR 08 2022
City of Lockport
Community Development

MD PROPERTIES

Estimate

ADDRESS
MD Properties LLC
109 E. 9th - Edward Jones Building

ESTIMATE # 1023 - ED Jones Doors
DATE 03/07/2022

DESCRIPTION	QTY	RATE	AMOUNT
Remove existing Edward Jones entry door and side lites. Install new 36" door (w/glass panel) w/ 12" side lite. Install new trim on interior side of door and paint. Re-work exterior side of door to accommodate new door configuration - trim work as needed. Supply and Install new door hardware/lock set - includes disposal of existing door, and delivery of new door.			1,025.00
Remove apartment door adjacent to Edward Jones officer door. Install new entry door to match style of Edward Jones Office door - no glass panel or side lite. Install new trim on interior side of door and paint. Re-work exterior side of door as needed to complete installation. Supply and Install new door hardware/lock set. Includes disposal of existing door and delivery of new door.			835.00

TOTAL **$1,860.00**

Accepted By

Accepted Date

Edward Jones | INVESTMENTS
MOTORCYCLE APPAREL
PREPARING FOR RETIREMENT
LIVING IN RETIREMENT
PAYING FOR EDUCATION
PREPARING FOR THE UNEXPECTED

City Council

Agenda Memorandum

Item # PD-1

To: **Mayor & City Council**

From: **Ron Huff, Deputy Chief**

Subject: **Will County Countywide All Hazard Mitigation Plan**

Date: **Wednesday, April 6, 2022**

BACKGROUND/HISTORY

In 2000, the United States Congress passed the Disaster Mitigation Act of 2000, which amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), creating the framework for state, local, tribal and territorial governments to engage in hazard mitigation planning to receive certain types of non-emergency disaster assistance. As part of this Act, jurisdictions wishing to apply for certain grants must have adopted an All Hazard Mitigation Plan (AHMP) that has been approved by the Federal Emergency Management Agency (FEMA). The AHMP is a document that identifies natural disaster risks and vulnerabilities that are common in a jurisdiction and develops long-term strategies for protecting people and property from similar events.

Will County, through the Will County Emergency Management Agency (WCEMA), first adopted an AHMP in 2013. This plan was approved by FEMA and adopted by municipalities throughout Will County. In 2020, this plan was updated and was resubmitted to FEMA for approval. The plan has met with tentative FEMA approval and now requires the adoption by municipalities within Will County to obtain final FEMA approval.

PROS/CONS/ALTERNATIVES

The Will County Emergency Management Agency serves as the primary emergency management organization in the County and provides support services to jurisdiction throughout the County for preparedness planning, disaster response, and mitigation. They have also been charged with developing and maintaining the county-wide AHMP. As part of these responsibilities, they often utilize grant programs to purchase equipment and provide training; these assets and trainings are made available to jurisdictions throughout the County, including the City of Lockport. By participating in this plan, the City would also be eligible for Federal pre-disaster and post-disaster mitigation funds.

Failing to adopt this plan, which was meticulously developed by the emergency management professionals at the WCEMA, could endanger the full approval of the plan by FEMA. This could negatively impact future funding opportunities that benefit all of Will County.

RECOMMENDATION

Approve Resolution No. 22-024 adopting the 2020 Countywide all Hazard Mitigation Plan.

ATTACHMENTS

Resolution No. 22-024 Adopting the 2020 Countywide All Hazards Mitigation Plan

Approved 2021 Hazard Mitigation Plan

Will County APA letter

SPECIFIC CITY COUNCIL ACTION REQUIRED

Approve Resolution No. 22-024 adopting the 2020 Countywide All Hazards Mitigation Plan.

RESOLUTION NO. 22-024

A RESOLUTION ADOPTING THE 2020 COUNTYWIDE ALL HAZARDS MITIGATION PLAN

WHEREAS, The VILLAGE/CITY OF_____ desires to minimize the impacts caused by disasters; and,

WHEREAS, identifying hazards, risks, and mitigation opportunities is an important part of the City of Lockport's Emergency Management posture; and

WHEREAS, the Will County Emergency Management Agency has recently coordinated planning efforts in order to revise the Countywide All Hazards Mitigation Plan; and

WHEREAS, municipalities, county agencies, and other governmental agencies and organizations have participated in the continued development and improvement of the Plan; and

WHEREAS, the Plan focuses future efforts to minimize the impact of disasters and to better plan for disaster response; and

WHEREAS, maintaining a current hazard mitigation plan that is in accordance with Federal mitigation planning requirements will ensure that the City may be eligible for Federal pre-disaster and post-disaster mitigation funds; and

WHEREAS, the Plan fulfills mitigation planning requirements identified in the Disaster Mitigation Act of 2000; and

WHEREAS, the City may undertake additional hazard mitigation planning activities to further identify and define hazard mitigation opportunities; and

WHEREAS, municipalities in Will County that participate in the continued development and revision of the Plan and that adopt the Plan by resolution may also fulfill their mitigation planning requirements.

NOW THEREFORE, BE IT RESOLVED BY THE MAYOR AND MEMBERS OF THE CITY COUNCIL OF THE CITY OF LOCKPORT, WILL COUNTY, ILLINOIS that:

Section 1: The Countywide All-Hazards Mitigation Plan, 2020 edition, be adopted by the City of Lockport.

Section 2: A copy of this resolution will be presented to the Will County Emergency Management Agency and will be considered part of the Countywide All-Hazards Mitigation Plan.

PASSED THIS _____DAY OF _____, 2022, with:

_____ALDERMEN voting aye _____ALDERMEN absent

_____ALDERMEN voting nay _____ALDERMEN abstaining

the MAYOR voting aye _____ voting nay _____ not voting _____

_____ KAIRIS _____KOSTECKI _____ GILLOGLY _____ SCHREIBER

_____BERGBOWER _____LOBES _____ BARTELSEN _____ SABAN

_____MAYOR

_____
Steven Streit, Mayor

ATTEST:

_____
Kathleen Gentile, City Clerk

Will County

County-wide All Hazard Mitigation Plan

2020

Update of 2013 Will County County-wide All Hazard Mitigation Plan

Developed by:

Will County All Hazard Mitigation Steering Committee

Based on 2008 Will County County-wide All Hazard Mitigation Plan by CTE | AECOM

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EXECUTIVE SUMMARY

The *Will County County-wide All Hazard Mitigation Plan* is designed to meet the requirements of the Federal Disaster Mitigation Act of 2000 (DMA2K) and provide a useful document to reduce the impact of hazards county-wide. The plan will meet the Act's hazard mitigation planning regulations that require jurisdictions to have an adopted and Federal Emergency Management Agency (FEMA) approved Hazard Mitigation Plan to be eligible for mitigation grant funding. Although the DMA2K requires local governments to only address natural hazards, the Will County Emergency Management Agency thought it was imperative to address all hazards including technological and societal hazards.

The 2020 update to the *Will County County-wide All Hazard Mitigation Plan* provides a first step towards identifying strategies and actions to prepare the community for natural, technological, and societal hazards. Emergency Management agencies at all levels of government in Will County realize the inter-dependencies of mitigation with response, recovery, and preparedness functions. This plan identifies select response, recovery, and preparedness actions and identifies agencies responsible for these actions.

Purpose

The intent of DMA2K is to control the cost of federal disaster assistance by initiating a sustained, national program for pre-disaster hazard mitigation planning. In order to be eligible for mitigation funding through FEMA's programs, communities must develop and adopt a hazard mitigation plan. This program enables the county and participating communities to implement planned, cost-effective mitigation measures before and after an event.

The mitigation planning and hazard analysis process in this plan identifies and prioritizes the steps and actions to mitigate the impact of various categories of hazards. The communities of Will County are familiar with the impacts of disasters and recognize that a disaster could occur with little or no warning. Planning for a sustainable, resilient, and prepared community is essential to reduce damages to homes, facilities, and infrastructure; prevent loss of life; minimize disruption of essential and critical services; and maintain continuity of the local economy and government operations.

Plan Review Tool

To ensure that the updated *Will County County-wide All Hazard Mitigation Plan* meets the requirements of DMA2K, the Mitigation Project Team cross-referenced the *All Hazard Mitigation Plan* with FEMA's *Local Mitigation Plan Review Tool*. FEMA uses the tool to evaluate mitigation plans. In addition, the tool identifies where each plan element is located within the plan document. The tool may also be used as part of an internal quality assurance procedure.

Public Involvement

Will County communities realize that public involvement is critical to the success of any strategic planning process, including hazard mitigation. It is important for hazard mitigation plans to target concerns, comments, and perception of risk as factors in creating mitigation strategies. To ensure consensus with the public, the Mitigation Project Team developed several mechanisms to reach out to the public to participate in the *Will County County-wide All Hazard Mitigation Plan*. Public input was incorporated into the mitigation plan through various efforts including:

- Steering Committee - A Mitigation Steering Committee comprised of various professionals with local knowledge and expertise was organized. The Mitigation Steering Committee members are identified in Appendix E.

- Local Input - The Mitigation Steering Committee members met with local organizations and jurisdictions to update them on the progress of the project, as well as to solicit their participation and support of the *All Hazard Mitigation Plan* to identify potential mitigation projects. Information, comments, concerns, and ideas that would be incorporated into the plan were gathered during these meetings. Expert Guidance - the original Mitigation Project Team, composed of CTE/AECOM and the Polis Center, held interviews to solicit input and guidance from experts in given fields and provide modeling of likely hazards. This information and guidance were included in the development of the plan.

- Workshops - The Hazard Mitigation Steering Committee held mitigation workshops to review and update the hazard risk assessment, mitigation goals and objectives, and mitigation actions to be incorporated into the 2020 *Will County County-wide All Hazard Mitigation Plan*. Invitations

to attend these workshops were extended to local jurisdictions, various community organizations, and neighboring counties.

- Public Meetings - The Mitigation Team developed a public survey for the plan update to gauge the concerns of the public, as well as provide feedback to help guide the Committee in identifying potential mitigation actions. The questionnaire was developed to target the public's thoughts on what their and their community's greatest risks are, what they have done to mitigate at their home, and what they would do when a disaster strikes. This questionnaire was available through the Will County EMA website (http://www.willcountyema.org), Facebook, and other social media platforms along with jurisdictional websites. This allowed the public to communicate their concerns, comments, and ideas on what their community and/or Will County can do to mitigate hazards. The public was also given an opportunity to review the updated plan which was posted on the Will County EMA website and social media along with the ability for the public to posts comments.

Planning Process

The *Will County County-wide All Hazard Mitigation Plan* process involves four distinct phases that will enable communities to articulate their risks and identify and develop mitigation actions for all hazards. These phases are:

- Organize Resources
- Assess Risks
- Identify Mitigation Actions
- Implement the Mitigation Plan

Organize Resources

The vital component of this effort is to identify the Mitigation Steering Committee. The Mitigation Steering Committee acts as a point of contact for the various interested groups and provided support of the Mitigation Planning process. Identification of this core group is important in ensuring implementation and support of the Mitigation Plan. The following characteristics were considered when soliciting participation:

- Ability to speak for the organization;
- Provide visionary characteristics;

- Have a desire and time to commit, and;
- Have an understanding of local politics and issues.

Will County EMA chaired this committee and representatives from Will County departments provided strategic guidance and were active throughout the development of the hazard mitigation plan. Many of the Will County representatives were also members of local organizations that have relevance to the *Will County County-wide All Hazard Mitigation Plan* and its update.

Risk Assessment

The County government recognizes the importance of identifying and analyzing Will County's hazards; therefore, Will County reviewed and updated the hazard risk analysis for the 2020 plan.

The assessment and analysis of the vulnerability to the county is a definitive measure of the risk associated with each individual hazard. The Risk Assessment describes, analyzes, and evaluates the risks facing Will County from three categories of hazards: Natural, Technological, and Societal.

The description of each hazard category elaborates upon and:

- Defines the different types of hazards
- Identifies historical events that have occurred locally and/or regionally
- Defines the hazard profiles, parameters, and characteristics
- Assesses possible vulnerabilities
- Determines probable scenarios
- Models select hazards

The risks include the following:

Natural Hazards	Technological Hazards	Societal Hazards
Tornado	Hazardous Materials – Fixed Site & Transportation Accident	Public Health
Thunderstorm		Enemy Attack
Winter/Ice Storm	Fire	Terrorist Attack
Flood, Flash Flood, Ice Jams	Nuclear Power Plant Accident	Civil Disturbance
Extreme Heat	Pipeline Rupture	
Earthquake	Non-Hazardous Materials – Transportation Accident	
Drought	Dam Failure	
	Infrastructure Failure	
	Land Subsidence	

Mitigation Goals and Objectives

Through these efforts, All Hazard Mitigation Goals and Objectives were developed and updated. Goals define the expectations of the plan and serve as general guidelines. They are typically broad policy-type statements, long term, and represent global visions. Objectives are strategies or implementation steps to attain an identified goal. Unlike goals, objectives are specific and measurable. The goals and objectives were identified during the risk assessment and molded throughout the planning process, then finalized and updated during the Mitigation Workshops.

Goal #1: *Protect and secure life and property.*

Goal #2: *Continue to improve and enhance county-wide emergency management programs and develop relationships county-wide.*

Goal #3: *Ensure economic stability, preserve cultural resources, and improve quality of life throughout Will County.*

Goal #4: *Develop, promote, and integrate mitigation actions.*

Goal #5: *Take advantage of opportunities offered by growth while also protecting natural systems and natural resources.*

Mitigation Actions and Implementation

The updated Mitigation Action Plan identifies mitigation actions intended to reduce loss from future hazard events throughout the county. The mitigation strategies were developed from the risk assessment and public participation process. Each mitigation strategy describes the problem or opportunity, how to implement it, funding sources, and responsible agencies. Mitigation strategies were defined and prioritized primarily through a formalized workshop with steering committee members and jurisdictional representatives. To support the identified mitigation actions, this plan also identifies select response, recovery, and preparedness actions that are related to the overall mitigation strategy.

The initial selection and prioritization of these strategies was drafted by the mitigation steering committee, using the following criteria to identify mitigation strategies and actions that:

- Address plan goals and objectives.
- Take advantage of opportunities presented by on-going or prospective initiatives, programs, and activities related to emergency management, public safety, homeland security.

- Are within the capabilities to execute the mitigation action.
- Offer a significant benefit to the community in relation to its cost.
- Have an identified funding source or sources.
- Have an identified lead agency with appropriate jurisdictional authority to coordinate implementation.
- Have an identified schedule for implementation.

A benefit/cost analysis is an important component in the hazard mitigation planning process. As the scope of mitigation actions are defined and costs are developed, the Mitigation Steering Committee will work with other departments and local jurisdictions to analyze these actions based on FEMA's benefit cost methodology. This analysis will assist in determining the actions necessary to effectively minimize costs and prevent damage from future hazards.

Implementation, Monitoring, and Maintenance

Will County EMA will maintain and update the 2020 *Will County County-wide All Hazard Mitigation Plan* and continue to encourage participation by all communities in the county. The update of this plan will occur every five years as mandated by DMA2K with input from participating communities. The Will County Mitigation Steering Committee will gather each year to assess the status of the mitigation actions. Public input will continuously be solicited via the Will County EMA website as well as through local organizations and public-private partnerships.

CHAPTER 1: INTRODUCTION

Will County has been one of the nation's fastest growing counties. It is all too familiar with natural disasters, the existing risk of technological hazards, and the growing threat of societal hazards. After decades of gradual change, urban sprawl began to move into the farmland areas. Since 2000, the population of the county has increased by 184,717 (36% growth). People have been attracted to Will County because of opportunities arising from the expansion of businesses and homes. Some view this growth as a sign of prosperity and progress; however, it also results in increased traffic, greater demand on infrastructure, and a loss of open space. The most devastating impact can be one that is not realized each day until a disaster strikes.

WILL COUNTY FEDERAL DECLARATION HISTORY

Date	Declaration #	Incident Type
04/25/1967	DR-227	Tornado
06/10/1974	DR-438	Tornado & Flooding
01/16/1979	DR-3068	Snow
06/30/1981	DR-643	Flood
02/23/1985	DR-735	Severe Storm, Flooding & Ice Jams
08/29/1990	DR-878	Tornado
07/18/1996	DR-1129	Flood
01/01/1999	EM-3134	Snow
12/11/2000	EM-3161	Severe Winter Storm
09/11/2001		Simultaneous Terrorist Attacks
04/20/2004	DR-1513	Tornadoes
08/29/2005	EM-3230	Hurricane Katrina Evacuation
08/23/2007	DR-1729	Severe Storms & Flooding
09/13/2008	DR-1800	Severe Storms & Flooding
02/02/2011	DR-1960	Snow Storm
04/18/2013	DR-4116	Flood
11/17/2013	DR-4157	Tornado

Available from: https://www.fema.gov/disasters

Although disasters have occurred in the Will County, the county and its jurisdictions have not experienced a catastrophic natural event, a terrorist attack, or an incident of national significance. Despite this, emergency management agencies throughout the county recognize that a disaster could occur in the future with little or no warning. The development of open space and farmland, increasing dependency on technology, and new developing threats greatly enhance the possibility and impact of a disaster. Planning for a sustainable, resilient, and prepared community is essential to prevent loss of life; disruption of essential and critical services; economic and business interruption; and damages to homes, facilities, and infrastructure. Most important, this plan will assist the communities of Will County in recognizing its vulnerabilities and preparing for future recovery efforts.

Over the past decades, the nation has witnessed an alarming number of disasters incurring substantial destruction. Destruction associated with disasters has created a significant increase in direct and indirect costs, as well as economic disruption and loss of life. The toll of a disaster on a community extends far

beyond the physical damage, but can also result in the long term disruption of local and regional economies. As a result, Congress passed Public Law 106-390, The Disaster Mitigation Act of 2000 (DMA2K). The intent of DMA2K was to control federal costs of disaster assistance by initiating a national, sustained program for pre-disaster hazard mitigation. This program enables participating communities to implement planned, pre-identified, and cost-effective mitigation measures before or after an event. In order to be eligible for mitigation funding through FEMA programs, communities must develop and adopt a hazard mitigation plan.

Hazard mitigation planning in Will County began in 1985 with a resolution by the county to address flooding of the Kankakee River in the Wilmington area. The resolution gave the support needed to develop a flood hazard mitigation plan for the county to encourage public/private property owners to take steps to reduce their susceptibility to flood damage. Additionally, the resolution authorized the coordination of mitigation activities with agencies within the county and to seek state and federal assistance as needed.

The current *Will County County-Wide All Hazard Mitigation Plan* includes jurisdictions that participated in the hazard mitigation planning process. Will County EMA is the county organization that provides emergency management services throughout Will County. Will County EMA applied for and received funding to update the 2013 hazard mitigation plan and worked closely with local jurisdictions, municipalities, and townships throughout the mitigation planning process to create its plan and updates.

Resolution of Adoption

This plan serves to recommend mitigation measures for Will County. Adoption of this plan by the Will County Board and the participating communities initiates the implementation of these recommendations. Adoption is also a requirement for recognition of the plan by mitigation funding programs.

The adoption of this *Will County County-Wide All Hazard Mitigation Plan* was done by resolution of the County Board. A sample resolution of adoption is included as Appendix A of the plan. Resolutions of adoption by Will County and participating jurisdictions will become part of this plan as they are adopted. Through these resolutions of adoption, each jurisdiction will certify their agreement with the risk assessment and the mitigation goals, objectives, strategies, actions, implementation, monitoring, and update schedule.

The municipal, fire protection districts, colleges, and other agencies' resolutions should adopt each action item that is pertinent to the community and assign a person responsible for it. Once the state and federal

reviewers certify the plan approval, Will County will forward the plan to each participating jurisdiction for formal adoption. Copies of these resolutions will be held on file with the Will County EMA. With adoption, the county and each municipality, agency, or institution are individually eligible to apply for FEMA mitigation grant funding.

Planning Process Methods

The *Will County County-Wide All Hazard Mitigation Plan* process involves four distinct phases that will enable the communities within Will County to articulate their risks and identify and develop mitigation actions. These phases include:

- Organize Resources
- Assess Risks
- Identify Mitigation Actions
- Develop and Implement the Mitigation Plan

Organize Resources

Will County EMA served as the coordinating body for the planning process. They collaborated closely with county departments, communities of Will County, and local public and private organizations. Furthermore, Will County EMA solicited participation from surrounding communities to be involved throughout the process.

The Will County Mitigation Steering Committee was actively involved in all of the stages of the planning process: hazard identification, risk assessment, mitigation strategy development, and mitigation action identification. Disasters often cross county boundaries; therefore, Will County solicited the participation of several jurisdictions that straddle the boundaries of the county to improve the opportunity to identify and implement regional mitigation actions. Several advantages of this relationship include:

- Establishment of relationships prior to an event occurring. These relationships are fundamental to emergency management activities during all phases: preparedness, response, recovery, and mitigation
- Identification of issues affecting multiple jurisdictions that may be discussed and leveraged together to show a greater benefit of a mitigation action

- Collaboration which allows for resource sharing between communities and neighboring counties
- Reduced duplication of efforts

Many individuals and groups were crucial contributors to the creation of this plan. The following identifies them and their role in the process.

Will County Emergency Management Agency

Will County EMA works closely with all jurisdictional emergency management agencies throughout the county to provide emergency management services. Will County EMA applied for and received funding from IEMA to update the 2013 hazard mitigation plan. Will County EMA was the lead for the 2020 update of the plan and chaired the Will County Mitigation Steering Committee. Will County EMA served as the coordinating body for the planning process and collaborated closely with other county departments, local jurisdictions, local organizations, and the public. Furthermore, Will County EMA solicited participation from the public and surrounding communities to be involved throughout the process.

Mitigation Project Team

The Mitigation Project Team consisted of a core team with mitigation and recovery experience as well as Geographic Information Systems (GIS) analysis and U.S Multi-hazard (HAZUS-MH) modeling. The original plan's Mitigation Project Team was led by a Certified Emergency and Floodplain Manager and consisted of professionals with diverse backgrounds in emergency management, engineering, environmental sciences, and homeland security. GIS analysis and HAZUS-MH modeling were performed by the Polis Center (Polis), a not-for-profit, university-based organization with staff dedicated to researching and applying GIS technology.

Will County Mitigation Steering Committee

The Will County Mitigation Steering Committee was comprised of officials from various Will County departments that are actively involved with local organizations and are conduits to local jurisdictions:

- Will County EMA
- Will County Land Use Department
- Will County GIS

Participating Communities

The Mitigation Steering Committee solicited the participation of local jurisdictions throughout the mitigation planning process. County and local jurisdictions were invited to participate in the plan update process. This includes the thirty-seven municipalities that have all or some of their municipal limits within Will County. The municipalities that are predominantly within surrounding counties but whose municipal limits expand into Will County are denoted (*) in the following table.

Will County, IL Municipalities Eligible for Plan Participation

The following thirty-seven municipalities were invited to participate by furnishing data, information, ideas, mitigation suggestions, and issues on the topics included within the development of this *plan*:

City of Aurora *	Village of Homer Glen	Village of Plainfield
Village of Beecher	City of Joliet	Village of Rockdale
Village of Bolingbrook	Village of Lemont *	Village of Romeoville
Village of Braceville *	City of Lockport	Village of Sauk Village *
City of Braidwood	Village of Manhattan	Village of Shorewood
Village of Channahon	Village of Minooka *	Village of Steger *
Village of Coal City *	Village of Mokena	Village of Symerton
City of Crest Hill	Village of Monee	Village of Tinley Park *
Village of Crete	City of Naperville *	Village of University Park
Village of Diamond *	Village of New Lenox	City of Wilmington
Village of Elwood	Village of Orland Park *	Village of Woodridge *
Village of Frankfort	Village of Park Forest *	
Village of Godley *	Village of Peotone	

* Jurisdictions that border or have only a portion of their corporate limits in Will County and may choose not to adopt this *Plan*.

The these municipalities along with county and other stakeholders were invited to three county-wide Mitigation Plan Update Workshops. After each workshop, all jurisdictions were provided by email workshop materials and suggested updates collected during the workshop for review. Those who were not able to attend a workshop were encouraged to provide their comments and questions. Not all of the jurisdictions were able to attend the workshops, but of those who did, many submitted comments on the workshop results by email, telephone, or contact with Mitigation Steering Committee members. Those jurisdictions that did not attend any workshop or respond to workshop follow-up emails were contacted by telephone, email, and face-to-face at other meetings. The importance of the mitigation plan update and their participation was stressed in these contacts. Most of the jurisdictions whose municipal limits are within Will County that did not respond are small communities that only have part-time or volunteer staff.

Jurisdictions participated in a variety of ways as outlined in the following table.

Jurisdiction Participation was defined by the Mitigation Steering Committee during the planning process. Collectively, it was decided that each jurisdiction must meet one of the following criteria to be included within the plan.

- Provide representation during at least one planning meeting
- Submit an inventory of plans, data, and reports relevant to hazard mitigation planning
- Review and complete the Hazard Mitigation Action form
- Identify and delineate natural, technological, and societal hazards throughout Will County
- Identify critical "at risk" structures and facilities
- Develop community wide mitigation goals
- Submit techniques to plan for, reduce, and manage expected losses
- Provide technical and financial assistance and incentives to facilitate loss reduction projects
- Review and comment on the draft plan
- Incorporate the plan into existing planning efforts
- Formally adopt the plan
- Participate in plan maintenance through yearly reviews and five year updates

A number of jurisdictions whose municipal limits are predominantly outside of Will County participated in the development of the plan update. Those jurisdictions that did not are involved with the Hazard Mitigation Plan of their respective county. These jurisdictions were aware of Will County's progress in updating the plan and indicated they were following the progress through the email updates.

Representatives from jurisdictions within and outside Will County who met the participation requirement by participating in meetings, document review, and information gathering are identified in the following table. Additional information on jurisdictional participation may be found in Appendix E.

WILL COUNTY ALL HAZARD MITIGATION PLAN – 2020 UPDATE COUNTY & COMMUNITY PLANNING REPRESENTATIVES		
Community	**Representative**	**Title**
Beecher	Denis Tatgenhorst	EMA Director, Village of Beecher
	Robert Heim	Planning & Zoning Commissioner, Village of Beecher
Bolingbrook	Troy Kirch	EMA Director, Village of Bolingbrook
Braidwood	Josh Bolatto	Coordinator, Braidwood ESDA
	Mike Compton	Assistant Coordinator, Braidwood ESDA
	Tony Altiery	Village Administrator, City of Braidwood
Channahon	John Grimmenga	ESDA Coordinator, Village of Channahon
	Jeff Toepper	Deputy Chief, Channahon Fire Protection District
Crest Hill	Bradley Hertzmann	Deputy Chief of Police, City of Crest Hill
	Thomas Migatz	Director of Public Works, City of Crest Hill
Crete	Marty Braccio	EMA Director, Village of Crete
Diamond*	Teresa Kernc	Mayor, Village of Diamond
	Lori Homes	Village Clerk, Village of Diamond
	Austin Vining	Maintenance Supervisor/Public Works, Village of Diamond
Elwood	William Offerman	Fire Chief, Elwood Fire Protection District
Frankfort	John Burich	Chief of Police, Frankfort Police Department
	William Dowding	Deputy Chief of Police, Frankfort Police Department
	Robert Piscia	Village Administrator, Village of Frankfort
Godley	Tami Branum	ESDA Coordinator, Village of Godley
	Roxanne Alton	Assistant ESDA Coordinator & Village Treasurer, Village of Godley
Homer Glen	John Robinson	EMA Coordinator, Village of Homer Glen
	Michael Slaviero	Firefighter, Homer Township Fire Protection District
IEMA	Lisa Anderson	Region 3 Coordinator, Illinois Emergency Management Agency
INEOS	Kyle Schaumburg	Fire Chief, INEOS Channahon
	Bob Johansen	Safety Specialists, INEOS Channahon
Joliet	Greg Blaskey	Fire Chief/EMA Director, City of Joliet
	Jeff Carey	Deputy Fire Chief, City of Joliet
Lemont	Thomas Ballard	Director EMA, Village of Lemont
Lockport	Phillip Rittenhouse	EMA Coordinator, City of Lockport
Manhattan	Terry Doyle	EMA Chief, Village of Manhattan
	Joel Werner	Deputy Chief EMA, Village of Manhattan
Midewin National Tallgrass Prairie USDAFS	Chris Lundgren	Forest Fire Management Officer
* Multi-County *Jurisdictional Partner - within Will & Neighboring Counties*		

WILL COUNTY ALL HAZARD MITIGATION PLAN – 2020 UPDATE COUNTY & COMMUNITY PLANNING REPRESENTATIVES (cont.)		
Mokena	Howard Stephens	Fire Chief, Mokena Fire Protections District
	Rick Campbell	Assistant Chief, Mokena Fire Protections District
	Joe Cirelli	Assistant Chief, Mokena Fire Protections District
	Mark Detloff	Assistant Public Works Director, Village of Mokena
Monee	Randy Ulaskas	Director EMA, Village of Monee
	D.J. Kruzel	Superintendent Public Works/ Lt. EMA, Village of Monee
Naperville	Dan Nelson	Coordinator EMA, City of Naperville
	Bill Novack	Director of Transportation, Engineering & Development, City of Naperville
	Dick Dublinski	Director of Public Works, City of Naperville
New Lenox	Daniel Martin	Safe Community Coordinator, Village of New Lenox
	Peter Fattore	Emergency Management Officer, Village of New Lenox
	Alex Vancina	Emergency Services, Village of New Lenox
	William Byerley	Emergency Services, Village of New Lenox
Northwest Homer Fire Protection District	Todd Fonfara	Deputy Fire Chief
Park Forest*	Pat Hisel	Lieutenant, Village of Park Forest Fire Department
	Ryan Roberts	Deputy Chief, Village of Park Forest Fire Department
Peotone	William Mort	Chief, Village of Peotone Police Department
Plainfield	Ken Ruggles	Commander, Village of Plainfield Police & Emergency Management
	John Konopek	Chief, Village of Plainfield Police Department
	Roger Bonuchi	Captain, Village of Plainfield Emergency Management
River Valley Detention Center	Bruce Graham	Assistant Superintendent
Rockdale	James Planinsek	Public Works Superintendent, Village of Rockdale
Romeoville	Mike Littrell	Coordinator, Village of Romeoville EMA
	Kent Adams	Fire Chief, Village of Romeoville Fire Department
Shorewood	Aaron Klima	Director, Shorewood EMA / Chief, Shorewood Police
Silver Cross Hospital	Megan Lynch	Trauma Coordinator/Registered Emergency Room Nurse
Steger*	Mary Jo Seehausen	Village Administrator, Village of Steger
Wilmington	Dennis Houseman	Director, City of Wilmington ESDA
* Multi-County *Jurisdictional Partner - within Will & Neighboring Counties*		

WILL COUNTY ALL HAZARD MITIGATION PLAN – 2020 UPDATE COUNTY & COMMUNITY PLANNING REPRESENTATIVES (cont.)		
Will County	Harold Damron	Director, Will County EMA
	Thomas Murray	Chief Deputy Director, Will County EMA
	Allison Anderson	Deputy Director, Will County EMA
	Domingo Kaller	Planning Officer, Will County EMA
	Maria Pergi	Planning & Exercise Officer, Will County EMA
	Katherine Fajfar	Technological Hazards Planner, Will County EMA
	Owen Needham	Chief Building Official, Building Division, Will County Land Use Department
	Nicole Roedl	Engineering Technician II, Engineering Development Reviews Division, Will County Land Use Department
	Tim Anderson	Senior Waste Analyst, Resource Recovery & Energy Division, Will County Land Use Department
	Scott Killinger	Chief Subdivision Engineer, Development Review Division, Will County Land Use Department
	Tim Helmer	General Combination Inspector, Building Division, Will County Land Use Department
	Jenna MacInnes	Building Inspector, Building Division, Will County Land Use Department
	Chris Ohlrogge	Building Inspector, Building Division, Will County Land Use Department
	Elizabeth Bilotta	Assistant Executive Director, Will County Health Department
	Kathleen Weber	Emergency Response Coordinator, Will County Health Department
	Barbara Agor	Emergency Response Specialist, Will County Health Department
	Rebecca Colwell-Ongenae	GIS Manager, Will County
	Jayne Ballun	Emergency Preparedness Planning Consultant

Many of these jurisdictions helped to solicit public participation by posting links to the public survey and draft plan update on their websites and through social media.

In addition to the local municipality participation, the Will County Land Use Department and Stormwater Management Planning Committee were involved throughout the mitigation planning process. The Will County Stormwater Management Planning Committee is comprised of municipal representatives that promote and support stormwater management practices. Will County Land Use Department staff were a part of the plan update team to assist in the mitigation planning process, review and draft mitigation goals and objectives, and act as a subject matter experts with regards to natural hazards and land use issues.

Agency and Authority Meetings

Will County EMA and the Mitigation Project Team met with a variety of county departments, jurisdictions, and local organizations to obtain a strong understanding of their facilities and operations, risks, existing programs and projects, and opportunities to implement mitigation actions. A summary and explanation of these meetings is provided in Appendix E.

Expertise Interviews

The Mitigation Project Team interviewed and solicited input from a variety of experts in the field of engineering, natural hazards, technological hazards, terrorism, etc. A summary and explanation of these meetings is provided in Appendix E.

Public Involvement

The broad scope of the *Will County County-Wide All Hazard Mitigation Plan* did create challenges due to the nature of technological and societal hazards and the ability to share sensitive information with the public. Today's society prohibits openly sharing vital documents and information since this information could identify potential vulnerabilities. Despite the security issues, the Mitigation Team developed several mechanisms to secure sensitive information and still reach out to the public to participate in the *Will County County-Wide All Hazard Mitigation Plan*. Public input was incorporated into the plan through various efforts.

- A Mitigation Steering Committee comprised of various professionals with local knowledge and expertise was organized. The Mitigation Steering Committee members are identified in Appendix E.
- The Mitigation Project Team held meetings with various governing entities and jurisdictions to understand their risks and to gather information, as well as comments, concerns, and ideas that would be incorporated into the plan. Those attending included various professionals in emergency services, engineering and planning, local jurisdictions, county departments, and community organizations. A summary of these meetings is provided in Appendix E.
- The Mitigation Project Team held interviews to solicit input and guidance from experts in given fields. This information and guidance was included in the development of the plan. A summary of these interviews is provided in Appendix E.

- The Hazard Mitigation Steering Committee held workshops to review and define the mitigation goals and objectives and to review and identify mitigation actions to be incorporated into the *Will County County-Wide All Hazard Mitigation Plan*. Invitations were extended to various community organizations to attend this workshop. A copy of the Hazard Mitigation Action form that was distributed is provided in Appendix D.

- Will County EMA posted an overview of the County-Wide All Hazard Mitigation project and a public survey on the Will County and jurisdictional websites and social media. The questionnaire was developed to target the public's thoughts on what their and their community's greatest risk is, what they have done to mitigate at their home, and what they would do when a disaster strikes. A copy of the survey and its results are provided in Appendix E.

  In this update of the plan, the public survey provided insight into the power of the internet and social media and its avid use by the public. There were over 1,100 respondents (less than 100 in 2013) to the survey from 36 different county communities. Many more community members viewed the survey website but did not complete the survey. These numbers indicate that the internet and social media can be an effective tool to educate, inform, and have a dialog with the public about preparedness, response, and recovery to emergencies.

- A draft of the 2020 *Will County County-Wide All Hazard Mitigation Plan* was posted on the Will County EMA, jurisdictional websites, and social media for public review and comment.

Resources

The Will County Planning Committee utilized a variety of planning documents and technical data, reports and studies to direct the plan's development. Resources include land use plans, comprehensive plans, city ordinances, building codes, zoning ordinances, historical research documents, subject-specific text books, interviews with local officials, interviews with regional experts, local planning, engineering, GIS data, and emergency management documents. The planning process also incorporated the existing *2013 Will County Hazard Mitigation Plan* and elements of the *2018 Illinois State Hazard Mitigation* plan into the creation of this update along with a variety of FEMA reference documents. In the initial plan, the Project Team utilized HAZUS-MH. HAZUS-MH is a GIS based loss estimation model developed by FEMA. HAZUS-MH was used to model the county-wide impacts of historical earthquakes and flooding events. A mitigation action has been added to this update to reevaluate the HAZUS-MH models to determine the effect of population and industry growth on these hazards.

REFERENCE AND INFORMATION SOURCES	
AT&T	Information and data on area communication systems
Bureau of Labor Statistics	Economic data
CARES Engagement Network	Data, maps, and community needs assessment
Centers for Disease Control and Prevention	Information, data, charts/graphs, and loss history on public health risks
City of Redmond Office of Emergency Management	Hazard Identification Vulnerability Analysis (HIVA) 2001
Chicago Land Speedway	Area Entertainment - NASCAR
Climatology for Chicago O'Hare IL	Area climate information
Climate-charts.com	Climate Data
Commonwealth Edison	Information and data on energy systems
Exelon Corporation	Information on nuclear power plants and their function
Federal Emergency Management Agency	Guides, plans, data, charts/graphs, authorities, hazard information, and other emergency planning information
GEOMET Technologies, Inc	Maryland Hazard Analysis
The Great Central U.S. Shake Out	Earthquake preparedness in the Midwest
Haston & Pickering, *Foodborne Disease Outbreaks*	Public Health Information
HAZUS	Hazard modeling
International Code Council	Jurisdictional adoption of International Codes
Illinois Climate Atlas	Climate Controls
Illinois Commerce Commission	Pipeline safety
Illinois Department of Natural Resources	Information, data, charts/graphs on rivers, dams, levees
Illinois Department of Public Health (IDPH)	Public health data
Illinois Department of Transportation (IDOT)	Transportation information and *IL State Freight Plan*
Illinois Emergency Management Agency	Planning guides, state and local mitigation plans, data, charts/graphs, hazard information, and descriptions of Federal and State roles
Illinois-Indiana-Wisconsin (IL-IN-WI) Combined Statistical Area (CSA) under the Regional Catastrophic Preparedness Grant Program (RCPGP)	Research of risk data and hazard analysis
Illinois Mine Subsidence Insurance Fund (IMSIF)	Mine Subsidence history and data
Illinois State Geological Survey	Information, data, charts/graphs on earthquakes
Illinois State Water Survey	Information data, charts/graphs on climate
Increasing Funding and Financing Options for Sustainable Stormwater Infrastructure	Identifies potential sources for funding stormwater infrastructure projects
Joliet/Will County Center for Economic Development	Information, data, charts/graphs on county economics
Landesman, L.	Public Health Management of Disaster (2001). Washington, D.C.: American Public Health Association.

REFERENCE AND INFORMATION SOURCES (CONT.)	
Metra	Passenger rail information
Michigan Department of State Police.	Planning guides Michigan Hazard Analysis and Mitigation Plan
Midwestern Regional Climate Center (MRCC)	Natural hazard data
Moving Will County	Overview of highway network in Will County
National Centers for Environmental Information	Natural hazard data
National Climatic Data Center	Information, data, and loss history on natural hazards
National Drought Mitigation Center	Drought mitigation
National Flood Insurance Program	Information, data, and loss history on floods
National Highway Traffic Safety Administration	Transportation incident data
National Institutes of Health	Public Health Information
National Institute of Standards and Technology	Survey regarding evacuation needs of mobility impaired
National Inventory of Dams	Information and data on county dams
National Levee Database	Information on levees
National Oceanic and Atmospheric Administration (NOAA)	Information, data, charts/graphs on weather
National Pipeline Mapping System	Pipeline maps
National Registrar of Historic Places	Information on historic buildings
National Resources Conservation Service	Information on agriculture, erosion
National Risk Index for Natural Hazards (NRI)	Online mapping application identifying communities most at risk to 18 natural hazards
National Transportation Safety Board	Information, data, and loss history on transportation hazards
National Weather Service Forecast Office	Information, data, charts/graphs on weather events
Nicor Gas	Information and data on energy sources
Northeastern Illinois Planning Commission	Regional planning information
National Park Service, Nps.gov	Information on historic buildings
National Response Center	Data on hazard material incidents
Office of Pipeline Safety	Information, data, charts/graphs, loss history on pipeline hazards
Pipeline and Hazardous Materials Safety Administration (PHMSA)	Information, data, charts/graphs, loss history on pipeline and transportation hazards
Pipelines and Informed Planning Alliance (PIPA)	Pipeline safety
The Polis Center at IUPUI	Hazard modeling
Research!America	Public Health Data
State Climatologist Office for Illinois	Information, data, charts/graphs, loss history on weather
Tulane University	Information on flood

REFERENCE AND INFORMATION SOURCES (CONT.)	
U.S. Army Corps of Engineers	Information, data, charts/graphs, loss history on dams/levees
U.S. Census Bureau	Population data and characteristics (2010)
U.S. Climate Data	Climate Data
U.S. Code - 18 U.S. Code § 2331.Definitions	Definitions of terrorism
U.S. Department of Agriculture	Information, data, and charts/graphs
U.S. Department of Transportation	Information, data, charts/graphs, loss history on transportation hazards
U.S. Drought Monitor	Information on droughts
U.S. Energy Information Administration	Information on energy data
U.S. Environmental Protection Agency	Information and data on environmental issues
U.S. Fire Administration	Fire hazard data
U.S. Forest Service	Federal Parks
U.S. Geological Survey	Information, data, charts/graphs, loss history on earthquakes
U.S. Nuclear Regulatory Commission (NRC)	Nuclear power information
Weather.gov	Weather facts and incident data
Weather-and-climate.com	Climate Data
Will County Center for Economic Development (CED)	Business information
Will County Government	Plans, authorities, data, maps, and descriptions of county government roles
Will County Health Department	Health and Social data
Will County Regional Office of Education	Information on county education
Workforce Investment Board of Will County	Information on jobs and industry in Will County
World Health Organization	Information, data, and charts/graphs on public health hazards
Will/South Co. Soil & Water Conservation District	Information on flooding and erosion

Identify Hazards and Assess Risk

The Mitigation Project Team recognizes that the assessment and analysis of vulnerability is a definitive measure of the risk associated with each individual hazard. The All Hazard Risk Assessment summarizes the 2020 *Will County Hazard Analysis* and further describes, analyzes, and assesses the county-wide risks from three categories of hazards: natural, technological, and societal. The description of each hazard category elaborates upon and defines the different types of hazards, identifies historical events that have occurred locally and/or regionally; defines the hazard profiles, parameters, and characteristics; assesses possible vulnerabilities; determines probable scenarios; and models select hazards. The associated risks for each hazard were defined through the following process:

1. Identify, define, and describe each hazard
2. Determine hazard profile and characteristics
3. Identify historical occurrences
4. Analyze and assess hazard risk

In order to effectively and efficiently integrate existing documents and operations, the Will County Hazard Analysis conducted in 2020 was incorporated into the *Will County County-Wide All Hazard Mitigation Plan*. This allowed Will County to identify mitigation objectives, strategies, and actions that address all of Will County's risks. The *Will County Terrorism Vulnerability Assessment* and the *Terrorism Vulnerability Assessment of Critical Infrastructure Results* were not referenced in this document due to the sensitive information that is contained in these reports.

The *2020 Will County Hazard Analysis* utilized a formal, structured procedure to evaluate hazards. Will County utilized a process similar to IEMA's for assessing and evaluating hazards in order to promote a common base and consistency in the analysis by defining criteria and providing a scoring system. Four criteria were used to describe and assess the potential hazards, the four criteria include:

History — Past record of occurrences of the specified hazard. It is a guide of what has occurred in the past but is not a guarantee of what may occur in the future.

Vulnerability — Pertains to the people that might be killed, injured, or contaminated and to property that might be destroyed, damaged, or contaminated due to the occurrences of a specified hazard.

Maximum Threat — Consists of the impacts from a 'worst case' scenario of a specified hazard and is where the greatest impact to people and property is expected and assessed.

Probability — Refers to the likelihood of the occurrence of a specified hazard. It is expressed as the number of chances per year that an event of a specific intensity will occur.

Identify Mitigation Goals, Objectives, and Actions

The Mitigation Goals, Objectives, and Actions address the intent of this document and the actions to reduce loss from future hazard events throughout the county. Mitigation strategies were reviewed, defined, and prioritized primarily through Mitigation Workshops with committee members and participating jurisdictions. The Mitigation Workshop participants were encouraged to identify mitigation strategies that had an all hazards impact or targeted the community's greatest risks. Potential strategies were developed using criteria developed by FEMA. These evaluation criteria consist of public support, technical feasibility, staffing, funding, maintenance requirements, political support, legal authority, and cost effectiveness.

The mitigation plan identifies mitigation actions and implementation strategies. The mitigation actions and strategies were developed from the risk assessment and the public participation process. The mitigation actions were prioritized by those hazards that have the greatest risk (i.e. significant probability of occurring and a significant impact). The Mitigation Steering Committee was encouraged to not limit their focus of mitigation actions to these hazards.

Each mitigation strategy describes the opportunity, how to implement it, funding sources, and responsible agencies.

Problem/Opportunity:	Describes either a problem or a possible opportunity to reduce risk.
Implementation Strategy:	Each mitigation strategy includes ideas to implement and accomplish the specific project and potential resources, which may include grant programs or human resources.
Lead Agency:	The agency or agencies that will organize resources, find appropriate funding, or oversee project implementation, monitoring and evaluation.
Funding:	Offers suggestions on potential financial resources for implementing the mitigation strategy. This includes funding from government agencies as well as various different types of grants.
Timeline:	Estimates the amount of time it will take to begin implementation of each strategy.

Mitigation Plan Development

The *Will County County-Wide All Hazard Mitigation Plan* documents the mitigation planning process and addresses the elements required in 44 CFR Part 201.6(c). Although the DMA2K requires local governments to only address natural hazards, Will County EMA thought it was imperative to address all hazards, including technological and societal (which includes terrorism) hazards. Will County EMA also recognizes the importance of integrating mitigation with other state and federal directives.

Plan Monitoring and Maintenance

The Mitigation Steering Committee, with support of participating jurisdictions, will review the plan annually or within 45 days of any disaster event. It will regularly review each goal and objective to determine its relevance to the changing situation throughout Will County. It will also monitor and evaluate the mitigation strategies in this plan to ensure that the document reflects current hazard analyses, development trends, code changes, and risk analyses and perceptions. The committee will hear progress reports from the parties responsible for the various implementation actions to monitor progress and create future action plans and mitigation strategies. It will review the plan when other plans are being updated, such as capital improvement project plans and comprehensive plan updates to ensure consistency.

The participating jurisdictions and Will County recognize the importance of effectively communicating with the public about the community's hazards and what they can do to be prepared and mitigate their threats. Continued public involvement is an important part of implementing, monitoring, and maintaining the *Will County County-Wide All Hazard Mitigation Plan*. Will County EMA has provided a forum to educate the public and solicit input, in order to effectively involve residents in the update and review of the plan, as members of the Planning Committee.

Will County EMA, with active participation of county departments, local jurisdictions, and organizations, will maintain and update the *Will County County-Wide All Hazard Mitigation Plan*. The update of this plan will occur every five years as mandated by DMA2K. The Hazard Mitigation Steering Committee will continue to solicit additional members and gather each year to assess the status of the mitigation actions. Public input will be solicited throughout the year through a variety of methods that include public meetings, website postings, and other means to provide a conduit to the community.

FEMA Mitigation Plan Review Tool

The *Will County County-Wide All Hazard Mitigation Plan* is designed to meet the requirements of DMA2K, while also developing a useable document to identify opportunities to alleviate the impact and/or consequence of hazards on all of the communities of Will County. To ensure that the plan meets the requirements of DMA2K, the Mitigation Project Team cross-referenced the All Hazard Mitigation Plan with FEMA's *Local Mitigation Plan Review Tool*. FEMA uses this tool to evaluate mitigation plans. In addition, the tool identifies where each plan element is located within the plan document. The review tool can also be used as part of an internal quality assurance procedure.

CHAPTER 2: WILL COUNTY COMMUNITY OVERVIEW

A community overview is presented to provide background information in order to put the risk assessment into perspective. The community overview also aids in the evaluation of proposed mitigation measures. To ensure the integration of the *Will County County-Wide All Hazard Mitigation Plan* with other county, jurisdictional, and emergency management planning documents, portions of this section originating from the Will County Hazard Analysis were updated with recent changes within Will County and the participating jurisdictions and supplemented with information on hazard mitigation planning.

Historical Overview

The Will County area was inhabited over time by various native American Indian tribes as far back as 3,000 to 4,000 years ago. People were drawn to the area for its abundance of resources and accessibility to other parts of the country. A rich supply of hunting game, timber, fertile soil, and water sources met the needs of the early inhabitants and the old Sauk Trail along with the Des Plaines, DuPage, and Kankakee Rivers afforded routes for travel. The county was formed in 1836 from Cook and Iroquois Counties.

The county's name honors Dr. Conrad Will who was a member of the first Constitutional Convention and the Illinois Legislature until his death in 1835. Will County included an area north of the Kankakee River, now part of Kankakee County, but its present boundaries have remained as established in 1852. It was originally divided into ten election districts and seventeen road districts and now consists of twenty-four townships.

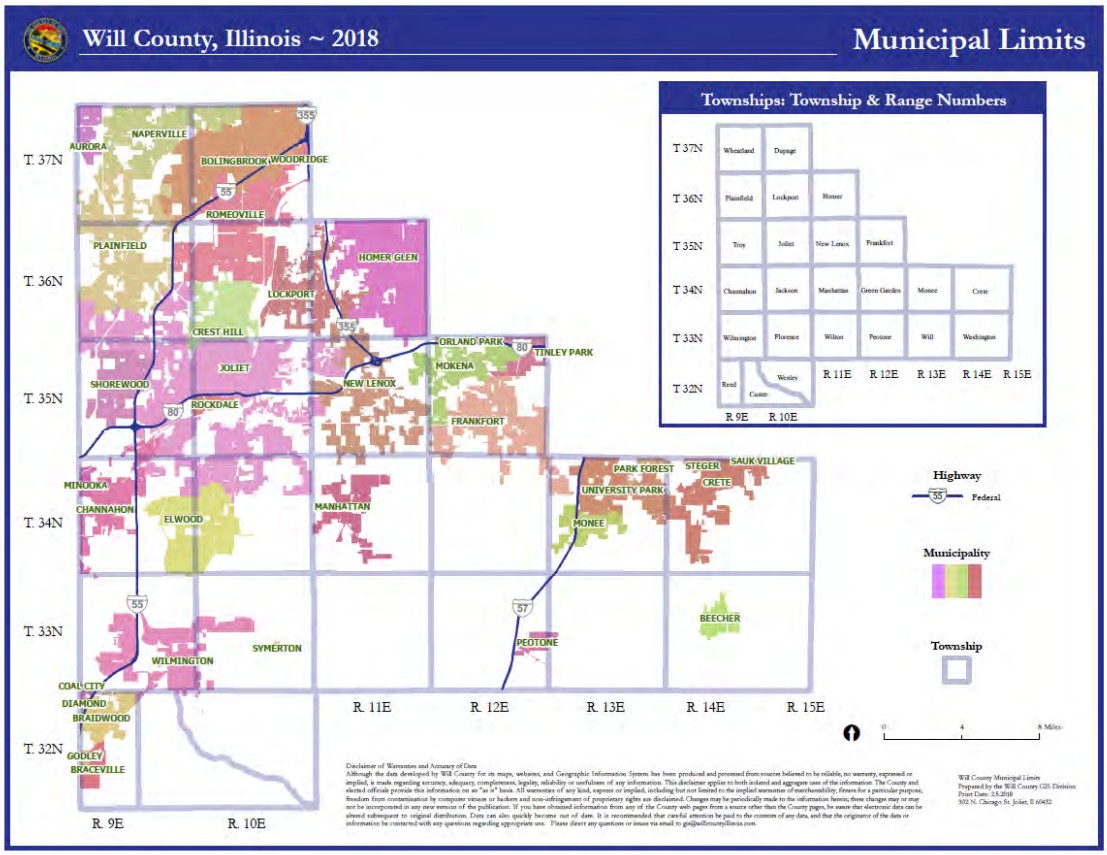
Will County Municipalities

Will County consists of 37 municipalities that range from small farmland communities to large suburban cities. Several of these municipalities cross Will County's jurisdictional boundaries into neighboring counties.

Will County's Municipalities:

City of Aurora*
Village of Beecher
Village of Bolingbrook
Village of Braceville*
City of Braidwood
Village of Channahon
Village of Coal City*
City of Crest Hill
Village of Crete
Village of Diamond*
Village of Elwood
Village of Frankfort
Village of Godley*
Village of Homer Glen
City of Joliet
Village of Lemont*
City of Lockport
Village of Manhattan
Village of Minooka*
Village of Mokena
Village of Monee
City of Naperville*
Village of New Lenox
Village of Orland Park*
Village of Park Forest*
Village of Peotone
Village of Plainfield
Village of Rockdale
Village of Romeoville
Village of Sauk Village*
Village of Shorewood
Village of Steger*
Village of Symerton
Village of Tinley Park
Village of University Park*
City of Wilmington
Village of Woodridge*

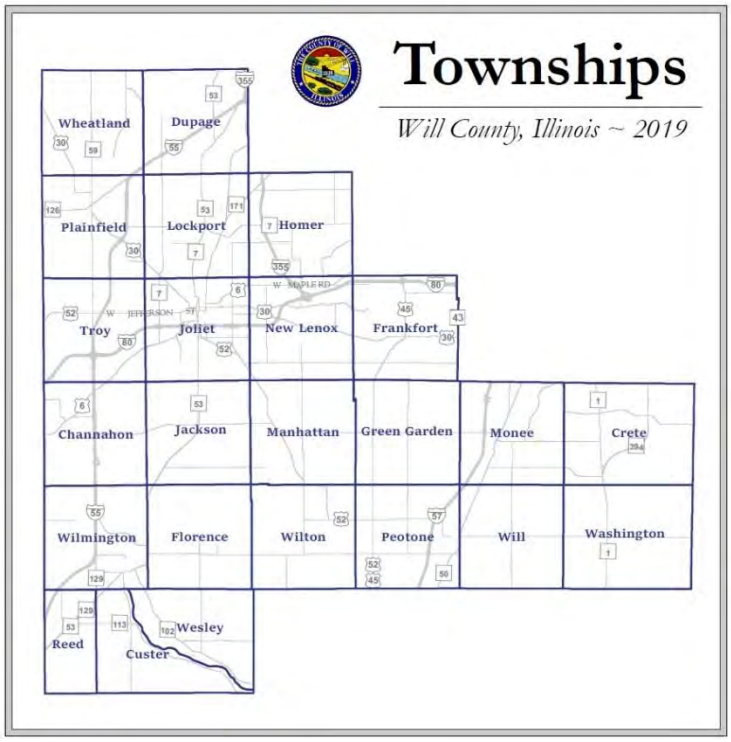
* Jurisdictions that border or have only a portion of their corporate limits within Will County



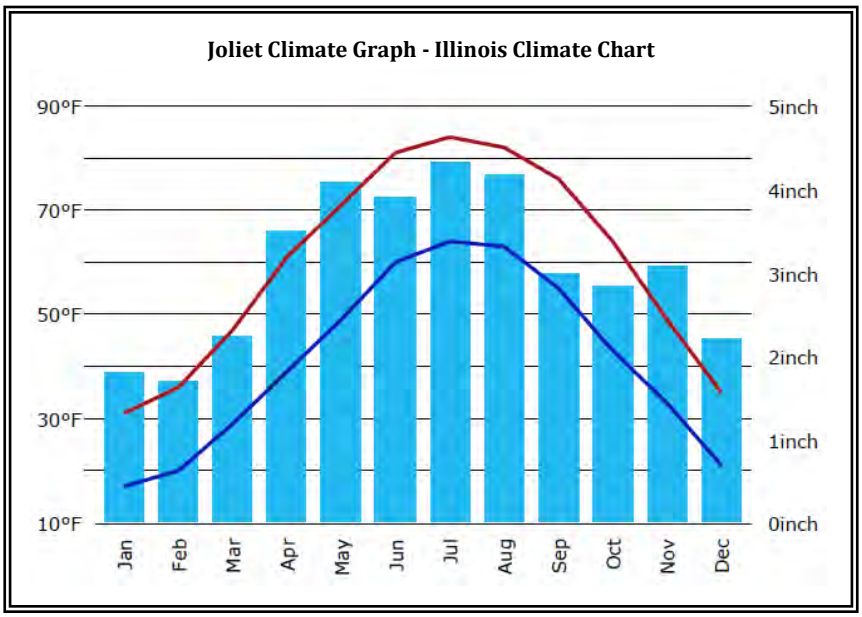
Geography and Climate

Will County, covering an area of 846 square miles, is one of Illinois' 102 counties. The county is part of the Chicago Metropolitan area, located in northeastern Illinois. Joliet, the county seat, is located approximately forty miles southwest of Chicago at an altitude of approximately 600 feet above sea level. The continental glaciers that covered Illinois thousands of years ago created the relatively flat terrain. As the Wisconsonian, the last glacier in Illinois, retreated and melted, the lakes and rivers that were important to the county's early inhabitants were formed. Today, water transportation remains important for the shipment of goods by the county's three main rivers: Des Plaines, DuPage, and Kankakee. These rivers run along the Chicago Sanitary and Ship Canal and Illinois and Michigan (I&M) Canal and provide a connection between the Great Lakes and Gulf of Mexico.

After glaciation, prairies formed over most of Illinois. The morainal and Grand Prairie sections predominated in Will County. The windblown silt deposited during glacial retreat and prairie vegetation created a mollisol or dark-colored soil found in the northern half or two-thirds of Illinois. This type of soil is conducive to the growing of corn, oats, soybean, wheat, and hay that are grown by today's farmers.



The area experiences a humid continental climate with hot summers and cold winters. Three air masses influence the county's climate. Generally in the winter, cold, dry air flows down from Canada. The summer months experience warm, very humid air from the Gulf of Mexico. Dry, warm air from the Pacific Ocean occurs especially in the fall.



Maximum temperatures in the summer average 85° F in July, but temperatures have been known to reach into the 100's. Minimum temperatures in the winter average 12° F in January; however, lows have occurred in the –20's. Humidity in the summer and wind in the winter intensify the problems of extreme temperature that endanger the population. Average rainfall for the area is 35.8" and average snowfall is 38.6". The length of the growing season is approximately 165 days with the last spring frost occurring around May 1st and the first fall frost occurring near October 15th of each year.

Will County: Temperature - Precipitation - Sunshine

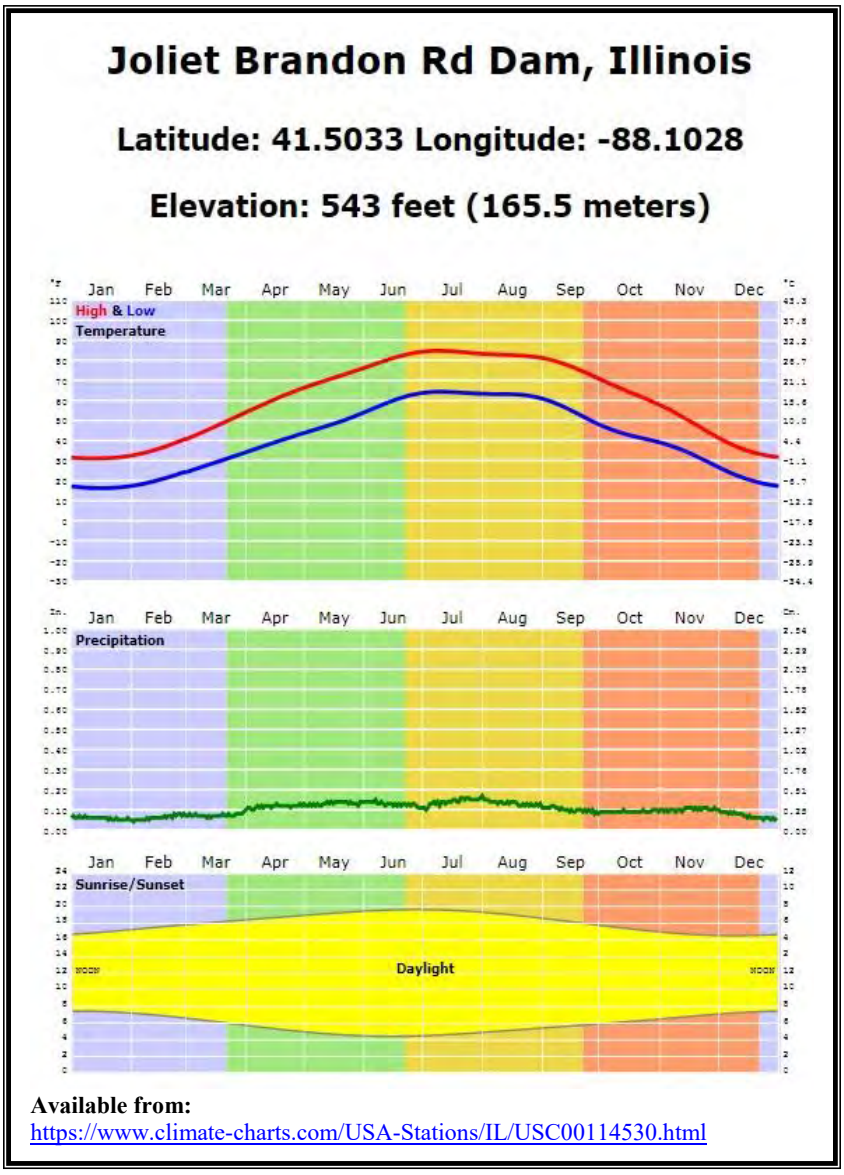
	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Average high in °F	31	36	47	61	71	81	84	82	76	64	49	35
Average low in °F	17	20	29	39	49	60	64	63	55	43	33	21
Avg. precipitation - inch	1.81	1.69	2.24	3.5	4.09	3.9	4.33	4.17	2.99	2.83	3.07	2.2
Days with precipitation (2019)	11	10	12	13	12	11	9	8	8	7	10	10
Hours of sunshine	126	142	199	221	274	300	333	299	247	216	136	118

Sources:
U.S. Climate Data: https://www.usclimatedata.com/climate/joliet/illinois/united-states/usil0592/2019/12
Weather & Climate: https://weather-and-climate.com/average-monthly-hours-Sunshine,joliet-illinois-us,United-States-of-America

Per the State Climatologist Office for Illinois:

Climate conditions have effects on human health and safety. Temperature extremes and storms are responsible for deaths and health problems. Each year, 20 to 30 deaths in Illinois are attributed to floods, winter storms, tornadoes, and lightning."

Heat and cold waves are other climate hazards associated with high death tolls. Illinois experienced two of its most deadly heat waves during the 1990s. The 1995 heat wave, the deadliest on record, led to 753 Illinois deaths. That heat wave and another in 1999, caused major power outages in the Chicago metropolitan area. Annually, 74 deaths are attributed to heat and 18 deaths are attributed to cold, far exceeding deaths due to tornadoes, lightning, and floods.



Available from:
https://www.climate-charts.com/USA-Stations/IL/USC00114530.html

Flooding is the single most damaging weather hazard in Illinois. Ever-increasing heavy precipitation since the 1940s has led to increased flood peaks on Illinois' rivers. *Flood losses in Illinois, $257 million annually since 1983, are the third highest in the nation. Within Illinois and the Midwest, flood losses have been increasing at a greater rate than elsewhere in the nation. Over a 45-year period (1955-1999), Illinois had $5.195 billion in flood losses; 74% of these losses have occurred since 1985.*

Severe Weather

Illinois experiences about 29 tornadoes annually. Peak months are April-June (63 percent of the total), but tornadoes have occurred in all months. Although Illinois averages four tornado-related fatalities per year, the number varies widely from year to year.

Thunderstorms account for 50-60 percent of annual precipitation and are quite common in Illinois with an average of 60 storms (far northeast) to 80 storms (southwest). Nearly half of all thunderstorm days occur during the June-August period. Similarly, the average number of cloud-to-ground lightning strikes per square mile ranges from 5 strikes (northeast) to more than 11 strikes (southwest). Some thunderstorms produce hail, and annual average hail-days vary from 3.3 days (southwest) to less than 1.8 days (northeast).

Climatic Controls

Five factors control the continental climate of Illinois: sun, weather systems, topography, urban areas, and Lake Michigan. Two major controls are latitude (reflecting the amount of solar input) and weather systems (air masses and cyclonic storms). The effects of topography, Lake Michigan, and urban areas are of lesser significance because they influence local climate conditions, rather than conditions statewide. (Source: https://www.isws.illinois.edu/statecli/General/Illinois-climate-narrative.htm)

Climatic Controls	
Sun	• Primary energy source for virtually all weather phenomena, in large part, determines air temperatures and seasonal variations • Solar energy is three to four times greater in early summer than in early winter at Illinois' mid-latitude location, which results in warm summers and cold winters when combined with the state's inland location
Weather Systems	• Second major factor affecting the state's climate • Create wide variety of weather conditions that occur almost daily as a result of varying air masses and passing storm systems • Polar jet stream often is located near or over Illinois, especially in fall, winter, and spring, and is the focal point for the creation and movement of low-pressure storm systems, characterized by clouds, winds, and precipitation • Settled weather associated with high pressure systems is generally ended every few days by the passage of low-pressure systems
Topography	• Shawnee Hills extend across southern Illinois and have elevations 500 to 900 feet higher than the surrounding terrain • This change in elevation is enough to increase annual precipitation by about 10 to 15 percent

Climatic Controls (cont.)	
Urban Areas	• Buildings, parking lots, roads, and industrial activities make the urban climate noticeably different than that of surrounding rural areas • Chicago tends to be warmer by 2°F, on average, especially at night • Also enhance summertime precipitation downwind of the city and cause changes in humidity, cloudiness, wind speed and direction
Lake Michigan	• Influences the climate of northeastern Illinois, especially Chicago • Large thermal mass of the lake tends to moderate temperatures, causing cooler summers and warmer winters • Major benefit is cool lake breezes that provide some relief from summer heat • Also tends to increase cloudiness in the area and suppress summer precipitation • Winter precipitation is enhanced by lake-effect snows that occur when winds blow from the north or northeast • Winds allow air to pass over the relatively warm lake, boosting storm system energy and water content, leading to increased snowfall
Source: Illinois Climate Atlas. S. A. Changnon, J. R. Angel, and K. E. Kunkel. Illinois State Water Survey, Champaign, Illinois.	

Climate and the Economy

Major businesses in Illinois are highly climate sensitive. Crop yields are dependent upon climate conditions because irrigation generally is not used. Illinois serves as the nation's center for air and surface transportation. With the nation's second busiest passenger airport (O'Hare) and the rail hub of the nation at Chicago, Illinois also is the heart of the nation's trucking industry. Each form of transportation is influenced by weather and climate extremes, and resulting delays in shipments are a major problem for manufacturers in Illinois.

Vegetation

Will County is located at the northeastern edge of the Tall Grass Prairie biome. The area was historically dominated by prairie and scattered woodlands, with wetlands associated with depressions and riverine systems. Much of the original vegetative communities of Will County are no longer present. The county is now made up primarily of agricultural land with various urban and suburban communities. Remnants of pre-settlement vegetation can still be found in the various Will County Forest Preserve District preserves and greenways, Illinois State Parks, and Illinois Nature Preserves located within the county.

Rivers

Three major river corridors are located within Will County; these corridors are associated with the DuPage River, the Kankakee River, and the Des Plaines River. Various creeks feed into the three main rivers, including Forked, Manhattan, Pike, Rock Run, Trim, Spring, Deer, Lily Cache, Grant, Thorn, Jackson, Prairie, Hickory, Sugar, and Plum Creeks.

The DuPage River is 84 miles in length and travels through DuPage County and western Will County. The DuPage River is the largest tributary of the Des Plaines River and has two branches, the East Branch and the West Branch. The DuPage River enters Will County in Bolingbrook and travels south to Channahon where it joins the Des Plaines River and turns west, until they both join the Kankakee River to become the Illinois River.

The Kankakee River enters Will County in the southwestern section of the county. It traverses west through the southwestern-most portion of the county. It eventually joins the Des Plaines River to form the Illinois River.

The Des Plaines River flows southward from Wisconsin until it becomes adjacent to the Chicago Sanitary and Ships Canal in Lockport Township. It traverses south adjacent to the Chicago Sanitary and Ships Canal and the I & M Canal, passes east of Romeoville, and turns southwest just south of Joliet. The Des Plaines River joins the Kankakee River just west of Joliet to form the Illinois River.

The stream corridors in Will County are important natural features and are protected by Will County's Stream and Wetland Protection Ordinance which prohibits development within stated setbacks. The *Will County Land Resource Management Plan, Open Space Element* states that "streams and river systems are corridors of exceptional significance for resource protection and preservation of important natural habitats in the county."

Land Use Patterns

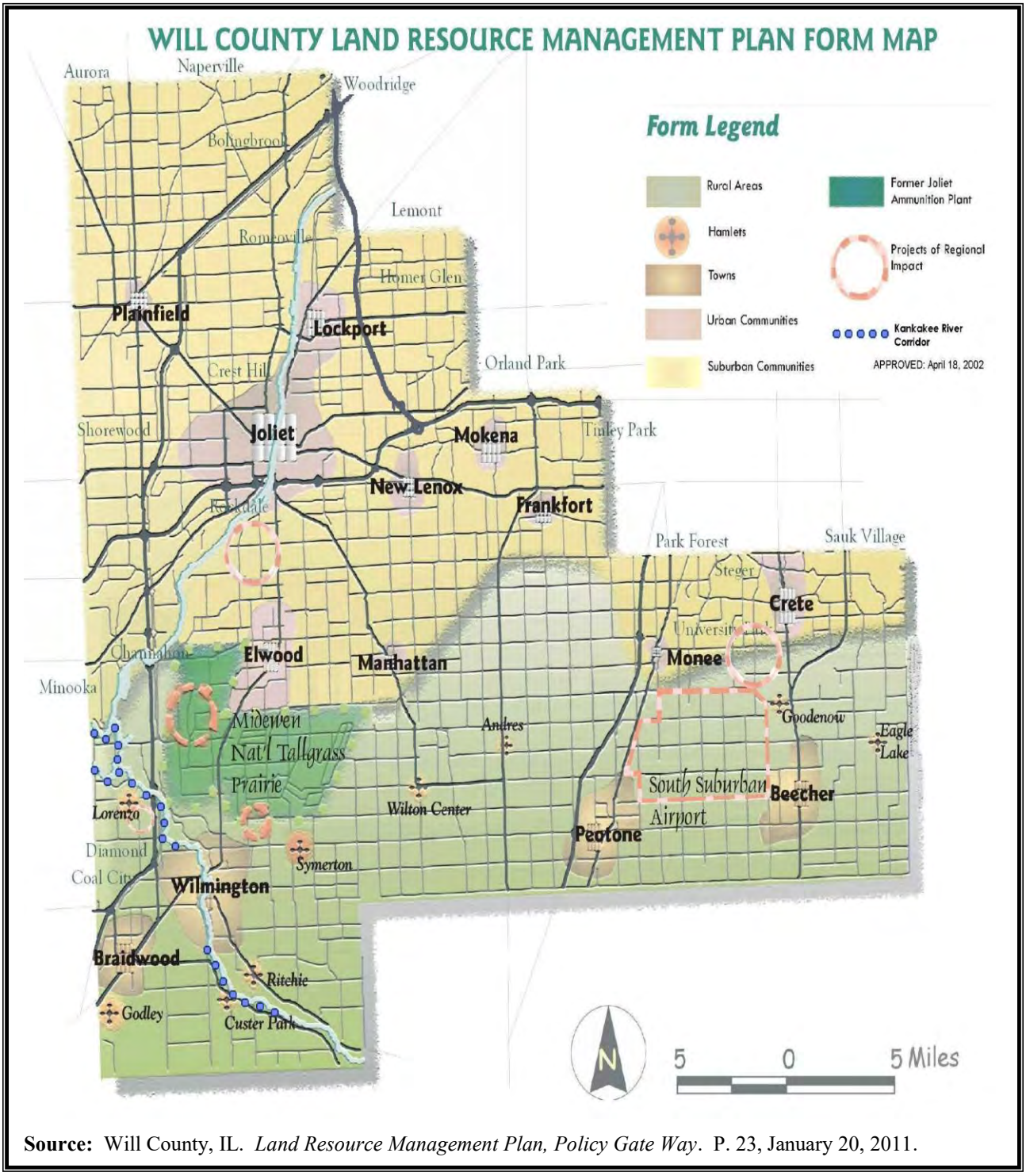
Will County has a mixture of land uses that range from urban to rural areas. Over the years, changes in land use have been decided by the more than thirty different authorities in charge of planning and land use regulation. In 2011, the County Board approved a new *Land Resource Management Plan* (LRMP).

Community members realize the importance of the development of a regional plan that coordinates the management of land use within the county. The *Will County Illinois Land Resource Management Plan* provides the county and local authorities with a framework for the form and shape of future growth. The idea of the plan is to identify the county as a leader on county-wide land use issues. It is also to assist local authorities with the site-specific issues of growth while

supporting open space, farms, and environmentally sensitive land that has characterized Will County over the years.[1]

Currently, there are over 500,000 acres of land in Will County. Approximately 100,000 acres are developed for non-agricultural use. Almost 248,000 acres are used for agricultural purposes with the remaining 100,000 acres vacant. This provides land beyond expected future demands. Urban areas are presently found in the northern half of the county. Joliet, the county seat, is the largest city in Will County. Other urban centers located in the northern townships are Plainfield, Lockport, New Lenox, Mokena, and Frankfort along with Monee and Crete found in the most eastern townships. The City of Naperville and the Village of Bolingbrook are urban centers; however, their boundaries span both Will County and DuPage County.

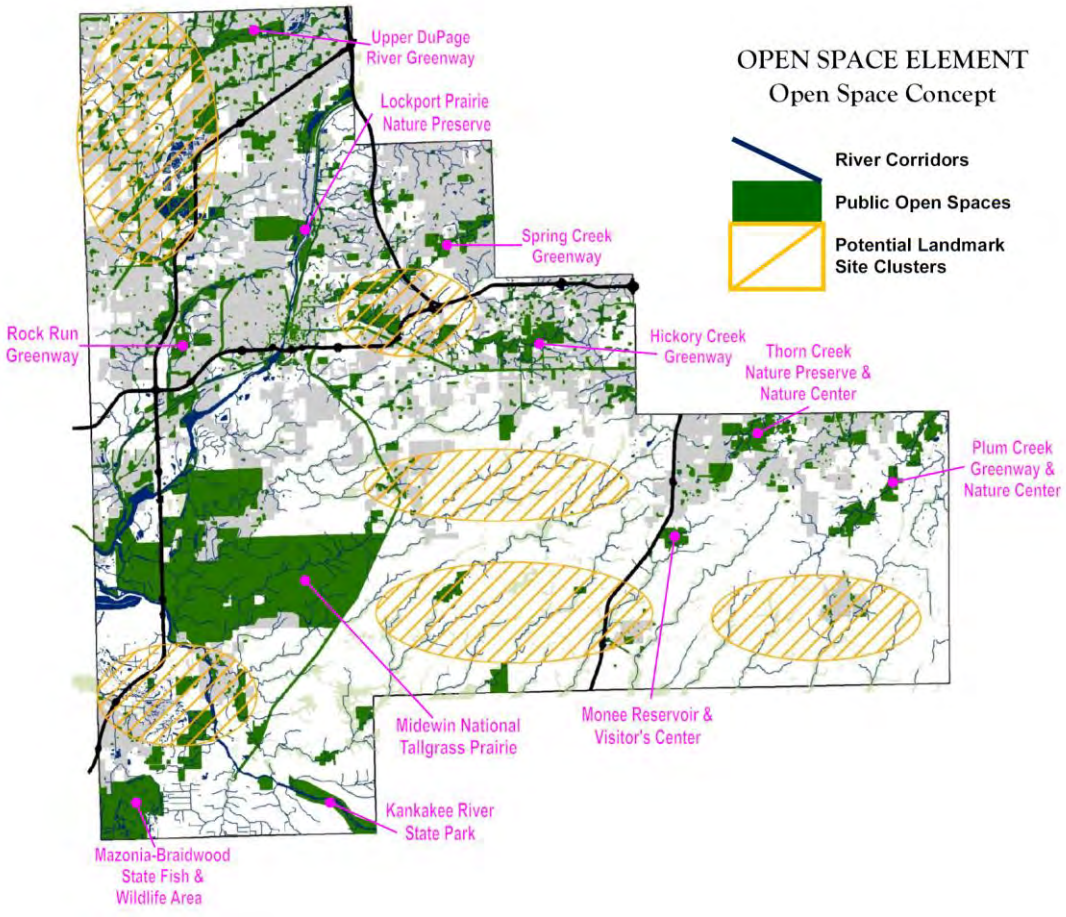
[1] The *Will County, Illinois Land Resource Management Plan*, January 20, 2011. https://www.willcountyillinois.com/County-Offices/Economic-Development/Land-Use/Administration-Planning/Long-Range-Planning-Projects.



Source: Will County, IL. *Land Resource Management Plan, Policy Gate Way*. P. 23, January 20, 2011.

The cities are located near major transportation corridors (I-55, I-80, I-57, freight and commuter trains, regional buses, and waterways) allowing businesses and residents convenient access to shipping, work, shopping, and entertainment. Because of this convenience and availability of jobs in the Chicago Metropolitan area, all of these communities are now encountering rapid growth that is expected to continue into the coming decades. To preserve open space and agricultural land use, the county's land use plan encourages future growth to be concentrated in existing urban areas. The plan recommends that development should occur in a logical and rational pattern to make effective use of existing infrastructure and avoid "sprawl" or "leapfrog" patterns.

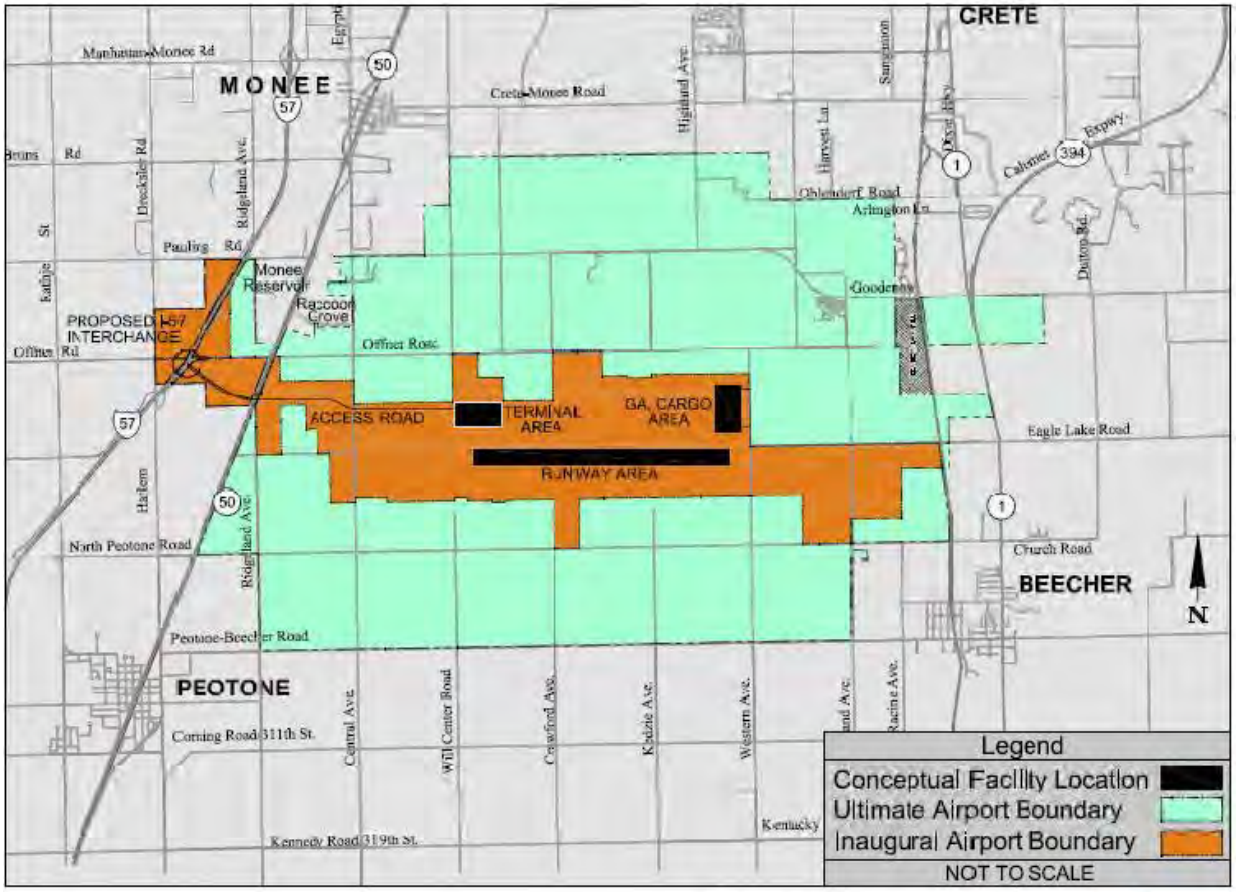
The rural areas are typified by agricultural uses, farm homesteads, and agricultural service businesses. Non-farm homes are generally built on larger lots without municipally oriented services such as water and sewer. Though there are farms scattered in between the cities and developments in northern Will County, rural development predominates in the southern half of the county. The county's land use plan indicates that the rural development and open space form is a pattern that is desirable and one that should be preserved.



Source: Will County, IL. *Land Resource Management Plan, Open Space Element*. P. 5, January 20, 2011.

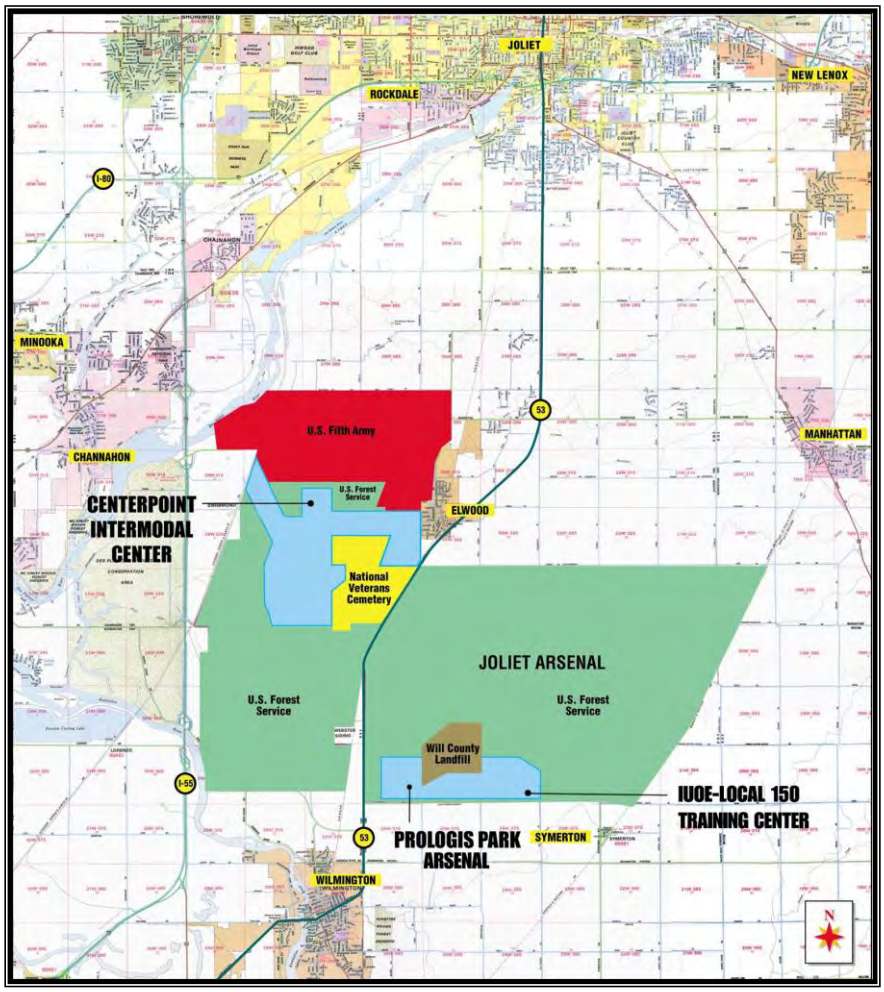
The South Suburban Airport is a major public aviation facility proposed for an unincorporated site in southern Will County. This new airport construction project will be designed to be a cargo-only facility. Upon completion, the airport will become the third major airport serving the Chicago city region. It will be flanked by the five municipalities of: Crete, Monee, Peotone, Beecher and University Park, and the hamlet Goodenow. The difficulty is to balance the demands for growth with the need to maintain agricultural viability and rural culture. Should the South Suburban Airport become a reality, the demand for growth in the southeast sector of the county will be intensified. This new airport will help to alleviate the congestion at Chicago's two airports, but it will dramatically impact the area within the surrounding ten miles of the proposed new facility. Thus, the time is now for the county and local authorities to work together to prepare a plan that will meet the needs of the area while preserving the rural development form and property rights of farmers and agricultural businesses.

Proposed South Suburban Airport



Proposed configuration of the South Suburban Airport.

Source: Will County, IL. *Land Resource Management Plan, Forms & Concept Handbook.* 1.3.4, January 20, 2011.

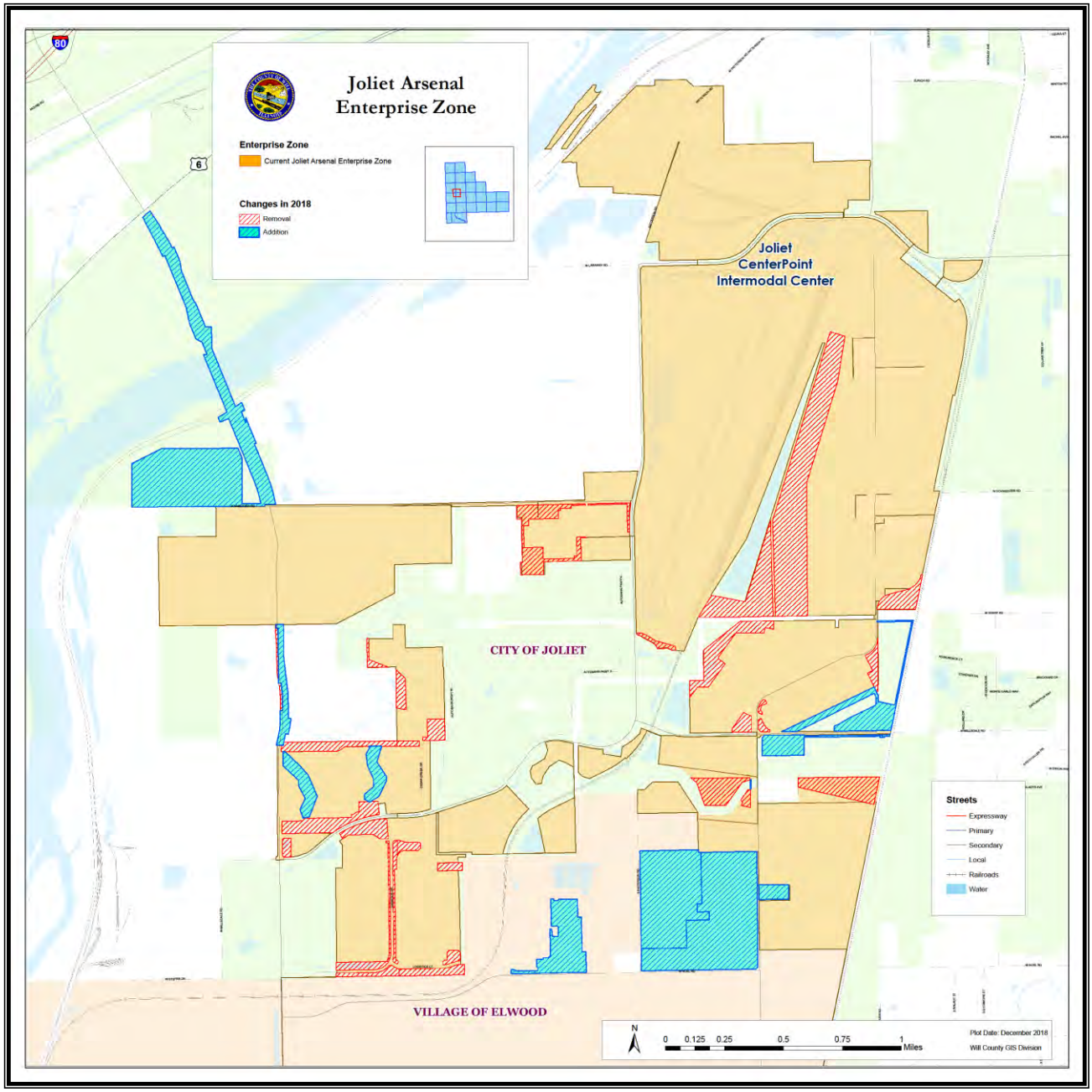


In the mid 1990's, federal and state law created a special district to re-utilize land (24,000 acres) formerly occupied by the Joliet Army Ammunition Plant (JOAAP). Four distinct land uses were created. The first is a new national cemetery (Lincoln National Cemetery), the second is the preservation of prairie (Midewin National Tallgrass Prairie), another is a Will County landfill (Prairie View Recycling and Disposal Facility), and last are two industrial developments (Deer Run Industrial Park and the Island City Industrial Park). All four uses are endorsed by the Will County's land use plan. The development preserves open space while providing important economic development.

Included in the industrial development is an intermodal facility that is expected to ship between 1.7 and 4.6 million cargo containers and create 8,000 jobs. The recycling and disposal facility anticipates twenty to twenty-three years of operation that will accept 14 million tons of waste excluding the waste from the former arsenal site. This development suits the use of this land while utilizing existing infrastructure and respecting the natural landscape.

The Joliet Arsenal Enterprise Zone (JAEZ) was created in 2002 by Will County to foster development in and around the former Joliet Army Ammunition Plant, known as the Joliet Arsenal, which was decommissioned by the US Army in 1993. The Zone has a successful history of creating employment and investment opportunities at the Elwood CenterPoint Intermodal Facility, the Local 150 training center, the Exxon Mobile refinery, and other projects. The Zone has been expanded on multiple occasions in the past, most recently in 2010 with the Ridge Port Logistics Center in Wilmington and in

2011 with the CenterPoint Intermodal Center in Joliet. The JAEZ is currently using the maximum allowable square footage. (See: https://www.willcountyillinois.com/County-Offices/Finance-and-Revenue/Joliet-Arsenal-Enterprise-Zone)



Transportation Network

As in the past, Will County's transportation infrastructure is essential to its economic well-being and quality of life. Being close to Chicago has led Will County to develop an intricate and varied transportation system for the conveyance of raw materials, finished goods, workers, and tourists in and out of Chicago and its metropolitan area. It consists of roads, commuter and freight rail services, regional buses, waterways, and bikeways that transport goods and people. Because transportation is so important to the county, the county has adopted a *2040 Long Range Transportation Plan.*

The concept of the plan stresses the relationship between land use policy and transportation facilities and service. It identifies the strength and weaknesses of the current infrastructure, links transportation with land-use patterns, anticipates transportation needs for the coming decades, and provides recommendations for solving problems, meeting needs, and addressing transportation expansion within the county. As the county experiences growth, particularly in the north and central sections of the county, improvements in the current transportation infrastructure and new transportation routes will be necessary to accommodate the increase in population, businesses, and industries.

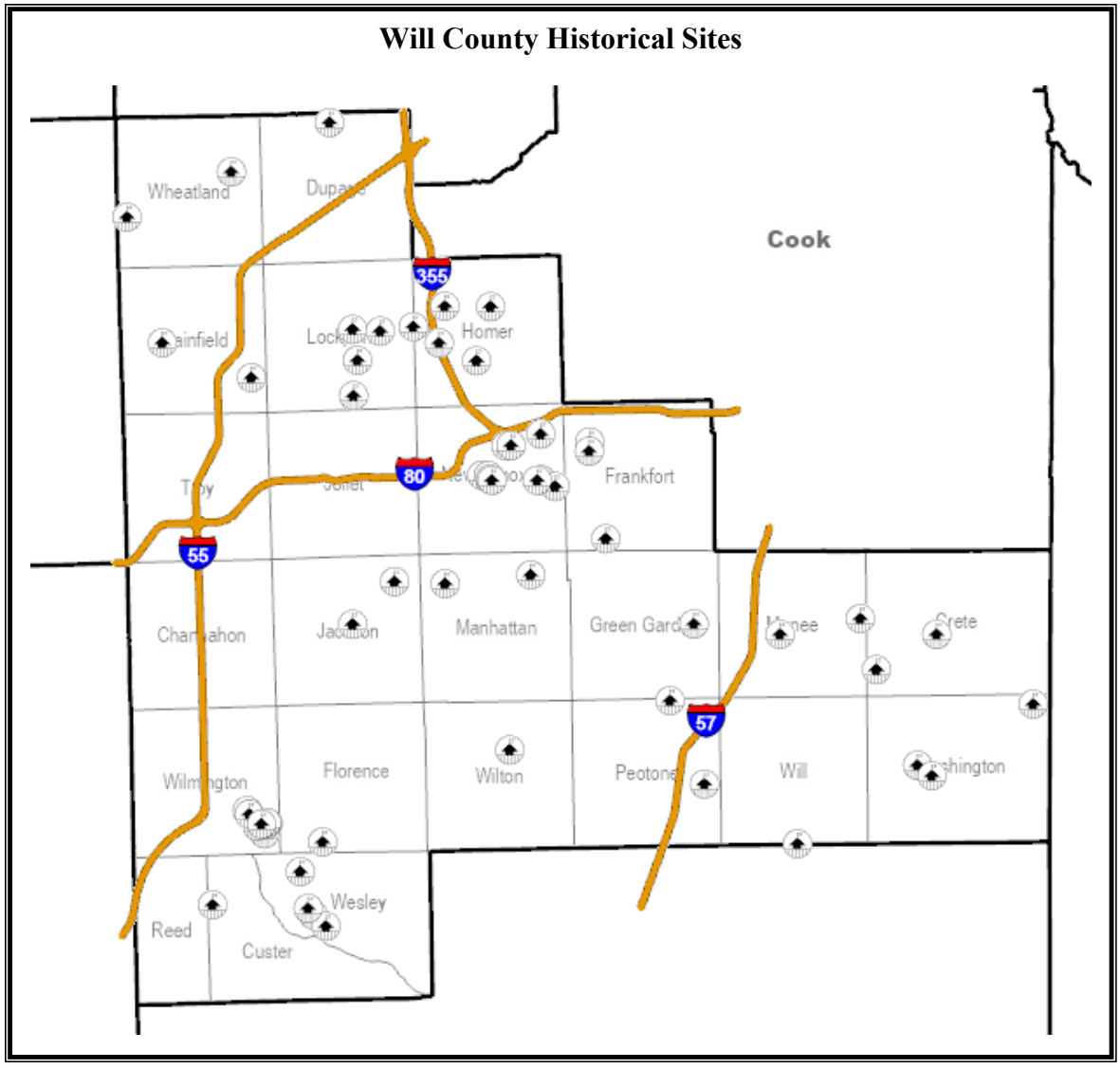
There are three major travel corridors within Will County: first, a northeasterly flow to and from Chicago from the northwestern sections of the county; second, a north-south flow to and from Chicago from the central and eastern sections of the county; and third, a north-south inter-suburban flow between Will and DuPage Counties that provide work commuting routes.

Buildings

The largest metropolitan area within Will County is Joliet, the county seat. Joliet possesses both a government center and a rich cultural heritage. The central downtown area is home to both city and county government services; Joliet City Hall and the Will County Courthouse are located in the central downtown area. In addition to government services, Joliet is home to the Rialto Square Theatre, which is listed on the National Register of Historic Places and is considered by many to be one of the most beautiful theaters in the United States. Also located in Joliet, the Jacob Henry Mansion is a historic landmark which is used for special events.

Historic Sites

Will County has many historic sites located within the county that have been preserved. Currently, Will County is home to 36 properties/structures listed on the National Register of Historic Places.[2]



[2] https://www.nps.gov/subjects/nationalregister/index.htm

National Historic Register Properties within Will County[3]		
	Name	**Location**
	Alternate Route 66, Wilmington to Joliet	Illinois Route 53 between Wilmington & Joliet
	Beecher Mausoleum	Jct. of IL 1 & Horner Ln., Beecher, IL
	Brandon Road Lock & Dam Historic District	1100 Brandon Road Joliet
	Briscoe Mounds	Front Street along the Des Plaines River Channahon
	Chicago Sanitary & Ship Canal Historic District	Illinois Waterway miles 290.0 – 321.7
	Christ Episcopal Church	75 W. Van Buren St, Joliet
	Downtown Peotone Historic District	East side of N 1st St & both sides of N 2nd Street roughly bounded to the S by the alley S of Main Street & to the N by North St. Peotone
	Downtown Plainfield Historic District	Lockport bounded by Division & Main Sts., Plainfield
	Eagle Hotel	100-104 Water St, Wilmington

[3] https://nationalregisterofhistoricplaces.com/il/will/state.html & https://www.nps.gov/subjects/nationalregister/data-downloads.htm

National Historic Register Properties within Will County (cont.)		
	Name	**Location**
	Fitzpatrick House	Route 53 Lockport
	Flanders House	405 W. Main Street Plainfield.
	Ron George Round Barn	NE of Romeoville off US 66 Romeoville
	John Heck House	1225 S. Hamilton Lockport
	Jacob H. Henry House	20 S. Eastern Ave Joliet
	Illinois & Michigan Canal	7 miles SW of Joliet on U.S. Route 6 in Channahon State Park Joliet
	Joliet YMCA	215 N. Ottawa Street Joliet
	Joliet East Side Historic District	Between Washington and Union Sts, 4th and Eastern Avenues Joliet

National Historic Register Properties within Will County (cont.)		
	Name	**Location**
	Joliet Municipal Airport	4000 W. Jefferson Street Joliet
	Joliet Steel Works	927 Collins Street Joliet
	Joliet Township High School	201 E. Jefferson Street Joliet
	Lockport Historic District	Between 7th and 11th Sts and Canal and Washington Steets Lockport
	Lockport Lock, Dam & Power House Historic District	2502 Channel Drive Lockport
	Louis Joliet Hotel	22 E. Clinton Street Joliet
	McGovney-Yunker Farmstead	10824 LaPorte Road Mokena
	Robert Milne House	535 E. 7th Street Lockport

National Historic Register Properties within Will County (cont.)		
	Name	**Location**
	Peotone Mill	433 W. Corning Avenue Peotone
	Plainfield Halfway House	503 Main Street Plainfield
	Rubens Rialto Square Theater	102 N. Chicago Street Joliet
	Hiram B. Scutt Mansion	206 N. Broadway Joliet
	Small-Towle House	515 County Road Wilmington
	Standard Oil Gasoline Station	600 W. Lockport Plainfield
	Stone Manor	SE of Lockport Lockport
	U S Post Office	150 N. Scott Street Joliet

National Historic Register Properties within Will County (cont.)		
	Name	**Location**
	Union Station	50 E. Jefferson Street Joliet
	Upper Bluff Historic District	Between Taylor, Center and Campbell Sts and Raynor Avenue Joliet
	Will County Historical Society Headquarters	803 S. State Street Lockport

Will County Land Use Department also maintains a register of historic places. The Will County Local Landmark Program describes the difference between the National Register and Will County landmark status as follows:

> "*National Register properties are designated after much research, documentation, and review by the State and National Park Service. Although National Register (NR) properties are designated as such after intense scrutiny and listing opens up financial opportunities, this designation is primarily honorary. Will County landmark status is protective and where a National Register property can change overtime without local oversight (review for NR properties takes place only for federal and state-funded undertakings), if you own a county landmark, you can be assured that it will remain for future generations."*

Following are the places that are considered Historic Landmarks on this register. Additional information can be located at: https://www.willcountyillinois.com/County-Offices/Economic-Development/Land-Use/Development-Review/Historic-Preservation/Will-County-Local-Landmark-Program.

Will County Register of Historic Landmarks	
Name	**Location**
Austin-Welter Barn	Homer Township
Baker-Koren Barn a.k.a. Round Barn Farm Museum (John C. Baker Barn, circa 1898)	Manhattan Township
Beecher Mausoleum, circa 1913	Beecher Township
Beecher Railroad Depot, circa 1872	Village of Beecher
Boardman Cemetery	City of Bolingbrook
Bowen-Tyrakowski House (Rodney Bowen House)	City of Wilmington
Brown Cemetery	Custer Township
Brown Church Cemetery	Jackson Township
District 117 Paton School	Manhattan Township
Division Street Bridge across the Des Plaines River (16th Street Bridge, circa 1899)	Lockport Township
Ducker-Cervantes-Squires House (James Ducker House)	Village of Mokena
Gooding Issert Farmstead	Wesley Township
Fiddyment-Garrett-Musial Home (John Fiddyment Home, circa 1840s-Burned Down)	Lockport Township
Fred Francis 4-H Field	Village of New Lenox
Haven Administrative Center (New Lenox.Haven Grade School)	Village of New Lenox
Gooding-Hull House (William Gooding House)	Lockport Township
Friedrich Gottlieb Seggerbruch Homestead (The Carl Gottlieb Seggebruch Homestead)	Crete Township
Horner Barn (Katz-Piepenbrick-Horner Barn)	Village of Beecher
Joliet Works, US Steel, Koppers Coke Oven Plant	Joliet Township
Koppers Coke Oven Plant	Lockport Township
Krohn-Kwiatkowski House (Christian Krohn House)	Will Township
Landon's Store (Wesley Township Hall, circa 1872)	Village of Peotone
John Lane Monument, circa 1916	Homer Township
Lewis University Alumni Relations Development Office (Patrick Fitzpatrick House, circa 1842)	Lockport Township
Lincoln Highway Marker	Village of New Lenox
Lovell Farmstead (Oliver Lovell Farmstead)	Florence Township
Marshall Cemetery	New Lenox Township
McGinnis-Kahler-Hackett House (McGinnis-Kahler House)	Florence Township

Will County Register of Historic Landmarks (cont.)	
Name	**Location**
Methodist Episcopal Church of Wesley (Ritchey United Methodist Church)	Wesley Township
Kathy A. Miller Insurance Agency (Dickson General Store)	Village of New Lenox
Monee Creamery	Village of Monee
North Island City Memorial Flagpole (Joliet Arsenal Flagpole)	City of Wilmington
North Providence Ridge Cemetery	Jackson Township
Octagon House a.k.a. Aldrich-Schutten House (David Aldrich House)	City of Wilmington
Ogren-Reed House	Village of New Lenox
Old Brick Tavern Monument (Lincoln Hotel/Old Brick Tavern)	New Lenox Township
Old City Hall, Wilmington (Wilmington City Hall)	City of Wilmington
Paton School, circa 1860	Manhattan Township
Peotone Mill (H.A. Rathje Mill, circa 1872)	Village of Peotone
Pioneer Memorial Cemetery	Frankfort Township
The Renwick Road Bridge (Springbanks Road Bridge, circa 1912)	Plainfield Township
Riegel Farmstead (Koelling, Riegel, Manilow Farstead)	Village of University Park
Ritchie Railroad Depot (Wabash Railroad Depot)	Wesley Township
Russell-Hoyt-Wilbourn-White-Parker-Smazik House (Benjamin F. Russell House)	Village of Homer Glen
St. John United Church of Christ (St. Johannes Evangelische Gemeinde)	Joliet Township
Salisbury-Paulsen-Blazina House (John Salisbury House)	Village of New Lenox
Schmuhl School (District 121 Schmuhl School	New Lenox Township
Scout Cabin (Boy Scout Cabin)	Village of New Lenox
Solder's Widow's Laundry House (demolished)	Wilmington Township
Small-Towel House	Wilmington Township
Tilsy-Konow Barn (William Tilsy Barn)	Village of Homer Glen
Union Burial Society Cemetery, circa 1852	Frankfort Township

Will County Register of Historic Landmarks (cont.)	
Name	**Location**
The Union Cemetery (German Baptist Society Cemetery, circa 1860)	Green Garden Township
Wydajewski Home (Francis Walker Home)	New Lenox Township
Wayfarer Farm (Carl Wilhelm Steiber House)	Crete Township
Wheatland Township Cemetery	Wheatland Township
Wheatland Presbyterian Church and Cemetery	Wheatland Township
Dr. Edwin R. Willard House	Wilmington Township
Source: https://willcountygis.maps.arcgis.com/apps/MapTour/index.html?appid=f22096650e954910a2b88108bec63405#map	

Transportation

Roads: The highway system consists of four interstate highways that include I-55, I-57, I-80, and I-355. Interstates 55 and 80 intersect in Joliet, the county seat, providing high accessibility. The state highways include IL 1, 7, 50, 53, 59, 102, 113, 126, 171, and 394 along with U.S. Routes 6, 30, 45, and 52. Fifty-six county highways exist to provide service between U.S. and state highways. Township roads serve the needs of the farming community and municipal streets serve local and through traffic within a city or village.

The *Will County 2030 Transportation Framework Plan* identified the fact that substantial growth is forecasted for Will County, this growth will require transportation improvements. The plan makes specific suggestions for regional interstate, major roadway, arterial streets, and intersection realignments to accommodate this growth.[4] *Will County Connects 2040 Long Range Transportation Plan* serves as an update to the *Will County 2030 Transportation Framework Plan* and identifies the many changes in the county's transportation needs since the *2030 Plan* was developed. The *2040 Plan* helps to prioritize transportation investments and relate those priorities to transportation partners at the State, regional, and local levels.[5]

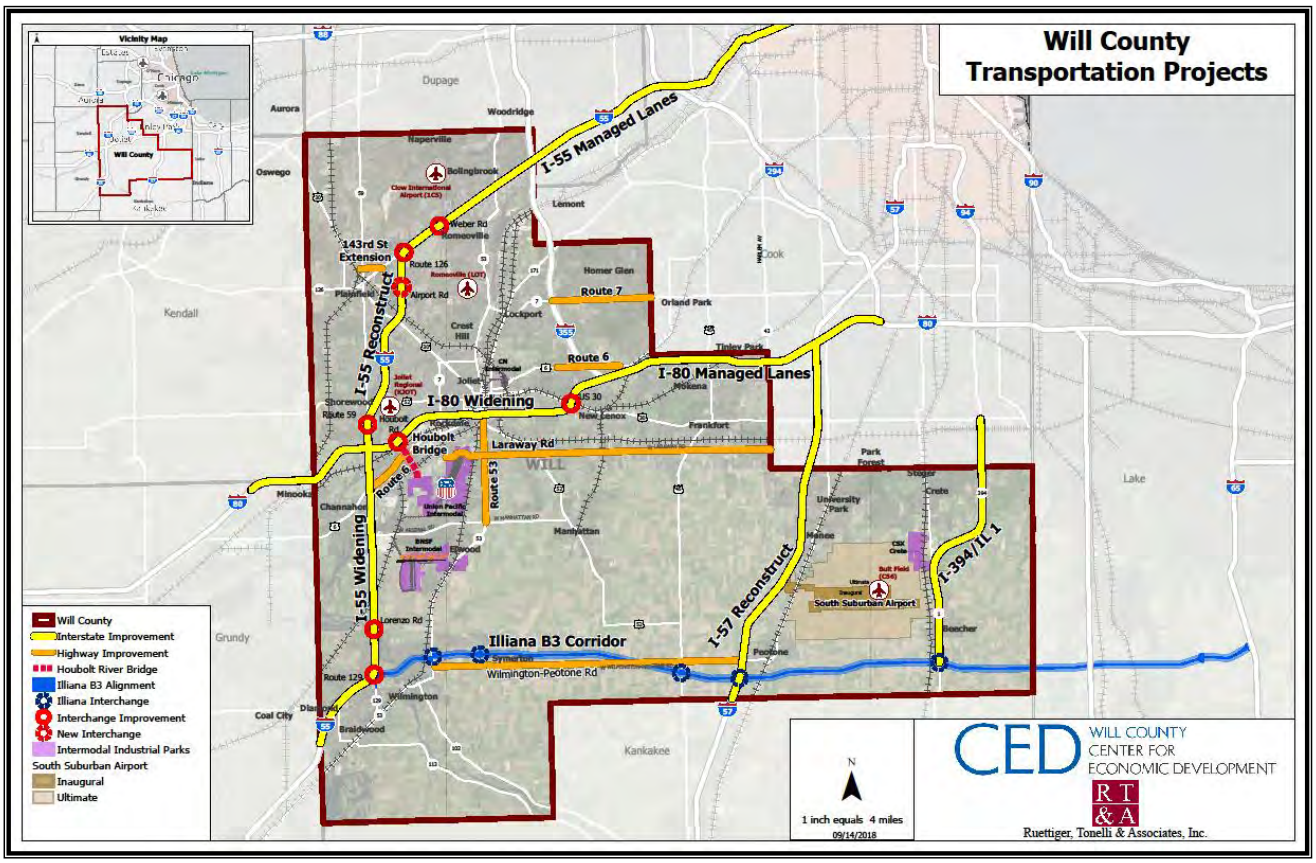
In 2019, Will County received from the State of Illinois' ReBuild Illinois and Five Year Multi-year Plan for Illinois Department of Transportation (IDOT) Capital Plan $1.2 billion for the reconstruction of I-80

[4] Barton-Aschman Associates, *Will County 2030 Transportation Framework Plan,* March 2009. https://www.willcountyillinois.com/County-Offices/Economic-Development/Land-Use/Administration-Planning/Long-Range-Planning-Projects

[5] Will County Division of Transportation. *Will County Connects 2040 Long Range Transportation Plan*, March 2017. https://www.willcountyillinois.com/Portals/0/Highway/Long%20Range%20Transportation/will_county_transporation_report_2017_final4_web.pdf?ver=2017-04-25-112630-497

from Minooka to New Lenox. An additional $21.5 billion from IDOT will fund the following projects over the next five years:

- I-57 at South Suburban Airport Interchange Project - $205.5 million
- I-55 at Airport Rd. & Rte. 126 Interchanges - $181.4 million
- I-55 at Illinois 129 and Lorenzo Rd. Interchanges - $148.7 million
- I-55 at Rte. 59 Interchange Expansion Project - $78.8 million
- Route 53 from Route 52 to Arsenal Rd. Improvement Project - $50.1 million



Rail, Bus, and Non-motorized Transportation: Four commuter rail lines connect Will County to downtown Chicago: Metra Electric from University Park, Metra Southwest Service to Manhattan, Metra Heritage Corridor from Joliet through Lockport, and Metra Rock Island District from Joliet through New Lenox and Mokena. There is a need for Metra Commuter Rail improvements in the Heritage Corridor, Rock Island District, Southwest Service, Electric district, and Southeast Service lines to

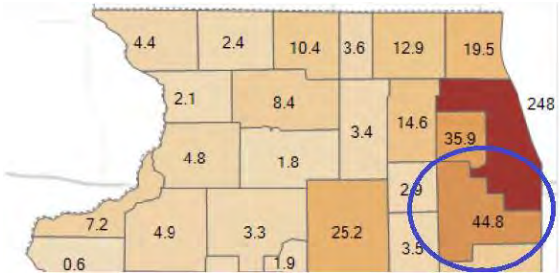
accommodate the growth that is forecasted for Will County.[6] In addition, Amtrak provides interstate passenger train travel. Bus service is provided through four types of transit service by the Pace System: traditional fixed route, limited express bus, dial-a-ride, and custom service. The county region has very limited non-motorized transportation in the form of bikeways and pedestrian paths.

Freight rail is also important to the economy of Will County. As with road and commuter rail systems, freight rail systems lead in and out of the center of Chicago. Rail shipments to, from, and within Illinois in 2014 measured over 454 million tons and were comprised of coal, mixed freight, food products, farm products, and chemicals.

Lockport Lock, Dam, & Powerhouse

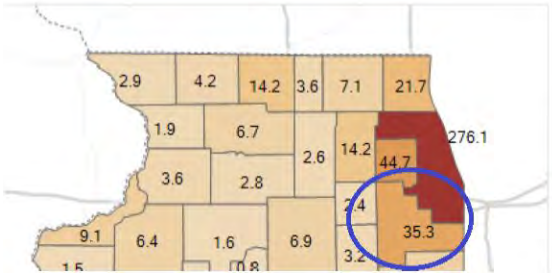
Waterways: The Illinois water system provides additional economic value to Will County. The Des Plaines River and Chicago Sanitary and Ship Canal cross through Will County connecting Chicago and the Great Lakes to the Illinois River that flows south to the Mississippi River and eventually leads into the Gulf of Mexico. In 1999, tonnage of commodities shipped to, from, and within the state totaled

Tons of Freight Originated by County and Mode Shares



	Tons 2014 (M)	%	Mode Share: Truck - FAF Dis	Rail Intermodal - STB	Rail Carload - STB	Water - TS
Cook	248.4	29.9%	54.3%	17.1%	24.6%	4.0%
St. Clair	45.6	5.5%	19.3%	3.0%	32.1%	45.7%
Will	44.8	5.4%	69.7%	25.3%	1.8%	3.2%
DuPage	35.9	4.3%	93.6%		0.5%	5.9%
La Salle	25.2	3.0%	53.3%		41.6%	5.1%
Crawford	22.3	2.7%	94.6%		5.4%	

Tons of Freight Terminated by County and Mode Shares



	Tons 2014 (M)	%	Mode Share: Truck - FAF Dis	Rail Inter modal - STB	Rail Carload - STB	Water - TS
Cook	276.1	33.4%	52.1%	14.1%	30.1%	3.7%
DuPage	44.7	5.4%	83.9%		8.3%	7.7%
Will	35.3	4.3%	47.3%	23.1%	25.7%	3.9%
St. Clair	34.4	4.2%	37.0%	3.5%	51.1%	8.4%
Madison	24.0	2.9%	62.3%	0.8%	28.9%	8.0%
Tazewell	23.7	2.9%	49.0%		48.2%	2.8%

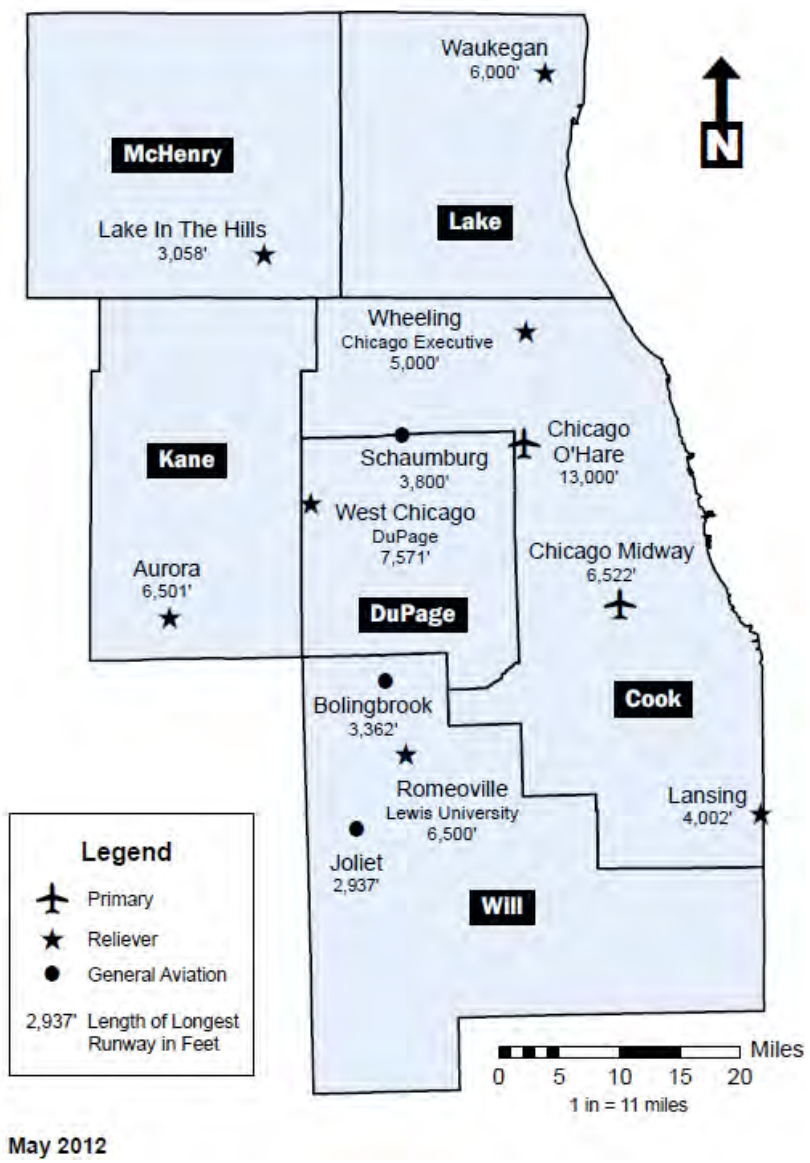
Source: Illinois Department of Transportation. *Illinois State Freight Plan*, October 3, 2017, Amended 2018.

[6] Barton-Aschman Associates, *Will County 2030 Transportation Framework Plan,* March 2009. https://www.willcountyillinois.com/County-Offices/Economic-Development/Land-Use/Administration-Planning/Long-Range-Planning-Projects

over 107.8 million. Goods shipped on the waterways consist of coal, petroleum, aggregates, grain, chemicals, ores, minerals, iron, and steel. This transportation system faces the problem of delays to commercial navigation traffic due to limited lockage capacity and increasing traffic. There are two navigation locks in Will County. Lock chambers throughout the state are over 70 years old and were built to accommodate 600-foot tows. Today's tows are typically 1,110 feet in length necessitating double lockages. Thus, their passage requires more time and money.

Airports: A number of general aviation airports exist within the county: Joliet Park District, Lewis University, Howell Airport, Clow International Airport, and numerous small, privately held airports. In addition to local airports, there is easy accessibility to Chicago's O'Hare International and Midway Airports. Plans are being debated for a South Suburban Airport which would be located in the county's Peotone area and would demand additional infrastructure to support transportation needs and area growth that would inevitably result.

Public Use Airports

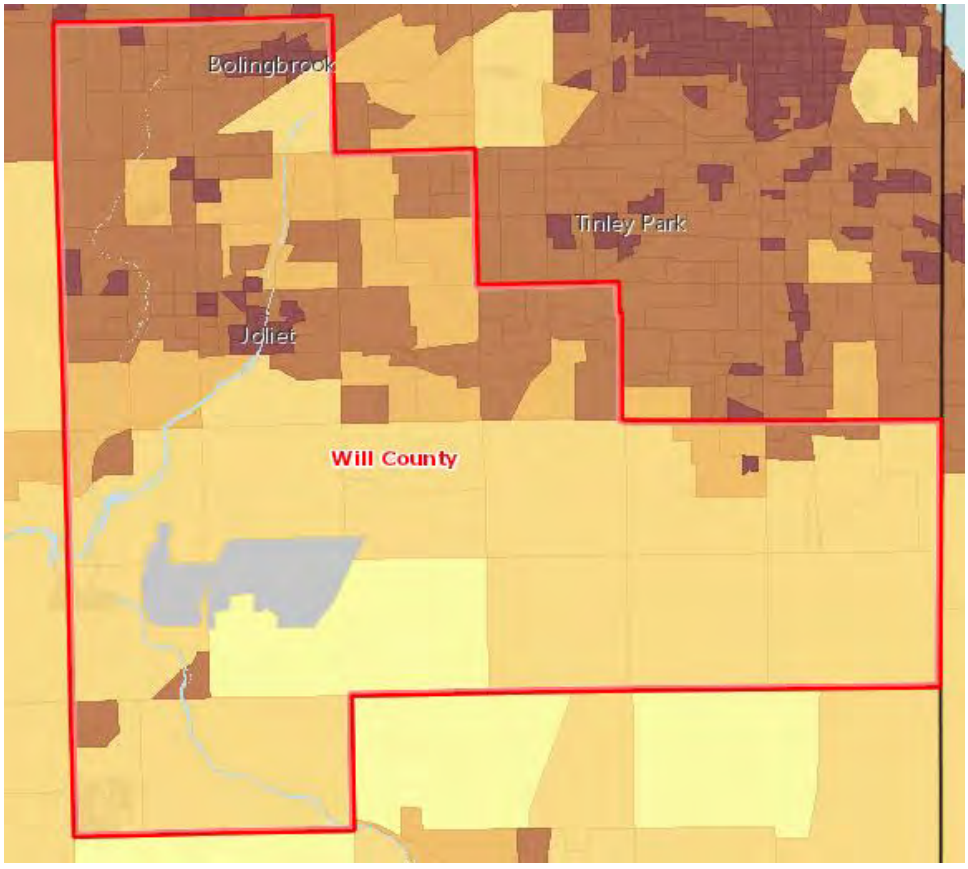


Source: IDOT. Airport Inventory Report. June, 2012.

Population Characteristics

It is important to examine the population characteristics since densely populated areas typically experience the majority of destruction during a disaster. Further, growing communities offer opportunities to identify additional mitigation measures. Between 1990 and 2010, Will County's population grew by over 320,000 people, nearly doubling its population in just twenty years. U.S. Census Bureau's 2019 population estimate for the county is 690,743.

Will County Population Density

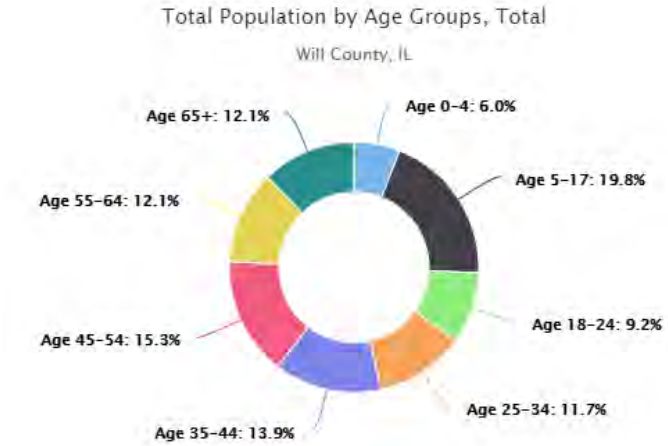


Population, Density (Persons per Sq Mile) by Tract, ACS 2014-18

- Over 5,000
- 1,001 - 5,000
- 501 - 1,000
- 51 - 500
- Under 51
- No Data or Data Suppressed

See: https://willcountyhealth.org/data/will-county-demographics-statistics-and-additional-data/

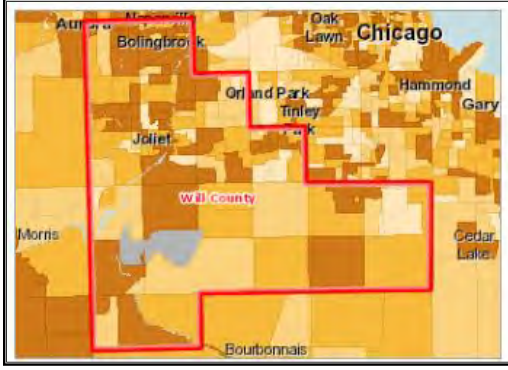
Approximately 85% of the county's population lives in the northern townships of Wheatland, DuPage, Plainfield, Lockport, Homer, Troy, Joliet, New Lenox, and Frankfort. Accordingly, it is also where the major urban areas are concentrated and the most growth is being experienced. The remaining townships, with the exception of Monee and Crete, are more rural in their characteristics. The age distribution throughout the county population is 25.8% for under 18 years old, 62.2% for 18 to 64 years, and 12.1% for ages 65 years and older.

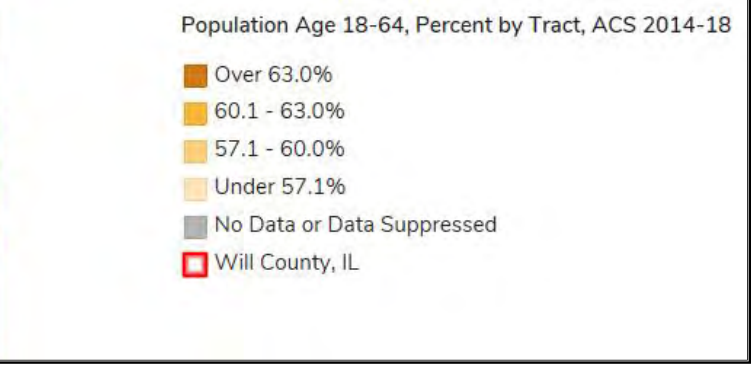


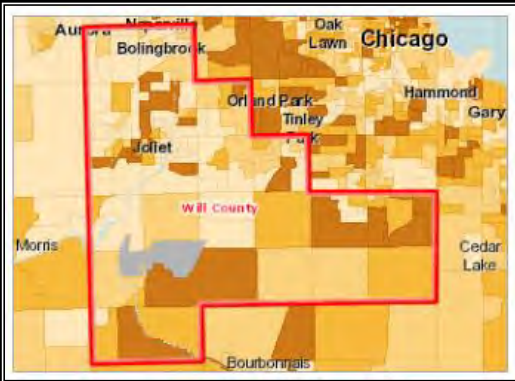
See: https://willcountyhealth.org/data/will-county-demographics-statistics-and-additional-data/

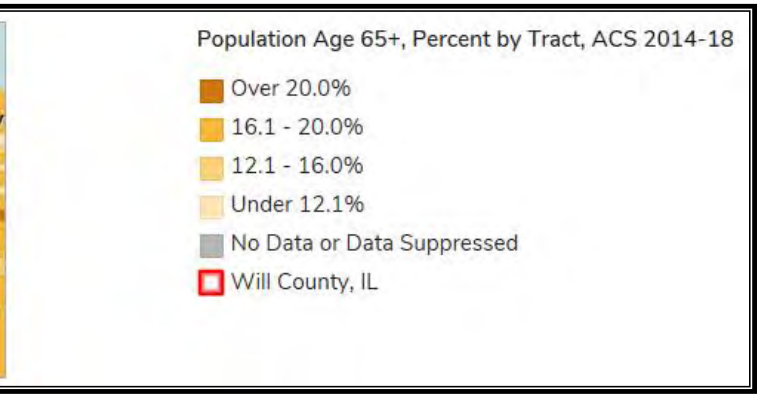
Households by Composition and Relationship to Householder

Report Area	Total Households	Married Family Households	Single Male Family Households	Single Female Family Households	Non-Family Households
Will County, IL	227,848	136,421	9,848	25,520	56,059



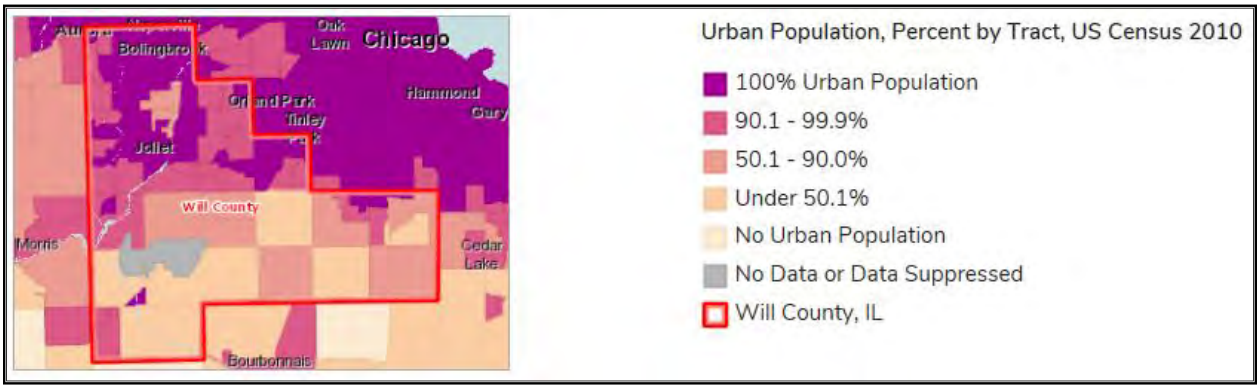






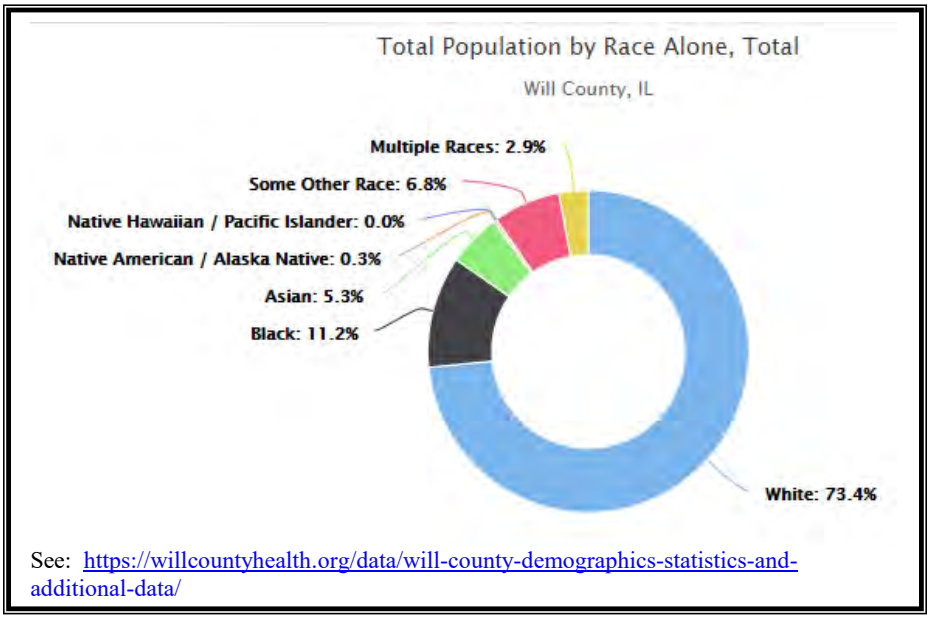
Growth: Census statistics show that Will County is the fifth fastest growing county in the State of Illinois since 2010. The county increased in population from just over 350,000 in 1990 to over 677,000 in 2010. In 2019, estimates placed the county's population at 690,743. Estimated population totals for Will County is expected to grow by 9,567 over the next five years.

The townships that may expect to see significant growth are DuPage, Frankfort, Homer, Monee, New Lenox, Plainfield, Troy, and Wheatland. Rapid employment growth will be seen in DuPage, Troy, Frankfort, Monee, and Crete Townships. Should the proposed South Suburban Airport be built, higher growth in population and employment will occur in Monee, Crete, Peotone, Will, and possibly Green Garden and Washington townships.



Gender, Age, and Race:

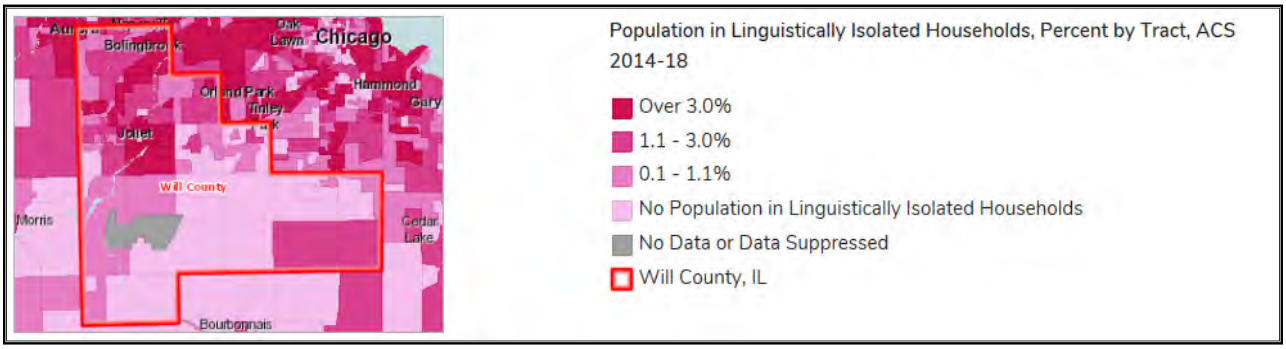
The population of the county is almost equally divided between male and female. The median age is 37.6 years for the county, but a median between three to eight years higher is seen in the more rural townships. County-wide, the population is predominantly white, 73.4%, with more diverse populations found in the townships of Wheatland, DuPage, Lockport, Troy, Joliet, Monee, Crete, and Wesley. Blacks or African Americans represent 11.2% of the county population and Hispanics or Latinos total 17%.



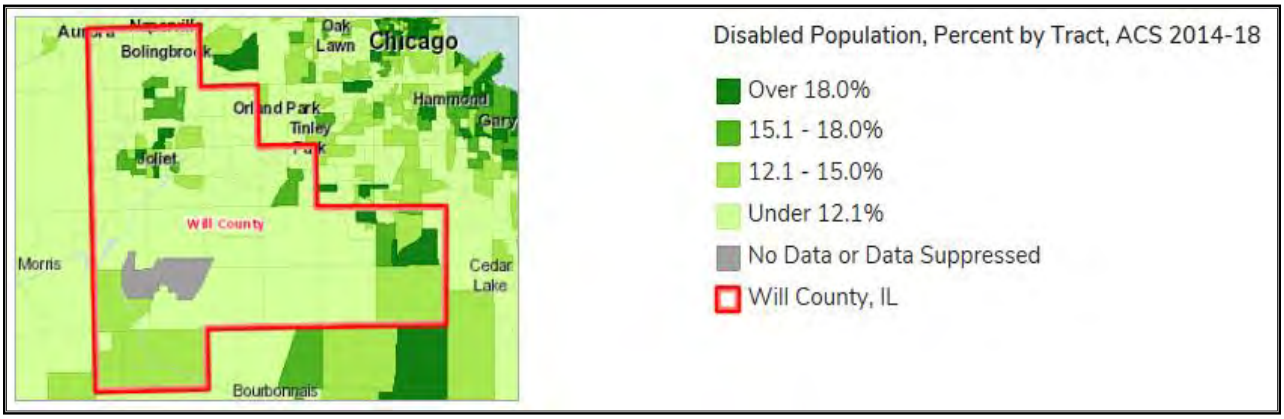
See: https://willcountyhealth.org/data/will-county-demographics-statistics-and-additional-data/

Language: English is the predominant language spoken at home throughout the county (79.9% of the population five years and over). Spanish (7%), Indo-European (3.2%), and Asian and Pacific Island (1.4%) were the other predominant languages spoken at home. Those who speak English less than "very well" represent 4.6% of the county's population five years and over. Individual townships have fairly similar statistics with the exception being Joliet, Will, and rural townships.

In Joliet Township, English only is spoken at home in 80.3% of the population five years and over. The rural townships tend to have an English only rate of approximately 95% with Spanish and Indo-European being evenly split with a rate of approximately 2% each. These townships also have a lower rate, roughly 1%, of the population that does not speak English well.



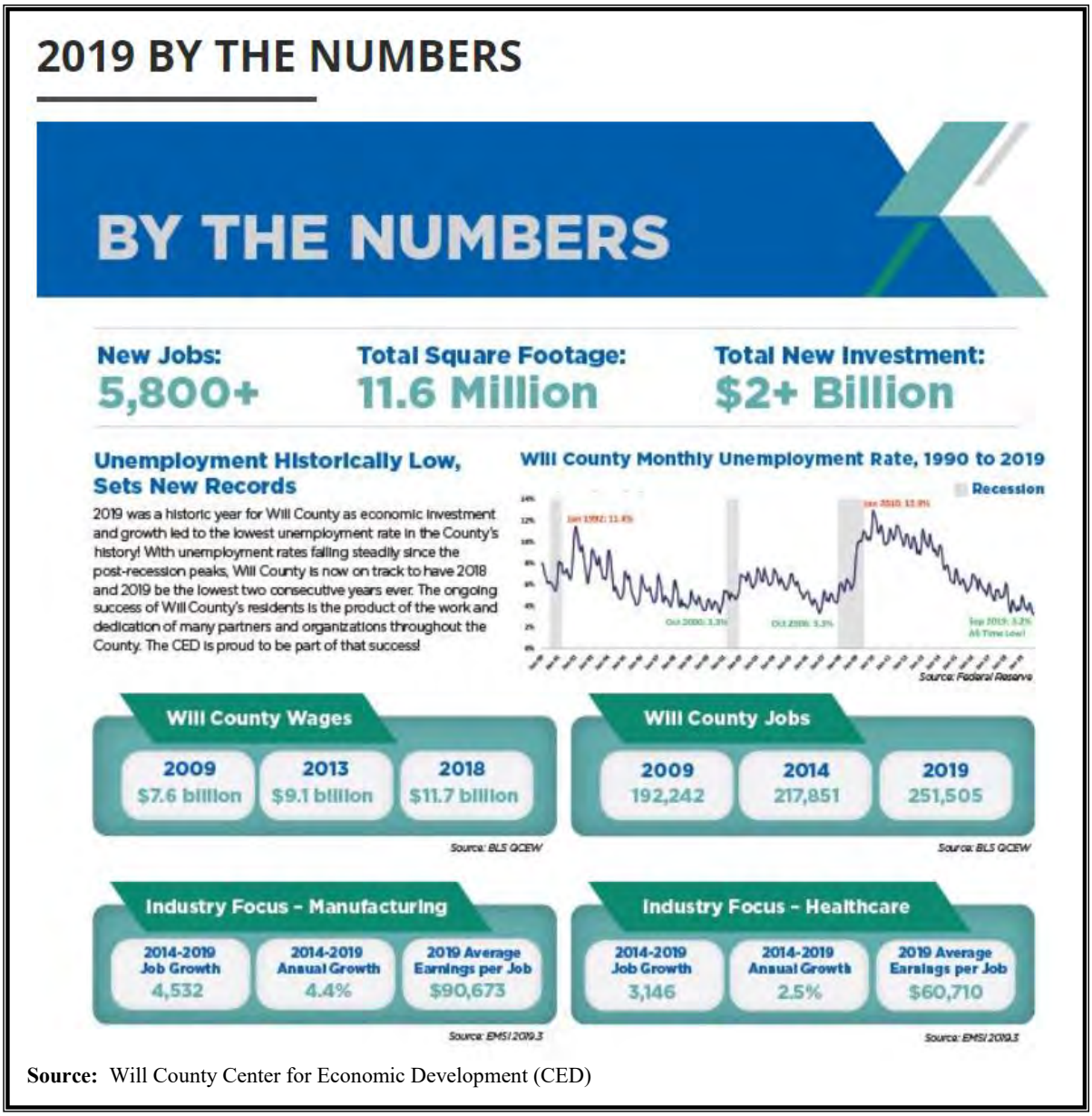
Special Needs: Based on the 2000 census, there are approximately 59,972 people disabled within the county's population. Of the people ages under 18 years, 2.7% are disabled. The population of 18 to 64 years of age has a 6.88% disabled rate. Last, 31.9% of the county's people 65 and older are disabled. This pattern of distribution is consistent throughout most of the townships. Per the 2010 census, lower rates of disability are seen in Wheatland Township's population of five to twenty years (3.9%) and New Lenox and Frankfort Townships' sixty-five years and over population (31.8%, 30.2% respectively). Joliet Township has a higher rate of disability (21.8%) in its twenty-one to sixty-four years population.



Economic Characteristics: Again, location is essential to Will County's economic success. Will County is proximate to Chicago, one of the nation's major cities. O'Hare and Midway Airports, four interstate highways, intermodal transport, railways, and waterways provide access for goods, services, and workers to move in and out of Chicago. The county's strategic location, available and affordable land, and more than 190 million square feet of industrial space make the county a very desirable location for business and industry. Will County has become the largest inland port in North America, handling over 3 million twenty-foot equivalent (TEU) containers annually. Will County has an employed labor force of almost 350,000 people that includes skilled labor. Of the people age twenty-five years and older, 90.9% are high school graduates and 33.9% have bachelor degrees or higher. Add to that, the county's central location in a metropolitan area allows businesses to draw from a seven-county labor force of 4.3 million people.

Approximately 7% of Will County residents have income below the Federal Poverty Level (FPL). Five percent of all families and 27.8% of families whose head of household is female have income levels below the poverty level (U.S. Census, 2017 estimate). Economics can also impact the ability to respond to or recover from a disaster. Poorer residents may not have the resources to stockpile supplies for a disaster, evacuate, or rebuild following a disaster.

Range of Entities: Business entities encompass manufacturing, retail, professional service, education services, health care, real estate, and a growing entertainment industry. Major employers include transportation and warehousing, accommodation and food services, government, construction, healthcare, retail trade, and manufacturing. According to the Bureau of Labor Statistics, Will County is well positioned for business growth for the next twenty years. The county's strategic location; available and affordable land; tremendous highway, rail, water, and air transportation assets; and more than 190 million square feet of industrial space make it a very desirable location for business and industry. Couple that with a robust, highly skilled local and regional workforce, low property taxes, and a pro-growth attitude among its thirty-seven municipalities, Will County is a leading "job growth engine" in the Midwest. Will County has added over 17,000 jobs in the last 3 years.



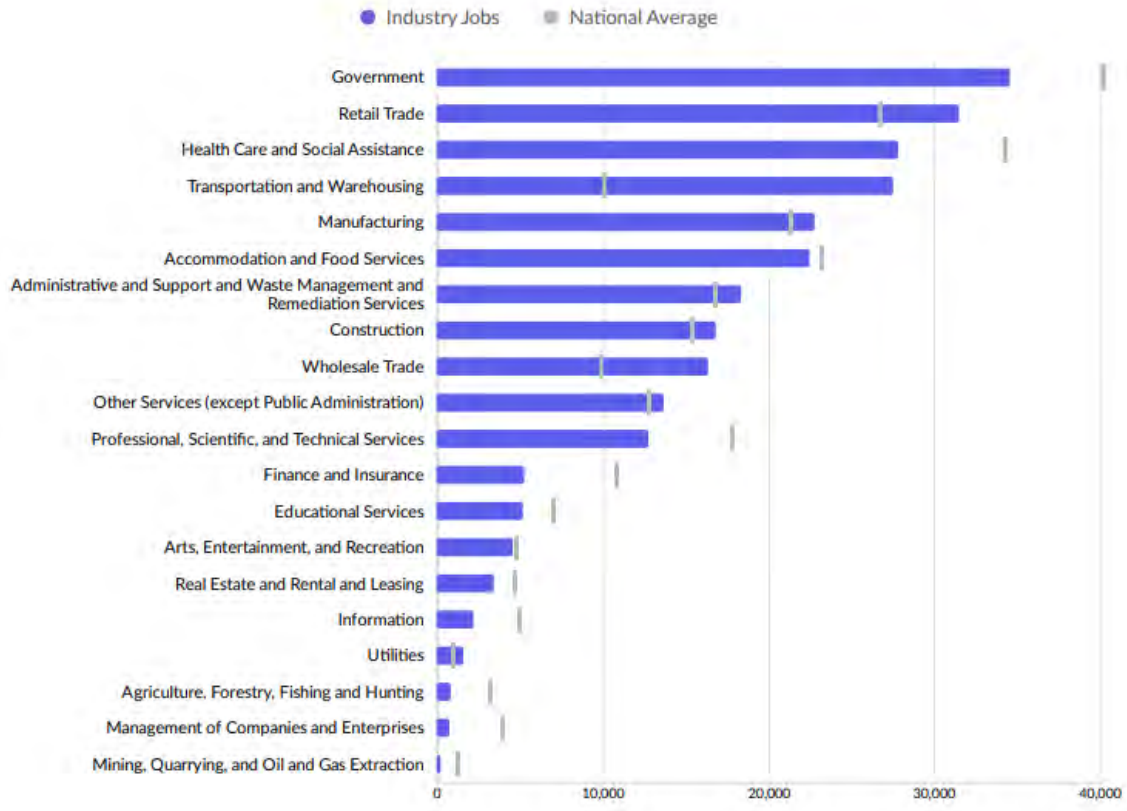
Source: Will County Center for Economic Development (CED)

With almost 250,000 acres of farm land in Will County, there are just over 500 full time farms averaging 323 acres. The county's climate and soil support a variety of agricultural commodities such as grains, hay, fruits, vegetables, cattle, swine, sheep, and poultry. Market value of agricultural products sold is over $107 million consisting of crop sales (92%) and livestock sales (8%). Similar to Illinois' total production, corn (17 million bushels) and soybeans (4.6 million bushels) are the primary crops produced and swine (42,557

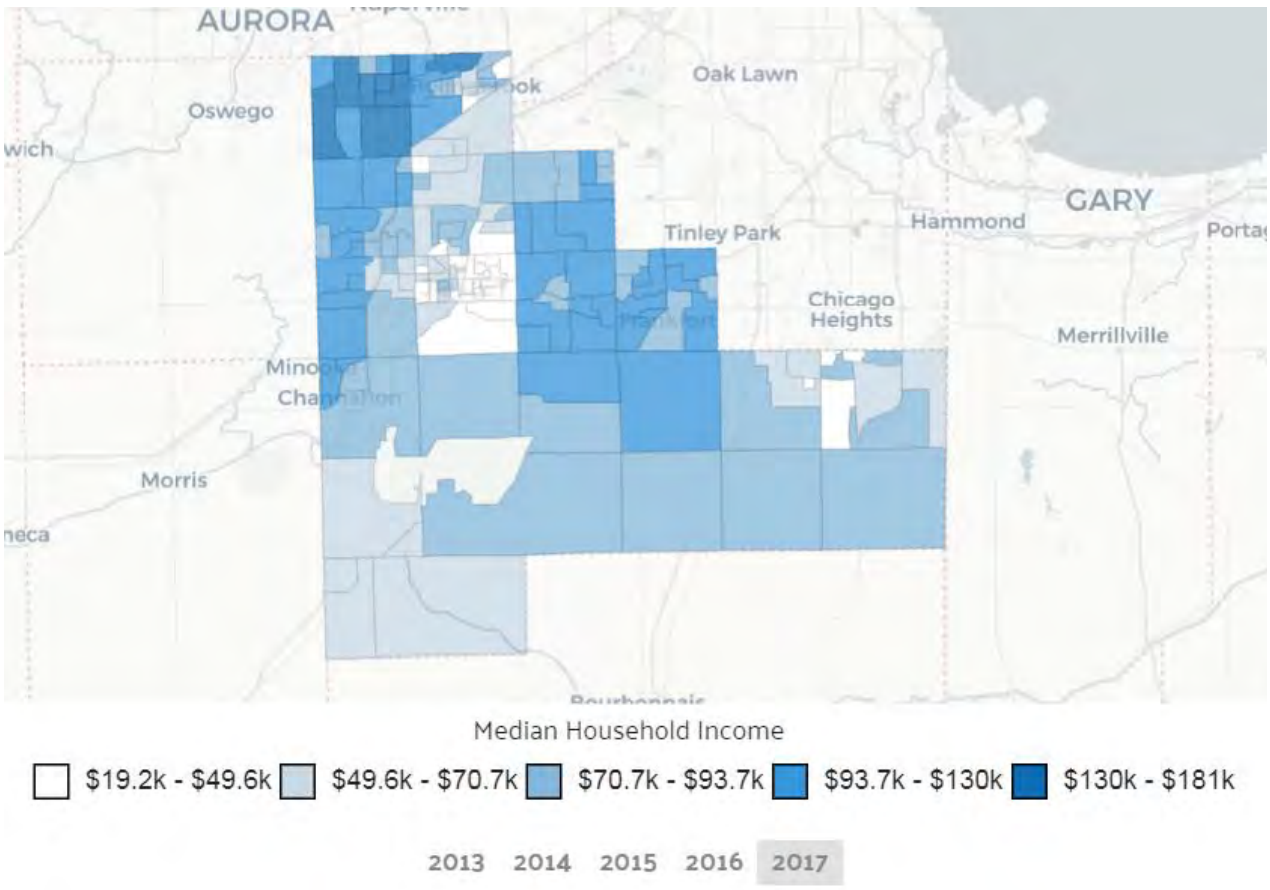
sold) the main livestock sold. The county's transportation system allows easy shipment of crops and livestock for processing and export.

Earnings: Per capita, personal income in 2018 was $52,953 and ranked 20th in the state, representing 84% of the state's average of $31,856. Median household income estimated by American Community Survey is $83,504. This is an increase of approximately $12,000 since 2013.

As of 2018, there are over 227,000 housing units with a median value of $242,800 of which 80% are owner occupied. The unemployment rate as of February, 2020, was 3.8%. Restrictions because of the COVID-19 virus have raised the unemployment rate to 5.6% as of March, 2020.



Source: Workforce Investment Board of Will County. *Economy Overview*. 2019.



Source: Data USA: Will County

Taxes: Various tax structures are applied to business, personal income, and property within Will County. Federal and state income taxes are applied to personal and corporate income, but no local personal or corporate income taxes exists. A state sales tax of 6.25% is applied to tangible personal property with local sales tax rates varying from 0 to 2.5%. The state imposes a utility tax on electricity and natural gas supplies, and some local governments also collect a utility tax. Local governments are authorized to collect property taxes on real property that is assessed at 33.4% of market value. The typical tax rate per $100 of assessed value is $6.62.

Incentives: Along with the application of federal, state, and local taxes, a number of tax incentives are applied to promote development and expansion of businesses and rejuvenate economically distressed areas. As an example, Joliet, Lockport, and Rockdale are part of the Des Plaines River Valley Enterprise Zone that provides ten-year property tax abatement and other tax incentives on all real improvements that increase the assessed valuation of property. Other forms of incentives to encourage business development,

expansion, modernization, and competitive improvement include participation loan programs, industrial training programs, industrial revenue bonds, environmental bonds, venture funds, tax increment financing (TIF), block grants, and various Small Business Administration (SBA) assistance programs. These assistance programs are provided by federal, state, and local sources.

Growth Resources: Encouraging growth, a number of organizations provide business development resources to expand the economy within the county. To name a few, Will County Center for Economic Development provides information and assistance in locating or expanding businesses in Will County. The Illinois Department of Commerce & Community Affairs is the state's economic development agency that provides programs and services designed to help Illinois businesses thrive in the global economy. The Workforce Investment Board of Will County brings together a myriad of employment, training, and educational services, transforming them into a comprehensive and easily accessed system that supports the development of a world-class workforce. The Joliet Arsenal Development Authority oversees the redevelopment of the former Joliet Army Ammunition Plant property. Joliet City Center Partnership also provides programs and incentives to help new and expanding businesses. Another business development resource is the Three Rivers Manufacturer's Association that serves the needs of local manufacturers in Will and Grundy Counties. The assistance and resources that organizations like these provide make the area attractive to businesses looking to develop or expand.

Future: What the economic future holds for Will County can only be estimated. The Chicago metropolitan area continues to grow outward into the surrounding counties. It is forecasted that the area as a whole will grow by 25% while Will County is expected to grow over 60% within the next twenty years. The building of the South Suburban Airport is a factor that will have the greatest effect on the county's growth. If it is built, there will be a large demand for services, infrastructure, workers, housing, schools, etc. to support its function. This additional source for transportation of goods and people will increase the rate of business development. This means there will be more people and property to protect from hazards, more technology and businesses that may present a hazard, and more people and businesses that could attract or be affected by societal hazards. Assessing the risks, planning, mitigating hazards, and preparing for emergencies will remain essential activities to ensure the safety of Will County's residents.

Essential Government Services

There are many community service organizations needed to effectively carry out the emergency management plan in the event of an occurrence. Local law enforcement, fire departments, and emergency medical services (EMS) are called first when an emergency occurs. Hospitals care for the sick and injured.

Law Enforcement: Law enforcement's role is to safeguard lives and property, enforce the law, and maintain order. Within Will County, there is a county sheriff's office, thirty-three municipal police departments, five special district police departments, six railroad police departments, and four university police departments. The Illinois State Police also maintains a station north of Joliet.

Fire Protection and Emergency Medical Service: Municipal fire departments and local fire districts safeguard lives and protect property by containing fires and responding to accidents or other emergencies. The larger communities in Will County have full-time fire department staffs. The smaller communities have volunteer staffs that respond when an emergency occurs. There are also several special fire departments maintained by the major oil and chemical companies. EMS is responsible for immediate medical attention. There are over twenty local EMS units within the county and several private or corporate EMS units serving the community. For care beyond first aid, Will County has three hospitals, Presence Central and Suburban Hospitals, Silver Cross Hospital and Medical Centers, and AMITA Health Adventist Medical Center Bolingbrook. Silver Oaks Behavioral Hospital is associated with Silver Cross Hospital and Medical Centers.

The Will County Health Department is another agency providing important services to the public, not only in the event of an emergency, but also every day. They provide comprehensive public health programs and primary health care and dental service for medically underserved residents. Public health professionals work to prevent disease and promote a healthy environment for the county's residents. Throughout an emergency, public health consequences are evaluated, findings are reviewed, and affected people are debriefed. The Epidemiology and Communicable Disease Program protects and promotes the health of Will County residents through surveillance, field investigations, health assessments, and epidemiologic studies. The program is designed to advise patients, as well as educate patients and the public on how to prevent communicable diseases. Public health also supports the provision of health care, evacuation of patients, hospital care coordination, public health information, victim identification, and mortuary services. Emergencies may include, among others, hazardous chemicals, contaminated food or water, infectious/communicable disease, floods, tornadoes, or radiation exposure.

Schools: Will County currently has 29 school districts under the jurisdiction of the Will County Regional Office of Education. This office oversees twenty elementary districts, three high school districts, and six unit districts.[7]

Additionally, there are other school districts located within the county that may come under other jurisdictions because their district boundaries are of a multi-county nature. High School Districts located within Will County include Beecher, Channahon, Crete Monee, Joliet Township, Lincoln Way, Lockport Township, Naperville, Peotone, Plainfield, Reed Cluster (Braidwood), Valley View (Romeoville and Bolingbrook), and Wilmington.

Elementary School Districts located in Will County include Beecher, Braidwood, Chaney Monge, Channahon, Crete-Monee, Elwood, Fairmont, Frankfort, Homer, Joliet, Laraway, Ludwig-Reed-Walsh, Manhattan, Milne-Kelvin Grove, Mokena, Naperville, New Lenox, Peotone, Plainfield, Richland, Rockdale, Summit Hill, Taft (Lockport), Troy, Union, University Park, Valley View, Will County, and Wilmington. A map of the school district boundaries within Will County can be found at: http://www.willroe.org/index.php/district-info/school-district-maps/.

Non-Essential Government Services

Will County has a rich and diversified offering of publicly owned recreational facilities located throughout the county. There are also several Illinois state parks located in the county. Channahon State Park is the official trailhead for the I&M Canal State Trail. The I&M Canal State Trail is made up of 61 miles of multi-purpose trail that ends at LaSalle/Peru. The Des Plaines Fish and Wildlife Area in Wilmington offers fishing and hunting opportunities, as well as an 80-acre nature preserve. Additionally, the State of Illinois recognizes ten dedicated nature preserves in Will County. A dedicated nature preserve is designed to preserve the natural features of the land; nature preserves do not necessarily allow public access but most do. Only high quality natural areas qualify for this designation.

There are two federally-owned parks located within Will County. The I & M Canal National Heritage Canal is operated by the National Park Service and serves to maintain the historic and cultural heritage associated with what was originally a 97-mile canal from the Chicago River to the Illinois River. Today, the Park Service offers a variety of recreational and interpretive services for visitors. The U.S. Forest Service operates the first tallgrass prairie in the United States, Midewin National Tallgrass

[7] http://www.willroe.org/index.php/schools-districts/school-directory

Prairie. Established in 1996, this 15,454-acre property once belonged to the Joliet Army Ammunition Plant. Today, it is being restored to tallgrass prairie and is dedicated to conserving, restoring, and enhancing natural habitat. A significant number of threatened and endangered species are located at Midewin. More information may be found at www.fs.fed.us/mntp.

The county also owns and operates a variety of open-space parcels through the Will County Forest Preserve District. The county currently has almost forty improved forest preserves, thirty unimproved forest preserves, and fifteen trails.

Will County Forest Preserves – Improved			
Name	**Location**	**Name**	**Location**
Braidwood Dunes and Savanna Nature Preserve	Braidwood	Messenger Woods Nature Preserve	Homer Glen
Colvin Grove Preserve	Joliet	Monee Reservoir	Monee Township
Evans-Judge Preserve	Wilmington	O'Hara Woods Preserve	Romeoville
Forked Creek Preserve	Wilmington	Plum Valley Preserve	Crete Township
Goodenow Grove Nature Preserve	Crete	Prairie Bluff Preserve	Crest Hill
Hadley Valley	Homer Glen, Joliet	Raccoon Grove Nature Preserve	Monee Township
Hammel Woods	Shorewood	Riverview Farmstead Preserve	Naperville
Hickory Creek Preserve	Mokena, New Lenox	Romeoville Prairie	Romeoville
Isle A La Cache	Romeoville	Rock Run Preserve	Joliet
Joliet Iron Works Historic Site	Joliet	Rock Run Rookery Preserve	Joliet
Kankakee Sands Preserve	Kankakee	Runyon Preserve	Lockport
Keepataw Preserve	Lemont	Sauk Trail Reservoir	Frankfort
Lake Chaminwood Preserve	Troy Township	Sugar Creek Preserve	Joliet
Lake Renwick Preserve	Plainfield	Teale Woods Preserve	Joliet
Lambs Woods	Lockport	Theodore Marsh	Crest Hill
Laughton Preserve	Manhattan	Thorn Creek Woods Nature Preserve	Park Forest
Lockport Prairie Nature Preserve	Lockport Township	Vermont Cemetery Preserve	Aurora
Lower Rock Run	Joliet	Veterans Woods	Romeoville
McKinley Woods	Channahon	Whalon Lake	Naperville
Messenger Marsh	Homer Glen	Wolf Creek Preserve	Naperville
Source: https://www.reconnectwithnature.org/			

Will County Forest Preserves – Unimproved	
Name	**General Location**
Alessio Prairie	Crest Hill
Birds Junction Marsh	Shorewood
Black Walnut Creek Preserve	Crete Township
Briscoe Mounds	Channahon
Caton Farm Preserve	Joliet
Deer Creek Preserve	Crete Township
Donohue Grove Preserve	Wilmington/Wesley Township
DuPage River Confluence Preserve	Naperville/Bolingbrook
Fiddyment Creek Preserve	Homer Glen
Hastert-Bechstein Preserve	Channahon
Hunters Woods	Frankfort
Huyck's Grove Preserve	Peotone/Wilton Township
Jackson Creek Preserve	Frankfort/Green Garden Township
John Wesley Preserve	Wilmington/Wesley Township
Kraske Preserve	Crest Hill
Lake of the Woods Preserve	Shorewood
Lily Cache Wetlands	Romeoville
Lockport Loop Trail	Lockport
Lockport Prairie East Preserve	Lockport
Moeller Woods Preserve	Crete Township
Plum Valley Ravines	Crete Township
Potawatomi Woods Preserve	New Lenox
Prairie Creek Preserve	Manhattan Township
Romeoville Prairie Nature Preserve	Romeoville
Sand Ridge Savanna Nature Preserve	Wilmington/Custer Township
Thorn Creek Headwaters Preserve	Steger-Park/Monee Township
Thorn Grove Preserve	Steger/Crete Township
Vincennes Trail	Beecher/Crete Township
Walnut Hollow	Joliet Township
Wayne Lehnert Preserve	Peotone Township

The Will County Forest Preserve provides miles of trails for hiking, bicycling, in-line skating, equestrian, jogging, and cross country skiing. Maps of these trails can be found at http://www.reconnectwithnature.org/preserves-trails and include the Old Plank Road Trail, I & M Canal Trail, Hickory Creek Bikeways, Rock Run Trail, Lake Renwick Bikeway, and the Waubonsee Glacial Trail.

Will County Trails	
Name	**General Location**
Centennial Trail	Joliet
DuPage River Trail	Shorewood/Naperville
Hickory Creek Bikeway	New Lenox/Mokena
I&M Canal Trail	Lockport
Joliet Junction Trail	Crest Hill/Joliet
Lake Renwick Bikeway	Plainfield
Normantown Trail	Naperville
Old Plank Road Trail	Joliet, New Lenox, Frankfort, Matteson, & Park Forest
Plum Creek Greenway Trail	Crete
Rock Run Greenway Trail	Crest Hill/Joliet
Route 30 Bikeway	New Lenox, Mokena, & Frankfort
Spring Creek Greenway Trail	New Lenox/Homer Glen
Tall Grass Greenway Trail	Wheatland Township, Naperville
Veterans Memorial Trail	Romeoville, Woodridge
Wauponsee Glacial Trail	Joliet, Manhattan, Symerton, & Custer Park
Source: https://www.reconnectwithnature.org/	

A number of municipal recreation departments and independent park districts operate throughout Will County. These park districts offer a variety of services, including recreational opportunities, fitness classes, and enrichment classes. Recreation departments and park districts are operated in and near the communities of Bolingbrook, Channahon, Crete, Elwood, Frankfort, Joliet, Lemont, Lockport Township, Manhattan, Mokena, Naperville, New Lenox, Plainfield, Romeoville, and Shorewood.

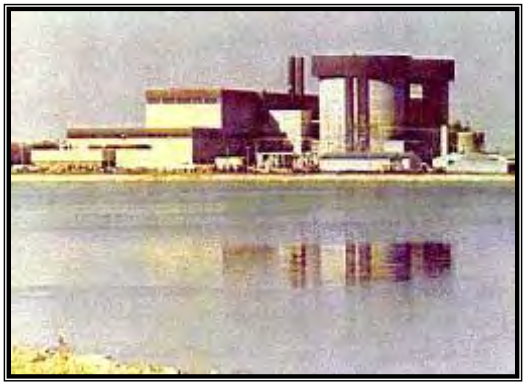
There is one privately owned facility that was developed for public use in Will County that deserves to be mentioned. The Chicagoland Speedway and Route 66 Raceway make up the Joliet Motor Sports Complex, the largest sporting facility in Illinois. This facility is a multi-purpose motor sports complex that provides for a variety racing types, including NASCAR.[8] It is reported to be a world-class racing facility.

[8] http://www.chicagolandspeedway.com/?homepage=true

Utilities

Utilities provide power needed by homes and businesses to operate. Commonwealth Edison (ComEd) is one of the nation's largest electric utilities with $15 billion in revenues and four million people across northern Illinois as a customer base. ComEd works with businesses to provide in-depth site selection information, critical utility analysis, and access to Illinois business resources. With the passage of the Smart Grid Law in 2011, ComEd has embarked on a ten-year, $2.6 billion dollar infrastructure program to modernize the northern Illinois energy grid. The improvements have provided improved, reliability and service, options for energy savings, and jobs and development in the communities.

Nuclear Power: Nuclear power is an important source for generating electricity and accounts for 52.2% of Illinois' electricity source. Braidwood Nuclear Power Station is a two-unit nuclear generating facility, located within Will County, twenty-two miles southwest of Joliet. Dresden Nuclear Generating Station is located in Grundy County outside of Morris, but its ten-mile emergency planning zone includes part of the southwest area of Will County.



A benefit of nuclear power is clean air, as no harmful gases are emitted into the environment by the process. The concern, of course, is radiation exposure that may occur either as a result of an accident or sabotage. Thus, careful security measures and emergency management planning for these facilities are necessary to ensure the safety of the public.

Natural Gas: Nicor Gas is one of the largest providers in its industry with a customer base of 2.2 million residential, public sector, and business customers. Nicor has provided natural gas service in northern Illinois for over six decades. Their service area covers roughly 17,000 square miles and supports more than 34,000 miles of gas main. Nicor has connections to eight interstate pipelines, is accessible to all major gas producing areas in the county, and has an extensive system of underground gas storage. Flexible rates, options to choose alternate commodity suppliers, a competitively priced gas commodity, and reliable delivery allow customers to depend on Nicor Gas.

Telecommunications: AT&T is the world's largest telecommunication company providing connectivity, technology, media, and entertainment. AT&T serves 100 million U.S. customers providing them TV,

mobile, and broadband services. They also serve almost 3 million business customers with high-speed, highly secure connectivity. Their revenues in 2019 were $142.4 billion.

Community Vulnerability

The activities and businesses that attract people to live and work in Will County and bring economic stability to the area also present hazards that put the population at risk. Relating to the concerns that arise from the use of utilities, hazards exist from the operation of the many chemical companies located in the county. Petroleum refineries and product manufacturing; paper, soap and cleaning compounds; and plastics and rubber manufacturing all utilize or produce materials that pose fire, toxin, or explosion risks that can injure people and damage property and the environment. These hazardous occurrences can occur on site or while the materials or products are being transported by truck, rail, or boat. To balance the economic benefit to the county with the hazards of chemical production, adequate safety measures must be in place to protect workers and the surrounding population.

There are also growing vulnerabilities with the rapidly expanding intermodal transportation system that is putting Will County on the map as the largest inland port. Trucks, trains, and barges are putting a burden on the infrastructure that is compounded by exposure to the elements. A recent example being a viaduct traveled daily by heavy trucks was destroyed by heavy spring rains. Warehouses are subject to damage by natural elements and possible fire or explosion because of their contents. Dangerous accidents occur as a result of the number of trucks that may be carrying hazardous materials or sharing the roads with local commuters.

On a daily basis, the primary purpose of school facilities is education. The public school districts within Will County, in addition to a number of private schools, educate students who attend kindergarten through twelfth grade. One junior college and three four-year colleges operate within the boundaries of the county. These facilities serve the important daily function of education, but they can also act as a resource for emergency management by utilizing the school facilities for community centers in the event of an occurrence.

Community centers may be needed to accommodate the population displaced by evacuation, to act as a medical center, or to house emergency personnel coming to assist from outside the county. These facilities can also be the target of the many hazards facing the county. Because of the number of students and faculty concentrated within a facility, emergency management must be prepared to handle high numbers of injuries or deaths should the facility be damaged during an occurrence. Tornadoes, fires, heating equipment explosions, food poisoning, bomb threats, or terrorist type attacks are all potential disasters that must be prepared for through emergency management.

Part of the county's economy is the entertainment industry. Historic sites, theaters, park district facilities, hunting, fishing, boating, and golf are many of the leisure activities enjoyed by residents of Will County. There are also casino boats, motor sports complexes, and a baseball park which attract local community members and people from the surrounding Chicago metropolitan area. Economically these entertainment centers bring added revenue from ticket sales, restaurants, and hotel services. But like the schools, there are security issues that must be addressed to protect the hundreds or thousands of people attending events from the effects of natural, technological, and societal hazards. Preparations must be in place to effectively manage any emergencies that may occur.

Recent events point out the county's and world's vulnerability to pandemics. To ease the burden on hospitals and maximize available bed space and equipment, the world's economic and social structure have been closed except for essential services. Quickly, public health and researchers began searching for treatment options, protection measures, and development of a cure. Manufacturing turned their production towards needed medical equipment. Logistic efforts focused on moving supplies and creating additional hospital/treatment centers to care for COVID-19 patients.

Profile Summary

Understanding the geography, activities, population characteristics, economy, and community services is important to identifying the hazards facing a community, perceiving the effects hazards will have on people and property, determining the vulnerability of the population, and surmising the probability that an emergency will occur. This information base provides the backdrop for assessing the hazards that should be addressed for the protection and well-being of the community. The preparation of the hazard analysis is part science but also part art. Facts are combined with experience, perceptions, priorities, and culture to identify and develop a ranking of the hazards to be used for emergency planning.

Keep in mind that community characteristics continually change and a key element of Will County's future is growth. Thus, the hazard analysis is not a static process. As changes occur, the hazard analysis will need to be re-evaluated and modified to address the changing needs of the county.

Significant Future Development Plans

It is important for the *Will County County-Wide All Hazard Mitigation Plan* to be incorporated into other county plans. The following is a discussion of Will County's development initiatives. Hazard mitigation should be incorporated wherever feasible.

Land Resource Management Plan

The Will County Land Resource Management Plan was developed to establish a framework which allows local communities to work with regional entities in order to allow for carefully planned land development and management during Will County's projected growth. The following priority issues were identified in the plan:

- Regional coordination among various government entities,
- The need for regional open-space and agricultural protection,
- The need for environmental protection,
- The quality and timing of new development,
- Automotive transportation needs,
- Promoting a compact (non-sprawled) form of development,
- Housing density and variety, and
- Non-automotive transportation needs.

The Land Resource Management Plan identifies goals and strategies to fulfill the priority issues identified. Additionally, the plan provides use concepts that provide guidance to local communities on how to manage land use by such categories as development, open space, transportation, historic preservation, and stormwater management.

A Forms & Concepts Handbook accompanies the Land Resource Management Plan, in which regional development forms should be promoted. Development use concepts are provided to guide local communities in assessing specific development proposals to see if they fit with the community's land use form. Specific development forms discussed in this handbook are:

- Rural areas
- Hamlets

- Towns
- Urban communities
- Suburban communities
- Interstate access locations
- Former Joliet Army Ammunition Plant area
- South Suburban Airport

Specific development use concepts designed to protect the chosen development form are provided in the handbook. These development use concepts include:

- Agriculture
- Conservation design
- Conventional residential suburban
- Traditional residential
- Multi-family complex
- Employment campuses
- Regional commercial
- Mid-scale commercial
- Neighborhood commercial
- Free standing industry and office
- Projects of regional impact

An Open Space Element handbook also accompanies the *Land Resource Management Plan*. This handbook promotes initiatives for managing development in high priority areas to create greenway corridors as well as create large preserves for the protection of biodiversity. This handbook also provides criteria for identifying land for inclusion in the open space system.

Will County 2030 Transportation Framework Plan

The *Will County 2030 Transportation Framework Plan* and *Will Connects 2040 Long Range Transportation Plan* are the outcome of a collaborative effort among municipalities, townships, and regional agencies. The plans were written to guide transportation improvements through the year 2040 for all modes of transportation, including roads, public transportation, railroads, bikeways, pedestrian, equestrian, and airport transportation.

The Transportation Framework Plan identified the fact that substantial growth is forecasted for Will County; this growth will require transportation improvements. DuPage, Wheatland, Homer, Lockport, New Lenox, Frankfort, Plainfield, Monee, and Crete were identified as the townships predicted to experience the greatest amount of growth and in need of the greatest amount of transportation improvements. Will Township will also experience significant increases in transportation needs if the South Suburban Airport is built. Continued growth in the east, southwest, northwest and west central areas will require improved Metra commuter train service.

These plans make specific suggestions for roadway improvements, including major roadways, arterial streets, and intersection realignments. Additionally, specific recommendations are made for regional arterial improvements, corridor studies, Metra commuter rail improvements, and Pace bus system improvements. The intent is to know immediate and future needs in order to coordinate with Federal, State, and local partners and maximize funding as it becomes available.

Will County Stormwater Management Plan

The *Will County Stormwater Management Plan* represents a coordinated effort on the part of Will County and its municipalities to manage issues as they pertain to floodplain and stormwater management. Planning activities are coordinated through the Will County Stormwater Management Planning Committee. The Committee focuses on existing stormwater management programs as well as issues related to future development. A major focus area is the adoption of a county-wide stormwater ordinance to ensure consistency of approach and to coordinate stormwater issues that extend beyond political boundaries. The reduction of risk brought about by flooding is an important goal of the Stormwater Management Plan and the Stormwater Management Planning Committee.

CHAPTER 3: ALL HAZARD RISK ASSESSMENT SUMMARY

Will County EMA has been proactive in identifying risks. In 2003 and 2004, Will County EMA first published several hazard and vulnerability assessments including the *Will County Hazard Analysis, Will County Terrorism Vulnerability Assessment* (not for Public Distribution), and the *Will County Terrorism Vulnerability Assessment of Critical Infrastructure Results* (not for Public Distribution). Will County EMA recognizes that the assessment and analysis of vulnerability to the county is a definitive measure of the risk associated with each individual hazard.

In order to effectively and efficiently integrate existing documents and operations, the updated 2020 *Will County Hazard Analysis* has been incorporated into the *Will County County-Wide All Hazard Mitigation Plan*. This allows Will County to identify mitigation objectives, strategies, and actions that address all of Will County's risks. *The Will County Terrorism Vulnerability Assessment* and the *Terrorism Vulnerability Assessment of Critical Infrastructure Results* were not incorporated into this document due to the sensitive information that is contained in these reports.

Will County developed a hazard risk assessment in 2003. This document was updated in 2008 and 2013, as part of the All-Hazard Mitigation Plan. Using this assessment as a baseline document and incorporating new data that encompasses the years 2014-2020, the Will County planning team updated and re-developed a comprehensive all-hazards risk assessment that thoroughly analyzed the county's natural, technological, and societal hazard risks. The planning team re-evaluated and updated the following elements in the previously developed risk assessment: hazard identification, inventory of community assets vulnerable to the hazards, hazard events profile, magnitude, history, probability, impacts, flood insurance claims, repetitive losses, and future development trends. The committee decided to utilize the rating system identified in the original 2008 plan.

The 2020 *Will County Hazard Analysis* utilizes a formal, structured procedure to develop mitigation and emergency operation plans. The Federal Emergency Management Agency (FEMA) has developed a process for assessing and evaluating hazards. Will County chose this process in order to reduce inconsistencies and promote a common base for completing the analysis by defining criteria and providing a scoring system. Four criteria were used to describe and assess the potential hazards; the four criteria include:

- *History* – past record of occurrences of the specified hazard. It is a guide of what has occurred in the past but is not a guarantee of what may occur in the future.
- *Vulnerability* – pertains to the people that might be killed, injured, or contaminated and to property that might be destroyed, damaged, or contaminated due to the occurrences of a specified hazard.
- *Maximum Threat* – consists of the impacts from a 'worst case' scenario of a specified hazard and is where the greatest impact to people and property is expected and assessed.
- *Probability* – refers to the likelihood of the occurrence of a specified hazard. It is expressed as the number of chances per year that an event of a specific intensity will occur.

Each of the four criteria is given a weighting factor as one criterion can be judged to be more important than another:

History	2 points
Vulnerability	5 points
Maximum Threat	10 points
Probability	7 points

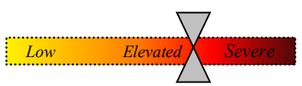
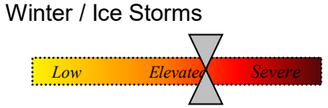
Each of the four criteria were evaluated and given a description of the likelihood or impact of the event. The descriptive terms used were low, medium, and high. Each of the three descriptive terms is given a numerical value:

Low	1 point
Medium	5 points
High	10 points

The composite score for each hazard is calculated by multiplying the descriptive numerical value assigned to each weighted criterion score. Each weighted score is summed to determine the hazards composite score.

The following is a list of the natural, technological, and societal hazards investigated, while a summary of the 2020 *Will County Hazard Analysis* is shown on the following pages.

Natural Hazards	**Technological Hazards**	**Societal Hazards**
Tornado	Hazardous Materials – Fixed Site & Transportation Accident	Public Health
Thunderstorm		Enemy Attack
Winter/Ice Storm	Fire	Terrorist Attack
Flood, Flash Flood, Ice Jams	Nuclear Power Plant Accident	Civil Disturbance
	Pipeline Rupture	
Extreme Heat	Non-Hazardous Materials – Transportation Accident	
Earthquake	Dam Failure	
Drought	Infrastructure Failure	
	Land Subsidence	

NATURAL HAZARDS RISK SUMMARY								
Hazards and Risk Rating	**Hazard Assessment**	**Location**	**Hazard Rating and Score**				**Overall Hazard Rating and Score**	**Most Severe Historical Events**
			History	**Vulnerability**	**Maximum Threat**	**Probability**		
Tornado 	Tornados are short lived, but have the potential of destroying everything in their path. Most tornados have a 3-stage life cycle where they develop, mature, and dissipate. A tornado can occur at any time of the year requiring the county to be prepared at all times. Illinois averages 29 tornados per year; however, 105 tornados were reported on 1998 and 107 in 1974. Since 1954, Will County has averaged one recorded tornado per year.	County-Wide	High	Med	Med	High	**High**	June 26, 2018: EF1 tornado, $30K in damage September 18, 2015: EF1 tornado, $79K in damage June 22, 2015: EF2 tornado, $250k in damage June 15, 2015: EF1 tornado, $100K in damage June 30, 2014: EF1 tornado, $500K in damage November 17, 2013: F2 tornado, injured 5. August 15, 1993: F2 tornado caused $1 million in damage and injured 2. August 28, 1990: F5 tornado caused 29 deaths, 350 injuries, and $244 million in damages. May 9, 1988: F2 tornado caused $1+ million and injured 3. April 27, 1984: F3 tornado caused $2.5 million in damage, killed 1, and injured 5. April 6, 1972: F2 tornado caused $750k in damage, killed 1, and injured 22. November 12, 1965: F2 tornado caused $25 million in damage, killed 2, and injured 90. April 23, 1961: F3 tornado caused $2.5 million in damage, injured 4.
			19	13	68	64	164	
Thunderstorm 	Severe thunderstorms are weather systems accompanied by strong winds, lightning, heavy rain, and possibly hail and tornados. Thunderstorms can fall into 4 categories: Single-cell storms, multi-cell cluster storms, multi-cell line storms, and super cell storms. Super cell storms are the most severe and cause extensive damage and threat to life.	County-Wide	High	High	Low	High	**Medium /High**	Will County has experienced almost 200 severe Thunderstorms and High Wind since 1950.
			19	46	17	64	146	
Winter / Ice Storms 	A winter storm is considered to be severe when 6+ inches of snow have fallen within a 48 hour period. Winter and ice storms can cause widespread damage and disruption. Heavy snow or ice can paralyze transportation systems, cause automobile accidents, strand vehicles, and damage building roofs. Ice can incapacitate an area and damage vegetation, buildings, and utilities.	County-Wide	High	High	Low	High	**Medium**	Will County has experienced over 80 snow and ice events since 1995. Will County has experienced a severe winter storm each winter for over a century and experiences an average of 3 severe storms per year.
			18	44	17	58	137	

NATURAL HAZARDS RISK SUMMARY								
Hazards and Risk Rating	**Hazard Assessment**	**Location**	**Hazard Rating and Score**				**Overall Hazard Rating and Score**	**Most Severe Historical Events**
			History	**Vulnerability**	**Maximum Threat**	**Probability**		
Flood, Flash Flood, Ice Jam Low Elevated Severe	As land becomes more developed, the risk and economic losses from flooding have increased. The effects of a flood can be devastating. Damages to buildings, facilities, utilities, businesses, and farmland can be expected within the floodway. Debris generated from the flood can hinder the community and damage property.	Select areas: Des Plaines River, I & M Canal, Kankakee River, etc. See hazard map for details.	High	Low	Low	High	**Medium**	The Des Plaines River and its tributaries (Hickory and Spring Creeks) have caused an average annual loss of over $100,000 to the urban areas of Will County. Will County has been declared a Presidential Disaster area in 1974, 1981, 1985 1996, 2008, and 2013 due to flooding. One of Will County's greatest floods occurred along the Des Plaines River in 1996.
	Flash floods are a result of torrential rainfall over a short period of time, a sudden release of water from a dam or lock failure, or breakup of an ice jam.	Select areas: Des Plaines River, I & M Canal, Kankakee River, etc. See hazard map for details.	17	10	17	58	102	Will County has experienced 65 incidents of Flood and/or Flash Flooding since 1996 with six Federal disaster declarations.
	Ice jams develop when mild temperatures occur in a location with deep snow cover and frozen rivers. Large chunks of ice accumulate near river obstructions (i.e. bridges, dams) which cause flooding to the surrounding area.	Select areas: Des Plaines River, I & M Canal, Kankakee River, etc. See hazard map for details.						The Kankakee River in the Wilmington areas has been the most prevalent area where ice jams occur. See page 4-103.
Extreme Heat Low Elevated Severe	Prolonged periods of extreme heat and humidity have a deleterious effect upon a community, particularly the elderly and those who cannot afford cooling capabilities. Heatstroke and heat exhaustion are more intense in urban areas. Other effects of extreme heat are water shortages, fire hazards, excessive demands for energy, damaged crops, and danger to livestock.	County-Wide	Low	Low	Low	Med	**Low**	See page 4-132.
			8	18	13	33	72	

NATURAL HAZARDS RISK SUMMARY								
Hazards and Risk Rating	**Hazard Assessment**	**Location**	**Hazard Rating and Score**				**Overall Hazard Rating and Score**	**Most Severe Historical Events**
			History	**Vulnerability**	**Maximum Threat**	**Probability**		
Earthquake 	There are thousands of earthquakes in the US each year, but most are so small in magnitude that they are barely noticed. Some of the most violent earthquakes have occurred in the central US. The New Madrid Fault Zone runs from Cairo, Illinois to Memphis, Tennessee. Will County would be affected indirectly from a large New Madrid Earthquake. The Sandwich Fault zone is located in northern Illinois and extends into Will County.	See Hazard Map	Low	Low	Med	Low	**Low**	August 20, 1804 - An estimated 4.5 magnitude earthquake shook the southern Lake Michigan area. May 26, 1909 - an estimated 5.1 magnitude occurred in northern Illinois. The exact location isn't known, but the greatest shaking occurred in and near Aurora. December 29, 1985 - an estimated 3.0 magnitude occurred in northern Illinois, 31 miles outside of Chicago June 24, 2004 a 4.2 magnitude earthquake occurred near Ottawa, IL. February 10, 2010 at 3.8 magnitude earthquake occurred near Lily Lake in Kane County.
			2	14	41	7	64	
Drought 	A drought is a period of drier-than-normal conditions that results in water-related problems. The amount of precipitation at a particular location varies from year to year but, over a period of years, the average amount is fairly constant. Drought typically impacts crops resulting in low yields and economic losses.	County-Wide, greatest impacts to agricultural areas	Med	Low	Low	Low	**Low**	Summer of 2005 - Will County farmers suffered extreme financial losses as a result of the drought as their crops continue to fail. Will County declared an Agriculture Emergency and requested the State of Illinois through its Emergency Management Agency and Department of Agriculture to assist in recovery efforts.
			9	9	10	23	51	

TECHNOLOGICAL HAZARDS RISK SUMMARY								
Hazards and Risk Rating	**Hazard Assessment**	**Location**	**Hazard Rating and Score**				**Overall Hazard Rating and Score**	**Most Severe Historical Events**
			History	**Vulnerability**	**Maximum Threat**	**Probability**		
Hazardous Materials Release: Fixed Site & Transportation Low Elevated Severe	Will County has many oil refineries, chemical manufacturers, and other businesses that use hazardous materials in their processing. Chemicals and materials in use vary in toxicity. A small release of many of these chemicals may have little effect on the surrounding environment; however, the release of some chemicals or radioactive materials could have long lasting effects.	Industrial and Commercial Districts - over 300 facilities are reported on EPA's Toxic Release Inventory	High	Low	High	High	**High**	See page 4-161
	Thousands of hazardous materials are shipped on a daily basis through local communities by all modes of transportation. Will County has an extensive network of rail and highways, as well as barge traffic. Accidents can be usually handled by local emergency services, but some accidents may spread to surrounding communities. Statistically, most hazardous material accidents are caused by some type of human error and rarely by mechanical failure of a carrying vessel.	County-Wide	19	9	72	65	165	
Fire Low Elevated Severe	Fire is an occurrence of uncontrolled burning which results in major structural damage to residential, commercial, industrial, institutional or other types of property.	County-Wide, greatest impacts to agricultural areas	High	Low	High	High	**High**	See page 4-164
			15	9	88	51	163	

TECHNOLOGICAL HAZARDS RISK SUMMARY								
Hazards and Risk Rating	**Hazard Assessment**	**Location**	**Hazard Rating and Score**				**Overall Hazard Rating and Score**	**Most Severe Historical Events**
			History	**Vulnerability**	**Maximum Threat**	**Probability**		
Nuclear Power Plant Accident Low Elevated Severe	There is one nuclear power plant located in Will County. There is also one nuclear power plant that is located in a neighboring county, but in close proximity of Will County placing the county within the EPZ. Nuclear power plants are regulated by the US NRC who have posed stringent rules during design, construction, and operation to ensure the public's safety.	The plume emergency planning zone - encompasses a 10-mile radius of the facilities. The ingestion emergency planning zone encompasses a 50-mile radius.	Low	Med	High	Low	**Medium**	No local historical events have occurred
			2	26	88	7	123	
Pipelines Low Elevated Severe	The most common materials carried by pipelines is petroleum, crude oil, propane, ammonia, kerosene, and natural gas. The release of material can be caused by pipe failure due to age or breakage during excavation activities which can result in explosion, fire, pollution, or loss of essential utilities.	County-Wide	High	Low	Med	High	**Medium**	See page 4-182
			17	7	46	50	120	
Transportation: Non-Hazardous Material Release Low Elevated Severe	Motor vehicles, airplanes, trains, or boats are all subject to the risk of accidents. These accidents can occur anywhere within the transportation system because of the driver's error, mechanical failure, poor weather conditions, or sabotage. Though accidents are normally not considered disasters, the results of an accident can be of severe magnitude.	County-Wide	High	Low	Low	High	**Medium**	See page 4-198
			15	7	25	61	108	

TECHNOLOGICAL HAZARDS RISK SUMMARY									
Hazards and Risk Rating	**Hazard Assessment**	**Location**	**Extent**	**Hazard Rating and Score**				**Overall Hazard Rating and Score**	**Most Severe Historical Events**
				History	**Vulnerability**	**Maximum Threat**	**Probability**		
Dam Failure	Dams usually fail as a result of the secondary effects of storms. A flood that is caused by the breach of a dam may be of greater magnitude than floods originating from the runoff of rainfall or snowmelt.	Select areas: Des Plaines River, I & M Canal, Kankakee River, etc. See hazard map for details	Low	Low	Low	High	Low	**Medium/ Low**	See page 4-215
				2	8	73	9	92	
Infrastructure Failure	Will County citizens are dependent on a functional public and private utilities to provide essential services (power, heating, water, sewage disposal, storm drainage, communications and transportation). Failure can occur within a distribution system or be caused by external factors such as severe storms or fires.	County-Wide	High	Low	Low	Med	Low	**Low**	Not provided in the 2020 Will County Hazard Analysis
				2	17	37	7	63	
Land Subsidence	Land subsidence, which is a decline in land-surface elevation caused by removal of subsurface support, can result from natural and human activities. Subsidence poses a greater risk to property than life. Subsidence can cause cracking of buildings, utility failure, and road collapse.	County-Wide	Low	Low	Low	Low	Low	**Low**	Not provided in the 2020 Will County Hazard Analysis
				2	5	10	7	24	

SOCIETAL HAZARDS RISK SUMMARY								
Hazards and Risk Rating	**Hazard Assessment***	**Location**	**Hazard Rating and Score**				**Overall Hazard Rating and Score**	**Most Severe Historical Events**
			History	**Vulnerability**	**Maximum Threat**	**Probability**		
Public Health Low Elevated Severe	Major epidemics are uncommon but still exist as a threat. Though diseases that were life threatening years ago are now under control, unexpected sources of infection do occur and can spread before the source of the problem can be contained.	County-Wide	High	High	Med	Med	**High**	Up through the early 1900's there was significant risk from diseases such as tuberculosis, typhoid fever, poliomyelitis, and measles. The West Nile virus was first documented in Illinois in 2001. By the end of 2002, 18 of the confirmed cases were in Will County. Non-pharmacological & immunization measures were implemented for H1N1 in spring of 2009 with Mass immunization beginning 10/2009. The 2014-2016 Ebola epidemic in West Africa was the largest outbreak in history. Rarely found in Illinois but the Zika Virus is considered a risk associated through travel. In late 2019, a new Coronavirus originating in Wuhan, China has spread throughout the world. This pandemic is still being studied with experts racing to slow its spread.
			15	37	66	45	163	
Enemy Attack Low Elevated Severe	Enemy attack is any hostile action taken against the United States by foreign forces that result in the destruction of military and/or civilian targets. The threat of nuclear, chemical, and biological weapons is worrisome as their development and delivery systems are improved by Third World nations.	County-Wide	Low	Med	High	Low	**Medium**	There has not been an enemy attack on the continental United States in the past century.
			2	33	84	7	126	
Terrorist Attack Low Elevated Severe	Terrorists consist of international, domestic, left or right-wing, special interests, anarchists or neo-fascists. Terrorists typically target infrastructure that are more critical to daily operations and are hard to restore to service.	Select potential targets throughout Will County	Low	Low	High	Low	**Medium**	Specific threats of terrorism have not been made against any critical infrastructure within Will County; however, Federal officials have issued warnings of potential attacks against chemical, oil/power, and agricultural industries.
			2	10	88	9	109	

SOCIETAL HAZARDS RISK SUMMARY								
Hazards and Risk Rating	**Hazard Assessment***	**Location**	**Hazard Rating and Score**				**Overall Hazard Rating and Score**	**Most Severe Historical Events**
			History	**Vulnerability**	**Maximum Threat**	**Probability**		
Civil Disturbance ow Elevated Severe	Civil disturbances are incidents that intend to disrupt a community to the degree that police intervention is required to maintain public safety. The threat from a disturbance varies by the type, severity, and range of the event.	County-Wide	Low	Low	Low	Low	**Low**	In 2020, police shootings have prompted numerous protests and riots/looting throughout the U.S. It is thought some domestic terrorists have used these events to cause disruptions within our cities.
			2	5	17	7	31	

Hazard Loss Modeling

To supplement the impact analysis and risk determination, a hazard loss model and analysis was performed for select scenarios for natural, technological, and societal hazards. The scenarios selected were based on historical occurrences of disasters, availability of data, and the severity of the hazard risk. The hazard loss analysis process utilized Hazards U.S. - Multi-hazard (HAZUS-MH) modeling, GIS analysis, and available historical disaster data and information to conduct quantitative analysis to estimate the loss due to the selected natural, technological and societal hazard events. HAZUS-MH is a powerful risk assessment software program for analyzing potential losses from floods, hurricane winds and earthquakes. In HAZUS-MH, current scientific and engineering knowledge is coupled with the latest Geographic Information Systems (GIS) technology to produce estimates of hazard related damage before, or after, a disaster occurs.

The analysis reports obtained from the HAZUS-MH model includes the following:

- Estimation of the losses to structures and contents
- Estimation of the losses to structure use and function
- Projection of human losses
- Estimation of the primary direct and indirect loss

The HAZUS-MH and GIS analyses were used to determine which individual assets were vulnerable to the largest potential losses; by adding the structure loss, content loss, and function loss for each asset to determine the total loss. This process produced the following:

- Calculation of the losses to each asset
- Calculation of the estimated damages for each hazard event
- Creation of a map that shows a composite of the areas of highest loss

Many of the human-induced hazards provide some unique implications for loss estimation because these events can take place with different magnitudes, in any location, at any time, and under various circumstances. Because the characteristics of many of the human-induced events are not definitive, a generalized loss analysis was conducted. The following scenarios were assessed and analyzed utilizing GIS data and HAZUS-MH modeling.

- Overbank Flooding Event of Will County Stream and River Reaches.

- A F4 Plainfield Tornado.
- A 5.3 magnitude earthquake in DuPage County. This was the largest historical earthquake in the Chicago area.
- A hazardous materials release from a large industrial facility.
- A hazardous materials release from a transportation incident.
- A terrorist bombing with a similar magnitude of that of the 1995 Oklahoma City bombing.

The Hazard Loss Modeling findings and reports are provided in Appendix B.

With population growth, the expansion of intermodal transportation, and the adoption of DFIRMS within the county since the last update of this plan, a mitigation action has been included in this plan to update the Hazard Loss Modeling. It is anticipated that the changes within the county since the original modeling may possible show an increase in the impact of the hazards. If so, updated modeling would be an important tool in planning and mitigation strategy.

Scenario Summaries

Overbank Flooding Event of Will County Stream and River Reaches

The FEMA Flood Insurance Rate Maps (FIRM) indicate that a large area of Will County's built environment is within the Base Flood Elevation. The Base Flood Elevation (BFE) is defined as the area that has a 1% chance of flooding in any given year. HAZUS-MH Flood Risk Module would be utilized for modeling riverine flooding of Will County's stream and river network.

F4 Plainfield Tornado

GIS Analysis was utilized to determine the impacts of the 1990 Plainfield Illinois F4 tornado that skipped through Will County during mid afternoon. Although the track of this tornado was identified, detailed information on the area damaged could not be determined. Will County GIS data was utilized to determine structures identified within the damage areas. The potential loss of a F4 tornado traveling a similar path as the 1990 F4 tornado was projected based on today's built environment and in today's economy.

5.1 Magnitude Earthquake in DuPage County, Illinois

This was the largest historical earthquake in the Chicago area. HAZUS-MH Earthquake Risk Module provides estimates of damage and loss to buildings, essential facilities, transportation and utility lifelines, and population based on scenario or probabilistic earthquakes. In addition, the Earthquake Risk Module estimates the debris generated, fire, casualties, and shelter requirements following the disaster. Based on consultation with the Illinois State Geologic Survey, the May 26, 1909 earthquake that occurred near Aurora, Illinois is the best scenario to model with the limitations on available data. Although this earthquake was a 5.1-magnitude, limitations of the HAZUS-MH model does not provide accurate information for those earthquakes less than a magnitude 5.5. Therefore, this earthquake analysis assumes that this historical earthquake had a magnitude of 5.5. Due to information constraints on soil types, the analysis of a larger earthquake generated from the New Madrid Fault could not be conducted.

Hazardous Materials Release: Fixed Facility

The U.S. EPA's ALOHA (Areal Locations of Hazardous Atmospheres) model was utilized to assess the area of impact for a chlorine release at a large industrial facility located southwest of Joliet near Arsenal Road and Interstate 55. Chlorine is a common chemical that is used in industrial operations and can be found in either liquid or gas form. For this scenario, moderate atmospheric and climatic conditions with a slight breeze from the west were assumed. The target area of Arsenal Road and I-55, "Joliet Arsenal Hub", was chosen due to its large industrial facilities, rail and truck hubs, and the presence of a large number of large quantity hazardous material generators.

Hazardous Materials Release: Transportation Incident

The U.S. EPA's ALOHA (Areal Locations of Hazardous Atmospheres) model was utilized to assess a chlorine release from a barge at a large transportation hub southwest of Joliet at US Route 6, Interstate 55, and the Des Plaines River. Rail, truck tankers, and barges commonly haul chlorine, as well as other hazardous materials, to and from facilities. For this scenario, moderate atmospheric and climatic conditions with a slight breeze from the west were assumed. The target area of the US Route 6, I-55, and Des Plaines River was chosen due to its heavy barge traffic, large rail and truck hubs, as well as the presence of a large number of large quantity hazardous material generators.

Terrorist Bombing

GIS Analysis was utilized to determine the impacts of a bombing near a critical infrastructure of Will County with a similar magnitude of the April 19, 1995, Oklahoma City Bombing. In the Oklahoma City Bombing, a Ryder rental truck was loaded with approximately 5,000 pounds of ammonium nitrate fertilizer and detonated outside of the Murrah Federal Building. The explosion generated a pressure blast of 500,000 psi, destroyed one-third of the Murrah Federal Building, and created a crater thirty feet wide and eight feet deep. The Will County target analyzed in this hazard modeling is the Will County Court House.

Limitations

The analysis of hazards is complicated by a number of factors including laws, customs, ethics, values, attitudes, political preferences, and complex infrastructures and built environment. A hazard analysis provides a wealth of valuable information that is essential for identifying goals, prioritizing actions, planning and preparedness, and recovering and mitigating future hazards.

The assessment of data and identifying the risk to a community is not a hard science. It is difficult to predict hazard impacts, and conclusions are not absolute. The perception of what constitutes a risk and a judgment of its impact can differ from individual to individual. The changing natural, built, or societal environments can have a significant affect on each hazard assessment. A hazard risk assessment does provide a guide to evaluate Will County's risks and guides the Will County EMA to perform their mission of protecting the county. For this reason, it is important to periodically update and improve the County's Risk Assessment with best available data.

Regional All Hazard Risk Assessment Project

FEMA provides funds to the Illinois-Indiana-Wisconsin (IL-IN-WI) Combined Statistical Area (CSA) under the Regional Catastrophic Preparedness Grant Program (RCPGP). The purpose of the RCPGP is to support preparedness efforts of local jurisdictions, spanning multiple states, in planning for catastrophic events or disasters. An initiative under the RCPGP was the Regional All Hazard Risk Assessment Project. Will County Emergency Management Agency was a member of this subcommittee whose mission was to plan for and mitigate catastrophic and routine incidents.

The project completed in July, 2013, provided Will County with two analysis tracks. The first was an assessment of the capabilities of the County to implement the 31 Core Capabilities described in the National Preparedness Goal. The other was software called System-wide Multi-hazard Risk Tool (SMRT) utilized to conduct risk analysis. SMRT was used for the regional assessment of chosen hazards: tornados, extreme heat, pandemic, blackout, and terrorism.

Additional grant funding may be made in the near future to the RCPGP. This could provide opportunities for the IL-IN-WI CSA to further study hazard impact regionally and locally. Study results could provide Will County data that normally would be unavailable to the county. Additionally, RCPGP projects could further the development of regional planning and mitigation strategies. Will County looks forward to participating in future RCPGP planning programs.

CHAPTER 4: HAZARD PROFILES AND VULNERABILITY ASSESSMENT

The following profiles include not only natural hazards but also technological and societal hazards that have the potential to affect Will County. The location of Will County is a factor in many of the hazards that face the county. Being located in the Midwest, the county is subject to extreme changes in climate. During the spring through fall seasons, the county experiences many thunderstorms. These storms can be quite severe and bring with them the damaging effects of wind, lightning, hail, and flood. Will County is also located in the section of the United States that experiences the most tornado activity. The worst tornado to hit the county occurred in 1990. The summer months can also bring high temperatures which may lead to periods of drought and its damaging effect on crops and water supply. As the seasons change to winter, the temperature can change to extreme cold and along with this cold often comes snow, ice, more wind, and more flooding. These winter storms can knock down the power supply and bring travel routes to a close.

The location of Will County is also the reason for many of the technological and societal hazards that the county may experience. Being proximate to Chicago, Will County is the hub for major transportation systems that lead into the Chicago area. Intermodal systems use interstate highways, railways, bus routes, waterways, pipelines, and airports to transport raw materials, finished products, and people in and out of the county. These transportation systems encourage the development of business enterprises which bring in materials to produce products utilized throughout the country and the world.

Along with these transportation systems and entities of commerce come risks. Some of the chemicals used in manufacturing and agriculture have hazardous effects on people and the environment. As these chemicals are transported or processed, there is the potential for spills, fire, explosion, and harmful contamination. Nuclear power plants utilize fuel that can have damaging effects for generations should it be released during transportation or a plant accident. Though technological advances have helped to

make Will County prosperous, the potential for harm must be addressed through programs of preparedness.

Again, the location of Will County plays a part in societal hazards. The ease of transportation, the growing job market, and the mix of urban and rural lifestyles attract people to work and live in Will County. The spread of the Chicago metropolitan area also has an effect on the county's society as it spills into Will County. As more people come to live and work in Will County, urban areas develop bringing in more business, manufacturing, retail shopping, and entertainment venues. Growth in urban areas brings with it an increase in potential for public health issues and civil disturbance. Growth in business and housing, along with the proximity to Chicago, increase the potential for terrorist and enemy attack. Nuclear power plants, refineries, large entertainment venues, an army training center, and the nearness of Chicago, all make Will County attractive as a target for terrorists and our enemies. An attack in Will County would bring the attention that terrorists seek and produce damage that could impact other areas of our country.

Each of the following hazard profiles provides a summary of their characteristics, the risk that they pose, and the vulnerabilities of the county that require the attention and planning of first responders and supporting agencies to protect the welfare of the public of Will County.

Climate Change

The State Climatologist Office for Illinois provide the following definitions for climate and climate change (Available from: https://www.isws.illinois.edu/statecli/climate-change/glossary.htm):

Climate - The slowly varying aspects of the atmosphere–hydrosphere–land surface system. It is typically characterized in terms of suitable averages of the climate system over periods of a month or more, taking into consideration the variability in time of these averaged quantities. Climatic classifications include the spatial variation of these time-averaged variables. Beginning with the view of local climate as little more than the annual course of long-term averages of surface temperature and precipitation, the concept of climate has broadened and evolved in recent decades in response to the increased understanding of the underlying processes that determine climate and its variability.

Climate Change - Any systematic change in the long-term statistics of climate elements (such as temperature, pressure, or winds) sustained over several decades or longer. Climate change may be due to natural external forces, such as changes in solar emission or slow changes in the earth's orbital elements; natural internal processes of the climate system; or anthropogenic forcing.

The following profiles do not detail any effects climate change may have on hazards that impact Will County. However, information on climate change is available from the state level and can be found at:

- State Climatologist Office for Illinois - https://www.isws.illinois.edu/statecli/climate-change/cc.htm
- NOAA National Centers for Environmental Information – State Climate Summaries (Illinois) - https://statesummaries.ncics.org/chapter/il/
- 2018 Illinois Natural Hazard Mitigation Plan - https://www2.illinois.gov/iema/Mitigation/Documents/Plan_IllMitigationPlan.pdf

Future

What the economic future holds for Will County can only be estimated. The Chicago metropolitan area continues to grow outward into the surrounding counties. According the Workforce Investment Board of Will County, the population is expected to increase by 1.4% by 2024, adding 9,567 people. Jobs in Will County increased by 13% from 2014 to 2019 outpacing the national growth rate of 7.3%. Jobs are expected to continue to rise reaching almost 293,000 jobs by 2024. Will County has become the largest inland port in North America handling over 3 million twenty-foot equivalent unit (TEU) containers annually. So its economic future and job growth may trend towards its top growing industry and occupations of transportation and warehousing.

The building of the South Suburban Airport will allow an increase in the transport of goods and have an impact on the county's growth. If it is built, there will be a large demand for services, infrastructure, workers, housing, schools, etc. to support its function. This additional source for transportation of goods and people will increase the rate of business development. This means there will be more people and property to protect from hazards, more technology and businesses that may present a hazard, and more people and businesses that could attract or be affected by societal hazards.

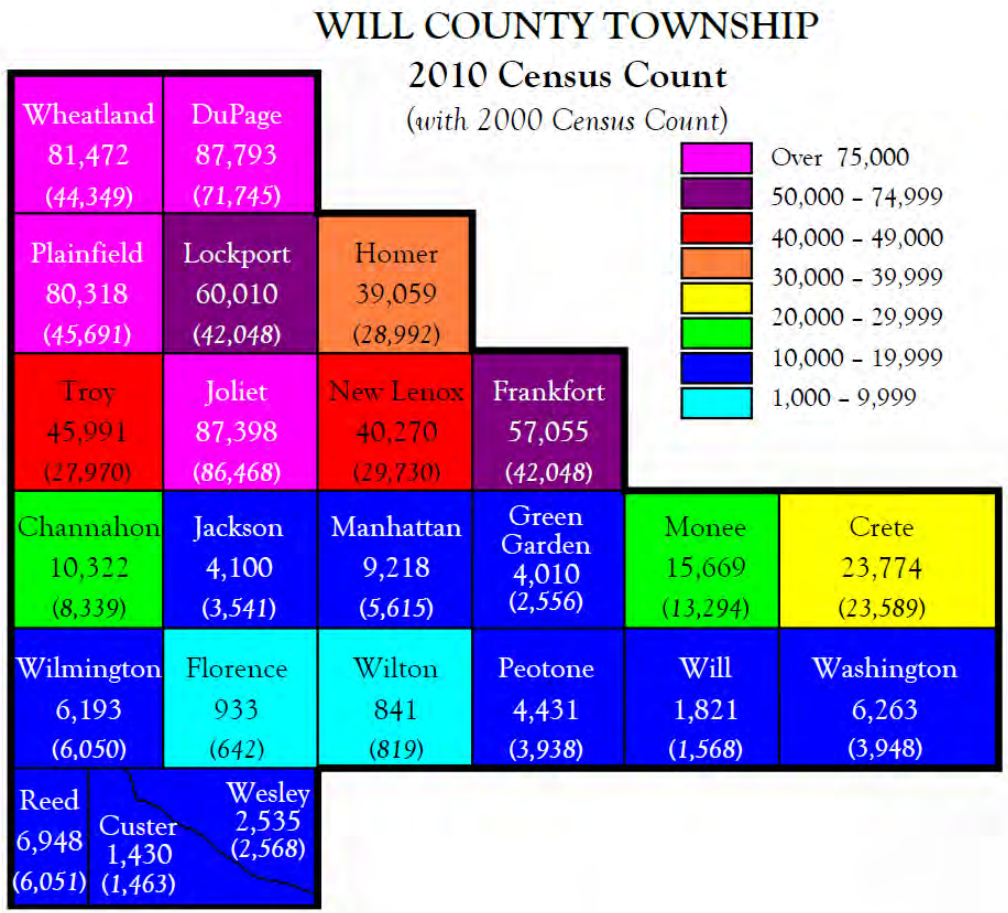
Assessing the risks, planning, mitigating hazards, and preparing for emergencies will remain essential activities to ensure the safety of Will County's residents. Routine updating of demographic data and careful tracking of hazards will be important and will require a coordinated effort of all agencies and municipalities responsible for a proactive approach through mitigation planning within Will County. The information concerning changes in hazards and risks and their impact on the county's population and assets will be critical in maintaining and updating mitigation plans.

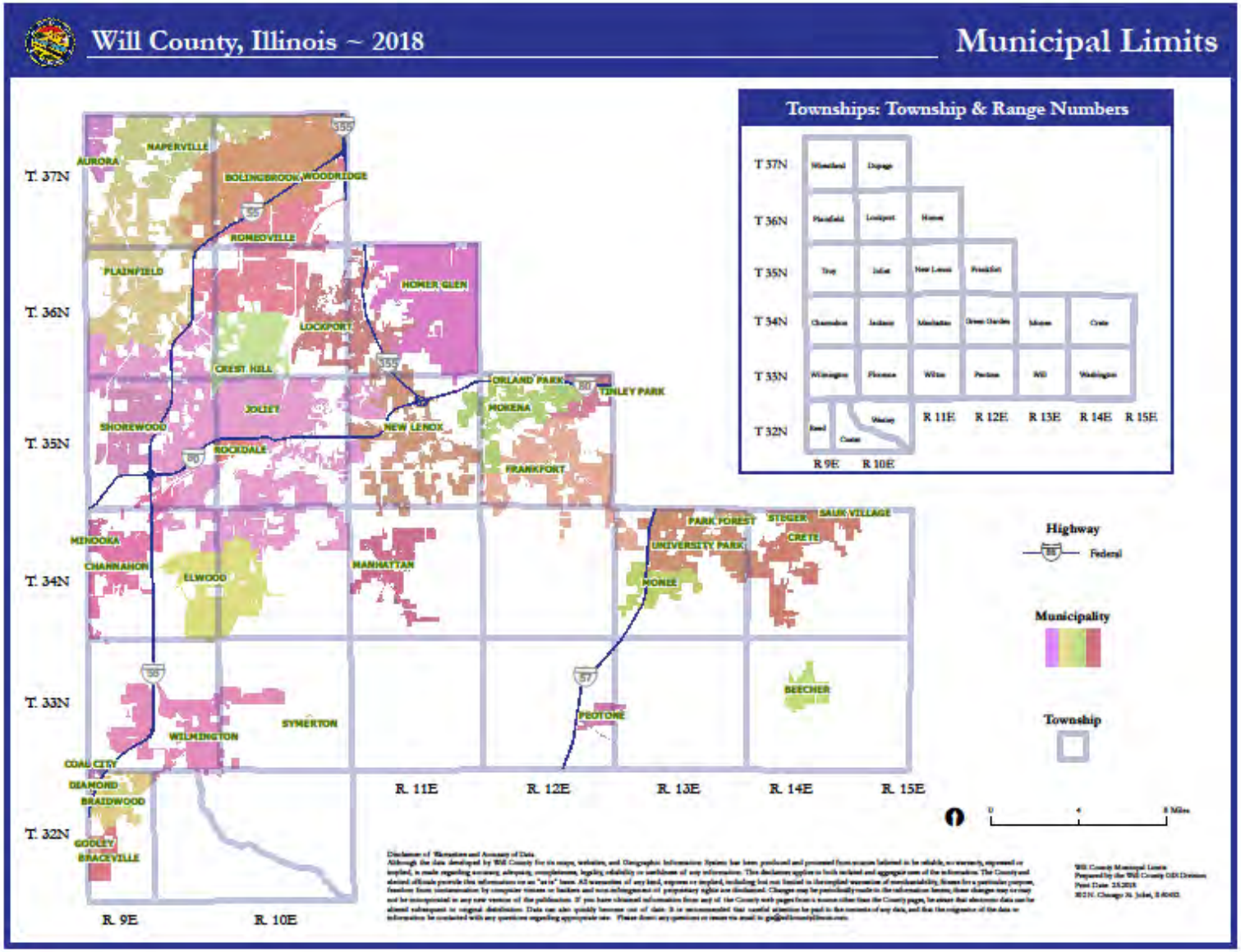
Will County Major Industry Employment (Source: Workforce Investment Board of Will County)	
Government	34,529
Retail Trade (2012)	31,471
Healthcare & Social Assistance	27,807
Transportation & Warehousing	27,537
Manufacturing	22,792
Accommodation & Food Services	22,491
Admin, Support, Waste Mgmt. Remediation	18,355
Construction	16,838
Wholesale Trade	16,355
Other Services (except Public Admin)	13,759
Professional, Scientific & Technical Services	12,799
Finance & Insurance	5,294
Educational Services	5,199
Arts, Entertainment, & Recreation	4,614
Real Estate & Rental & Leasing	3,439
Information	2,232
Utilities	1,597
Agriculture, Forestry, Fishing & Hunting	813
Management of Companies & Enterprises	739
Mining, Quarrying, & Oil/Gas Extraction	193

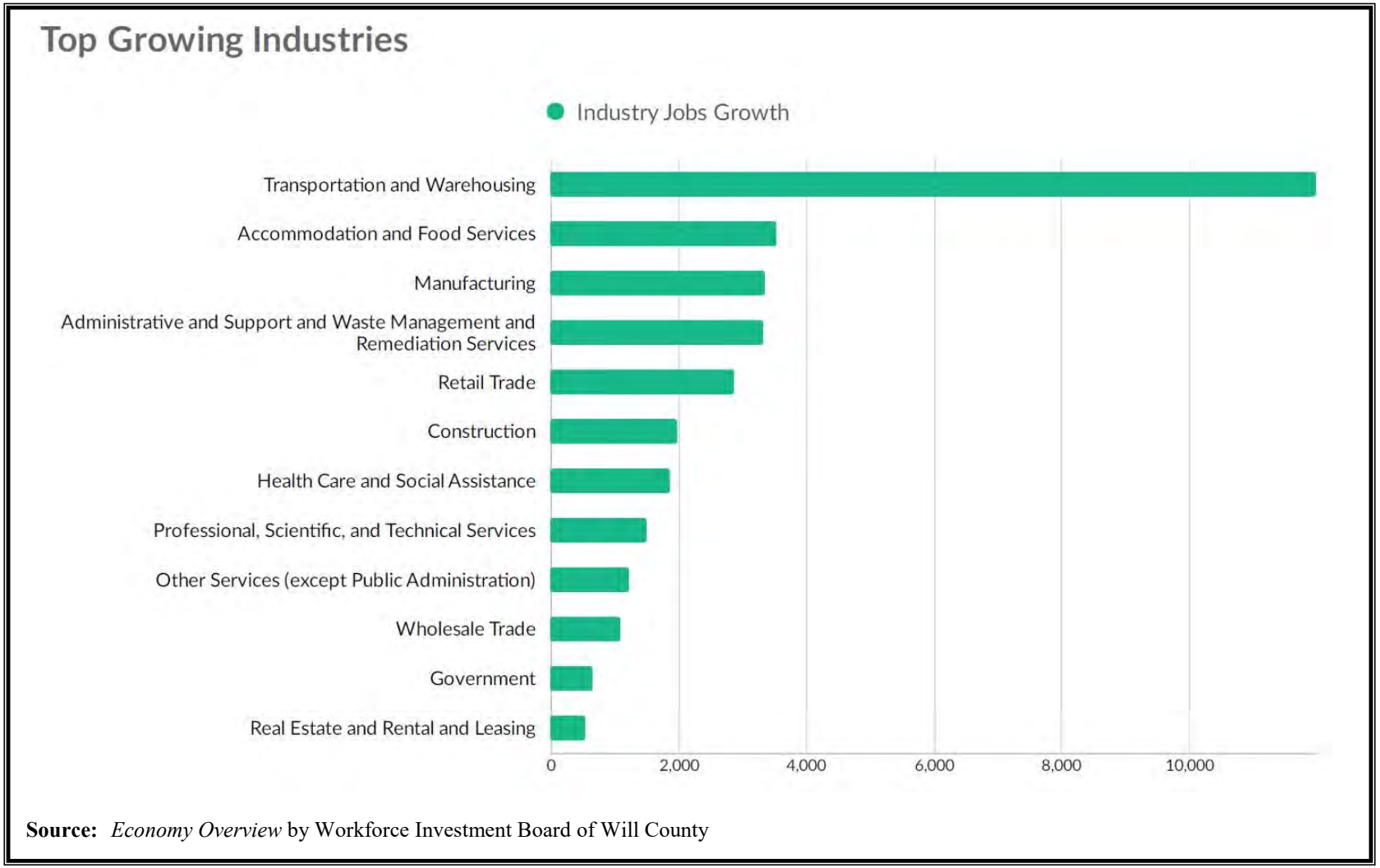
County Assets

Will County's assets lie in its people, institutions, businesses, infrastructure, land, and natural resources. The reason for conducting preparedness plans, such as this mitigation plan, is to evaluate the impact of hazards on these assets and to determine effective methods to protect people and property. The following charts and graphs summarize these assets.

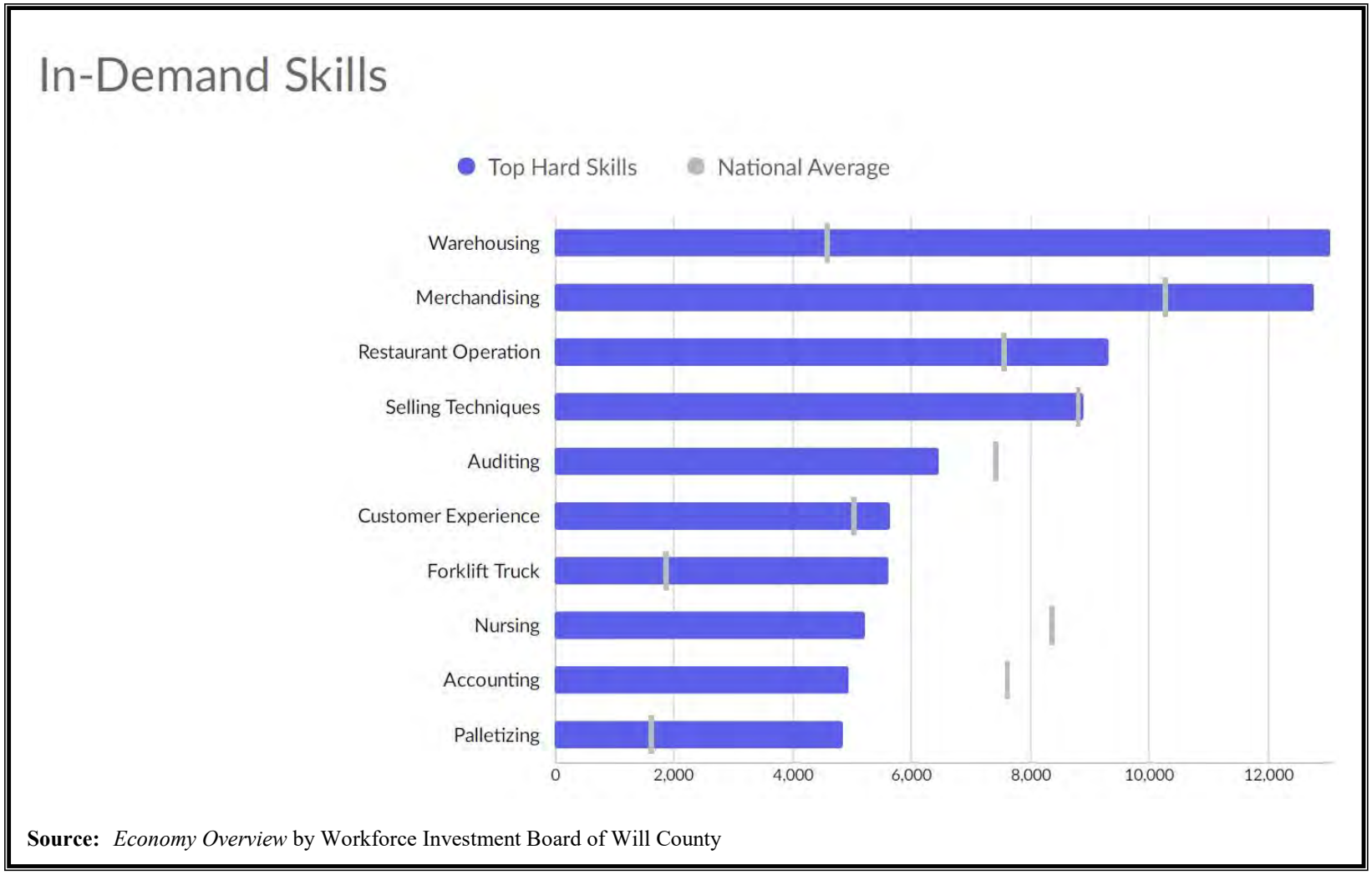
Township Populations and Estimated Housing Units per Township (Source: U.S. Census Bureau 2018 & Will Co. Assessor)			
Township	**Land Area (sq. mi.)**	**Total Population**	**Total Housing Units**
Channahon	35.7	10,743	3,914
Crete	44.4	23,382	9,953
Custer	26.4	1,410	561
Du Page	36.8	89,285	27,153
Florence	36.5	1,010	383
Frankfort	36.8	59,631	21,455
Green Garden	36.7	3,992	1,446
Homer	36.1	39,701	15,008
Jackson	36.1	4,048	1,785
Joliet	36.1	86,664	28,107
Lockport	36.6	60,088	21,528
Manhattan	36.9	7,999	4,542
Monee	35.9	15,455	5,313
New Lenox	35.9	42,761	15,871
Peotone	36.3	4,411	1,477
Plainfield	35.2	82,735	27,523
Reed	18.0	7,051	3,782
Troy	35.4	47,710	18,719
Washington	44.7	6,338	2,754
Wesley	28.5	2,203	1,208
Wheatland	35.8	85,249	28,399
Will	36.2	1,805	340
Wilmington	36.0	6,122	2,331
Wilton	36.3	828	170



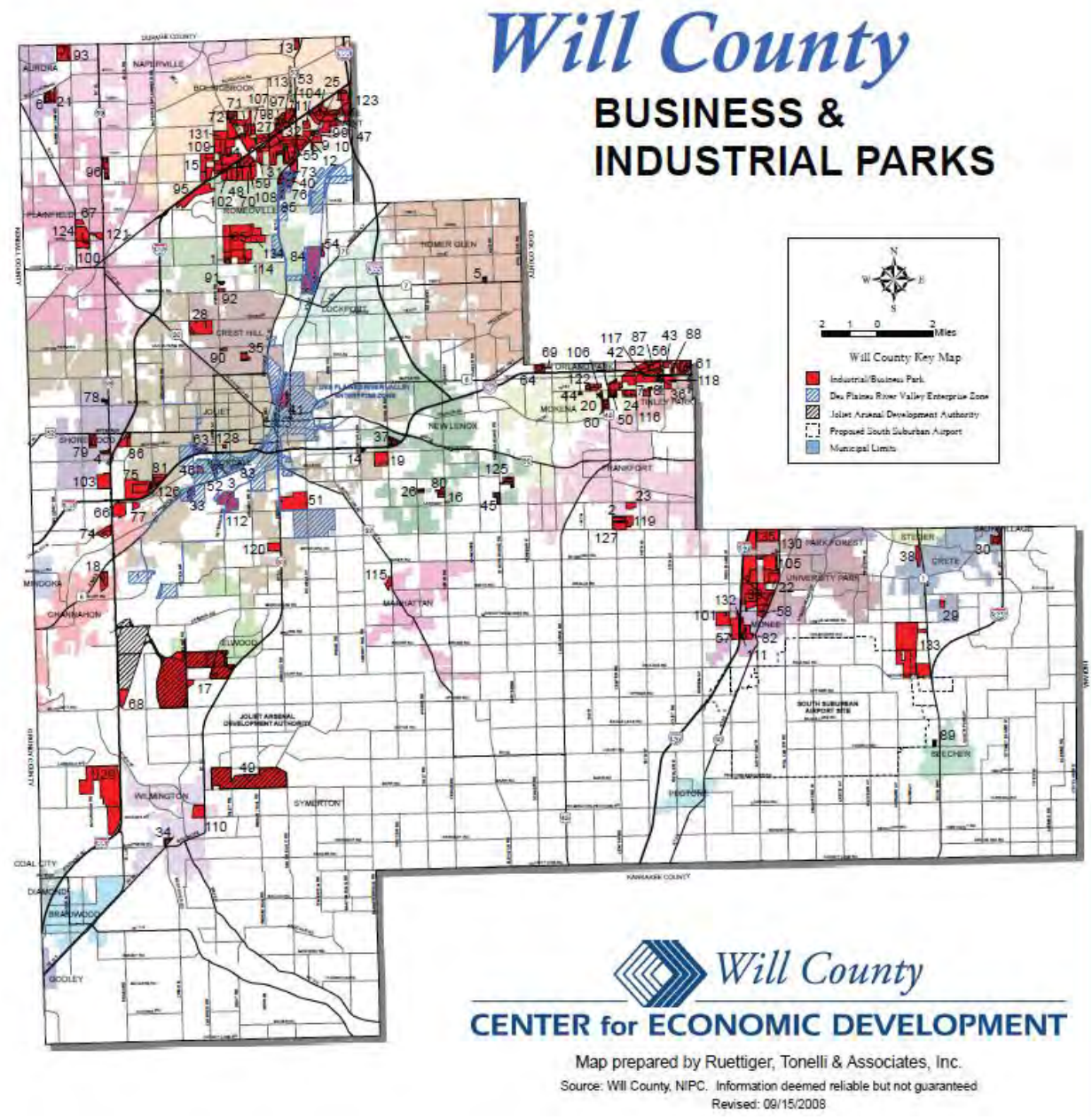

Will County, Illinois ~ 2018
Municipal Limits
Townships: Township & Range Numbers
T 37N
T 36N
T 35N
T 34N
T 33N
T 32N
R 9E
R 10E
R 11E
R 12E
R 13E
R 14E
R 15E
NAPERVILLE
AURORA
BOLINGBROOK
WOODRIDGE
ROMEOVILLE
PLAINFIELD
HOMER GLEN
LOCKPORT
CREST HILL
JOLIET
SHOREWOOD
ROCKDALE
NEW LENOX
ORLAND PARK
TINLEY PARK
MOKENA
FRANKFORT
MINOOKA
CHANNAHON
ELWOOD
MANHATTAN
PARK FOREST
STEGER
SAUK VILLAGE
CRETE
UNIVERSITY PARK
MONEE
BEECHER
PEOTONE
SYMERTON
WILMINGTON
COAL CITY
DIAMOND
BRAIDWOOD
GODLEY
BRACEVILLE
Highway
Federal
Municipality
Township
0
4
8 Miles



Source: *Economy Overview* by Workforce Investment Board of Will County



Source: *Economy Overview* by Workforce Investment Board of Will County


Will County
BUSINESS &
INDUSTRIAL PARKS
Will County Key Map
Industrial/Business Park
Du Plaine River Valley Enterprise Zone
Joliet Arsenal Development Authority
Proposed South Suburban Airport
Municipal Limits
Miles
Will County
CENTER for ECONOMIC DEVELOPMENT
Map prepared by Ruettiger, Tonelli & Associates, Inc.
Source: Will County, NIPC. Information deemed reliable but not guaranteed
Revised: 09/15/2008

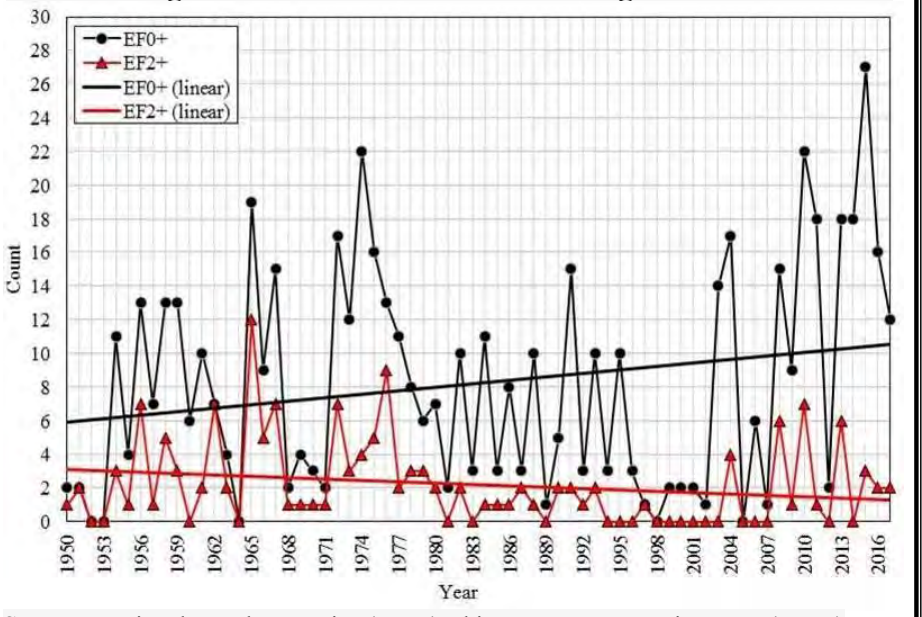
Township	Structures by Type and Value								
	Residential	Residential Value ($)	Commercial	Commercial Value ($)	Industrial	Industrial Value ($)	Agriculture	Agriculture Value ($)	Value Total ($)
Channahon	3,914	893,698,626	111	45,237,693	247	1,608,054,942	98	9,900,549	2,556,891,810
Crete	9,953	1,173,814,740	485	157,091,337	64	45,104,991	472	59,834,370	1,435,845,438
Custer	561	111,512,472	16	3,077,085	10	2,984,784	285	37,216,806	154,791,147
DuPage	27,153	6,279,916,638	716	1,102,631,811	810	3,236,652,945	36	5,400,408	10,624,601,802
Florence	383	58,864,581	3	648,123	8	28,302,978	247	34,032,672	121,848,354
Frankfort	21,455	6,160,651,704	1,282	995,283,213	604	424,252,485	187	23,115,879	7,603,303,281
Green Garden	1,446	403,671,447	23	15,425,715	32	829,959	520	124,378,644	544,305,765
Homer	15,008	4,430,623,221	389	359,888,706	162	233,544,795	254	47,047,875	5,071,104,597
Jackson	1,785	295,641,342	168	53,151,408	185	544,565,940	292	22,834,983	916,193,673
Joliet	28,107	3,004,070,358	2,349	827,950,674	526	509,995,086	183	15,137,706	4,357,153,824
Lockport	21,528	3,740,426,502	1,094	527,908,131	529	667,102,491	123	18,289,209	4,953,726,333
Manhattan	4,542	892,866,156	135	39,202,521	62	60,744,207	381	80,680,392	892,866,156
Monee	5,313	690,841,485	233	124,864,440	198	595,699,332	337	44,954,094	1,456,359,351
New Lenox	15,871	4,248,451,620	433	375,676,542	635	325,672,251	221	24,961,881	4,974,762,294
Peotone	1,477	253,207,176	138	60,081,669	26	8,743,929	351	68,799,519	390,832,293
Plainfield	27,523	5,926,958,364	937	712,253,487	139	70,033,176	106	17,473,701	6,726,718,728
Reed	3,782	425,694,627	91	21,863,883	63	1,412,845,617	102	4,713,342	1,865,117,469
Troy	18,719	3,826,423,548	748	762,166,209	359	651,776,562	127	20,287,014	5,260,653,333
Washington	2,754	359,789,607	119	44,793,372	31	10,847,826	551	104,509,503	519,940,308
Wesley	1,208	121,625,628	5	873,276	9	5,803,617	289	42,349,707	170,652,228
Wheatland	28,399	10,437,474,054	413	600,772,116	367	175,061,949	159	21,523,164	11,234,832,283
Will	340	64,510,992	28	11,491,743	4	4,768,698	420	65,574,414	146,345,847
Wilmington	2,331	340,074,792	365	103,095,354	108	290,525,445	134	16,792,209	750,487,800
Wilton	170	38,064,603	3	103,095,354	-	-	435	72,418,611	110,951,724
Will County TOTALS:	243,722	48,251,915,919	10,284	7,048,523,862	5,178	10,913,914,005	6,310	982,226,652	72,840,285,838

TORNADOES

Hazard Characterization

A tornado is defined as a local atmospheric storm of short duration composed of winds rotating at very high speeds, usually moving in a counter-clockwise direction. It is visible as a vortex, a whirlpool-like column of winds rotating around a hollow cavity in which centrifugal forces produce a partial vacuum. Conditions leading to tornadoes often result in other dangerous storm activities such as severe thunderstorms, high winds, lightning, hail, and heavy rain. Tornado formation requires the presence of air layers that differ in temperature, moisture, density, and wind flow. The rotary winds twist and rip at structures and the tornado's central vacuum creates explosive pressure changes. Tornadoes, one of nature's most violent storms, tend to be short-lived but intensely menacing. They have the potential to destroy everything in their path and pose a significant threat to life.

Most tornadoes have a three-stage life cycle where they develop, mature, and dissipate. The average path of a tornado is approximately one-eighth mile wide and three miles long with a wind speed of forty or more miles per hour; however, tornadoes have been recorded that have traveled a path over one mile wide and almost three-hundred miles long.



Source: National Weather Service (NWS) Chicago County Warning Area (CWA)

Frequency of tornadoes varies by season, but in Illinois, most occur from April through July during the late afternoon usually when there is warm, humid, and unsettled weather. Of the 1,200 tornadoes that occur in the United States each year, roughly 3% result in casualties. Improved warning systems have drastically reduced tornado related deaths since the 1950's.

Tornado intensities have been measured by the Fujita Damage Scale which rates tornadoes based on damage caused and not size of storm. The Fujita scale has been in use for 42 years. It has been a useful tool for categorizing tornadoes; however, the scale's primary limitations are a lack of damage indicators, no account of construction quality and variability, and no definitive correlation between damage and wind-speed. Researchers, building on the original Fujita Scale, developed the Enhanced Fujita Scale to overcome these limitations. This new scale is still a set of wind estimates (not measurements) based on damage. It uses three-second gust estimates at the point of damage based on a judgment of 8 levels of damage to 28 indicators. The use of the Enhanced Fujita Scale began in 2007.

ENHANCED FUJITA SCALE		
CATEGORY	**3 SECOND GUST (mph)**	**EFFECTS**
EF0	65 – 85	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF1	86 – 110	Moderate damage. Roofs severely stripped: mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken
EF2	111 – 135	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136 – 165	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166 – 200	Devastating damage. Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF5	> 200	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (109 yd); high-rise buildings have significant structural deformation; incredible phenomena will occur.

Weak tornadoes (F0-F1):

- Represent 80% of all tornadoes with less than 5% of tornado deaths.
- Their time span ranges from one to over ten minutes long.
- They can have a path length of up to three miles and a wind speed of 60 to 115 miles per hour.

Strong tornadoes (F2-F3):

- Comprise 19% of all tornadoes with less than 30% of tornado deaths.
- Their time span is 20 minutes or longer, their path length is in excess of 15 miles.
- Their wind speeds range from 110 to 205 miles per hour.

Most unusual are the violent tornadoes (F4-F5):

- They represent 1% of all tornadoes but constitute 70% of all tornado deaths.
- Violent tornadoes last an hour or longer, have a path length in excess of 50 miles.
- They have recorded wind speeds of over 200 miles per hour.

History

Statewide, Illinois is ranked high in terms of the number of tornadoes and tornado impacts (damages, deaths, and injuries). In fact, Illinois has experienced some of the worst tornadoes in U.S. history. The infamous Tri-State tornado occurred on March 18, 1925, passing through southern Missouri, Illinois, and Indiana, leaving 695 dead and 2000 injured. The Mattoon tornado of May 26, 1917, left 101 dead and 638 injured.

Will County has experienced 72 tornadoes since 1950 or roughly an average of one tornado per year. Most have been weak tornadoes over this time period, ten have been strong storms, and one was a violent F5. The strong storms that have occurred over the years have also impacted the lives and property of the county's citizens.

Though there are no absolutes and you can see from the table of *Impact of Tornadoes* on Will County that tornadoes can occur at any time of year, but are more likely to happen between 3pm and 7pm during April, May, and June. Each occurrence has the potential of being an EF5 tornado with a detrimental impact on the lives and economic factors of the community. Thus, it is important to have an understanding of how tornadoes occur, how to educate and notify the public of their impending occurrence, and how to prepare and recover from the storm.

The most important mitigating factor is advanced warning which does not prevent property damage but does save lives. The Emergency Alert System (EAS) is a national system used by state and local governments to disperse emergency information by connecting the agencies with media and broadcasting stations. Along with the EAS, the primary means of radio communication between Will County and the State of Illinois is via the StarCom21 radio system. Will County Emergency Management Agency (WCEMA) also monitors the State EOC's state backup station (45.44 MHZ). The National Weather Service's (NWS) NOAA weather radio (162.425 MHZ) out of Chicago is one of NWS's seven stations used to broadcast in the county. The NWS monitors atmospheric conditions and issues a *Tornado Watch* when formation of a tornado is possible. When a tornado is sighted, the NWS issues a *Tornado Warning* identifying the tornado's location, direction it is moving, and speed.

Additionally, Will County has outdoor warning sirens and an enhanced emergency alert system used to notify registered public that an emergency exists through email, pagers, cell phone text message, or voice

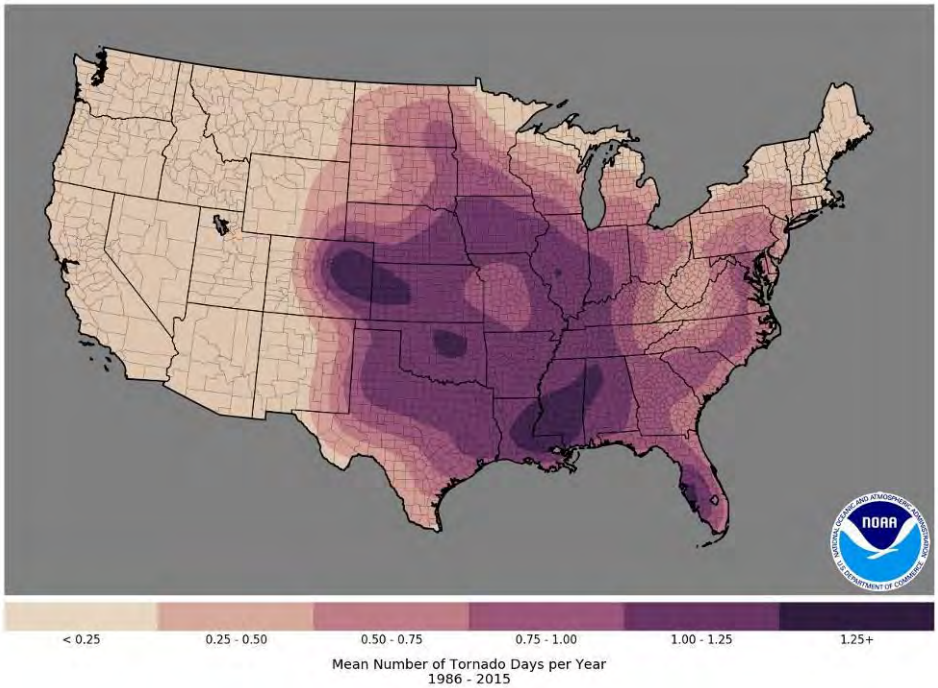
message on home phones. These various information sources are used to create a web of redundancy. This system of cross monitoring protects the public should one notification mode fail to forward the information. Tornado preparedness information is listed on the WCEMA website. Because tornadoes are so prevalent within the county, everyone must be prepared for the potential hazard so that they are able to respond promptly and efficiently.

IMPACT OF TORNADOES ON WILL COUNTY
(Source: NOAA/National Centers for Environmental Information / WC EMA)

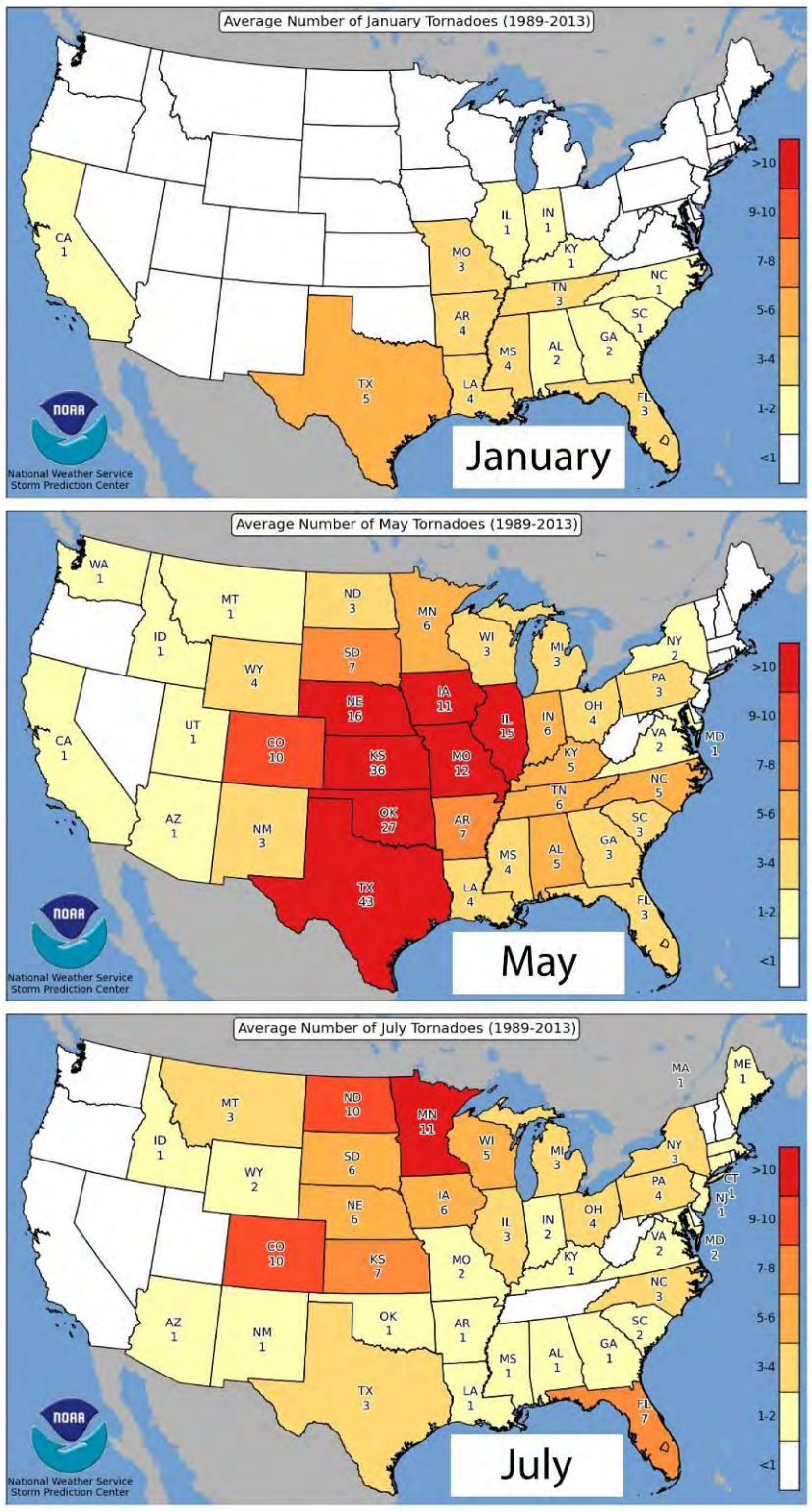
Location	Date	Magnitude	Deaths/ Injuries	Property Damage	Federal Declaration
Peotone	05/18/1883	F2	2 Injured		
Channahon	06/10/1890	F2			
Manhattan	05/26/1917	F4	3 Dead 60 Injured		
Channahon/ Romeoville	03/28/1920	F4	20 Dead 300 Injured		
Braidwood	04/07/1948	F3	1 Injured		
Joliet	08/15/1858	F2			
Will County	04/16/1960	F1		$3 K	
Will County	07/02/1960	F1		$250 K	
Will County	04/23/1961	F3	4 Injured	$2.5 M	
Will County	09/22/1961	F1		$25 K	
Will County	11/12/1965	F2	2 Dead 90 Injured	$25 M	
Will County	04/25/1967				DR-227
Will County	06/10/1967	F1		$25 K	
Will County	06/30/1969	F1		$250 K	
Will County	04/06/1972	F2	1 Dead 22 Injured	$750 K	
Joliet	07/17/1972	F3			
Will County	07/27/1973	F1		$25 K	
Will County	06/30/1977	F0		$28 K	
Will County	06/25/1978	F1	1 Dead	$253 K	
Will County	06/29/1979	F0	1 Injured	$25 K	
Will County	04/03/1982	F0		$250 K	
Will County	04/27/1984	F3	1 Dead 5 Injured	$2.5 M	
Will County	06/13/1984	F1		$500 K	
Wilmington/ New Lenox	04/05/1988	F2			
Will County	05/08/1988	F1	4 Injured	$750 K	
Will County	05/09/1988	F2	3 Injured	$1 M	
Will County	08/28/1990	F5	29 Dead 350 Injured	$250 M	DR-878
Will County	03/27/1991	F3	7 injured	$50 M	
New Lenox	08/15/1993	F2	2 Injured	$1 M	
Beecher	04/26/1994	F1		$100 K	
Plainfield	06/02/1995	F0		$2 K	
Mokena	07/18/1997	F1	2 Injured		
Plainfield	08/25/2001	F0			
Joliet/ Wilmington	05/30/2003	F1		$60 K	
Joliet/ Beecher	04/20/2004	F1		$5 M	DR-1513
Plainfield	04/26/2007	EF0		$100 k	
Bolingbrook	08/05/2007	EF0		$40 K	

IMPACT OF TORNADOES ON WILL COUNTY (cont.) (Source: NOAA/National Centers for Environmental Information / WC EMA)					
Location	**Date**	**Magnitude**	**Deaths/ Injuries**	**Property Damage**	**Federal Declaration**
Godley/ Wilton Center/ Monee	06/07/2008	EF2	6 Injured	$6.55 M	
Plainfield	08/04/2008	EF1		$500 K	
Peotone	10/26/2010	EF2	2 Injured	$500 K	
Wilton Center	06/12/2013	EF0		$35K	
Braidwood	11/17/2013	EF2	3 Injured	$2M	DR-4157
Wilton				$750K	
Walker	06/30/2014	EF1		$500K	
Symerton	06/15/2015	EF1		$100K	
Braidwood	06/22/2015	EF2		$250K	
Plainfield Clow Airport	08/18/2015	EF0		$0	
Monee	09/18/2015	EF1		$70K	
Beecher	06/09/2017	EF0		$0	
Manhattan	06/26/2018	EF0		$0	
		EF1		$30K	
Manhattan	08/20/2018	EF0		$0	
Lorenzo	01/18/2019	EFU		$0	
Lewis Airport	05/27/2019	EF0		$0	

Mean Number of Tornado Days per Year: 1986-2015

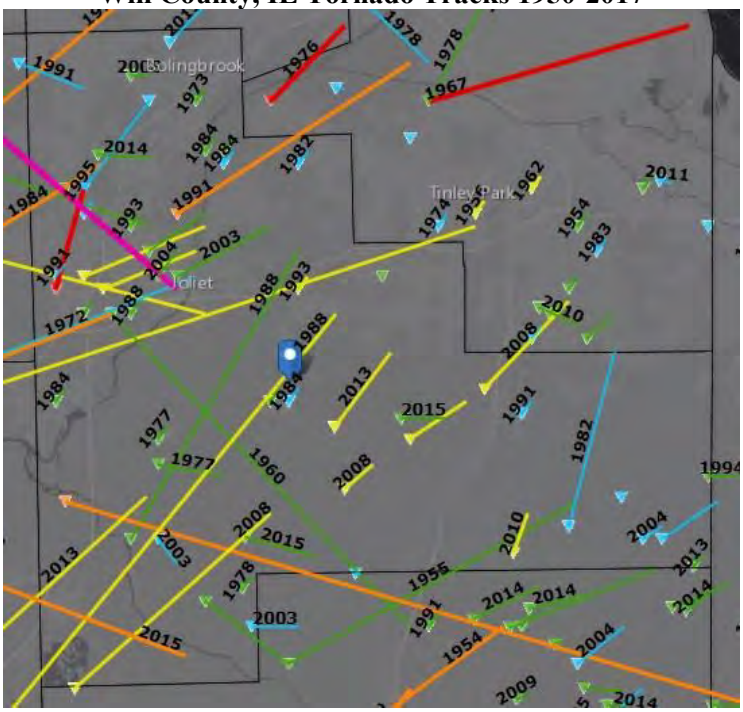


Source: National Weather Service Storm Predication Center



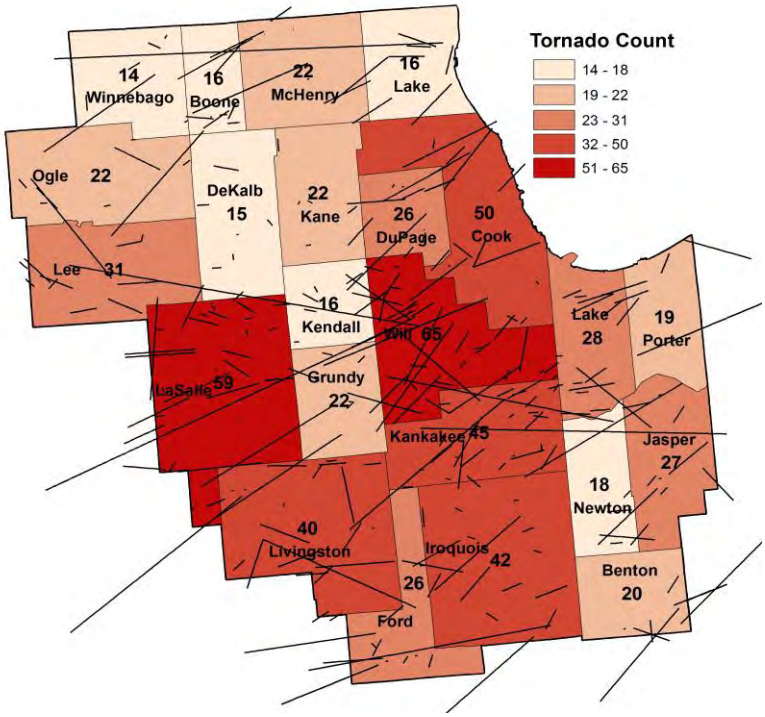
Source: National Weather Service Storm Predication Center

Will County, IL Tornado Tracks 1950-2017



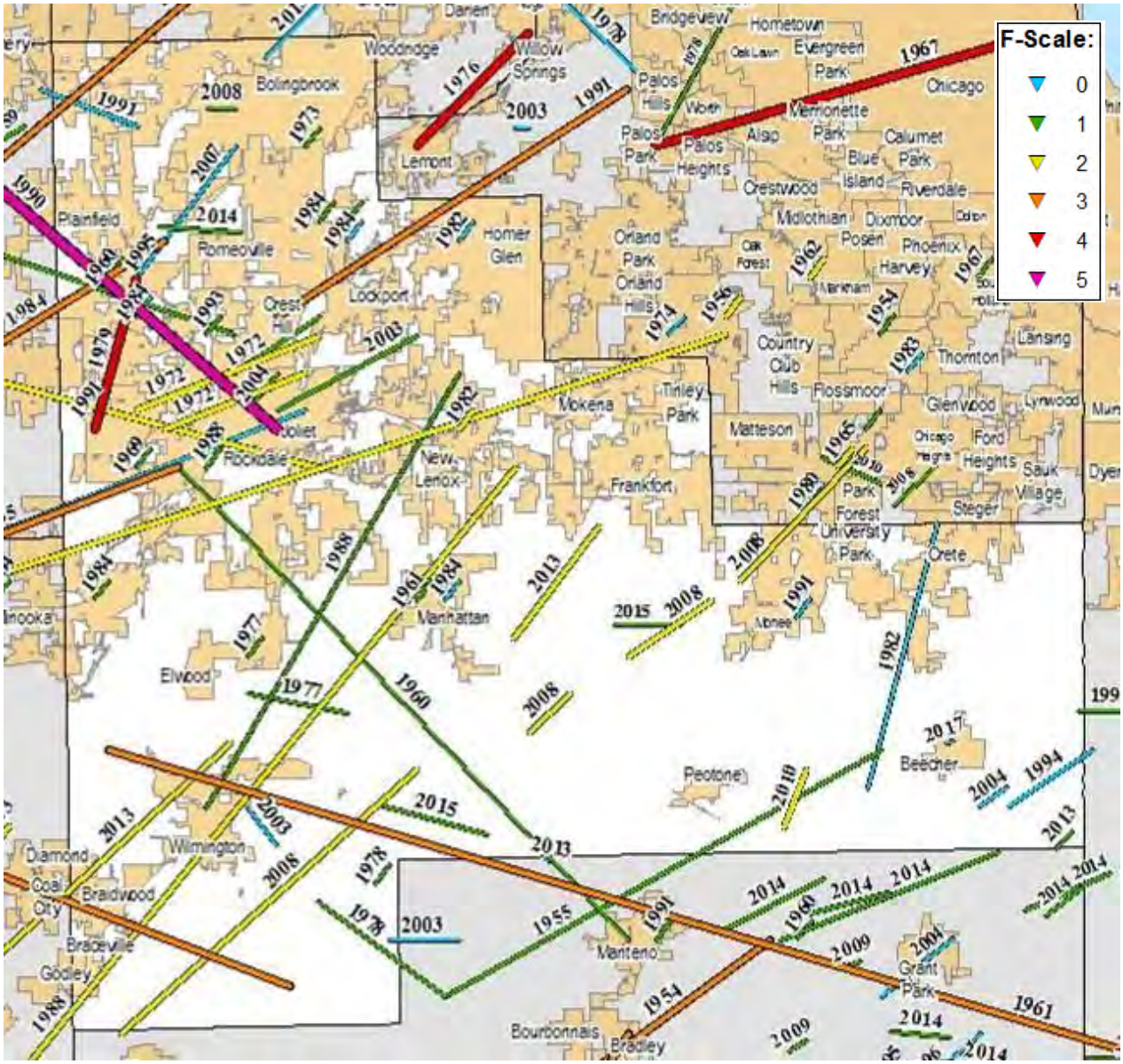
Source: Midwestern Regional Climate Center (MRCC)

All Tornadoes by County from 1950-2017

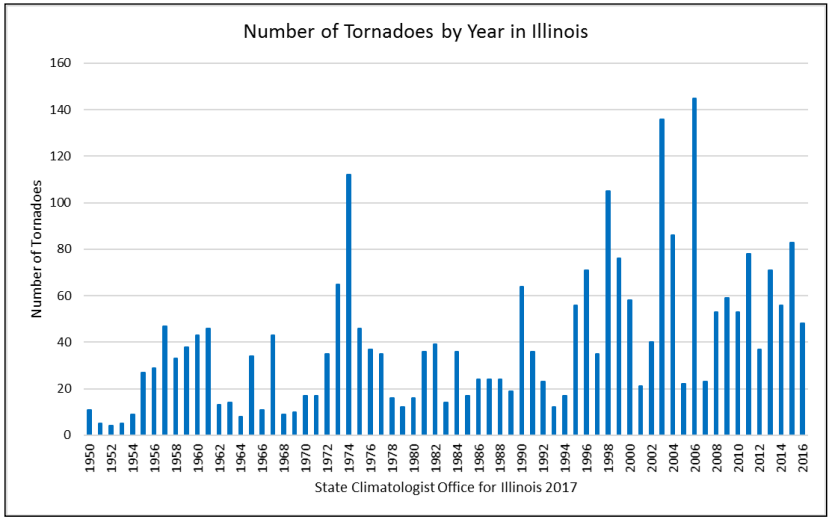


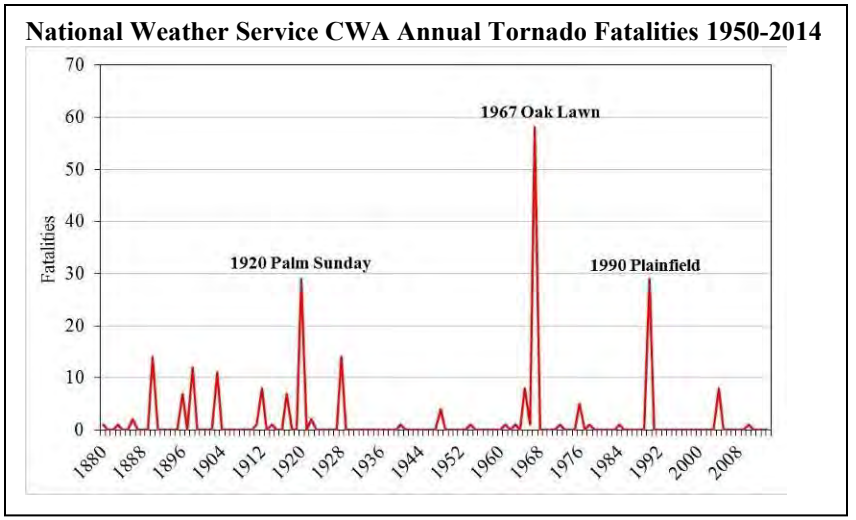
Source: Midwestern Regional Climate Center (MRCC)

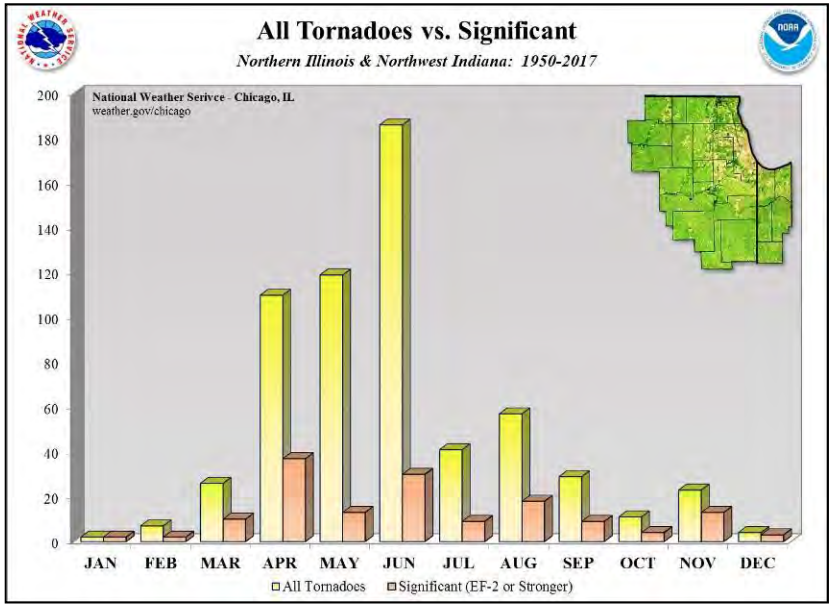
Will County Tornado Tracks: 1950 - 2017

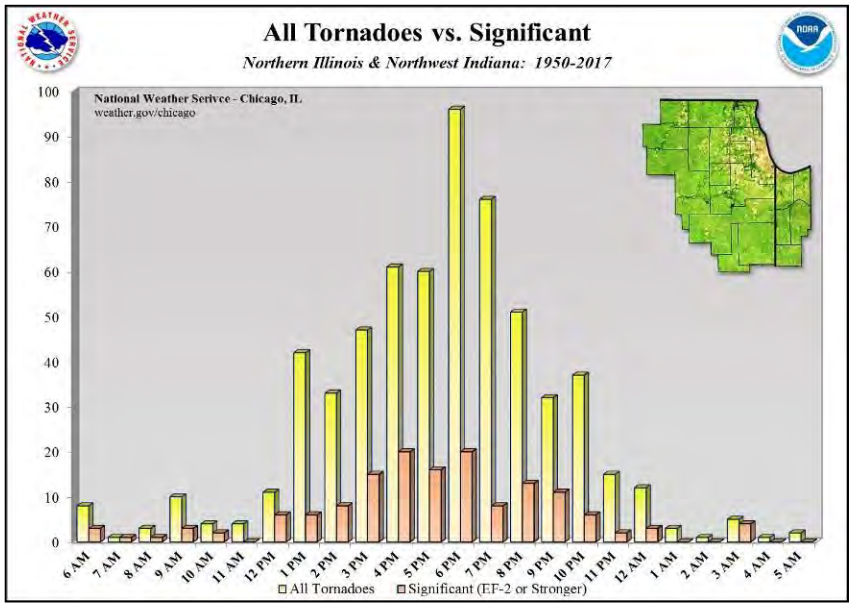


Source: National Oceanic and Atmospheric Administration (NOAA) Midwestern Regional Climate Center (MRCC)


Number of Tornadoes by Year in Illinois
Number of Tornadoes
State Climatologist Office for Illinois 2017


National Weather Service CWA Annual Tornado Fatalities 1950-2014
Fatalities
1967 Oak Lawn
1920 Palm Sunday
1990 Plainfield


All Tornadoes vs. Significant
Northern Illinois & Northwest Indiana: 1950-2017
National Weather Serivce - Chicago, IL
weather.gov/chicago
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
All Tornadoes
Significant (EF-2 or Stronger)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Northern Illinois & Northwest Indiana: 1950-2017
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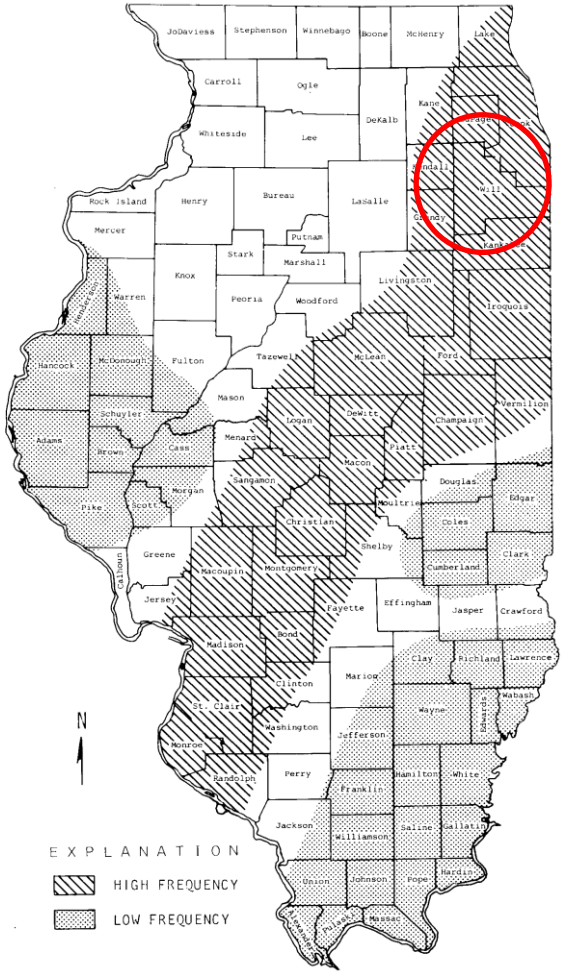
weather.gov/chicago
All Tornadoes
Significant (EF-2 or Stronger)

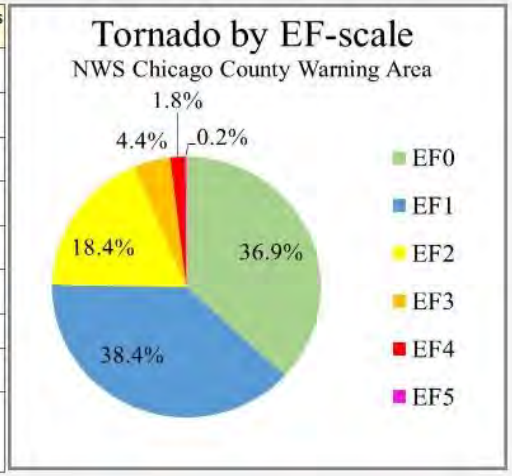
Areas of Relative Tornado Frequency in Illinois

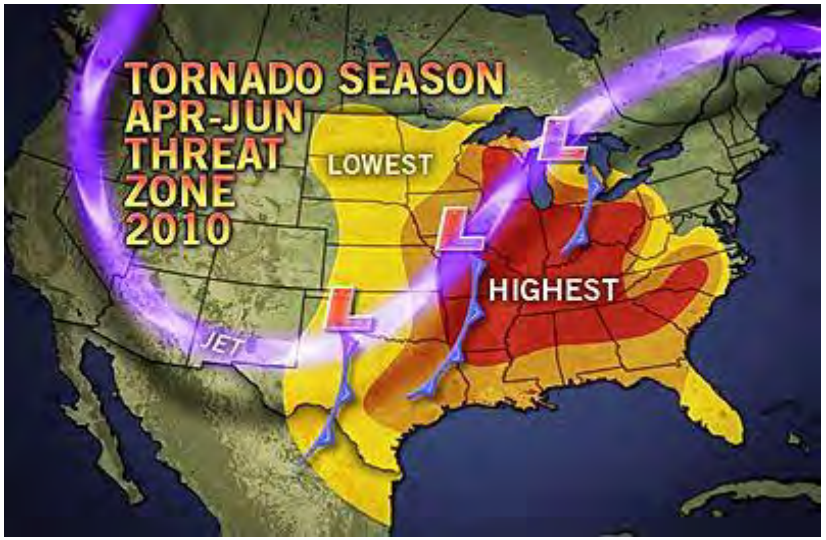


Available from: http://www.sws.uiuc.edu/pubdoc/C/ISWSC-103.pdf

NWS Chicago CWA Tornado Percentage Counts by Magnitude 1950-2017

EF Damage	% of All Tornadoes
EF-0	36.9%
EF-1	38.4%
EF-2	18.4%
EF-3	4.4%
EF-4	1.8%
EF-5	0.2%
Significant (EF-2+)	24.8%
Violent (EF-4+)	2.0%

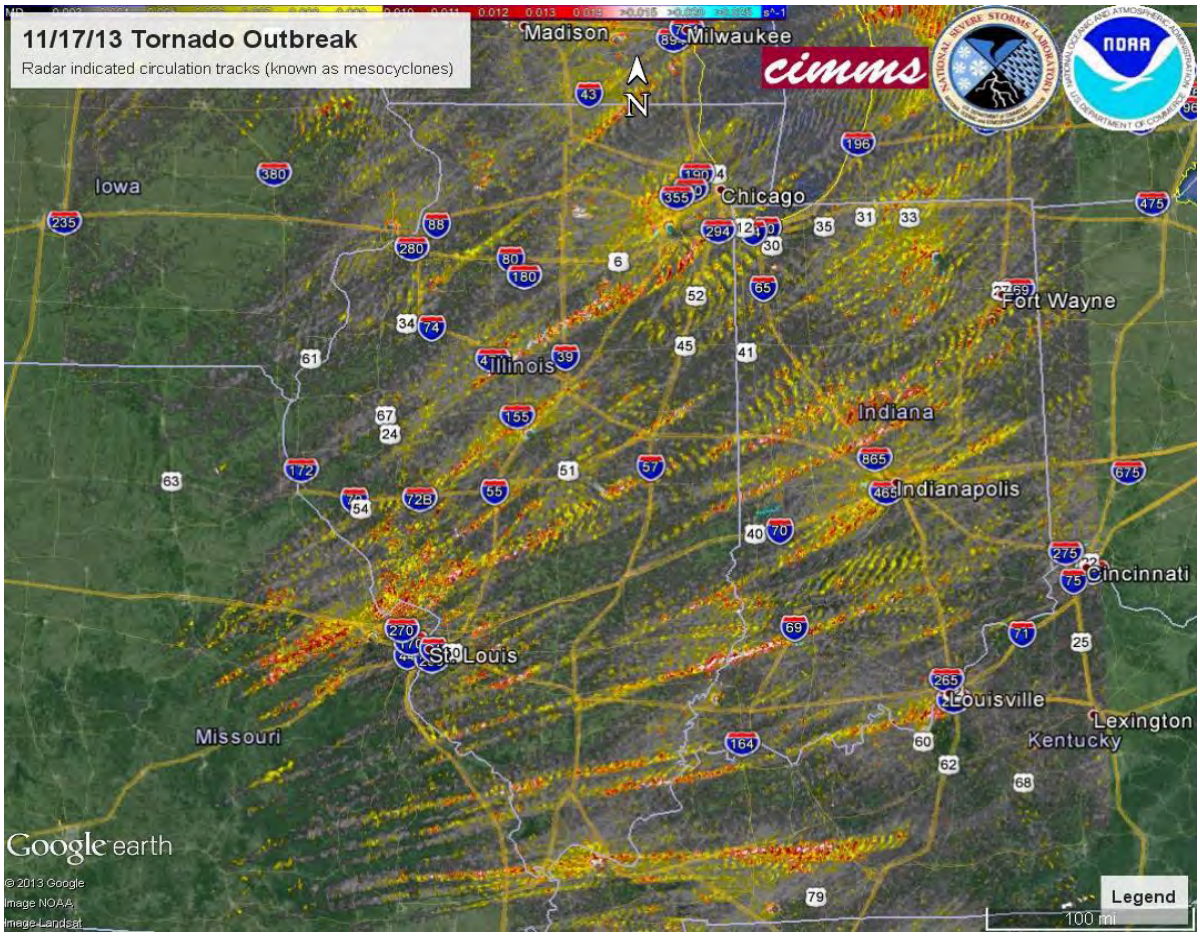




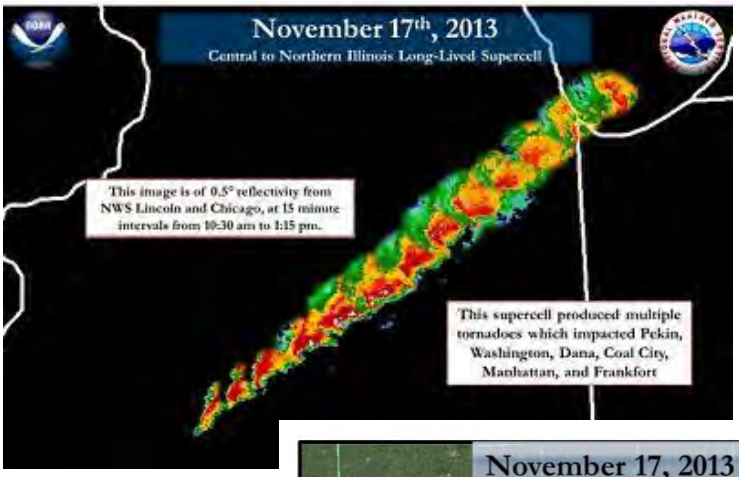
Source: AccuWeather.com

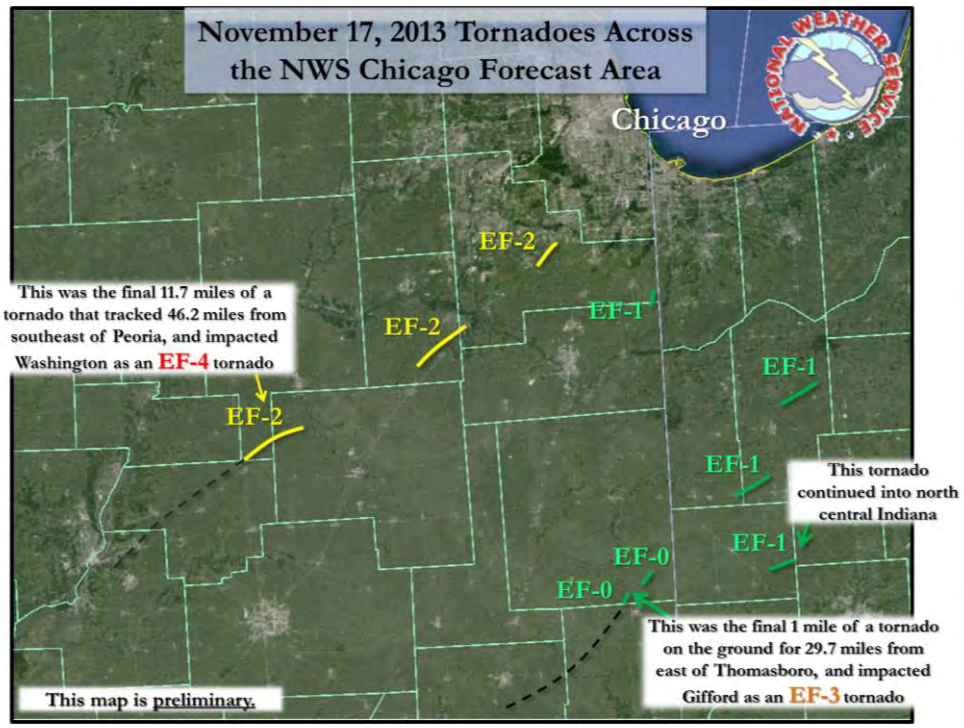
Severe Storms and Tornado – November 17, 2013
Federal Disaster Declaration #4157
Individual Assistance - $23,397 (76 referrals)
Public Assistance - unavailable

The potential for severe weather was detected several days in advance. As early as Thursday morning, November 14, most of central and southeast Illinois was included in the severe weather outlook for Sunday. At that range, areas are highlighted if there is at least a 30% chance of receiving severe weather. The outlook from late Saturday morning, indicated a 45% chance of severe weather over much of the Midwest and a 10% chance of seeing significant severe weather (defined as either tornadoes of at least EF-2 strength, winds of 75 mph, hail of at least 2" in diameter, or any combination thereof) within 25 miles of any given point.

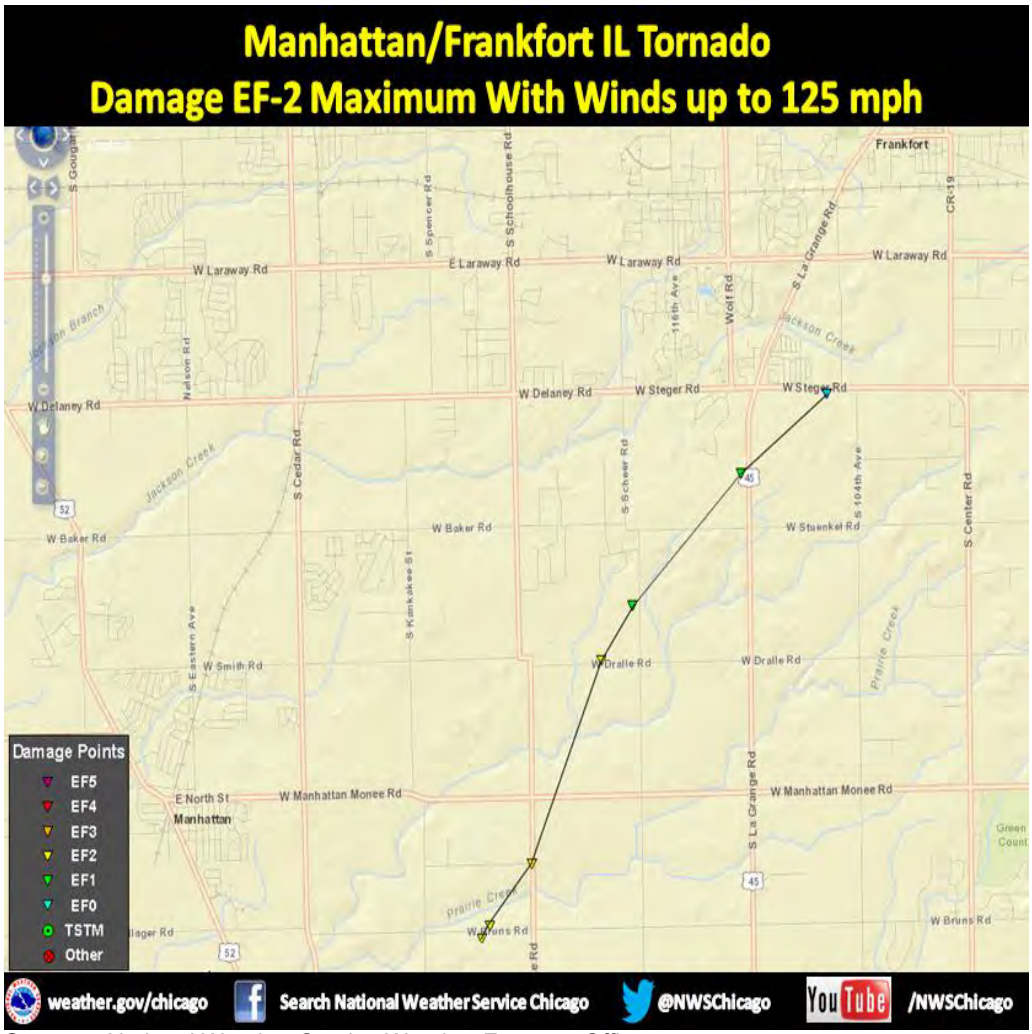


Around midnight Sunday morning, the outlook from the Storm Prediction Center highlighted eastern Illinois as being in a "high risk" of severe weather and by the 7 am update, expanded it further west to near I-55. At 8:40 am, Tornado Watch #561 was issued for most of Illinois. SPC declared this as a "Particularly Dangerous Situation" (PDS) watch, meaning there was a threat for several intense, long-track tornadoes, potential for many reports of large hail over 2 inches in diameter, and damaging wind gusts potentially in excess of 80 mph. The NWS offices in Lincoln, Chicago, Milwaukee, Davenport, and St. Louis participated in a conference call with SPC around 8:30 am to discuss the issuance of this watch.

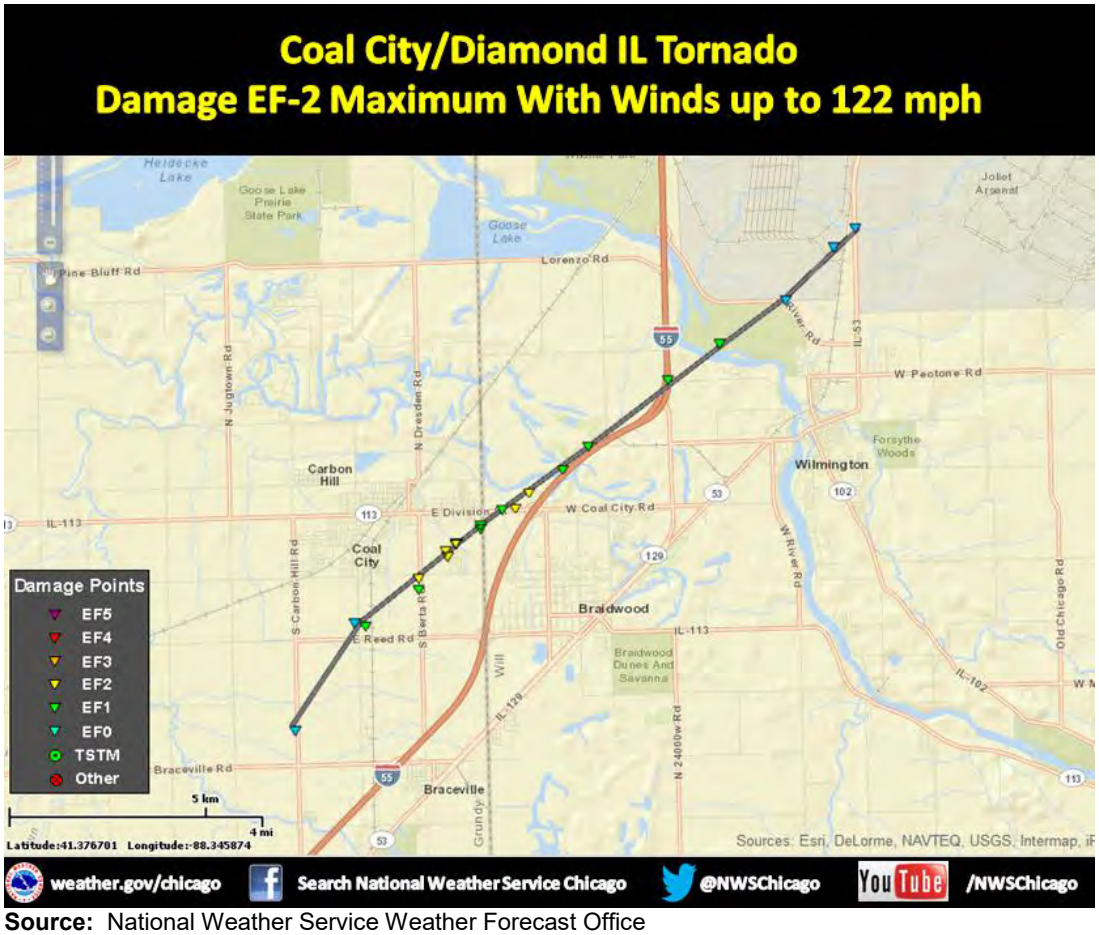




The severe storms and tornadoes left significant damage in Diamond and the area from Manhattan to Frankfort. Fifteen Illinois counties, including Will County, were granted federal disaster declarations on November 26, 2013. Local, state and federal agencies are currently working to assess the damage incurred from the storms.

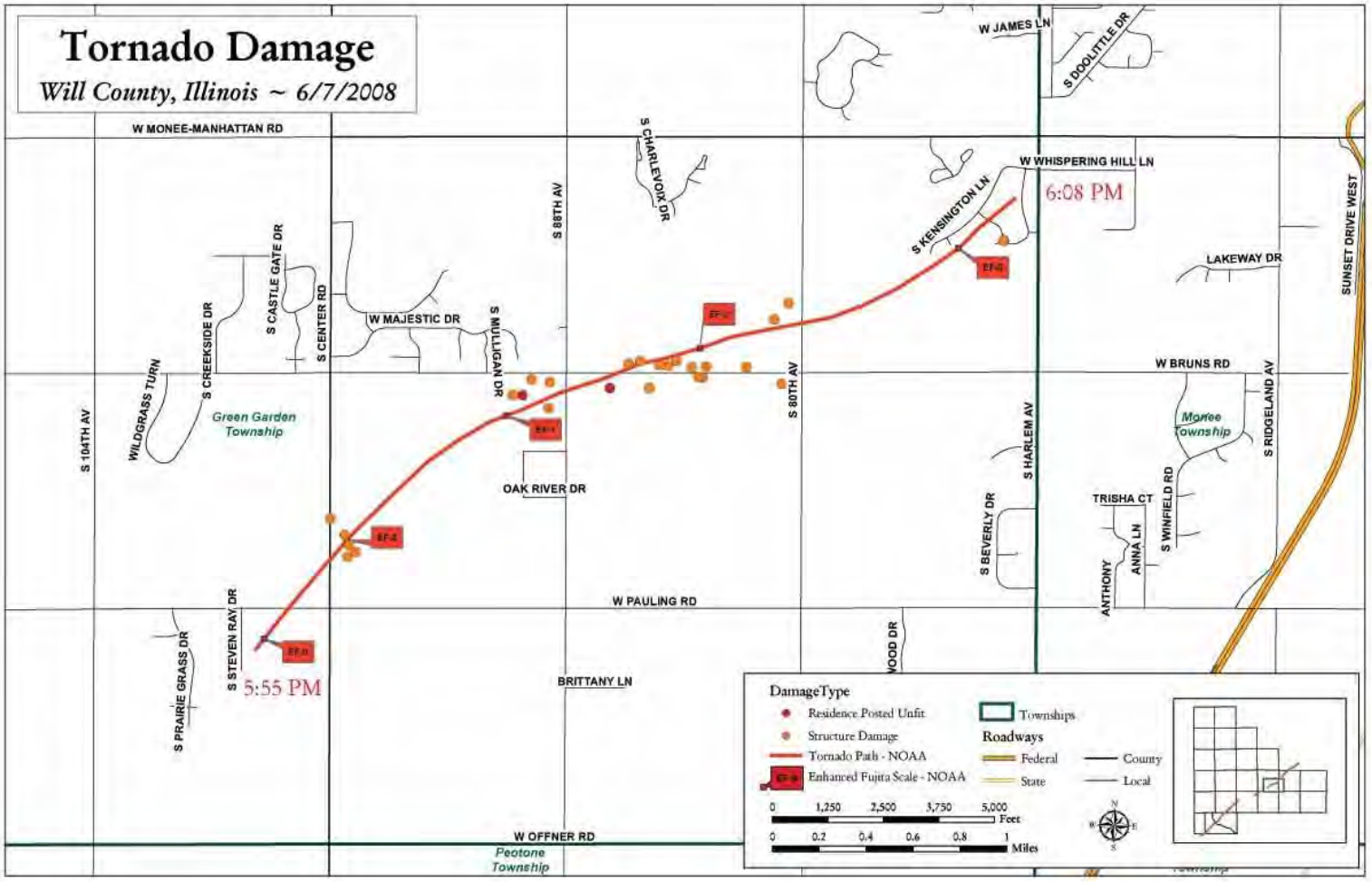


Source: National Weather Service Weather Forecast Office



Source: National Weather Service Weather Forecast Office

EF-2 Tornado – June 7, 2008 through Monee, Wilton Center, and Godley
Property Damage - $6.55M
Injuries – 6, Deaths – 0



Plainfield Tornado – August 29, 1990
Federal Disaster Declaration #878
Public Assistance - $6,053,773
Individual Assistance – unavailable

The Plainfield F5 storm occurred August 28, 1990, causing damage predominantly in the Plainfield area. Before the tornado developed, the severe thunderstorm produced wind gusts in the 80-100 mph range. The F5 tornado was on the ground for over 16 miles, touching down first near Oswego and lifting 20 minutes later in Joliet. It killed twenty-nine people, injured 350 people, and caused damages of $250 million. Developing beyond the usual tornado season, this fast forming and deadly storm caught everyone off guard. The storm was a testament that tornadoes can occur any time of year. It also provided valuable information to the county and local agencies allowing improvement in preparedness, response, and recovery plans.

The Plainfield Tornado challenged both meteorologists and citizens in terms of tornado preparedness. Substantial safety measures were enacted in the years following the tornado; among these are frequent and regular tornado drills performed in schools. The development of Next Generation Radar (NEXRAD) contributes greatly to the ability of meteorologists to recognize tornadic activity. NEXRAD contains the ability to detect the wind speed and direction inside the storm. The ability to see rotation inside a storm on both the microscale (tornadic) and mesoscale (supercellular) measurements has allowed forecasters to issue severe thunderstorm and tornado warnings in more timely fashion and with a higher probability of detection.

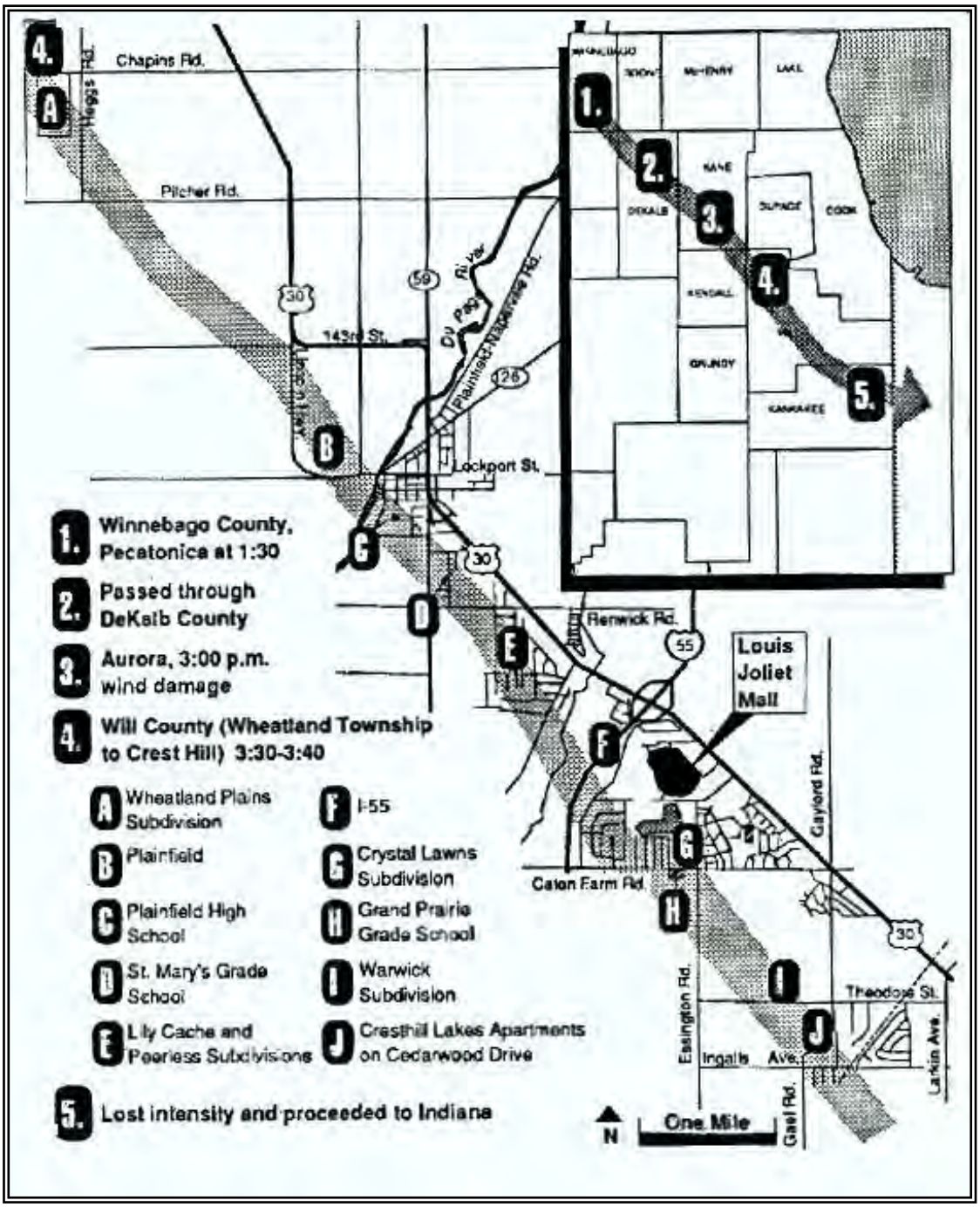
Damage Path of the Plainfield Tornado, August 28, 1990

Tornado Damage in Plainfield

Damaged Plainfield High School

AUGUST 29, 1990 - TORNADO DAMAGE ASSESSMENT		
Township	**Structure Type**	**Estimated Amount**
Wheatland	Residential	$5,200,000
Plainfield	Residential – 915 Homes	61,500,000
	Commercial	3,000,00
	High School Administrative Building Grade School	60,000,000
	Church & Private School	6,000,000
Troy	Condos – 19 units	685,000
	Apartments – 3 buildings	5,000,000
Joliet	Residential – 35 homes	2,225,000

PATH OF 1990 PLAINFIELD TORNADO



Mitigation Measures

With the number and intensity of tornadoes that have occurred in Will County, it is important to look at measures that can be taken to mitigate the impact of tornadoes on communities.

- Safe rooms were one action item that participants discussed. The expense to retrofit existing structures can be prohibitive, but the county and communities can encourage the construction and use of safe rooms in new construction.
- Through building codes, wind resistant construction and materials can be encouraged to make structures more resistant to wind storms. Communities adopting international building code standards are listed in Chapter 5, page 5-13.
- Forecasting of severe weather by the National Weather Service (NWS) continues to improve providing timely alerts advising the public to take cover. The county has been working together with the NWS, the U.S. Geological Survey, GIS, web-developers, and others to electronically link monitoring systems and use the latest communication tools to improve forecasting and alert systems in order to provide the public with real-time storm information.
- The county and communities have been distributing education materials on the dangers of severe weather and how to prepare through websites, social media, newsletters, news media, and community events. Some sources of preparedness materials include FEMA, American Red Cross, Illinois EMA, CDC, and Illinois Department of Public Health (IDPH).
    - WC EMA's Public Preparedness Group attends community events throughout the county providing emergency preparedness education.
    - AmeriCorps volunteers have served throughout the county working with schools, seniors, etc. Some sources of preparedness materials include FEMA, American Red Cross, Illinois EMA, CDC, and Illinois Department of Public Health (IDPH).
    - WC Health Department utilizes volunteers through the Medical Reserve Corps (MRC) to assist with public health events.
    - The National Weather Service (NWS) has prepared local communities and colleges within Will County to be StormReady by helping them to develop plans to handle all types of extreme weather.
    - The NWS also prepares communities by holding Storm Spotter classes for communities and Advanced Severe Weather exercises for local responders.

- The NWS conducts training and table tops exercises with communities instructing them how to use their online weather tools to prepare for and monitor weather activity during special events.
- The NWS sponsors the sale of weather radios at local stores; these events are supported by WC EMA, American Red Cross (ARC), and other response organizations who provide educational material to the public.
- Outdoor sirens are tested the first Tuesday of each month at 10:00 am followed by a StarCom radio check of responders in Will County and surrounding counties.

Risk Characterization

A tornado can occur at any time of the year requiring the county to be prepared at all times. Since 1950, the National Weather Service (NWS) Chicago County Warning Area (CWA) has experienced 615 tornadoes of which 152 were significant (EF-2+). At least 24 tornadoes were reported during the storms of November 17, 2013. Out of all of the counties within Illinois, Will County has been ranked as one of the top counties in the state affected by tornadoes.

Due to the destructive nature of tornadoes and wind, these events impact human life, health, and public safety. Community-wide impacts include: utility damage and outages, infrastructure damage (transportation and communication systems), structural damage, and damaged or destroyed critical facilities. Tornadoes can also cause severe transportation problems and make travel extremely dangerous.

Impact: High

Damage to Buildings

Although tornadoes strike at random, making all buildings vulnerable, three types of structures are more likely to suffer damage:

- Mobile homes
- Homes on crawlspaces (more susceptible to lift)
- Buildings with large spans, such as airplane hangars, gymnasiums and factories

As Will County has become the largest inland port in North America, warehousing and intermodal centers with massive buildings and large numbers of transport vehicles are potentially at risk by tornadoes.

Structures within the direct path of a tornado vortex are often reduced to rubble. However, structures adjacent to the tornado's path are often severely damaged by high winds flowing into the tornado vortex, known as inflow winds. It is here, adjacent to the tornado's path, where the building type and construction techniques are critical to the structure's survival. Tornado impact to buildings is high.

Critical Facilities

Because a tornado can hit anywhere in the county, all critical facilities are susceptible to being hit. Schools are a particular concern for two reasons:

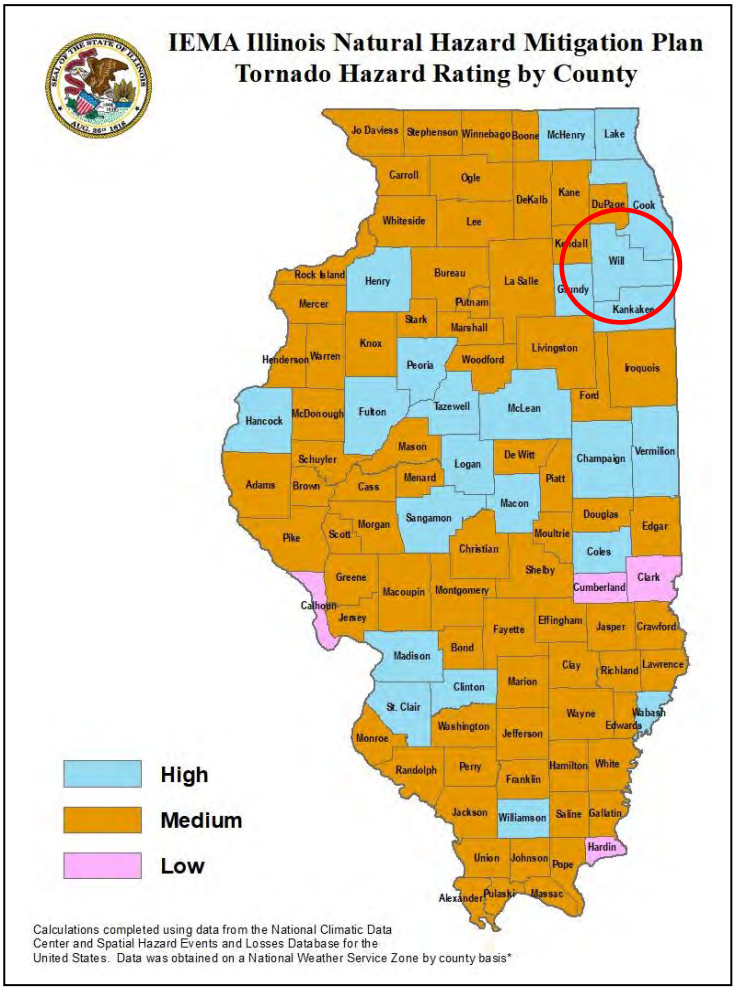
- They have large numbers of people present, either during school or as a storm shelter.
- They have large span areas, such as gyms and theaters.

The 1990 Plainfield tornado was an unfortunate example of this. It struck the Plainfield High School, Grand Prairie Elementary School, St. Mary Immaculate Church, and the gymnasium to the Church's elementary school. Cost to repair the two public schools was estimated at up to $35 million. The cost for the church and its school was $5 million. Other large span buildings were also affected in 1990. In addition to the schools and their gyms, hangers at the Aurora Airport and Joliet's Essington Road Fire Station were damaged.

Health and Safety

The numerous deaths and injuries incurred by tornadoes since the 1950's give testament to the threat Will County's population faces from tornadoes. Flying debris, collapsing structures, or being swept away by wind are just a few of the elements that may cause death or injury. Following a tornado, damaged buildings are a potential health hazard due to instability, electrical system damage, and gas leaks. Sewage and water lines may also be damaged. However, these problems would be localized. Impact upon people is high.

Economic Impact



The major impact of a tornado on the local economy is damage to businesses and infrastructure. A heavily damaged business, especially one that was barely making a profit, often has to be closed. The post-disaster damage report stated that at least 50 businesses were destroyed by the 1990 tornado.

Infrastructure damage is usually limited to above ground utilities, such as power lines. ComEd and Exelon have emergency programs to prepare their systems and the public before, during, and after storms. They provide the ability for the public to report and locate outages online or by mobile app and social media. The 1990 tornado knocked out two 345,000 volt transmission towers, leaving 65,000 Com Ed customers without power. Damage to phone lines left 14,000 customers without service. Damage to utility lines can usually be repaired or replaced relatively quickly.

Damage to roads and railroads is usually localized. If it can't be repaired promptly, alternate transportation routes are usually available. Transportation was disrupted when highways were closed during the August, 1990, storm due to high winds and debris.

Public expenditures include search and rescue, shelters, transportation systems, and emergency protection measures. The large expenses are for repairs to public facilities and clean-up and disposal

of debris. Most public facilities are insured, so the economic impact on the local treasury may be small.

Clean-up and disposal can be a larger problem, especially with limited landfill capacity near the damage site. Preliminary damage assessments for public expenditures after the 1990 tornado totaled $4 million, 2/3 of that for debris clearance. Will County has developed a FEMA approved Debris Management Plan to manage disaster clean-up and disposal.

Future Occurrences

With 72 occurrences of tornadoes in Will County over the last 70 years, the likelihood of another tornado occurrence is approximately once in any given year. Tornadoes, like other climatological hazards, are not bound to a particular path or location; therefore, all jurisdictions within Will County have the same probability of being struck.

TORNADO OCCURRENCE		
Type	**Number of Occurrences Since 1950**	**Annual Mean**
Tornadoes	72	1.03

The *2018 Illinois Natural Hazard Mitigation Plan* rates the tornado hazard for Will County as high and provides the following data.

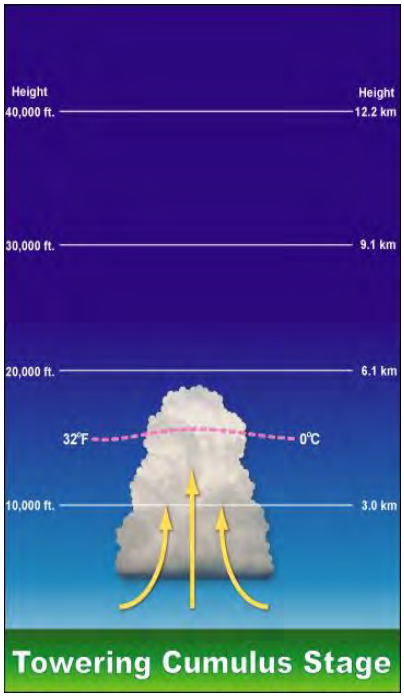
Tornado Occurrence between 1950 & 2017	**Rank by County**	**County**	**Tornadoes per 100 sq. miles**	**Total Tornadoes**	**County Area (sq. miles)**
	1	Will	11.88	69	581
Tornado Loss Estimates for Will County	**# of Tornadoes 1950 - 2017**	**Total Recorded Loss**	**Average $ in Crop & Property Damage per Event**	**Annual Probability of Event**	**Estimated Annual Loss**
	67	$350,317,000	$5,228,612	102%	$5,307,833

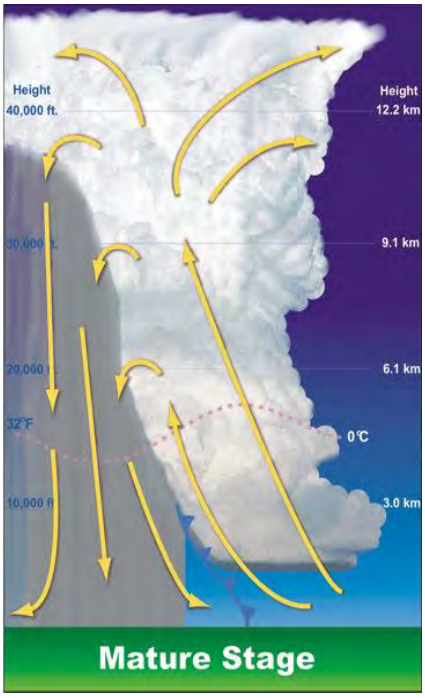
THUNDERSTORM

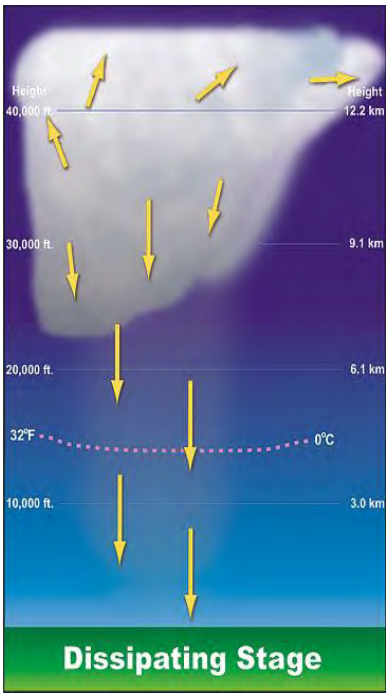
Hazard Characterization

Severe thunderstorms are weather systems accompanied by strong winds, lightning, heavy rain, and possibly hail and tornadoes.

- They occur anytime of year, but more frequently during the warm spring and summer months.
- Thunderstorms typically only last thirty to forty minutes.
- They form when a shallow layer of warm, moist air meets up with a deeper layer of cool, dry air.
- All thunderstorms follow a three-stage life cycle.
  - The cumulus stage is the development period where the storm consists only of updrafts or upward moving air currents. The updrafts reach heights of 20,000 feet above ground.
  - The mature stage is the strongest and most dangerous stage of the storm cycle. Upward and downward moving air currents collide with precipitation resulting in the downdraft area. As the downdraft reaches the ground, it spreads out and forms a gust front where damaging winds may develop.
  - In the dissipating stage, excessive precipitation and downdrafts weaken the storm, gust fronts move away depleting the energy of the storm.





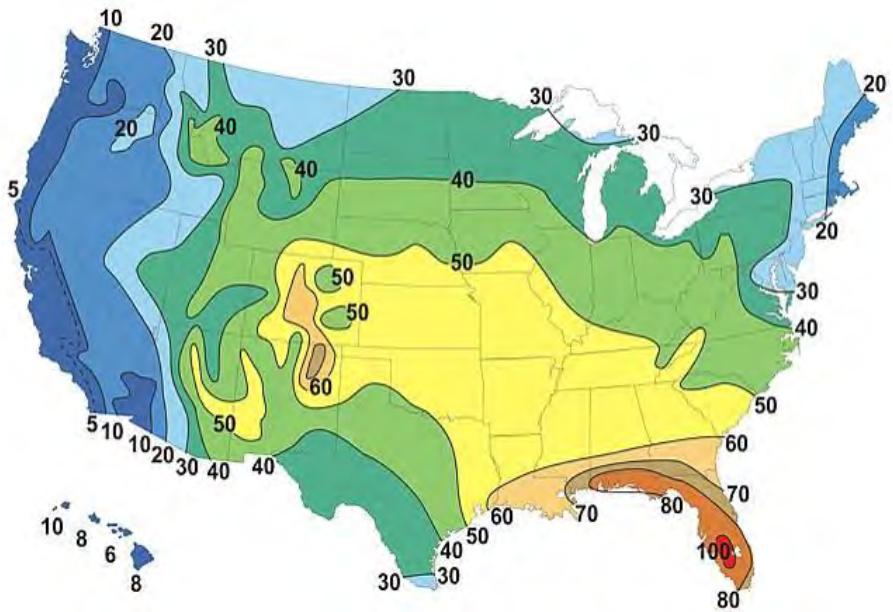


Thunder storms can fall into four categories. Singe-cell storms are typically weak, short-lived, and poorly organized. Multicell cluster storms are the most common type and are a cluster of cells moving as one unit. Multicell line storms are squall lines that have a long line of storms with a continuous gust front from the forward edge of the storm. Supercell storms have a single updraft, are very strong, and produce severe weather. Along with wind that can damage property, lightning also poses a serious hazard causing fire to property that is struck and serious injury or death to individuals who are struck.

Severe thunderstorms are most likely to happen in the spring and summer months and during the afternoon and evening hours but can occur year-round and at all hours. Thunderstorms can bring four hazards:

- Flooding,
- Lightning,
- High winds, tornadoes and microbursts, and
- Hail.

Average Number of Thunderstorm Days per Year in the U.S.

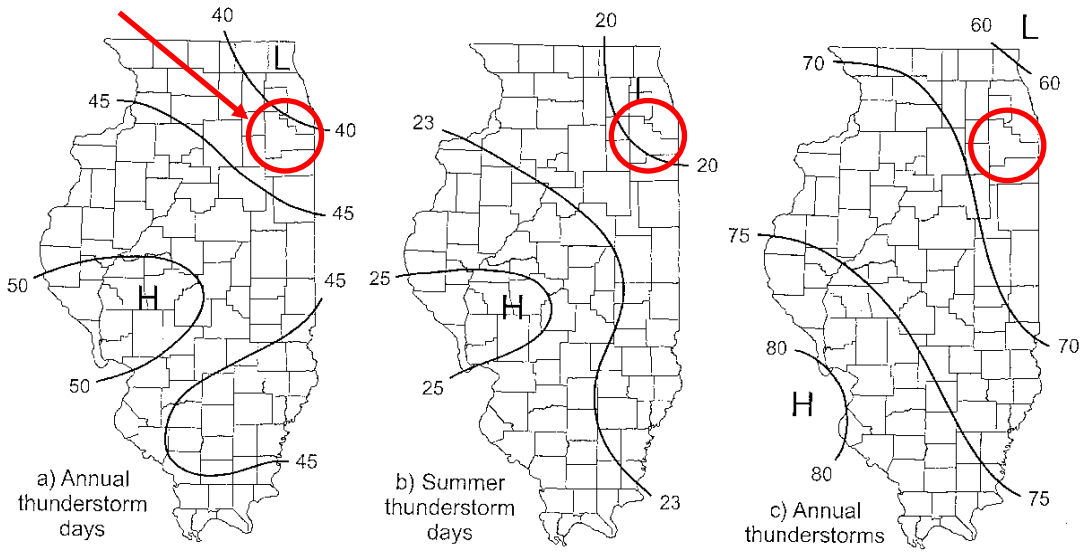


Source: National Weather Service

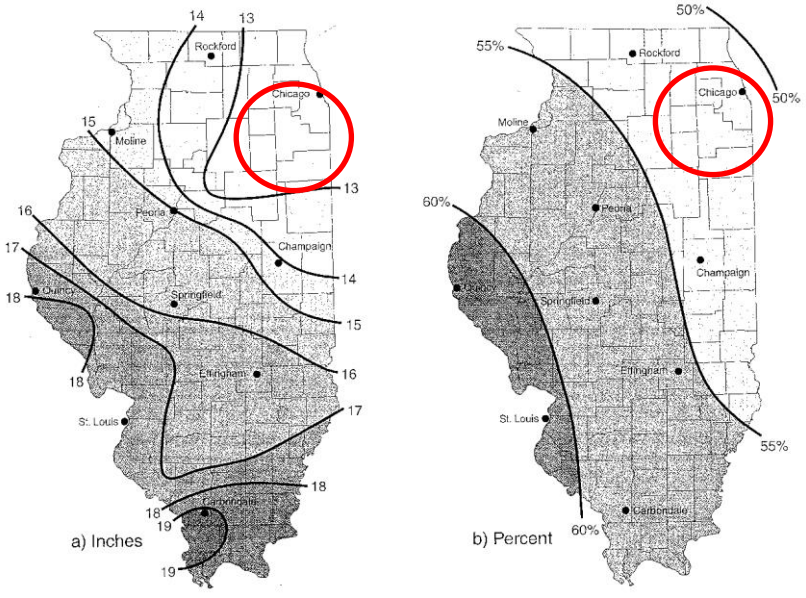
In Illinois, thunderstorms occur when there is a collision of moist, warm air moving north from the Gulf of Mexico with colder fronts moving east from the Rocky Mountains resulting in cold air overriding a layer of warm air causing the warm air to rise rapidly. Thunderstorms may occur singly, in clusters, or in lines. In the course of a few hours, it is possible for several thunderstorms to affect one location or a single thunderstorm to affect one location for an extended time. Thunderstorms typically are 15 miles in diameter and produce heavy rain anywhere from 30 minutes to an hour.

1901-1998

Will County

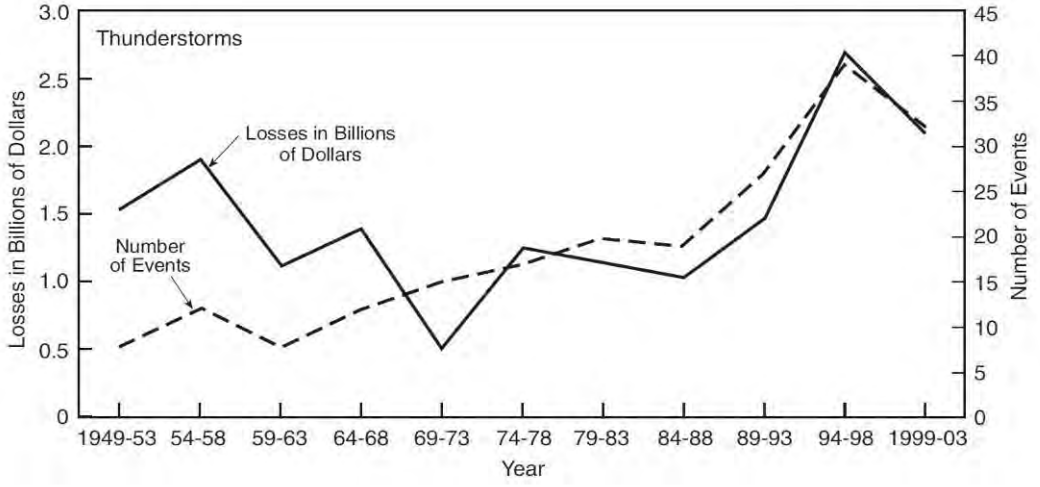


Average annual precipitation from thunderstorms (inches) and as percent of total annual precipitation:



Of the estimated 100,000 thunderstorms each year, approximately 10 percent are classified severe. Severe storms either produce hail of at least three-quarters of an inch thick, have winds of 58 miles per hour or higher, or produce a tornado. In Illinois, severe thunderstorms are most likely to happen in the spring and summer and frequently occur in the late afternoon or evening. Thunderstorms can bring heavy rain, strong winds, hail, lightning and tornadoes. Thunderstorms can cause several types of damaging wind. A downward rush of cool descending air from a thunderstorm is a microburst.

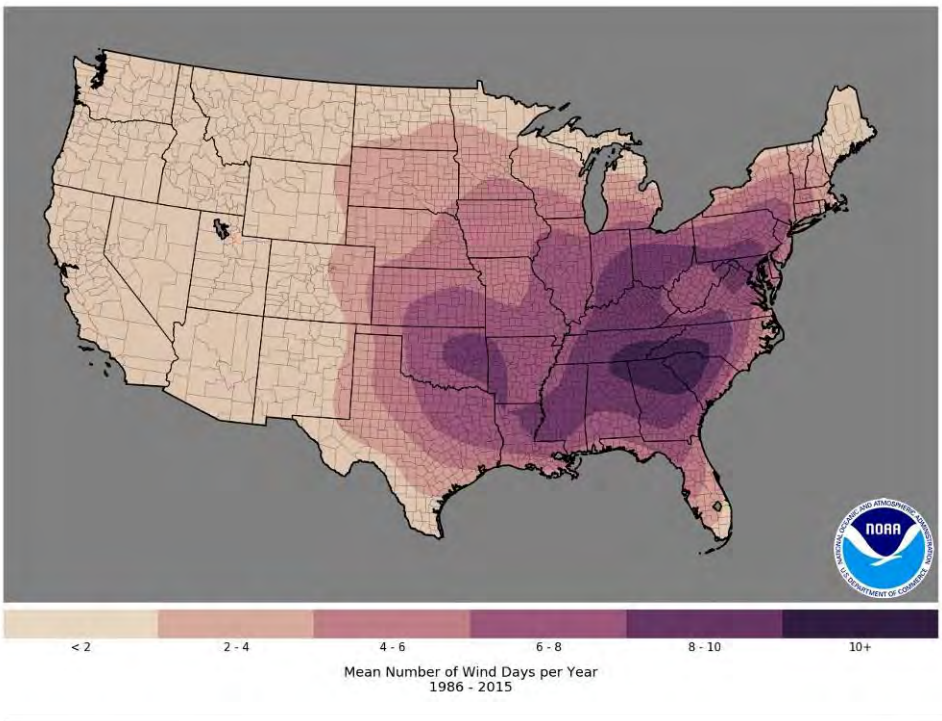
Thunderstorm Events in the Midwest:
Creating More Than $1 M in Property Losses, 1949 – 2003

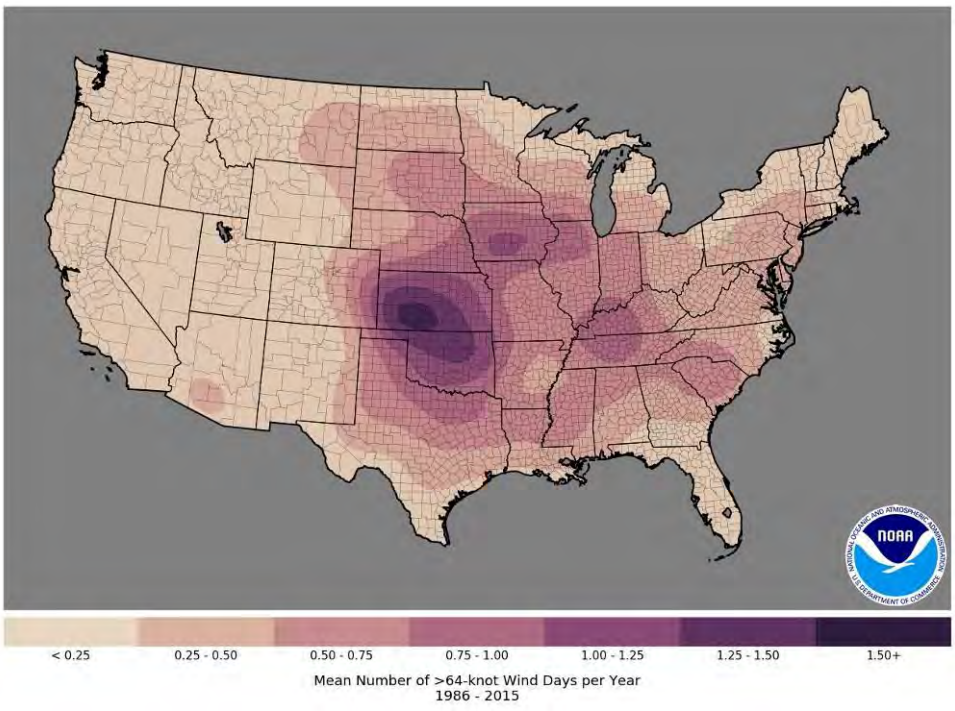


----- # of Events per 5 yr Period
Amount of Losses in $Billions

Source: Changnon, A. and Kunkel, K., Illinois State Water Survey. *Severe Storms in the Midwest*. June, 2006

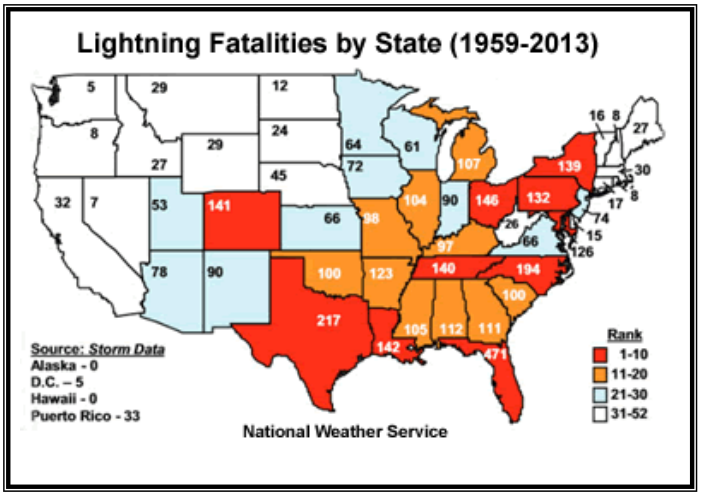
Source: Hall, B. and Phelps, M., *Reading Between the Contour Lines of the Wind Speed Maps: Giving Tornadoes Their Due.* International Institute of Building Enclosure Consultants. Jan.

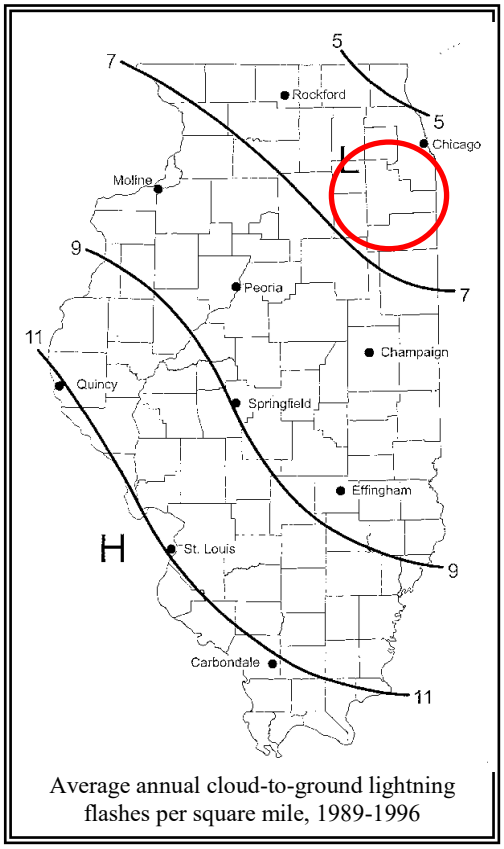




Source: National Weather Service Storm Predication Center

Lightning occurs during all thunderstorms and is an electrical discharge that results from the buildup of positive and negative charges. Lightning appears as a "bolt" when the buildup becomes strong with the flash of light occurring between the clouds and the ground. In a split second, the bolt of lightning reaches a temperature approaching 50,000 degrees Fahrenheit.





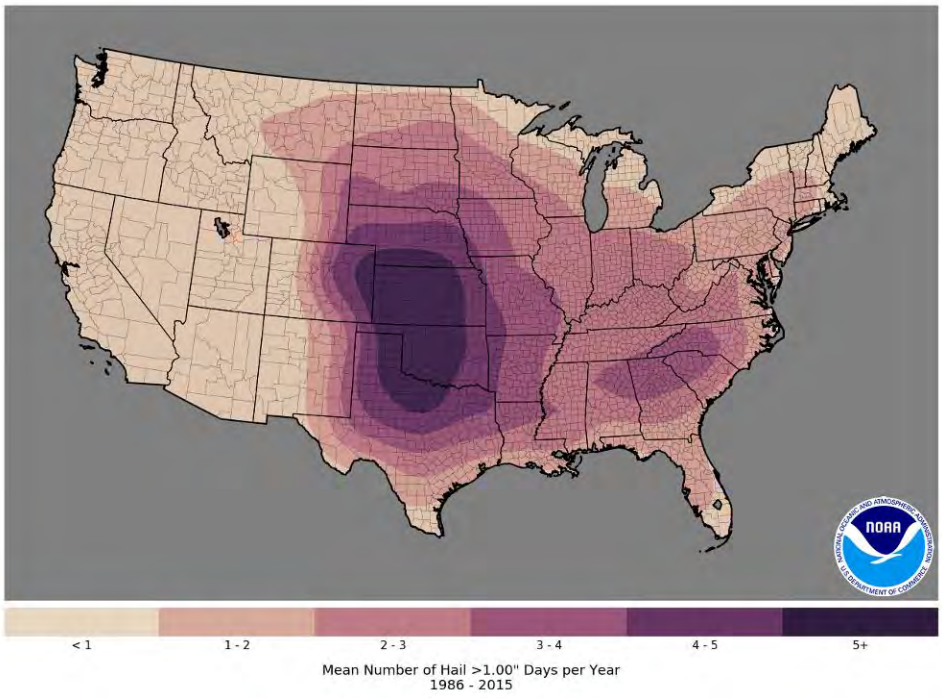
Average annual cloud-to-ground lightning flashes per square mile, 1989-1996

Lightning has killed 29 people and injured hundreds more in Illinois since 1990. In 2001, Illinois ranked second in the United States for lightning fatalities. Thunder is the rapid heating and cooling of air near the lightning.

In addition to lightning, a thunderstorm can also produce hail which can be very destructive to plants/crops, animals and property causing nationally over a billion dollars in damage each year. Hail can be as small as a pea and as large as a softball. Most hail has a diameter smaller than a dime; however, there are records of hailstones weighing more than a pound. Hail rarely causes injuries, but it can cause millions of dollars in damages to crops, vehicles, and buildings.

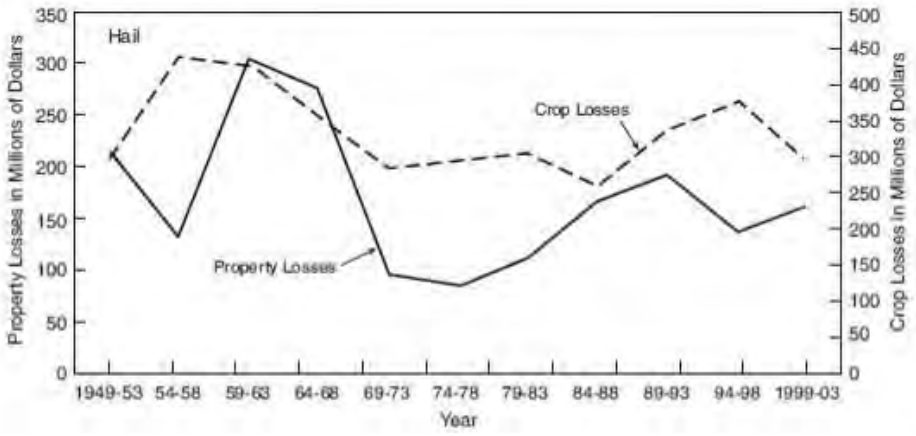
These balls of ice begin as a large frozen raindrop. Super cooled water droplets hit ice crystals and freeze instantly. The hailstones grow as more and more droplets hit these ice balls and freeze as they fall through the clouds. As the hailstones reach the bottom of the clouds the wind updrafts may send the hail back up into the cloud to repeat the process and continue to grow. When the weight of the hailstones

becomes too heavy to be supported by the updrafts, they fall out of the clouds. The very largest recorded hailstone was over 5.6 inches in diameter and weighed 26 ounces; however, large hail is usually less than two inches in diameter and most is smaller than a dime.



Source: National Weather Service Storm Predication Center

Hail Losses to Crops and Property over 5-year Periods: 1949 - 2003



Source: Changnon, A. and Kunkel, K., Illinois State Water Survey. *Severe Storms in the Midwest*.
June, 2006

History

Will County has experienced over 200 severe storm events since 1950. Federal Emergency Declarations of severe storms in Will County have occurred five times:

- June 30, 1981, over $4 million in damages throughout Illinois
- March 29, 1985, almost $8 million in damages throughout Illinois
- July 25, 1996, almost $259 million in damages throughout Illinois, I-55 flooded
- April 23, 2004, almost $6 million in damages throughout Illinois
- August 23, 2007, over $230 thousand in damages throughout Will County
- September 13, 2008, over $4.3 million individual assistance provided to households by FEMA
- April, 2013, over $1.4 million individual assistance provided to households and $1.4 million in public assistance by FEMA

Although they do not receive as much recognition as tornado events, thunderstorm winds cause more damage year-to-year than tornadoes. In 1993 alone, Illinois experienced 38 events of thunderstorm winds which caused a minimum estimate of well over five million dollars in damage, while the 34 tornadoes caused a maximum of just over 1.5 million dollars. Seven severe thunderstorms traversed the state in June of 1993, creating most of this damage, but significant losses occurred in seven other months. In the 10-year period from 1981 to 1990, damage estimates from severe wind equaled or exceeded damages caused by tornadoes in five of the years. In addition, death tolls from severe winds exceeded tornado deaths for six of these years, and the number of injuries caused by severe wind was greater in three years (data from *Storm Data* publication, NOAA/NWS). The damages caused by high winds have been relatively consistent from year-to-year.

Nationwide it is estimated that 25 million cloud-to-ground lightning flashes occur each year, 1,000 people are injured, and 80 are killed with about $5 billion in economic impact resulting from lightning. According to Mr. Chris Miller, WCM, National Weather Service, Lincoln, IL, "Illinois experiences nearly 650,000 lightning strikes each year." Illinois ranks high among the 50 states for lightning fatalities. Over the past 50 years, 99 people have been killed by lightning in Illinois. As a result, IEMA and the NWS have recently established the Lightning Safety Awareness Week as a public education project.

Hail occurs frequently in Illinois averaging 74 times a year or 3,951 times since 1950. There have been no deaths, but 23 injuries. Hail does extensive damage: property damage over $73 million and crop

damage over $5 million in the last 53 years. The potential size of hail stones illustrate the damage they can cause. April 23, 1961, several six inch hail stones were reported in Kankakee, IL. While six inches is very unusual, 46 events had hail stones greater than three inches and in the 2-3 inch range.

IMPACT OF THUNDERSTORMS ON WILL COUNTY
(Source: NOAA/National Centers for Environmental Information / WC EMA)

Year	Number of Storms	Magnitude	Annual Damages	Federal Declarations	Year	Number of Storms	Magnitude	Annual Damages	Federal Declarations
1956	2	95 kts.			1996	5	52-56 kts.	$45 K	
1959	1				1997	5	50-61 kts.		
1961	3	64 kts.			1998	6	50-68 kts.		
1962	1	90 kts.			1999	3	50 kts.		
1964	4	50-61 kts.			2000	3	50 kts.		
1965	5	50-79 kts.			2001	7	50-57 kts.		
1966	2	52 kts.			2002	1	50 kts.		
1968	1	52 kts.			2003	11	50-65 kts.	$35 K	
1972	2	52 kts.			2004	7	50-55 kts.		
1973	2				2005	5	50-65 kts.	$103 K	
1974	3	75 kts.			2006	8	50-65 kts.	$15 K	
1975	3	61 kts.			2007	13	50-70 kts.	$234 K 1 Injured	08/23/2007 DR-1729
1976	5	50-60 kts.			2008	5	50-83 kts.	$284 K	
1977	1	52 kts.			2009	7	50-65 kts.	$48 K	
1978	2	52 kts.			2010	27	50-70 kts.	$327.5 K	
1980	1	52 kts.			2011	10	52-62 K	$6.5 K	
1981	1				2012	12	50-76 kts.	$145 K 1 Injured	
1983	2				2013	20	50-66 kts.	$841 K	
1985	1	52 kts.			2014	16	50-78 kts.	$660 K	
1988	3		1 Injured		2015	4	43-60 kts.	$30 K	
1991	4	52-69 kts.			2016	3	50-52 kts.		
1992	5	63-69 kts.			2017	20	50-61 kts.	$27.5 K	
1993	2		$500 K 2 Injured		2018	6	50-56 kts.	$3 K	09/13/2008 DR-1800
1994	5	56 kts.	$50 K		2019	25	50-60 kts.		
1995	1	52 kts.							

IMPACT OF LIGHTNING ON WILL COUNTY (Source: NOAA/National Centers for Environmental Information / WC EMA)									
Location	Date	Deaths	Injuries	Property Damage	Location	Date	Deaths	Injuries	Property Damage
Joliet	07/07/1994	1	0	0	Plainfield	06/19/2009	0	0	$10 K
Plainfield	06/20/2000	0	0	20K	Joliet	07/24/2009	0	0	$50 K
Joliet	06/25/2002	0	1	0	Monee	07/24/2009	0	0	$25 K
Plainfield	03/30/2004	0	0	0	New Lenox	05/26/2010	0	0	$30 K
Joliet	03/30/2004	0	1	0	Crest Hill	05/31/2010	0	0	$10 K
Lockport	03/30/2004	0	0	0	Joliet	05/31/2010	0	0	$5 K
Plainfield	03/30/2004	0	0	0	Joliet	07/11/2010	0	0	$40 K
Joliet	03/30/2004	0	0	0	Joliet	07/23/2010	0	0	$20 K
Wilmington	05/30/2004	0	0	0	Beecher	05/22/2011	0	0	$300 K
Joliet	05/30/2004	0	0	0	Naperville	05/29/2011	0	0	$300 K
Joliet	06/11/2004	0	0	0	New Lenox	08/02/2011	0	0	$200 K
Elwood	06/11/2004	0	0	0	Joliet	06/29/2012	0	0	$105 K
Joliet	03/12/2006	0	0	0	Monee	08/04/2012	0	0	$10 K
Frankfort	04/02/2006	0	0	0	Naperville	06/12/2013	0	0	$10 K
Channahon	07/27/2006	0	0	$25 K	Plainfield	06/12/2013	0	0	$10 K
Mokena	07/27/2006	0	0	0	Joliet	06/24/2013	0	0	$150 K
Joliet	08/10/2006	0	0	$100 K	Bolingbrook	07/28/2016	1	1	0
New Lenox	05/26/2007	0	0	$50 K	Bolingbrook	07/28/2016	0	1	0
Plainfield	05/26/2008	0	0	$50 K	Bolingbrook	09/03/2018	1	0	0

IMPACT OF HAIL ON WILL COUNTY – Larger Than 1” (Source: NOAA/National Centers for Environmental Information / WC EMA)								
Location	Date	Mag.	Location	Date	Mag.	Location	Date	Mag.
Will Co.	04/23/1961	3”	Walker	05/31/2010	.88”	Barbers Corners	10/05/2013	1.0”
Will Co.	04/30/1962	1.25”	Crete	06/01/2010	.75”	Ingalls Park	11/17/2013	1.75”
Will Co.	06/21/1968	1.5”	Bolingbrook	06/23/2010	1.0”	Eagles Lake	06/28/2014	1.0”
Will Co.	05/29/1969	1.75”	Joliet	04/03/2011	1.75”	Idylside	08/01/2014	.88”
Will Co.	09/17/1972	1.5”	Channahon	04/03/2011	1.0”	Mokena	08/25/2014	.75”
Will Co.	06/27/1973	1.75”	Preston Heights	04/03/2011	.75”	Shorewood	04/08/2015	1.0”
Will Co.	05/16/1974	1.75”	Wilmington	04/19/2011	.75”	Joliet	04/08/2015	.75”
Will Co.	06/20/1979	1.75”	Crest Hill	05/11/2011	1.0”	Lidice	04/08/2015	1.0”
Will Co.	06/08/1981	1.75”	Beecher	05/22/2011	1.75”	Lockport	04/08/2015	1.0”
Will Co.	06/22/1984	2.75”	Monee	05/25/2011	.75”	Channahon	04/09/2015	1.0”
Will Co.	04/22/1988	1.75”	Crete	05/28/2011	.88”	Romeoville	06/10/2015	1.25”
Will Co.	06/26/1989	1.75”	New Lenox	05/29/2011	.75”	South Lockport	06/10/2015	.75”
Will Co.	07/07/1991	2.75”	Normantown	06/04/2011	1.75”	Lidice	06/10/2015	1.25”
Will Co.	04/10/1992	1.75”	Plainfield	06/04/2011	1.0”	Plainfield	06/10/2015	1.0”
Braidwood	08/01/1993	1.5”	Lockport Lewis Airport	06/04/2011	1.0”	Lockport	06/10/2015	2.0”
Plainfield	04/26/1994	1.75”	Lockport	06/04/2011	1.0”	Lockport Lewis Airport	06/10/2015	1.5”
Wilmington	04/26/1994		Manhattan	06/04/2011	1.25”	Shorewood	06/10/2015	1.0”
Frankfort	04/26/1994		Manhattan	06/04/2011	1.75”	Channahon	06/10/2015	1.75”
Braidwood	04/26/1994		Monee	06/04/2011	.88”	Shorewood	06/20/2015	.75
Braidwood	04/26/1994		Eagle Lake	06/04/2011	1.0”	Beecher	07/17/2016	.75”
Mokena	04/26/1994		Park Forest South	06/30/2011	1.5”	Shorewood	02/28/2017	1.25”

IMPACT OF HAIL ON WILL COUNTY – Larger Than 1" (cont.) (Source: NOAA/National Centers for Environmental Information / WC EMA)								
Location	**Date**	**Mag.**	**Location**	**Date**	**Mag.**	**Location**	**Date**	**Mag.**
Monee	04/26/1994		Faithorn	06/30/2011	1.0"	Crystal Lawns	02/28/2017	1.0"
Mokena	06/13/1994	1.75"	Peotone	08/13/2011	1.0"	Plainfield	02/28/2017	1.25"
Crete	04/12/1996	1.75"	Gooding Grove	09/03/2011	1.75"	Lockport Lewis Airport	02/28/2017	.75"
Wilmington	04/12/1996	1.75"	Shorewood	09/03/2011	1.25"	Goodings Grove	02/28/2017	.88"
Mokena	04/19/1996	1.75"	Elwood	09/03/2011	.88"	Shorewood	02/28/2017	1.0"
Lockport, ,	05/16/1996	1.75"	Rest Haven	03/23/2012	.75"	Frankfort	02/28/2017	.88"
Monee	04/12/1996	1.75"	Lockport Lewis Airport	04/15/2012	.75"	Mokena	02/28/2017	.75"
Lockport	04/12/1996	1.75"	Plainfield	05/03/2012	.75"	Frankfort	02/28/2017	1.75"
Wilmington	05/05/1997	1.75"	Braidwood	06/16/2012	.75"	Barbers Corners	03/20/2017	.75"
Peotone	07/18/1997	1.75"	Peotone	06/16/2012	.75"	Crete	03/20/2017	.75"
Wilmington	04/10/1999	1.75"	Arbury Hills	06/28/2012	.75"	Romeoville	03/20/2017	.75"
Shorewood	05/18/2000	1.75"	Crete	06/28/2012	.75"	Plainfield	04/10/2017	1.0"
Joliet	05/18/2000	1.75"	Crete	06/29/2012	1.0"	Romeoville	04/10/2017	1.0"
Romeoville	05/28/2003	1.25"	Peotone	06/29/2012	.88"	Normantown	04/10/2017	.75"
Plainfield	07/15/2003	1.75"	Mokena	06/29/2012	.88"	Plainfield	06/13/2017	.88"
Romeoville	07/17/2003	1.25"	Braidwood	07/01/2012	.88"	Normantown	06/13/2017	1.0"
Joliet	04/20/2004	1.75"	Plainfield	07/01/2012	.75"	Plainfield	06/13/2017	1.0"
Plainfield	05/23/2004	1.75"	Beecher	07/01/2012	1.0"	New Lenox	06/14/2017	1.0"
Lockport	05/23/2004	1.75"	New Lenox	07/31/2012	1.0"	Romeoville	07/23/2017	1.0"
Plainfield	03/30/2005	1.75"	Plainfield Clow Airport	11/10/2012	1.5"	Mokena	08/28/2017	.75
Joliet	03/30/2005	1.75"	Barbers Corners	11/10/2012	1.0"	Shorewood	03/14/2019	1.0"
Shorewood	03/30/2005	1.5"	Plainfield Clow Airport	11/11/2012	.75"	Steger	03/14/2019	1.0"
Plainfield	03/30/2005	1.75"	Goodings Grove	01/28/2013	.75"	Plainfield Clow Airport	04/22/2019	.88
Romeoville	03/30/2005	1.75"	Mokena	05/03/2013	.75"	Plainfield	05/16/2019	1.0"
Joliet	03/30/2005	1.75"	Bolingbrook	06/12/2013	1.0"	Plainfield	05/27/2019	1.0"
Crest Hill	03/30/2005	1.5"	Bolingbrook	06/12/2013	1.0"	Plainfield Clow Airport	05/27/2019	1.5"
Plainfield	05/19/2005	1.75"	Ingalls Park	06/12/2013	.75"	Romeoville	05/27/2019	1.0"
Joliet	03/12/2006	1.75"	Mokena	06/12/2013	.75"	Lockport Lewis Airport	05/27/2019	1.25"
Frankfort	04/02/2006	1.5"	Channahon	06/12/2013	.88"	Steger	05/27/2019	1.5"
Joliet	10/18/2007	1.75"	Crete	06/12/2013	1.75"	Crete	05/27/2019	.88"
Joliet	03/10/2010	.88"	Caton Farm	08/07/2013	.75"	Plainfield Clow Airport	06/26/2019	.88"
Wilmington	05/07/2010	.88"	Plainfield Clow Airport	09/11/2013	2.0"	Steger	06/26/2019	.88"
Peotone	05/07/2010	.75"	Plainfield Clow Airport	09/11/2013	1.75"	Caton Farm	06/26/2019	1.0"
Manhattan	05/12/2010	.75"	Lockport Lewis Airport	09/11/2013	1.0"	Goodings Grove	06/28/2019	1.75"
Peotone	05/26/2010	1.0"	Lockport Lewis Airport	10/03/2013	1.0"	Lockport	06/28/2019	1.0"

Risk Characterization

Impact: Medium/High

Damage to Buildings

As with tornadoes, mobile homes are at a high risk to damage from thunderstorms. Wind and water damage can result when windows are broken by flying debris or hail. Lightning can cause direct damage to structures (especially those without lightning protection systems) and can cause fires that damage forests and structures. Straight line winds will damage roofs, overturn or push mobile homes off foundations, push autos off the road, and may destroy attached garages. Straight line winds are the leading cause of wind related damage. Although they do not receive as much recognition as tornado events, high winds cause more damage year-to-year than tornadoes.

Hail can inflict severe damage to roofs, windows and siding, depending on hailstone size and winds. The size of hailstones is a direct function of the severity and size of the storm. Significant damage does not result until the stones reach 1.5 inches in diameter, which occurs in less than half of all hailstorms.

Critical Facilities

Critical facilities are susceptible to the same damage and disruption from thunderstorms as other buildings. Emergency operations can be disrupted as thunderstorms and lightning affect radio communications and antennas are a prime target for lightning. To date, there is no record of critical facilities having incurred any damages due to severe storms. Damage to critical facilities is considered moderate.

Health and Safety

No special health problems are attributable to thunderstorms, other than the potential for tetanus and other diseases that arise from injuries and damaged property. Serious burns or death are the common outcomes when lightning strikes a human being. Overall health hazard: Low

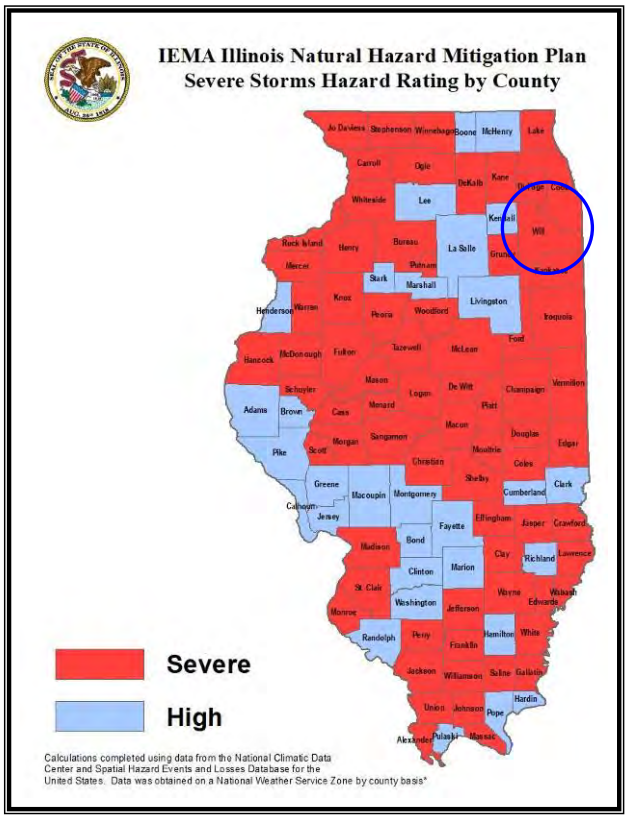
The threat to life varies by the cause of death. Between 1995 and 2000, the NWS reported 20 people in Illinois were killed by flash floods, wind, and lightning resulting from thunderstorms. Hail rarely causes loss of life.

Lighting kills more people than tornadoes. Most lightning fatalities and injuries occur outdoors at recreation events and under or near trees. Most of these deaths can be prevented through safe practices. Much information has come out over the last 20 years about lightning safety, for example, before 1990, an average of 89 people were killed by lightning each year. By 2000, this number had dropped to 52.

Hail occurs frequently in Illinois averaging 74 times a year or 3,951 times since 1950. There have been no deaths, but 23 injuries.

Economic Impact

Thunderstorms can impact transportation and utilities. Airplanes have crashed when hit by downbursts or lightning. Automobiles and their windshields are subject to damage by hail. Power lines can be knocked out by lightning or knocked down by wind and debris. Lightning can also cause power surges that damage appliances, electronic equipment and computers. However, many buildings have lightning rods and backup power systems that can recover quickly. Cost of clean-up by towns can be extensive.



Future Occurrences

All counties are susceptible to severe storms. At any one time, it has been determined that over 25% of the county population might experience severe storms. This determination is supported by Mr. Chris Miller, WCM, National Weather Service, Lincoln, IL, as follows: "Damage from severe thunderstorms is usually on a much broader spatial scale in the State of Illinois. The past 49 years of data indicated that more than 11,000 reports of severe thunderstorm damage occurred (approximately 7,000 wind and 4,000 hail reports) in the State of Illinois. Approximately 80% of the

severe thunderstorms are multicellular or a supercell hybrid, which are capable of producing damaging wind and/or large hail over approximately a 400 to 500 square mile area. The remaining severe thunderstorms are squall lines, which can produce damage over 100% of the affected counties. Thus, the vulnerability to severe thunderstorms should be high (greater than 25% of the population affected) in each county across Illinois." This is reinforced by a study done by Stanley Chagnon of Chagnon Climatologist, in his publication *Thunderstorms Across the Nation - An Atlas of Storms, Hail, and Their Damages in the 20th Century*. This study indicated that in an analysis of thunderstorm caused catastrophes, Illinois ranked 4th in the United States in total thunderstorm catastrophes between 1949 and 1998.

SEVERE STORM OCCURRENCE			
Type	**Number of Occurrences Since 1996**	**Number of Occurrences Since 1950**	**Annual Mean**
Thunderstorm & High Wind		195	2.8
Lightning	26		0.9
Hail		151	2.2

The *2018 Illinois Natural Hazard Mitigation Plan* rates the severe storms hazard for Will County as severe.

Severe Storms Loss Estimates for Will County	**# of Storms 1951 - 2017**	**Total Recorded Loss**	**Average $ in Crop & Property Damage per Event**	**Annual Probability of Event**	**Estimated Annual Loss**
	339	$3,705,500	$10,931	514%	$56,144

WINTER / ICE STORMS

Hazard Characterization

The National Weather Service refers to Winter Storms as the *Deceptive Killers* because most deaths are indirectly related to the storm. Instead, people die in traffic accidents on icy roads and of hypothermia from prolonged exposure to cold. A winter storm is considered to be severe when:

- Six or more inches of snow have fallen within a forty-eight hour period;
- A snow storm has produced conditions, such as high winds, leading to property damage, death, or injuries regardless of the amount of snowfall;
- There is a glaze storm in which ten percent of the cooperative U.S. Weather Bureau substations in Illinois have reported glaze; or
- There is a glaze storm in which property damage, deaths, or injuries have occurred.

Snow and ice are threats to most of the U.S. during the northern hemisphere's winter, which begins December 21st and ends March 21st. During the early and late months of the winter season, snow becomes warmer, giving it a greater tendency to melt on contact or stick to the surface. The beginning and end of the winter season also brings a greater chance of freezing rain and sleet.

There are many ways for winter storms to form, but certain key ingredients are needed. First temperatures must be below freezing in the clouds and near the ground. There must be a source of moisture in the form of evaporating water. Severe winter storms are fueled by strong temperature gradients and an active upper-level cold jet stream. When you hear the term "severe winter storm warning", freezing temperatures, heavy snowfall, or freezing rain come to mind. There are three categories of winter storms:

Blizzard: This is the most dangerous of all winter storms. A blizzard combines low temperatures, heavy snowfall, and winds of at least 35 miles per hour, reducing visibility to one-quarter mile or less for at least three hours.

Heavy Snow Storm: Will produce six inches or more of snow in 48-hours or less.

Ice Storm: Occurs when moisture falls and freezes immediately upon impact accumulating at least .25" of ice on exposed surfaces. Ice storms occur when cold air at the surface is overridden by warm, moist air at higher altitudes.

Winter and ice storms can cause widespread damage and disruption. Heavy snow or ice can paralyze transportation systems, cause automobile accidents, strand vehicles, damage building roofs, interrupt communication and electrical power service, adversely affect business continuity, or cause people to have heart attacks while shoveling heavy snow. Snow, along with high winds and extreme cold, can incapacitate the entire affected area. Temperature and wind produce a "wind chill factor" which applies only to people and other living things. Wind chill is based on the rate of heat loss from exposed skin. As wind increases, heat is carried away from the body at an accelerated rate that drives down the body temperature. Wind chill measures how cold the wind makes exposed skin feel and helps to predict the likelihood for frostbite or hypothermia.

Ice or glazing can also incapacitate an area and damage vegetation, buildings, and communication systems by downing utility lines and poles. Secondary effects of winter/ice storms are flooding, electrocution from downed power lines, or freezing to death when isolated or trapped by blizzard conditions. These storms also result in extensive damage because they can persist over longer periods of time than all other forms of severe weather. Winter/ice storms cause devastating damage and pose a dangerous threat to life by shutting down normal day-to-day operations.

The amount and extent of snow or ice, air temperature, wind speed, and event duration are characteristics of a severe winter storm. All of these combine to determine the severity of the storm.

Snow Storm: If melted, an inch of snow falling at 32 degrees contains twice the amount of water as an inch of snow falling at 10 degrees. This relationship determines whether snow will blow and drift with high winds that make conditions hazardous for hours or perhaps days. If the temperature is near freezing when snow falls, it rarely drifts. As the temperature falls farther from the freezing mark, then snow is lighter and more prone to blow and drift.

Ice Storm: Factors in how much damage will occur are the amounts of rain causing icing to take place, the strength of the wind, and whether or not the storm strikes an urban or rural area.

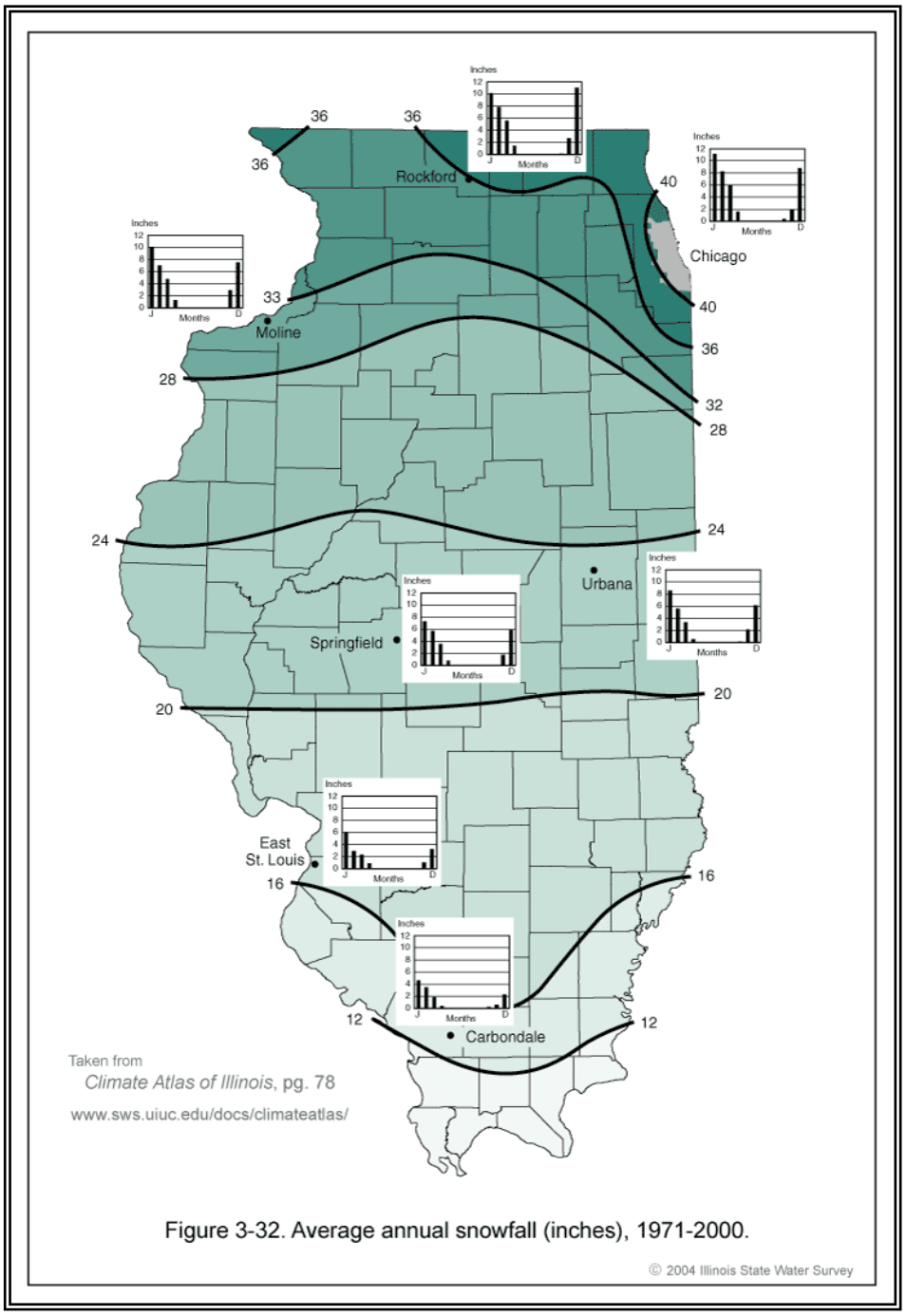
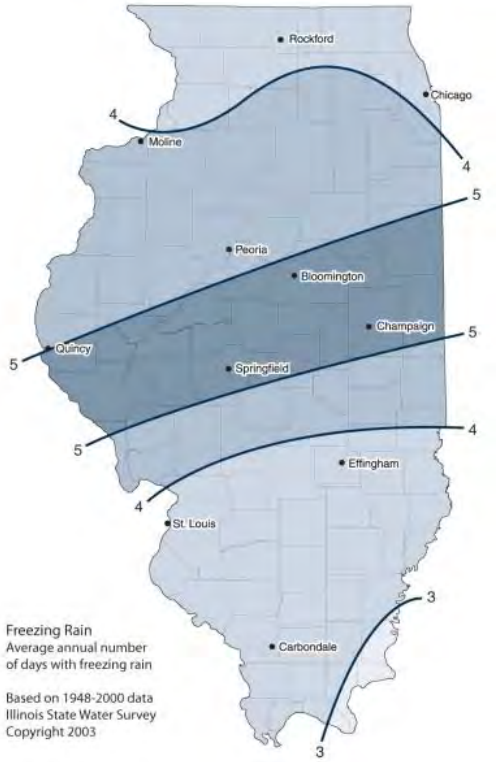


Figure 3-32. Average annual snowfall (inches), 1971-2000.

TERMS USED BY WEATHER FORECASTERS	
Freezing Rain	Rain that freezes when it hits the ground, creating a coating of ice on roads, walkways, trees and power lines.
Sleet	Rain that turns to ice pellets before reaching the ground. Sleet also causes roads to freeze and become slippery.
Winter Storm Watch	A winter storm is possible in your area.
Winter Storm Warning	A winter storm is occurring, or will soon occur in your area.
Blizzard Warning	Sustained winds or frequent gusts to 35 miles-per-hour or greater and considerable falling or blowing snow (reducing visibility to less than a quarter mile) are expected to prevail for a period of three hours or longer.
Frost/Freeze Warning	Below freezing temperatures are expected.
Source: Are You Ready?, FEMA, H-34/September 2002	

Average Annual Number of Days with Freezing Rain (Ice)

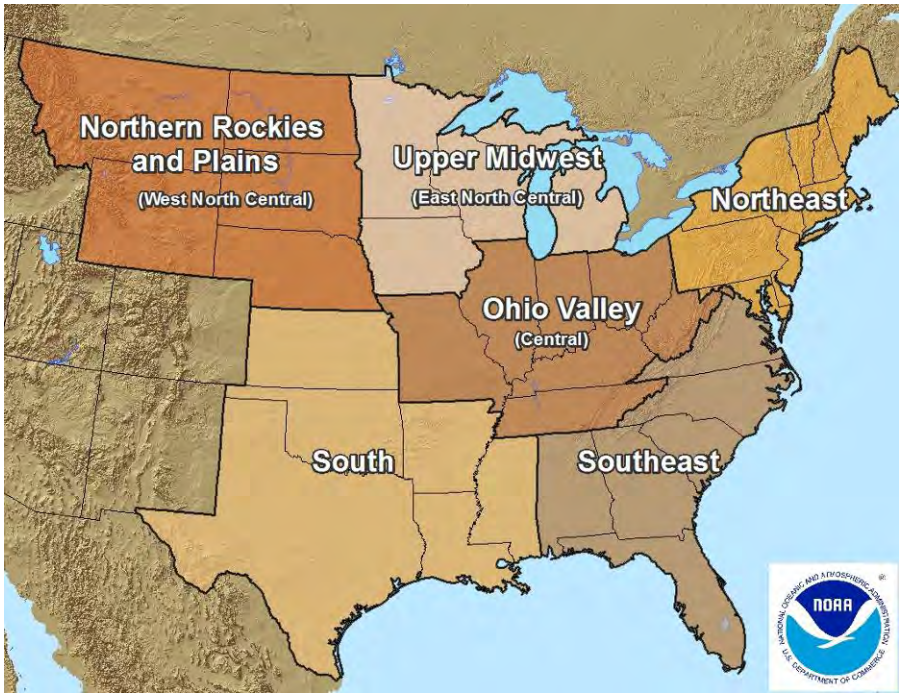


Available from: https://stateclimatologist.web.illinois.edu/climate-of-illinois/ice-storms-in-illinois/

Regional Snowfall Index

NOAA's National Centers for Environmental Information now produces the Regional Snowfall Index (RSI) for significant snowstorms that impact the eastern two-thirds of the U.S. It is based on the spatial extent of the storm, the amount of snowfall, and the juxtaposition of these elements with population. The inclusion of population with the RSI ties the index to societal impacts.

Regional Snowfall Index (RSI) – Six Easternmost Climate Regions



Available from: https://www.ncdc.noaa.gov/snow-and-ice/rsi/

The RSI ranks snowstorm impacts on a scale from 1 to 5, similar to scales for tornadoes and hurricanes.

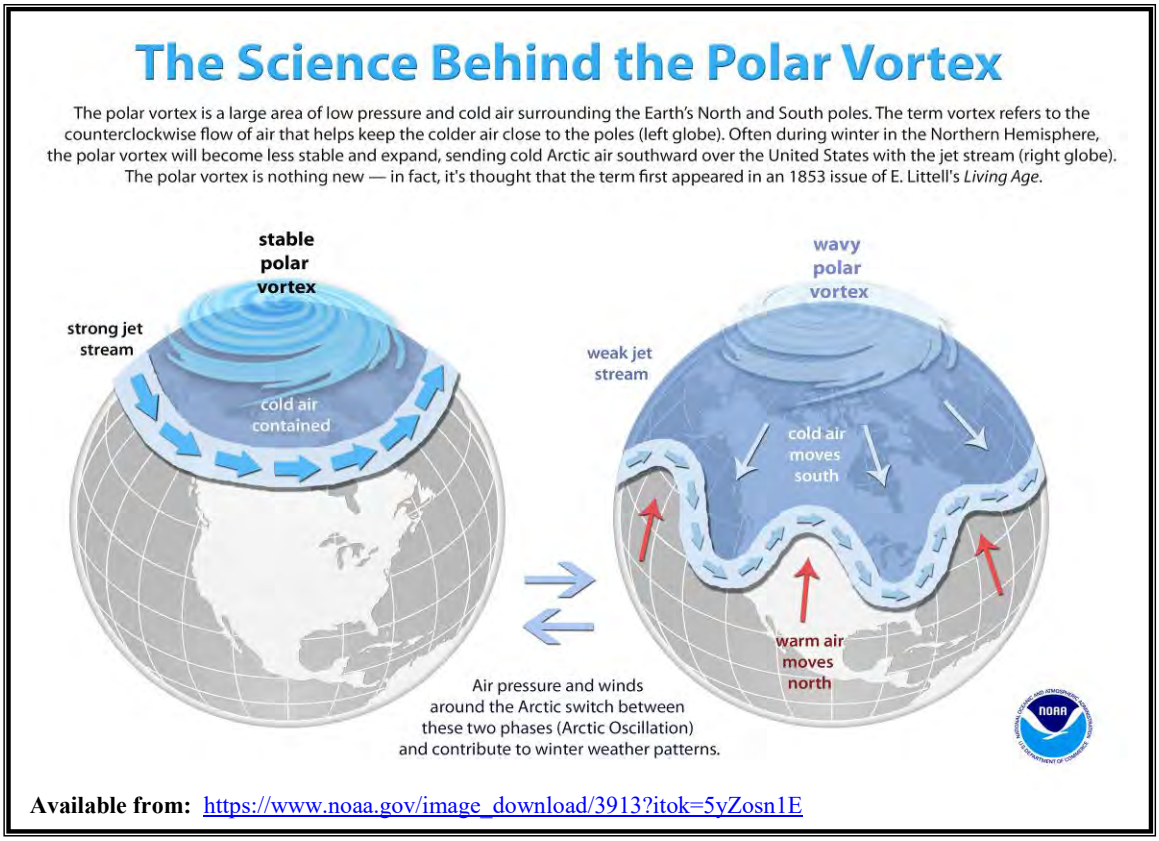
RSI Map Viewer available from: https://gis.ncdc.noaa.gov/maps/ncei/rsi

RSI SNOWSTORM IMPACT RANK		
Category	**RSI Value**	**Description**
1	1-3	Notable
2	3-6	Significant
3	6-10	Major
4	10-18	Crippling
5	18.0+	Extreme

Extreme Cold & Wind Chill

Polar Vortex *became a popular weather term in recent years according to Climate.gov. Polar vortex is a large area of low pressure and cold are surrounding the Earth's North and South poles. Vortex refers to the counter-clockwise flow of air that helps keep the colder air close to the poles. Often in winter, the polar vortex will become less stable and expand, sending cold Artic air southward over the United States with the jet stream.* A polar vortex is capable of delivering subzero temperatures for several days at a time.

(See: https://www.noaa.gov/multimedia/infographic/science-behind-polar-vortex-you-might-want-to-put-on-sweater)



Available from: https://www.noaa.gov/image_download/3913?itok=5yZosn1E

A recent polar vortex in Will County occurred at the end of January, 2019, causing the State of Illinois to issue a disaster proclamation. A concern raised during the hazard analysis was the impact of the extreme cold on response equipment/vehicles, transportation systems, utilities, and water resources. A specific issue during this event was the inability of response agencies to maintain the function of vehicles and response equipment.

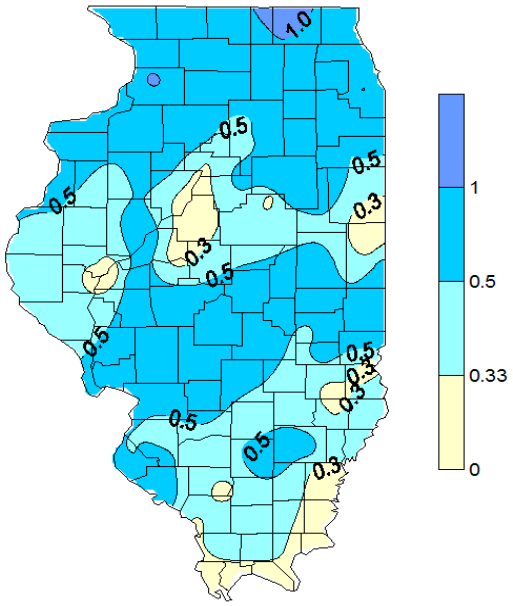
History

Will County has experienced over forty winter storm events since 1993. Federal Emergency Declarations of severe winter storms in Will County have occurred three times:

- January 16, 1979 with over $58 million in damages throughout Illinois
- January 8, 1999 with over $40 million in damages throughout Illinois
- January 17, 2001, with just under $23 million in damages throughout Illinois
- January 31 – February 3, 2011, approximately $250,000 damages in Will County

One of the worst winter storms to impact the state was on January 26-27, 1967, when as much as 23 inches of snow fell on Moline (Rock Island County) and the Chicago area, paralyzing O'Hare International Airport. Travel throughout Northern Illinois was curtailed and areas to the south experienced a glaze of ice which made travel virtually impossible until January 29, 1967. Fifty deaths were directly attributed to this storm.

Average Number of Days with 6 or More Inches of Snowfall per Winter 1971-2000



"0.33 days per winter" means one storm every 3 years, on average
"0.5 days per winter" means one storm every other year, on average

Source: Illinois State Water Survey, 2003

Illinois has experienced a severe winter storm each winter for over a century and experiences an average of five severe storms per year during the November-April period. These storms may be those with only heavy snow, or with snow and ice mixed, or with ice (glaze) only. Although the average number of severe winter storms is five per winter, as many as 18 have occurred in one winter (1977-1978) and as few as two (1921-1922).

Severe winters are characterized by either extremely cold periods one to two months in duration, or by severe ice storms or heavy snowfalls occurring repeatedly over a period of six to twelve weeks. Ice storms tend to fill a 50-80 mile band between heavy snows to the north and rain to the south. Being in the northern portion of the state, Will County experiences an annual average of 140 days at or below 32°F and 36 inches of snow.

Winter Storm – January 8, 1999

Federal Emergency Declaration #3134
Public Assistance - $1,010,500

A winter storm struck portions of the Midwest on January 1 to 3, 1999, producing 9 to 22 inches of snow and northeast winds gusting to over 30 mph in the Chicago area. Soon after the snow ended, record low temperatures occurred on January 3rd and 4th with values of -20°F or lower. The governor of Illinois declared the entire state a disaster on January 4th. The worst impact was the storm's effect on transportation which was either halted or delayed for two to four days and the source of many accidents. Automobiles, trains, airplanes, boats, and snowmobiles were impacted. Issues that developed as a result of this winter storm included:

- County and municipalities incurred problems and high costs with snow removal – this proved to be the major share of public assistance.
- Major vehicle accidents occurred on roadways with deaths (1 in Will County) and injuries.
- Retail businesses closed, transportation of raw materials and finished goods were delayed, and schools closed.
- Stranded traveling motorists were housed in emergency shelters.
- Vehicles parked on city streets were buried as snow removal equipment tried to clear streets.
- Blood shortages occurred.

Fortunately, the storm was accurately predicted several days in advance allowing communities to prepare, was spread out over a long duration, and occurred on a long holiday weekend. Those factors helped mitigate the impact on transportation and commerce.

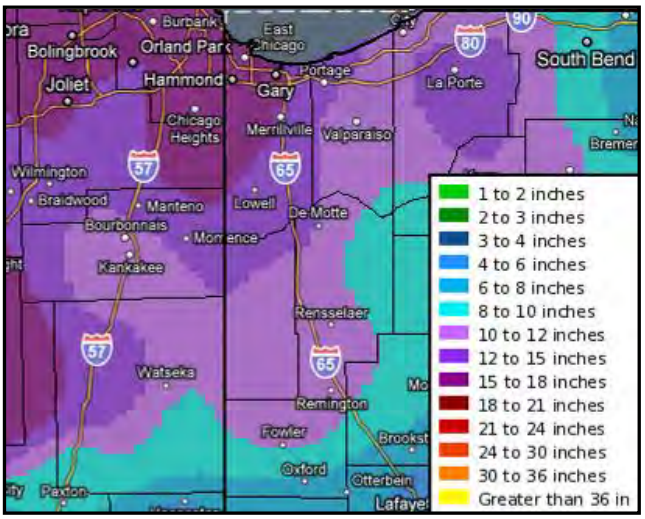
Severe Winter Storm and Snow – January 31 to February 3, 2011

Federal Disaster Declaration #1960

Public Assistance - $2,976,578

Northern Illinois and northwest Indiana were walloped by a powerful winter storm between January 31 and February 2, 2011. An initial period of light accumulating snow occurred from the evening of January 31st into the morning of February 1st, including lake effect snowfall over northeastern Illinois. From the afternoon of February 1st through the early morning of February 2nd, the snowstorm was accompanied by fierce winds, gusting to 50 to 60 mph and higher. The intense winds and heavy snow reduced visibility to

near zero at times and produced widespread snowdrifts of 2 to 5 feet, and a few drifts of 10 feet or more. Up to 18 inches of snow fell in Will County. This storm was classified as a blizzard, with sustained winds or frequent gusts of 35 mph or greater and severely reduced visibility for a prolonged period of time. Lightning was observed all across the region on February 1st and increased in frequency late that night.



Will County prepositioned cots throughout the county and anticipated that the assistance provided by the American Red Cross would be limited due to widespread difficult travel conditions. Most shelterees, in excess of 250, were rescued from stranded vehicles. Limited power outages occurred with small numbers of customers affected. The major issue was the clearing of roads being hampered by drifting snow and numerous abandoned vehicles.

The 2011 storm was also well forecasted. This allowed the county and communities to alert the public utilizing traditional news media along with website and social media tools. These communication tools were also used to provide the public with winter storm readiness tips. The advanced notice of the storm, better communications and planning, and better snow clearing techniques resulted in far less disruption. As a result, the number of stranded vehicles with this storm was much lower than the 1967 blizzard, but the photos and footage of the stranded vehicles on Lake Shore Drive have left an indelible imprint on the minds of many.

A major source for this information comes from the National Climatic Data Center (NCDC) which receives data from the National Weather Service (NWS). Following is the information collected for blizzards, cold/wind chill, extreme cold/wind chill, heavy snow, and ice storm. The following are additional winter events as defined by the NCDC.

Cold/Wind Chill Period of low temperatures or wind chill temperatures reaching or exceeding locally/regionally defined advisory (typical value is -18°F or colder) conditions, on a widespread or localized basis.

Extreme Cold/Wind Chill A period of extremely low temperatures or wind chill temperatures reaching or exceeding locally/regionally defined warning criteria (typical value around -35°F or colder), on a widespread or localized basis.

IMPACT OF WINTER/ICE EVENTS ON WILL COUNTY
(Source: NOAA/National Centers for Environmental Information / WC EMA)

Date	Time	Type	Deaths	Injuries	Property Damage	Federal Declaration
01/16/1979		Snow Storm				EM-3068
12/08/1995	12:00 PM	Winter Storm	0	0	0	
02/02/1996	12:00 AM	Cold/Wind Chill	0	0	0	
01/09/1997	12:00 AM	Winter Storm	0	0	0	
01/15/1997	06:00 AM	Winter Storm	0	0	0	
12/09/1997	06:00 PM	Heavy Snow	0	0	0	
01/01/1999	07:00 PM	Heavy Snow	1	0	0	EM-3134
03/08/1999	05:00 PM	Heavy Snow	0	0	0	
01/19/2000	12:00 PM	Heavy Snow	0	0	0	
02/18/2000	03:00 AM	Heavy Snow	0	0	0	
12/11/2000	03:00 AM	Blizzard	0	0	0	EM-3161
01/30/2002	07:00 PM	Winter Storm	0	0	0	
03/02/2002	09:00 AM	Winter Storm	0	0	0	
01/23/2003	01:00 AM	Cold/Wind Chill	0	0	0	
03/04/2003	02:50 PM	Winter Storm	0	0	0	
01/04/2004	07:00 AM	Heavy Snow	0	0	0	
01/29/2004	06:00 PM	Cold/Wind Chill	0	0	0	
01/04/2005	07:00 PM	Heavy Snow	0	0	0	
01/21/2005	04:00 PM	Heavy Snow	0	0	0	
12/08/2005	05:00 PM	Winter Storm	0	0	0	
11/30/2006	07:00 PM	Winter Storm	0	0	0	
12/01/2006	12:00 AM	Winter Storm	0	0	0	
02/03/2007	06:00 PM	Extreme Cold/ Wind Chill	0	0	0	
02/06/2007	07:00 AM	Winter Storm	0	0	0	

IMPACT OF WINTER/ICE EVENTS ON WILL COUNTY (Source: NOAA/National Centers for Environmental Information / WC EMA)						
Date	**Time**	**Type**	**Deaths**	**Injuries**	**Property Damage**	**Federal Declaration**
02/13/2007	02:00 AM	Blizzard	0	0	0	
02/25/2007	04:00 PM	Winter Storm	0	0	0	
12/01/2007	11:00 AM	Ice Storm	0	0	0	
12/15/2007	06:00 PM	Heavy Snow	0	0	0	
12/31/2007	01:00 AM	Heavy Snow	0	0	0	
01/29/2008	06:30 PM	Winter Storm	0	0	0	
01/31/2008	09:00 AM	Winter Storm	0	0	0	
02/01/2008	12:00 AM	Winter Storm	0	0	0	
02/25/2008	05:00 PM	Winter Storm	0	0	0	
12/15/2008	12:00 AM	Cold/Wind Chill	1	0	0	
12/18/2008	10:00 PM	Winter Storm	0	0	0	
12/21/2008	01:00 AM	Blizzard	0	0	0	
12/21/2008	07:00 AM	Extreme Cold/Wind Chill	0	0	0	
01/14/2009	01:00 AM	Winter Storm	0	0	0	
01/15/2009	06:00 AM	Extreme Cold/Wind Chill	0	0	0	
12/23/2009	10:00 AM	Heavy Snow	0	0	0	
12/23/2009	10:00 AM	Ice Storm	0	0	0	
12/30/2009	12:00 AM	Cold/Wind Chill	1	0	0	
01/07/2010	01:00 AM	Winter Storm	0	0	0	
02/08/2010	10:00 PM	Winter Storm	0	0	0	
12/03/2010	12:00 AM	Cold/Wind Chill	2	0	0	
12/11/2010	02:00 PM	Winter Storm	0	0	0	
12/27/2010	06:00 PM	Cold/Wind Chill	1	0	0	
02/01/2011	01:00 PM	Blizzard	0	0	$250 K	DR-1960
01/12/2012	08:00 AM	Winter Storm	0	0	0	
01/20/2012	11:00 AM	Winter Storm	0	0	0	
02/28/2012	12:00 AM	Cold/Wind Chill	1	0	0	
03/05/2013	06:00 AM	Winter Storm	0	0	0	
01/02/2014	04:00 AM	Lake-effect Snow	0	0	0	
01/04/2014	01:15 PM	Heavy Snow	0	0	0	
01/06/2014	02:00 AM	Extreme Cold/Wind Chill	0	0	0	
01/26/2014	07:00 PM	Winter Storm	0	0	0	

IMPACT OF WINTER/ICE EVENTS ON WILL COUNTY (Source: NOAA/National Centers for Environmental Information / WC EMA)						
Date	**Time**	**Type**	**Deaths**	**Injuries**	**Property Damage**	**Federal Declaration**
01/28/2014	05:35 AM	Extreme Cold/Wind Chill	0	0	0	
02/01/2014	04:00 AM	Heavy Snow	0	0	0	
02/04/2014	11:00 AM	Heavy Snow	0	0	0	
02/17/2014	05:00 AM	Heavy Snow	0	0	0	
03/11/2014	10:00 PM	Heavy Snow	0	0	0	
01/05/2015	09:00 PM	Cold/Wind Chill	1	0	0	
01/08/2015	02:00 AM	Extreme Cold/Wind Chill	0	0	0	
01/15/2015	08:25 AM	Cold/Wind Chill	2	0	0	
02/01/2015	12:00 AM	Heavy Snow	0	0	0	
11/20/2015	05:00 PM	Heavy Snow	0	0	0	
12/28/2015	01:00 AM	Sleet	0	0	0	
02/19/2016	01:31 PM	High Wind	0	0	0	
02/24/2016	10:45 AM	Heavy Snow	0	0	0	
12/04/2016	09:55 AM	Heavy Snow	0	0	0	
01/10/2017	03:14 PM	High Wind	0	0	0	
01/02/2018	07:35 AM	Extreme Cold/Wind Chill	0	0	0	
01/24/2018	03:30 AM	Winter Weather	0	0	$500K	
02/08/2018	06:00 PM	Winter Storm	0	0	0	
12/29/2018	06:00 AM	Winter Weather	0	0	0	
01/22/2019	08:00 AM	Winter Weather	0	0	0	
01/29/2019	10:15 PM	Extreme Cold/Wind Chill	0	0	0	
02/05/2019	05:30 PM	Winter Weather	0	0	0	
02/11/2019	03:00 PM	Ice Storm	0	0	0	
02/17/2019	04:30 AM	Winter Weather	0	0	0	
02/24/2019	08:00 AM	High Wind	0	0	$25K	
10/31/2019	07:00 AM	Winter Weather	0	0	0	

Mitigation Measures

Actions that can be taken to mitigate the impact of winter storms include:

- The adoption and enforcement of building codes that ensure structural stability, address snow roof loads, and provide adequate insulation. Jurisdictions that have adopted the International Building Code (IBC) and International Residential Code (IRC) are listed in Chapter 5, page 5-13 and 5-14.
- Trees and other vegetation cause about 20% of all electric service interruptions. Preventive pruning around aerial power lines is vital to providing reliable electric service. ComEd, the electric provider in Will County, has a routine tree maintenance that keeps above ground power lines clear. This program includes tree trimming, tree removal, and clearing storm-damaged trees or tree limbs from power lines. Their vegetation management crews are trained in proper arboricultural pruning techniques that meet the standards set by the American National Standards Institute (ANSI). ComEd is also upgrading overhead power lines with new overhead cables. The new cables are stronger, have a protective coating and are spaced closer together to help reduce power outages caused by severe weather, trees, and wildlife. Additionally, overhead power lines are being replaced in some areas with underground cable so customers experience fewer power outages.
- ComEd also employs smart grids that monitor the electric grid and respond to potential problems and interruptions and smart switches that automatically reroute electricity around problem areas so customers experience fewer and shorter power outages.
- A leading cause of death during winter storms is from automobile or other transportation accidents. Strategies to reduce accidents is planning for adequate road and debris clearing capabilities, using snow fencing to limit blowing and drifting of snow over critical roadway segments, and utilizing roadway heating technology to prevent snow/ice buildup.
- Public education about severe winter weather impacts and how the public can prepare is essential. Will County EMA and communities have ongoing public education for severe winter weather preparation through websites, social media, alert systems, traditional news media, and community events. Education outreach continues to improve as technology expands communication tool choices.

- Will County and the communities work with the American Red Cross to maintain a system of warming centers to protect vulnerable populations and people who become stranded on the roadways.
- The NWS sponsors the sale of weather radios at local stores; these events are supported by WC EMA, American Red Cross (ARC), and other response organizations who provide educational material to the public.
- Will County Center for Community Concerns assists low and moderate income families and individuals to obtain needed resources during short term emergencies. This includes assistance in paying for winter heating or repair/replacement of home heating systems.

Risk Characterization

Impact: Medium

Damage to Buildings

Historically, roofs would collapse due to heavy snow loads, but most buildings are now constructed with low temperatures, snow loads, and ice storms in mind. With today's energy consciousness, buildings are much better insulated than they were 50 years ago. Winter storms do not have a major impact on buildings. Impact on buildings is low.

Critical Facilities

The major impacts of snow and ice storms on property are to utilities and roads. Power lines and tree limbs coated with heavy ice result in disrupted power and telephone service, often for days. Even small accumulations of ice can be extremely dangerous to motorists and pedestrians. Bridges and overpasses are particularly dangerous because they freeze before other surfaces. When transportation is disrupted, schools close, emergency services are delayed, some businesses close, and some government services are delayed. Impact on critical facilities is low.

Health and Safety

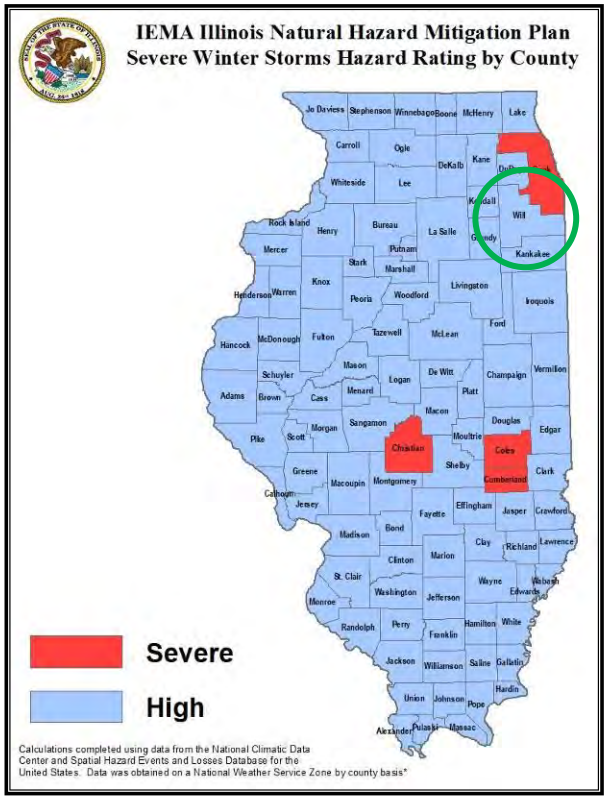
Winter storms bring the following two types of safety hazards:

- Weather-related hazards, including hazardous driving and walking conditions, and heart attacks from strenuous activity such as shoveling snow.

- Extreme cold from the low temperatures, wind chill, and loss of heat due to power outages.

In the United States, the number of deaths peaks in midwinter and reaches a low point in late summer, but most deaths are not directly related to the weather. Certain populations are especially vulnerable to the cold, including the elderly, the homeless, and lower income families with heating problems. About 70% of the injuries caused by snow and ice storms result from vehicle accidents and 25% occur to people caught out in the storm. Extreme cold can result in people and animals suffering from frostbite and hypothermia. Frostbite is damage to tissue caused by the effects of ice crystals in frozen tissue. Extremities (hands, feet, ears, and nose) with more circulation difficulties are most frequently affected.

Hypothermia is the lowering of the core body temperature. It is "clinically significant" when the body temperature is below 95°F. Severe hypothermia occurs when the body's temperature drops below 85°F, resulting in unconsciousness. If help does not come, death follows. Great care is needed to properly re-warm a person, even in mild cases. Health and safety impact is moderate.



Economic Impact

Loss of power means businesses and manufacturing concerns must close down. Loss of access due to snow or ice covered roads has a similar effect. There are also impacts when people cannot get to work, to school, or to the store. The cost of snow removal for winter events can be significant and difficult to budget for. Economic impact is moderate.

Future Occurrences

Based on weather patterns and past severe winter storm events, the probability of a winter storm is high for any given year.

WINTER/ICE STORMS OCCURRENCE		
Type	**Number of Occurrences Since 1995**	**Annual Mean**
Winter/Ice Storms, Cold or Extreme Cold/Wind Chill, Heavy Snow, Blizzard, High Wind	82	3.1

The *2018 Illinois Natural Hazard Mitigation Plan* rates the severe winter storm hazard for Will County as high and provides the following data.

Severe Winter Storm Loss Estimates for Will County	**# of Winter Storms 1951 - 2017**	**Total Recorded Loss**	**Average $ in Crop & Property Damage per Event**	**Annual Probability of Event**	**Estimated Annual Loss**
	23	$0	$0	35%	$0

FLOOD, FLASH FLOODS, URBAN FLOODS, and ICE JAMS

Hazard Characterization

Rivers and streams naturally overflow onto the lands adjacent to them. These lands, or floodplains, act as a natural reservoir and temporary channel for the excess water that dissipates over time. Flooding has only become a problem since people started to occupy the floodplains. The attractiveness of the level, fertile land of the floodplain has encouraged development despite the flood-prone nature of the area. However as these lands have become further developed, it has given rise to an increasing public demand for protection from the economic losses caused by the inevitable flooding.

Often riverine flooding occurs in early spring as a result of excessive rainfall or the combination of rainfall and snowmelt. Ice jams are also a cause of flooding in Will County in winter and early spring and may cause dangerous flash flooding to occur if the ice suddenly gives way. Severe thunderstorms may cause flash flooding during the summer or fall, although these are normally localized and have more impact on watercourses with smaller drainage areas. Flash flooding can cause damage to buildings and infrastructure such as culverts and roadways due to the velocity and debris load typical of this type of flooding.

Flooding may not always be directly attributable to a river, stream, or lake overflowing its banks. Rather, it may be the combination of excessive rainfall and/or snowmelt, saturated ground, and inadequate drainage. With no place to go, the water will pond in isolated low areas that are often not in a mapped floodplain. These areas can be backyards, city streets, or entire neighborhoods. This type of flooding, often called urban flooding, is becoming increasingly prevalent as development outstrips the ability of the drainage infrastructure to properly carry and disperse the water flow. Urban flooding also occurs due to combined storm and sanitary sewers that cannot handle the tremendous flow of water that often accompanies storm events. Typically, the result is water backing into basements that damages mechanical systems and can create serious public health and safety concerns. Other cases involve the ponding of waters across roads or in other low-lying areas. In Illinois, over 90% of urban flooding damage claims from 2007 to 2014 were outside the mapped floodplains.

Except for fire, the most common hazard in the United States is flooding with thousands of incidents occurring each year from oceans, rivers, lakes, small streams, gullies, creeks, culverts, dry streambeds or

low lying ground. The Federal Emergency Management Agency's (FEMA) standard definition of a flood is:

> *A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties (at least one of which is the policyholder's property) from:*
>
> - *Overflow of inland or tidal waters; or*
> - *Unusual and rapid accumulation or runoff of surface waters from any source; or*
> - *Mudflow; or*
> - *Collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.*

A simpler definition is too much water in the wrong place. Since water circulates from clouds to the soil to streams to rivers to the oceans and returns to the clouds, a scientific definition of a flood is an imbalance in the "hydrological system" with more water flowing through the system than the system can draw off.

Flood Terms

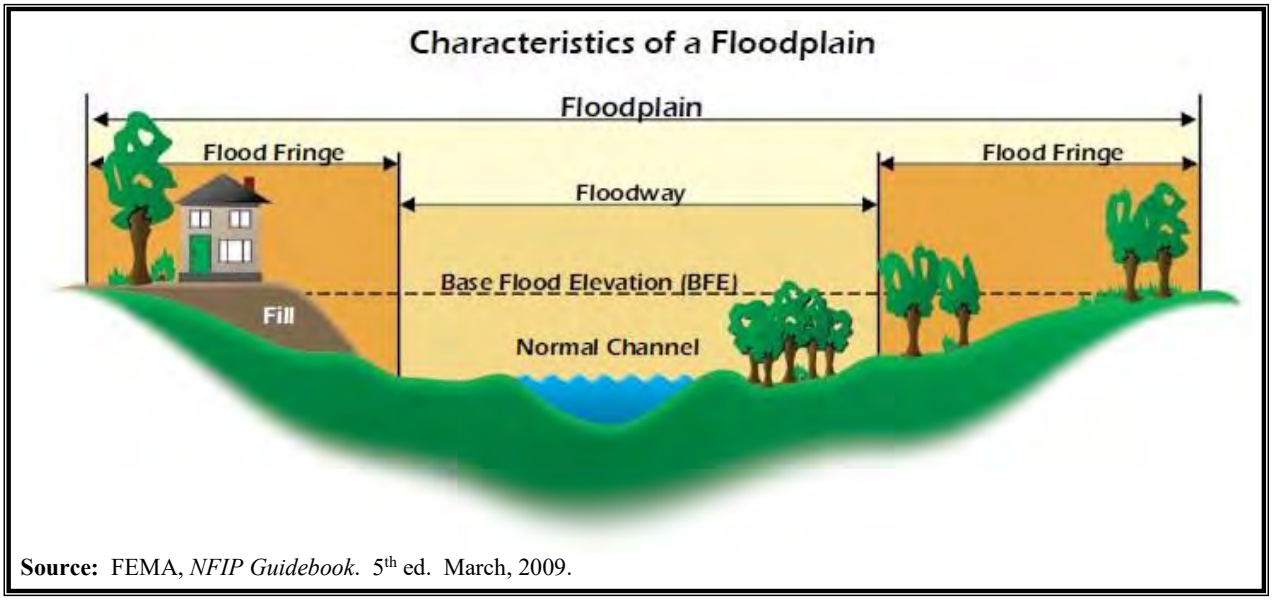
100-Year Flood Plain:	A flood event that statistically has a 1 out of 100 (or one percent) chance of being equaled or exceeded on a specific watercourse in any given year. A flood event of this magnitude is often used to determine if flood insurance is required for a federally backed loan for buildings in the 100-year floodplain.
500-Year Flood Plain:	A flood having a 0.2% or greater annual probability of occurring every year.
Base Flood:	Defined by FEMA as the flood having a 1-percent probability of being equaled or exceeded in any given year; also referred to as the 100-year flood.
Flood Stage:	The point at which the water level in a stream begins to cause damage to structures.

Floodplain: The area adjoining a watercourse that may be covered by floodwater during a flood. The 100-year floodplain is the land typically adjacent to a body of water with ground surface elevations at or below the base flood or the 100-year frequency flood elevation. This area, if left undisturbed, acts to store excess floodwater. The 100-year floodplain is made up of two sections: the floodway and the flood fringe, together these sections are also referred to as the Special Flood Hazard Area or the SFHA.

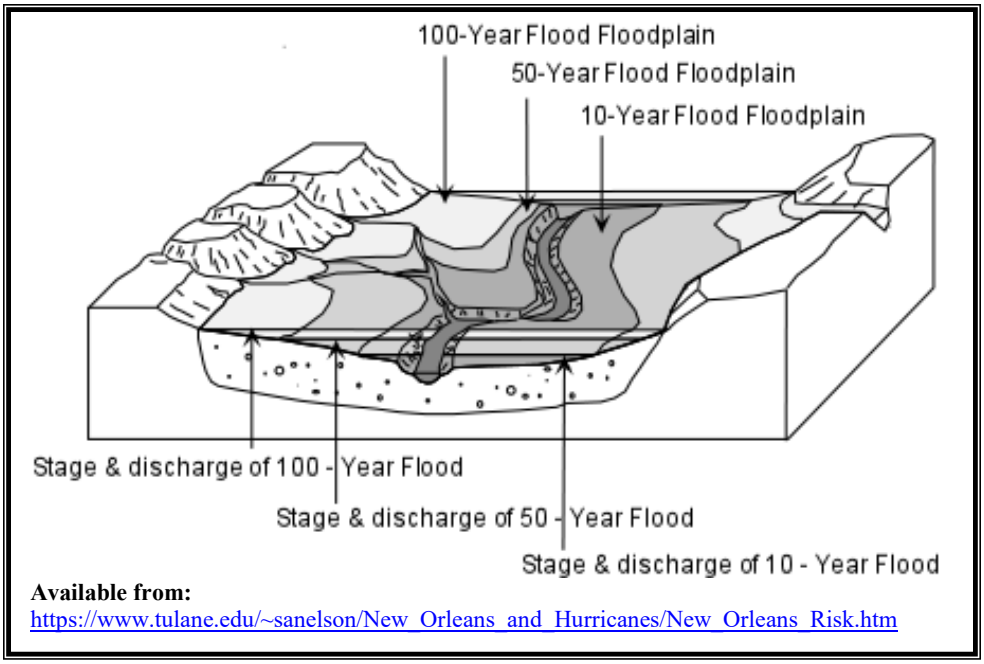
Floodway: A flow path (sometimes artificial) that carries significant volumes of floodwaters during a flood. The floodway carries the bulk of the floodwater downstream and is usually the area where water velocities and forces are the greatest. NFIP regulations require that the floodway be kept open and free from development or other structures that would obstruct or divert flood flows onto other properties. The floodway is needed to store and convey the critical duration 100-year frequency flood discharge with no more than a 0.1 foot increase in flood stage due to the loss of flood conveyance or storage and no more than a 10% increase in velocities.

Flood Fringe: The areas of a delineated floodplain adjacent to the floodway where encroachment may be permitted.

Mitigation: Flood mitigation is any action taken to reduce risk to people or property from flooding and its effects. *Nonstructural* measures are used to make existing and future development more resilient to flooding or to preserve (or restore) natural floodplain functions so that developed property is not affected. These include elevating structures, demolishing structures, flood proofing non-residential buildings, relocating or elevating furnaces and water heaters, etc. Structural measures seek to prevent the advance of flood waters, usually through an engineered measure such as a dam, levee, or floodwall.



Source: FEMA, *NFIP Guidebook*. 5th ed. March, 2009.



Available from:
https://www.tulane.edu/~sanelson/New_Orleans_and_Hurricanes/New_Orleans_Risk.htm

Commonly, people interpret the 50-year flood definition to mean "once every 50 years." This is incorrect. Statistically speaking, a 50-year flood has a 1/50 (2 %) chance of occurring in any given year. In reality, a 50-year flood could occur two times in the same year, two years in a row, or four times over the course of 50 years. It is possible not to have a 50-year flood over the course of 100 years.

FEMA uses the "base" flood as the basis for its regulatory requirements and flood insurance rate setting; it is also the basis for this analysis. The base flood is the 1% chance flood, i.e., the flood that has a 1% (one out of 100) chance of occurring in any given year. The 1% chance flood has also been called the 100-year flood. The "500-year flood" has a 0.2 % chance of occurring in any given year. While the odds are more remote, it is the national standard used for protecting critical facilities, such as hospitals and power plants.

What are the odds of a flood?

The term "100-year flood" has caused much confusion for people not familiar with statistics. Another way of looking at it is to think of the odds that a base flood will happen sometime during the life of a 30-year mortgage (26% chance).

Chance of Flooding over a Period of Years

Flood Size

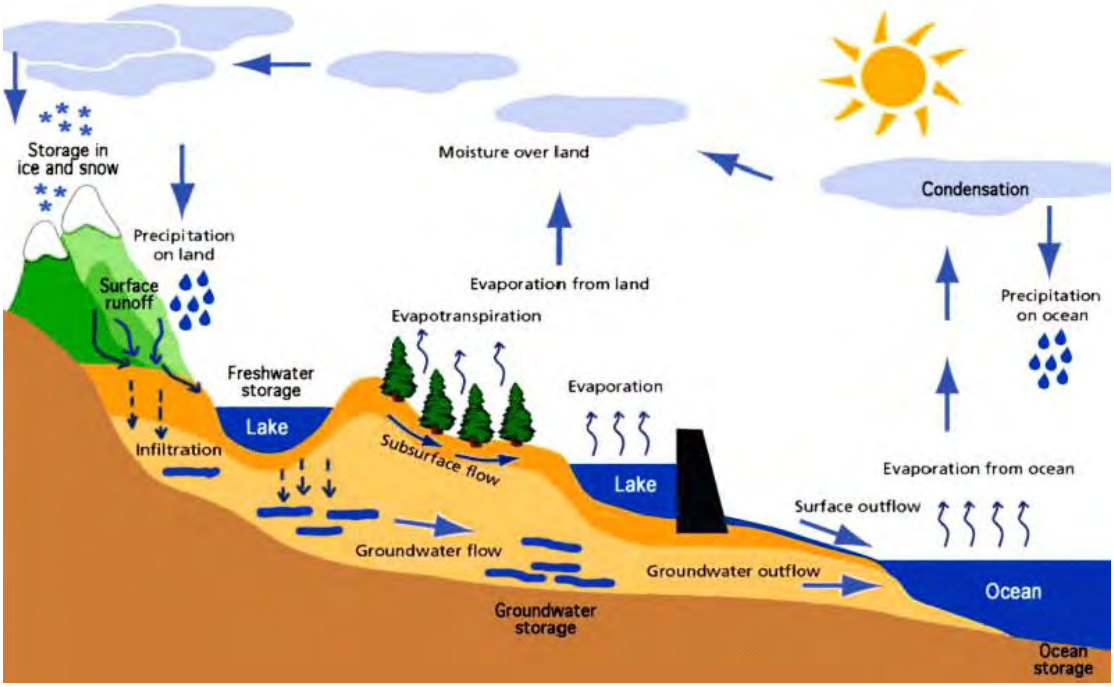
Period	*10-year*	*25-year*	*50-year*	*100-year*
1 year	10%	4%	2%	1%
10 years	65%	34%	18%	10%
20 years	88%	56%	33%	18%
30 years	96%	71%	45%	26%
50 years	99%	87%	64%	39%

Even these numbers do not convey the true flood risk because they focus on the larger, less frequent, floods. If a house is low enough, it may be subject to the 10- or 25-year flood. During the proverbial 30-year mortgage, it may have a 26% chance of being hit by the 100-year flood, but the odds are 96% (nearly guaranteed) that a 10-year flood will occur during the 30 year period. Compare those odds to the only 5% chance that the house will catch fire during the same 30-year mortgage.

See Flood Return Period Calculator:
https://www.weather.gov/epz/wxcalc_floodperiod

Hydrologic Cycle

The hydrologic cycle begins with the evaporation of water from the surface of the ocean. As moist air is lifted, it cools and water vapor condenses to form clouds. Moisture is transported around the globe until it returns to the surface as precipitation. Once the water reaches the ground, one of two processes may occur: 1) some of the water may evaporate back into the atmosphere or 2) the water may penetrate the surface and become groundwater. Groundwater either seeps its way into the oceans, rivers, and streams or is released back into the atmosphere through transpiration. The balance of water that remains on the earth's surface is runoff, which empties into lakes, rivers and streams and is carried back to the oceans where the cycle begins again.



Summary of the Hydrologic Cycle

Types of Flooding

There are many factors that contribute to the flooding. These factors include an abnormally heavy or intense rainfall, the melting of packed snow, the simultaneous arrival of flood crests from major tributaries, the formation of ice jams that block flow, inadequately designed storm water systems, and the creation of hydrologic structures (i.e. dams and levees) which are prone to failure and either cause an incident or aggravate an already existing one. Primarily, floods do occur in the springtime but can occur any time of the year. The types of flooding experienced in Will County are:

Riverine: Develop along a defined creek or river. Large river systems have floods that develop more slowly, sometimes over a period of days or weeks.

Flash: Develop quickly, sometimes in just a few minutes. Flash floods are typically the result of intense storms dropping large amounts of rain within a brief period or they can be caused by a structure failure, such as a dam, culvert, levee, or a debris jam. They can be in a mapped floodplain but can occur anywhere.

Ice Jam: Jammed ice creates a dam across the channel over which the water and ice mixture continues to flow causing more jamming to occur. Water levels upstream from the ice dam may rise rapidly and overflow the channel banks. When the ice dam fails, flooding occurs as the water stored behind the ice dam is quickly released.

Shallow Depth: Occurs outside a defined river or stream, typically ponding in a low-lying area or behind an obstruction, such as a railroad or levee.

Aquifer: Water is expelled from a subterranean geologic formation to the surface causing flooding in the immediate area.

Subterranean: Water floods into tunnels that are normally dry.

Urban: Occurs when rainfall overwhelms the capacity of drainage systems, such as storm sewers, and inundates property in a built environment, particularly in densely populated areas. Urban flooding also includes sanitary sewer backups when the groundwater infiltrates and fills sanitary sewers, combined sewer backup, and seepage through building walls and floors.

Impact of Floods

The effects of a flood can be devastating and floods are probably the most pervasive of all natural hazards in the U.S. Between the inundation of water and the force of the current, both lives and property can be lost. People and animals can drown or be injured by the floodwaters and the current-borne debris. The water and debris causes structural damage to buildings, roads, bridges, and railroads as well as cars and personal property. Sanitary, power, water, and communication installations can be severely damaged and their systems interrupted for long periods of time. Crops can be carried away by the current or destroyed by the inundation. Farmlands and developed areas may experience severe erosion resulting in the loss of valuable topsoil and private property can be washed away.

Many low lying areas or floodplain areas of the county are damaged yearly by heavy rains. Although the flooding may not have been declared federal disasters, the damage caused can be extensive. The flooded areas can be evacuated; however, the property owners are faced with the repeated costs of repairs and the emotional toll of the flooding.

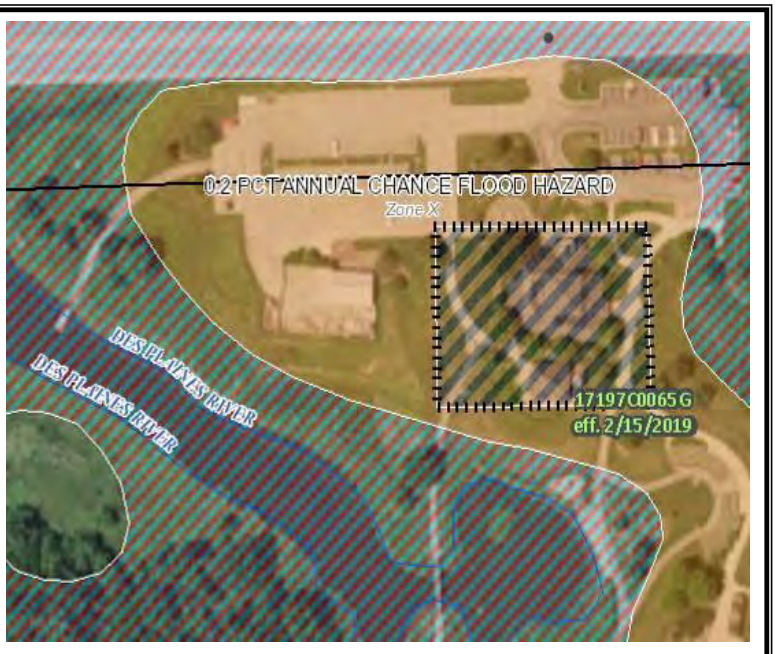
Flash Flooding

Flash flooding is often the result of levee failure. Levee failure can be due to many factors including overtopping during large flood events, underseepage, lack of maintenance allowing for the growth of trees or animal burrows, utility or building encroachments, and erosion.

The National Levee Database is a list of some of our nation's levees. The Isle a la Cache levee in Romeoville is the only levee listed for Will County.

Will County Levees

Available from: National Levee Database



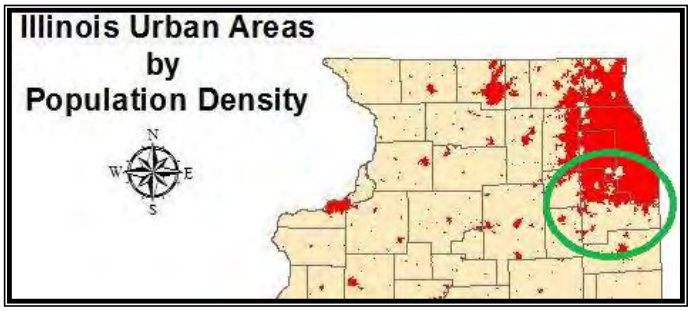
FEMA Accredited Levee on Des Plaines River at Isle a la Cache, Romeoville, IL

The levee, located in a Will County Forest Preserve protects the historic Isle a la Cache museum, located on an island in the Des Plaines River.

There are several other areas in Will County where levees provide some protection from flooding. Many levees protect a single property such as a quarry site, electric power substation, wastewater treatment, or water treatment plant. The Isle a la Cache is the only levee with FEMA accreditation as shown

on the flood map. Portions of Joliet are protected by a levee, railroad embankment, and road closure gates. The City is working on FEMA accreditation of the levee, which includes an operations and maintenance plan.

Urban Flooding

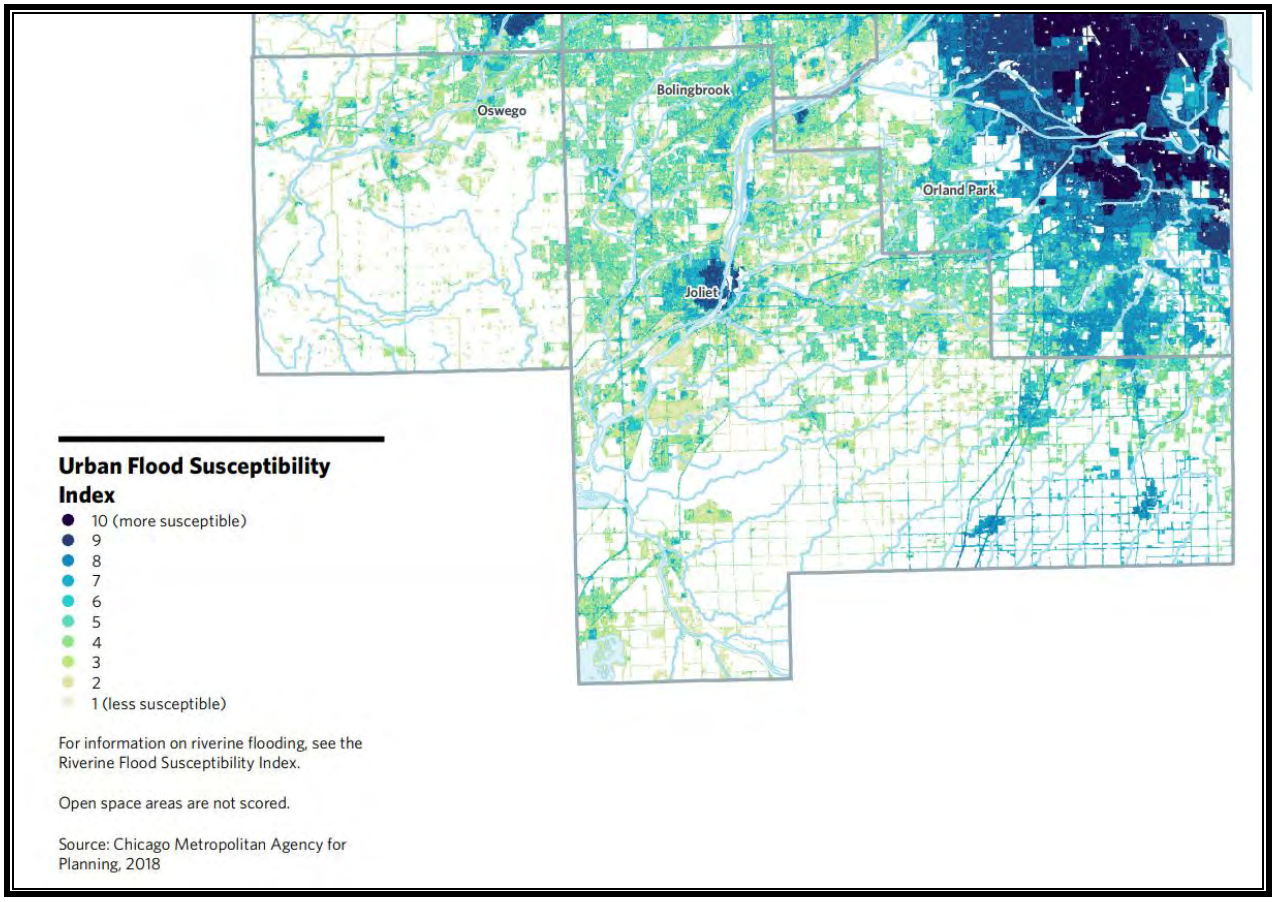


The Illinois General Assembly under the Urban Flooding Awareness Act (PA98-0858 – August 3, 2014) tasked the Illinois Department of Natural Resources (IDNR) to evaluate urban flooding in Illinois. Their research identified urban flooding as a major issue with $2.319 billion in documented damage throughout the state between 2007 and 2014. The largest percentage of insurance claims occurred in the six-county Chicago Metropolitan Area in northeastern Illinois.

Urban flooding is most common in older sections of communities where original storm sewers were not designed to present day standards with the ability to handle increased runoff. Common factors singly or in combination which can lead to urban flooding and damage include environmental, development and impervious surfaces, and aging and limited infrastructure. But as more land is converted to urban area, the availability of undeveloped land for water infiltration into the soil decreases. Increased land development also creates frequent and chronic flooding during the natural process of overbank flooding. The IDNR's *Report for the Urban Flooding Awareness Act* and *Model Stormwater Management Ordinance* is available from: https://www2.illinois.gov/dnr/WaterResources/Documents/Final_UFAA_Report.pdf.

The Chicago Metropolitan Agency for Planning (CMAP) has developed an urban flood susceptibility index (FSI). The northern half of Will County, as well as the I-57 and Dixie Highway corridors, have increased risk for urban flooding. The City of Joliet, due to their density and age of infrastructure has the highest risk. The CMAP guide, *Guide to Flood Susceptibility and Stormwater Planning*, integrates more information about flooding conditions into future land use and transportation planning processes. The guide introduces the FSI and how it can be used to quickly identify areas that could be more susceptible to flooding and incorporate that information into any standard

planning project. The index map can be viewed at: https://www.cmap.illinois.gov/documents/10180/402128/LSM_UrbanFSIv3.pdf/f5eea1a5-99d1-14ee-60a4-6d91ceee3179.



Erosion

Per FEMA, erosion is the wearing away of land, such as loss of riverbank, beach, shoreline, or dune material. It is measured as the rate of change in the position or displacement of a riverbank or shoreline over a period of time.

- Short-term erosion often occurs from periodic natural events, such as flooding or hurricanes.
- Long-term erosion is a result of multi-year impacts such as repetitive flooding, wave action, sediment loss, or subsidence.

- Death or injury are not usually associated with erosion; but erosion can destroy buildings and infrastructure.

Erosion problems can be mitigated through planning and regulations or structure and infrastructure projects.

- Erosion risk can be assessed and monitored with mapping techniques.
  - GIS can be used to identify and map erosion hazard areas and areas of at-risk structures.
  - Databases can be used to track vulnerability to erosion.
- Erosion damage can be mitigated through development regulations in hazard areas.
  - Regulations and plans can be developed to address erosion protections, control easements, erosion surcharges on homes, prohibiting development in high hazard areas, or locating utilities and critical facilities outside the area susceptible to erosion.
- Development can be designed to minimize damage due to erosion by using open or deep foundation systems, clustering buildings during construction, or designing and orienting infrastructure to deter erosion.
- Remove existing buildings and infrastructure from erosion hazard areas and enforce permanent restrictions on the land.
- Stabilize erosion hazard areas through proper bank stabilization techniques.
- Incorporate appropriate erosion control measures during active construction.
- Increase awareness of erosion through education and disclosure of property located in high-risk areas.[1]

Erosion hazard within Will County includes issues with stormwater discharges and flooding, storm drain damage from pavement connections, construction site runoff, and sediment loss. The Will County Stormwater Management Ordinance (WCSM Ordinance) includes a section on Sediment and Erosion Control (See Section 55.035: http://library.amlegal.com/nxt/gateway.dll/Illinois/willcounty_il/titlevpublicworks/chapter55stormwatermanagement?f=templates$fn=default.htm$3.0$vid=amlegal:willcounty_il$anc=JD_Chapter55). This ordinance sets standards and requirements for sediment and erosion

[1] FEMA. *Mitigation Ideas*. January, 2013.

control. Under WCSM Ordinance, all jurisdictions within the county must adopt and enforce the WCSM Ordinance or another ordinance that is consistent with and at least as strict as the WCSM Ordinance.

Unincorporated Will County is also compliant with the National Pollutant Discharge Elimination System (NPDES) that addresses significant sources of pollution in storm water runoff, public education, construction site runoff, and other sources to protect water quality. It also contains information regarding public participation and involvement, illicit discharge detention and elimination, post-construction runoff controls, and pollution prevention and housekeeping. The concern is stormwater runoff that is transported through municipal separate storm sewer systems (MS4s) that may discharge untreated into local water bodies. (See: https://www.epa.gov/npdes/stormwater-discharges-municipal-sources)

In farming, the primary cause of erosion in the Corn Belt, which includes Will County, is water. The National Resources Conservation Service (NRSC) and Will County Soil and Water Conservation District (SWCD) have witnessed considerable soil loss reductions by working with local farmers to implement various soil erosion control practices that include High Residue Farming, Cover Crops, Contour Grass Buffers, Filter Strips, Terraces, Grass Waterways, and Grade Stabilization Structures. Several of these practices are used in combination with each other on many farms as an effective system for controlling erosion.

The Will South Cook SWCD and NRSC provide area farmers with soil erosion education and data for the county (See: http://www.will-scookswcd.org/). It is estimated with very few exceptions that erosion control in Will County is at or below the Allowable Soil Loss indicating that the county's agricultural community understands the importance of controlling soil erosion.

Floodwater Roadway Overtopping

In addition to building damage, floods may also damage local roadways, driveway, culverts, and ditches when they are overtopped by floodwaters. While submerged, floodwater acts as a lubricant for the pavement, loosening its bonds. As current, winds, and even storms push the water around the surface, material may be pulled away from the sides of the road. Rock and soil will typically just wash away but this erosion may remove the support needed for pavement structure. For culverts

constantly trying to equalize pressure, climbing and receding floodwater also contributes to erosion. Roadway overtopping is a major safety concern because of the potential for rapid soil erosion resulting in partial or complete failure of the roadway embankment. Damage repairs can be expensive and take considerable time to complete. Efforts to alleviate overtopping require identifying the source of the water flow and using methods such as larger culverts or redirection of the water flow to mitigate the issue.

Severe storms cause flooding leading to eroded pavement.

Photo by Eric Ginnard – eginnard@shawmedia.com

WILL COUNTY ROADWAY OVERTOPPING ISSUES	
Area of County	**Flood Prone Area**
Northwest	CH1 (Parker Rd) by Cell Tower just north of US Route 6 to the Bible Church
	CH35 (135th Street) between Gordon Lane and Emily Lane
East	CH48 (Old Monee Rd) on the North end close to the County Line
	CH25 (Wilmington-Peotone Rd) in the area of 10504 Wilmington Peotone Rd.
	CH20 (North Peotone Rd) Culvert just west of the Fire Station
	CH20 (North Peotone Rd) 1st curve coming out of Peotone
	CH20 (North Peotone Rd) south of the creek between the two curves east of I57
	CH58 (County Line Rd) between Crawford & 8000 E on the north side
	CH21 (Crete-Monee Rd) at W. Pinewood Drive
South	CH25 (Wilmington Peotone Rd) @ Wilton Center Rd
	CH25 (Wilmington Peotone Rd) @ Rowell Ave
	CH25 (Wilmington Peotone Rd) @ Indian Trail Rd
	CH25 (Wilmington Peotone Rd) bridge between Rt. 45 & 120th Rd
	CH17 (Arsenal Rd) @ Ridge Rd
	CH17 (Arsenal Rd) @ Cherry Hill Rd
	CH17 (Arsenal Rd) @ Gouger Rd
	CH90 (Hoff Rd) between Ridge Rd and Cherry Hill Rd
	CH79 (Tully Rd) @ Wilmington Peotone Rd
	CH7 (Old Chicago Rd) roughly 2000’ north of Wilmington Peotone Rd
	CH26 (Zilm/West River Rd) between Coal City Rd & Illinois Rt. 113
Northeast	CH4s (Cedar Rd) between Laraway Rd & Ford Dr.
	CH52 (Gouger Rd) @ CH64 (Francis Rd)

Dam Failure
Flooding can also result from dam failure. Further discussion of Dam Failure is found later in this chapter.

Watersheds

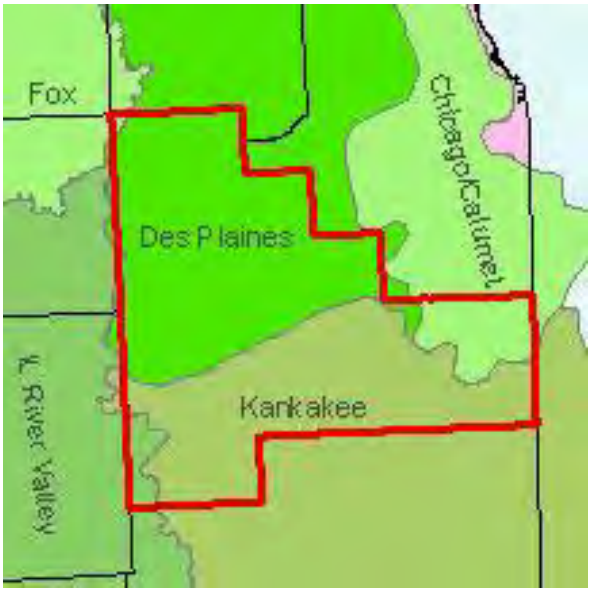
A watershed is defined by the 1988 Will County Stormwater Management Plan as all land area drained by, or contributing water to, the same stream, lake, or stormwater facility. Therefore, a watershed can be defined for a single drainage ditch, a local creek, or a large river. A watershed for a larger river, often called a river basin, is a combination of the drainage area for all the streams and smaller rivers that drain into the larger river. Smaller channels or tributaries collect runoff from rain and snowmelt and send the water to larger channels and eventually to the main channel that is the water course in the watershed.

Many watershed characteristics affect flooding. The slope of the watershed and the amount of connected impervious areas will affect runoff speed and infiltration. The presence of wetlands or other natural depressional areas that can retain stormwater will reduce runoff. The use of and size of stormwater management basins can also reduce runoff.

Will County Watersheds

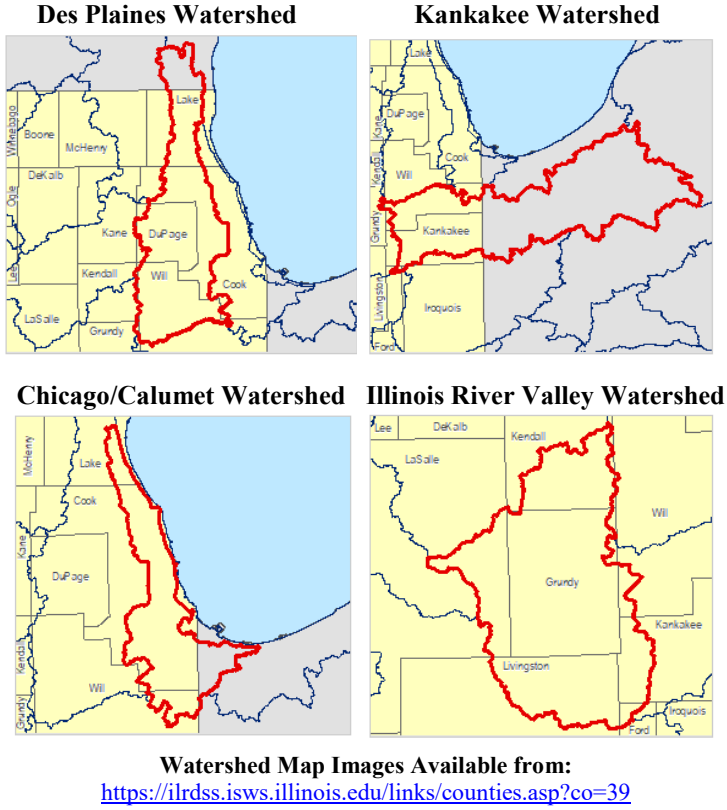
For planning purposes, the county has been divided into four primary watersheds.

- Calumet
- Des Plaines
- DuPage (part of the Des Plaines)
- Kankakee



The two principal river basins are the Des Plaines to the north and west and the Kankakee River Basin to the south and east. Several large tributaries to the Des Plaines River also flow through the county, including the DuPage River and the Chicago Sanitary and Ship Canal.

The Des Plaines River flows through the western portion of the county and its watershed covers virtually all of Cook and DuPage Counties and nearly half of Lake County. It has headwater areas in both Wisconsin and Indiana. The drainage area of the Des Plaines River basin within Will County is 478 square miles.



Watershed Map Images Available from:
https://ilrdss.isws.illinois.edu/links/counties.asp?co=39

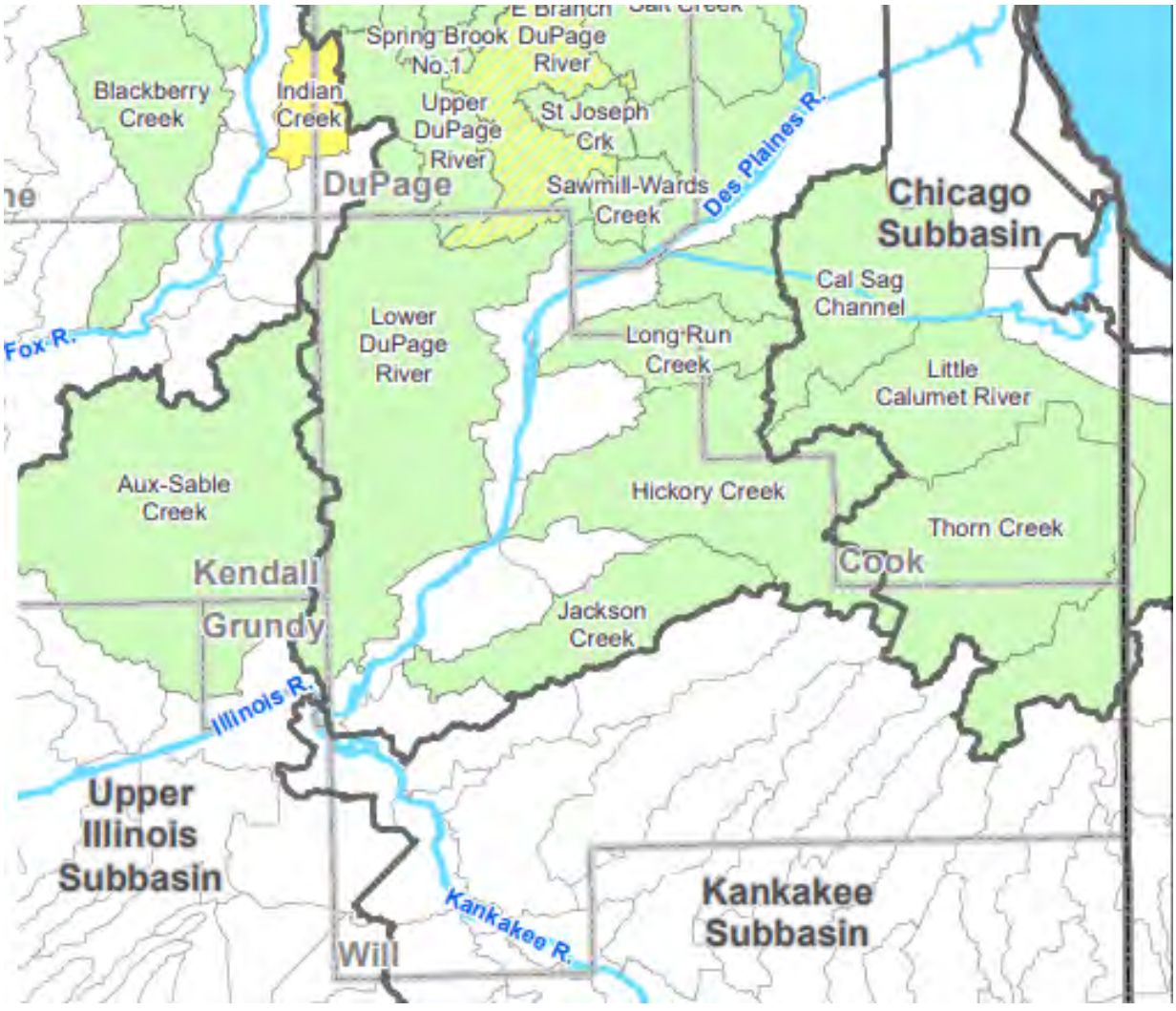
The Kankakee River basin area within Will County is 368 square miles. Although the Kankakee River flows through the southwest corner of the county, the majority of the Kankakee River basin area is in Will County with the headwater area composed of numerous smaller streams that drain through Kankakee County before joining the Kankakee River. The Kankakee River and the Des Plaines River join to form the Illinois River just outside Will County. For planning purposes, the two basins have been divided into four main watershed planning units.

The character of the four watershed planning units varies both in terms of the demographics and the physical conditions. The Des Plaines River, Calumet River, and DuPage River watersheds have significant urban and suburban components. Conversely, the Kankakee River Watershed is primarily rural and has over 75% of its land area in agricultural production. There are relatively few lakes in Will County and there is very little data on the lakes that do exist.

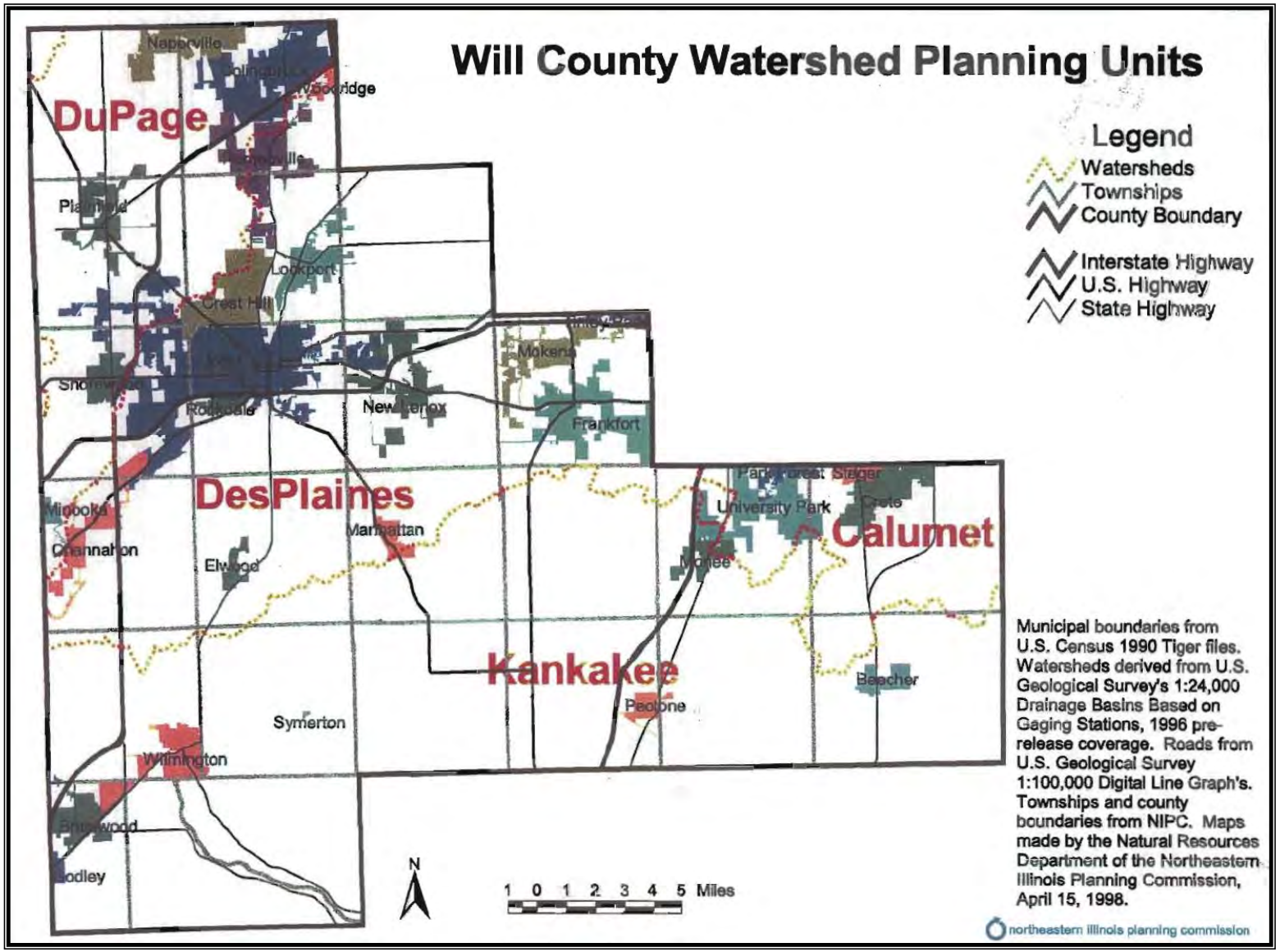
WILL COUNTY RIVERS and STREAMS		
Butterfield Creek East Branch	Jackson Creek	Rock Run Tributary No. 2
Deer Creek	Kahler Road Drainage Ditch	Rock Run Tributary No. 3
Des Plaines River	Kankakee River	Spring Creek
Tributary A Des Plaines River	Kankakee River East Channel	Spring Creek Tributary
DuPage River	Lily Cache Creek	Springhole Creek
West Branch DuPage River	Long Run	St. Anne School Tributary
East Branch DuPage River	Manhattan Creek	St. Francis Academy Creek
East Marley Creek	Manhattan Road Ditch	Sugar Run
East Norman Drain	Marley Creek	Sunnyland Drain
Fiddyment Creek	Milne Creek	Sunnyland Drain Tributary
Forked Creek	Naperville Road Tributary	Thorn Creek
Goose Creek	Northern Tributary to Union Drainage Ditch	Thorne Creek
Hammel Creek		Trim Creek
Hammel Creek Tributary	Plum Creek	Trim Creek Tributary
Hickory Creek	Robin Hill Drive Split Flow	Union Drainage Ditch
Hickory Creek Tributary A	Rock Run North	Unnamed Creek (South of 87th Street)
Hickory Creek Tributary 1	Rock Run Slough	West Norman Drain
Illinois & Michigan Canal	Rock Run South	Wolf Creek
Jackson Branch Creek	Rock Run Tributary No. 1	Lily Cache Slough

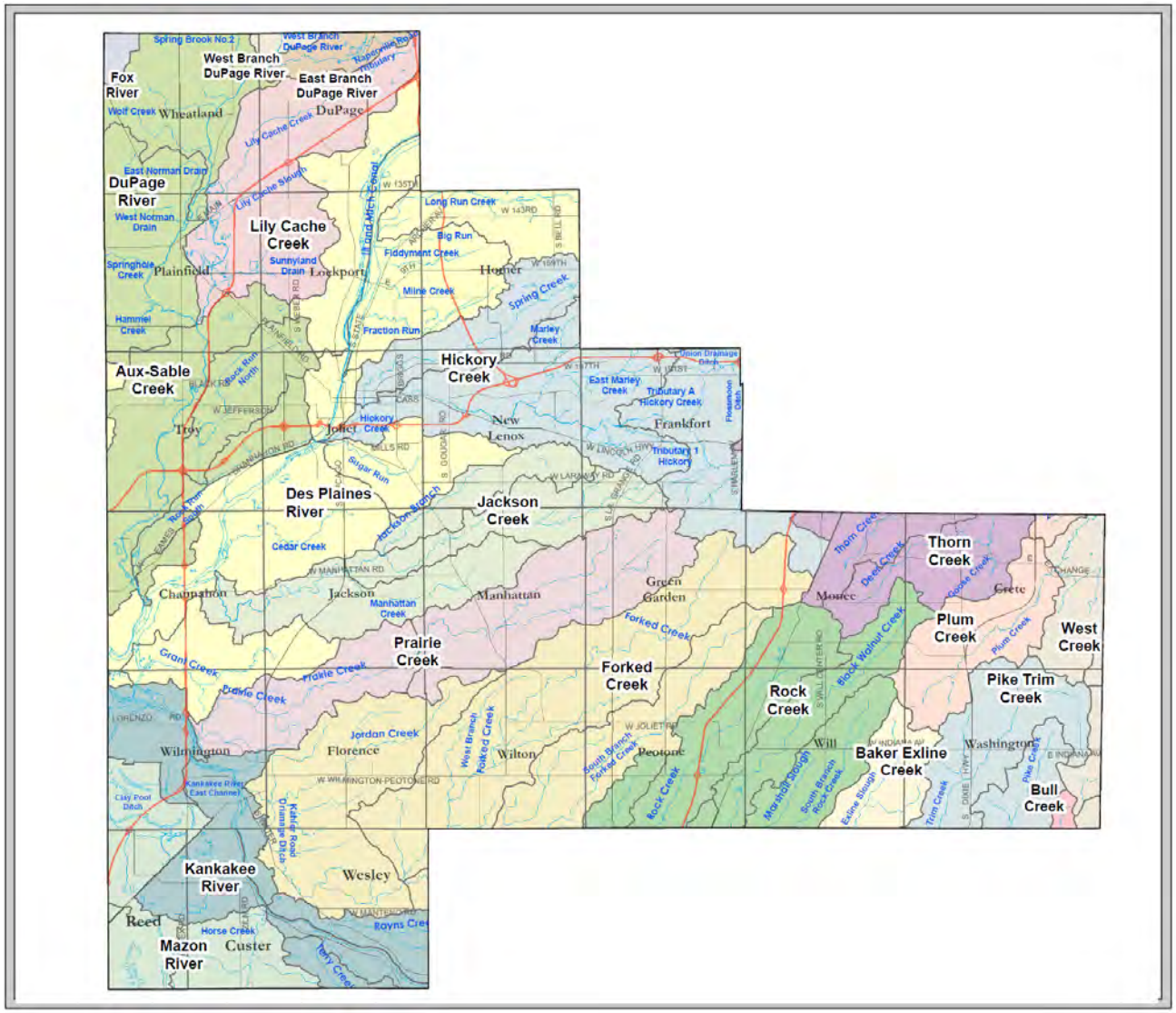
Will County Public Waters

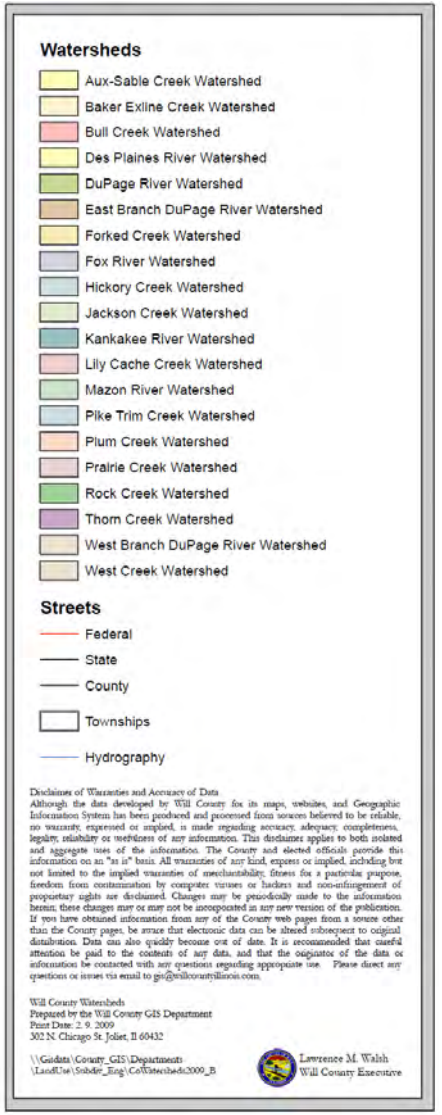
Source: Illinois Department of Natural Resources



Source: Chicago Metropolitan Planning Agency, November 2019


Will County Watershed Planning Units
DuPage
DesPlaines
Kankakee
Calumet
Legend
Watersheds
Townships
County Boundary
Interstate Highway
U.S. Highway
State Highway
Naperville
Lockport
Crest Hill
Shorewood
Rockdale
New Lenox
Mokena
Frankfort
Manhattan
Elwood
Channahon
Minooka
Symerton
Wilmington
Braidwood
Godley
University Park
Peotone
Beecher
N
1 0 1 2 3 4 5 Miles
Municipal boundaries from U.S. Census 1990 Tiger files. Watersheds derived from U.S. Geological Survey's 1:24,000 Drainage Basins Based on Gaging Stations, 1996 pre-release coverage. Roads from U.S. Geological Survey 1:100,000 Digital Line Graph's. Townships and county boundaries from NIPC. Maps made by the Natural Resources Department of the Northeastern Illinois Planning Commission, April 15, 1998.
northeastern illinois planning commission


Fox River
West Branch DuPage River
East Branch DuPage River
DuPage River
Lily Cache Creek
Aux-Sable Creek
Hickory Creek
Des Plaines River
Jackson Creek
Prairie Creek
Forked Creek
Rock Creek
Thorn Creek
Plum Creek
West Creek
Pike Trim Creek
Baker Exline Creek
Bull Creek
Kankakee River
Mazon River
Wheatland
DuPage
Plainfield
Lockport
Homer
New Lenox
Frankfort
Troy
Joliet
Champaign
Jackson
Manhattan
Green Garden
Monee
Crete
Wilmington
Florence
Wilton
Peotone
Will
Washington
Wesley
Reed
Mazon
Custer


Watersheds
Aux-Sable Creek Watershed
Baker Exline Creek Watershed
Bull Creek Watershed
Des Plaines River Watershed
DuPage River Watershed
East Branch DuPage River Watershed
Forked Creek Watershed
Fox River Watershed
Hickory Creek Watershed
Jackson Creek Watershed
Kankakee River Watershed
Lily Cache Creek Watershed
Mazon River Watershed
Pike Trim Creek Watershed
Plum Creek Watershed
Prairie Creek Watershed
Rock Creek Watershed
Thorn Creek Watershed
West Branch DuPage River Watershed
West Creek Watershed
Streets
Federal
State
County
Townships
Hydrography
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Will County Watersheds
Prepared by the Will County GIS Department
Print Date: 2. 9. 2009
302 N. Chicago St. Joliet, Il 60432
\\Gisdata\County_GIS\Departments\LandUse\Subdiv_Eng\CoWatersheds2009_B
Lawrence M. Walsh
Will County Executive

WILL COUNTY WATERSHEDS									
Watershed Name	**Watershed Grouping**	**Total Drainage Area (sq. miles)**	**Percentage in Will Co. (%)**	**Drainage Area within Will Co. (sq. miles)**	**Watershed Plan**	**Drainage Districts within Watershed**	**Major Tributaries**	**Townships**	**Municipalities**
Aux-Sable Creek		172	0.6	1.1	Yes	No		Plainfield, Troy	City of Joliet, Village of Shorewood
Baker Exline Creek	Kankakee	> 17.8		12.7	No	Yes	Exline Slough	Washington, Will	
Bull Creek	Kankakee	6.3	19.0	1.2	No	No		Washington	
Des Plaines River	Des Plaines	2111	6.8	142.5	No	No	Des Plaines River	Channahon, DuPage, Florence, Homer, Jackson, Joliet, Lockport, New Lenox, Troy, Wilmington	City of Crest Hill, City of Joliet, City of Lockport, Village of Bolingbrook, Village of New Lenox, Village of Channahon, Village of Elwood, Village of Homer Glen, Village of Lemont, Village of Rockdale, Village of Romeoville, Village of Woodridge
DuPage River (Includes East & West Branches)	DuPage	376	30.9	116.2	YES	No	DuPage River	Channahon, DuPage, Joliet, Lockport, Plainfield, Troy, Wheatland	City of Aurora, City of Crest Hill, City of Joliet, City of Naperville, Village of Bolingbrook, Village of Channahon, Village of Minooka, Village of Plainfield, Village of Rockdale, Village of Shorewood
East Branch DuPage River	DuPage	82	8.2	6.7	YES	No	East Branch DuPage River	DuPage, Wheatland	City of Naperville, Village of Bolingbrook, Village of Woodridge
Forked Creek	Kankakee	137	101.8	139.4	No	No	South Branch Forked Creek, Forked Creek, West Branch Forked Creek	Florence, Green Garden, Manhattan, Monee, Peotone, Wesley, Wilmington, Wilton	City of Wilmington, Village of University Park, Village of Frankfort, Village of Monee, Village of Symerton
Fox River		2642	0.1	2.2	Yes	No		Wheatland	City of Aurora, City of Naperville
Hickory Creek	Des Plaines	107	84.4	90.3	YES	No	Hickory Creek	Frankfort, Green Garden, Homer, Joliet, Lockport, Manhattan, New Lenox	City of Joliet, City of Lockport, Village of University Park, Village of New Lenox, Village of Frankfort, Village of Homer Glen, Village of Mokena, Village of Orland Park, Village of Tinley Park
Jackson Creek	Des Plaines	58.5	100.0	58.5	Yes	No	Jackson Creek	Channahon, Frankfort, Green Garden, Jackson, Joliet, Manhattan, New Lenox	City of Joliet, Village of New Lenox, Village of Elwood, Village of Frankfort, Village of Manhattan, Village of Mokena

WILL COUNTY WATERSHEDS (cont.)									
Watershed Name	**Watershed Grouping**	**Total Drainage Area (sq. miles)**	**Percentage in Will Co. (%)**	**Drainage Area within Will Co. (sq. miles)**	**Watershed Plan**	**Drainage Districts within Watershed**	**Major Tributaries**	**Townships**	**Municipalities**
Lily Cache Creek	DuPage	45.1	104.2	47.0	No	No	Lily Cache Creek	DuPage, Lockport, Plainfield, Wheatland	City of Crest Hill, City of Joliet, Village of Bolingbrook, Village of Plainfield, Village of Romeoville, Village of Woodridge
Mazon River	Kankakee	455	8.0	36.2	Yes	No	Horse Creek	Custer, Reed, Wilmington	City of Braidwood, City of Wilmington, Village of Coal City, Village of Braceville, Village of Diamond, Village of Godley
Pike Trim Creek	Kankakee	*		34.7	Yes	Yes	Pike Creek, Trim Creek	Crete, Washington, Will	Village of Beecher
Plum Creek	Calumet	34.8	70.7	24.6	No	No	Plum Creek	Crete, Manhattan, Washington, Will	Village of Beecher, Village of Crete, Village of Sauk Village
Prairie Creek	Kankakee	58.5	100.0	58.5	No	No	Prairie Creek	Florence, Frankfort, Green Garden, Jackson, Manhattan, Wilmington, Wilton	City of Wilmington, Village of Frankfort, Village of Manhattan
Rock Creek	Kankakee	*		68.5	No	Yes	South Branch Rock Creek, Marshall Slough, Blackwalnut Creek, Rock Creek	Crete, Green Garden, Manhattan, Peotone, Will, Wilton	Village of University Park, Village of Crete, Village of Monee, Village of Peotone
Thorn Creek	Calumet	104	29.1	30.3	Yes	No	Butterfield Creek, Thorn Creek	Crete, Frankfort, Manhattan	Village of University Park, Village of Crete, Village of Frankfort, Village of Monee, Village of Steger, Village of Park Forest
West Branch Dupage River	DuPage	125	1.8	2.2	Yes	No	West Branch DuPage River	DuPage, Wheatland	City of Naperville, Village of Bolingbrook
West Creek	Calumet	*		2.0	No	No	Plum Creek	Crete, Washington	
Note: * Indicates Total Drainage Area Unavailable				Total: 917.8	* Impairments include siltation, nutrients, and metals. Hydromodification				

Watershed Group	Percentage of Will County
Kankakee	44
Calumet	7
DuPage	16
Des Plaines	33

Will County Stormwater Management Planning Committee

Will County Stormwater Management Planning Committee (WCSM Planning Committee) is an intergovernmental entity with representation from both municipalities and Will County. The WCSM Planning Committee is an advisory body to the Will County Board and is responsible for directing the implementation of the county's *Comprehensive Stormwater Management Plan* and its revision, if necessary. The Stormwater Plan establishes the recommended role of the WCSM Planning Committee, which are:

Administration & Management: The WCSM Planning Committee is composed of half municipal and half County Board representation. It has authority to establish its own committees and to retain engineering, legal, and financial advisors and inspection personnel; yet, it is planned that county staff will provide these services for the committee as feasible. The committee is required by state statutes to meet, at a minimum, quarterly. (See: https://www.willcountyillinois.com/County-Offices/Economic-Development/Stormwater-Management-Planning-Committee/Members)

Regulation: The WCSM Planning Committee is an advisory body to the County Board and is instrumental in developing and maintaining a county-wide ordinance for the County Board and in advising the County Board on issues related to stormwater management in Will County. The committee's recommendations require due consideration and any regulatory enactments in contravention to the committee's recommendations requires a super majority vote of the County Board.

Planning: This is a primary role for the WCSM Planning Committee that includes the preparation and maintenance of the *Comprehensive Stormwater Management Plan*, the WCSM Ordinance, and implementation of the county-wide plan.

Maintenance: The Stormwater Management Plan provides authority for the county to ensure maintenance of stormwater facilities and the natural drainage system. The WCSM Planning Committee receives from the county a budgeted amount each year to provide 50/50 assistance towards projects within Will County.

The Will County Land Use Department website provides the public with valuable information on the WCSM Planning Committee's mission and activities. (See: https://www.willcountyillinois.com/County-Offices/Economic-Development/Stormwater-Management-Planning-Committee)

Will County Stormwater Management Ordinance and Guides:

The WCSM Ordinance was developed to ensure it incorporated the minimum requirements of the National Flood Insurance Program (NFIP) and was accordingly reviewed by the Illinois Department of Natural Resources (IDNR). Included within the ordinance:

- Requirements for construction in floodplains and floodways,
- Protection standards for building and public health,
- Compensatory storage volume requirements,
- Floodway standards, and
- Bridge and culvert standards.

The ordinance also outlines the developments that are permitted in the floodway (appropriate uses) providing they:

- Do not cause an increase in flood heights or velocities for all flood events up to and including the base flood,
- Will not create a damaging or potentially damaging increase in flood heights or velocity,
- Will not be a threat to public health safety and welfare,
- Will not impair the natural hydrologic and hydraulic functions of the floodway channel, or
- Will not permanently impair existing water quality or aquatic habitat.

Will County's Stormwater Management Ordinance (Will County Code of Ordinances, Chap. 55) requires, with state authority, communities within the county to adopt and enforce this ordinance or adopt and enforce a municipal ordinance that is consistent with and at least as strict as the county regulations. Each community meeting the requirements is certified by the Stormwater Committee and is delegated the responsibility for ordinance enforcement. Within a delegated community, the community can issue permits for appropriate uses in the floodway. If a community does not have delegation authority, a permit must be issued by the IDNR. The Stormwater Committee shall

periodically review the implementation and enforcement of this ordinance by each certified community.

A few communities (Coal City, Godley, Braceville, and Symerton) have not pursued certification for the Countywide Ordinance primarily due to their small footprint within Will County. For the small amount of development within their community that could fall within Will County, the cost would be prohibitive for them to conduct reviews. In these instances, any development within these areas is to be reviewed by Will County.

Will County Stormwater Management Information Resources:

- Will County Stormwater Management Ordinance
  http://library.amlegal.com/nxt/gateway.dll/Illinois/willcounty_il/titlevpublicworks/chapter55stormwatermanagement?f=templates$fn=default.htm$3.0$vid=amlegal:willcounty_il$anc=JD_Chapter55

- Will County Comprehensive Stormwater Management Plan and
  Will County Stormwater Technical Guidance Manual
  https://www.willcountyillinois.com/County-Offices/Economic-Development/Stormwater-Management-Planning-Committee/Plans-Projects

- Countywide Stream Maintenance and Inspection Manual
  https://www.willcountyillinois.com/County-Offices/Economic-Development/Land-Use/Development-Review

The following table identifies the Will County communities participating in the NFIP and WCSM Planning Committee certification. The exception is Godley, a small community, which lies in Zone X indicating the area is outside of the 500-year flood. Historically, Godley has not participated in in the NFIP. Will County Land Use and Godley will review the feasibility of their participating in the NFIP.

Will County Community Participation in Floodplain Management				
Jurisdiction	**NFIP#**	**Participation Date**	**Current Effective FIRM Date**	**WCSMPC Certification Date**
Aurora	170320B	06/14/74	08/01/19	NA
Beecher	170696B	04/12/74	02/15/19	11/18/2003
Bolingbrook	170812B	04/12/74	08/01/19	01/20/2004
Braceville	171020B	08/02/12	NSFHA	NA
Braidwood	170848B	04/11/75	02/15/19 (M)	07/13/2004
Channahon	170698B	03/29/74	02/15/19	12/16/2003
Coal City	170258B	03/08/74	02/15/19 (M)	NA
Crest Hill	170699B	03/29/74	02/15/19	01/20/2004
Crete	170700B	04/12/74	02/15/19	12/16/2003
Diamond	170259B	01/16/76	02/15/19 (M)	01/10/2006
Elwood	170849B	02/21/75	02/15/19	01/17/2004
Frankfort	170701B	04/05/74	02/15/19	11/18/2003
Godley	∗			NA
Homer Glen	171080B	04/07/77	02/15/19	12/16/2003
Joliet	170702B	05/31/74	02/15/19	12/16/2003
Lemont	170117B	03/29/74	08/01/19	NA
Lockport	170703B	03/08/74	02/15/19	12/16/2003
Manhattan	170704B	03/15/74	02/15/19	01/20/2004
Minooka	171019B	09/16/88	02/15/19	01/20/2004
Mokena	170705B	04/05/74	02/15/19	01/20/2004
Monee	171029B	09/06/95	02/15/19 (M)	01/20/2004
Naperville	170213B	04/12/74	08/01/19	01/20/2004
New Lenox	170706B	05/24/74	02/15/19	12/16/2003
Orland Park	170140B	03/22/74	11/01/19	01/20/2004
Park Forest	170145B	04/12/74	02/15/19	01/20/2004
Peotone	170709B	03/15/74	02/15/19 (M)	04/20/2004
Plainfield	170771B	11/29/74	02/15/19	01/20/2004
Rockdale	170710B	03/22/74	02/15/19	01/20/2004
Romeoville	170711B	03/29/74	02/15/19	11/18/2003
Sauk Village	170157B	03/08/74	02/15/19	NA
Shorewood	170712B	04/05/74	02/15/19	12/16/2003
Steger	170713	05/03/74	08/19/08	01/20/2004
Symerton	170714	06/30/76	09/06/95	
Tinley Park	170169B	05/17/74	11/01/19	12/16/2003
University Park	170708B	09/19/75	02/15/19	01/20/2004
Will County	170695B	04/22/77	02/15/19	01/20/2004
Wilmington	170715B	04/12/74	02/15/19	01/20/2004
Woodridge	170737B	04/05/74	08/01/19	NA

NSFHA - No Special Flood Hazard Area (All Zone C)
M - No Elevation Determined (All Zone A, C & X)
NA - Multi-county community, may opt to another
∗ - DFIRM dated 02/14/2019 – Zone X, Area of Minimal Flood Hazard; Community historically has not participated in NFIP

National Flood Insurance Program

For many years, the strategy for reducing flood damage followed a structural approach of building dams and levees and making channel modifications. However, this approach did not slow the rising cost of flood damage and did not provide an affordable opportunity for individuals to purchase insurance to protect them from flood losses. It became apparent that a different approach was needed.

The NFIP was instituted in 1968 to make flood insurance available in communities that have agreed to reduce flood losses by regulating and restricting future floodplain development. As a participant in the NFIP, a community must adopt floodplain regulations that:

- Require any new residential construction within the 100-year floodplain to have the lowest floor, including the basement, elevated above the 100-year flood elevation
- Require non-residential structures to be elevated or dry flood proofed above the 100-year flood elevation (the flood proofing must be certified by a registered professional engineer or architect)
- Require anchoring of manufactured homes in flood prone areas.
- The community must also maintain a record of all lowest floor elevations or the elevations to which buildings in flood hazard areas have been flood proofed.[2]

In Illinois, higher standards than the NFIP are required. Buildings must be protected to 1 foot above the 100-year flood elevation. Development in the floodway is also restricted and requires state permits.

In return for adopting floodplain management regulations, the federal government makes flood insurance available to the citizens of the community. In 1973, the NFIP was amended to mandate the purchase of flood insurance, as a condition of any loan that is federally regulated, supervised, or insured for construction activities within the 100-year floodplain. Following this mandate, the mapping of our local floodplains began as communities sought to join the NFIP. Throughout its history, the NFIP has provided tens of billions of dollars in claims helping many thousands of home and business owners to recover from the devastating effects of flooding. As the costs and consequences of flooding increase, it is more important than ever to have access to flood insurance.

[2] FEMA. "A Chronology of Major Events Affecting the National Flood Insurance Program." American Institute for Research, December, 2005.

In 2012, Congress passed the Biggert-Waters Flood Insurance Reform Act of 2012 (BW-12) to continue and strengthen the program. BW-12 required changes to all major components of the program including flood insurance, flood hazard mapping, grants, and the management of floodplains. The Homeowner Flood Insurance Affordability Act of 2014 repealed and modified certain provisions of BW-12. Addressed were refunds, rates, and surcharges; mapping; promotion of mitigation; and provisions for flood insurance advocacy.

Under all of these recent reforms, the cost of flood insurance through the NFIP has increased on the average of 8% a year, with some policies increasing at larger percentage. Many property owners are finding it difficult to sustain the annual premiums. More premium rate changes are coming to the NFIP in 2021 under a program called Risk Rating 2.0.reforms. It is anticipated that these changes will benefit the residents in Will County.

To help property owners that are substantially damaged, the NFIP does offer policy holders $30,000 to cover the cost to mitigate the flood risk. This is called Increased Cost of Compliance (ICC) coverage. ICC covers the cost to bring the structure into compliance, including to elevate, relocate, demolish, or for non-residential dry flood proof. This coverage can be transferred to a local government if the property is acquired to cover the cost of demolition.

Flood Insurance Rate Maps and Flood Insurance Study

The 1968 National Flood Insurance Act required that flood zones be established to define locations subject to higher probability of flooding. Maps were created that showed the location of the 100-year floodplain, known as Special Hazard Flood Areas (SHFA). FEMA's floodplain maps, also called Flood Insurance Rate Maps (FIRM), were the nationally accepted source of data for determining if a building is located in a flood zone. These maps were used to determine the type of construction allowed and assign flood insurance rates. In the 1980s, digital data began to be used to process and produce the paper FIRMs. GIS came of age in the early 1990s and in 2003, a multi-year billion dollar program called Map Modernization began. This effort provided reliable digital FIRM data (DFIRMs) to the GIS community and has brought floodplain management into a new age.

The first flood maps and Flood Insurance Study (FIS) in the county were issued in Naperville in March 1979. Most other communities and the unincorporated area of the county were issued maps

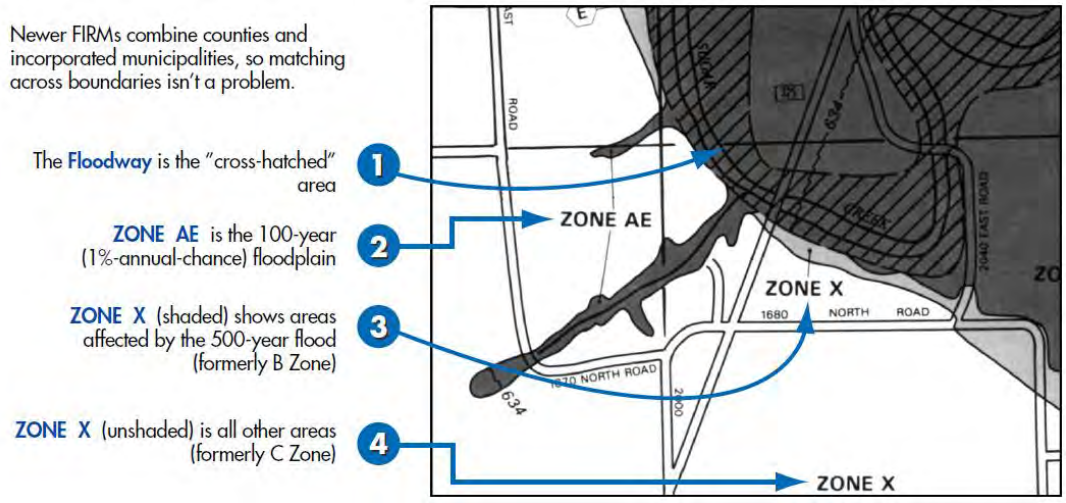
over the next six years for their corporate boundaries until Will County received its first county-wide map in September 1995. On February 15, 2019, the latest county-wide FIRM and FIS were issued for Will County.

The FIRM, combined with the FIS, are designed to provide the user with the ability to determine the flood zone and base flood elevation, for any location in the county. They provide the NFIP community information, map panel information, cross section and hydraulic structure information, flood elevation profiles, and base map information like road, stream, and public land survey data. This data can be found at the FEMA Map Service Center website. The new FIRMs can also be viewed on FEMA's National Flood Hazard Layer viewer as shown in the image below of Rock Run Creek in Joliet.

The Will County GIS Viewer now provides the limits of the floodplain as a layer. The county's GIS can be used in locating and characterizing floodplains accurately, making it a vital tool for emergency managers, planners, building inspectors, insurance agencies, residents, and others.

As an example of the information provided by the county's new DFIRMs, these maps identified parts of City of Joliet's downtown area that potentially lie in the 100 year floodplain which were not shown in previous maps. This has resulted in the City of Joliet and Army Corps of Engineers working together to identify the potential cause and plan for mitigating any issues. (See Mitigation Measures on p. 4-106 for additional information.)

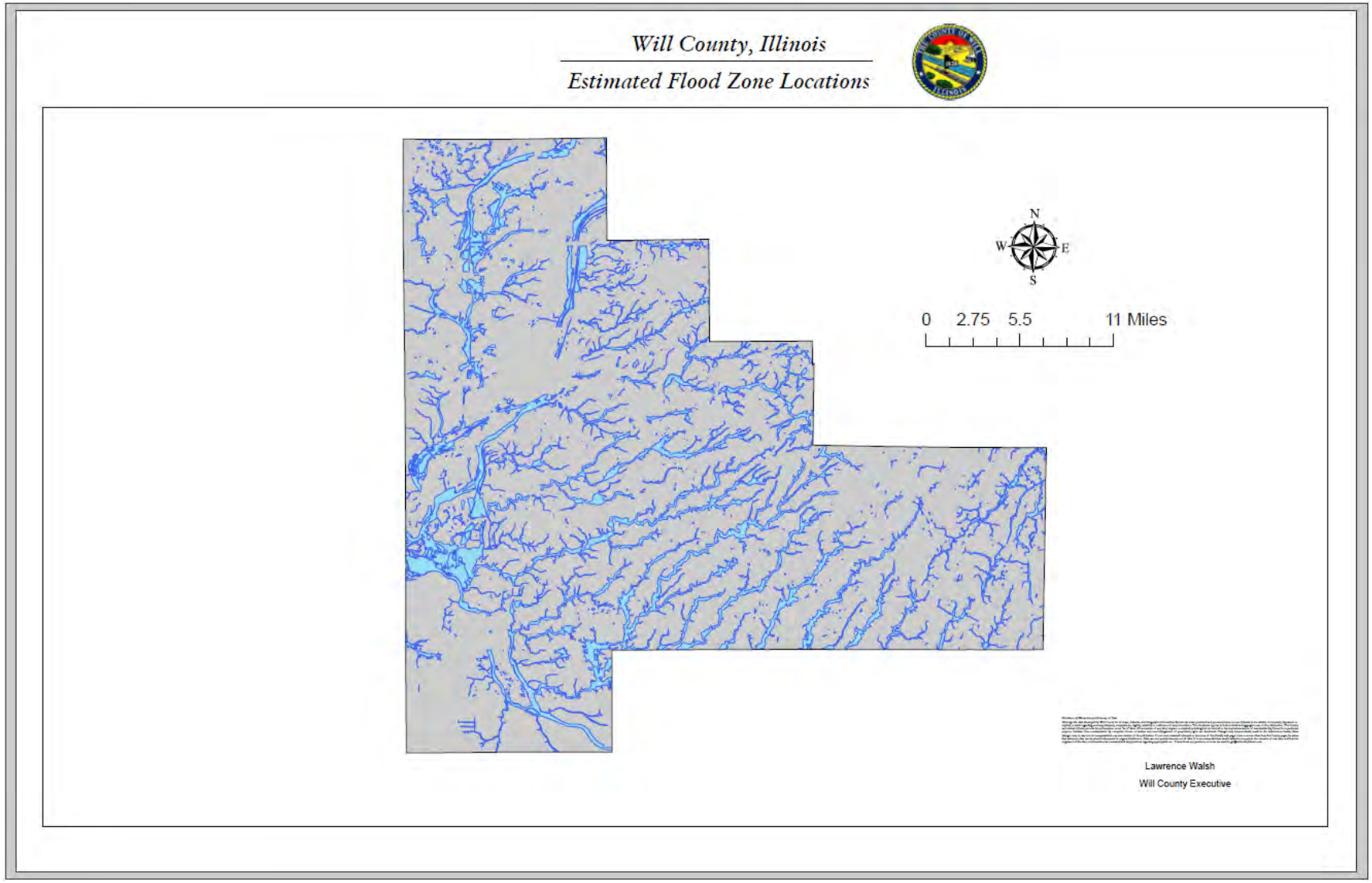
Example of a Flood Insurance Rate Map



Source: Illinois Department of Natural Resources. Office of Water Resources, "Floodplain Management in Illinois: Quick Guide, 2001.

Enhanced Detail of Will County 2019 FIRM

Source: FEMA National Flood Hazard Layer Viewer


Will County, Illinois
Estimated Flood Zone Locations
N
W
E
S
0 2.75 5.5 11 Miles
Lawrence Walsh
Will County Executive

WILL COUNTY NFIP STATISTICS 1978 to 2019											
Community	**Total Losses**	**Open Losses**	**Closed With Pay Losses**	**Closed Without Pay Losses**	**Repetitive Losses**			**Building Payments**	**Contents Payments**	**Increased Cost of Compliance Payments**	**Total Payments ($)**
					# Losses	**# Properties**	**Average Payment**				
TOTAL Will Co.	**2,739**	**4**	**2,199**	**536**	**475**	**151**	**$13,966**	**$20,577,810**	**$4,436,314**	**$30,000**	**$25,044,124**
Aurora*	247	0	203	44				2,276,578	614,563	0	2,891,141
Beecher	5	0	4	1	2	1	6,352	17,840	0	0	17,840
Bolingbrook	55	0	40	15				646,079	172,323	0	818,402
Braceville*	2	0	2	0				55,035	6,431	0	61,466
Braidwood	1	0	1	0				31,932	7,290	0	39,222
Channahon	18	0	14	4				293,139	0	0	293,139
Coal City*	8	0	5	3				48,222	15,113	0	63,336
Crest Hill	10	0	6	4	4	1	3,422	3,045	103,394	0	106,439
Crete	18	0	13	5	9	3	11,749	101,607	10,872	0	112,479
Diamond*	3	0	3	0				52,478	0	0	52,478
Elwood					8	3	4,564				36,511
Frankfort*	18	0	13	5				481,202	15,080	0	496,281
Godley											
Homer Glen	2	0	2	0				6,550	836	0	7,386
Joliet	755	0	618	137				2,594,406	350,667	0	2,945,072
Lemont*	7	0	6	1				30,323	3,665	0	33,988
Lockport	89	0	73	16	14	5	8,068	377,527	160,896	0	538,423
Manhattan	5	0	3	2				52,369	208	0	52,577
Minooka*	5	0	5	0				190,608	21,226	0	211,833
Mokena	8	0	5	3				12,080	1,862	0	13,942
Monee											
Naperville*	173	0	114	59				986,366	122,803	0	1,109,169
New Lenox	48	1	38	98	25	7	18,068	212,067	232,927	0	444,994
Orland Park*	69	0	53	16				649,782	157,348	0	807,129
Oswego*	8	0	4	4				55,400	0	0	55,400
Park Forest*											
Peotone	1	0	1	0				1,334	859	0	2,193
Plainfield	85	0	74	11				1,753,806	187,956	0	1,941,762
Rockdale	2	0	1	1				8,118	3,209	0	11,326
Romeoville	8	0	6	2	2	1	5,141	27,512	20,807	0	48,318
Sauk Village*	12	0	7	5				22,731	8,599	0	31,330
Shorewood	65	0	55	10	9	3	16,479	811,222	161,961	0	973,184
Steger*	13	1	10	2				212,373	5,795	0	218,168
Symerton	1	0	0	1				0	0	0	0
Tinley Park*	72	0	37	35				104,230	9,199	0	113,429
University Park	2	0	0	2				0	0	0	0
Will County Unincorporated	907	2	769	136	385	120	14,229	8,305,064	2,010,390	30,000	10,345,454
Wilmington					17	7	15,030				
Woodridge*	17	0	14	3				156,789	30,037	0	186,825

* Jurisdictions that border or have only a portion of their corporate limits in Will County

WILL COUNTY NFIP STATISTICS As of 12/31/2019			
Community	**Policies in Force**	**Insurance In-Force ($)**	**Written Premium In-Force ($)**
TOTAL Will Co.	3,040	623,401,400	2,898.340
Aurora*	604	96,795,000	432,012
Beecher	3	1,850,000	2,399
Bolingbrook	52	11,776,300	33,391
Braceville*	3	1,050,000	2,913
Braidwood	6	1,500,000	2,808
Channahon	19	5,663,000	22,682
Coal City*	2	62,000	658
Crest Hill	14	4,722,900	9,667
Crete	10	1,920,00	6,377
Diamond*	3	591,000	1,773
Elwood			
Frankfort	50	12,153,500	37,751
Godley*			
Homer Glen	31	8,723,900	31,050
Joliet	588	85,821,300	791,843
Lemont*	3	1,050,000	1,336
Lockport	33	7,630,400	50,520
Manhattan	2	700,000	892
Minooka*	15	3,691,000	7,967
Mokena	18	5,386,000	17,678
128Monee	1	100,000	264
Naperville*	499	119,636,200	345,813
New Lenox	24	7,183,500	27,398
Orland Park*	60	18,861,200	45,107
Oswego*	41	10,533,000	31,256
Park Forest*	9	1,694,000	2,845
Peotone	4	420,000	2,893
Plainfield	73	21,171,100	60,700
Rockdale	1	250,000	1,182
Romeoville	10	2,479,500	5,326
Sauk Village*	12	3,883,000	14,485
Shorewood	43	12,024,300	38,205
Steger*	14	3,783,500	17,461
Symerton	1	350,000	446
Tinley Park*	186	36,036,700	161,208
University Park	3	928,000	2,322
Will County Unincorporated	553	119,914,700	633,198
Wilmington	25	5,211,400	37,017
Woodridge*	25	7,855,000	17,497

* Jurisdictions that border or have only a portion of their corporate limits in Will County

Will County Repetitive Flood Losses and Mitigation Spending (2020 Data)				
Occupancy		**Count**		**Total Losses**
		1%Annual Chance Flood (100 yr)	**0.2% Annual Chance Flood (500 yr)**	
Residential	Single-family	121	34	$6,580,110
	Multi-family	3	2	$148,784
	Condo	4		$338,301
Commercial		13	5	1,992,330
Total:		141	41	$9,059,525
Total Mitigation Funding Spent since 1996				$10.6 million
Mitigation Funding - 1996				$4.1 million
Mitigation Funding - 2008				$6.5 million

FLASH FLOODS

Hazard Characterization

Flash floods are a result of torrential rainfall over a short period of time, a sudden release of water from a dam failure, or breakup of an ice jam. These floods occur suddenly with tremendous force. Flash floods can turn calm rivers and streams into a turbulent torrent that is able to carry away boulders, trees, houses, trailers, cars, and people.

Flash flooding is a major killer. All flash floods strike quickly and end swiftly. They can be deadly because they produce rapid rises in water levels and have devastating flow velocities. Many flash floods occur at night when they are difficult to see. Most flash flood deaths are related to vehicles being washed away. People are warned not to attempt driving or walking across a flooded area because as little as two feet of moving water will carry most cars away.

Flash floods can occur within several seconds to several hours and with little warning. Several factors contribute to flash flooding. Among these are rainfall intensity, rainfall duration, surface conditions, and topography and slope of the receiving basin. Most flash flooding is caused by slow-moving thunderstorms in a local area or by heavy rains associated with hurricanes and tropical storms. Although flash flooding occurs often along mountain streams, it is also common in urbanized areas where much of the ground is covered by impervious surfaces.

Areas with steep slopes and narrow stream valleys are particularly vulnerable to flash flooding, as are the banks of small tributary streams. In hilly areas, the high-velocity flows and short warning time make flash floods hazardous and very destructive. Flash floods also can be caused by high intensity rainfall; infrastructure failure such as stormwater storage basin, dam, or levee; the release of ice-jam flooding; or debris.

ICE JAMS

Hazard Characteristics

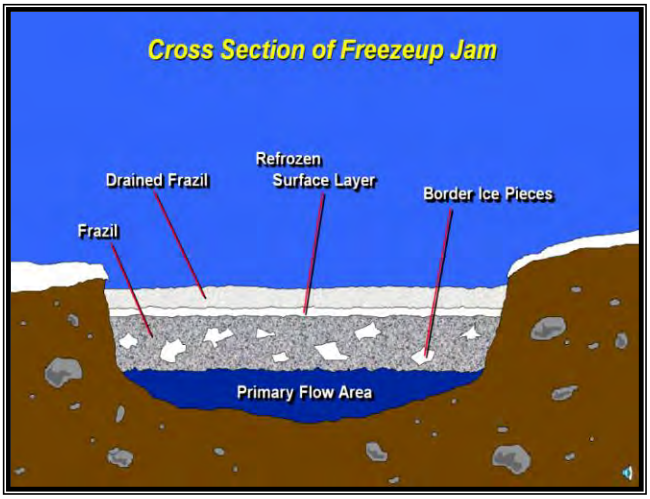
Ice jams develop when mild temperatures occur in a location with deep snow cover and totally or partially frozen rivers. The rising water in rivers then breaks the ice layer into large chunks. As these chunks float downriver, they accumulate near obstructions, bridges, and dams. This ice jam then creates a dam across

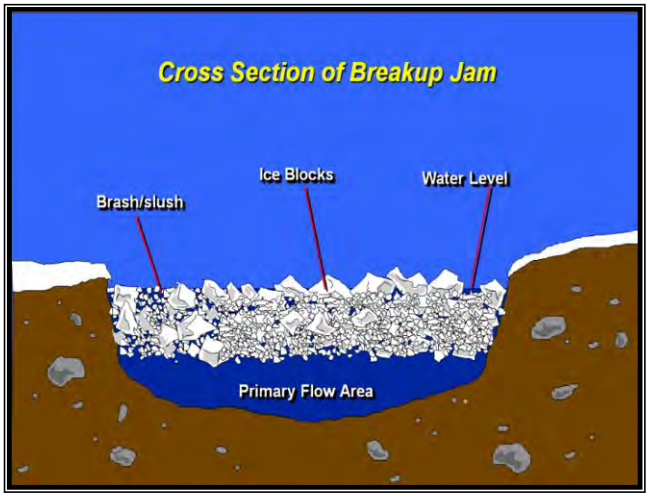
the channel over which the water and ice mixture continues to flow allowing more jamming to occur. Backwater upstream from the ice dam forces the water to overflow, flooding the surrounding area and damaging low-lying areas and municipal structures. Flooding moves downstream when the ice dam fails, and the water stored behind the dam is released. At this time, the flood takes on the characteristics of a flash flood, with the added danger of ice flows, that when driven by the energy of the flood-wave, can inflict serious damage on structures.

An added danger of being caught in an ice-jam flood is hypothermia, which can kill quickly. The highest percentage of ice jams occur in the month of January followed by the month of March.

There are generally two types of ice jams:

- Frazil ice freezes the river and forms a dam.
- When warm weather and rain break up frozen rivers or any time there is a rapid cycle of freezing and thawing, broken ice floats downriver until it is blocked by an obstruction such as a bridge or shallow area.





Ice jams present three hazards:

- Sudden flooding of areas upstream from the jam, often on clear days with little or no warning.
- Sudden flooding of areas downstream when an ice jam breaks. The impact is similar to a dam break, damaging or destroying buildings and structures.
- Movement of ice chunks that can push over trees and crush buildings.

History: Flood, Flash Flood, and Ice Jams

The Kankakee River downstream of Wilmington is prone to Ice Jams

Will County has always been afflicted by the constant damage and destruction of flooding. Damage caused by the 1974 floods was sufficient to declare the county to be a Presidential disaster area. Once again, a Presidential disaster would be declared in this area due to the flooding in June, 1981. The DuPage River was declared a State Disaster area from the flooding of July 1983, which included the Will County townships of DuPage, Homer, Lockport, Plainfield, and Troy. Federal disasters were again declared for flooding, including the DuPage River area, occurring in July 1996; September 2008; and April 2013. Mitigation funding of approximately $10.6 million has been spent in Will County from the 1996 and 2008 floods.

Severe Storms and Flooding – July 17 to August 7, 1996
Federal Disaster Declaration #1129
Public Assistance - $4,265,671
Individual Assistance - $933,042 (974 referrals)

Severe storms and torrential rains began on July 17th and continued intermittently through August 7, 1996. Nearly 17 inches of rain fell in northern Will County on July 17th and 18th. Flash flooding resulted in widespread power outages, disruption of commuter rail service, and the flooding of thousands of homes and hundreds of businesses. Major transportation routes including interstate highways, city streets, and commuter rail lines were closed due to the flooding. Damage was widespread throughout Will County with several millions of dollars in property damage. Major flooding occurred in the western half of the county in the townships of Lockport, New Lenox, Joliet, Wheatland, DuPage, Homer, Frankfort, Troy, Wilton, Plainfield, Crete, and Channahon. As a result of the federal declaration, grants and low interest loans were made available to homeowners. Home located along the DuPage River were purchased by the federal government in Plainfield, Shorewood, and Channahon. Public assistance helped to rebuild roads and bridges that were destroyed or damaged as a result of the flooding.

Severe Storms and Flooding – September 13, 2008
Federal Disaster Declaration #1800
Public Assistance - $667,787
Individual Assistance - $1,438,500 (1,159 referrals)

A flood watch was put into effect in the early morning of September 13th and continued into September 15, 2008. A tornado watch also occurred on September 13th. Rainfall amounts varied around the county from 6 to 9 inches with the heaviest amounts occurring in the central and eastern parts of the county. Flooding issues included sewer back-ups, flooded roads, river flooding, and water in basements. Flooding prompted road closures affected approximately 25 arterial streets along with numerous side streets. The DuPage River level rose to 23.86 feet, surpassing the record set in 1996, causing flooding in the Bolingbrook area. Plainfield, Joliet, and Shorewood undertook sandbagging efforts at various locations along the DuPage River with several homes in the Plainfield area evacuated due to rising water. Sporadic instances of motorists becoming trapped attempting to drive through high water occurred. Beecher experienced a partial disruption to its sanitary sewer system resulting in sewer back-ups in several homes.

The Will County EMA website was a source of information for the public on current flood conditions and weather advisories, what to do if their home was flooded, links to river gauges in Will County, and available monetary assistance for flood damaged homes. Along with traditional news media, the county's websites provided an information resource for those seeking assistance available under the federal and state emergency declarations.

Severe Storms and Flooding – April 18, 2013
Federal Disaster Declaration #4116
Public Assistance - $1,238,434
Individual Assistance - $4,368,244 (2,385 referrals)

In April 2013, Will County and other northern Illinois counties experienced a large amount of precipitation within a short period of time. The rain began on April 17th and continued into April 19th causing severe flooding throughout the county resulting in damage to roads, businesses, and homes. Rain totals varied from 3" to almost 7" across the county. Areas along the DuPage River including western Joliet, Plainfield, and Shorewood generally received the heaviest rainfall amounts. The Kankakee and Des Plaines Rivers did not experience flooding; however all watersheds

tributary to those rivers overflowed. Road closures were experienced in Bolingbrook, Joliet, Naperville, and Plainfield along with closures on state roads and inter-state highways. Limited power outages were experienced. Public safety communications for several fire departments in the southwest portion of the county were disrupted due to the flooding of their primary communications tower. Schools were closed in Plainfield, Wilmington, and one elementary school in Joliet. Plainfield temporarily sheltered 12 residents at one of their high schools. Will County hospitals supported Morris Hospital with their evacuation effort. Thirty-eight counties were declared in a "state of emergency" by Governor Quinn with thirty-three counties declared federal disasters.

IMPACT OF FLOOD/FLASH FLOOD EVENTS ON WILL COUNTY (Source: National Climatic Data Center / WC EMA)								
Location	**Date**	**Time**	**Type**	**Deaths**	**Injuries**	**Property Damage**	**Crop Damage**	**Federal Declaration**
Will Co.	06/10/1974		Flood					DR-438
Will Co.	06/30/1981		Flood					DR-643
Will Co.	02/23/1985		Flood					DR-735
Will Co.	05/15/1993		Flood	0	1	0	0	
Will Co.	06/01/1995		Flood	0	0	0	0	
Will Co.	04/22/1996	04:00 AM	Flood	0	0	35K	30K	
Will Co.	05/01/1996	12:01 AM	Flood	0	0	100K	0	
Will Co.	07/17/1996	06:00 PM	Flash Flood	2	0	0	0	
Will Co.	07/18/1996		Flood					DR-1129
Will Co.	02/20/1997							
Will Co.	05/06/1998	12:45 PM	Flash Flood	0	0	0	0	
Will Co.	08/03/1998	11:00 PM	Flood	0	0	0	0	
Will Co.	04/27/1999	08:45 AM	Flood	0	0	0	0	
Custer Park	06/22/1999	04:15 PM	Flash Flood	0	0	0	0	
	06/17/2000	07:00 AM	Flood	0	0	10K	0	
Will Co.	07/10/2000	04:00 AM	Flash Flood	0	0	0	0	
Plainfield	10/13/2001	04:15 PM	Flash Flood	0	0		0	
	12/17/2001	02:00 AM	Flood	0	0	8K	0	
Will Co.	07/27/2003	11:30 AM	Flash Flood	0	0	140M	0	
Will Co.	08/03/2003	04:45 PM	Flash Flood	0	0	500K	0	
Joliet, Romeoville, Mokena & Lockport	04/20/2004	06:35 PM	Flash Flood	0	0	0	0	
Will Co.	05/13/2004	04:45 PM	Flash Flood	0	0	0	0	
Channahon, Monee, Joliet	05/30/2004	06:25 PM	Flash Flood	0	0	0	0	
Will Co.	06/10/2004	05:59 PM	Flash Flood	0	0	0	0	
Will Co.	06/11/2004	09:15 PM	Flash Flood	0	0	0	0	
Will Co.	01/13/2005	01:05 AM	Flood	0	0	0	0	
Will Co.	02/14/2005	03:07 AM	Flood	0	0	0	0	
Will Co.	03/30/2005	07:20 PM	Flood	0	0	0	0	
Will Co.	06/04/2005	04:20 PM	Flash Flood	0	0	0	0	
Beecher	04/16/2006	03:42 PM	Flood	0	0	0	0	
Lockport	07/11/2006	10:30 PM	Flood	0	0	0	0	
Will Co.	07/27/2006	03:36 PM	Flood/Flash Flood	0	0	0	0	
Joliet	08/10/2006	08:20 AM	Flood	0	0	0	0	
Channahon	09/13/2006	07:00 AM	Flood	0	0	0	0	
Bolingbrook	10/02/2006		Flash Flood	0	0	600,000		
Romeoville	03/01/2007	09:45 AM	Flood	0	0	0	0	
Joliet	05/26/2007	03:11 PM	Flood	0	0	0	0	
Joliet	06/26/2007	01:30 PM	Flood	0	0	0	0	
Joliet	07/18/2007	09:23 PM	Flood	0	0	0	0	
Romeoville	08/05/2007	05:05 PM	Flood	0	0	0	0	
Romeoville	08/22/2007	09:30 PM	Flood	0	0	0	0	

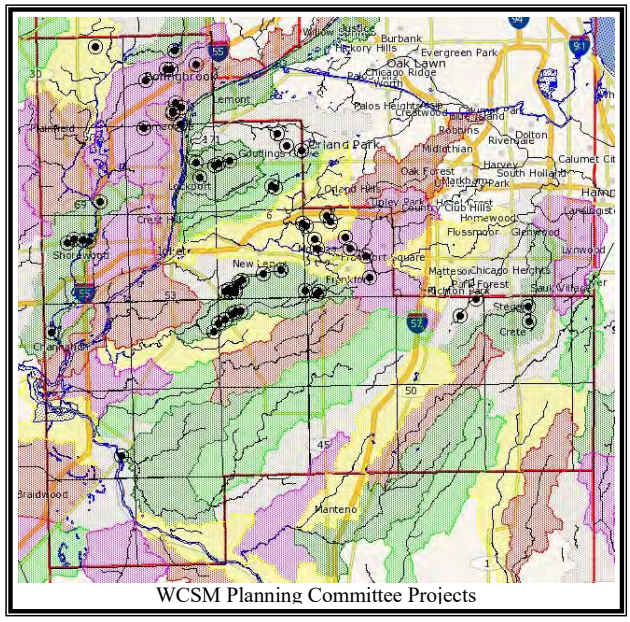
IMPACT OF FLOOD/FLASH FLOOD EVENTS ON WILL COUNTY (cont.) (Source: National Climatic Data Center / WC EMA)								
Location	**Date**	**Time**	**Type**	**Deaths**	**Injuries**	**Property Damage**	**Crop Damage**	**Federal Declaration**
Joliet	08/23/2007	06:05 PM	Flood	0	0	0	0	
Crest Hill				0	0	0	0	
Crete								
Peotone		08:12 PM		0	0	$25 K	0	
Plainfield		08:21 PM		0	0	0	0	
New Lenox								
Bolingbrook,		06:00 PM	Flash Flood	0	0	0		
Wilmington		09:30 PM		0	0	$15 K	0	
Romeoville	01/08/2008	06:10 AM	Flood	0	0	0	0	
Mokena								
Crete		08:00 AM	Flash Flood	0	0	0	0	
Wilmington	01/22/2008	11:34 AM	Flash Flood	0	0	$100 K	0	
Crest Hill	02/17/2008	03:45 PM	Flood	0	0	0	0	
Joliet	06/04/2008	11:33 PM	Flash Flood	0	0	0	0	
Crest Hill	08/04/2008	07:50 PM	Flood	0	0	0	0	
Will County	09/14/2008	03:30 PM	Flood	0	0	0	0	DR-1800
		07:00 AM	Flash Flood	0	0	$1 M	0	
Lockport		07:00 AM	Flash Flood	0	0	$500 K	0	
Tinley Park	02/26/2009	09:00 PM	Flood	0	0	0	0	
Joliet	03/08/2009	12:10 PM	Flood	0	0	0	0	
Lemont								
Peotone								
Fairmont								
Plainfield	05/26/2009	07:00 PM	Flood	0	0	0	0	
Will County	06/16/2009	05:15 PM	Flash Flood	0	0	0	0	
Ingalls Park	06/23/2010	05:15 PM	Flood	0	0	0	0	
Bolingbrook								
New Lenox		06:45 PM	Flash Flood	0	0	0		
New Lenox	07/24/2010	10:02 PM	Flood	0	0	0	0	
Peotone	07/25/2010	01:15 AM	Flood	0	0	0	0	
Wilton Center	08/03/2010	04:30 AM	Flash Flood	0	0	0	0	
Will County		04:30 AM		0	0	$1 M		
Monee	05/28/2011	06:23 PM	Flood	0	0	0	0	
Crete		06:30 PM	Flash Flood	0	0	0	0	
Lemont	06/09/2011	08:05 PM	Flood	0	0	0	0	
Romeoville								
Peotone								
Plainfield		06:10 am	Flash Flood	0	0	0	0	
Wilmington	05/07/2012	11:00 AM	Flash Flood	0	0	0	0	
		01:00 PM		0	0	0	0	
Plainfield Twp.	03/10/2013	06:05 AM	Flood	0	0	0	0	
Will County	04/18/2013		Flood	0	0	0	0	DR-4116
			Flash Flood	0	0	0	0	

IMPACT OF FLOOD/FLASH FLOOD EVENTS ON WILL COUNTY (cont.) (Source: National Climatic Data Center / WC EMA)								
Location	**Date**	**Time**	**Type**	**Deaths**	**Injuries**	**Property Damage**	**Crop Damage**	**Federal Declaration**
Bolingbrook	05/28/2013	07:55 PM	Flood	0	0	0	0	
Joliet	06/21/2014	5:45 PM	Flood	0	0	0	0	
Eagle Lake		5:57 PM	Flash Flood	0	0	0	0	
Monee Sanger Airport	06/07/2015	03:35 PM	Flood	0	0	0	0	
Crete		03:45 PM		0	0	0	0	
Joliet	06/10/2015	06:05 PM	Flood	0	0	0	0	
Wilmington	06/15/2015	10:15 AM	Flash Flood	0	0	0	0	
Ritchie	06/22/2015	09:50 PM	Flash Flood	0	0	0	0	
Godley	08/28/2016	01:30 PM	Flash Flood	0	0	1.0 K		
Joliet	02/28/2017	06:15 PM	Flood	0	0	0	0	
Joliet Twp.		06:30 PM		0	0	0	0	
Plainfield Clow Airport	07/23/2017	04:20 PM	Flood	0	0	0	0	
Crystal Lawns		04:50 PM		0	0	0	0	
Steger	10/14/2017	08:15 PM	Flood	0	0	0	0	
Crete Twp.	02/19/2018	11:30 PM	Flash Flood	0	0	0	0	
Peotone	02/20/2018	00:00	Flood	0	0	0	0	
Wilmington Twp.	02/06/2019	09:00 AM	Flash Flood	0	0	0	0	
Joliet Twp.	04/30/2019	03:00 PM	Flood	0	0	0	0	
Andres	05/01/2019	00:00	Flood	0	0	0	0	
Ridgewood				0	0	0	0	
Wolfs	05/27/2019	01:00 PM	Flood	0	0	0	0	
Plainfield Clow Airport		01:15 PM		0	0	0	0	
Steger	06/26/2019	11:30 PM	Flash Flood	0	0	0	0	
Raynor Park	06/30/2019	11:30 PM	Flood	0	0	0	0	
Wheatland Twp.	09/27/2019		Flash Flood	0	0	0	0	
Brunning				0	0	0	0	
Wheatland Twp.	09/28/2019		Flood	0	0	0	0	
Brunning				0	0	0	0	
Plainfield Twp.	10/26/2019		Flood	0	0	0	0	

IMPACT OF ICE JAM EVENTS ON WILL COUNTY (Source: National Climatic Data Center / WC EMA)							
Date	**Town**	**River**	**Discharge (cfs)**	**Date**	**Town**	**River**	**Discharge (cfs)**
01/21/1916	Wilmington	Kankakee		03/08/1979	Shorewood	DuPage	
02/14/1918	Wilmington	Kankakee		12/17/1979	Shorewood	DuPage	60
02/07/1924	Wilmington	Kankakee	16,600	02/22/1980	Joliet	Hickory Creek	490
02/05/1027	Wilmington	Kankakee	20,100	02/23/1982	Wilmington	Kankakee	
12/09/1927	Wilmington	Kankakee	24,000	02/01/1984	Wilmington	Kankakee	
01/12/1928	Wilmington	Kankakee	13,100	02/07/1985	Wilmington	Kankakee	
01/23/1929	Wilmington	Kankakee	18,100	02/23/1985	Wilmington	Kankakee	50,000
01/04/1930	Wilmington	Kankakee	15,600	12/23/1985	Wilmington	Kankakee	50,000
02/15/1935	Wilmington	Kankakee		01/17/1988	Joliet	Hickory Creek	
02/29/1936	Wilmington	Kankakee	16,000	01/19/1988	Wilmington	Kankakee	
01/28/1937	Wilmington	Kankakee		02/18/1988	Wilmington	Kankakee	
02/20/1939	Wilmington	Kankakee	15,000	12/28/1990	Wilmington	Kankakee	
02/06/1943	Wilmington	Kankakee	15,000	02/26/1993	Wilmington	Kankakee	
02/19/1946	Wilmington	Kankakee		02/19/1994	Wilmington	Kankakee	
02/15/1947	Troy	DuPage	1,500	01/08/1996	Troy	DuPage	115
02/28/1948	Wilmington	Kankakee		01/12/1996	Wilmington	Kankakee	
02/01/1949	Wilmington	Kankakee		12/26/1996	Wilmington	Kankakee	
02/13/1049	Troy	DuPage	4,500	12/26/1996	Wilmington	Kankakee	
03/03/1950	Wilmington	Kankakee		01/27/1997	Shorewood	DuPage	
02/19/1951	Wilmington	Kankakee	30,000	01/22/1999	Joliet	Hickory Creek	600
01/31/1952	Wilmington	Kankakee		01/21/2000	Shorewood	DuPage	64
02/20/1955	Custer Park	Terry Creek		01/27/2000	Joliet	Hickory Creek	9.2
02/20/1955	Wilmington	Kankakee		12/26/2000	Joliet	Hickory Creek	8.6
11/17/1955	Troy	DuPage	.2	02/01/2001	Wilmington	Kankakee	
02/19/1957	Wilmington	Kankakee		12/31/2001	Wilmington	Kankakee	
01/09/1958	Wilmington	Kankakee		12/06/2002	Shorewood	DuPage	117
02/14/1959	Wilmington	Kankakee		01/11/2003	Shorewood	DuPage	113
02/13/1959	Wilmington	Kankakee		12/24/2004	Wilmington	Kankakee	
01/23/1960	Wilmington	Kankakee		02/01/2007	Wilmington	Kankakee	
03/08/1963	Wilmington	Kankakee		02/25/2007	Wilmington	Kankakee	
02/08/1965	Troy	DuPage	1,400	01/20/2008	Wilmington	Kankakee	
02/22/1965	Troy	DuPage	89	01/24/2008	Wilmington	Kankakee	7,100
01/17/1966	Wilmington	Kankakee		12/22/2008	Wilmington	Kankakee	
02/16/1967	Wilmington	Kankakee	5,000	12/27/2008	Wilmington	Kankakee	
01/30/1968	Wilmington	Kankakee		12/29/2008	Shorewood	DuPage	
02/19/1971	Shorewood	DuPage	1,400	01/14/2009	Wilmington	Kankakee	
02/19/1971	Joliet	Hickory Creek	560	01/03/2010	Wilmington	Kankakee	
01/21/1974	Wilmington	Kankakee		01/10/2010	Joliet	Hickory Creek	5.4
12/17/1978	Wilmington	Kankakee	10,000	01/10/2011	Wilmington	Kankakee	
12/29/1978	Wilmington	Kankakee	508	01/07/2015	Wilmington	Kankakee	
03/04/1979	Joliet	Hickory Creek	1,880	01/21/2016	Wilmington	Kankakee	
03/08/1979	Wilmington	Kankakee	48,000	01/26/2019	Wilmington	Kankakee	

Mitigation Measures

To address flooding issues within Will County after the 1996 flood, the Will County Comprehensive Stormwater Management Plan was developed in 1998. It established the WCSM Planning Committee (see p. 4-85), composed of municipal and County Board members, who were tasked to develop a county-wide ordinance to address stormwater and floodplain management. This ordinance, the WCSM Ordinance, has set the minimum standards for flood control issues throughout the county and is adopted and implemented by all municipalities in the county. The WCSM Planning Committee identifies flood mitigation projects through the recommendations of municipalities, review of available watershed studies, and evaluation of flood incidents. The WCSM Planning Committee works with surrounding counties to address flooding issues with watersheds that cross county borders. Some examples of their projects are available from: https://www.willcountyillinois.com/County-Offices/Economic-Development/Stormwater-Management-Planning-Committee/Plans-Projects.



WCSM Planning Committee Projects

Many types of flood mitigation measures are available to the WCSM Planning Committee and community partners. Some for them to consider are:

- Maintaining and implementing the Will County Comprehensive Stormwater Management Plan to identify flooding issues and strategizing methods to address those issues will continue to reduce damages to infrastructure and buildings. Issues to be addressed in the county's watersheds by the WCSM Planning Committee include surface flooding, stream maintenance, erosion/sedimentation control, water quality, watershed education, infrastructure maintenance, agency coordination, and property damage.
- Improving enforcement of the Will County Water Resource Ordinance and Stormwater Management Ordinance, especially as it pertains to completion of post-flood damage assessments and implementation of the substantial improvement and substantial damage provisions.

- Improving WCSM Planning Committee planning and project prioritization by conducting watershed studies that provide an analysis of each watershed's function, behavior, physical characteristics, and population/land use distribution. The studies will document the flooding issues in each watershed for development of a flood mitigation project list and provide the WCSM Planning Committee with a basis for cost/benefit analysis, project prioritization, and partner support.
- The adoption of IBC and IRC building standards (see p. 5-13 for jurisdictions) and development plans (see p. 5-11 for jurisdictional plans) have helped to alleviate flooding issues in construction that has occurred after a communities first FIRM, which defined the community's floodplains..
- Federal funding after the 1996 and 2008 floods has helped to purchase or retrofit older buildings located in floodplains. A large share of the properties purchased after the 1996 flood were located along the DuPage River and Jackson Creek. Buyouts after the 2008 were residential in nature and targeted properties located in Plainfield, Channahon, and Crete Townships. Continued buyouts of pre-FIRM structures in special flood hazard areas or retrofitting will help to alleviate issues with repetitive loss properties.
- Improved technology in monitoring rain and stream gauges allows the NWS and USGS to develop better forecasting models and real-time data that will enable government agencies, private institutions, and individuals to make more informed decisions about risk based policies and actions to mitigate the dangers posed by floods. Additionally, improved forecasting and real-time data combined with the latest in communications and alert systems will also mitigate the dangers of floods and help to save lives. Will County Land Use Department and Emergency Management Agency (EMA) continue to partner with the NWS, USGS, and other agencies to improve forecasting, utilize advanced technology, implement mitigation measures, and maintain planning to ensure the public's safety.
- Communities within Will County are part of the NFIP and under the Will County *Water Resource Ordinance and Stormwater Management Ordinance* already exceed the minimum standards of the NFIP. The county and communities could further improve their floodplain management by participating in the NFIP's Community Rating System (CRS) program. The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements in areas such as public outreach, stream maintenance, floodplain open space preservation, and acquisition of floodplain structures.

Through this program, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from meeting the three goals of the CRS: Reduce flood damage to insurable property, strengthen and support the insurance aspects of the NFIP, and encourage a comprehensive approach to floodplain management.

- Identifying critical facilities located in the 100-year and 500-year floodplain with GIS and maintain a data-base to prioritize for flood mitigation and emergency planning.
- Developing and maintaining a county-wide database of flood prone properties to be acquired.
- Another important mitigation measure is flood risk and mitigation techniques education. Federal and state agencies provide a wealth of information on flood risks and dangers which can be provided to the public in flood prone areas. Also, it is important to inform the public about the availability of flood insurance. Other education outreach can inform the public about mitigation techniques that they can implement at their homes or businesses. Educational material can be provided to the public through expanding communication technology. Print material can be distributed through traditional methods of brochures, news media, newsletters, or presentations at community events. Websites and the growing social media are other educational avenues to reach the public. Smartphone applications (apps) are another effective educational tool. County and communities can continue their public education by adding new and improved communication tools to their outreach efforts.
- *City of Joliet and I&M Canal*

  The DFIRMS that went into effect in Will County on February 15, 2019, placed a large portion of the City of Joliet's downtown area into the 100-year floodplain. Prior to these new maps, the area was not considered to be located in the floodplain. The basis for the change is a scenario in which the Des Plaines River, where flood walls terminate, would backup into the I&M Canal causing the water to overtop some existing ground elevations adjacent to the canal. The City of Joliet has joined with the Army Corp of Engineers to develop a plan to raise existing lower ground elevations above the 100-year floodplain elevation and certify the new ground elevations as a levee. The intent of mitigation is to remove the floodplain from this area.

Flood Mitigation Projects

As part of WCSM Planning Committee mitigation planning, projects are identified for maintenance, repairs, study, flood mitigation, etc. Below is a list of potential projects. Some are current projects, others are ongoing, awaiting funding, in planning, or to be studied.

WILL COUNTY STORMWATER MANAGEMENT ONGOING AND COMPLETED PROJECTS		
River & Stream Projects	Multi-year	US Army Corps of Engineers, DuPage River Engineering & Implementation (multiyear)
	2018	Washington Street Streambank Stabilization (City of Joliet)
		Crystal Creek Streambank Stabilization (Village of Mokena)
		Hickory Creek Streambank Stabilization (Village of New Lenox with NL VFW)
	2017	DuPage River Bank Stabilization Projects (Bolingbrook Park District)
	2014	Stream maintenance, Village of Monee
Drainage Improvements	2020	Jasmine Ditch Restoration (City of Crest Hill)
		Symerton Road Drainage Improvements (Florence Township)
		Bradshaw Subdivision Drainage Restoration (New Lenox Township)
		Stevens Lane Drainage (Wilmington & Wilmington Tsp, Willett Hoffman design)
		Wilton Township Drainage and culvert projects
	2019	Raynor Ave Storm Sewer (City of Crest Hill)
		Bio retention basin (City of Joliet)
		Abby Glenn Drainage Improvement (City of Lockport)
		Birch Drive Drainage Improvement (Village of Shorewood)
		Walsh Road Bridge & Ditch Cleaning (Wilton Township)
		County Line & Cedar Road Ditch Cleaning and install pipe (Wilton Township)
		Knollcrest Unit 2 Subdivision Drainage Restoration (New Lenox Township)
	2018	Root Street Drainage (City of Crest Hill)
		Replace/maintain W Brittany Lane tile (Green Garden Township)
		Natures Crossing Drainage (Plainfield Park District)
		Countyline Road Ditching (Plainfield Township)
	2017	Thorne Creek Subdivision Drainage Improvement (Village of Park Forest)
	2015	Sunnyland Subdivision Stormwater and Drainage Improvement Project

WILL COUNTY STORMWATER MANAGEMENT ONGOING AND COMPLETED PROJECTS		
Erosion Management	2018	Pilcher Park Erosion Management Project (Joliet Park District)
	2017	Riverwoods Creek Erosion Control Project (Village of Bolingbrook)
Storm Sewer & Retention Pond Improvements/Repairs	2020	Rain Garden (City of Joliet)
		Broken Arrow (City of Lockport)
		Main Street Storm Sewer Phase 3 (Village of Monee)
		Prairie Ponds Outlet (Village of Plainfield)
		Crystal Lawns Subdivision (Plainfield Township)
		Shell Lake, Phase 2 (Wheatland Township)
	2019	Bristol Park Storm Sewer collapse (New Lenox Park District)
		Main Street Storm Sewer Phase 2 (Village of Monee)
		Clow Creek Industrial Park (Wheatland Township)
		Kankakee River Drive Improvements- 3 locations (Wilmington Township)
	2018	Main Street Storm Sewer Phase I (Village of Monee)
	2017	Durness Court Storm Sewer Reconstruction (City of Crest Hill)
		Rain Garden at East Waste Water treatment Plant (City of Joliet)
		Porter Plaza Storm Sewer Project (City of Lockport)
		Rain Gardens (Villages of Mokena and New Lenox with Hickory Creek Watershed Planning Group)
		Thorne Creek Subdivision Drainage Improvement (Village of Park Forest)
	2015	Wheatland Township – Clow Creek Drainage Improvement Project
		City of Lockport 3rd and Summit Storm Water Project
	2014	Storm sewer installation, Village of Crest Hill

PROPOSED PROJECTS	
Drainage & Storm Sewer Improvements/Maintenance	Briarcliff Rd Storm Sewer Replacement (Village of Bolingbrook)
	Box culvert repair and maintenance (Create Township)
	Root/Grandview storm sewer extension (City of Crest Hill)
	Pilcher Park BMPs (Joliet Park District)
	West Park Drainage Improvement (Joliet Park District)
	Bonnie Brea storm sewer rehab (City of Lockport)
	Rain Garden (Village of Mokena)
	Rain Garden (Village of Mokena)
	Lilly Cache Acers Subdivision drainage (Plainfield Township)
River & Stream Projecs	US Army Corps of Engineers, DuPage River Engineering & Implementation
	Milne Creek Streambank Stabilization (City of Lockport, HLR design)

2009 Watershed Districts Survey

In 2009, a survey was conducted of the watershed districts. The tables below include a description of problems for each watershed. Some of these problems have been addressed since the survey was conducted, others are ongoing, being studied, in planning, awaiting funding, or not active at this time. As funding and time allows, a new survey would assist in identifying the current status of these items and additional needs.

Will County Watershed Concerns Legend:

Description of Stream Problem	*Category*
Flooding = Surface Flooding	**A = Flood Control - Debris removal**
Maintenance = Stream Maintenance	**B = Water Quality**
Erosion = Erosion/Sedimentation Control	**C = Ecosystem Enhancement**
Water = Water Quality	**D = Buffer/Riparian Zone Development**
Education = Watershed Education	**E = Public Education/Watershed Planning**
Infrastructure = Infrastructure Maintenance	**F = Flood Storage/Reservoirs**
Coordination = Agency Coordination	
Damage = Property Damage	

Watershed	Description of Watershed Problem	Primary Area of Concern of Watershed Stakeholders	Comments/Concerns of Watershed Stakeholders	Estimated Cost for Phase 1 Watershed Plan Development	% of Watershed Area in Will County	% of Will County Area in the Watershed	# of Municipalities Within Watershed	# of Townships Within Watershed	Category
Aux Sable Creek	Flooding, Maintenance, Erosion, Water, Education, Infrastructure, Coordination, Damage	Water quality impacts due to development	Need more cleaning of rivers and creeks in flood areas, need water quality enforcement included in the Ordinance.	$10,000	0.6	0.1	2	2	B
Baker Exline Creek	Flooding, Maintenance, Erosion, Water, Damage		Erosion Control and Sediment Control, removal of trees	$14,000	N/A	1.4	0	2	A/C/D
Bull Creek	Flooding, Maintenance, Erosion, Water, Damage		Better erosion and sediment control	$1,300	19.0	0.1		1	D

Source of Information is from Watershed Questionnaire 3/31/2009

Will County Watershed Concerns Legend:

Description of Stream Problem	*Category*
Flooding = Surface Flooding	**A = Flood Control - Debris removal**
Maintenance = Stream Maintenance	**B = Water Quality**
Erosion = Erosion/Sedimentation Control	**C = Ecosystem Enhancement**
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Coordination = Agency Coordination	
Damage = Property Damage	

Watershed	Description of Watershed Problem	Primary Area of Concern of Watershed Stakeholders	Comments/Concerns of Watershed Stakeholders	Estimated Cost for Phase 1 Watershed Plan Development	% of Watershed Area in Will County	% of Will County Area in the Watershed	# of Municipalities Within Watershed	# of Townships Within Watershed	Category
DesPlaines River	Flooding, Maintenance, Erosion, Water, Education, Infrastructure, Coordination, Damage	Basement flooding, flooding, water quality	Need help with funding, better stream maintenance, establish buffers, natural detention basins, more infiltration/less discharge from basins, monitor discharge from WWTP, better inter-agency cooperation	$147,000	6.8	15.1	12	10	A/B/C/D
DuPage River	Flooding, Maintenance, Erosion, Water, Education, Infrastructure, Coordination, Damage	Flooding, basement flooding, water quality, roadway flooding	Need Stream Maintenance, establishment of buffers, more stringent detention parameters, natural detention basins, help with funding, watershed plan, improve education, improve coordination between agencies, eliminate pollution, storm infrastructure maintenance	$152,000	30.9	12.3	10	7	A/B/D/E
East Branch DuPage River	Water, Maintenance, Flooding, Erosion, Education	Water Quality, flooding	Potentially purchase quarries along river for open space and storage volume, more use of BMPs, better stream maintenance, educate the residence	$8,800	8.2	0.7	3	2	A/B/D/E/F

Source of Information is from Watershed Questionnaire 3/31/2009

Will County Watershed Concerns Legend:

Description of Stream Problem	*Category*
Flooding = Surface Flooding	**A = Flood Control - Debris removal**
Maintenance = Stream Maintenance	**B = Water Quality**
Erosion = Erosion/Sedimentation Control	**C = Ecosystem Enhancement**
Water = Water Quality	**D = Buffer/Riparian Zone Development**
Education = Watershed Education	**E = Public Education/Watershed Planning**
Infrastructure = Infrastructure Maintenance	**F = Flood Storage/Reservoirs**
Coordination = Agency Coordination	
Damage = Property Damage	

Watershed	Description of Watershed Problem	Primary Area of Concern of Watershed Stakeholders	Comments/Concerns of Watershed Stakeholders	Estimated Cost for Phase 1 Watershed Plan Development	% of Watershed Area in Will County	% of Will County Area in the Watershed	# of Municipalities Within Watershed	# of Townships Within Watershed	Category
Forked Creek	Maintenance, Water Education, Infrastructure, Flooding, Coordination, Damage	Flooding, water quality, farm drainage, roadway flooding, stream maintenance	Need funding help, potentially zero release from detention basins below 2 year event, more infiltration/less discharge, better stream maintenance, more BMPS, storm infrastructure maintenance, education	$156,000	100	14.8	5	8	A/B/C/D/E
Fox River	N/A	N/A	N/A	$15,000	0.1	0.2	2	1	
Hickory Creek	Flooding, Maintenance, Erosion, Water, Education, Infrastructure, Coordination, Damage	Flooding	Need Stream Maintenance, natural detention basins, help with funding, storm infrastructure maintenance, additional flood storage volume	$93,000	84.4	9.6	9	7	A/B/C/D/E
I&M Canal	Flooding, Maintenance, Damage, Erosion, Infrastructure	Basement Flooding, flooding	Stream Maintenance, establish buffers, natural detention basins, more stringent runoff and detention parameters	N/A	N/A	N/A	N/A	N/A	A/D

Source of Information is from Watershed Questionnaire 3/31/2009

Will County Watershed Concerns Legend:

Description of Stream Problem	*Category*
Flooding = Surface Flooding	**A = Flood Control - Debris removal**
Maintenance = Stream Maintenance	**B = Water Quality**
Erosion = Erosion/Sedimentation Control	**C = Ecosystem Enhancement**
Water = Water Quality	**D = Buffer/Riparian Zone Development**
Education = Watershed Education	**E = Public Education/Watershed Planning**
Infrastructure = Infrastructure Maintenance	**F = Flood Storage/Reservoirs**
Coordination = Agency Coordination	
Damage = Property Damage	

Watershed	Description of Watershed Problem	Primary Area of Concern of Watershed Stakeholders	Comments/Concerns of Watershed Stakeholders	Estimated Cost for Phase 1 Watershed Plan Development	% of Watershed Area in Will County	% of Will County Area in the Watershed	# of Municipalities Within Watershed	# of Townships Within Watershed	Category
Jackson Creek	Flooding, Maintenance, Erosion, Infrastructure, Water, Education	Water Quality	Need help with funding, stream maintenance, more infiltration/less discharge from basins, developers should repair stream damage caused by development	$60,000	100	6.2	6	7	A/B/C/D/E
Kankakee River	Flooding, Maintenance, Erosion, Water, Education, Infrastructure, Coordination, Damage	Basement flooding, flooding, erosion	Need better storm infrastructure maintenance, better planning, stream maintenance, filter strips/buffers, more stringent runoff and detention parameters, more and better BMPs	$58,000	1.0	5.5	3	6	A/B/C/D
Lily Cache Creek	Flooding, Maintenance, Erosion, Infrastructure, Coordination, Water	Flooding, roadway flooding	Improve education, better stream maintenance, increase the preservation of open space, better erosion and sediment control	$61,000	100	5.0	6	4	A/B/D/E
Mazon River	Maintenance, Erosion, Infrastructure		Upgrade the conveyance routes to standard, educate local units of government, better stream maintenance, update floodplain maps	$40,000	8.0	3.8	6	3	A/E

Source of Information is from Watershed Questionnaire 3/31/2009

Will County Watershed Concerns Legend:	
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Pike Trim Creek	Flooding, Maintenance, Erosion, Water, Damage, Education		Establish a 100 ft. buffer on Trim Creek, better erosion and sediment control, better stream maintenance, need funding help	$39,000	N/A	3.7	1	3	A/D
Plum Creek	Flooding, Maintenance, Infrastructure, Coordination, Erosion, Water, Damage	Flooding	Better stream maintenance for flood control and additional flood storage volume, erosion and sediment control	$54,000	70.7	2.6	3	4	A/B/F
Prairie Creek	Flooding, Maintenance, Infrastructure, Erosion, Water, Education	Flooding, stream maintenance, roadway flooding, detention pond discharges, stream backups, water quality	Need to prevent the streams and ditches from getting backed up with debris and provide better stream maintenance when it does. Need erosion control and watershed education, need to change groundwater recharge practices, need funding help, potential zero release from detention basins below 2 year event, more infiltration/less discharge	$65,000	100	6.2	3	7	A/B/C/D/E

Source of Information is from Watershed Questionnaire 3/31/2009

Will County Watershed Concerns Legend:

Description of Stream Problem	*Category*
Flooding = Surface Flooding	**A = Flood Control - Debris removal**
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Watershed	Description of Watershed Problem	Primary Area of Concern of Watershed Stakeholders	Comments/Concerns of Watershed Stakeholders	Estimated Cost for Phase 1 Watershed Plan Development	% of Watershed Area in Will County	% of Will County Area in the Watershed	# of Municipalities Within Watershed	# of Townships Within Watershed	Category
Rock Creek	Flooding, Maintenance, Infrastructure, Coordination, Education	Flooding, water quality	Better stream maintenance for flood control, BMPs for future development	$77,000	N/A	7.3	4	6	A/B
Thorn Creek	Flooding, Maintenance, Infrastructure, Coordination, Education	Flooding and water quality	Need a regular maintenance schedule and stronger BMPs for water quality	$67,000	29.1	3.2	6	3	A/B
West Branch DuPage River	Flooding, Erosion, Maintenance, Education, Coordination, Damage		Develop a watershed plan	$2,900	1.8	0.2	2	2	E
West Creek	Flooding, Erosion, Damage, Maintenance, Water		Better Stream Maintenance, erosion and sediment control	$4,400	N/A	2.0	0	2	A/B

Source of Information is from Watershed Questionnaire 3/31/2009

Watershed Studies

DuPage River, Illinois Feasibility Report and Integrated Environmental Assessment

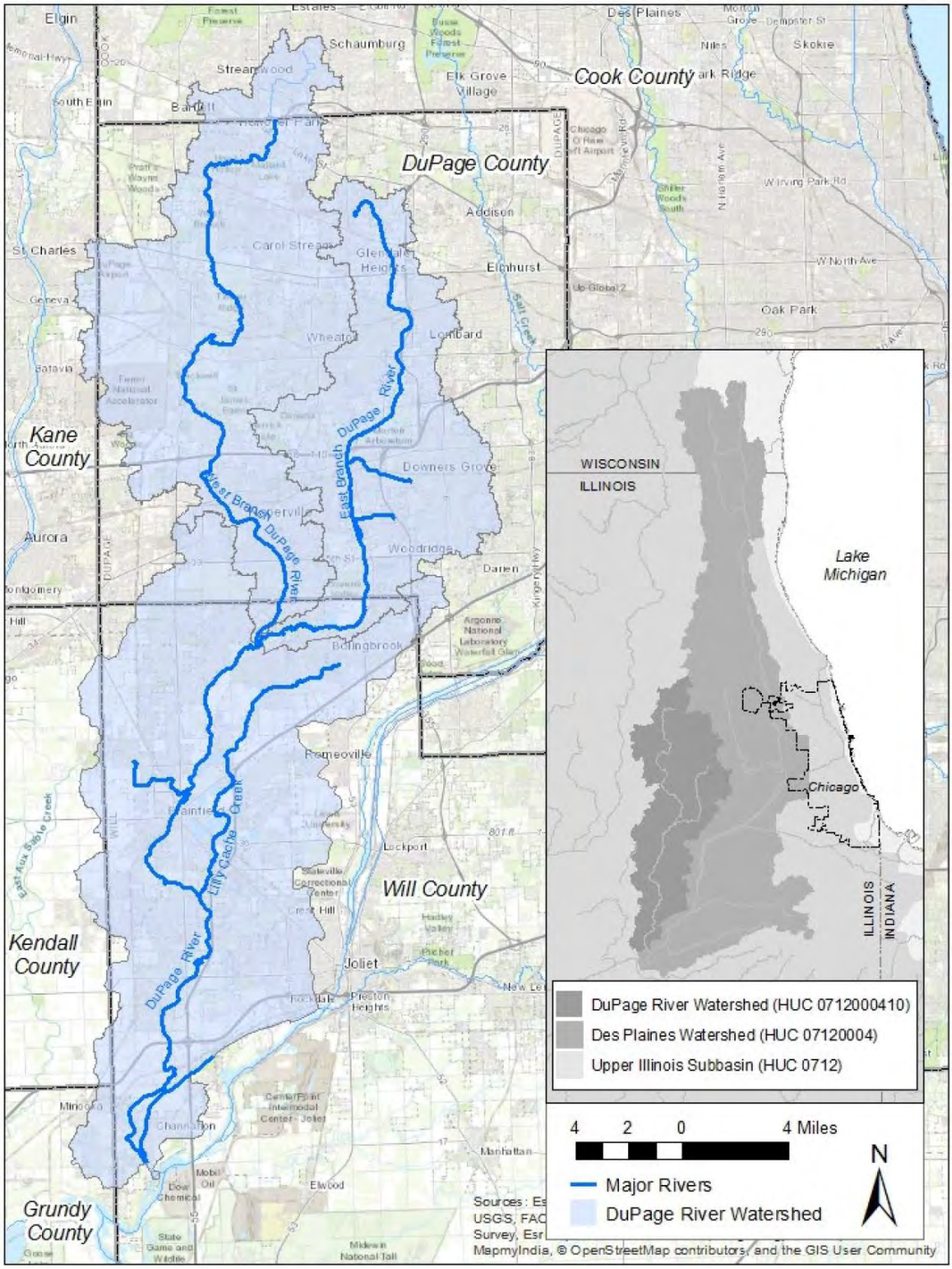
Will County partnered with the DuPage County Stormwater Management Planning Committee and the U.S. Army Corps of Engineers to conduct a study investigating overbank and backwater flooding along the DuPage River and its major tributaries which are tributary to the Illinois River. The study's emphasis was on prioritizing high-risk areas and developing a range of possible structural and nonstructural alternatives to address flood risks. The study area has experienced rapid development over the past several decades and currently includes forty communities and over 1 million residents. Major storm events resulting in overbank flooding in the basin occurred in 1996, 2008, 2010, and 2013. Will County was included in the 2013 federal disaster declaration (DR-4116) and $1.4 million in public assistance was provided within the county.

The study includes an assessment of existing and projected future damages without project conditions over a 50-year period of analysis. With a significant risk of overbank flooding existing in a number of locations across the watershed, costs of damages without project conditions are estimated at $5,317,000 annually. The problems within the DuPage River Watershed are system-wide requiring system-wide flood risk management solutions. Problems include development within the watershed which increase the amount of impervious surfaces. Opportunities exist to manage flood risk and improve resiliency. The objectives of the study are to reduce risk of flood damages to structures and infrastructures and reduce life-safety risk associated with overbank flooding.

Will County will be working with its partners to address the DuPage River Watershed study findings to mitigate flooding risks.

(**Feasibility Report available from:**
https://www.lrc.usace.army.mil/Portals/36/docs/projects/DuPage%20River/20190501/DuPage%20-%20Feasibility%20Report_FINAL_7_9_19.pdf)

DuPage River Watershed Study Area

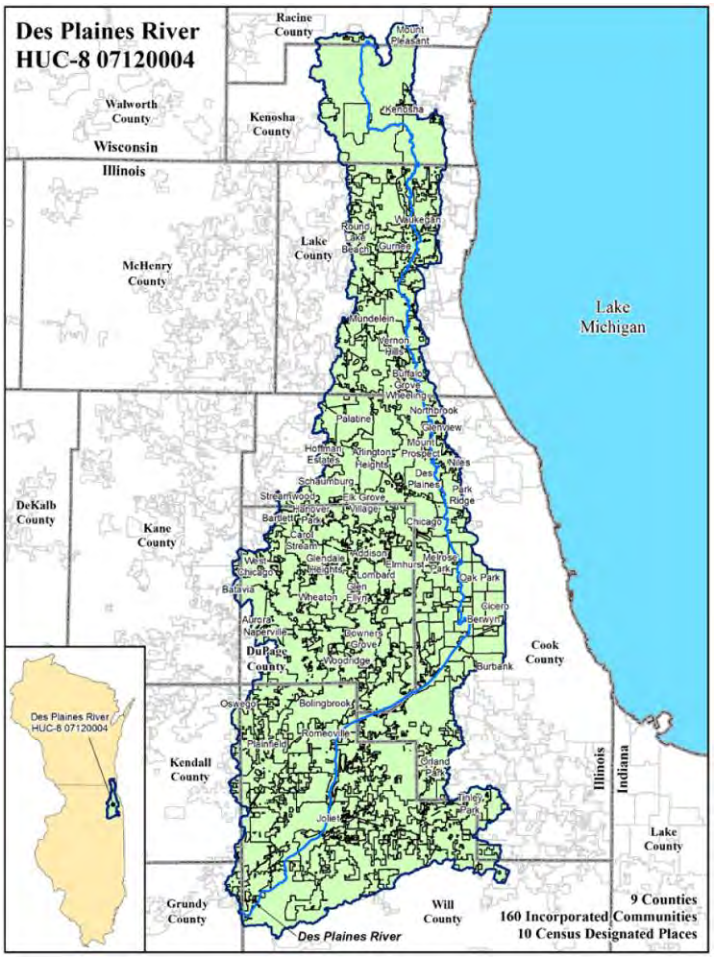


Source: DuPage River, Illinois Feasibility Report and Integrated Environmental Assessment

Des Plaines River Watershed Discovery Report

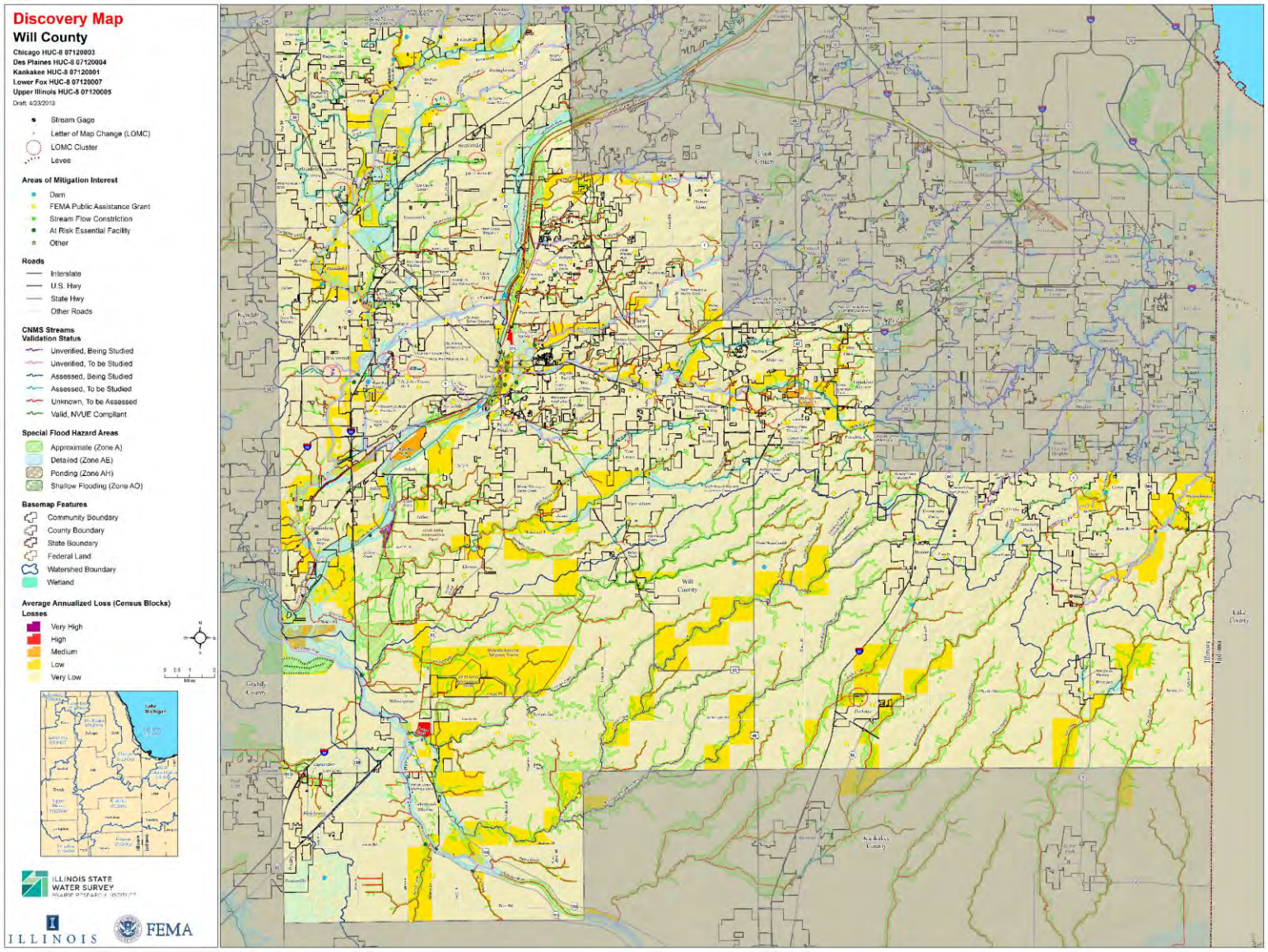
The Des Plaines River Watershed extends from the far southeastern part of Wisconsin to the northern edge of Will County, Illinois. The river has a long history of flooding that has resulted in millions of dollars of damages impacting structures, businesses, transportation networks, and injuries and lives. The U.S. Army Corps of Engineers (USACE) conducted a flood damage study of the watershed. The Discovery Report includes data collected from the study and identifies mitigation projects that include levees, roads that frequently flood, significant riverine erosion, at-risk essential facilities, stream flow constriction, and recent and/or future development. The results of the study allow the USACE to develop a phased plan to begin mitigating the watershed's flood problems. Pages 47-49 of the report list projects identified in Will County and provides the county with data to assist in prioritizing flood mitigation projects.

Des Plaines River Watershed



Source: *Des Plaines River Watershed Discovery Report*

(**Discovery Report available from:**
https://illinoisfloodmaps.org/DFIRMpdf/discovery/desplaines/DesPlaines_DiscoveryReport.pdf)



Available from: https://www.illinoisfloodmaps.org/DFIRMpdf/discovery/desplaines/WillCounty_DiscoveryMap_DRAFT.pdf

Risk Characterization

Flooding is generally part of a natural cycle that has many important and beneficial functions for the environment. Flooding raises the water table in wetlands, maintains biodiversity, and replenishes nutrients back into the soil. Additionally, higher water tables allow fish and water plants to re-colonize and may also help to control some invasive species. Flooding, however, becomes a problem in the built environment. Drainage systems and city sewers can become overwhelmed, causing raw sewage to back up in basements and onto roadways. Flooding in urban areas can also cause increased runoff, which may carry pollutants through storm sewers into rivers and lakes. Urban runoff can be toxic, as it may contain garbage, fertilizers, oil and other residues from city streets.

Riverine flooding has caused displacement, property damage, and impacts on the health of residents. Floods can damage or destroy public and private property, disable utilities, make roads and bridges impassable, destroy crops and agricultural lands, cause disruption to emergency services, and result in fatalities. People may be stranded in their homes for several days without power or heat, or they may be unable to reach their homes at all. Long-term collateral dangers include the outbreak of disease, widespread animal death, broken sewer lines causing water supply pollution, downed power lines, broken gas lines, fires, and the release of hazardous materials.

Flooding is a hazard whose risk is routinely underestimated by the public who may be inclined to attempt to walk or drive through shallow waters or to allow their children and pets to play in the water as if it were part of a beach or swimming pool. Public education is vital so that there is widespread knowledge of the contaminants and germs that floodwaters contain and a greater awareness of the risks that floodwaters pose to drivers and pedestrians.

Drivers need to know that roads and bridges are often weakened and degraded by flood impacts and that the road they assume is still there under shallow waters may no longer be intact. Floodwaters tend to conceal the presence of open manholes, dangerous debris (such as rusty nails and metal), and live electrical wires that can cause harmful shocks. Less than a foot of flowing water can cause vehicles to end up in a ditch or sinkhole where persons may find it impossible to escape from a submerged vehicle under the pressures exerted by flowing water.

Flooding is a major, recurring problem in Illinois. Any buildings in the flood plain are subject to flood damage. Flood damage in Will County results from several different causes. Floods on the Kankakee and Des Plaines Rivers, generally, are associated with spring snowmelt combined with ice jams and

frontal rain storms. Flooding is often aggravated by inter-basin flow between the Kankakee River and the Des Plaines River, the Kankakee River and Forked Creek, the I and M Canal and the DuPage River, and I and M Canal and Long Run. Floods on much smaller tributaries in Will County are caused by intense thunderstorms which occur in the summer and early fall.

Since the floodplains have been built upon over the years, it would be financially unfeasible for the state, county, or local community to buy all the properties in the floodplain. The NFIP requires that the county and communities, through their local floodplain ordinances, inspect all structures damaged in the floodplain by a flood or other event and require mitigation when the cost to repair is greater than 50% of the market value of the structure. When defined as a substantially damaged structure, a residential structure must either be elevated, demolished, or relocated and a non-residential structure must also be elevated, demolished, relocated, or dry flood proofed. The ordinance also requires that improvements to floodplain structures be limited to 50% of the structure's market value when flooding of the property is expected or predicted.

For low lying areas, some of the flooding is attributed to poor storm sewer and drainage systems, debris, and obstructions in side yard swales over overland flow paths. Many of these flooding problems can be alleviated with infrastructure improvements, stream maintenance programs, and enforcement of zoning codes or easement restrictions for illegal structure removal.

New construction near floodplains potentially alters surface water flows by diverting water to new courses or increases the amount of water that runs off impermeable pavement and roof surfaces. This diverts water, if done improperly, to areas previously safe from flooding. Higher risks are associated to areas with increased populations as well as residential growth. Per census data, Will County grew in population by 34.9% from 2000 to 2010 to a total of 677,560 people making it one of the fastest growing counties in the U.S. and it continues to grow with an estimated 2019 census total of 690,743. Future plans will continue to keep track of high growth populations and note that they have the potential for higher vulnerability to flooding issues.

Impact for Flood: Medium

Damage to Buildings

Buildings can be impacted by the velocity of flooding with the force of debris or ice against the exterior damaging the outside walls or pushing the structure off its foundation. Flood waters will deposit sediment and other contaminates. This is a severe problem when hazardous materials are released into the flood waters.

Will County Flood Loss Estimates (From 2018 IL Haz Mit. Plan)	
	($ per Thousand)
Total Losses	$1,399,440
Total Exposure	$15,129,593
Loss Ratio	0.08

Hydrostatic pressure, the pressure exerted by the water when it is at rest, can break walls, doors, and floors or even float a structure. Insulation, drywall and other building materials will deteriorate and decompose when wet. Wood will swell from the water and then warp when dried too quickly. Building contents are usually not salvageable after a flood. Any electrical appliances or gas powered engines will be unsafe unless properly dried and cleaned.

Upholstered furniture, carpeting, mattresses, and household goods cannot be dried out to useable condition. Dampness, unless mitigated within 24 to 48 hours, will then encourage the growth of mold. Mold spores can germinate and grow in a moist or damp environment on any surface that contains organic matter. A home that's been flooded can provide ideal conditions for the growth and proliferation of mold. Indoor mold can trigger allergies or allergy-like symptoms affecting the upper respiratory system.

Critical Facilities

For some activities and facilities, even a slight chance of flooding is too great a threat. Typical critical facilities include hospitals, fire stations, police stations, storage of critical records, and similar facilities. These facilities should be given special consideration when formulating regulatory alternatives and floodplain management plans. A critical facility should not be located in a floodplain if at all possible. If a critical facility must be located in a floodplain, it should be provided a higher level of protection so that it can continue to function and provide services after the flood. Communities should develop emergency plans to continue to provide these services during the flood.

Under Executive Order 11988, Floodplain Management, federal agencies funding and/or permitting critical facilities are required to avoid the 0.2% (500-year) floodplain or protect the facilities to the 0.2% chance flood level.

Under State of Illinois, Executive Order (EO) 2006-05 state agencies are prohibited from planning, funding and/or permitting new critical facilities in the floodplain. Where that is not practicable, these facilities shall have the lowest floor equal to or greater that the 500-year flood elevation or be structurally dry flood proofed to that same elevation. The EO includes police and fire stations, schools, hospitals, retirement homes, and senior care facilities as critical facilities that should be required to meet this standard.

Damage to critical facilities can add to the widespread damage experienced by floods by reducing services they provide to the public. Damage to utilities or pipelines can cause outages. Flooded water or wastewater treatment plants can create serious health hazards. Transportation and communication systems can be limited or shut down. Fires are damaging when areas are inaccessible to fire equipment.

Health and Safety

It is imperative that people heed warnings during floods. A car will float in less than two feet of moving water sweeping it into deeper waters. Most deaths during floods are a result of people trapped in their vehicles. It is important that people heed travel warnings as road conditions can be easily misjudged. Water on roads can be much deeper than it appears or sections of road or small bridges can be washed out and the damage not visible.

Health is affected when drinking water is contaminated with dirt, oil, chemicals, or other debris found in the stormwater runoff. It is important that private wells in flooded areas be tested for contamination and contaminated wells disinfected before resuming well use. As flood waters recede, pools of standing water become a breeding ground for mosquitoes. Wet farm fields negatively impact the planting and harvest seasons and can damage farm equipment. Damp areas of buildings not properly disinfected begin to grow mold or mildew. People may experience heart attacks from overexertion or stress. Deaths also occur from electrocution when electrical mechanisms short out and create live current.

Floods also have a psychological impact on the people who have lost their home or keepsakes. For those located in floodplain areas, knowledge that their homes could be flooded again causes additional psychological strain.

Economic Impact

Flooding has an economic impact on all residents of the county. Public dollars are spent on flood fighting, sandbags, fire department calls, road closures and repairs, clean-up, and repairs to damaged public property. If a disaster is declared a federal disaster, public assistance funds may be made available to cover some of these flood fighting and recovery costs. Communities should prepare accounting practices prior to an event to ensure as much of their costs are eligible for reimbursement.

The general public is further impacted when the underfunded NFIP makes payouts for flood claims. The NFIP is meant to be self-supporting, though in 2003 the Government Accountability Office (GAO) found that repetitive-loss properties cost the taxpayer about $200 million annually. To cover these costs, the NFIP borrows from the U.S. Treasury when losses are heavy, and these loans are paid back with interest. Since the NFIP was created in 1968, flood risks continue and the costs and consequences of flooding are increasing dramatically. As previously discussed, the Biggert-Waters Flood Insurance Reform Act of 2012 (BW-12) and the Homeowner Flood Insurance Affordability Act of 2104 were passed to make the NFIP more sustainable and financially sound.

Homeowners are faced with damages to the homes, loss of personal property including cars, furniture clothing, etc. While some will have flood insurance that will cover much of the damages many homeowners will have no coverage. Depending on the severity of the flooding, they may also face temporary housing costs. In federally declared disasters, Small Business Administration loans may be available to help people recover some of their financial losses and housing assistance may also be available.

Business losses also occur due to flood damage to the facility structures and inventory. Customers may not be able to reach businesses located in the flood area or raw materials or goods cannot be transported in or out. Additionally, businesses can be impacted by employees who must clean-up their flood damaged homes. Repeated flooding in an area can cause declining property values. In rural areas, flooded fields can mean the loss of the season's crops or food source for livestock.

Future Occurrence

Though flooding can never be eliminated, measures can be taken to lessen the impact of flooding. Among the more notable flood protection measures is the WCSM Planning Committee. It is responsible for directing the implementation of *Comprehensive Stormwater Management Plan* and provides the *Will County Stormwater Technical Guidance Manual* to developers, applicants, and administrators to assist them in complying with the Stormwater Management Ordinance and the technical requirements of a stormwater permit application.

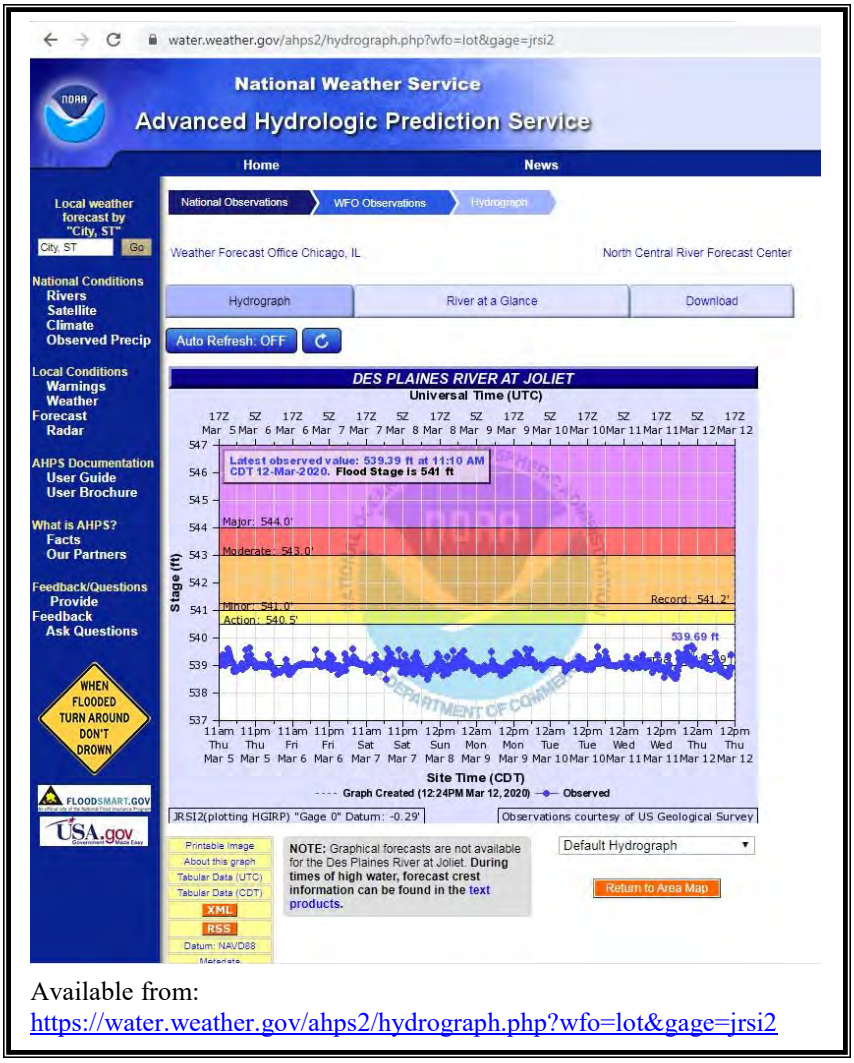
The primary purpose of the WCSM Planning Committee is to provide county-wide coordination of stormwater management in Will County, to ensure consistent levels of flood mitigation, and to prevent stormwater related problems throughout the county's watersheds. This provides for a consolidated county-wide framework.

The goals for the Will County Stormwater Program are as follows:

1. Consolidate and coordinate existing stormwater management programs and activities into an effective, unified county-wide structure.
2. Prevent increases in stormwater related problems associated with development, redevelopment, and other watershed activities.
3. Remediate existing problems related to improper management of stormwater runoff and encroachment into flood-prone areas.
4. Ensure maintenance, management, and sustainable operation of natural and manmade stormwater drainage and storage features.

A result of their work is the comprehensive county-wide stormwater ordinance that applies to both incorporated and unincorporated areas. It minimizes any increases in stormwater-related problems and specifies standards for stormwater drainage and detention, floodplain management, soil erosion and sediment control, and stream and wetland protection in a single document. To ensure consistency among watershed plans, the committee coordinates watershed projects within the county and with neighboring counties where watersheds cross county borders.

(See: https://www.willcountyillinois.com/County-Offices/Economic-Development/Stormwater-Management-Planning-Committee/Plans-Projects)



Available from:
https://water.weather.gov/ahps2/hydrograph.php?wfo=lot&gage=jrsi2

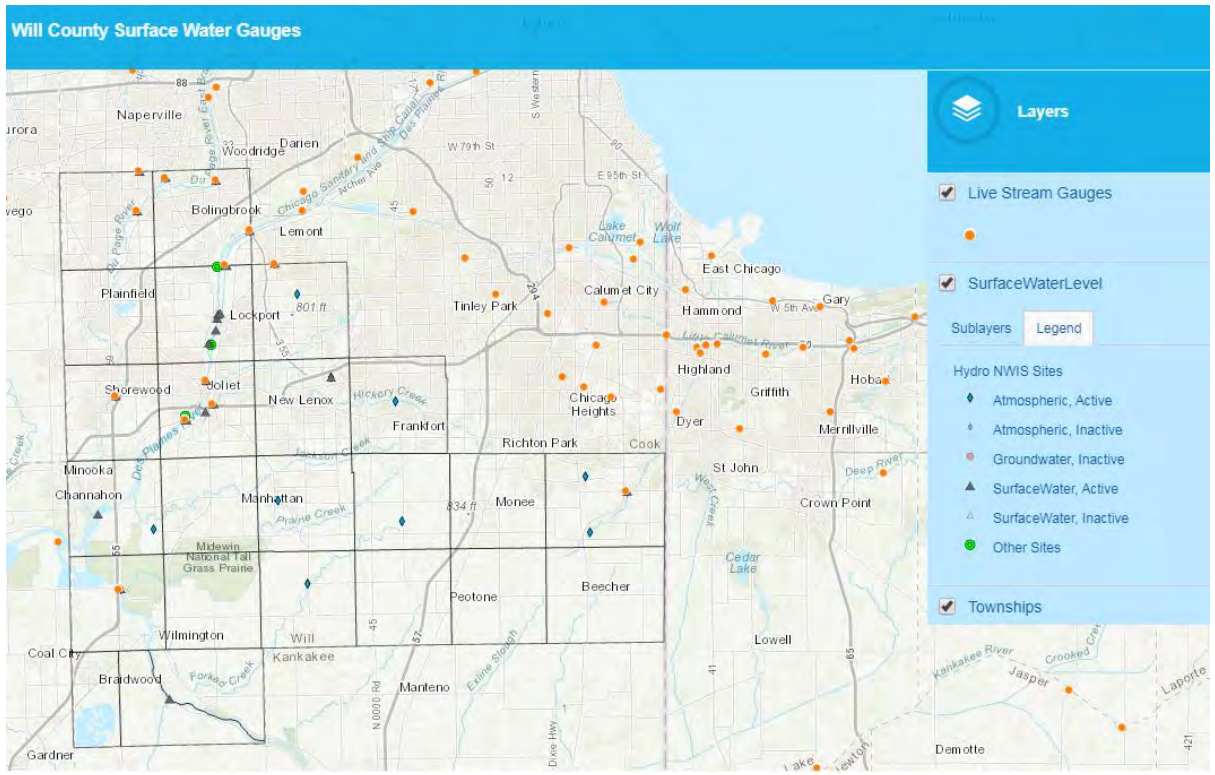
Another flood protective measure has been the increased use of stream gauge monitors with telemetry that provide real-time information. Stream gauges provide the National Weather Service (NWS), in collaboration with many federal, state, and local agencies, with accurate and updated data that improves their river forecasts and warning system for the protection of life and property, and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community. Real-time data can be obtained online as represented by this NWS sample and the following link to stream gauges.

- See Will County stream gauges: https://www.willcountyillinois.com/County-Offices/Economic-Development/Stormwater-Management-Planning-Committee/Plans-Projects

These telemetry monitored rain gauges also help to provide data that support flood inundation maps developed by the USGS. See flood information resources:

- USGS Flood Information (included Inundation Mapping Program): https://www.usgs.gov/mission-areas/water-resources/science/usgs-flood-information

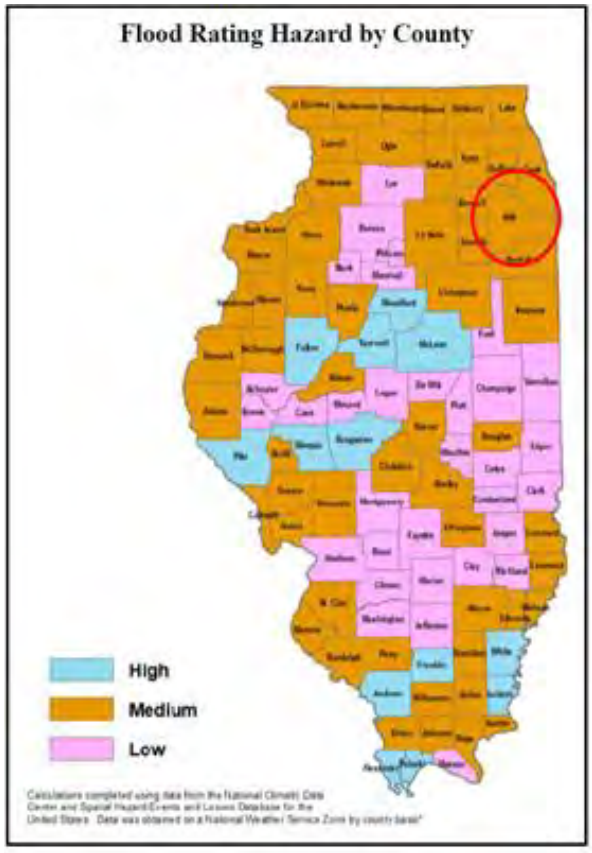
- Central Midwest Water Science Center: https://www.usgs.gov/centers/cm-water

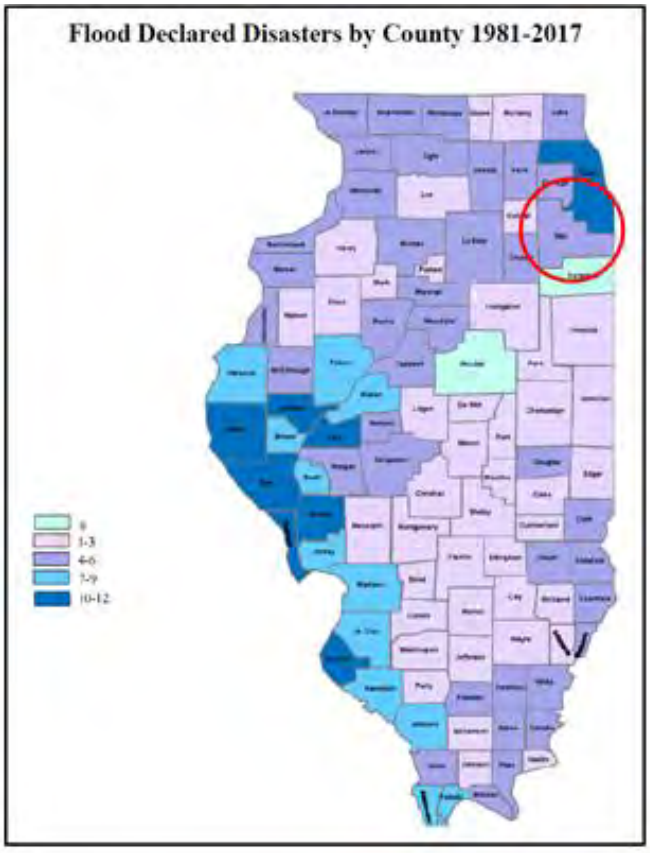


Available from: https://willcountygis.maps.arcgis.com/apps/View/index.html?appid=5417f1230cff4bb3972b74aaeeb5e078

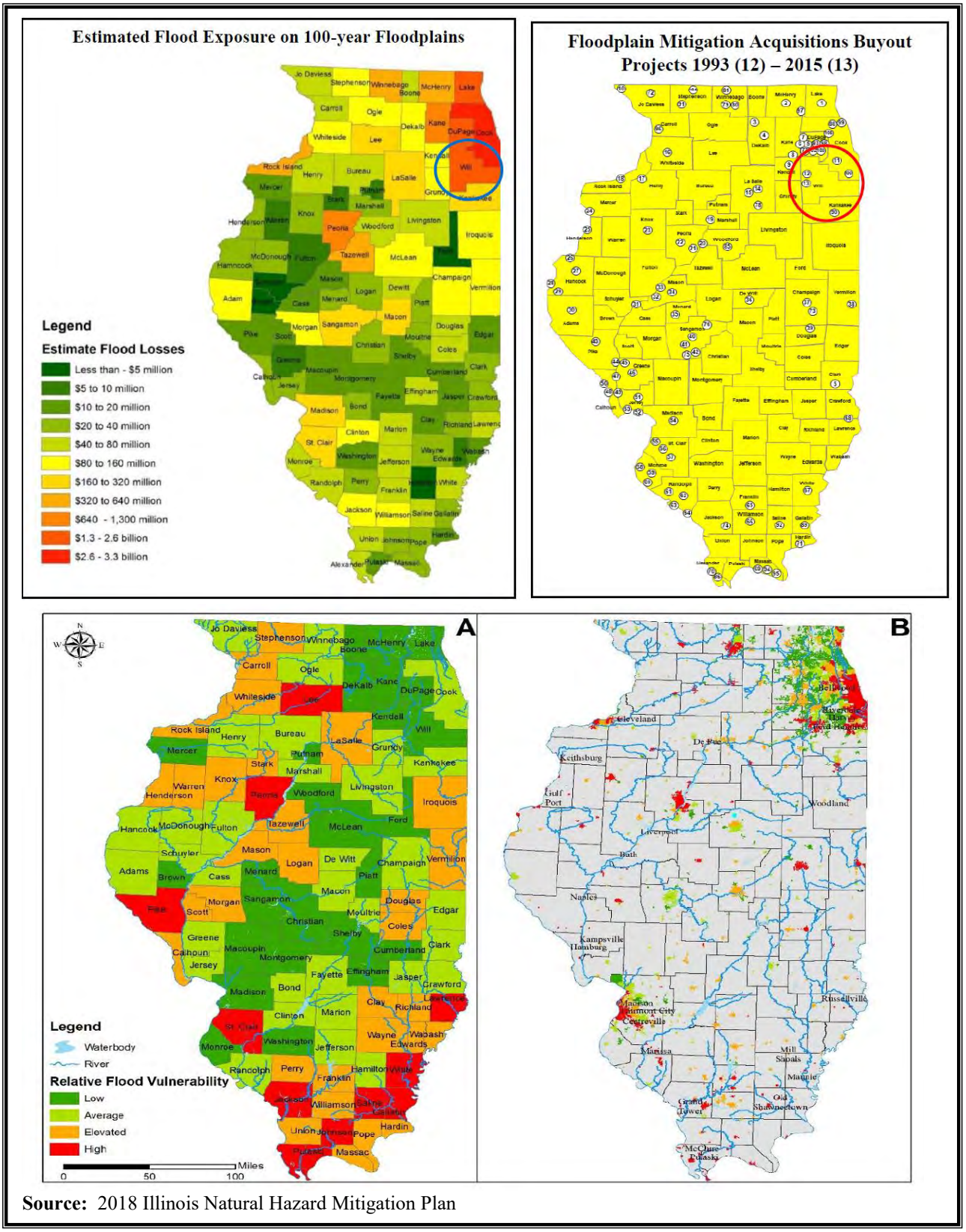
The *2018 Illinois Natural Hazard Mitigation Plan* rates the flood hazard for Will County as medium.

Flood, Flash Flood, & Ice Jams Events							
	# of Flood Events	# of Flash Flood Events	# of Ice Jams Events	# of Deaths	# of Injured	Property Damage	Crop Damage
	65	45	87	2	0	$20.201M	0
Average per year	.95 events	.66 events	.84 events	.03	0	$878.7K	0





Source: 2018 Illinois Natural Hazard Mitigation Plan



Source: 2018 Illinois Natural Hazard Mitigation Plan

EXTREME HEAT

Hazard Characterization

Extreme heat for a region is temperatures that hover 10 degrees or more above the average high temperature for several days to several weeks. The definition does vary by region; however, a heat wave is usually defined as a period of at least three consecutive days above 90 degrees. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when a "dome" of high atmospheric pressure traps hazy, damp air near the ground. Excessively dry and hot conditions can provoke dust storms and low visibility.

Prolonged periods of extreme heat and humidity have a deleterious effect on a community, particularly the elderly and those who cannot afford cooling capabilities. The National Weather Service (NWS) has devised the "heat index" to describe how hot it feels when temperature and humidity are combined. When the temperature is above 90º F and humidity is high, the body is under great stress to regulate the body's normal temperature.

Heat waves can cause heatstroke, a medical emergency, and heat exhaustion. Heatstroke causes high body temperatures and the victim may become delirious, stuporous, or comatose. Heat exhaustion is less severe but can cause dizziness, weakness, and fatigue. It is typically the result of fluid imbalance caused by increased perspiration. Extreme heat can also cause heat syncope, a loss of consciousness, and heat cramps, all brought on by over exercise.

EXTREME HEAT TERMS	
Heat Advisory	Issued within 12 hours of the onset of the following conditions: heat index of at least 105°F but less than 115°F for less than 3 hours per day, or nighttime lows above 80°F for 2 consecutive days.
Heat Wave	Prolonged period of excessive heat often combined with excessive humidity.
Heat Index	A number in degrees Fahrenheit (F) that tells how hot it feels when relative humidity is added to the air temperature. Exposure to full sunshine can increase the heat index by 15 degrees.
Heat Cramps	Muscular pains and spasms due to heavy exertion. Although heat cramps are the least severe of heat related medical problems, they are often the first signal that the body is having trouble with the heat
Heat Exhaustion	Typically occurs when people exercise heavily or work in a hot, humid place where body fluids are lost through heavy sweating. Blood flow to the skin increases, causing blood flow to decrease to the vital organs. This results in a form of mild shock. If not treated, the victim's condition will worsen. Body temperature will keep rising and the victim may suffer heat stroke.
Heat or Sun Stroke	Heat stroke is life-threatening. The victim's temperature control system, which produces sweating to cool the body, stops working. The body temperature can rise so high that brain damage and death may result if the body is not cooled quickly.
Source: Are You Ready?, FEMA, H-34/September, 2002	

Stagnant atmospheric (humid and muggy) conditions and poor air quality can induce heat-related illnesses. Heatstroke and heat exhaustion are more intense in urban areas. Other effects of extreme heat are water shortages, fire hazards, excessive demands for energy, damaged crops, and danger to livestock. Roads, bridges, railroad tracks, and other infrastructure can also be damaged by the thermal expansion caused by extreme heat.

HEAT INDEX / HEAT DISORDERS	
Heat Index	**Possible Heat Disorders for People in Higher Risk Groups**
125° or Higher	Heat stroke/sun stroke, highly likely with continued exposure.
104° - 126°	Sun stroke/heat cramps or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity.
91° - 103°	Sun stroke, heat cramps and heat exhaustion possible with prolonged exposure and/or physical activity.
80° - 90°	Fatigue and dehydration possible with prolonged exposure and/or physical activity.
Source: Heat Wave, produced by NOAA, FEMA and ARC, NOAA/PA 85001	

The NWS offices with responsibility for counties in the State of Illinois will initiate alert procedures to warn people of the impending danger due to excessive heat. When the heat index is forecasted to exceed 105 - 110 degrees for at least two consecutive days, NWS procedures are:

- Heat Index values will be included in all NWS forecasts
- "Hazardous Weather Outlook" products will highlight any threat of excessive heat for the following 1 to 7 day period
- "Excessive Heat Warning" products will present a detailed discussion of:
  - The extent and expected duration of the hazard, including forecast temperatures and heat index values
  - Who is most at risk
  - Safety rules for reducing the risk
- State and local health officials will assist in preparing emergency messages prior to and during excessive heat events. Meteorological information from "Excessive Heat Warnings" will be included, as well as more detailed medical information, advice, and names and telephone numbers of health officials
- Forecasts, outlooks and warnings will be released by the NWS to the media, over NOAA's All Hazards Weather Alert Radio system, and via NEWS web sites.

History

Severe heat waves have caused catastrophic crop failures, thousands of deaths and widespread power outages due to increased use of air conditioning. The Illinois Department of Public Health (IDPH) has provided information on heat related deaths. Identifying the exact number of deaths due to heat is very difficult. Usually heat is not the primary cause listed on the death certificate but an "underlying cause".

IMPACT OF HEAT EVENTS ON WILL COUNTY (Source: NOAA/National Centers for Environmental Information / WC EMA)
July 12, 1995
June 25, 1997
July 21, 1999
July 28, 1999
August 16, 1999
June 22, 2009
May 23, 2010
May 30, 2011
July 4, 2012
July 19, 2013
June, 29 & 30, 2018
July 17, 2019

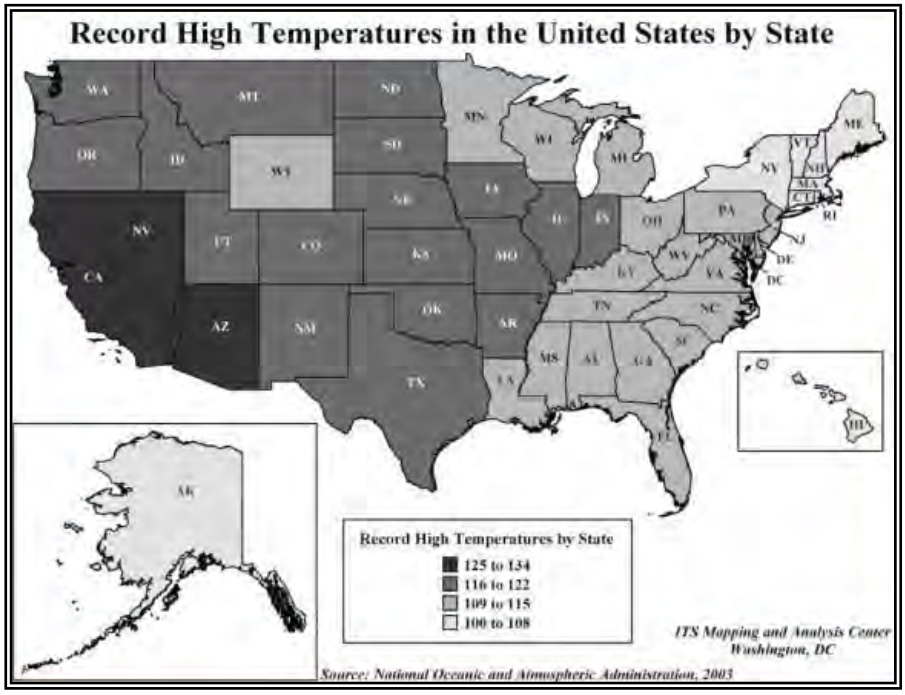
The heat waves of the summer of 1995 caused deaths and injuries previously unseen in the State of Illinois. Throughout the entire state, the combination of record or near record high temperatures and high dewpoint temperatures led to heat indices routinely above the 120-degree mark from July 12-17. The heat index peaked at 125 degrees on July 14 when the air temperature was 98 degrees and the relative humidity was 63 degrees.

An approach used by IDPH to identify heat as being responsible for deaths is to look at "excess deaths". In 1995, there were roughly 600-700 excess deaths. IDPH identifies heat as a contributor to the death of 600 to 700 people. These figures are slightly higher for 1995 than other figures identified in this section. All of the sources have documented that excessive heat can contribute to death.

HEAT RELATED DEATHS in ILLINOIS 1990-2007	
YEAR	**# of DEATHS**
1990	7
1991	10
1992	1
1993	12
1994	11
1995	152
1996	10
1997	12
1998	12
1999	174
2000	11
2001	19
2002	22
2003	5
2004	3
2005	10
2006	17
2007	8
2008	
2009	1
2010	3
2011	
2012	
2013	2
2014	
2015	
2016	
2017	
2018	
2019	

Conditions such as these create hardships for respiratory and cardiovascular systems of every person, but especially in toddlers and the elderly. The human body is very capable of handling extreme temperatures; however, when high humidity accompanies these conditions, it is often too much for the body to handle (the same is true for the human body with cold temperatures when combined with strong winds, producing dangerous wind chills).

Scattered power outages compounded the problem when Commonwealth Edison, the supplier of electricity to virtually the entire Chicago metropolitan area, and other electric utilities could not keep up with the record demand. Of the 583 fatalities associated with the 1995 heat waves, 75 death certificates listed heat as the primary cause and 508 as the secondary cause. In a sampling of 134 of the heat victims, 61% were over the age of 65, but only 2 of the 134 fatalities (1.5%) were toddlers. Five-hundred four of the deaths were in Chicago. At the time there was a perception that the numbers were inflated, later studies indicated the opposite was true and the heat victims were significantly undercounted. Local officials believed that many of the elderly were scared to come out of their apartments because of high amounts of crime in their neighborhoods. Many were found in their rooms with air temperatures in excess of 120 degrees. The City of Chicago has taken a number of steps to mitigate the health hazards in the event of future heat waves including a program for home visits to check the condition of people indicated as vulnerable.



In 1999, the entire Midwest was above normal in temperature for the month of July, with the last ten days consisting of a major heat wave. As a ten-day average, both maximum and minimum temperatures were 7 to 11 degrees above normal. The peak of the heat struck on July 29th and 30th in most of the Midwest. Minimums exceeded 78 degrees in cities like Chicago, St. Louis and Cincinnati, where many heat related deaths occurred. The maximum temperature exceeded 100 degrees in many of these same cities, with most of the Midwest recording maximums 10 to 20 degrees above normal.

Chicago had previously experienced deadly heat waves in 1955 when "large numbers of deaths" occurred and in 1916 with 535 deaths. In the 1990's, two significant heat waves impacted Chicago. In the 1995

heat wave, the number of estimated fatalities varies, but most sources agree that the number exceeded 700. Then in 1999, Chicago experienced another heat wave that closely matched the 1995 event but the death toll was reduced to approximately 100 people. A paper written by Michael Palace and Stanley Chignon, of the State Water Survey, attribute much of the reduction in deaths to mitigation efforts. The efforts included education by the news media and care monitoring procedures for the urban elderly. The September 2005, Chicago All-Hazard Risk Assessment also states the 1999 deaths were lower than 1995 and believed to be the result of the implementation of Chicago's Extreme Weather Operations Plan.

Risk Characterization

The New York Times article dated August 13, 2002, "Most Deadly of the Natural Disasters: The Heat Wave" states that heat waves kill more people in the United States than all other natural disasters combined." The article goes on to state that a University of Delaware study indicated that 1,500 American city dwellers die each year because of heat compared with 200 from tornadoes, earthquakes and floods combined.

This natural disaster has long been overlooked because there is no visible damage like in a tornado and its impact is greatly understated in terms of human toll because not all heat related deaths are recorded. The current mitigation planning process encourages the state to look at such factors as urbanization, the elderly, and low income. It is impossible to ignore these factors when analyzing heat waves. According to historical discussion and the above referenced article, when the Chicago heat wave of July 1995, occurred "the poor, the old, residents of abandoned and violent neighborhoods who lived alone, lacked access to transportation and lacked air-conditioning" were the victims.

The time we have until the next heat wave is unknown, but all of the major reports on global warming indicate that an increase in severe heat waves is likely. Chicago is one of the state's most vulnerable areas because of their size and population. Their risk assessment predicts 17.8 days a year where temperatures breach the 90 degree mark.

Articles all agree that summer heat kills more people than other natural hazards. The National Weather Service (NWS) indicates that in a normal year the number will be 175 Americans. Other sources project the number of deaths to be much higher each year. So not only do we not know when heat waves will strike, we do not have a firm estimate on the number of people who will be impacted.

Impact: Medium/Low

Damage to Buildings

Heat and drought have little or no impact on structures. In urban areas, planting trees to shade buildings and parking lots and using "green roofs" and cool roofing products to reflect sunlight and heat away from a building are ways to reduce the buildup of heat from buildings and pavement.

Critical Facilities

Extreme heat and drought can have an impact on water supply. The demand on electric utilities is elevated.

Health and Safety

Heat kills by pushing the human body beyond its limits. Under normal conditions, the body's internal thermostat produces perspiration that evaporates and cools the body. However, in extreme heat and high humidity, evaporation is slowed and the body must work extra hard to maintain a normal temperature.

Most heat disorders occur because the victim has been overexposed to heat or has over exercised for his or her age and physical condition. Other conditions that can induce heat-related illnesses include stagnant atmospheric conditions and poor air quality.

Extreme heat events can be just as deadly as other natural hazards due to the nature of the event. Extreme heat doesn't immediately impact people when it sets in, instead it is when the periods of extreme heat last for days and weeks that it takes its toll on people. The elderly are at particular risk.

Preparedness and mitigation actions for excessive heat are awareness education on the dangers of heat for the public and assistance to vulnerable populations to protect them from dangerous heat. Alerts from the National Weather Service (NWS) and text messages from Will County Emergency Management Agency (WCEMA) bring awareness to the public during periods of excessive heat. Opening of cooling centers during heat waves provides a respite to those without air conditioning. Social media and outreach at public events provide the public with educational material on excessive heat. Databases like WCEMA's Special Needs population and those of local social services provide a way to reach out to populations most vulnerable to heat. Additionally, utilities provide assistance for bill payments and maintaining service when temperatures reach extremes.

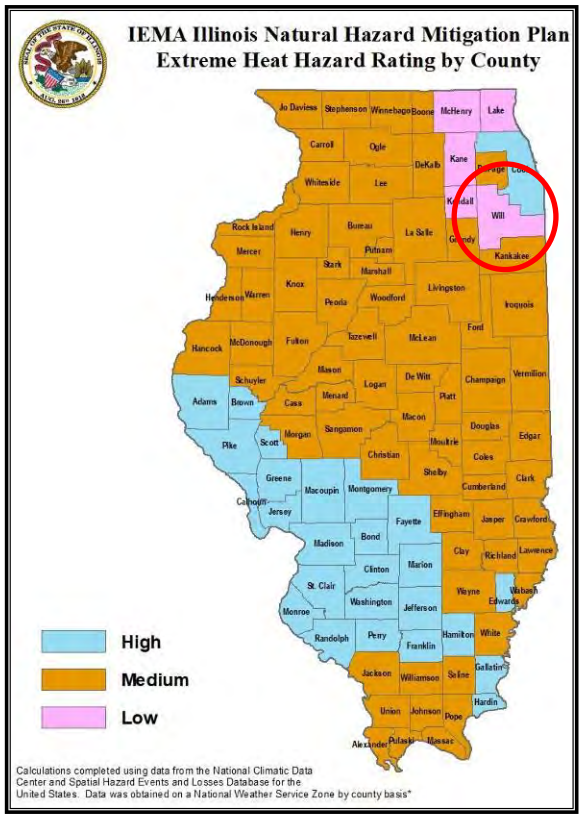
Economic Impact

Generally, extreme heat impacts agricultural areas in the state. As described under Drought, local farmers have resources for education on the effects and methods for preparing for extreme heat.

Future Occurrence

Extreme heat events do not have a specific area or size that is usually associated with them. Therefore, all areas located within Will County have a probability of being affected by one or more extreme heat events. The *2013 Illinois Natural Hazard Mitigation Plan* rates the extreme heat hazard for Will County as low.

HEAT/EXCESSIVE HEAT OCCURRENCE		
Type	**Number of Occurrences Since 1995**	**Annual Mean**
Heat/ Excessive Heat	12	.48



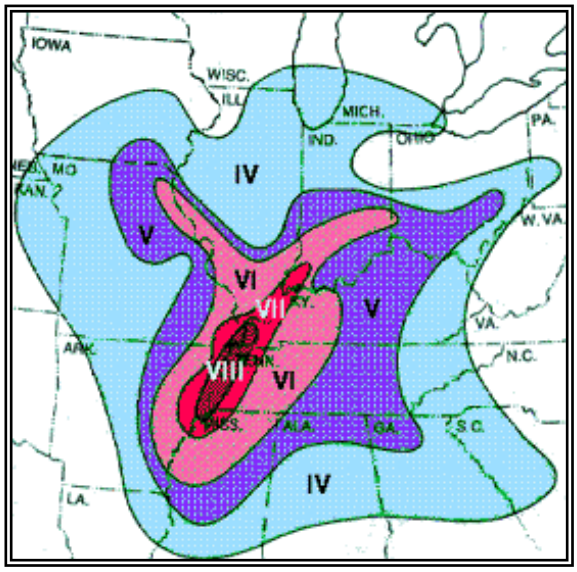
EARTHQUAKE

Hazard Characterization

The earth's crust is far from being a motionless mass, but rather, it is in a constant state of flux. A sudden motion of the ground that causes surface faulting or ground rupture, ground shaking, and ground failure is the result of an earthquake. The onset of a large earthquake is initially signaled by a deep rumbling or by disturbed air making a rushing sound. This is shortly followed by a series of violent ground movements. The ground often splits and there can be large, permanent displacements of the earth. Buildings, bridges, dams, tunnels, and other rigid structures are damaged or collapse when subjected to this stress.

In addition to structural problems, water in tanks, ponds, and rivers is frequently displaced. In lakes, an oscillation known as "seiching" occurs in which the water surges from one end of the lake to the other, causing the water to reach great heights and eventually the lake overflows its banks. Secondary effects are dam failures, fires, floods, and subsidence. Earthquakes can trigger other types of ground failures which could contribute to the damage, such as landslides and liquefaction. In the latter situation, shaking can mix groundwater and soil, liquefying and weakening the ground that supports buildings and severing utility lines. This is a special problem in floodplains where the water table is relatively high and the soils are more susceptible to liquefaction.

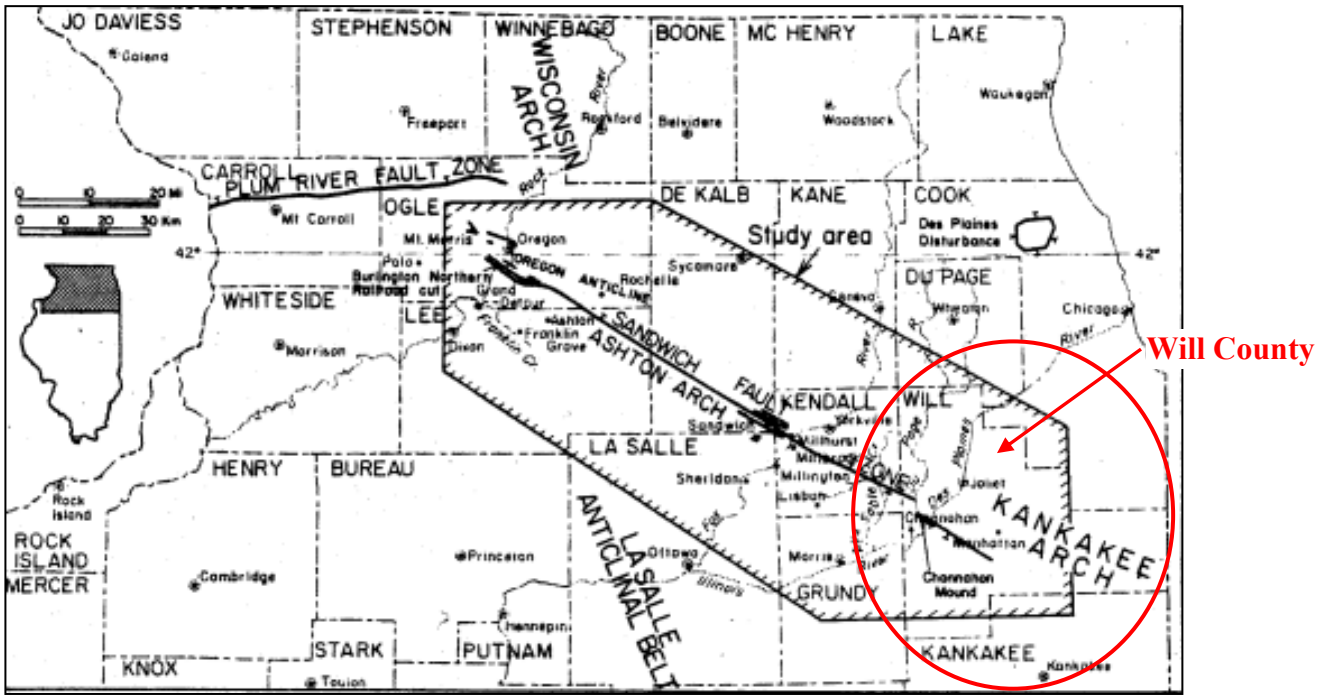
There are thousands of earthquakes in the U.S. each year, but most are so small in magnitude that they are unable to be felt. Historically, the most violent earthquakes have occurred in the central U.S. The old flat-lying, intact bedrock of the central United States behaves as a good "transmitter" of the earthquake's energy, and tremors can be felt hundreds of miles away. By contrast, the young, broken up bedrock of the West Coast allows the energy to dissipate quickly, which keeps the effects of the earthquake more localized.



The New Madrid Fault Zone runs from Cairo, Illinois to Memphis, Tennessee. It is the site of the most powerful earthquake ever recorded on this continent. An occurrence in this zone has occurred every 150

to 200 years; thus, it is likely that there will be another major earthquake within the next ten to twenty years. Should an earthquake occur in the New Madrid Fault Zone, Will County would be affected indirectly. The possibility of cracking could occur in plaster and chimneys of older buildings, and transit service would be delayed from the southern portion of the state.

The Sandwich Fault Zone is located in the highly populated northern part of Illinois. It is a narrow belt of high-angle faults that runs from Oregon, Illinois, southeast past Manhattan, Illinois. Knowledge of bedrock geology in this area has been applied in land-use planning. An understanding of the fault zone and associated geologic structures is important in evaluating the potential for underground disposal of waste materials and for underground storage and pipeline transportation of gas and liquid petroleum products. Also, the knowledge can be used to determine the suitability of sites for construction of major buildings, such as nuclear power plants.

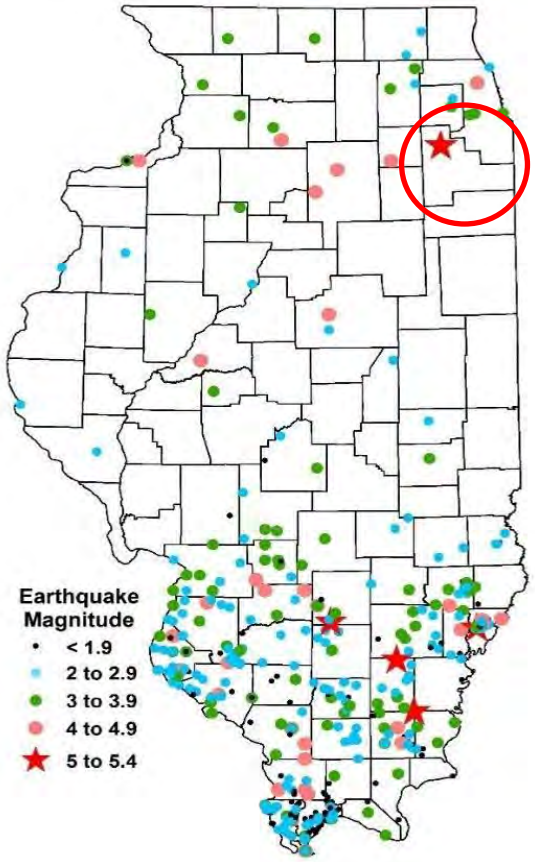


Sandwich Fault Zone Map

Magnitude and **intensity** are terms used to describe the severity of an earthquake, but they do not mean the same thing. *Magnitude* is a measure of the seismic energy released from the earthquake. It is calculated from measurements of the ground vibrations recorded by seismographs. Earthquake magnitudes are reported in logarithmic increments. This means that a magnitude 7 earthquake has about

32 times greater energy than a 6 and an increase of 0.2 means twice the energy is released. The *Richter Scale* is one of several variations of magnitude that are reported, each using a different formula to calculate the magnitude from the recorded vibrations (Bolt, 1993).

Earthquakes in Illinois from 1795 to 2017



Source: 2010 Illinois Hazard Mitigation Plan

Earthquakes in Illinois originate within the crust at depths of 1 to 20 km. The vibrations move out away from the point of origin (hypocenter or focus) through the bedrock and then up through the overlying soils on top of the bedrock. In the central part of the U.S., the bedrock is flat-lying, old, intact, and strong. Earthquake vibrations travel very far through material such as this in comparison to the young, broken, weak bedrock of the west coast. Because of this difference in bedrock, Central U.S. earthquakes are felt and cause damage over an area 15 to 20 times larger than California earthquakes with similar magnitudes.

Intensity is a description of the effects brought about by an earthquake, using the observations of people in the area affected. Intensities are based on descriptive reports, rather than calculated from instrument readings. In general, intensities decrease at greater distances from an epicenter. Intensities are influenced by the soils resting on bedrock. Thick, loose, saturated soils such as in river valleys may amplify earthquake ground motions and thus have higher intensities reported than just outside of the valley. Several formal intensity scales have been proposed for use in different parts of the world. In the U.S., earthquake intensities are reported using the twelve-point *Modified Mercalli Intensity Scale* increasing from barely detectable to catastrophic. For any earthquake, there will be multiple intensities, depending on the location of observers - but only one magnitude.

Modified Mercalli Intensity Scale

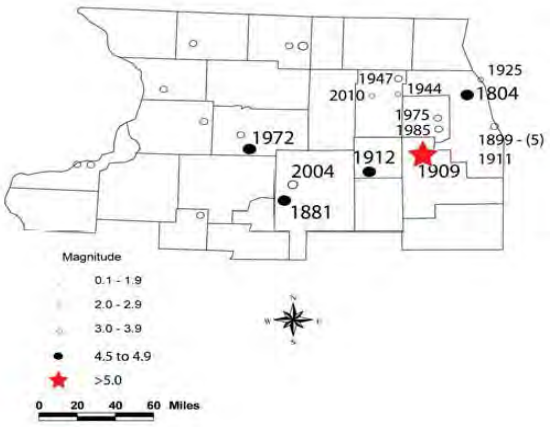
Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest,especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Source: U.S. Geological Survey

History

Records of earthquakes having epicenters in Illinois go back to January 8, 1795. This mild earthquake was centered near Fort Kaskaskia along the Mississippi River. About one earthquake a year occurs in Illinois and only nine of these were strong enough to cause minor damage. The largest recorded earthquake in Illinois occurred November 9, 1968 and measured 5.4 on the Richter Scale. Another earthquake near Olney, IL measuring a magnitude of 5.0 occurred on June 10, 1987, and was the last damaging earthquake in Illinois.

Northern Illinois Earthquakes



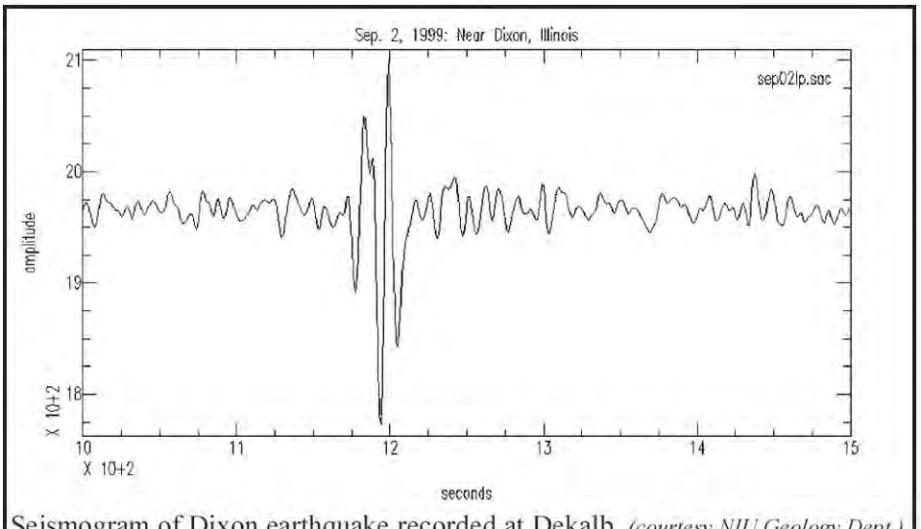
Source: 2010 Illinois Hazard Mitigation Plan

In the United States, the most frequent reports of earthquakes come from the West coast, but the largest earthquakes in the lower 48 states occurred in Missouri in 1811 and 1812 along the New Madrid Faults. The Great New Madrid Earthquakes are the benchmarks from which all earthquakes in the Midwest are

measured. An important fact is that the earthquakes of 1811 and 1812 were not single events. Rather the earthquakes were a series of over 2,000 shocks in five months.

Six of these quakes were larger than a magnitude of 7 on the Richter scale and two were near magnitude 8. They totally destroyed the town of New Madrid and caused the land to roll in visible waves. They raised and sank the land as much as 20 feet. The tremors of these earthquakes were no doubt felt throughout all of Illinois, since the quakes are said to have rung church bells in New England.

Northern Illinois: Fire in Aurora occurred in northern Illinois on May 26, 1909. The exact location of the magnitude 5.1 (estimated) earthquake is not known, but the largest intensities occurred in and near Aurora where many chimneys fell, a stove overturned, gas lines broke, and a fire started. Although considerable excitement ensued, the Aurora fire was quickly extinguished and soon forgotten. It was felt over 500,000 square miles, buildings swayed in Chicago where there was fear that the walls would collapse, houses were jostled out of plumb in Beloit, Wisconsin, and brick walls cracked as far away as Bloomington.



Seismogram of Dixon earthquake recorded at Dekalb. *(courtesy NIU Geology Dept.)*

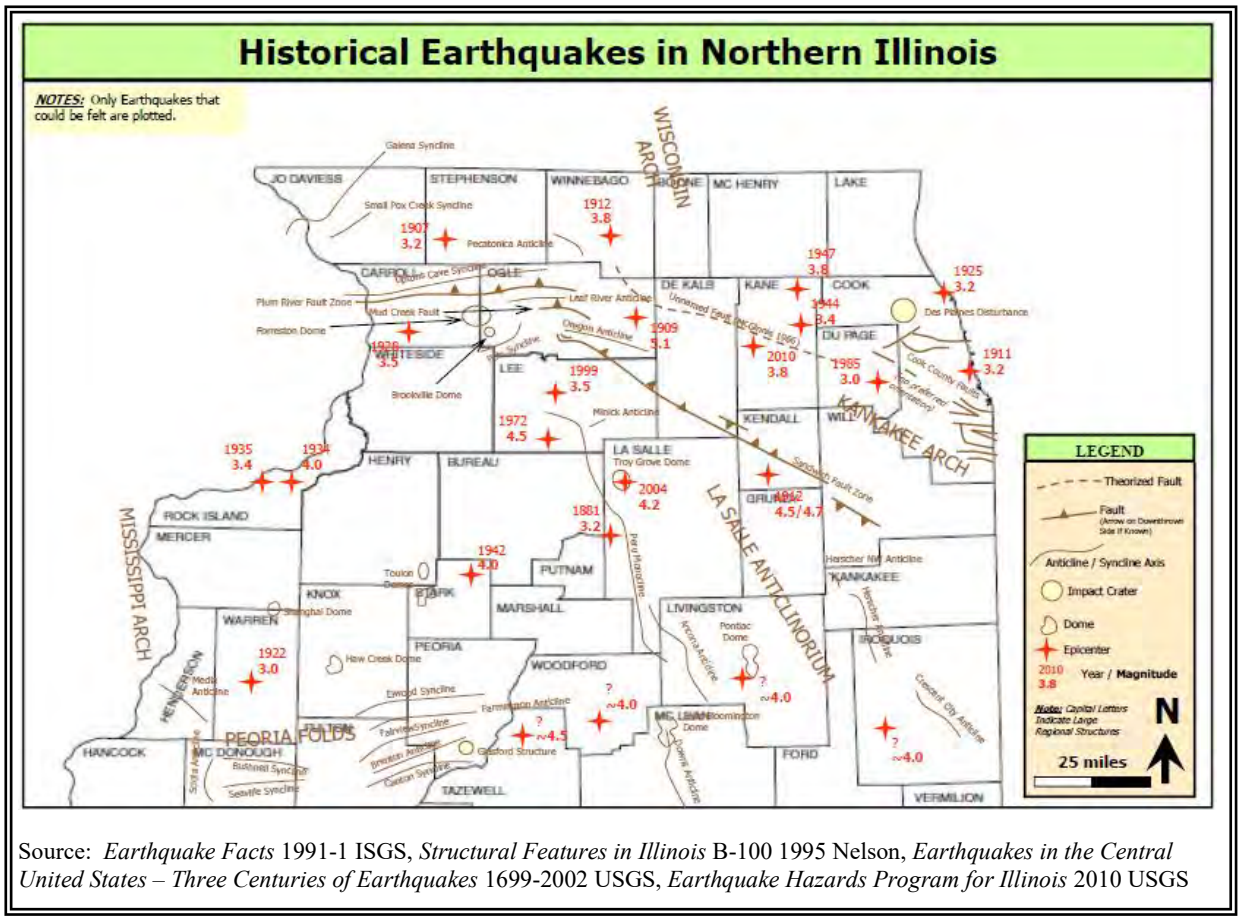
Available from: Illinois State Geological Survey

A somewhat smaller earthquake occurred nearby in 1912. A magnitude 4.0 earthquake centered in north-central Illinois south of Rockford, near the village of Amboy, woke many Chicago area residents when it struck late at night on September 15, 1972. It was felt over a very large area, but the intensity was much smaller than in the 1909 earthquake.

Twenty-seven years later on September 2, 1999, a magnitude 3.5 earthquake occurred at nearly the same location as the 1972 earthquake. The greatest intensities were several miles northwest of the epicenter as

located by regional seismographs. This same area also experienced a 4.2 magnitude event on June 28, 2004, which was felt in six states.

Many of the Illinois earthquakes have very small magnitudes, 2 to 4, that do not cause much damage, but are felt over large areas. Earthquakes occur throughout the state with most in the southern third of the state. Eight percent have occurred in the northern part of the state. Sixteen events have been recorded in Cook, DuPage, Kane, Kendall, and Will Counties since 1804. A 3.8 magnitude earthquake struck on February 10, 2010, about 2 miles northwest of Lily Lake in Kane County. This earthquake was located about 6 miles below the ground surface deep down within the granite.



Source: *Earthquake Facts* 1991-1 ISGS, *Structural Features in Illinois* B-100 1995 Nelson, *Earthquakes in the Central United States – Three Centuries of Earthquakes* 1699-2002 USGS, *Earthquake Hazards Program for Illinois* 2010 USGS

Risk Characterization

Very few of the earthquakes in Illinois during the last two centuries have caused any damage (Modified Mercalli Intensity of VI or higher) or injuries. Larger earthquakes in the New Madrid region have caused more damage in Illinois. The risk of probable damage from future earthquakes can be estimated based on the historical record of past earthquakes. The USGS has created maps for building codes in areas of the largest probable ground shaking that have a low probability of being exceeded over a 50 year period. They have plotted information as numerical values of ground shaking or accelerations. These values can be converted to Modified Mercalli Intensities. These USGS maps only show the estimate of shaking on the top of bedrock. Shaking will be modified by the overlying soils.

For most of Illinois, the risk is dominated by the possibility of large earthquakes recurring in the New Madrid Seismic Zone, south of Illinois. In this scenario, the maximum accelerations in the southern-most counties of Illinois exceed 60 percent of gravity, or Modified Mercalli Intensity X. Although the risk decreases to the north, there is a 2% probability during the next 50 years that accelerations greater than 10 percent of gravity, Modified Mercalli Intensity VII, could be exceeded in any of the southern half of Illinois. Because of the current record of minor to moderate earthquakes in northern Illinois, occurring west of Chicago, the risk of damaging earthquake motions increases in the western suburbs of Chicago. But if magnitude 4 to 5 earthquakes occur near or South of Chicago, as early events have been located, damage could occur to weak, old structures throughout parts of the city.

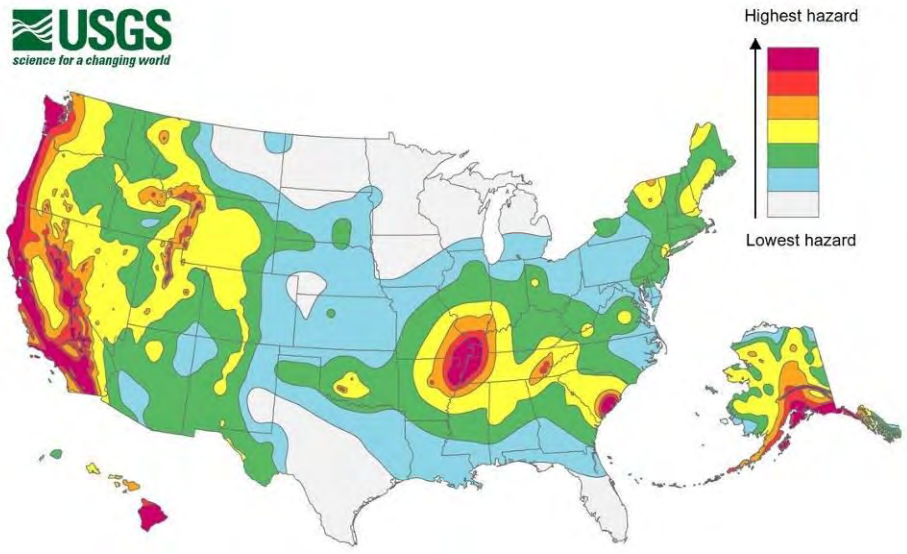
Earthquakes create numerous risks in people's homes. People can lessen the severity of earthquake damage by identifying hazards that exist in their homes, schools, or places of business and then systematically removing or correcting each hazard. This is especially important in the southernmost counties of Illinois where the earthquake risks are the greatest. Some common hazards include: free standing water heaters, stoves, and other gas or electric appliances which could move or fall during an earthquake; bookshelves or filing cabinets which are free standing or bookshelves with objects stored above head level; water or gas pipes which are not fastened well to walls or ceiling, and large panes of glass which could fracture and fly apart.

Some other things that people can do to make their homes more earthquake ready include: keeping a few days supply of food and water available; being sure each home has a fire extinguisher and smoke alarm; maintaining a properly equipped first aid kit complete with any necessary prescription medication in sufficient quantities to last a few days to a few weeks; organizing and testing a family emergency plan

which would help ensure each family member's survival; and having residents know how to turn off the gas supply to a building.

Should you be involved in an earthquake, remembering a few simple facts can greatly increase your chance of survival and can help to reduce the possibility of serious injury. If inside a building, stay inside and duck, cover, and hold. Protection inside a building is found next to or under heavy furniture. Do not run outside of a building during the shaking. Falling parts (bricks and glass) of buildings can kill or injure you. Rooms with lots of fixtures (hanging lights within a dropped ceiling) can be dangerous if they fall. Large windows or groups of windows can shatter and shards of glass can fly inward. These areas should be avoided. Large rooms with open-span ceilings or roofs are the most vulnerable to collapse and should be avoided.

USGS 2018 Long-term National Seismic Hazard Map



For over 20 years, IEMA has been involved in the Central United States Earthquake Consortium (CUSEC). During most of these years, an earthquake planner has been employed by IEMA. Part of their duties is to promote earthquake safety awareness. As discussed previously, there are steps individuals can take to make their surroundings more secure during an earthquake which have extensively been promoted. Also, there are earthquake resistant building techniques which can be incorporated into building construction. Unfortunately, the State of Illinois does not have a standard uniform building code. Each jurisdiction adopts and enforces the building code they chose. IEMA has worked to make southern Illinois aware of the earthquake risk and encouraged earthquake resistant construction in new buildings. All new schools built with state funds must comply with the 2007 International Building Code.

A preparedness program called The Great Central Shakeout began in 2014 designed to educate the public about how to protect themselves during a large earthquake and how to prepare. The 2014 drill spanned eleven states and included more than 2.7 million participants. The drill is held in October throughout Illinois along with other Great Shake Out regions across the U.S. Information on this program is available from: https://www.shakeout.org/centralus/index.html

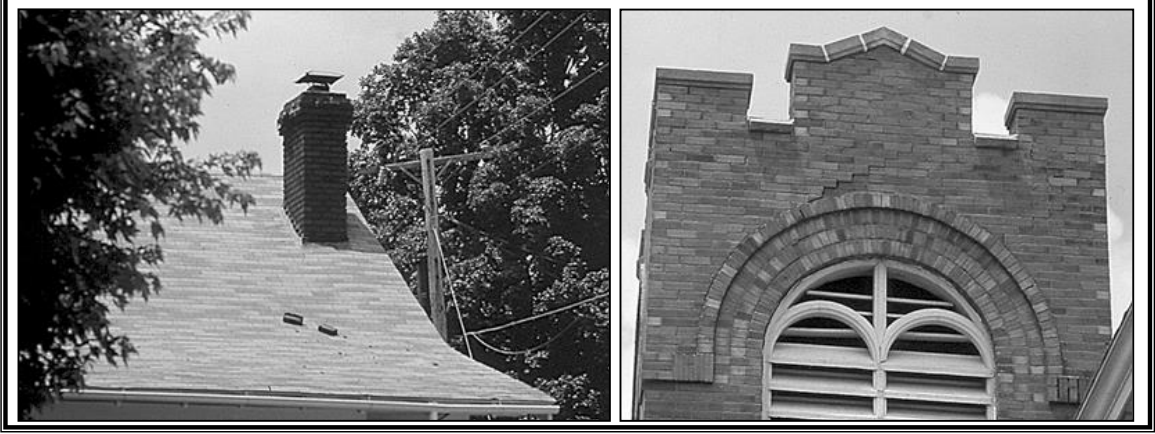
Damage to Buildings

Damage to buildings, highways, power lines, pipelines and other structures only partly depend on the amount of energy released during the earthquake. Certain kinds of earth materials resting on the bedrock amplify the earthquake ground motions. In Illinois, structures built on thick, loose sediments of river floodplains are more likely to be damaged than structures on glacial till (stiff, pebbly clay) or bedrock. In fact, seismic intensity may increase one or more units on the Modified Mercalli Intensity Scale if loose sediments are present. Also, loose sandy sediments with high moisture content can turn to liquid, quick sand type state - (liquefaction), when shaken enough.

Generally, wood frame buildings and structures on solid ground fare best during an earthquake. Wood frame buildings are flexible enough to withstand ground shaking and swaying. Evaluations of recent earthquakes found that damage was primarily caused to:

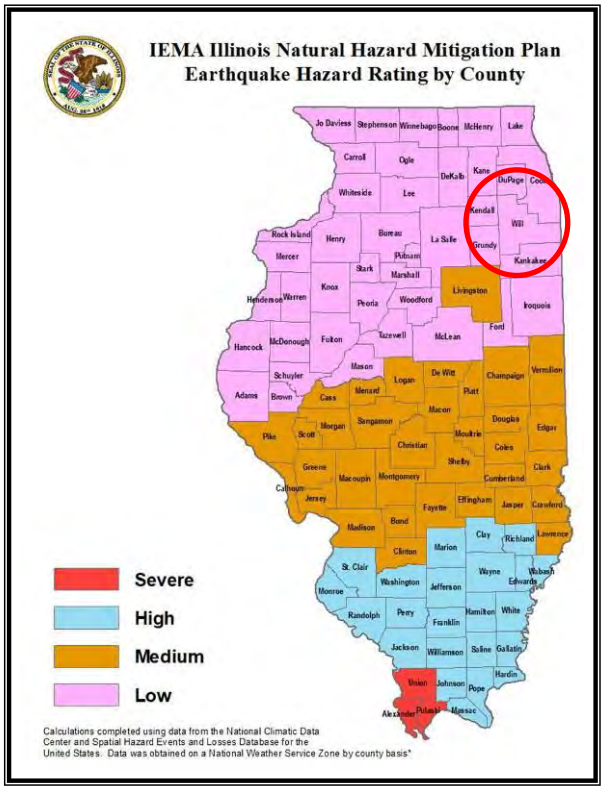
- Un-reinforced masonry structures
- Older buildings with some degree of deterioration
- Buildings without foundation ties
- Multi-story structures with open or "soft" first floors

Typical minor damage (Modified Mercalli Intensity VI to VII) from Lawrenceville, Illinois M 5.0 earthquake. Bricks thrown from Chimney and diagonal masonry cracks in church tower.



At risk in Will County, given the low threat of an earthquake at a Mercalli Intensity of VII or greater, are un-reinforced masonry structures. Most of these structures can be considered to be historical masonry buildings, built before current building codes. To strengthen structures and minimize damage, communities can adopt the International Building Coe (IBC) and International Residential Code (IRC)

Other areas of potential damage include transportation systems: bridges, pavement cracks or buckles, and misalignment or fissures of rail lines. Utilities could be impacted by downed power and communication lines, breaks in water and sanitary sewer lines, and cracking or breaking of natural gas pipelines. Cracks in dams or levees could cause failure.



Impact: Low

Critical Facilities

The overall earthquake damage to critical facilities is low.

Health and Safety

While injury and loss of life are important factors in other parts of Illinois when assessing earthquakes, they are of low concern for Will County. During an earthquake, injuries are expected to be few; however falling debris or fires could be a threat. Should a major earthquake impact southern Illinois, there exists the potential for damage to natural gas pipelines. This would be of greatest concern in the winter in northeastern Illinois.

Overall, the impact to health and safely is considered to be low. There are important things people should know what to do should an earthquake occur.

- Prepare your home by anchoring free standing objects like appliances, bookcases, cabinets, water heaters, overhead storage, etc.
- Have your emergency kit ready with food, water, medications, and a first aid kit

- Install in the home smoke alarms and equip with fire extinguisher
- Learn how to properly turn off gas and electric utilities
- Stay inside, duck under heavy furniture, cover the back of your head, and hold on to the furniture

Economic Impact

If any damage was sustained to businesses and infrastructure, the impact of an earthquake would be on the local economy. Public expenditures for repairs to public facilities and clean-up and disposal of debris can be high, especially if the structures are not insured for earthquakes. The overall expected economic impact is considered to be low.

Future Occurrence

The *2018 Illinois Natural Hazard Mitigation Plan* rates the earthquake hazard for Will County as low.

STATE-WIDE ESTIMATE WITH DEFAULT DATA

The Federal Emergency Management Agency sponsored HAZUS (Hazards US) computer loss estimation program comes with default data of building and some infrastructure inventory from various sources including the 2000 census. It uses one type of soil for the entire area. Soils modify the earthquake ground motions that travel through the bedrock and typically amplify the ground motions, increasing shaking at the ground surface as compared to the shaking on the bedrock. The default building inventory contains numbers of structures by construction type per census track and replacement costs for structures are based on an average cost per square foot for 2002. It contains an inventory of essential facilities such as: hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities and high potential loss facilities such as: dams, levees, military installations, nuclear power plants and hazardous material sites.

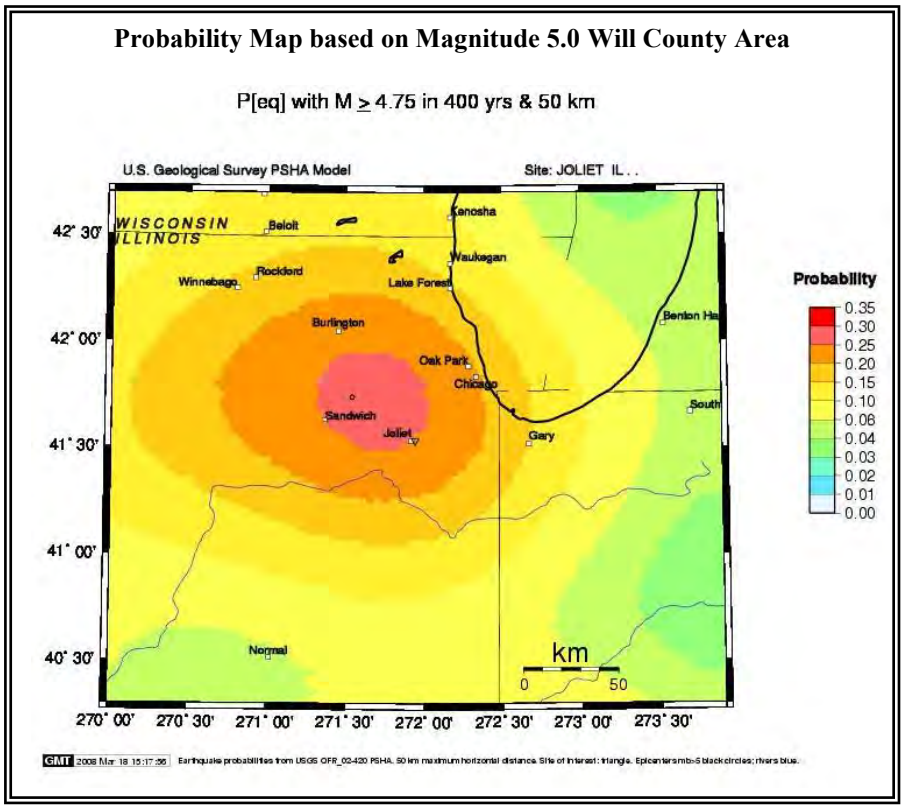
State-Wide Damage for Magnitude 6.3 New Madrid Event

HAZUS estimates that 4,453 buildings will sustain at least moderate damage and of those 1,689 will be completely damaged. No essential facilities are expected to be completely damaged and a large percentage will be functional on the day of the event. It is estimated 6,321 households will be without potable water and 3,964 without electricity on the day of the event. Eight of the 22,854 bridges in Illinois are expected to be completely damaged

along with two ferry facilities. Debris generated is estimated to be 219,000 tons. Displaced households are 1,882 with 556 requiring shelter. There are 540 casualties and a total direct economic impact of about $920 million.

State-Wide Damage for Magnitude 7.7 New Madrid Event

HAZUS estimates that 75,272 buildings will sustain at least moderate damage and of those 19,044 will be completely damaged. Forty-two essential facilities are expected to be completely damaged including two hospitals and many facilities will need a few days to a month to recover to functionality. It is estimated 100,483 households will be without potable water and 25,191 without electricity on the day of the event. Sixty-two of the 22,854 bridges in Illinois are expected to be completely damaged along with two ferry facilities and one airport. Debris generated is estimated to be 3,377,000 tons. Displaced households are 22,468 with 6,556 requiring shelter. There are 7,629 casualties and a total direct economic impact of about $9 billion.



DROUGHT

Hazard Characterization

The basic cause of drought in Will County and the surrounding counties is a prolonged deficiency of rainfall that can happen any time of the year. The effects of the drought vary in different areas due to such factors as unequal distribution of rainfall, differences in topography and soil, the erratic distribution of drainage features, and the continuing change in the underlying bedrock geology throughout Will County. In certain locations, man's erratic development, alteration, and misuse of natural resources will significantly affect the severity of the drought. Drought devastates crops resulting in low yields and economic losses. Winds blow away topsoil and create dust storms further eroding farm land. Water tables are lowered. Forests and grasslands are susceptible to fire.

A drought is defined as the cumulative deficit of precipitation relative to what is normal for a region over an extended period of time. Unlike other natural hazards, a drought is a non-event that evolves as a prolonged dry spell. Droughts occur when a long period passes without substantial rainfall. A heat wave combined with a drought is a very dangerous situation. When a drought begins or ends may be difficult to determine. A drought can be short, lasting just a few months, or persist for years before climatic conditions return to normal. There are four commonly used operational definitions:

Meteorological Drought:	A period of well-below-average precipitation that spans from a few months to a few years.
Agricultural Drought:	A period when soil moisture is inadequate to meet the demands for crops to initiate and sustain plant growth.
Hydrological Drought:	A period of below-average streamflow and/or depleted reservoir storage (i.e., streamflow, reservoir and lake levels, ground water).
Economic Drought:	This definition deals with the supply and demand of water. Some years there is an ample supply of water and in other years there is not enough to meet human and environmental needs.

While drought conditions can occur at any time throughout the year, the most apparent time is during the summer months. High temperatures, prolonged high winds, and low relative humidity can aggravate drought conditions. Because the impacts of a drought accumulate slowly at first, a drought may not be recognized until it has become well established. The many aspects of drought reflect its varied impacts on people and the environment. While the impacts of precipitation deficit may be extensive, it is the deficit, not the impacts, that defines a meteorological drought.

Drought causes losses to agriculture; affects domestic water supply, energy production, public health, and wildlife; and contributes to wildfire, to name a few of its effects.

Primary Effects

- Crop failure is the most apparent effect of drought in that it has a direct impact on the economy and, in many cases, health (nutrition) of the population that is affected by it. Due to a lack of water and moisture in the soil, many crops will not produce normally or efficiently and, often, may be lost entirely.
- Water shortage is a very serious effect of drought in that the availability of potable water is severely decreased when drought conditions persist. Springs, wells, streams, and reservoirs have been known to run dry due to the decrease in ground water, and, in extreme cases, navigable rivers have become unsafe for navigation as a result of drought.

Secondary Effects

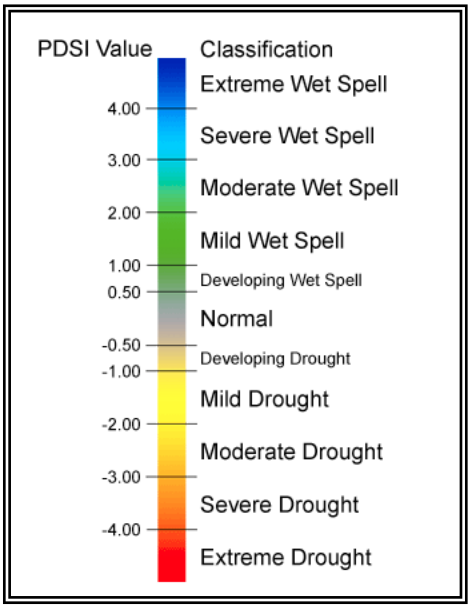
- Fire susceptibility is increased with the absence of moisture associated with a drought. Dry conditions have been known to promote the occurrence of widespread wildfires.
- Energy demands increase during periods of high heat.

Tertiary Effects

- Environmental degradation in the forms of erosion and ecological damage can be seen in cases of drought. As moisture in topsoil decreases and the ground becomes dryer, the susceptibility to windblown erosion increases. In prolonged drought situations, forest root systems can be damaged and/or destroyed resulting in loss of habitat for certain species. In addition, prolonged drought conditions may result in loss of food sources for certain species.

- In prolonged drought situations the soil surrounding structures subsides, sometimes creating cracks in foundations and separation of foundations from above ground portions of the structure.

The Palmer Drought Severity Index (PDSI) is an attempt to compare weekly temperature and precipitation readings over a defined climatic region in order to identify periods of abnormally dry (or wet) weather. These PDSI readings reflect the relative disparity between moisture supply (precipitation and soil moisture) and demand (evapotranspiration, soil recharge and runoff needs) for a particular region based upon what is considered normal for the area. The index is used to evaluate scope, severity, and duration of abnormal weather. Southern Illinois is generally more vulnerable to drought due to having soils that hold less water.



The PDSI is an important climatological tool for evaluating the scope, severity, and frequency of prolonged periods of abnormally dry or wet weather. It can be used to help delineate disaster areas and indicate the availability of irrigation water supplies, reservoir levels, range conditions, amount of stock water, and potential intensity of forest fires.

Droughts occur when a long period passes without substantial rainfall. A prolonged drought, such as the drought that remained in the Midwest from 1987 to 1991, can have a serious economic impact on a community. Increased demand for water and electricity may result in shortages of resources. Moreover, food shortages may occur if agricultural production is damaged or destroyed by a loss of crops or livestock.

The National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln, the National Oceanic and Atmospheric Administration (NOAA), and the U.S. Department of Agriculture (USDA) jointly produce the Drought Monitor. Drought Monitor assesses drought conditions weekly, based on how much precipitation did or did not fall and shows the parts of the U.S. that are in drought. It is unique in that it is not a statistical model, although numeric inputs come from many sources:

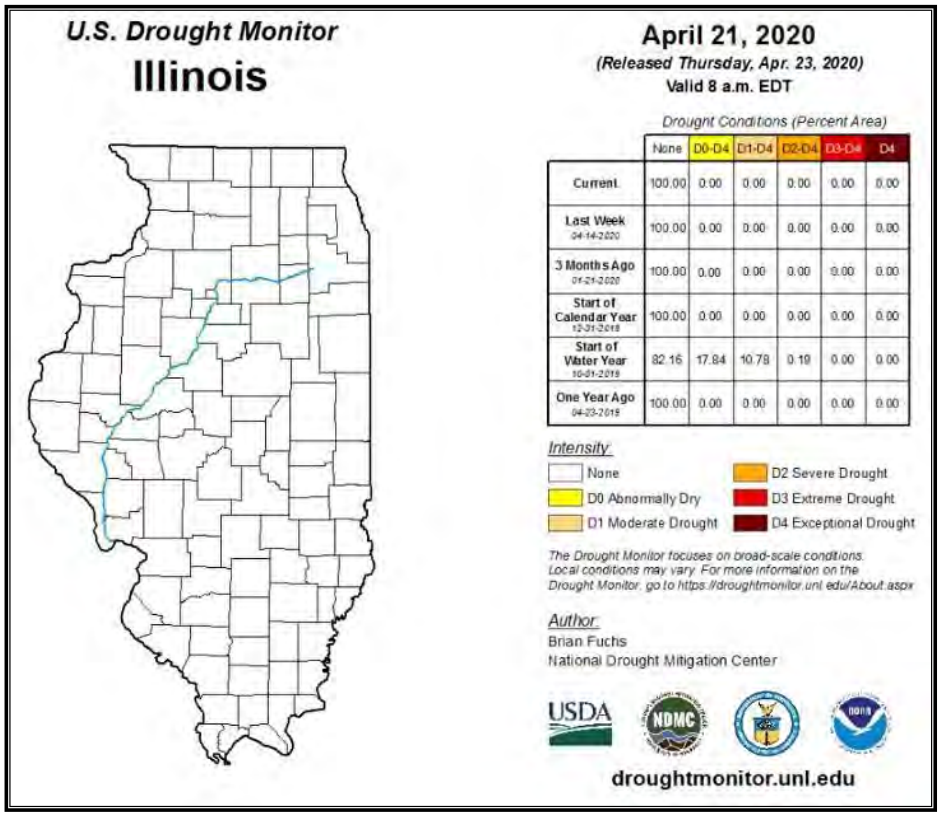
- Palmer Drought Severity Index,
- Standardized Precipitation Index, and other climatological inputs;

- Keech-Byram Drought Index for fire, satellite-based assessments of vegetation health, and various indicators of soil moisture and;
- Hydrologic data, particularly in the West, such as the Surface Water Supply Index and snowpack.

Unlike most of the weather maps people see in the news, the U.S. Drought Monitor is not a forecast. It looks backward and provides an assessment of drought conditions of the past week. It is available from: https://droughtmonitor.unl.edu/.

Drought is defined as a moisture deficit bad enough to have social, environmental or economic effects. The U.S. Drought Monitor provides a consistent big-picture look at drought conditions in the United States and is not meant to infer specifics about local conditions. The Drought Monitor map identifies areas of drought and labels them by intensity.

- D1 is the least intense level
- D4 the most intense.
- D0 areas are not in drought, but are experiencing abnormally dry conditions that could turn into drought or are recovering from drought but are not yet back to normal.



Drought Classification

Category	Description	Possible Impacts	Ranges				
			Palmer Drought Severity Index (PDSI)	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index (SPI)	Objective Drought Indicator Blends (Percentiles)
D0	Abnormally Dry	Going into drought: ▪ short-term dryness slowing planting, growth of crops or pastures Coming out of drought: ▪ some lingering water deficits ▪ pastures or crops not fully recovered	-1.0 to -1.9	21 to 30	21 to 30	-0.5 to -0.7	21 to 30
D1	Moderate Drought	▪ Some damage to crops, pastures ▪ Streams, reservoirs, or wells low, some water shortages developing or imminent ▪ Voluntary water-use restrictions requested	-2.0 to -2.9	11 to 20	11 to 20	-0.8 to -1.2	11 to 20
D2	Severe Drought	▪ Crop or pasture losses likely ▪ Water shortages common ▪ Water restrictions imposed	-3.0 to -3.9	6 to 10	6 to 10	-1.3 to -1.5	6 to 10
D3	Extreme Drought	▪ Major crop/pasture losses ▪ Widespread water shortages or restrictions	-4.0 to -4.9	3 to 5	3 to 5	-1.6 to -1.9	3 to 5
D4	Exceptional Drought	▪ Exceptional and widespread crop/pasture losses ▪ Shortages of water in reservoirs, streams, and wells creating water emergencies	-5.0 or less	0 to 2	0 to 2	-2.0 or less	0 to 2

Source: The National Drought Mitigation Center

No two states experience the same set of impacts during a drought. Tables have been developed with drought impacts that have been reported in each state, for each U.S Drought Monitor (USDM) category, during the onset of a major drought. This supplements and enhances the general nationwide information in the "Possible Impacts" column of the **U.S. Drought Monitor Classification Scheme**, describing what impacts may be associated with each level of drought.

Illinois Possible Drought Impacts

Category	Impact
D0	Soil moisture declines; lawns turn brown
D1	Row crops and pasture show drought stress
	Fireworks are banned
	Trees show drought stress; wildlife eat more crops
D2	Row crop and vegetable conditions are poor; hay yield is low; corn is baled for feed
	Outdoor burn bans are implemented
	Lawns go dormant; weeds grow faster
	Farmers are stressed; agriculture industry is hurting
	Power plant intake is compromised
	Water levels in wells, ponds, rivers, and lakes are low; streamflow is below average; voluntary water conservation is requested
D3	Disease kills deer; fish are stressed
	Vegetation is stressed
	Well and reservoir levels are very low
D4	Feed prices are high; crop loss is widespread; livestock are culled
	Wildlife are severely stressed; fish kills occur in lakes and rivers

Source: The National Drought Mitigation Center

History

One-month precipitation deficits on a statewide or regional basis do not usually constitute droughts, although there may be significant impacts on agriculture depending on the time in the growing season and on soil moisture conditions. Agricultural and hydrologic droughts have different lag times in relation to the timing of precipitation, and their intensities do not correlate exactly with one another.

Agricultural droughts typically trigger the availability of several USDA emergency assistance programs from the Farmers Home Administration (loans), Agricultural Stabilization and Conservation Service (disaster assistance payments), Natural Resource Conservation Service (formerly SCS, for technical assistance), and Federal Crop Insurance Corporation (loss claims). In September 1983, all 102 counties were proclaimed state disaster areas because of high temperatures and insufficient precipitation beginning in mid-June. More recently in 1988, 54 percent of the state was impacted by drought-like conditions, resulting in disaster relief payments to landowners and farmers exceeding $382 million, but no state proclamations.

IMPACT OF DROUGHT EVENTS ON WILL COUNTY (Source: NOAA/National Centers for Environmental Information / WC EMA)
September, 1998
August, 1999
September, 1999
October, 1999
November, 1999
December, 1999
August, 2002
September, 2002
June, 2005
July, 2005
August, 2005
September, 2005
October, 2005
November, 2005
December, 2005
January, 2006
February, 2006
The *2018 Illinois Hazard Mitigation Plan* notes that NCEI calculates drought losses & occurrences by region & not on a county by county basis.

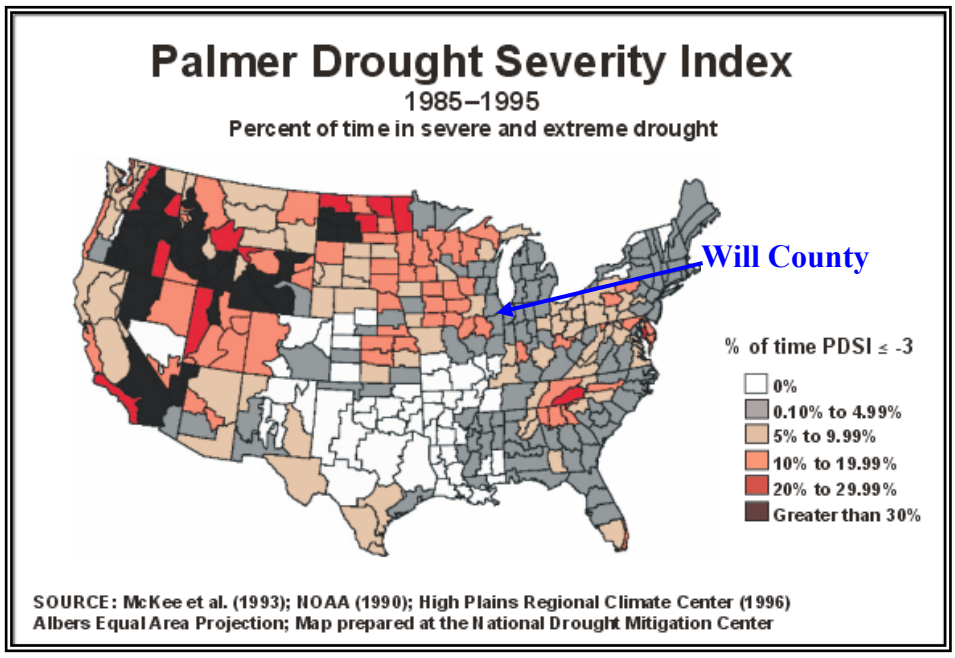
Both the timing and amount of precipitation are responsible for the occurrence of a drought. The mean annual precipitation in Illinois varies from 34 inches in Northern Illinois to 46 inches in the South. Annual amounts fluctuate primarily within a 10-inch range of the median. The most severe drought in recent years was 1988, when rainfall was 88 percent of normal. The timing or distribution was also abnormal because 1988 saw less than 50 percent of the April through August normal rainfall. Droughts of this magnitude occur about once every 21 years.

A smaller drought occurred in the northern two-thirds of the state (NWS zones 1-10). Although it only lasted through the month of May 1992, Chicago, Moline, and Rockford recorded the driest May on record and Springfield and Peoria their second driest.

Precipitation of less than 88 percent of normal also occurred in all of Illinois in September of 1994, Northwestern Illinois in December of 1994, the northern half of the state in February of 1995, all of the

state in March, and the northern half again in June of 1995. However, even though precipitation values were below average, none of these were considered drought-like conditions officially.

Precipitation values from 54 to 65 percent of normal for the months of February and April of 1996, in northwest and central portions of the state would technically put those areas into the 3-month or 6-month precipitation drought categories. However, above average precipitation in May reversed all drought impacts.



A severe drought struck Illinois in 2005-2006, especially in the northern half of the state. Dry conditions in 2005 reached a historic level of severity in some parts of Illinois and ranked as one of the three most severe droughts in Illinois in 112 years of records. The timing of the dryness during the spring and summer, when water demand and use are high, ensured substantial impacts on agriculture and other sectors. The drought also had several unusual characteristics. The drought area was long and narrow, extending from south Texas to the Great Lakes. But within the Midwest, the drought had relatively minor impact on states other than Illinois. A record number of remnants of hurricanes and tropical storms passed through Illinois during July, August and September, substantially ameliorating drought conditions in portions of central and southern Illinois. Crop yields were surprisingly high in parts of the state, perhaps providing evidence of increased drought resistance in modern varieties and the benefits of timely rains.

Risk Characterization

All areas in the United States are at risk of drought at any time of the year. The following paragraph was provided by Jim Angel, former State Climatologist at the Illinois State Water Survey, to explain the Illinois Hazard Rating Drought Map.

> "One of the obstacles to an objective and reasoned reaction to drought in Illinois is uncertainty over its definition. One way of measuring drought is through the Palmer Drought Severity Index (PDSI), which takes into account both temperature and precipitation in determining the severity of drought. Historically, the 1930s and 1950s were periods when drought was most frequent and troublesome in Illinois. More recently, the 1988 drought was severe but short-lived, lasting from June to October of that year. Based on the PDSI, the risk of drought has historically been evenly distributed across the state. This is not surprising since drought is partially the result of changes in the large-scale circulation patterns of the atmosphere, for example, the location of a high-pressure dome over the Midwest in summer. Historically, moderate to severe drought occurs about 17% of the time in Illinois. However, Southern Illinois is generally more vulnerable to drought due to soils that hold less water and water supplies that are more likely to rely on shallow groundwater and surface water."

Impact: Low

Damage to Buildings

Heat and drought have little or no impact on structures. The impact on buildings is low. Since impact is low, the vulnerability of extreme heat and drought has not been calculated.

Critical Facilities

The impact of extreme heat and drought to critical facilities is low. Though extreme heat and drought can have an impact on water supply. The demand on electric utilities is elevated. Preparedness and mitigation actions should include education of the public on water saving techniques that include installing low flow water faucets, showerheads, and toilets. Repairing plumbing leaks, reducing the amount of water used by running full dishwasher and washing machine loads, and utilizing rain-capturing devices for irrigation.

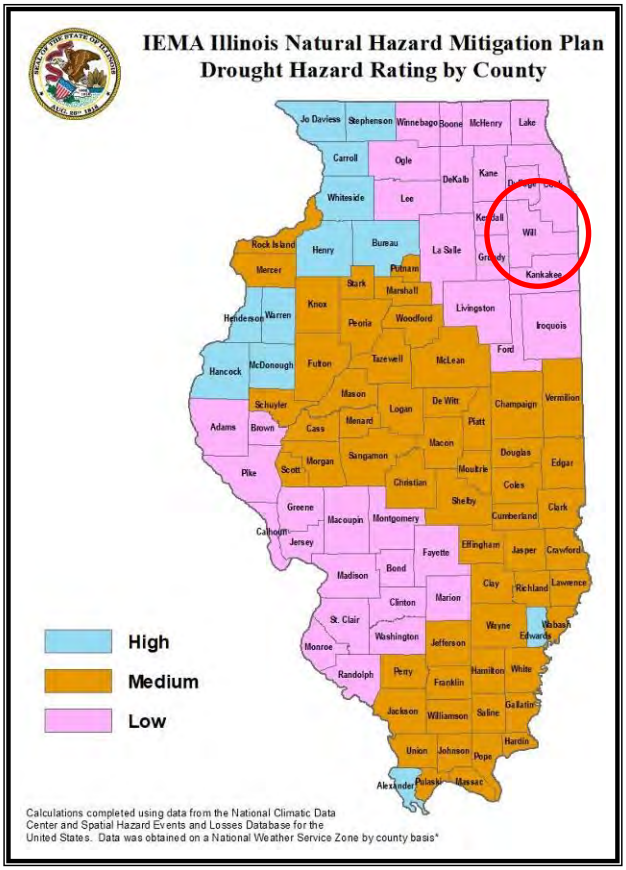
Health and Safety

Will County, like most areas of the Midwest, is very vulnerable to extreme heat. Stagnant atmospheric (humid and muggy) conditions and poor air quality can induce heat-related illnesses. Urban areas are exposed more acutely to the dangers of extreme heat due to heat being retained in asphalt and concrete and being released at night. In addition to air quality, concrete and asphalt store heat longer and gradually release the heat at night which produces higher nighttime temperatures, allowing little relief.

Young children; the elderly; those who are sick, overweight or have alcohol problems; and men in general (because they sweat more and become more quickly dehydrated) are more susceptible to extreme heat. Usually the victims have been overexposed to heat or have over-exercised for their age and physical condition. People are at risk for heat stroke or sun stroke, heat exhaustion, and dehydration. Impact on people is high.

Economic Impact

A heat wave combined with a drought creates a very dangerous environment. Also, a prolonged drought, such as the drought that plagued the Midwest from 1987 to 1991, can have a serious economic impact on a community. Increased demand for water and electricity may result in shortages of resources. Both of these can be supplied in the municipalities with no economic disruption. In rural areas and villages where water is drawn from shallow wells, rationing or lawn watering bans may be needed. Moreover, food shortages may occur if agricultural production is damaged or destroyed by a loss of crops or livestock.



Part of a preparedness and mitigation strategy would be to encourage farmers to implement soil and water conservation practices that promote resiliency by ensuring the health and quality of the soil. Conservation practices include rotation of crops, contour farming, the planting of cover crops, and zero or reduced tillage. Also, there is the availability of crop insurance to cover losses due to drought. Will County farmers have the support of education and data on drought, heat, and erosion issues through the Will County Farm Bureau, Will/South Cook Soil and Water Conservation District (SWCD), and the Natural Resources Conservation Service (NRCS).

There are no available figures on the cost of drought or heat to Will County. The 1988 drought/heat wave resulted in $382 million in disaster relief payments to landowners and farmers throughout the state. While not the major industry as in the past, agriculture is still important to the county's economy. A severe drought would have a ripple effect on other sectors, especially in the rural areas.

Future Occurrences

Per IEMA, all counties within the state are affected by drought to some degree and are considered at risk for damages. From 1990 to 2017, the state estimated the annual statewide losses to be approximately $72 million dollars. The 2004 Illinois Hazard Mitigation Plan estimated that the frequency of droughts in the state "occurs about once every 21 years." Extreme heat events have occurred more frequently in Will County.

The *2018 Illinois Natural Hazard Mitigation Plan* rates Will County's future risk of drought as low. Using NCEI data, the state developed loss estimates for each county within the state and the following figure provides the result of this analysis for Will County.

Severe Drought Estimates for Will County (NCEI)	**# of Droughts 1951 – 2017**	**Total Recorded Loss**	**Average $ in Crop & Property Damage per Event**	**Annual Probability of Event**	**Estimated Annual Loss**
	9	$0	$0	14%	$0

DROUGHT OCCURRENCES		
Type	**Number of Occurrences Since 1993**	**Annual Mean**
Drought	9	0.3

HAZARDOUS MATERIAL – FIXED SITE and TRANSPORTATION

Hazard Characterization

Will County has many oil refineries, chemical manufacturers, and other businesses that use hazardous materials in their processing. A dozen facilities are listed on the State Hazardous Sites list. Over three hundred facilities are Environmental Protection Agency (EPA) regulated and are required to report to the EPA the storage and releases of specific chemicals. This reporting system is guided by the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 and provides information for hazardous and toxic chemicals.

EPCRA establishes requirements for federal, state and local governments, Indian tribes, and industry regarding emergency planning and "Community Right-to-Know" reporting on hazardous and toxic chemicals. The Community Right-to-Know provisions help increase the public's knowledge and access to information on chemicals at individual facilities, their uses, and releases into the environment. States and communities, working with facilities, may use the information to improve chemical safety and protect public health and the environment. EPCRA has four major provisions:

- Emergency planning (sections 301-303)
- Emergency release notification (section 304)
- Hazardous chemical storage reporting requirements (sections 311-312)
- Toxic chemical release inventory (section 313)

Reporting Schedules

Section	
302	One time notification to SERC/TERC and LEPC
304	Each time a release above a reportable quantity of an EHS or CERCLA Hazardous Substance occurs to LEPC and SERC or TERC.
311	One time submission of Safety Data Sheets (SDS) or list of hazardous chemicals. An update is required for new chemicals or new information about chemicals already submitted to the SERC or TERC, LEPC, and the fire department with jurisdiction over the facility.
312	Annually, by March 1 to SERC or TERC, LEPC, and the fire department with jurisdiction over the facility.
313	Annually, by July 1 to EPA, states, and tribes

SERC:	State Emergency Response Commission
TERC:	Tribal Emergency Response Commission
LEPC:	Local Emergency Response Committee
EHS:	Extremely Hazardous Substance
CERCLA:	Comprehensive Environmental Response, Compensation, & Liability Act
EPA:	Environmental Protection Agency

Releases of hazardous or toxic chemicals must be reported which include emission of gases, wastewater releases into rivers and other bodies of water, solid waste disposal in landfills, injection of wastes into underground wells, transfer of wastewaters to public sewage plants, and transfer of wastes to off-site facilities for treatment or storage.

EPCRA CHEMICALS REPORTING THRESHOLDS				
Chemical Covered	**Section 302** ~355 EHS	**Section 304** >1,000 substances	**Sections 311/312** ~ 500,000 hazardous chemicals	**Section 313** > 650 Toxic Chemicals & categories
Thresholds	Have present onsite, at any one time, an EHS in quantity = or > TPQ	Release of an EHS in quantity = or > RQ or RQ of CERCLA defined hazardous substance = or > RQ	EHS in quantity = or > TPA or 500 pounds (whichever is less for EHSs) OSHA hazardous chemical (SDS) = or > 10,000 lbs 75,000 gallons for gasoline 100,000 gallons for diesel 10,000 pounds for all other hazardous chemicals	25,000 pounds per year manufactured or processed 10,000 pounds a year otherwise used Persistent bio-accumulative toxics have lower thresholds
TPQ: Threshold Planning Quantity **EHS:** Extremely Hazardous Substances **RQ:** Reportable Quantity **SDS:** Safety Data Sheet				

The chemicals and materials that these facilities use have a wide range of toxicity. A small release of many of these chemicals may have little effect on the surrounding environment; however, the release of some chemicals or radioactive materials could have long lasting effects on the environment and injure or kill many people in the affected area. The hazard from these chemicals can be explosive, flammable, combustible, corrosive, reactive, poisonous, toxic, a biological agent, or radioactive.

Hazardous materials can be spilled or released during the manufacturing or refining process or they can be spilled during transportation to or from these facilities as raw elements or processed goods. Radioactive materials used in medicine and industry are included along with the nuclear sites located in Braidwood and nearby Grundy County. Thousands of hazardous materials are shipped on a daily basis through the county's local communities by all modes of transportation. With the intermodal systems in place in Will County, hazardous chemicals are transported by rail, highway, pipeline, and waterway on a daily basis. Crude oil rail shipments average two to fourteen unit trains (unit trains = minimum of three car loads) per week transiting Will County. An accident within any of these transportation systems could cause an emergency affecting many people.

Hazardous materials include corrosives, flammables, toxic materials, radioactive substances, explosives, dangerous gases, and poisons. Accidents may affect the immediate vicinity of the accident site or spread to involve a portion of the surrounding community. These types of accidents can usually be handled effectively by local emergency services. Large-scale accidents that involve a widespread release of a toxic substance may have severe implications for the surrounding environment and population.

Statistically, most hazardous material accidents are caused by some type of human error and rarely by mechanical failure of the facility or carrying vessel.

History

Numerous spills have occurred along the county's highway and railway systems. Most involve the spill of diesel fuel, but others have involved corrosive and flammable liquids.

- On December 12, 2004, two-thousand gallons of diesel fuel were spilled in Joliet along the BNSF railroad.
- A spill on July 19, 2001, involved 13,000 gallons of Nalkylene 540 L detergent Alkylate on the Des Plaines River near Channahon.
- On July 2, 1999, 12,000 lb. of an oil/water mix was dispersed near Channahon affecting 7,500 people, 2,500 homes, and area crops.

IMPACT OF HAZARDOUS MATERIAL – FIXED SITE & TRANSPORTATION EVENTS IN WILL COUNTY
Number of Incidents from 1990 to 2020
(Source: National Response Center)

Fixed Site	Pipeline	Vehicle	Railroad	Railroad – No Release	Storage Tank	Vessel	Unknown Source	Aircraft
1,116	93	142	73	92	84	121	191	–

Risk Characterization

Hazardous material incidents are intentional and/or unintentional releases of a hazardous material. Each incident's impact and resulting response depends on many variables that include the quantity and specific characteristics of the material, the conditions of the release, the weather conditions in the area of the release, and the area/population centers involved. The effects of the spill could be limited to the incident site or quickly spread by wind or water for many miles.

Hazardous material site control and clean-up is a highly technical and expensive process requiring specialized training and equipment. Local fire districts have some limited ability to deal with hazardous material, but area chemical facilities and the Will County EMA also have HAZMAT teams who are specially trained to deal with such incidents.

Will County EMA's Hazardous Materials Team is composed of volunteers who are certified in hazardous material response and mitigation for leaks, spills, and fires. The team is composed of Occupational Safety and Health Administration (OSHA), National Fire Protection Association (NFPA), and Illinois Office of the State Fire Marshal (OSFM) certified personnel from the fire service, industry, and emergency management. The team is trained to the specialist level and supported by industrial hygienists. The team provides emergency mitigation containment and control of all types of hazardous material.

Will County has a diverse mix of manufacturing and agricultural entities. Both types of entities deal with chemicals that can have hazardous effects. In addition, the agricultural economy can be affected when hazardous chemicals are dispersed by the wind over farm fields or livestock. Spills and releases are usually random, but are minimized with regular inspections and maintenance, good housekeeping, effective emergency plans, readily available fire suppression equipment, proper warning labels, the use of appropriate containers and storage, and training in proper safety and handling procedures.

Will County has a Local Emergency Planning Committee (LEPC) composed of representatives from the following groups or organizations: state and local officials, local environmental groups, law enforcement, hospital, local government EMA, transportation, fire-fighting, broadcast and print media, first aid or emergency medical services, community groups, health, and, owners and operators of facilities subject to Section 620.90 of the State of Illinois EPCRA Rule. The Will County Local Emergency Planning Committee (LEPC) was formed in April, 1987 under the Superfund Amendments and Reauthorization Act of 1986. The law revised and expanded the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA). The LEPC's purpose is to support the entities in meeting reporting and planning requirements of EPCRA as well as provide information to the public.

Supporting the county's education, planning, response, and recovery is the Illinois Emergency Management Agency's (IEMA) State Emergency Response Commission (SERC) which promotes chemical emergency preparedness and prevention throughout the State of Illinois. The Illinois Department of Public Health (IDPH) provides support through investigation and testing by their Epidemiology and Environmental Health Protection units.

Impact: High

Damage to Buildings

Damage can result from contamination, but in most cases damage or destruction occurs from fire or explosion.

Critical Facilities

Critical infrastructures can be damaged or destroyed by fire or explosion. Water supplies can be contaminated when hazardous chemicals enter the water system or aquifers.

Health and Safety

Health problems may be immediate, such as skin burns, eye and lung irritation, or delayed, such as cancer and genetic damage. Environmental concerns include contamination of drinking water, waterways, air, soil/farm land, vegetation, wildlife, and structures.

Economic Impact

Chemicals released into the environment contaminating soil, ground or surface water, buildings, and crops or affecting the health of the area population can prove costly to contain, remediate, and cleanup to acceptable standards. Cleanup bills, legal liabilities, and frustration for affected property owners are some of problems commonly associated with spills. When the responsible party for the spill cannot be identified, it can leave the local and state government in charge of protecting the public and financing the clean-up process.

Future Occurrence

As the county continues to grow and attract more industrial and manufacturing companies, warehousing, and intermodal transport, the potential for future hazardous material spills and release will also grow.

FIRE

Hazard Characterization

Fire is any occurrence of uncontrolled burning which results in major structural damage to residential, commercial, industrial, institutional, or other types of property. In urban areas where buildings are set close together, fire can jump from one building to another, resulting in major conflagration. Embers from these fires can travel by wind to the roofs of other structures setting off secondary fires. Fire can also damage forests and grassy areas.

Fire at an industrial site may involve flammable or hazardous materials. Fire may ensue at a gasoline service station or from a damaged pipeline. Fire may cause serious explosions. It can have a major environmental impact from the release of hazardous materials into the air, drainage systems, soil, or adjacent buildings during the fire or while it is being extinguished. Along with property damage, it is a hazard to the county's community causing injury or death to occupants and responders. It can also damage utilities or force evacuation of the affected area.

History

Numerous fires have occurred in the history of Will County. Major occurrences include:

IMPACT OF FIRES ON WILL COUNTY
(Source: WC EMA/Local News Media Reports)

Date	Location	Type	Impact
January 8. 2020	Joliet	Apartment Bldg. Fire	$70,000 Damages 3 Families Displaced
August 3, 2019	New Lenox	Chemical/Warehouse Fire	Bldg. #1 – Total Loss Bldg #2 – Heavy Damage Env. Cleanup - $473,697 0 Injuries or Death
August 14, 2001	Lemont	Refinery Fire	$25 million damages
July 2, 1999	Channahon	Propane Explosion	2 Injured
April 29, 1999	Romeoville	Pipeline Rupture	7 Injured 34 Townhomes destroyed 199 out 394 homes damaged
March 17, 1990	Lemont	Refinery Fire	1 Injured 65,000 gal. Gal.Oil storage tank
April 23, 1988	Joliet	Grain Elevator Explosion	3 Injured, 5 Dead
March 12, 1988	Rockdale	Werco Warehouse Fire	6 Injured $5 + million damages
July 23, 1984	Romeoville	Union Oil Refinery Explosion	30 Injured, 17 Dead $25 million damages
June 5, 1942	Elwood	Elwood Ordnance Plant (Joliet Army Ammunition Plant) Explosion	67 Injured, 49 Dead $30 million damages

Risk Characterization

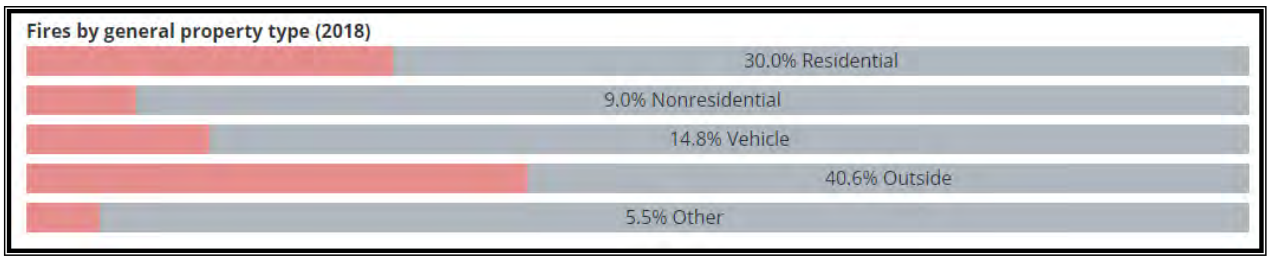
A fire or explosion may occur at any time with no warning. Urban fires may result in very costly damages. Urban communities with newer industrial and business facilities are reasonably secure from potential conflagration. These buildings are generally constructed of fire resistive materials, protected with automatic sprinkler systems, equipped with fire extinguishing and fire detection systems, and reasonably well separated. However, there is always the risk of accidents, equipment failure, hazardous materials explosions, secondary fires caused by other hazards, or intentionally set fires.

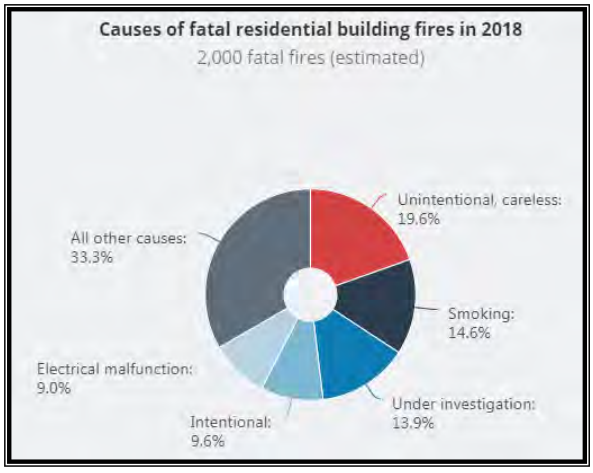
Illinois Fire Deaths, Rates, & Relative Risk (2017)	
Fire Deaths	146
Fire Death per million population	11.4
Relative Risk	1.0

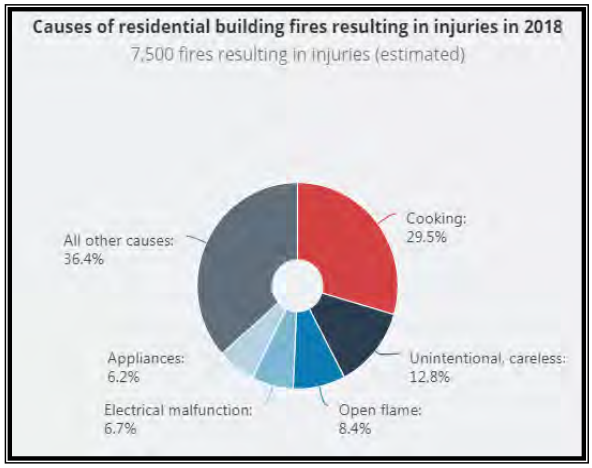
The U.S. Fire Administration reports the following for the period of 2008-2017:

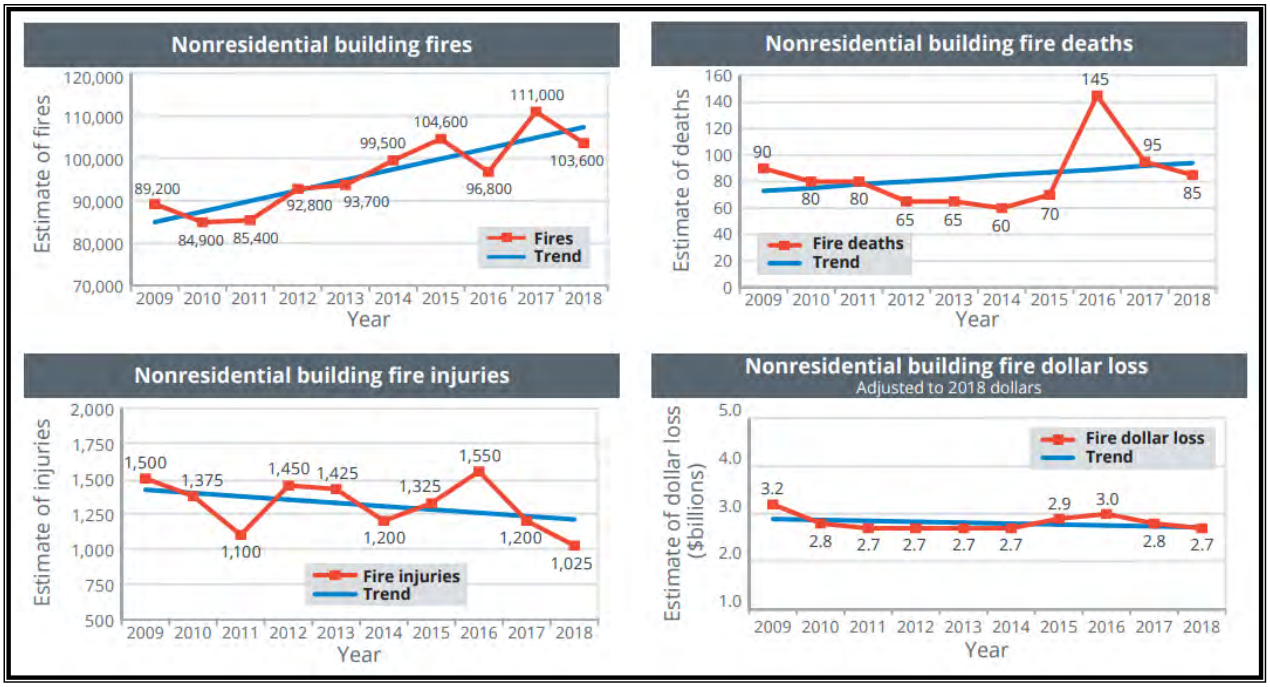
National Trends in Fires, Deaths, Injuries, and Dollar Loss		
	In 2018	Trend From 2009
Fires	1,318,500	-2.5% ↓
Deaths	3,655	+20.5% ↑
Injuries	15,200	-17.0% ↓
$ Loss	$25.6 billion	+90.6% ↑
No Large $	$13.2 billions	-3.8% ↓

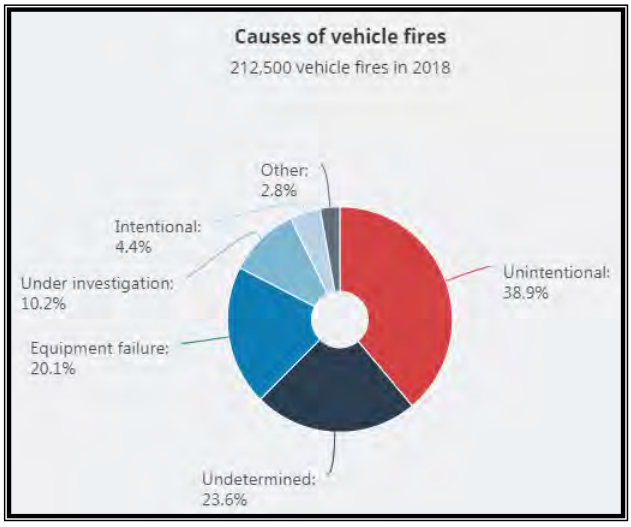
National Firefighter Deaths (2018)	
Died on Duty	82
Died from Heart Attacks	33
Died from Activities Related to Emergency Incident	42
Died from Activities at Fire Scene	30
Died During Training Activities	9
Died Responding To/Returning From Emergency Incident	10

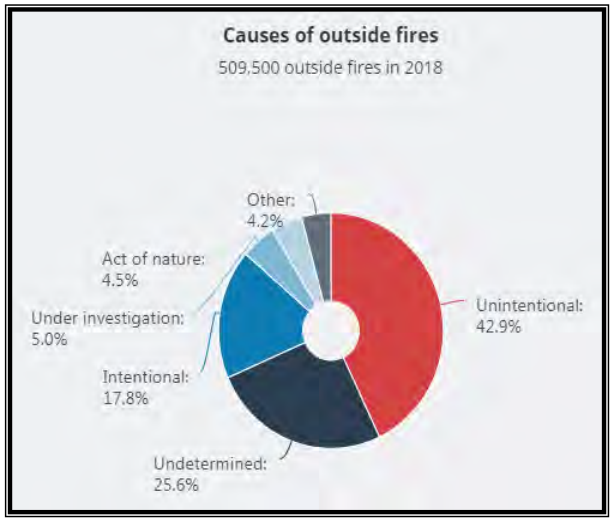












Older facilities and homes are one potential source of fire hazard. These structures may not meet the standards of current building codes that prevent fires. The wiring, heating/cooling systems, and appliances may be in need of repair or replacement which could cause a fire. The facility may not have smoke alarms that would alert occupants to a fire outbreak or lack fire extinguishers to put out small fires. Regular maintenance and repair of all facilities helps to avoid fire hazards.

Will County has become a hub for intermodal transportation and warehousing. This could potentially raise the risk of fire resulting from transportation accidents, spills and improper storage of hazardous materials, improper training or mishandling of materials and equipment, insufficient or misuse of safety equipment, poorly maintained facilities, etc. Thus, it is important that building codes be strictly enforced during the construction of these facilities and preventative measures be implemented by the owners to prevent fires from happening.

Prevention is a solution to reduce destructive fires. It is incumbent upon each citizen to prepare and practice fire safety. Good public education programs on fire safety, fire alarms, and fire response are important prevention measures.

Safety tips:

- Install and maintain smoke alarms, fire extinguishers, and sprinklers (commercial facilities)
- Create and practice an evacuation strategy
- Practice good housekeeping and properly store and dispose of hazardous materials
- Eliminate electrical hazards
- Schedule routine equipment maintenance
- Establish designated smoking areas far away from building
- Train employees how to property operate machinery and safely store and dispose of hazardous materials
- Conduct routine fire drills
- Post clear exits and escape routes

Impact: High

Damage to Buildings

Fires cause serious damage or destruction to buildings.

Critical Facilities

Critical facilities can be seriously damaged or destroyed by fires disrupting services to businesses and household.

Health and Safety

Fires cause serious burns, injuries, smoke inhalation, and death to individuals inside burning buildings, first responders, and area population when hazardous chemicals are released into the atmosphere as a result of fire or explosion.

Fire can have a major impact on the environment and may require costly cleanup

Economic Impact

Injury, loss of property, and business interruption can have devastating economic impact to individuals, businesses, industry, and populations served by affected businesses and infrastructure. There may or may not be insurance to cover the cost of structure repair or replacement, injuries, or lost business.

Future Occurrence

The risk of fire is always a potential but can be mitigated with fire safety practices, fire detection systems, fire suppression equipment, and fire resistive materials. New facilities must meet building codes which are implemented to reduce fire risk for the protection of people and property.

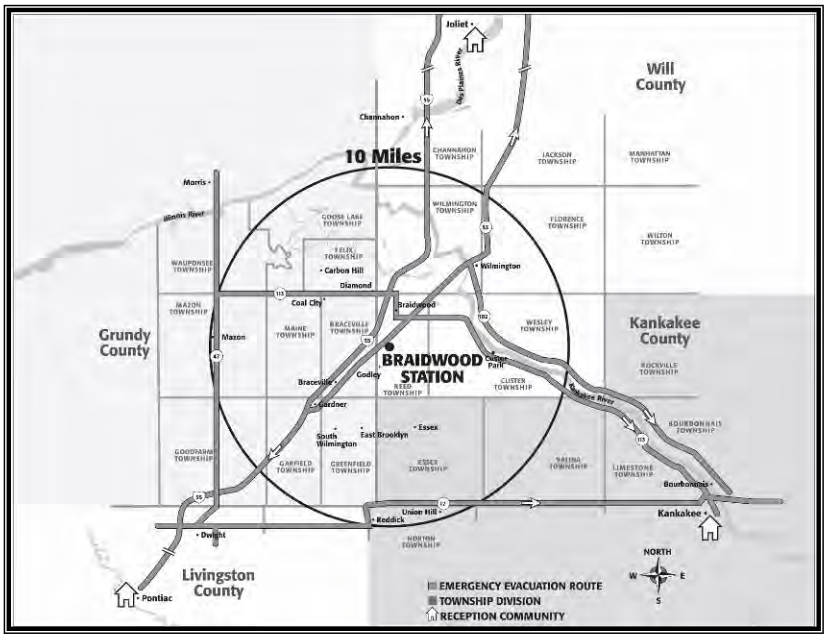
NUCLEAR POWER PLANT ACCIDENT

Hazard Characterization

There are two nuclear power plants, the Braidwood Nuclear Power Station and Dresden Nuclear Generating Station that have direct effect on the population of Will County. The areas of risk associated with these facilities are the potential plume's emergency planning zone that encompasses a ten-mile radius of the facility and the ingestion emergency planning zone that encompasses a fifty-mile radius. Because of the danger of exposure from radioactive materials, these plants are sited away from major population centers and are designed with safety systems and back-up safety systems. Nuclear plants are required to have an emergency radiological response plan in effect.

Braidwood Generating Station

Exelon's newest nuclear power station is located in northeastern Illinois, approximately 20 miles southwest of Joliet and about 60 miles southwest of Chicago in Will County. The station is built on a 4,457-acre site, and its cooling lake was formed from scarred farming land and an old strip mine. It's Units 1 and 2 began commercial operation in July and October of 1988, respectively. The initial construction cost for the station was $5.2 billion.

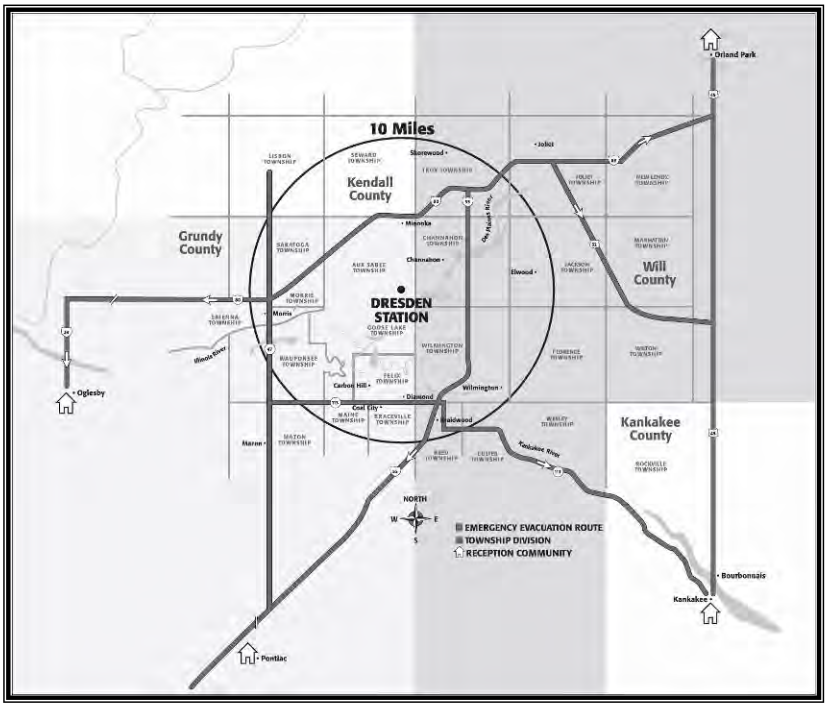


Both of Braidwood's units are pressurized water reactors designed by Westinghouse. Each unit is capable of generating nearly 1,200 net megawatts and together they can produce enough power to support the electricity needs of over two million average American homes.

Braidwood has about 763 Exelon employees. The majority of Braidwood's employees live in Grundy and Will Counties. The station's annual payroll is about $78 million. Additionally, during refuel

outages, Braidwood employs several hundred temporary contractors, who boost the local economy during their stay. Exelon pays taxes totaling about $26.5 million every year to support county and township government, area schools, libraries, park districts and other taxing bodies.

Dresden Generating Station



Located in rural Grundy County, Dresden is home to the nation's first full-scale, privately financed nuclear power plant which began operation in 1960. Capable of generating 210 megawatts of electricity before its retirement in 1978, Dresden Unit 1 is designated a Nuclear Historic Landmark by the American Nuclear Society. Dresden Units 2 and 3 began commercial operation in 1970 and 1971, respectively. In October of 2004, the Nuclear Regulatory Commission renewed the operating licenses for both units for an additional 20 years, extending them to 2029 and 2031. Both units contain boiling water reactors designed by General Electric. Each unit is capable of generating nearly 900 megawatts of electricity, which together can produce enough power to support the electricity needs of over 1.5 million average American homes.

Dresden has about 850 Exelon employees. Most of Dresden's employees live in Grundy and Will Counties. The station's annual payroll is about $74 million. Additionally, during refueling outages, Dresden employs several hundred temporary contractors who boost the local economy during their stay. Exelon pays taxes totaling about $24.8 million every year to support county and township government, area schools, libraries, park districts and other taxing bodies. .

Generation of Electricity

Power plants create electricity by running steam turbines, which are powered either by the fossil fuels coal, oil, or natural gas or by nuclear power. Nuclear technology produces energy by splitting uranium atoms in a process called fission. Fission generates heat that boils water for the steam that runs the turbines, which produce the electricity that we all use, making, for instance, toast for breakfast. In a nuclear power plant, pea-sized uranium pellets are stacked inside long, thin fuel rods which are grouped in "assemblies" inside a reactor "core." The core is encased in a very thick steel capsule, and the entire reactor is further protected by an airtight steel and concrete building called a "containment." This complex structure is designed to help ensure the safe utilization of nuclear power.

Waste

Any fuel used to produce energy also produces waste. By-products of coal-burning include smoke, ashes and slag. Even with the latest technologies, it is impossible to prevent some of this waste from reaching the environment outside the power plant. Nuclear power generation, on the other hand, produces waste primarily in the form of spent fuel, which is not released into the environment. Besides helping to protect the environment, nuclear energy is also highly efficient, producing vastly more energy for its weight than coal or oil. We would have to burn 120+ gallons of oil or up to a ton of coal to produce the same amount of energy as that found in a single pellet of uranium.

History

Worldwide

Three significant accidents in the sixty year history of civil nuclear power generation are:

Three Mile Island (USA 1979) The reactor was severely damaged but radiation was contained and there were no adverse health or environmental consequences.

Chernobyl (Ukraine 1986) The destruction of the reactor by steam explosion and fire directly killed 41 people and had significant health and

environmental consequences. Studies continue on the health effects on the impacted population.

Fukushima (Japan 2011) Following a major earthquake, a tsunami disabled the power supply and cooling of three reactors. All three cores largely melted in the first three days. There were no deaths and exposure doses to radiation from the nuclear accident were low, but over 100,000 people had to be evacuated from their homes. The Fukushima Health Management Survey (FHMS) was implemented after the accident as a way to monitor the long-term health of residents, promote their future well-being, and confirm whether long-term low-dose radiation exposure effects health. Responses showed very low-radiation exposure doses among residents with low expectations for radiation-related health effects. However, psychological distress and an increase in lifestyle-related health problems were found to be far greater among people in Fukushima than those in other areas affected by the nuclear accident.

Will County

Nuclear regulatory agencies require testing of groundwater along with emissions from nuclear generation facilities. Tritium is a radioactive isotope of hydrogen that produces a weak level of radiation. It is produced naturally in the upper atmosphere when cosmic rays strike atmospheric gases and is produced in larger quantities as a by-product of the nuclear energy industry. When combined with oxygen, tritium has the same chemical properties as water. Tritium can be found at very low levels in nearly all water sources. The area located on the northeast corner of the Braidwood Generation Station property just south of Smiley Road was the location of tritiated water that spilled back in 1998.

Risk Characterization

Essentially, radiation is a form of energy that can travel through the air, just like light, heat or radio waves. Small amounts of radiation are naturally generated by different elements in the environment. Food, water, air and sunlight all expose us daily to tiny amounts of radiation. Uranium is simply a more powerful source of radiation which, when used properly, can be highly beneficial.

Sometimes people are concerned that a power plant reactor will "blow up," but this is virtually impossible. The uranium contains only 3 to 4 percent fissionable material, and the fuel is further diluted to slow down the fission process. This low concentration can generate enough heat to boil water but not enough to explode. In short, there is no way for a power plant reactor to produce a nuclear explosion.

Some people also think that they, or the environment, may be accidentally exposed to nuclear radiation by living or being near a nuclear power plant. Although radioactivity can be dangerous, keep in mind that a

power plant reactor is designed to contain radiation, protecting the rest of the plant and the surrounding community. To ensure the greatest safety; however, any incident at a power plant that presents the slightest potential for a leak would be addressed with the utmost care. First, special teams would gather detailed radiation readings at the plant and throughout surrounding areas. Depending on a number of factors, which include the amount of radiation released and weather conditions that would affect movement of the radioactive "plume", state officials would recommend a course of action. A significant incident might require people to stay indoors or to evacuate to temporary relocation centers. In any event, you would be instructed in a safe course of action to protect yourself and your loved ones.

Accidents occur in three different levels or degrees. The first degree is an accident that is handled effectively within the plant by safety systems. The second is an accident in which the safety systems malfunction and radioactive noble gases and iodine are released into the atmosphere. The third degree is a core meltdown and involves an accident in the cooling system. Three dominant exposure modes people experience as a result of a release of radioactive materials are whole body exposure, thyroid exposure, and exposure from ingestion of radioactive materials.

Regulations for nuclear power plants are stringent to ensure the public's safety.

- Nuclear Power Plants (six) in Illinois and the United States are subject to meeting standards established by the U.S. Nuclear Regulatory Commission (NRC) and the state. These building and construction standards are delineated in each plant's Updated Safety Analysis Report.
- There are no specific land-use practices in place for areas surrounding a nuclear power plant. However, for the area surrounding each nuclear power plant, a 10-mile Emergency Planning Zone has been established. Detailed plans are established, implemented, and trained against to ensure that offsite response organizations can effectively manage an accident at a nuclear power plant.
- The IEMA limits the quantities of radioactive materials a facility can have on hand at any one time. A licensing and enforcement program accomplishes this limitation.
- For existing nuclear power plants, utility access controls are in place to prevent unauthorized access to the facility. IEMA works with shippers of high hazard radioactive material to improve the performance of shipping containers.
- The basic characteristics of radiation are fixed by the Laws of Physics and are immutable. IEMA is working with manufacturers of high hazard radioactive materials to improve their basic

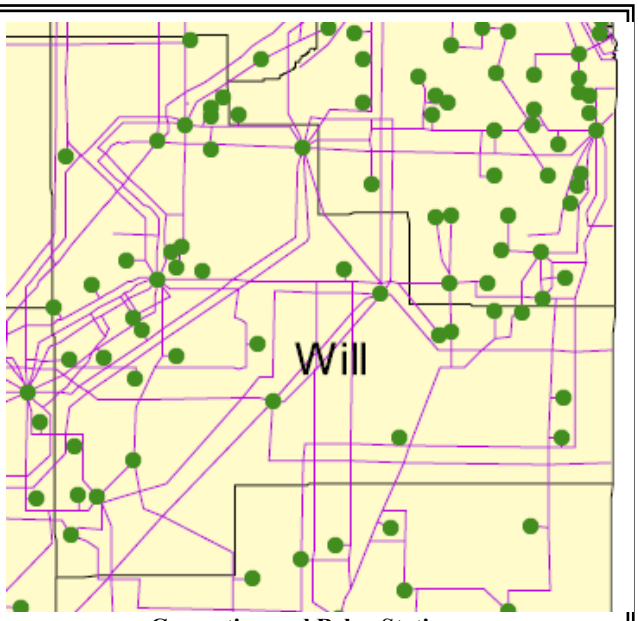
structural integrity and reduce the probability of release during normal use and accident conditions.

- The NRC reviews all licensing issues to ensure the requirements for nuclear power plant protective systems and equipment are maintained. Additionally, IEMA's Resident Inspectors routinely inspect these systems for operability and maintenance activities. IEMA Response personnel are equipped with appropriate radiological detection and monitoring instrumentation, personal protective equipment, dosimetry, training, and procedures to handle a radiological emergency.
- Nuclear power plants are designed, built, and operated with redundant and diverse critical systems and equipment.

Impact: Medium

Damage to Buildings

Damage to property is low; however, contamination could have major adverse effects rendering buildings and facilities unusable.



Generating and Relay Stations
Major Electrical Transmission Lines

Critical Facilities

Damage or destruction of the nuclear generation station would impact the production and delivery of electricity to the area. Complete shutdown of the Braidwood station could impact electric service to as many as two million homes. The shutdown of Dresden could impact electric service to as many as 1.5 million homes. Water and sewer utilities would be unable to function without electricity to power pumps.

Health and Safety

Radiation is measured in rems or in millirems (thousandths of a rem). On average, a person living in Illinois receives about 300 millirem of radiation annually from natural sources and another 60 millirem or so from X-rays and other medical procedures. It takes more than 60 times this much,

over 20,000 millirem in a single day, to produce identifiable effects in the body. Federal regulations allow workers to receive up to 5,000 millirem of radiation in the course of a year's work.

Economic Impact

The partial or complete loss of electric generation would have a severe economic impact on Will County and the surrounding area. Homes and businesses would lose the use of utilities necessary for everyday living and business activities. Transportations systems would be impeded since road and railways would lose the use of lights and signals necessary for controlling traffic. Fuel would become unavailable without functioning fuel pumps. Most needed services would be impacted.

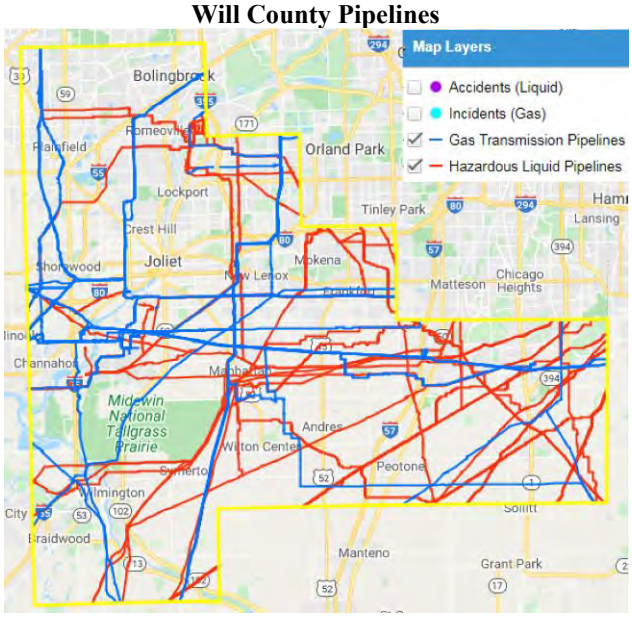
Future Occurrences

There have been three major reactor accidents in the history of civil nuclear power: Three Mile Island, Chernobyl, and Fukushima nuclear disasters. These are the only major accidents to have occurred in more than 14,500 cumulative reactor years of commercial operations in thirty-three countries. One was contained without harm to anyone, the next involved an intense fire without provision for containment, and the third severely tested the containment, allowing some release of radioactivity. Extraordinary effort has been put into safety and security issues to safeguard the public against harmful incidents with stringent regulations enforced by the Nuclear Regulatory Commission. The risks from western nuclear power plants, in terms or the consequences of an accident or terrorist attack, are minimal.

PIPELINE RUPTURES

Hazard Characterization

Pipelines are a potential hazard because of the materials conveyed within them. The most common materials carried by pipelines are petroleum, crude oil, propane, natural gas, CO_2, and ethanol. Pipelines range in diameter from 3/8 inch to 3+ feet in diameter with many of the pipes having been laid more than twenty-five years ago. Elements in the soil such as moisture, bacteria, or acids act on the pipes causing damaging exposure. The release of material because of pipe failure due to age or breakage during excavation work can cause explosion, fire, pollution, or loss of communication or power. Pipeline failures can also be secondary to land subsidence, earthquake, fires, or erosion.

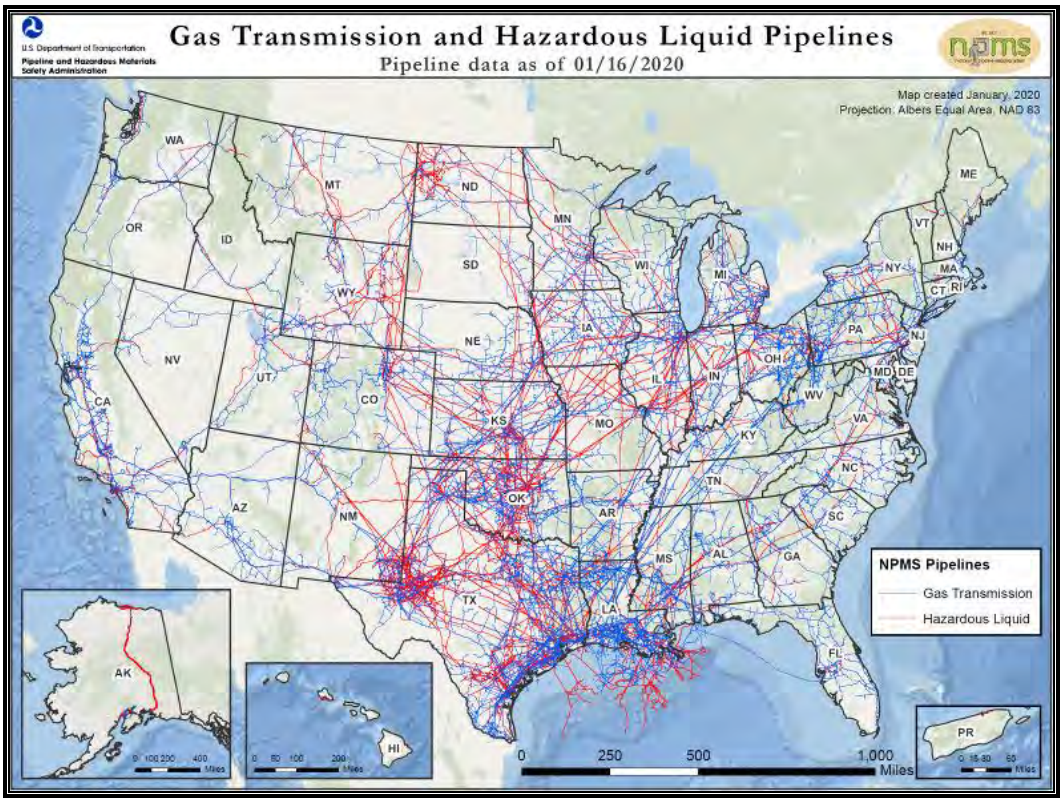


Source: National Pipeline Mapping System (NPMS), PHMSA

Pipelines are the safest method of transporting materials; however, it is not without problems. The results of pipeline failure are injuries, fatalities, and/or property damage. Pipeline failures are a potential hazard within Will County because of the vast network that travels through the county into Chicago. The county is a major hub in the United States natural gas pipeline grid where pipelines from Canada and the Gulf of Mexico meet and then fan out to serve the Midwest.

Because pipelines are a safe and economical method of transportation, more demands are being placed on this mode of energy transportation increasing the need to upgrade infrastructure and aging pipelines. As a result of many major incidents, the Department of Transportation (DOT) and Pipeline and Hazardous Materials Safety Administration (PHMSA) in 2011 called upon companies to accelerate the repair, rehabilitation, and replacement of the highest risk pipeline infrastructure. Pipelines at highest risk of incidence are made of cast and wrought iron and bare steel. Cast and wrought iron pipelines were installed over 60 years ago but these materials degrade over time. Thus, continued use of theses pipelines poses an increased risk of incident. Progress is published annually by PHMSA. Approximately 97% of

natural gas distribution pipelines in the U.S. are constructed of plastic or steel as of 2019. Significant improvement has been made in reducing risk and improving public safety by the changes in pipeline material, construction, and operations and maintenance practices.



The federal government establishes minimum pipeline safety standards under the U.S. Code of Federal Regulations (CFR), Title 49 "Transportation", Parts 190 - 199. The Office of Pipeline Safety (OPS), within the U.S. Department of Transportation - PHMSA, has overall regulatory responsibility for hazardous liquid and gas pipelines under its jurisdiction in the United States. OPS inspects and enforces the pipeline safety requirements for interstate gas pipeline operators in Illinois. OPS also inspects and enforces the pipeline safety regulations for both intrastate and interstate hazardous liquid pipeline operators in Illinois.

Operator compliance with state and federal pipeline safety regulations is monitored through a comprehensive inspection and enforcement program. The Illinois Commerce Commission's Pipeline Safety Section, certification by OPS, is in charge of identifying and checking standards of safety within the State of Illinois. They work in partnership with the federal PHMSA to assure pipeline operators are

meeting requirements for safe, reliable, and environmentally sound operation of their facilities. The program is comprised of field inspections of operations, maintenance, and construction activities; programmatic inspections of operator procedures, processes, and records; incident investigations and corrective actions; and through direct dialogue with operator management.

While PHMSA serves as the federal pipeline safety regulator, pipeline operators must know, understand, and manage the risks associated with their own pipeline facilities. In addition to PHMSA inspections, operators frequently conduct internal reviews of their procedures, facilities, staff, and emergency procedures.

Types of Pipelines

Gas Pipelines: Transport natural gas which contains primarily methane, ethane, and smaller amounts of other gases such as carbon dioxide and butane.

Hazardous Liquid Pipelines: Transport crude oil; refined petroleum products that include gasoline, diesel, jet fuel, and home heating oil; highly volatile liquids or natural gas liquids (NGL) which are butane, ethane, and propane; carbon dioxide; and anhydrous ammonia.

Purpose of Pipelines

Gathering Pipelines: Gather crude oil from production wells and move it to central gathering facilities where it is transported to refineries.

Transmission Lines: Transport crude oil and other products across the country and continental borders.

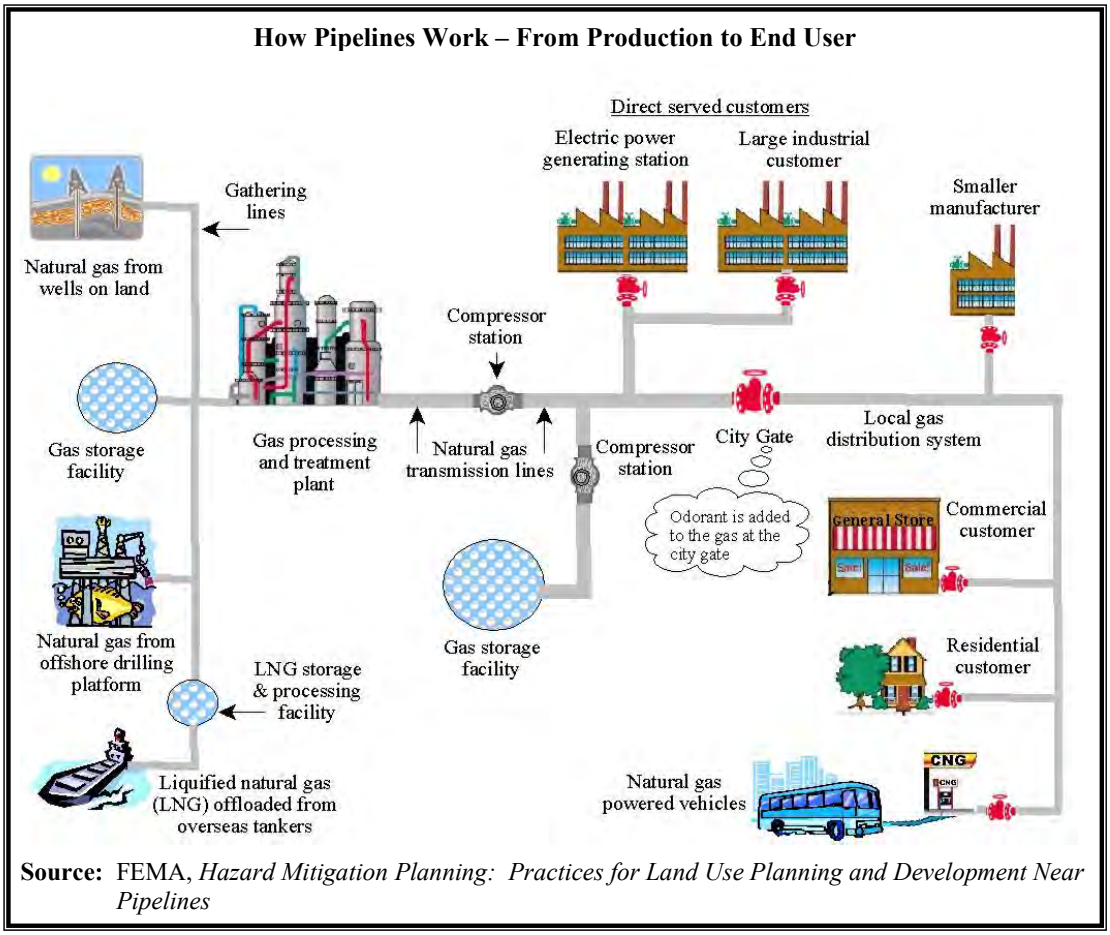
Geography of Pipelines

Intrastate Pipelines: Pipelines that operate within a single state which are authorized and overseen by the state.

Interstate Pipelines: Generally carry gas or oil long distances and across state lines.

Pipeline Markers

Because pipelines are usually underground, line markers and warning signs are located along transmission pipeline rights-of-way. Markers identity of the product being transported, the name of the pipeline operator, and telephone number to call in the event of an emergency.



Source: FEMA, *Hazard Mitigation Planning: Practices for Land Use Planning and Development Near Pipelines*

Reportable Incidents

Hazardous Liquids Pipeline Incident:

An event or failure in a pipeline system that must be reported to the Office of Pipeline Safety and that results in the release of a hazardous liquid or carbon dioxide and in any of the following:

- Explosion or fire not intentionally set by the operator
- Release of 5 gallons (19 liters) or more of hazardous liquid or carbon dioxide, except that no report is required for a release of less than 5 barrels (0.8 cubic meters) resulting from a pipeline maintenance activity if the release is:
  - Not otherwise reportable under this section (i.e., 49 CFR 195.50),
  - Not one described in 49 CFR 195.52(a)(4),
  - Confined to company property or pipeline right-of-way, and

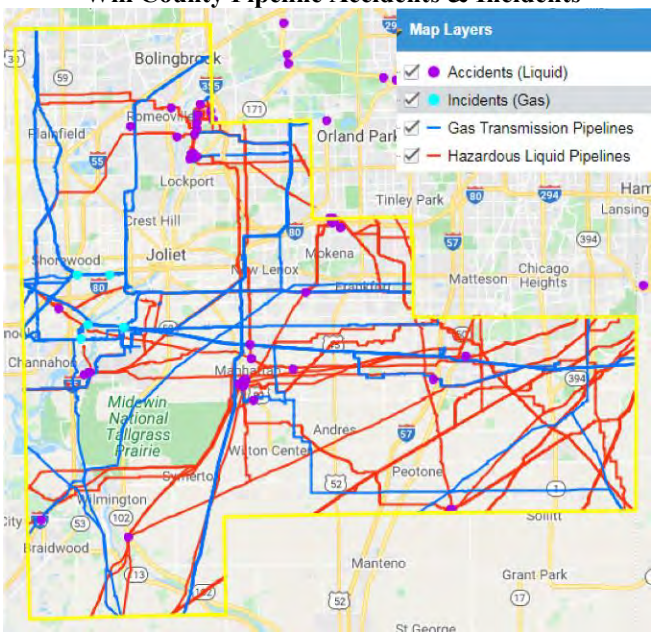
- Cleaned up promptly;
- Death of any person
- Personal injury necessitating hospitalization
- Estimated property damage, including cost of cleanup and recovery, value of lost product, and damage to the property of the operator or others, or both, exceeding $50,000 (49 CFR 149.50).

Natural Gas Pipeline Incident:

An event in the natural gas pipeline system that must be reported to the Office of Pipeline Safety and:

- Involves a release of gas from a pipeline or of liquefied natural gas (LNG) or gas from an LNG facility and results in:
  - Death, or personal injury necessitating in-patient hospitalization; or
  - Estimated property damage of $50,000 or more, including a loss to the operator and others, or both, but excluding the cost of gas lost; or
  - Unintentional estimated gas loss of three million cubic feet or more.
- Results in an emergency shutdown of an LNG facility.
- Is significant, in the judgment of the operator, even though it did not meet the criteria of (1) or (2) above (49 CFR 191.3).

Will County Pipeline Accidents & Incidents



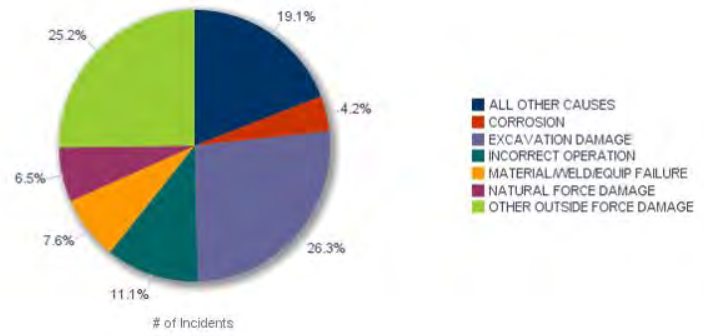
Source: National Pipeline Mapping System (NPMS), PHMSA

History

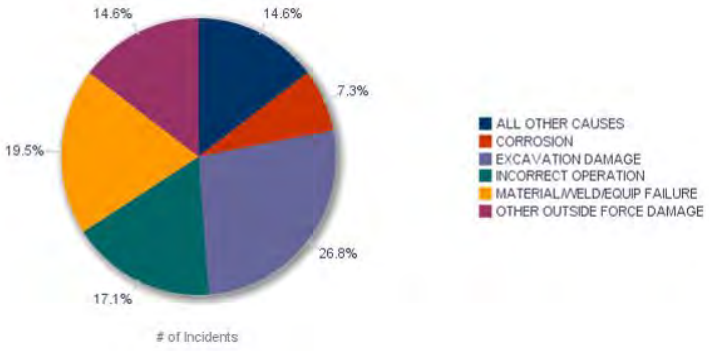
There are numerous causes of pipeline incidents. Almost 40% of the national incidents are a result of material failure or corrosion, over 25% are caused by human error or excavation damage, and 6.6% are a result of natural forces such as earth movement or floods.

Serious Incident Cause Breakdown 10 Year Average (2008-2015)

Gas Distribution



Gas Transmission



Source: U.S. DOT Pipeline, PHMSA

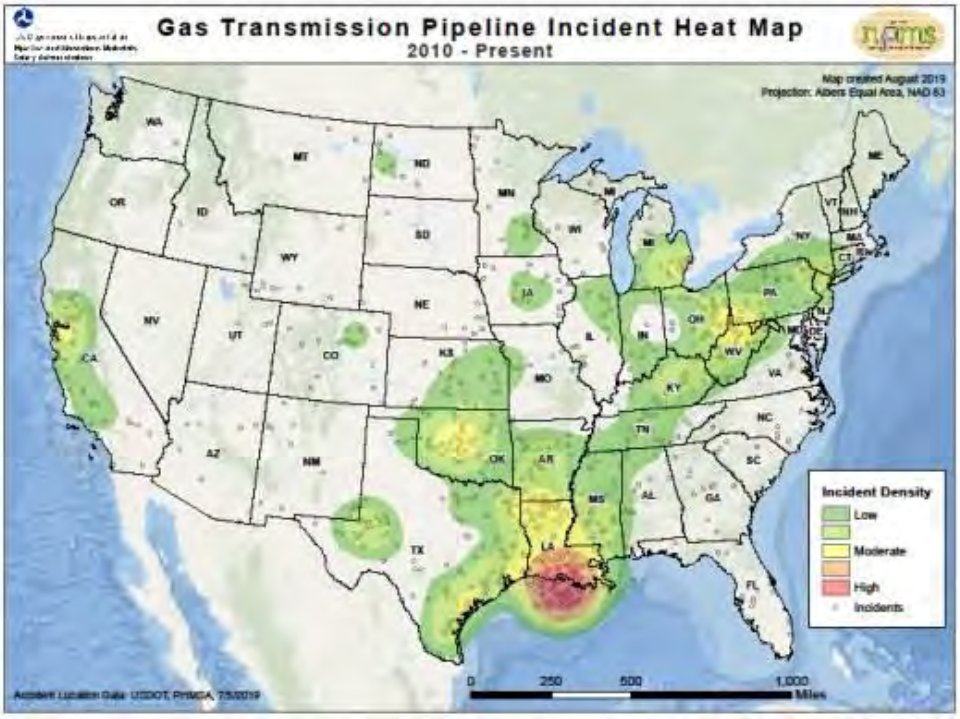
Will County has 714 miles of liquid pipeline and 783 mile of gas pipeline. The *Impact of Pipeline Events* tables in the following pages total the death, injury, or property damage that have occurred in Will County in the last thirty years.

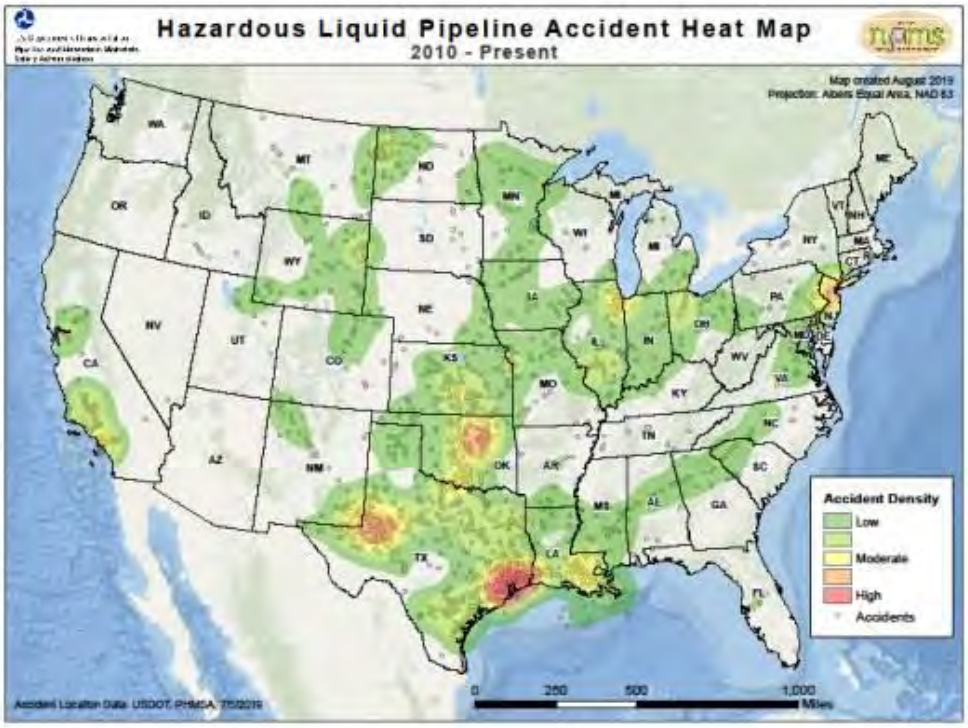
In April, 1999, a natural gas pipeline was struck during excavation work injuring 7 people, destroying 34 town homes, and damaging 199 homes out of 394.

In September 2010, a heavy crude oil leak was discovered beneath the street pavement. The probable cause was corrosion of the pipe wall caused by a leaking water pipe located 5 inches below the oil pipe. An estimated 270,000 gallons of oil was leaked. Damages and environmental cleanup costs exceeded $47 million. This incident exemplifies the cascading effect of a pipeline incident. Businesses near the leak were closed for one to nine days. Within less than a mile from the leak area are the Des Plaines River and Chicago Sanitary and Ship Canal, a residential area, and an ecologically sensitive area. The EPA removed approximately 1.5 million gallons of treated sewage lagoon water and 15,000 cubic yards of contaminated soils. Thirty-two animals died as a result of the leak and 141 turtles and frogs were treated and released.

IMPACT OF PIPELINE EVENTS ON WILL COUNTY (Source: Pipeline & Hazardous Materials Safety Administration / WC EMA)					
Date	**Location**	**Deaths**	**Injuries**	**Property Damage**	**Net Barrels Lost**
02/22/1988	I-80 & I-55	1			
04/27/1989	Romeoville				
09/08/1998	Lockport	0	0	$60,605	1,800
12/02/1998	Lemont	0	0	$181,814	259
12/07/1998	Essex	0	0	$480,110	0
02/14/1999	Crest Hill	0	0	$119,639	0
03/26/1999	Wilmington	0	0	$500,000	1,331
04/29/1999	Romeoville	0	7	$1,795	0
06/16/2001	BP North Am	0	0	$35,000	0
03/05/2002	Lockport	0	0	$376,604	0
06/18/2001	BP North Am	0	0	$14,000	0
06/07/2002	BP North Am	0	0	$3,000	0
08/27/2002	Shorewood	0	0	$151,127	0
11/01/2002	BP North Am	0	0	$35,000	0
03/13/2003	Cushing	0	0	$15,000	0
07/10/2003	Lemont	0	0	$854,248	15
08/08/2003	BP North Am	0	0	$10,000	0
09/13/2003	Bolingbrook	1	0	0	0
11/11/2003	Lemont	0	0	$9,084	6
11/14/2003	BP North Am	0	0	$20,000	0
12/02/2003	Amoco Oil	0	0	$13,560	0
01/11/2004	BP North Am	0	0	$7,510	0
01/31/2004	Lockport	0	0	$120,710	0
03/20/2004	Enbridge	0	0	$15,000	0
04/28/2004	Lockport	0	0	$164,576	0
05/03/2004	Manhattan	0	0	$241,421	0
02/11/2005	Enbridge	0	0	$40,000	0
03/27/2005	Northern IL Gas	0	0	$78,520	0
07/09/2005	Northern IL Gas	0	0	$40,500	0
07/10/2005	Lockport	0	0	$109,035	0
11/09/2005	BP North Am	0	0	$20,500	0
12/05/2005	Shorewood	0	0	$379,044	0
04/01/2006	Buckeye	0	0	$17,500	0
07/21/2006	Mobile	0	0	$8,697	0
08/12/2006	Romeoville	0	0	$467,139	1,419
02/23/2007	Manhattan	0	0	$1,731	10
05/10/2007	Enbridge	0	0	$40,500	1
05/16/2007	BP North Am	0	0	$37,745	0
08/17/2007	BP North Am	0	0	$6,500	0
02/06/2008	BP North Am	0	0	$30,000	0
02/17/2008	BP North Am	0	0	$10,000	0
03/11/2008	Wolverine	0	0	$47,000	0
03/14/2008	Lemont	0	0	$607,926	
05/16/2008	Natural Gas of Am	0	0	$94,000	0
08/18/2008	TE Products	0	0	$2,015	0

IMPACT OF PIPELINE EVENTS ON WILL COUNTY (cont.) (Source: Pipeline & Hazardous Materials Safety Administration / WC EMA)					
Date	**Location**	**Deaths**	**Injuries**	**Property Damage**	**Net Barrels Lost**
09/17/2008	Shorewood	0	0	$109,469	3
10/12/2008	Mobile Pipeline	0	0	$7,055	0
02/19/2009	Vector	0	0	$8,000	0
03/27/2009	BP North Am	0	0	$12,055	0
05/20/2009	Amoco Oil	0	0	$15,075	0
06/24/2009	Romeoville	0	1	$263,354	
11/13/2009	Enbridge	0	0	$50,000	0
12/01/2009	Wolverine	0	0	$3,000	0
03/21/2010	Mokena	0	0	$161,561	
09/09/2010	Romeoville	0	0	$49,003,154	0
12/14/2010	Lockport	0	0	$19,495,905	0
12/31/2010	Lockport	0	0	$255,268	0
01/18/2011	Mobile Pipeline	0	0	$5,520	0
05/14/2011	Romeoville	0	0	$724,047	100
05/26/2011	Monee	0	0	$419,135	3
08/08/2011	Lemont	0	0	$412,297	3
08/11/2011	Mustang	0	0	$197	0
09/29/2011	BP North Am	0	0	$66,000	0
03/03/2012	New Lenox	2	3	$2,836,777	1,245
04/04/2012	West Shore Pipeline	0	0	$35,000	0
05/18/2012	Manhattan	0	0	$395,779	0
11/20/2012	Mokena	0	0	$9,800,000	0
06/18/2013	ANR Pipeline	0	0	$58,653	0
09/29/2014	Enbridge	0	0	$169,096	0
11/07/2014	Enbridge	0	0	$32,391	0
01/01/2014	Enbridge	0	0	$150,090	0
8/20/2015	Enbridge	0	0	$1,576	0
03/08/2015	Buckeye	0	0	$331,600	0
01/29/2016	BP Pipeline	0	0	$75,015	0
12/15/2016	Northern IL Gas	0	2	$414,877	0
10/11/2016	Northern IL Gas	0	1	$1,188,813	0
03/14/2016	BP Pipeline	0	0	$13,710	0
8/22/2017	BP Pipeline	0	0	$621,050	0
10/25/2017	Exxon Mobile	0	0	$48,075	1
05/10/2017	Explorer Pipeline	0	0	$55	0
12/31/2017	Guardian Pipeline	0	0	$100,300	0
01/11/2017	Shell Pipeline	0	0	$96,000	0
07/13/2017	Enbridge	0	0	$353,792	0
02/15/2018	Explorer Pipeline	0	0	$295,850	0
08/06/2019	Wolverine	0	0	$5,622	0
01/02/2019	Enbridge	0	0	$57,409	0


Gas Transmission Pipeline Incident Heat Map
2010 - Present
Map created August 2019
Projection: Albers Equal Area, NAD 83
Incident Density
Low
Moderate
High
Incidents
0
250
500
1,000
Miles

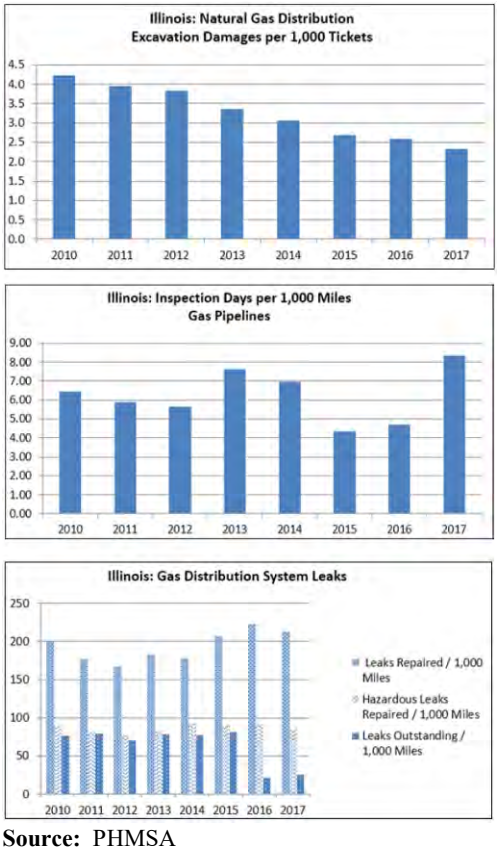

Hazardous Liquid Pipeline Accident Heat Map
2010 - Present
Map created August 2019
Projection: Albers Equal Area, NAD 83
Accident Density
Low
Moderate
High
Accidents
0
250
500
1,000
Miles

Risk Characterization

As communities and pipelines grow closer together, concerns about protecting people and the environment from risk of pipeline incidents have increased. Community awareness and involvement programs are a key component to pipeline safety. By knowing where pipelines are located and how to manage activities near them, we can live safely around them. Risks associated with pipeline incidents are explosion, contamination, asphyxiation, and fire resulting in injury, death, and property damage. Leaking pipes can send hazardous liquids into the soil or water or gases into the atmosphere. Fortunately, major incidents are infrequent.

Many transmission lines were laid decades ago through sparsely populated states in the Sun Belt and through West Coast states. These areas are now experiencing rapid population growth, raising concern about increased numbers of people living or working close to pipelines. Moreover, many lines that serve major cities and that run through heavily developed areas were constructed in what were then sparsely populated, rural areas. Few of these areas had extensive land use or zoning regulations in place at the time the lines were laid.

Illinois State Program Metrics



Source: PHMSA

Natural gas and petroleum pipelines are relatively secure because the majority of pipeline mileage is below ground. Operators generally also have in place security measures to protect pipeline facilities from vandalism or intrusion. This includes the employment of such measures as guards, fences, and electronic surveillance around facilities. Operators provide added protection against security concerns by conducting employee background checks and carrying out communications with residents along pipeline rights-of-way, police authorities, and emergency responders in affected communities.

After the terrorist attacks of September 11, 2001, awareness increased safeguards and security needs relative to our nation's critical infrastructure. The Office of Pipeline Safety (OPS), along with the Department of Homeland Security (DHS) and the pipeline industry began

looking at ways to enhance the security of our energy pipeline infrastructure thereby ensuring that critical energy transportation was not disrupted. Enhanced communication networks were developed to share information on suspicious activities and potential threats to the pipeline infrastructure and to begin identifying noteworthy and possible enhancements to help assure the security of hazardous liquid and natural gas pipeline systems.

Following September 11, 2001, OPS undertook several initiatives to help reduce the increased threat of terrorist activity against pipelines:

- Communications
- Vulnerability Assessments
- Developing consensus security guidance with the pipeline industry and states on conducting vulnerability assessments, improving security plans, developing specific deterrent and protective actions, and upgrading response and recovery plans
- Obtaining executive-level commitment from pipeline operators to implement needed security provisions described in the guidance
- Developing a definition for "critical pipeline facility" and a system of recommended deterrent and protective measures that are synchronized with the threat control levels of the Office of Homeland Security's threat warning system
- Drafting and distributing for review by state and federal officials initial verification audit protocols
- Soliciting research and development proposals to detect encroachments, continuously monitor rights-of-ways, and improve system controls
- Working with DOE and FERC to address issues related to rapid response and recovery of critical pipeline service in the case of a pipeline disturbance

The Pipeline Safety Improvement Act (PSIA) of 2002, serves to further strengthen regulations regarding pipeline safety and security. Federal pipeline safety regulations require pipeline operators to conduct continuing public awareness programs to provide pipeline safety information to four stakeholder audiences:

- Affected Public
- Emergency Officials
- Local Public Officials
- Excavators

OPS will continue its efforts relative to pipeline security by:

- Collaborating with pipeline operators, state pipeline safety agencies, and other federal agencies to continue identifying critical facilities using the established definition of "critical pipeline facility"
- Continuing work with the DOE, FERC, and other federal agencies, states, and the pipeline industry to advance planning for rapid response and recovery of damaged pipeline systems
  - This will include identifying and resolving barriers to recovery, including the sharing of critical parts and the need for emergency authorities
- Planning and conducting regional exercises with emphasis on response and recovery
- Continuing to work with state pipeline safety agencies to verify that pipeline operators have developed and implemented security, response, and recovery plans for critical pipeline facilities

The Pipelines and Informed Planning Alliance (PIPA) was formed in response to the Pipeline Safety Improvement Act of 2002, by PHMSA and consisted of 130 stakeholders. PIPA's purpose was to recommend practices on land use and development near transmission pipelines to reduce the potential risks of pipeline incidents. The alliance recommended 43 practices published in their report, *Partnering to Further Enhance Pipeline Safety in Communities Through Risk-Informed Land Use Planning: Final Report of Recommended Practices* (*PIPA Recommended Practices*).
(Available from: https://primis.phmsa.dot.gov/comm/pipa/pipa_audience_local_government.htm)

The potential hazards of transmission pipeline releases vary according to the failure mode of the pipeline, the commodity released, the operating conditions of the pipeline at the time of the incident, and the characteristics of the surrounding area. The varying behaviors of the products released during a pipeline incident will present different challenges for hazard mitigation.

Impact: Medium

Damage to Buildings

Pipeline incidents can cause extensive damage to buildings through contamination, fire, or explosion.

Critical Facilities

The United States currently consumes about 85 billion cubic feet of natural gas daily, nearly all of which is transported by pipeline and about 20.5 million barrels of petroleum products. Interruptions in pipeline service can cause delays in natural gas production and utilities, and chemical processing plants who utilize the products transported through the pipeline system. Transportation routes may by

impacted or closed causing delays in response/recovery efforts or emergency medical services. Communication systems or electric power can also be lost when underground lines are damaged.

Health and Safety

A hazardous liquid or gas released when pipelines are damaged or fail due to corrosion or material defects can cause injuries and death to people by ingestion or inhalation of toxins or fire or explosion. Pipeline ruptures may also have an environmental impact with lasting ecological effects, contamination of drinking water and waterways, or air pollution, all resulting in high costs for cleanup.

Economic Impact

Being that Will County is a major pipeline hub, a damaged pipeline can cause an interruption in service of that product not only locally but also throughout the region of its transport. This can cause a loss of natural gas needed to heat buildings or petroleum products being sent to refineries or processing centers causing delays in production.

Future Occurrence

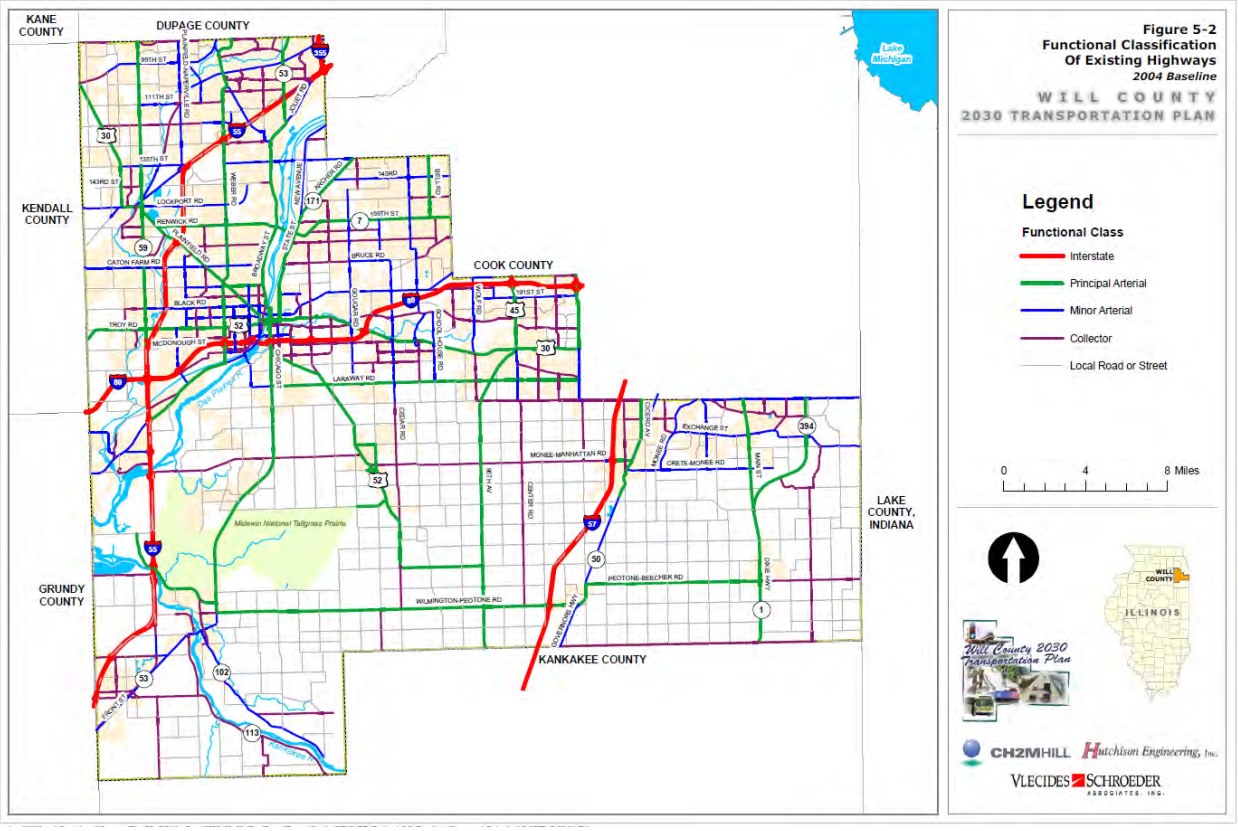
Due to its location, Will County has throughout its borders numerous pipeline systems carrying hazardous liquid and gas products. There is risk of serious incidents due to the nature of these products; however, government agencies and the pipeline industries are working together to promote and improve safety throughout the pipeline systems.

Pipeline Rupture Events reported between 2/22/1988 and 12/31/2019				
# of Pipeline Rupture Events	# of Deaths	# of Injured	Property Damage	Net Barrels Lost
86	4	14	$93,552,080	6,196
Data Source: Pipeline & Hazardous Materials Safety Administration / WC EMA				

NON-HAZARDOUS MATERIAL TRANSPORTATION

Hazard Characterization

The transportation sector consists of roads, commuter and freight rail services, regional buses, waterways, and bikeways that transport goods and people. Being proximate to Chicago has led Will County to develop an intricate and varied transportation system for the conveyance of raw materials, finished goods, workers, and tourists in and out of Chicago and its metropolitan area. It has developed over decades as a result of public and private investment. The diversity and size of the transportation sector makes it essential to the county's economy and security. The *Will County Connects 2040 Long Term Transportation Plan* states "our transportation network is one of the most important strategic assets we have in Will County, touching every aspect of our lives. It provides access to jobs, education, and healthcare; moves the goods and services we all rely on; and facilitates interaction with our families, friends, and the environment."



Will County's Transportation Assets:

- Hundreds of miles of roadways connecting communities across the county
- Access to 4 interstates and 6 Class I railroads that link to networks throughout the region and nation
- 3 navigable waterways that transport goods on freight barges
- Truck, rail, and waterborne intermodal terminals and nearly 150 million square feet of industrial space
- 4 Metra lines to move commuters throughout Chicagoland
- Over 20 Pace buses and one of the few Express Services (Bus-on-Shoulder) in operation
- Over 400 miles of bikeways to support mobility, public health, and environmental sustainability

Regardless of the mode of transportation, accidents can and do occur. Motor vehicles, airplanes, trains, or boats are all subject to the risk of accidents. These accidents can occur anywhere within the transportation system because of the driver's error, mechanical failure, poor weather conditions, or sabotage. With the many major highways, rail lines, airports, waterways, and intermodal connections, Will County does experience transportation accidents and must be prepared to provide immediate emergency response.

Though accidents normally are not considered disasters, the results of an accident can be of severe magnitude and it is these incidents that are addressed in preparedness planning. Multiple car and truck accidents, train derailments, airplane crashes, and boat accidents can cause mass injuries or death. Fire and explosions may result from the impact. Property may be damaged or destroyed by the accident. Any incident that slows or shuts down a major transportation route will affect the travel time of people and the transportation flow of raw materials and goods. To mitigate accidents, laws and regulations require driver training, provide rules for vehicle operation, and regulate vehicle maintenance. Laws and regulations cannot eliminate accidents, but they can help to lower the incidence of accidents.

Will County Transportation Maps, Plans, and Data

Maps (2019):

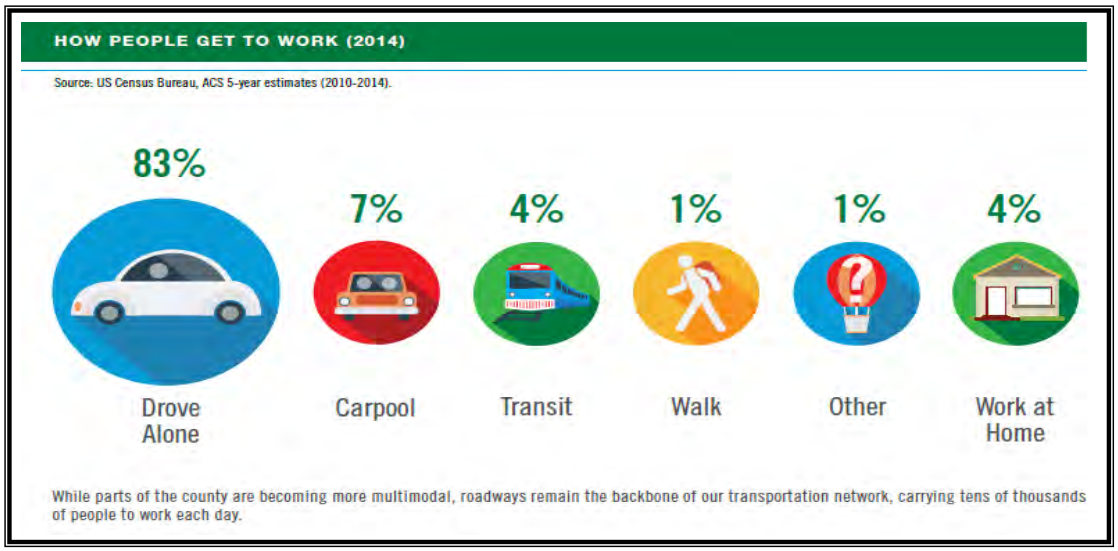
- Major Roads:
  https://www.willcountyillinois.com/Portals/0/GIS/Interest%20Maps/Street%20Maps/MAJOR_ROADS_B.pdf
- Highways and County Roads:
  https://www.willcountyillinois.com/Portals/0/GIS/Interest%20Maps/Street%20Maps/HIGHWAYMAP_E.pdf

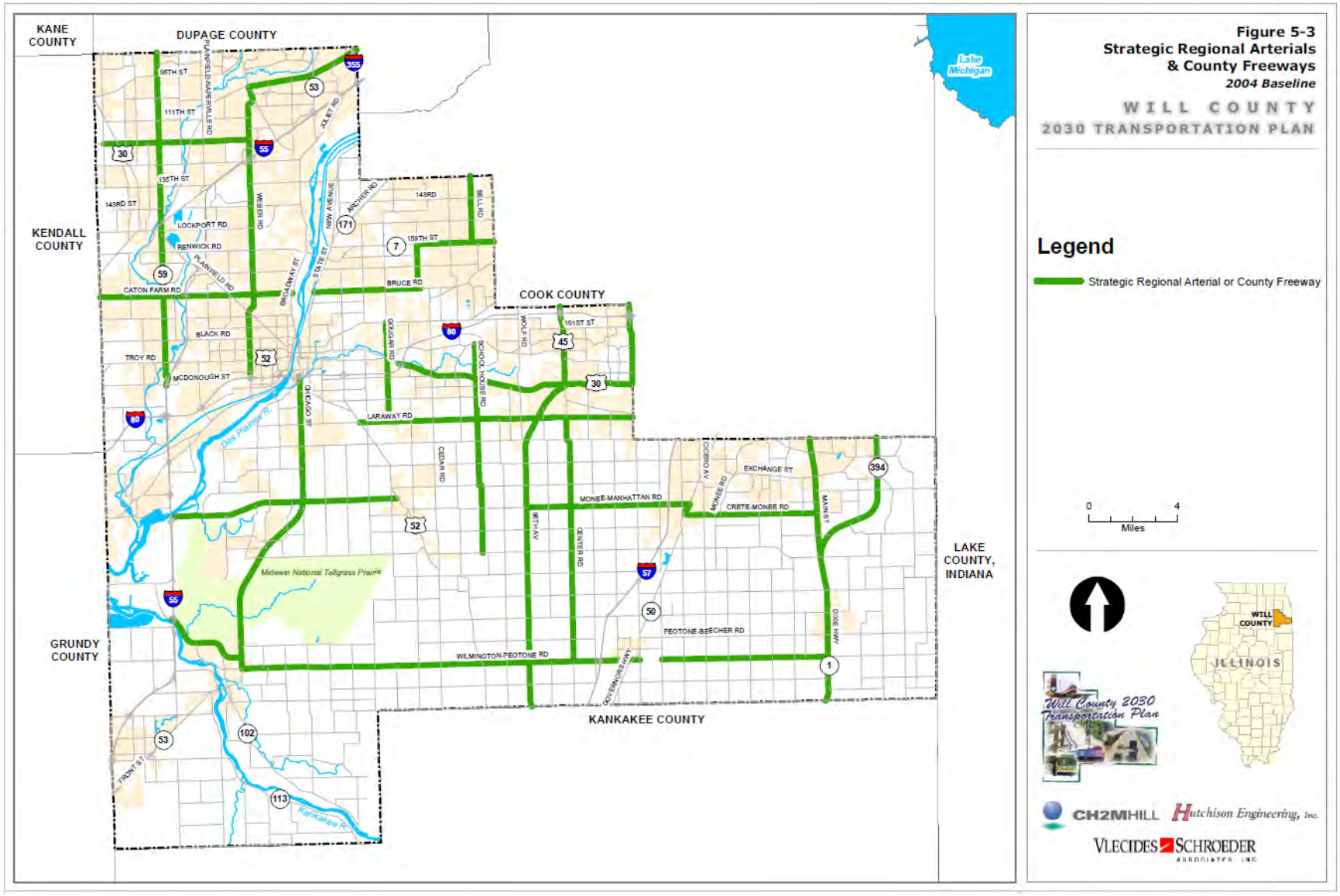
- Regional Transit: https://www.willcountyillinois.com/Portals/0/GIS/REGIONALTRANSIT_E.pdf

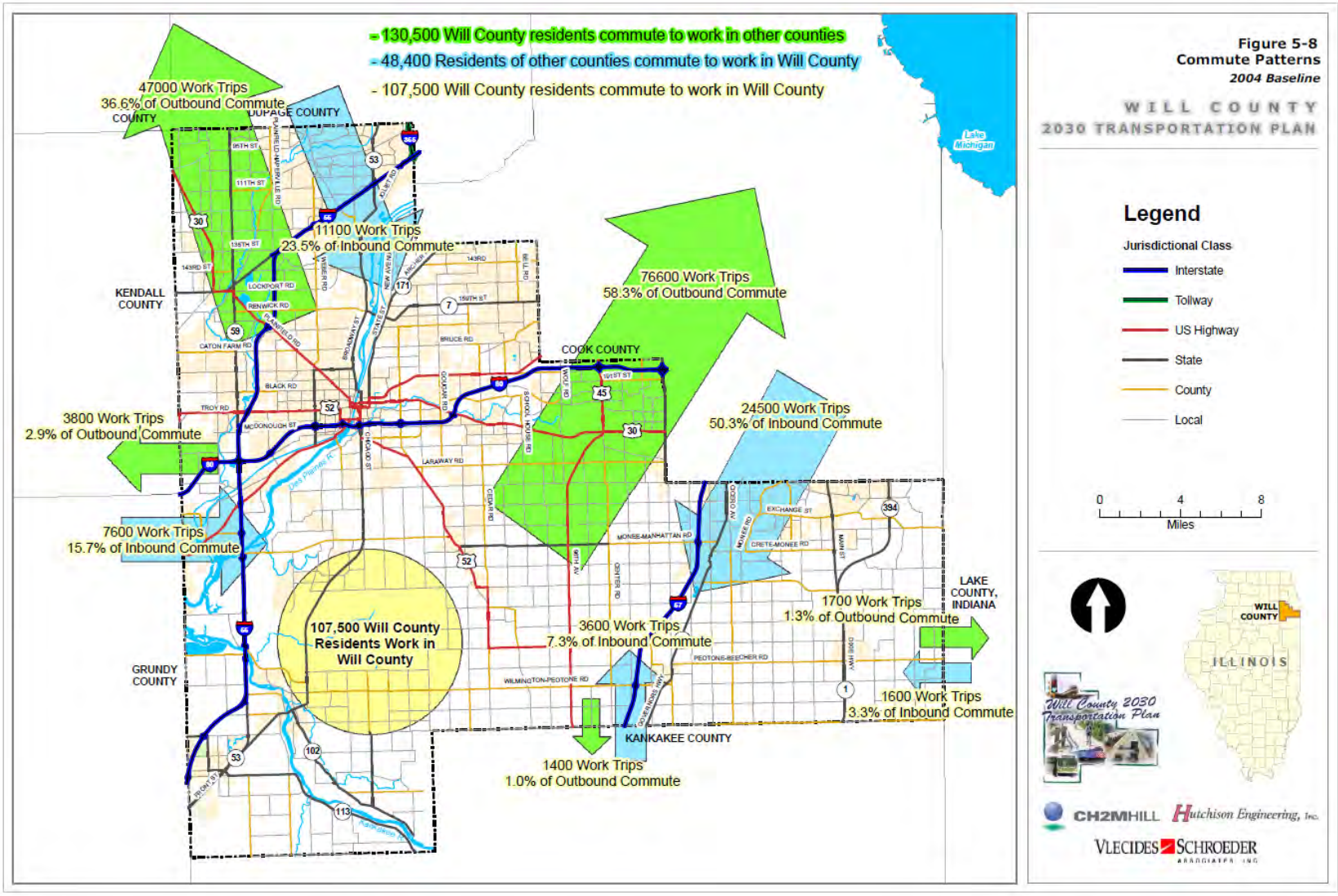
Plans and Data:

- Will County Connects 2040 Long Range Transportation Plan: https://www.willcountyillinois.com/Portals/0/Highway/Long%20Range%20Transportation/will_county_transporation_report_2017_final4_web.pdf?ver=2017-04-25-112630-497
- Will County Highway System & Construction Projects: https://www.willcountyillinois.com/County-Offices/Economic-Development/Division-of-Transportation/Highway-System-Construction-Projects
- Will County Transportation Improvement Plan FY 2020-2025: https://www.willcountyillinois.com/Portals/0/Highway/Long%20Range%20Transportation/19-152%20Transportation%20Improvement%20Plan%20FY%202020-2025.pdf?ver=2019-07-10-120942-137
- Will County Community Friendly Freight Mobility Plan: https://www.willcountyfreight.org/
- Will County Inland Port Infrastructure Analysis: https://www.willcountyced.com/uploads/4/3/5/2/43522821/will_county_final_report_draft_5-17-12.pdf
- Moving Will County: https://www.thelakotagroup.com/wp-content/uploads/2019/12/TRUCK-ROUTING-ECR-6-12-20.pdf

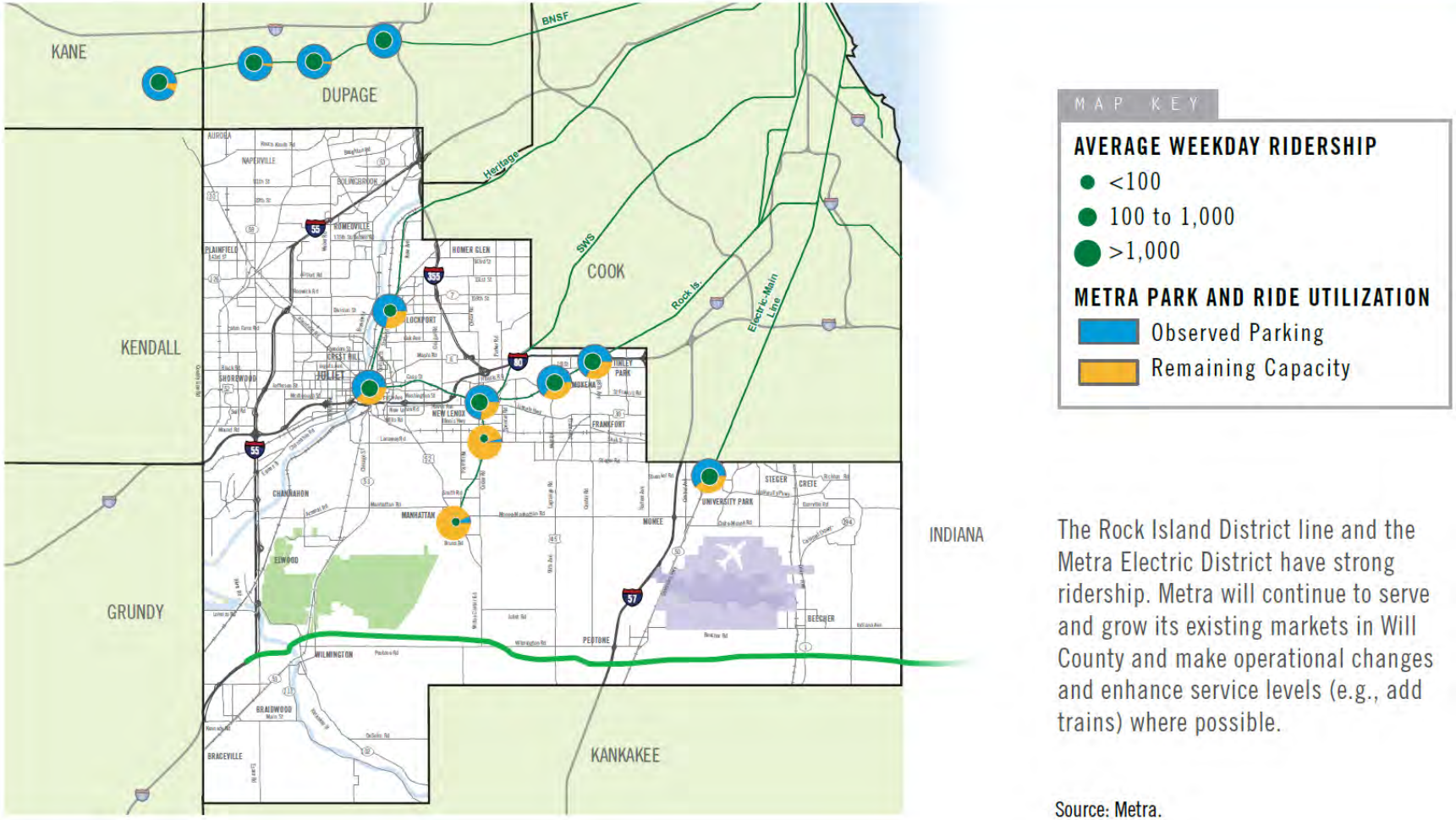
More Will County residents work outside the county than within. Over two-thirds of employed residents work outside of the county traveling mostly to Cook and DuPage counties. About half of Will County workers commute from areas outside the county and those workers come mainly from Cook County. Residents also utilized the county's transportation system for shopping, social, and recreational purposes. Traveling once was auto-centric, but now travel choices include public transit (bus, rail), car sharing, and biking.




KANE COUNTY
DUPAGE COUNTY
KENDALL COUNTY
COOK COUNTY
GRUNDY COUNTY
KANKAKEE COUNTY
LAKE COUNTY, INDIANA
Lake Michigan
Des Plaines R.
Midewin National Tallgrass Prairie
Kankakee R.
95TH ST
111TH ST
135TH ST
143RD ST
143RD
159TH ST
191ST ST
LOCKPORT RD
RENWICK RD
PLAINFIELD RD
CATON FARM RD
BRUCE RD
BLACK RD
TROY RD
MCDONOUGH ST
LARAWAY RD
MONEE-MANHATTAN RD
CRETE-MONEE RD
EXCHANGE ST
PEOTONE-BEECHER RD
WILMINGTON-PEOTONE RD
FRONT ST
JOLIET RD
WEBER RD
NEW AVENUE
ARCHER RD
BELL RD
BROADWAY ST
STATE ST
CHICAGO ST
COUGAR RD
SCHOOL HOUSE RD
WOLF RD
CEDAR RD
60TH AV
CENTER RD
CICERO AV
MONEE RD
MAIN ST
DIXIE HWY
GOVERNORS HWY
PLAINFIELD-NAPERVILLE RD
Figure 5-3
Strategic Regional Arterials
& County Freeways
2004 Baseline
WILL COUNTY
2030 TRANSPORTATION PLAN
Legend
Strategic Regional Arterial or County Freeway
0
4
Miles
WILL COUNTY
ILLINOIS
Will County 2030 Transportation Plan
CH2MHILL
Hutchison Engineering, Inc.
VLECIDES SCHROEDER ASSOCIATES, INC.


- 130,500 Will County residents commute to work in other counties
- 48,400 Residents of other counties commute to work in Will County
- 107,500 Will County residents commute to work in Will County
47000 Work Trips
36.6% of Outbound Commute
11100 Work Trips
23.5% of Inbound Commute
76600 Work Trips
58.3% of Outbound Commute
24500 Work Trips
50.3% of Inbound Commute
3800 Work Trips
2.9% of Outbound Commute
7600 Work Trips
15.7% of Inbound Commute
107,500 Will County Residents Work in Will County
1700 Work Trips
1.3% of Outbound Commute
3600 Work Trips
7.3% of Inbound Commute
1600 Work Trips
3.3% of Inbound Commute
1400 Work Trips
1.0% of Outbound Commute
DUPAGE COUNTY
KENDALL COUNTY
COOK COUNTY
GRUNDY COUNTY
KANKAKEE COUNTY
LAKE COUNTY, INDIANA
Lake Michigan
Figure 5-8
Commute Patterns
2004 Baseline
WILL COUNTY
2030 TRANSPORTATION PLAN
Legend
Jurisdictional Class
Interstate
Tollway
US Highway
State
County
Local
0 4 8
Miles
WILL COUNTY
ILLINOIS
Will County 2030 Transportation Plan
CH2MHILL
Hutchison Engineering, Inc.
VLECIDES SCHROEDER

METRA RIDERSHIP & PARK AND RIDE UTILIZATION (2014)



The Rock Island District line and the Metra Electric District have strong ridership. Metra will continue to serve and grow its existing markets in Will County and make operational changes and enhance service levels (e.g., add trains) where possible.

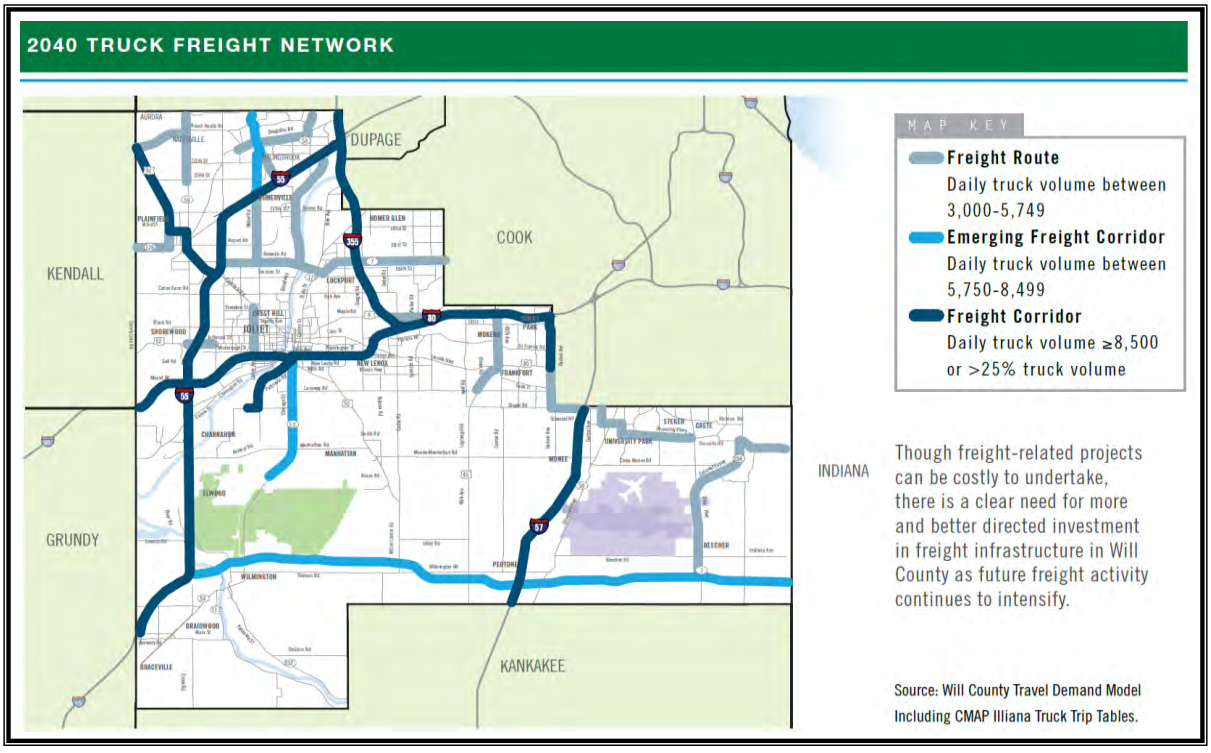
Source: Metra.

Will County's proximate location to Chicago and transportation systems of interstate highways, freight railroads, and inland waterways has allowed the county to flourish in inland intermodal activity and freight warehousing and distribution. The rapid success of global transportation has provided an important link in the global supply chains of many industries. Growth and success have also created many problems in the county's infrastructure which was not prepared for the congestion, wear and tear on roads and bridges not built for heavy trucks, noise, and safety issues on roads and rail crossings.

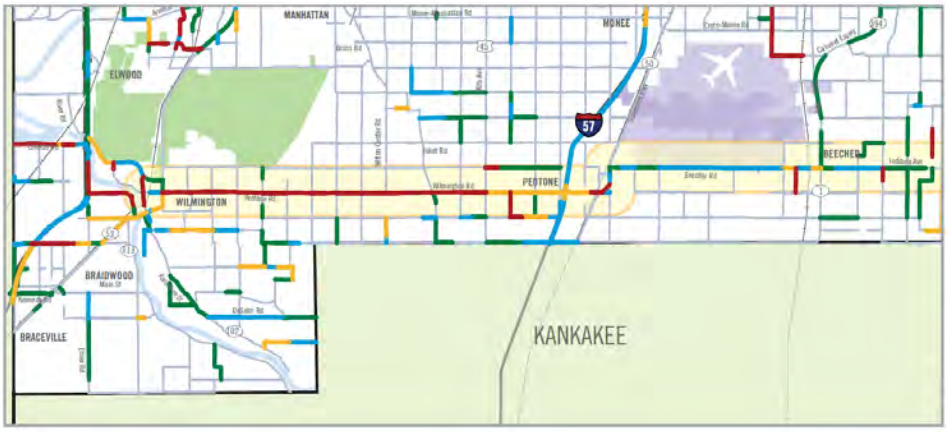
FREIGHT'S ROLE IN ECONOMIC DEVELOPMENT: MORE THAN INTERMODAL

Will County's freight activities extend beyond the 6,400 acres of its intermodal facilities in Joliet and Elwood (CenterPoint Intermodal Center) and the 1,000 acres in Wilmington (RidgePort Logistics Center). Warehouses, distribution centers, and trucking companies to support the intense amount of freight moving through these facilities have blossomed throughout the county in places like Romeoville, New Lenox, Bolingbrook, University Park, Sauk Village, and Crete.

Source: *Will County Connects: 2040 Long Range Transportation Plan*

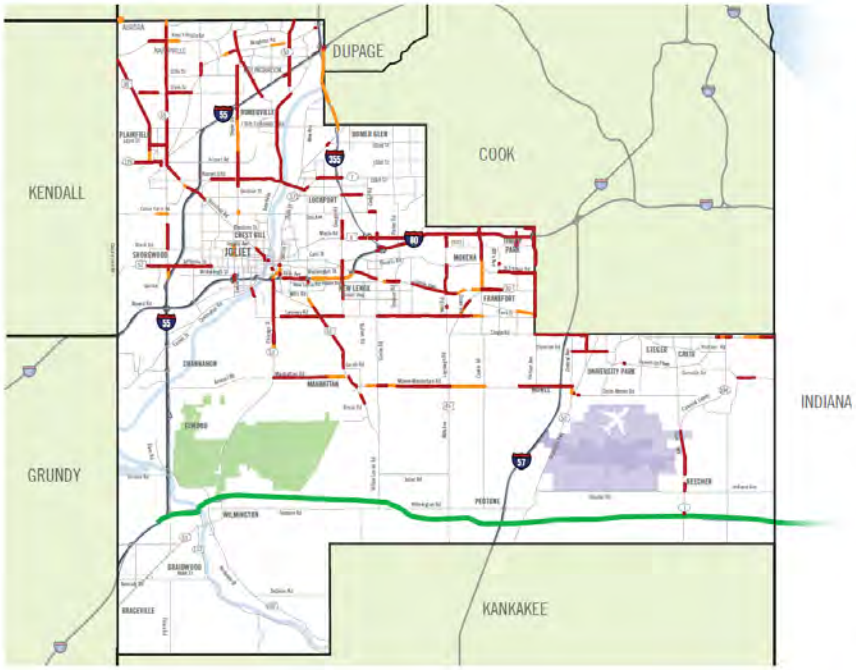


PERCENT TRUCK TRAFFIC ON WILMINGTON-PEOTONE ROAD



Source: Will County Travel Demand Model including CMAP Illiana Truck Trip Tables.

2040 CONGESTION AS MEASURED BY LEVEL OF SERVICE (DAILY)



While adding capacity can provide some congestion relief, it is not always the only answer. We must modernize county roadways through technology to maximize system efficiency and capacity, implement congestion management strategies, and foster viable alternatives to driving.

Source: Will County Travel Demand Model Including CMAP Illiana Truck Trip Tables.

History

With I-80 and I-55 being major transportation routes, numerous accidents have occurred on these highways. On January 25, 2002, a 15-passenger van was traveling too fast on icy roads. It slid out of control, crossed the median, and was struck by an on-coming tractor trailer. All eleven passengers in the vehicle were killed. Another highway incident occurred near Braidwood on April 30, 1999, involving a bus. Twenty people were injured and one was killed.

Train accidents have also involved many injuries. On April 6, 1989, fifty-eight people were injured; on March 21, 1988, sixteen were injured; and on July 1, 1987, twenty-eight were injured and one was killed.

As the intermodal transportation system grows within the county, so do the occurrences of accidents. The interstates, roads, bridges, and waterways were built long before freight vehicles were introduced to the area. As a result, large trucks have difficulty maneuvering ramps and turns and the mix of passenger cars and trucks often lead to accidents, particularly in the winter months.

Non-Hazardous Material Transportation Events reported between 01/01/2010 and 12/31/2017

Year	Vehicle Occupants														Motorcycles		TOTAL	
	Passenger Cars		Light Trucks		Large Trucks		Buses		Other Vehicles		Unknown Vehicles		Subtotal				Total Occupants Killed	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
2017	434	47.3	286	31.2	17	1.9	1	0.1	17	1.9	1	0.1	756	82.4	162	17.6	918	100.0
2016	406	44.9	296	32.7	23	2.5	0	0	24	2.7	1	0.1	750	83.0	154	17.0	904	100.0
2015	382	46.6	261	31.8	12	1.5	2	0.2	16	2.0	0	0	673	82.1	147	17.9	820	100.0
2014	367	47.8	254	33.1	18	2.3	0	0	11	1.4	0	0	650	84.6	118	15.4	768	100.0
2013	404	48.4	247	29.6	17	2.0	0	0	13	1.6	1	0.1	682	81.8	152	18.2	834	100.0
2012	368	46.8	240	30.5	10	1.3	1	0.1	13	1.7	6	0.8	638	81.2	148	18.8	786	100.0
2011	369	49.2	208	27.7	16	2.1	0	0	11	1.5	1	0.1	605	80.7	145	19.3	750	100.0
2010	397	50.5	228	29.0	17	2.2	0	0	11	1.4	2	0.3	655	83.3	131	16.7	786	100.0

(**Source:** National Highway Traffic Safety Administration)

Risk Characterization

Interdependences exist between the various modes of transportation as goods are moved in and out of the county between highway, rail, and water. Interdependences also exist between transportation and every other sector of the economy. Consequently, accidents in the transportation sector may impact other industries that rely on it for its transport of raw materials, finished goods, and workers.

Impact: Medium

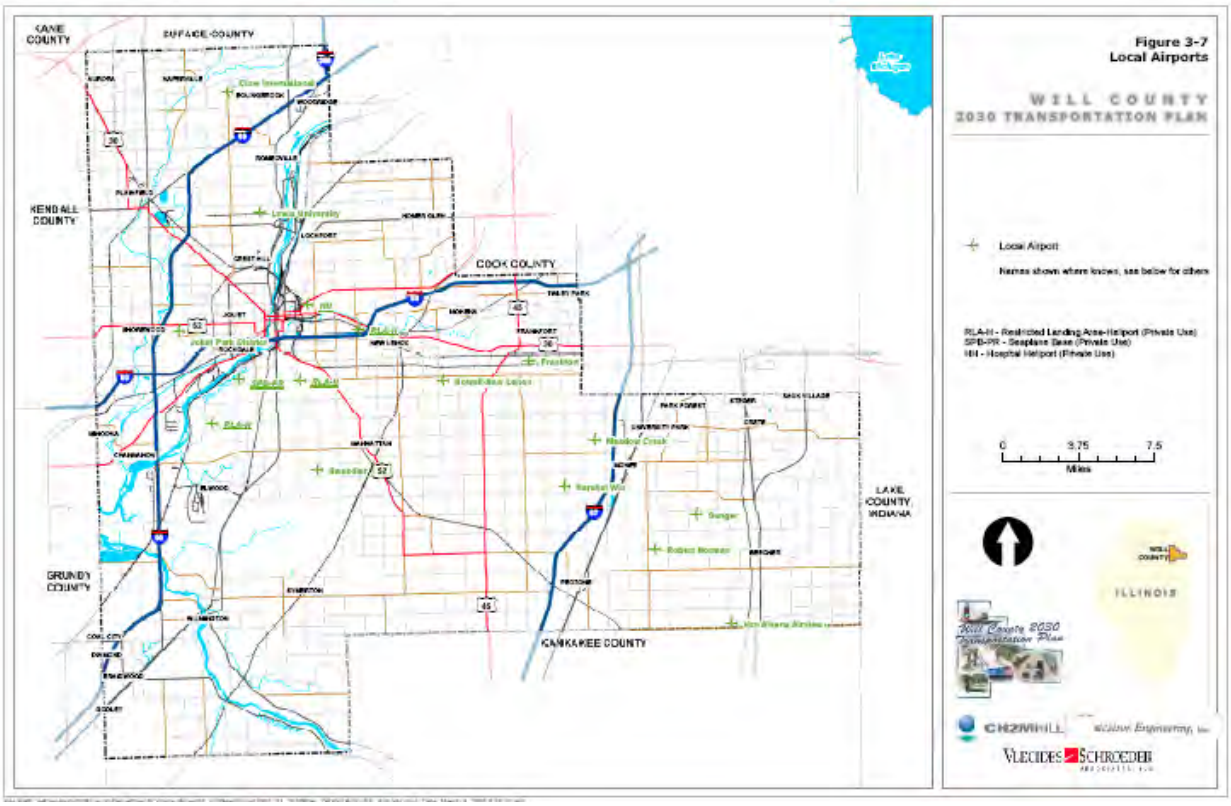
Transportation Modes

TRANSPORTATION SYSTEM HIGHLIGHTS

ROADWAYS	• Four Interstates totaling nearly 90 miles, including the Tollway • Nearly 270 miles of major arterial roads, such as IL 59 and IL 394	The amount of travel that each household makes - measured as vehicle miles traveled (VMT) - averaged nearly 24,000 VMT in Will County (2013)
AVIATION	Public General Aviation • Joliet: Joliet Regional Airport • Bolingbrook: Clow International Airport IDOT General Aviation – future site of the South Suburban Airport • Monee: Bult Field General Aviation/Corporate Reliever to Chicago Midway International Airport • Romeoville: Lewis University Airport	Aircraft operations (takeoffs or landings) in 2014: • Joliet Regional Airport: 25,000 • Clow International Airport: 50,000 • Lewis University Airport : 104,000
FREIGHT	Railroads move approximately 631 million tons of freight in the region, or 44% of total freight tonnage (2007)	Trucks make up one out of every six vehicles on Illinois' urban Interstates
WATERWAYS	River terminals along the county's three navigable waterways move barge traffic like coal and food and farm products	Over 20 million tons of freight moved on Will County waterways (2014)
TRANSIT	Metra • Four lines and 8 stations • Parking at each station Pace • Over 20 local buses and 2 Call-n-Ride service areas • 4 Bus-on-Shoulder Express routes and 5 Bus-on-Shoulder Park-n-Ride facilities • Numerous Park-n-Ride and RideShare lots	Metra weekday ridership reached over 10,000 at Will County's 8 stations (2014) Pace annual ridership reached over 2 million across all bus routes in Will County (2014)
BIKE / WALK	• Over 400 miles of existing on- and off-street bikeways • Over 700 miles of planned or proposed bikeways	Notable cross-county bikeways including I&M Canal Trail, the Wauponsee Glacial Trail, and the Old Plank Road Trail

Source: *Will County Connects: 2040 Long Range Transportation Plan*

Airports: The aviation mode has the symbolic value of representing the freedom of movement that Americans value so highly along with the technological and industrial prowess which has made the United States a world power. The nation's aviation system consists of airports/airplanes and the associated assets needed to support their operations and aviation command, control, communications, and information systems needed to maintain safe use of our national airspace. Will County has six private or general aviation airports that provide business and recreational aerial service to the local area.



Bridges: Vehicular and railroad bridges represent choke points and therefore play a very critical role and present unique challenges. Within Will County are major bridges that cross waterways, railways, and connect major interstates that are important links in the transportation system. Should they be damaged or destroyed, emergency response and movement of both commercial and private vehicles would be severely hampered.

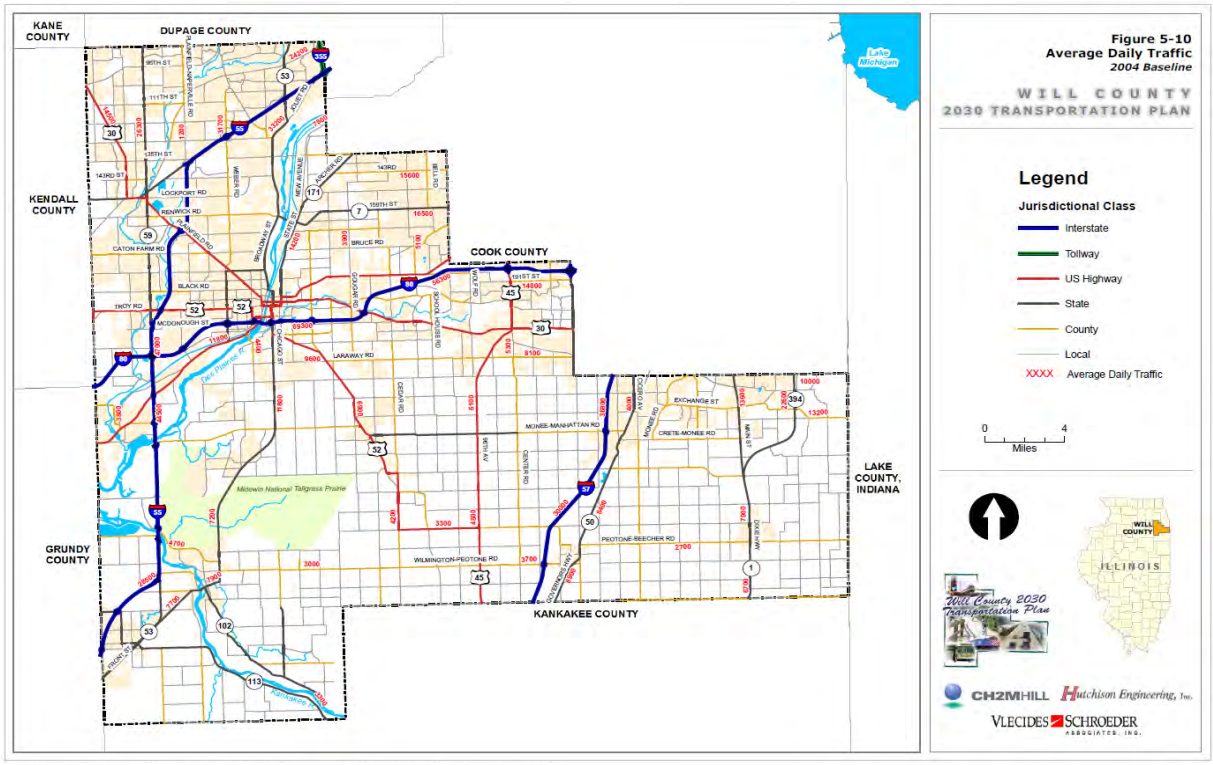
Highways: The trucking and busing industry is a fundamental component of not only our national but also our county transportation infrastructure. Without the transportation sector's resources, the movement of people, goods, and services would be greatly impeded. Components of this infrastructure include highways, roads, inter-modal terminals, bridges, tunnels, trucks, buses, and maintenance facilities. Millions of privately owned and commercial trucking vehicles utilize the extensive interstate system that crosses Illinois on a daily basis, and millions of tons of goods are shipped in and out of the state each year. The interstate network is vital to the commercial trucking industry for both intra- and inter-state shipments of products.

WHY TRANSPORTATION PROJECTS ARE SO EXPENSIVE

- Deferred maintenance grows the backlog of needed repairs and leads to higher costs in the future as assets continue to deteriorate.
- Shoehorning transportation projects alongside existing development patterns can add costs to purchase land, relocate utilities, and more.
- The cost of construction materials (e.g., concrete, asphalt products, steel) continues to rise.
- Often extensive environmental planning and mitigation requirements must be met before projects can move forward.

Source: *Will County Connects: 2040 Long Range Transportation Plan*

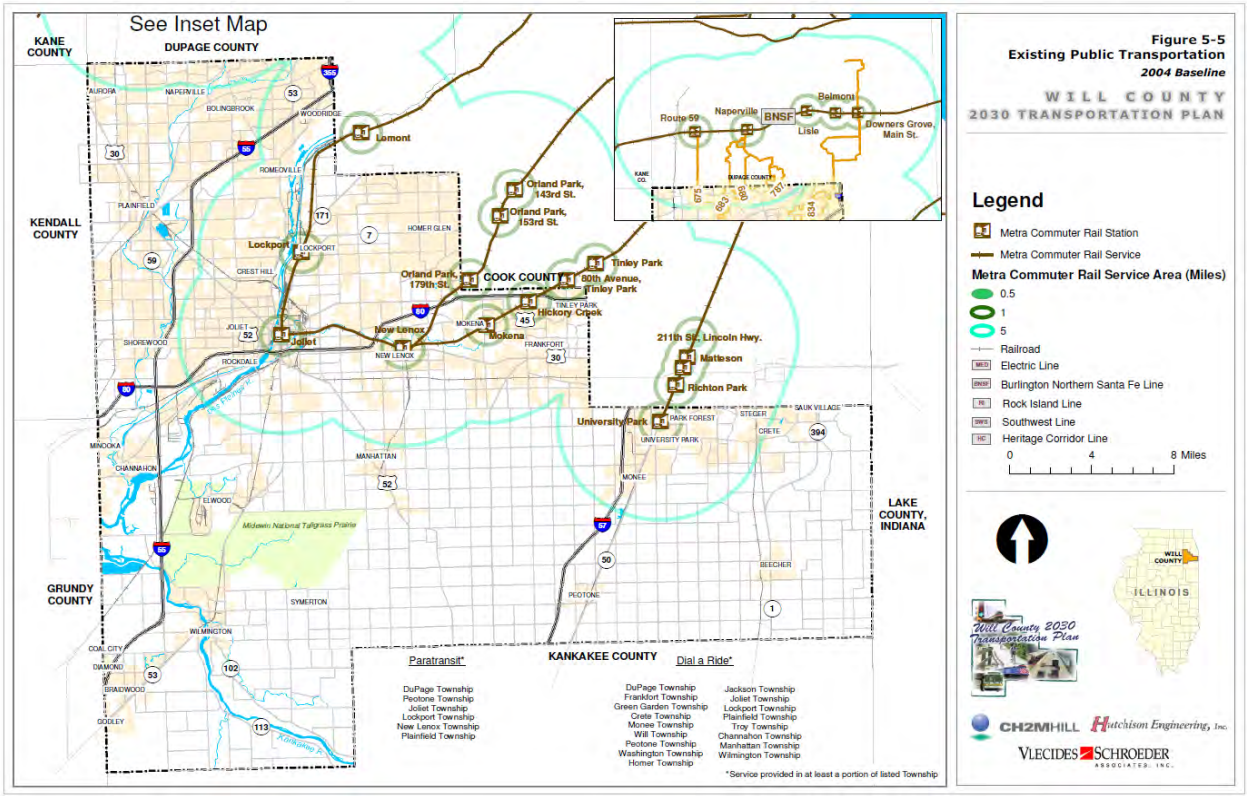
There are three major travel corridors within Will County: first, a northeasterly flow to and from Chicago from the northwestern sections of the county; second, a north-south flow to and from Chicago from the central and eastern sections of the county; and third, a north-south inter-suburban flow between Will and DuPage Counties that provide work commuting routes. The county's highway system consists of four interstate highways and nine state highways. The interstate highway system is designed as a paved, four-lane, high-speed vehicle travel corridor that allows virtually uninterrupted travel through the Chicago Metropolitan Area and to other parts of Illinois and surrounding states. Over one-hundred county highways exist to provide service between interstate and state highways while township roads serve the needs of the farming community and municipal streets serve local and through traffic within the cities and villages.

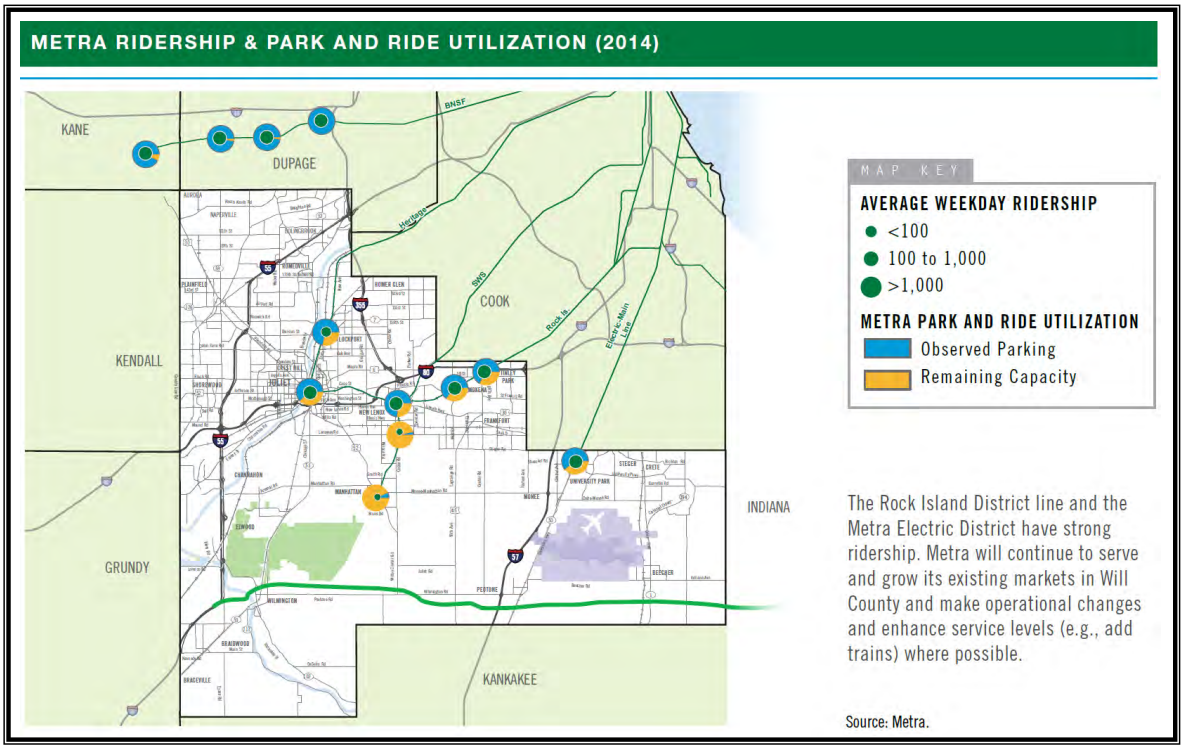


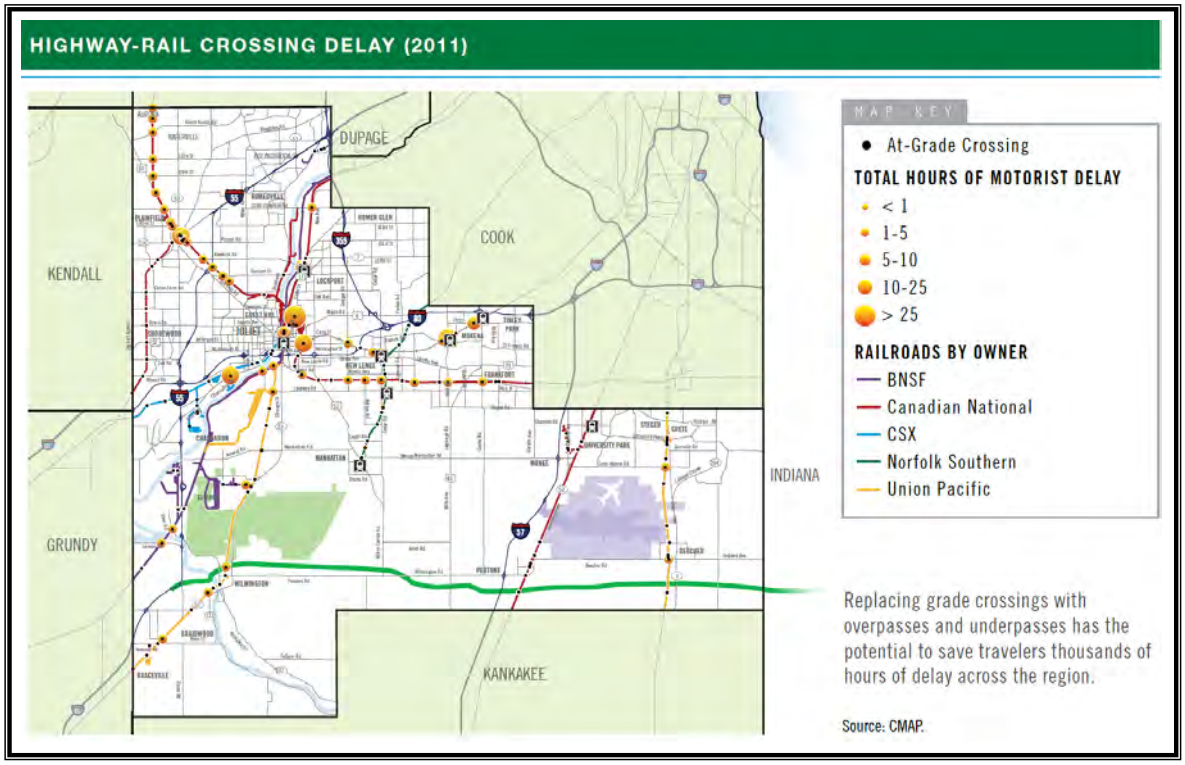
Railroads/ Train Stations:

Illinois is viewed as the center of the nation's rail network. Chicago is considered the railroad capital and has established its status as the nation's railroad intermodal hub. There are roughly 7,300 route miles or railroad lines in Illinois and approximately 4,000 of those miles are vital to the transportation of freight and passengers within Illinois. More than 40 railroads are able to provide service from Illinois to every part of the United States. Metra provides commuter transportation in and out of Will County. Freight trains carry mining, manufacturing, and agricultural products; liquid chemicals and fuels; and consumer goods. There are five Class I Railroads operating within Will County providing transportation of goods:

- BNSF Railway Company
- Union Pacific Railroad
- CSX Transportation
- Canadian National
- Norfolk Southern


See Inset Map
KANE COUNTY
DUPAGE COUNTY
KENDALL COUNTY
GRUNDY COUNTY
KANKAKEE COUNTY
LAKE COUNTY, INDIANA
COOK COUNTY
Lemont
Lockport
Joliet
New Lenox
Orland Park, 143rd St.
Orland Park, 153rd St.
Orland Park, 179th St.
Tinley Park
80th Avenue, Tinley Park
Hickory Creek
Mokena
211th St. Lincoln Hwy.
Matteson
Richton Park
University Park
Naperville
BNSF
Belmont
Lisle
Downers Grove, Main St.
Route 59
Paratransit*
Dial a Ride*
DuPage Township
Peotone Township
Joliet Township
Lockport Township
New Lenox Township
Plainfield Township
Jackson Township
Joliet Township
Lockport Township
Plainfield Township
Troy Township
Channahon Township
Manhattan Township
Wilmington Township
Frankfort Township
Green Garden Township
Crete Township
Monee Township
Will Township
Peotone Township
Washington Township
Homer Township
*Service provided in at least a portion of listed Township
Figure 5-5
Existing Public Transportation
2004 Baseline
WILL COUNTY
2030 TRANSPORTATION PLAN
Legend
Metra Commuter Rail Station
Metra Commuter Rail Service
Metra Commuter Rail Service Area (Miles)
0.5
1
5
Railroad
Electric Line
Burlington Northern Santa Fe Line
Rock Island Line
Southwest Line
Heritage Corridor Line
0
4
8 Miles
ILLINOIS
CH2MHILL
Hutchison Engineering, Inc.
VLECIDES SCHROEDER ASSOCIATES, INC.


METRA RIDERSHIP & PARK AND RIDE UTILIZATION (2014)
KANE
DUPAGE
COOK
KENDALL
GRUNDY
KANKAKEE
INDIANA
BNSF
Rock Is.
Electric Main Line
MAP KEY
AVERAGE WEEKDAY RIDERSHIP
<100
100 to 1,000
>1,000
METRA PARK AND RIDE UTILIZATION
Observed Parking
Remaining Capacity
The Rock Island District line and the Metra Electric District have strong ridership. Metra will continue to serve and grow its existing markets in Will County and make operational changes and enhance service levels (e.g., add trains) where possible.
Source: Metra.

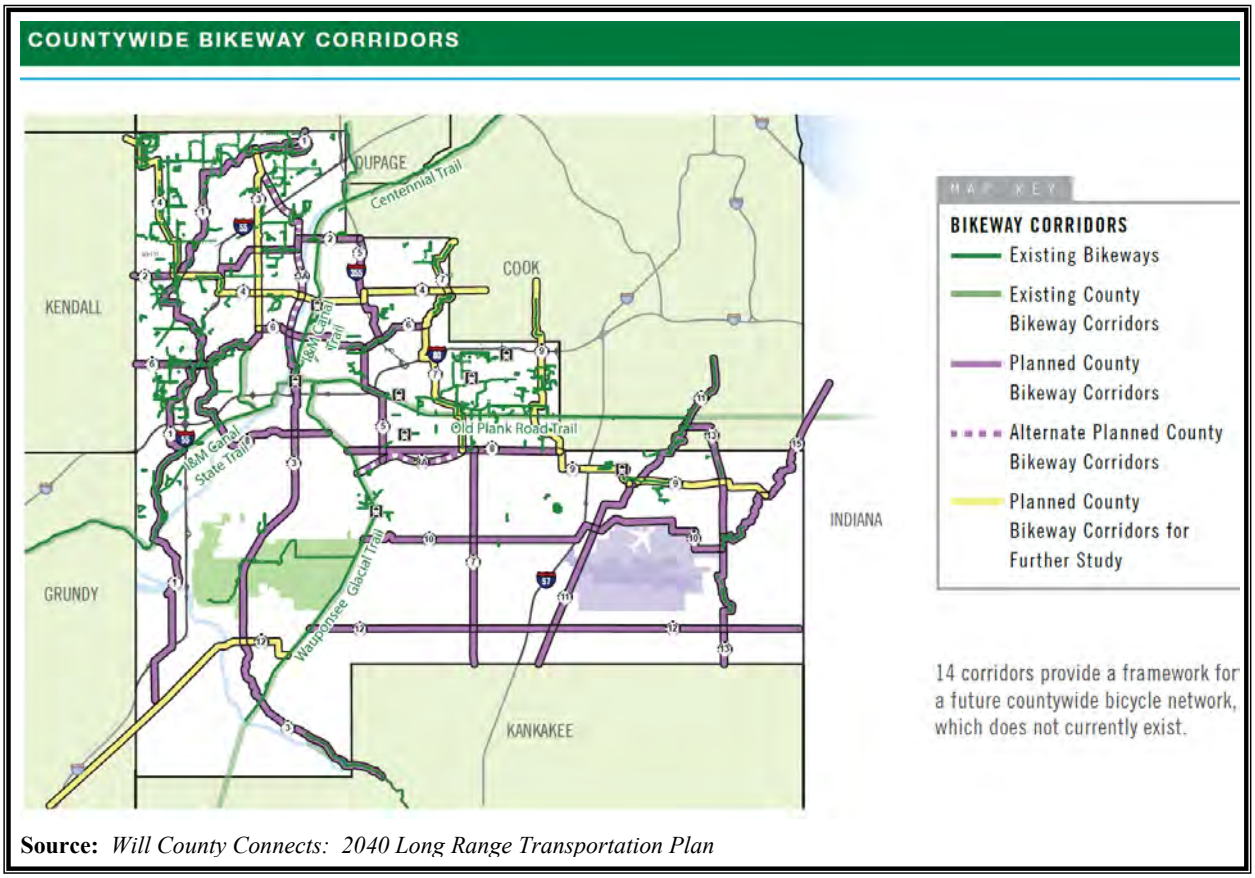


Waterways: Navigable waterways in Will County include -

- Illinois River – connects into the Mississippi River providing access to the Gulf of Mexico markets
- Des Plaines River/Chicago Sanitary and Ship Canal – parallels I-55 and connects to the south branch of the Chicago River
- Cal-Sag Channel – connects to Lake Michigan providing a gateway into the Great Lakes waterway system

A number of Will County businesses and industries rely heavily on these inland waterways and the Great Lakes system. The most common products transported by water are bulk commodities – coal, grain, sand, and stone.

Bikeway Network: Will County has over 400 miles of bikeways of which 89% are paved or limestone trails. As bikeway networks grow, there is the potential for the networks to interconnect allowing biking to become a viable transportation mode beyond recreational trips. Key to its further development is to create on- and off-street bikeway facilities.



Source: *Will County Connects: 2040 Long Range Transportation Plan*

To address transportation hazard issues, Will County has been working together with its public and private partners. They have been working together to identify the problems resulting from general growth, aging infrastructure, and the rapid development of the inland intermodal transportation and warehousing/distribution businesses. As they prioritize projects to address the county's needs, they are also working together to identify funding sources. With all sectors of the county working together to address infrastructure and transportation issues, a safer transportation system will be developed that protects the well-being and prosperity of residents, workers, and businesses.

Community Issue	Measures to Address
Safety	– Prioritize projects that address higher truck crash locations – Address critical at-grade rail crossings with safety concerns – Designate truck routes to reduce conflicts in residential areas
Trucks on Local Roads	– Partner with local communities, including townships, to designate truck routes to reduce conflicts in residential areas – Better communicate designated routes to truckers
Congestion	– Prioritize projects that address high congestion locations – Ensure new freight related developments address traffic growth and circulation through traffic plans and private sector cost sharing for improvements needed
Noise (also an environmental issue)	– Implement land use and zoning/site plan standards that include requirements for buffer areas and noise standards – Further investigate potential quiet zones for rail
Emergency Access	– Prioritize grade separations on roads with emergency facilities
Encroachment on Agricultural Land	– Create a County land use plan that creates strategies to focus new freight development in freight clusters. The County land use plan could also identify zones to protect agricultural areas that may be locally defined
Light Pollution and Aesthetics (also an environmental issue)	– Implement land use and zoning/site plan standards that include requirements for buffer areas and lighting standards, and aesthetic considerations, particularly for new freight related development

Environmental Issue	Measures to Address
Air Quality	– Partner with industry to minimize air quality impacts from freight – Partner on strong anti-idling regulations and technology – Plan for buffer zones around new/expanding freight developments
Water Quality	– Employ best management practices for avoidance and minimization of impacts to wetlands and for stormwater management – Consider water quality impacts in truck route selection and implement stormwater best management practices in roadway design
Hazardous Materials Transportation	– Regularly review and update route designations with partners – Ensure emergency management plans are reviewed and updated
Encroachment on Sensitive Areas	– Develop a county land use plan and strategy – Focus new freight development in existing identified freight clusters – Review truck routing to minimize impacts to adjacent environmentally sensitive areas

Source: *Will County Community Friendly Freight Mobility Plan*

Health and Safety

Traffic accidents are influenced by weather conditions, speed of traffic, and the number of vehicles occupying the road. Conditions that lead to accidents include rain, fog, ice, heavy rain, strong winds, high speed, and heavy traffic congestion. Accordingly, people are injured or killed as a result of accidents.

Economic Impact

Short delays due to slow downs or shut downs in transportation systems are the most common results of accidents. Should a major transportation route be shut down for an extended period of time, people traveling through that area and businesses transporting raw materials and goods could be impacted until that route is repaired.

Future Occurrence

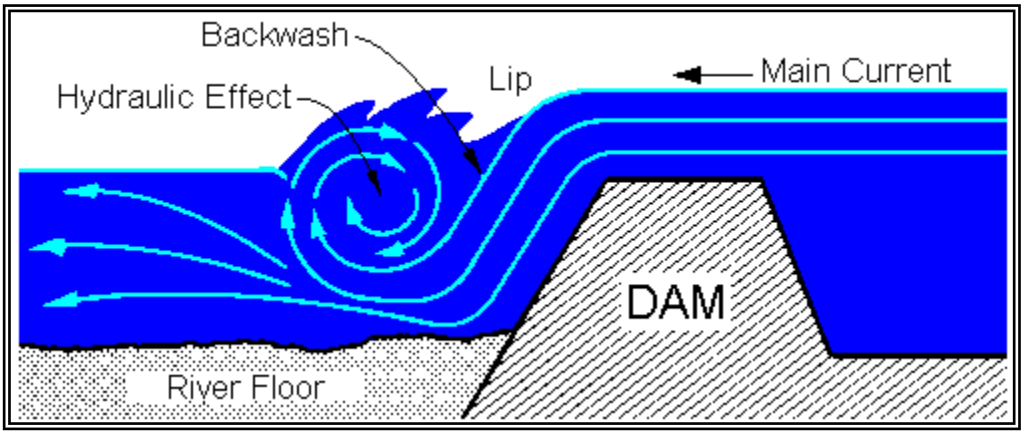
As the county grows in population and business/manufacturing entities, use of all transportation systems will increase which will likely increase the number of accidents.

DAM FAILURE

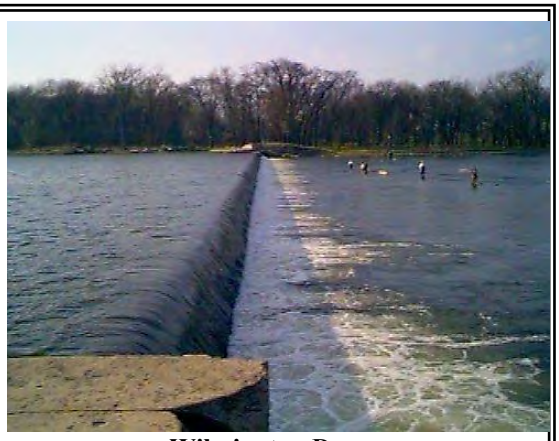
Hazard Characterization

A dam is built to control water and can be made from earth, rocks, or concrete. Dams are usually constructed on rivers to store water in a reservoir during times of excess flow and then released as needed. They are important because they provide water for drinking, industrial processes, fishing, recreation, navigation, and transport of raw goods on rivers. The water impounded behind a dam is referred to as the reservoir and is measured in acre-feet, with one acre-foot being the volume of water that covers one acre of land to a depth of one foot. Due to topography, even a small dam may have a reservoir containing many acre-feet of water.

Dam failure is an accidental or unintentional collapse or other failure of an impoundment structure that results in downstream flooding. Dams are man-made structures and dam failures are usually considered technological hazards; however, dams usually fail as a result of the secondary effects of storms. Dam failures may result from natural events, human-caused events, or a combination thereof. Failure can result in the release of the reservoir contents that include water, mine wastes or agricultural refuse causing a negative impact upstream or downstream or at a location remote from the dam. A flood that is caused by the breach of a dam may be of greater magnitude than a flood originating from the runoff of rainfall or snowmelt.



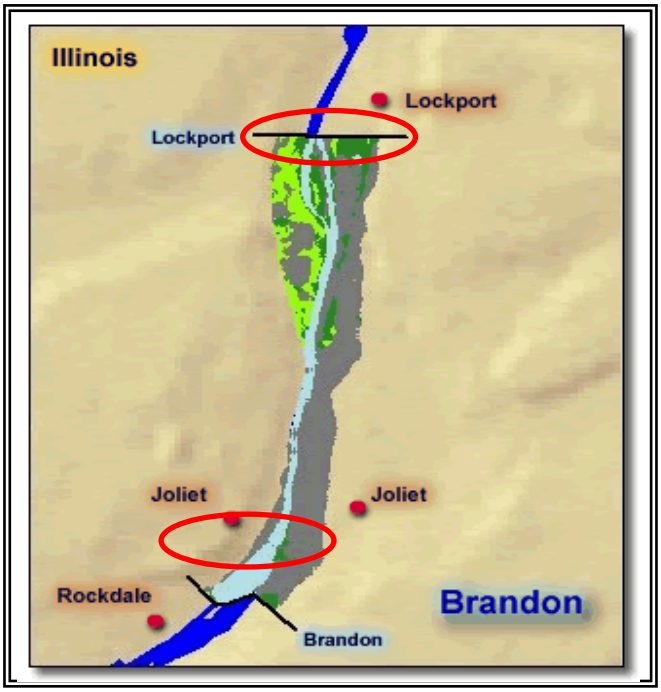
Will County is situated on the Illinois Waterway System, a primary waterway-barge link between the St. Lawrence Seaway, the Great Lakes, the Mississippi River, and the Gulf of Mexico. The system follows



Wilmington Dam

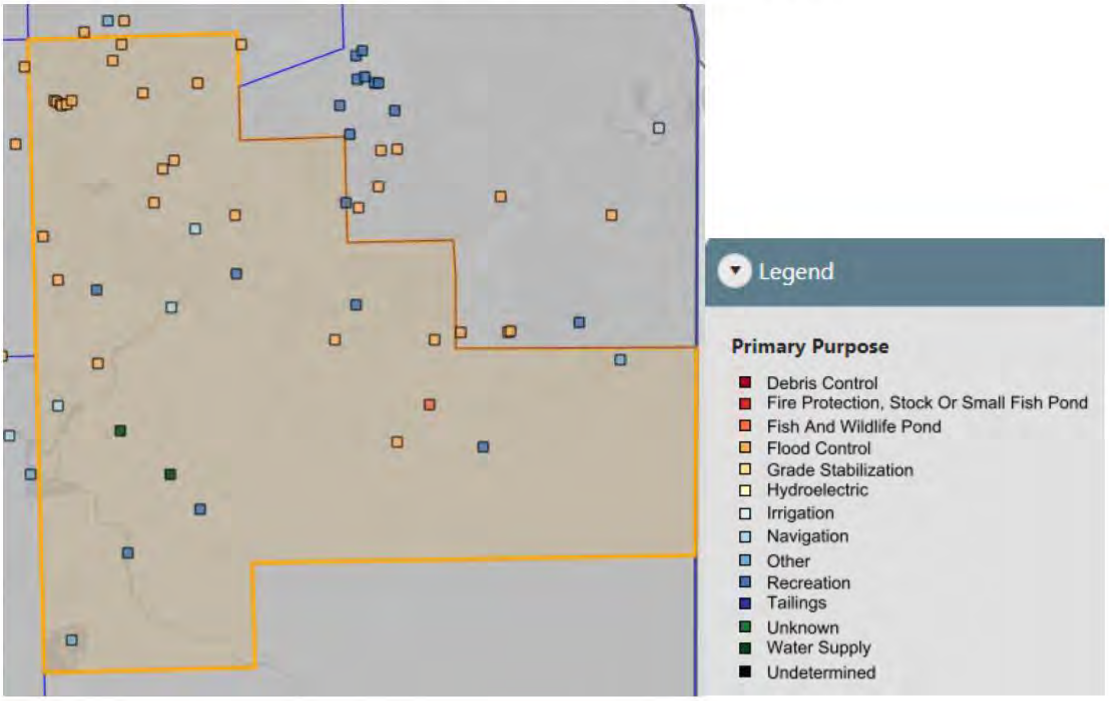
along the Illinois and Michigan (I&M) Canal and the Des Plaines River through Will County, providing manufacturers with excellent low-cost barge shipping opportunities for bulk materials. Coal, petroleum products, chemicals, metals and ores, non-metallic minerals, grain, stone, sand, clay, and cement are among the major commodities that travel through Will County on the Illinois Waterway System. Will County is home to the third greatest number of public and private waterway terminals in Illinois.

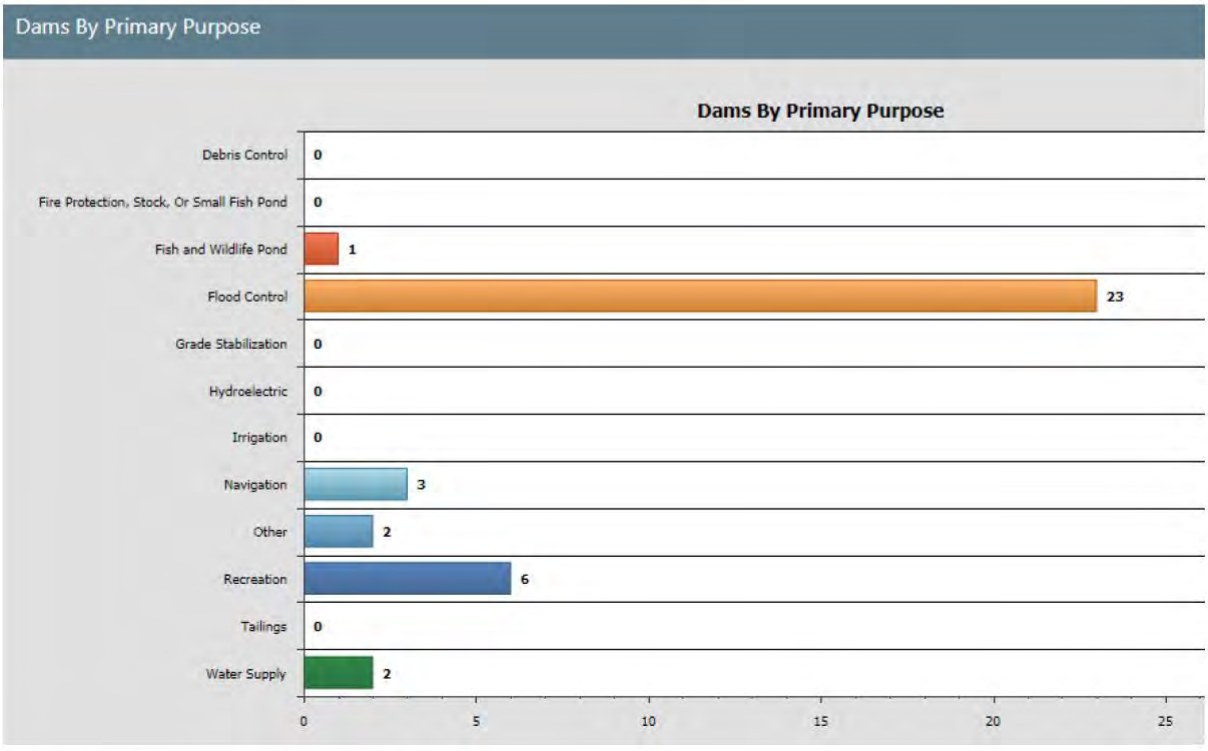
The Illinois Waterway system consists of 336 miles of water from the mouth of the Chicago River to the mouth of the Illinois River at Grafton, Illinois. It is a system of rivers, lakes, and canals which provide a shipping connection from the Great Lakes to the Gulf of Mexico via the Mississippi River. The I&M Canal opened in 1849. In 1900, the Chicago Sanitary and Ship Canal replaced it and reversed the flow of the Chicago River so it no longer flowed into Lake Michigan. The United States Army Corps of Engineers maintains a 9 foot deep navigation channel in the waterway.



A series of seven locks control water flows from Lake Michigan to the Mississippi River system. Two of those lock and dam systems are located in Will County: Brandon Road Lock and Dam and Lockport Lock and Dam.

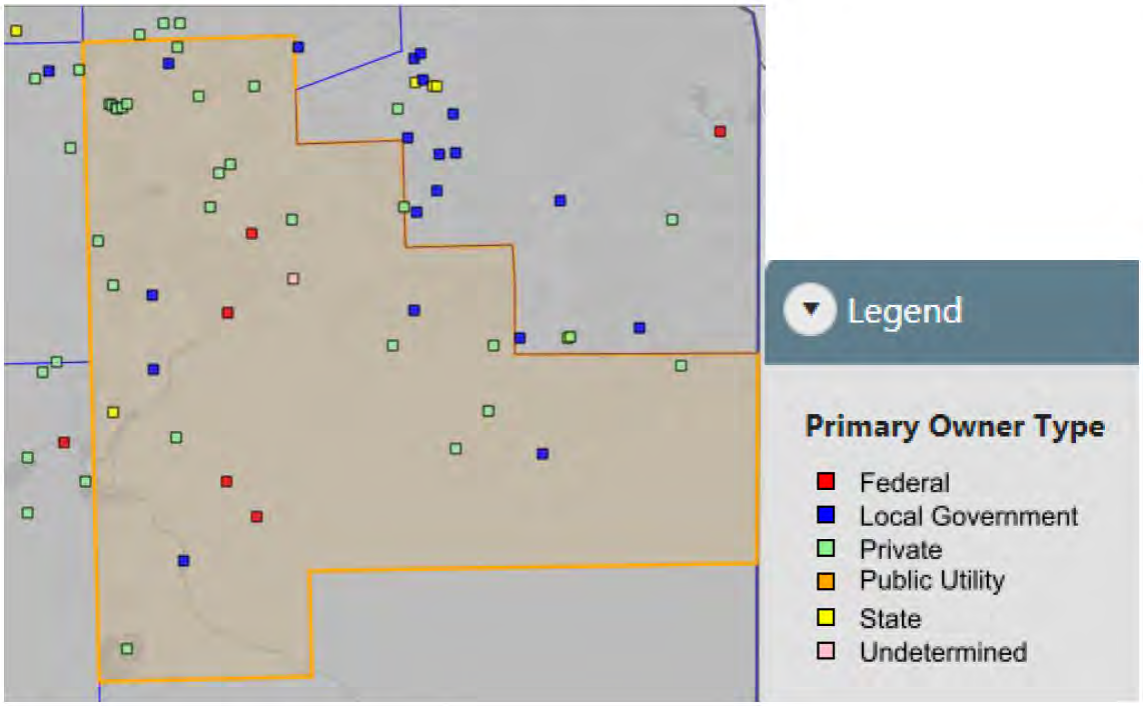
Will County Dams by Primary Purpose

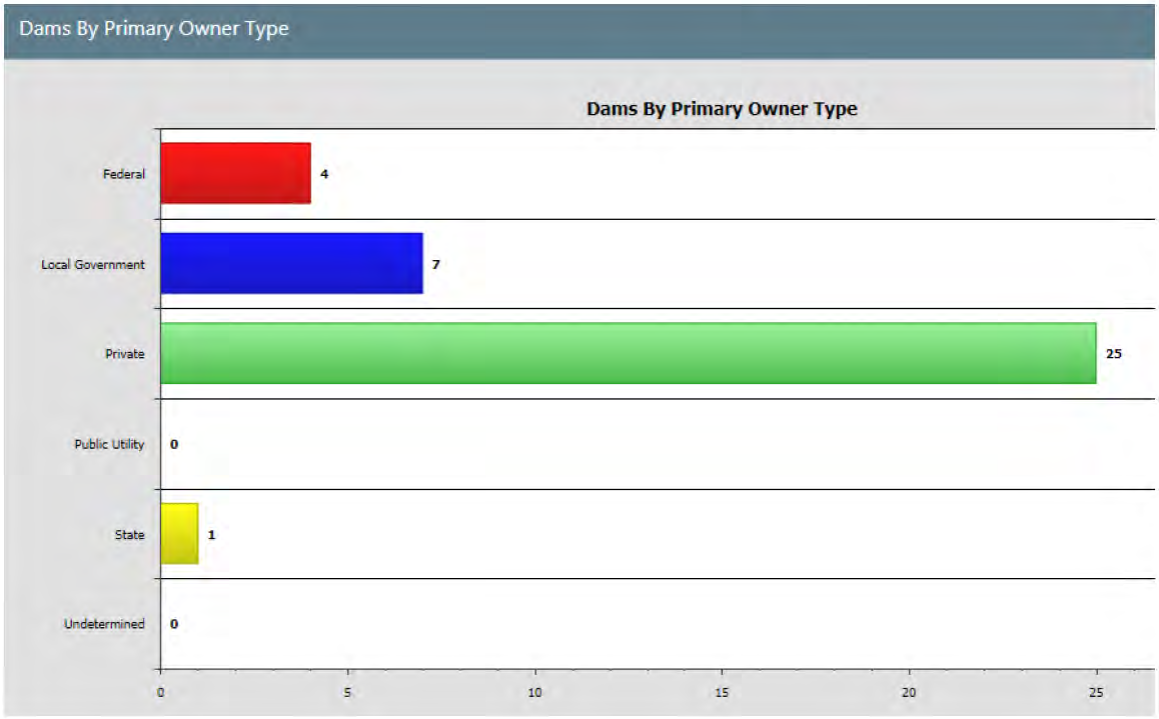




Source: US Army Corps of Engineers, National Inventory of Dams

Will County Dams by Primary Owner Type



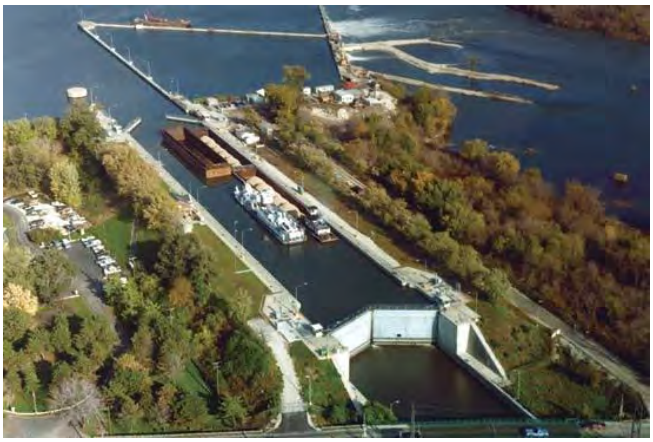


Source: US Army Corps of Engineers, National Inventory of Dams

Brandon Road Lock and Dam

Brandon Road Pool is created by Brandon Road Lock and Dam on the Des Plaines River in Will County, Illinois, and is used for improved navigation purposes. It connects from the Chicago River (connecting to Lake Michigan) to the Illinois River. It was completed in 1933. It is owned by U. S. Army Corps of Engineers.

Brandon Road Lock and Dam
(Source: U.S. Army Corps of Engineers**)**



BRANDON ROAD LOCK & DAM	COMMODITY TONNAGE	Coal	768,450
		Petroleum	2,008,175
		Chemicals	1,911,674
		Crude Materials	4,245,277
		Manufactured Goods	3,087,063
		Food/Farm Products	663,700
		Manufactured Machinery	57,030
		Waste Material	4,700
		Unknown	33,500
	LOCKAGES	Commercial Vessels	3,889
		Recreation Vessels	658

Brandon Road Lock and Dam, also known as Brandon Road Pool, is a gravity dam. The core is homogeneous, earth, concrete, and metal. The foundation is rock. Though originally completed in 1933, the structure was modified in 1985. Its height is 40 feet with a length of 14,250 feet. Its capacity is 4,500 acre feet. Normal storage is 4,500 acre feet. It drains an area of 1,500 square miles.

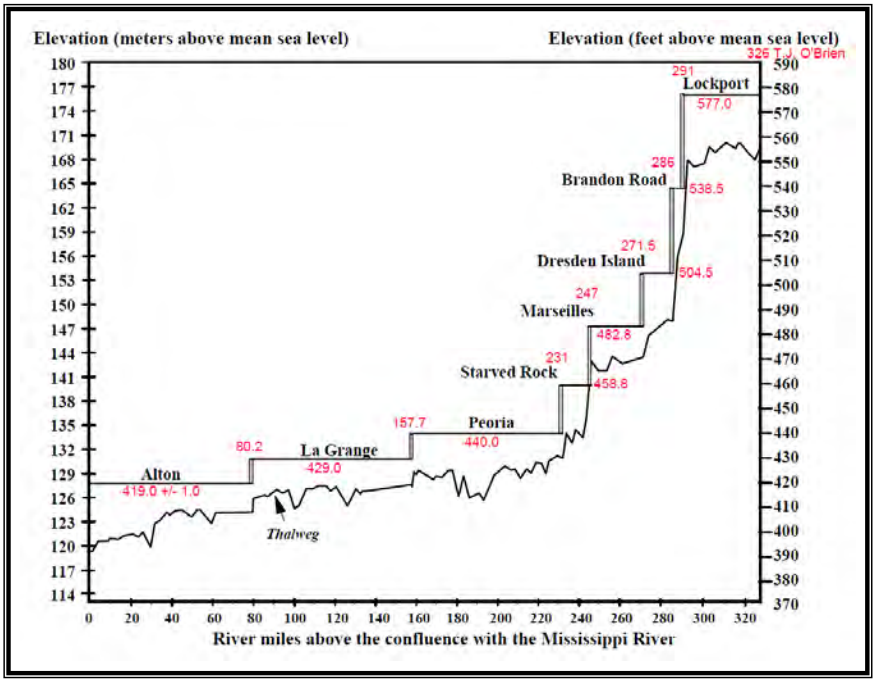
Lockport Lock and Dam

This lock and dam is located in Lockport, Illinois, within the three-mile lower reach of the Chicago Sanitary Ship Canal which extends from the Chicago River to the Illinois Waterway. The Lockport upper pool is perched 38 feet above the surrounding communities. The lock has a width of 110 feet and length of 600 feet. It was completed in 1933. Rehabilitation work was completed in 1989.

A safety assessment was completed in 2005. The Lockport Pool Approach Dike and walls were confirmed potentially unsafe. Total estimated repair project cost is $132,400,000. The Approach Dike is presently under repair with a 300 foot test section of full depth concrete cut-off wall being constructed. If successful, it will lead to 4,300 feet of the dike receiving a full depth cut-off wall. Interim risk reduction measures were completed including weir repair and tree cutting along the back side of the dike. In addition, design of the left descending bank wall repairs is underway with a proposed fourth quarter contract award.

Lockport Lock and Dam
(Source: U.S. Army Corps of Engineers**)**

LOCKPORT ROAD LOCK & DAM			
	COMMODITY TONNAGE	Coal	754,450
		Petroleum	2,008,075
		Chemicals	1,852,674
		Crude Materials	4,528,046
		Manufactured Goods	3,052,463
		Food/Farm Products	564,500
		Manufactured Machinery	45,930
		Waste Material	4,700
		Unknown	14,300
	LOCKAGES	Commercial Vessels	4,145
		Recreation Vessels	567



WILL COUNTY DAMS and LOCKS (Source: National Inventory of Dams)					
Dam Name	**Source**	**Year Completed**	**Storage (AC/FT)**	**Height (Ft)**	**Class**
Braidwood Station Cooling Pond Dam	Kankakee River	1979	35,000	22	High
Brandon Road Lock and Dam	Des Plaines River	1933	4,500	45	High
Brookwood Trace Dam	Springbrook Creek 2	1991	90	12	Low
Cedar Glen Unit 2 Dam	Spring Brook	1985	75	11	Low
Century Trace Lake Dam	Wolf Creek	2003	274	11	Low
Channahon Dam	DuPage River	1930E	750	25	Low
Deer Lake Dam	Deer Creek	1920	600	15	Significant
Deer Run Pond K Dam	Grant Creek - Offstream	2002	164	11	Low
Doyle Lake Dam	Trib. Jordan Creek	1973	142	14	Low
Glenn Circle East Dam	Wolf Creek	2003	274		Low
Gun Club Lake Dam (Hamburgh-Martin Number 6 Dam)	Trib. Hickory Creek	1969	102	20	Low
Joliet Junior College Lake Dam	Trib. Rock Run Creek	1980	59	11	Significant
Joliet West Side Wastewater Treatment Plant Dam	DesPlaines River - Offstream		77	25	Low
Kemery Lake Dam	Prairie Creek		116	20	High
Lakeview Estates Unit 2 Pond 02 Dam	Trib. Hickory Creek	2003	100	10	Low
Lily Cache Business Dam	Lily Cache Lane Trib.		67	14	Low
Lockport Lock	Chicago Sanitary & Ship Canal	1933	40,000	65	High
Lockport Powerhouse and Controlling Work Reservoir Dam	Chicago Sanitary & Ship Canal	1907	25,000	38	High
Maple Brook Estates Dam	Lily Cache Creek	1997E	97	6.6	Low
Millenium Parkway Dam	Wolf Creek	2003	150	10	Low
Monee Reservoir Dam	Trib. Rib Rock Creek	1900	650	29	Significant
Puddle Pond Dam	Trib. DuPage River	1957	80	17	III
Remington Lakes Dam	Trib. Mink Creek		71	9	Low
Sauk Trail Dam	Trib. Hickory Creek	1980	3,230	34	High
Spring Brook Gabion Dam	Spring Brook	1984	89	9	Low
Wilmington Dam	Kankakee River	1920	1,200	12	Low

State Regulation

The State of Illinois regulates dams under Title 17, Chapter I, III, Administrative Code 3702. Dams are categorized according to the probable loss of human life and the impacts on economic, environmental, and lifeline interests:

1. *Low Hazard Potential* — Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

2. *Significant Hazard Potential* Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

3. *High Hazard Potential* Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

Dam Hazard Potential Classification		
Classification	**Loss of Human Life**	**Economic, Environmental, Lifeline Losses**
Low	None expected	Low & generally limited to owner
Significant	None expected	Yes
High	Probable, one or more expected	Yes, but not necessary for this classification

History

The history of dam failure in Will County has primarily been the result of severe storms. The possibility of dam failure is rare if dams and locks are properly maintained and inspected.

IMPACT OF DAM FAILURE ON WILL COUNTY (Source: Cold Regions Research and Engineering Laboratory/ US Army Corps of Engineers National Inventory of Dams/WC EMA)		
Date	**Dam**	**Description**
07/17/1996	Maple Brook Estates Dam	> 10" Rainfall in 24 hr.
07/17/1996	Puddle Pond Dam	> 10" Rainfall in 24 hr.
07/17/1996	Cedar Glen Unit 2 Dam	> 10" Rainfall in 24 hr.
07/17/1996	Gun Club Lake Dam	> 10" Rainfall in 24 hr.
07/17/1996	Joliet Junior College Lake Dam	> 10" Rainfall in 24 hr.
07/17/1996	Channahon Dam	> 10" Rainfall in 24 hr.
06/1990	Wilmington Dam	Breach approx. 100" long
1948	Channahon Dam	High flow overtopped embankment

Risk Characterization

The affected area for dam failure includes the dam and the area impacted by the release of the water in the reservoir. For the most part, there are few people on the dam and the health and safety impacts are negligible. The threat in the area below the dam can be significant. Damages are similar to flooding with increased structural damages due to the higher velocities of flow. Responders will experience the same hazards as in other flood response situations.

More than half of the 240 operational Corps funded lock chambers in the U.S., which handle over 625 million tons of freight each year, are over 50 years old and have exceeded their economic design lives. The replacement value of our lock and dam facilities has been estimated at more than $125 billion. Owned and operated by the federal government, the system's infrastructure has been recapitalized with an investment at the grossly inadequate level of approximately $220 million annually over the past 10 years, although this trend has begun to improve in the past few years.

Many locks currently in use are too small for today's larger tows. This leaves the dams susceptible to closures and long delays for repairs and the inability to deal effectively with lines and wait times that result from their obsolescence. On the Upper Mississippi River, for instance, many lock chambers are 600 feet in length. However, the average length of a modern tow (15 barges pushed by a towboat) is 1,200 feet. Consequently, for a modern tow to navigate through these antiquated locks, it must split in half and transit the lock one section at a time, resulting in costly delays.

The U.S. Army Corps of Engineers reports increasing amounts of scheduled and unscheduled downtime at the locks on America's inland navigation system. In 2005, for example, the Corps reported navigation locks were unavailable (scheduled and unscheduled without ice) for about 110,000 hours (~ 4,600 days). Queue delays at congested or unavailable locks cost the industry hundreds of millions of dollars annually.

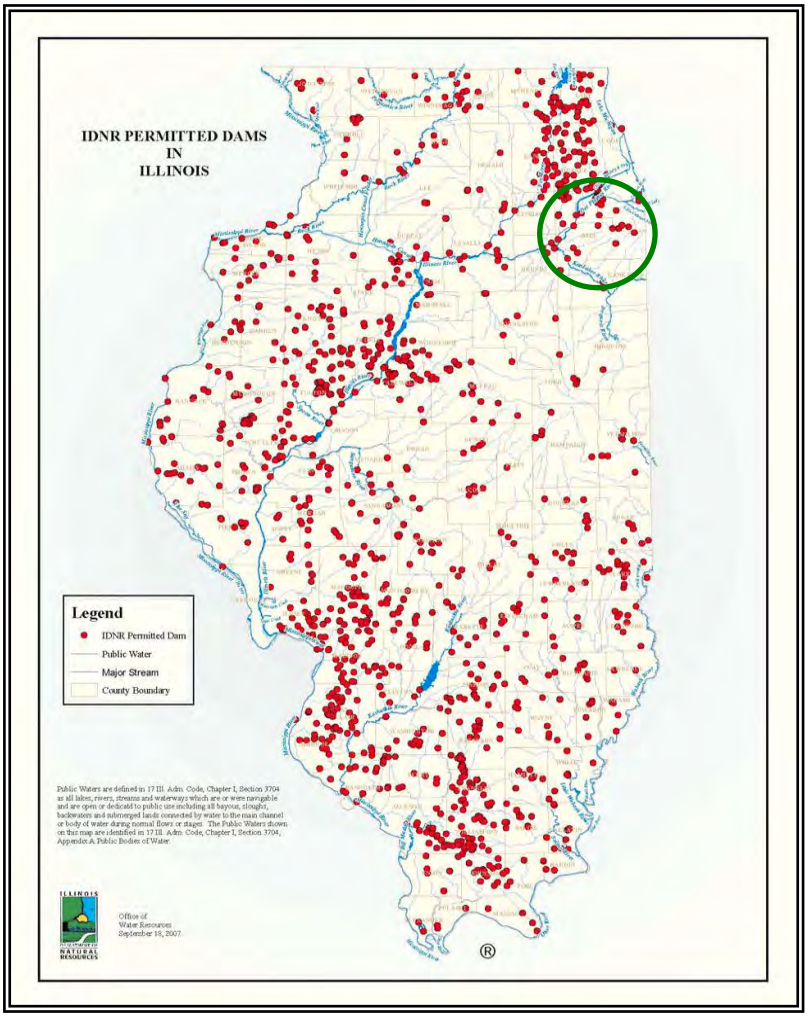
Waterborne transportation is generally out of sight, out of mind. But the inland waterways transportation system binds us together in this country and allows us to turn on lights, eat our cereal in the morning, and drive our cars to work. It deserves our support and our commitment to nurture it, not neglect it.

Impact: Medium

Dam Failures

Dam failures usually occur when the spillway capacity is inadequate and water overtops the dam or when internal erosion through the dam foundation occurs, also known as piping. If internal erosion or overtopping causes a full structural breach, a high-velocity, debris-laden wall of water is released and rushes downstream, damaging or destroying whatever is in its path. Dam failures may result from one or more the following:

- Prolonged periods of rainfall and flooding (the cause of most failures)
- Inadequate spillway capacity which causes excess overtopping flows
- Internal erosion due to embankment or foundation leakage or piping
- Improper maintenance
- Improper design
- Negligent operation
- Failure of upstream dams
- Landslides into reservoirs
- High winds
- Earthquakes.



For emergency planning purposes, dam failures are categorized as either *rainy day* or *sunny day failures. Rainy day failures* involve periods of excessive precipitation leading to an unusually high runoff. This high runoff increases the reservoir of the dam and if not controlled, the overtopping of the dam or excessive water pressure can lead to dam failure. Normal storm events can also lead to rainy day failures if water outlets are plugged with debris or otherwise made inoperable. *Sunny day*

failures occur due to poor dam maintenance, damage/obstruction of outlet systems, or vandalism. This is the worst type of failure and can be catastrophic because the breach is unexpected and there may be insufficient time to properly warn downstream residents.

If a dam suffers a partial or complete failure, the potential energy of the water stored behind even a small dam can cause loss of life and great property damage downstream. The following factors influence the impact of a dam failure:

- Level of failure (partial or complete)
- Rapidity of failure (sudden or gradual)
- Amount of water released
- Nature of the development or infrastructure located downstream

Damage to Buildings

Buildings downstream of a dam failure can be inundated and lost due to flooding. Damages are similar to flooding with increased structural damages due to the higher velocities of flow.

Critical Facilities

Essential utilities and facilities can be damaged or lost from resultant flooding due to dam failure.

Health and Safety

Injury and loss of life can occur when a dam fails or water overspills its banks. Damages to the environment are typically less than flooding. Duration of inundation due to dam failure is short.

Economic Impact

The economic impact from dam failure is similar to flooding. The local economy can be affected when businesses and homes are flooded by the overspill of a dam. Dam Failure can have a serious effect on the movement of goods through our waterway system that would have an impact beyond our local economic area. Our country's inland navigation system plays a critical role in our nation's economy, moving hundreds of millions of tons of domestic commerce valued at $300 billion annually. Additionally, our inland waterways facilitate a significant portion of the $851.5 billion worth of imports and exports to and from the United State each year. Specific data regarding economic impact can be found through IEMA – Economic Impact Multi-Hazards Estimates binder.

Future Occurrence

With five high hazard dams, Will County is vulnerable to dam failure; however, the likelihood of occurrence is low.

DAM FAILURE OCCURRENCES	
Number of Occurrences Since 1990	**Annual Mean**
7	.23

INFRASTRUCTURE FAILURE

Hazard Characterization

Infrastructure failure of critical public or private utilities results in a temporary loss of essential functions and/or services. The residents of Will County depend on the public and private utility infrastructure to provide essential services such as electric power, heating and air conditioning, water, sewage disposal and treatment, storm drainage, communications, and transportation. Failure of any of these services for an extended length of time would require an emergency management organization response to supply food, water, heating, etc. Failure can occur within a distribution system or be caused by external factors such as severe storms or fire. Codes and standards govern the design, construction, and operation of infrastructures, but they are inadequate to protect against disaster related damage.

Electricity failure interrupts the functions of businesses and homes, causes life-threatening situations in medical facilities, creates traffic stoppages, spoils food, and disrupts communication and computer functions. Failure of heating and air conditioning units can threaten lives in extreme cold or hot weather. Disruption of storm drainage can lead to flooding, and inoperable sewage treatment facilities will cause pollution leading to serious public health problems. Infrastructure failure heavily impacts the most vulnerable members of the community, namely the elderly, children, impoverished individuals, and people in poor health. The cost to repair these systems along with the economic and societal damage caused by lengthy disruption is excessively high.

History

Utility interruptions have been rare in Will County other than those associated with weather events.

Risk Characterization

Infrastructure failure may result from natural, technological, or societal hazards along with human error, equipment failure, or poor maintenance. The impact of infrastructure failure can be significant depending on the length of disruption and the extent of the affected area. Infrastructure failures can also create serious safety hazards when power lines are down, fire or explosion ensues, or hazardous materials are released into the environment.

Natural hazards include tornadoes and severe thunder or winter storms that may damage utility supply lines. Extreme heat can place a high demand for electricity causing an over-demand and failure of power

grids. Drought can impact water supplies. Technological hazards can impact infrastructure through fire, pipeline damage, or industrial accidents. Societal hazards include intentional acts of disruption resulting from terrorist attacks, civil disturbances, or sabotage.

Disruptions

Electric Utility: Affects the population primarily during winter and summer when the need and demand for heat and air-conditioning are high. Electric disruptions impact business when computers, lighting, refrigeration, gas pumps, and other equipment cannot be powered.

Telecommunications: Society has become very dependent on our variety of communication devices. When telephone service is disrupted, the use of land or cell phones, internet, or credit cards may be impacted. This can have a negative effect on emergency services and the banking system. Usage overloads of cell phones occur when there are large public events or emergencies. Storms may have an effect on radio communications. With many forms of communication devices available to us, the unavailability of one type should not affect the use of others.

Water Supply: Severe drought can have an impact on water supply causing restrictions on use.

Wastewater Services: Damage to wastewater facilities may cause sanitation and biological hazards, overloading of systems causing overflows and pollution, sewage discharge, and economic loss due to cleanup costs.

Gas Supply: Damage to gas supply systems can cause fire, explosion, death, evacuation of affected areas, loss of heat and cooking facilities, and economic losses to business and industry.

Petroleum Distribution: Loss of petroleum supply and distribution networks can be a result of fire or explosions and cause death, panic buying of fuel, social disruption, environmental cleanup costs, and economic losses to business and industry.

Transportation Systems: Infrastructure losses would cause the loss of traffic signals and damage to roadways, bridges, or waterways due to fire or explosion resulting in traffic congestion, social disorder, and economic losses.

Impact: Low

Damage to Buildings

Damage to buildings due to infrastructure failure is low. The potential exists for water damage when a facility is without heat and pipes freeze causing them to burst. Fire is another hazard when people find alternate sources for heat or light when electricity or heating fuel is disrupted. Explosion can occur from damaged gas lines.

Health and Safety

Impact on people and pets occurs when heating and cooling sources are lost. With extreme cold and heat events, the elderly are generally the first population group to be adversely affected. Injury or death may be possible when fire, explosions, or gas leaks occur.

Economic Impact

A study characterizing infrastructure failure interdependencies identified the sectors affected as: HVAC in buildings, effects on water systems, effects on health systems, and effects on road transportation systems. If disrupted by infrastructure failure, all of the sectors could have a significant impact on businesses and homes in the affected area.

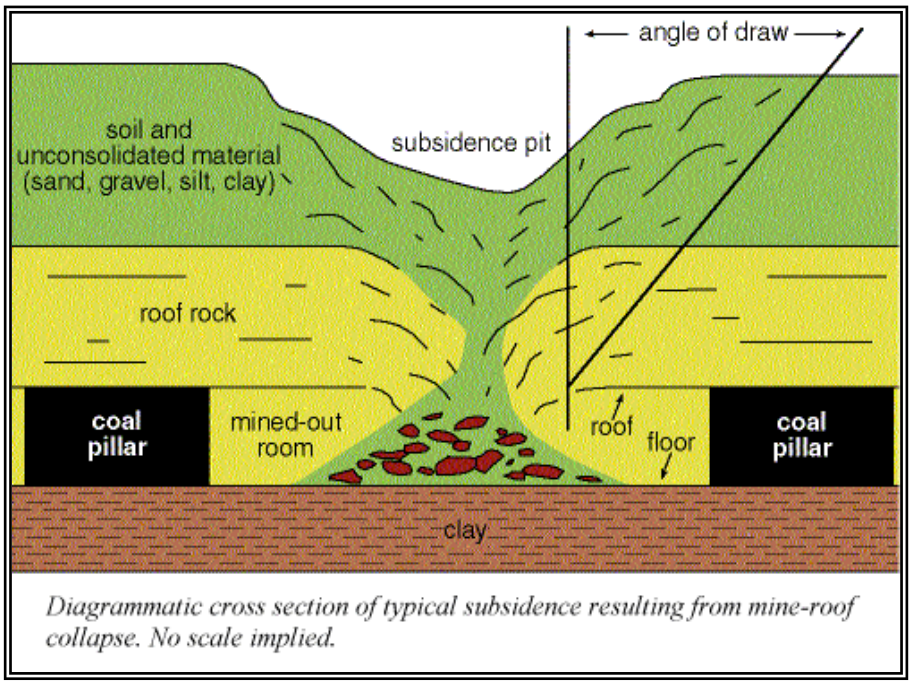
Future Occurrence

Infrastructure failure may occur individually or in combination with natural or technological hazards. It is estimated that the probability of occurrence and effect is low; however, the potential exists for widespread effect, particularly as secondary effects from hazards such as tornadoes.

LAND SUBSIDENCE

Hazard Characterization

Land subsidence is any vertical displacement or downward movement of a generally level ground surface resulting from either natural or man-induced surface or subsurface conditions. Natural subsidence occurs when the ground collapses into underground cavities produced by the solution of limestone or other soluble materials by groundwater. Drought or excessive rainfall can also cause sinkholes. Human-induced subsidence is caused mainly by groundwater withdrawal, drainage of organic soils, and underground mining.



Diagrammatic cross section of typical subsidence resulting from mine-roof collapse. No scale implied.

Loosely packed materials tend to compact and sink as time passes. In an open field, subsidence presents no real problem. Gradually, depressions make the land marshy and unfit for cultivation. The problem becomes serious where land has been developed. Subsidence poses a greater risk to property than to life and generally affects very few people. Land subsidence may take years to become apparent. As subsidence occurs, buildings begin to crack and slope to one side. Severe subsidence can result in complete collapse or deterioration serious enough to warrant the building being condemned. Roads can collapse. Gas mains and sewer lines underlying the building may also crack, thus causing secondary problems with explosions, fire, or flooding.

History

Most subsidence in Illinois is a result from underground mining. The first settlers of Illinois mined to extract coal, lead, zinc, fluorite, shale, claystone, limestone, and dolomite. Mines were located in low

population areas at that time with little regulation. Thus, there was rarely any structure damage if the ground settled. As towns developed over the mined areas, subsidence problems began causing structural damage.

The southwestern portion of Will County was once the site of shaft coalmines. Most of these mines were abandoned around the turn of the century, but the mined-out areas still exist. Estimates that were taken from the Illinois Geological Survey maps indicate that about one-eighth of the county was undermined. The communities of Diamond, Godley, and Braidwood have extensive underminings. A directory of coal mines for Will County dating as far back as 1873 is available from: https://isgs.illinois.edu/sites/isgs/files/maps/coal-maps/mines-series/mines-directories/pdf-files/mines-directory-will.pdf.

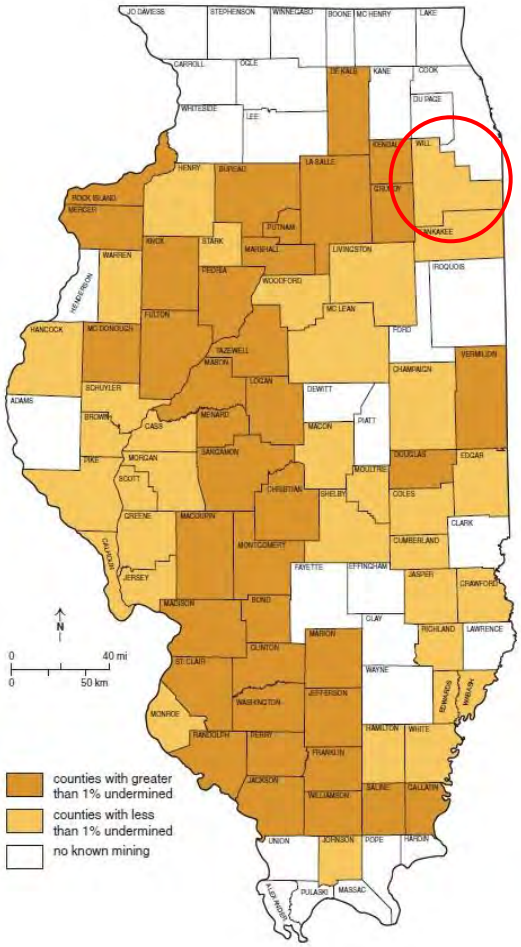
Many of the mining companies which operated in Illinois closed long before the mine subsidence occurred. Because property insurance did not cover such damage, property owners who experienced mine subsidence damage prior to 1979 had no recourse. For this reason along with high incidences of damage, special insurance coverage was created specifically to address mine subsidence problems faced by today's Illinois homeowners and the *Mine Subsidence Insurance Act* was passed in 1979. Through the Illinois Mine Subsidence Insurance Fund, coverage is available up to $750,000 for both residential and commercial structures. (Illinois Mine Subsidence Insurance Fund available at: https://www.imsif.com/).

The *2018 Illinois Hazard Mitigation Plan* shows no Illinois Mine Subsidence Insurance Fund confirmed claims for Will County during the period of 1999 – 2017. While over 800,000 acres of the state have been undermined for coal, the occurrence of mine subsidence, statistically, is fairly infrequent.

Coal Mined in Illinois

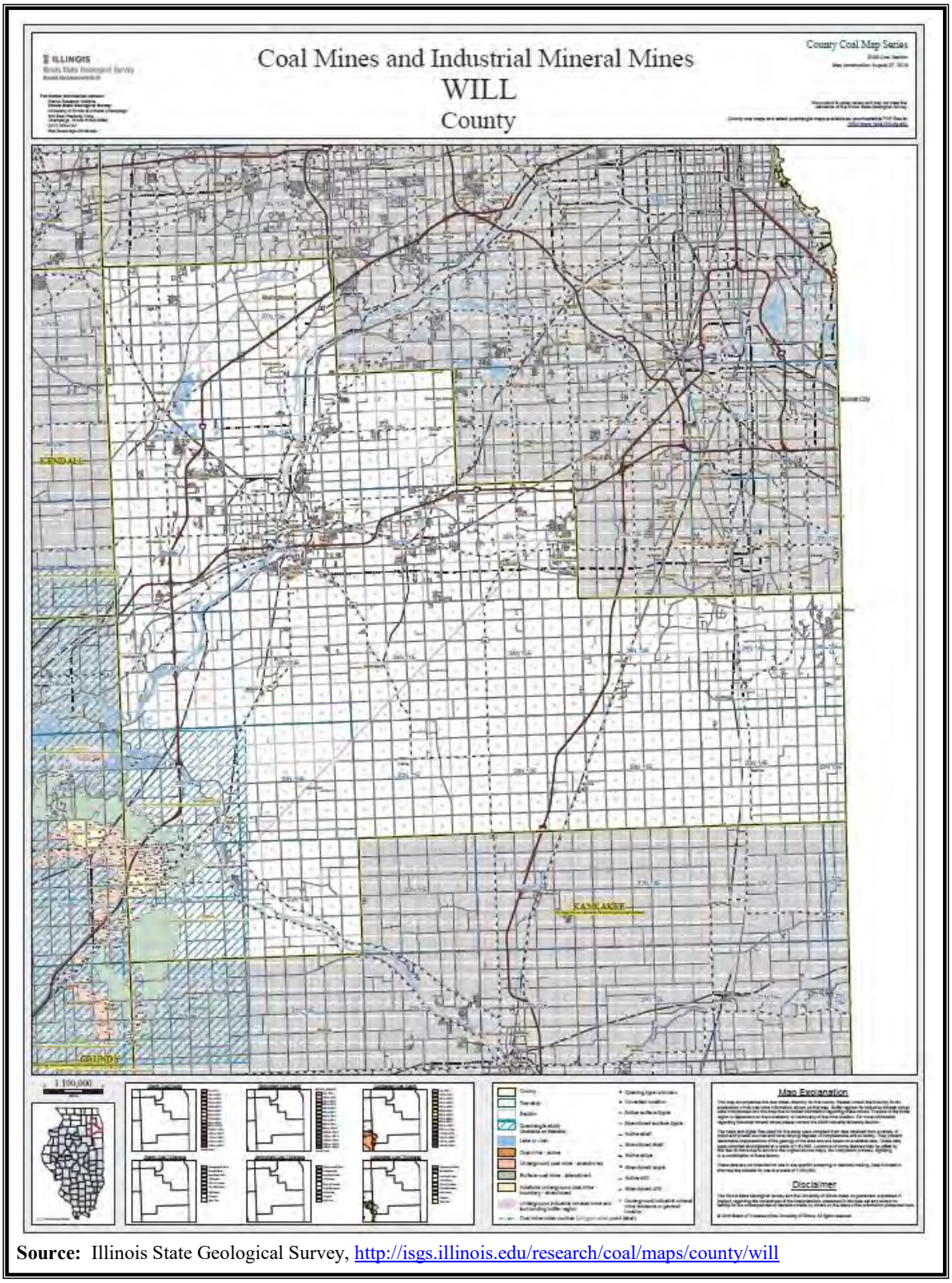
Source: *Mine Subsidence in Illinois: Facts for Homeowners.* Illinois State Geological Survey, 2013

Illinois Counties Undermined for Coal



Counties with undermined area of 1% or more are automatically included in the mine subsidence insurance program.

Source: *Mine Subsidence in Illinois: Facts for Homeowners.* Illinois State Geological Survey, 2013



Source: Illinois State Geological Survey, http://isgs.illinois.edu/research/coal/maps/county/will

Risk Characterization

Mine subsidence is affected by three aspects of Illinois geology:

- Much Illinois coal exists between weak layers of shale, claystone, limestone, and sandstone. These layers form a weak mine roof, allowing eventual collapse between support pillars.
- The layer under most Illinois coal is a soft clay, providing a poor foundation for mine roof support pillars, which can sink and collapse the mine.
- Illinois' soft coal tends to deteriorate upon contact with air in the mine. This means that roof support pillars carved out of the coal are prone to crumble and fail.

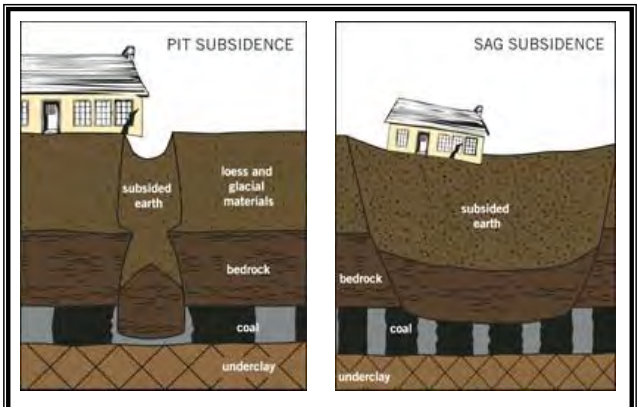
With a number of abandoned mines, additional dangers exit. Old mines may be partially collapsed or unstable making them inaccessible. Collapse of the mines may occur at any time and up to 100 years after mining. Some mines are full of water. Others may contain poisonous or explosive gases. Because of these dangerous issues, approval and supervision of the state mine inspector is required to access them. The Abandoned Mined Lands Reclamation Division (AMLRD) within the Illinois Department of Natural Resources (IDNR) deals with environmental and hazardous conditions of past coal mining activities.

Most mine subsidence in Illinois has been caused by coal mining. Pit and sag are two forms of land subsidence that occur in Illinois.

Pit Subsidence

Pit subsidence mostly occurs over shallow mines that are less than 100 feet deep and where bedrock over the mine is less than 50 feet thick and composed of weak rock materials like shale.

- Distinguished by a bell shaped hole – 6-8 feet deep by 2-40 feet across
- Ground movement is primarily downward and is swift and sudden
- Commonly occur after heavy rainfalls
- Damage may occur to structures if the pit subsidence occurs under the corner or foundation



Source: Illinois Mine Subsidence Insurance Fund

Sag or Trough Subsidence

Sag subsidence is the most common type of mine subsidence and forms a gentle depression

over a broad area. The sag may be as large as the mine panel and several acres of land may be affected. The ground moves in two directions. Vertical settlement occurs and the ground moves horizontally toward the center of the depression.

- First signs may appear suddenly (a few hours or days) with gradual movement continuing for a couple of years to over a decade
- Usually caused when coal pillars left to support the mine's roof disintegrate, collapse, or sink into a soft layer below the pillars
- Damage is usually subtle and may be mistaken for normal wear and tear until multiple signs appear
- The vertical and horizontal movement creates tension zones that pull apart structures, roads, driveways, sidewalks, sewer and water pipes, and other utilities.

The Illinois State Geological Survey maintains the Coal Mines in Illinois Viewer that allows the public to identify if their home is near mined areas and also publishes information guides that describe mine subsidence issues in Illinois and remedies for its occurrence.

- Coal Mine in Illinois Viewer: http://isgs.illinois.edu/ilmines
- *Mine Subsidence in Illinois: Facts for Homeowners* (available from: http://library.isgs.illinois.edu/Pubs/pdfs/circulars/c569-2013.pdf)
- *Planned Coal Mine Subsidence in Illinois: A Public Information Booklet* (available from: https://www.ideals.illinois.edu/bitstream/handle/2142/73425/c573.pdf?sequence=2&isAllowed=y)

Impact: Low

Damage to Buildings

Damage to property from mine subsidence can range from mild to severe. The following conditions may indicate a mine subsidence loss, but it is important to note that

these conditions are often times the result of normal ground movement due to changes in soil moisture or seasonal temperature changes.

- Sudden appearance of cracks in the building's foundation, exterior walls, basement or garage floors
- Foundation, porch or steps appear to pull away from the frame of the house
- Tilt in the house; doors start swinging open, or shut, or become jammed
- Windows start sticking, jamming, or even breaking
- Noticeable separations between walls and floors
- Water pipes break, resulting in contaminated tap water, loss of water pressure or interior water damage
- Popping or snapping might be heard as the ground shifts

If mine subsidence is the cause, it is likely that several of these problems will develop. Initial damage may occur within a few days or gradually over months. Ground movement from mine subsidence usually continues for years.

Future Occurrence

It is theoretically possible for an entire mine to collapse. Generally, with mine subsidence, it will not be an extensive area, usually less than 3 acres. Probably the most effective way of stopping mine subsidence is to eliminate gravity. Since we cannot do that, mine subsidence probably cannot be fully stopped. Modern mining techniques, such as those used in Illinois today, minimize the potential for future mine subsidence. The Illinois Mine Subsidence Insurance Fund generally investigates losses caused by older mines, which were mined a generation or two ago.

CYBERSECURITY

During the course of the county's hazard analysis, participants noted today's problem with cybersecurity. We were unable to evaluate this hazard during the analysis; however, it is important to identify it for study and begin to incorporate it into hazard mitigation planning. Thus, a synopsis of the hazard is included along with sources for information and mitigation. The intent is to incorporate cybersecurity into future hazard mitigation planning.

FEMA describes cyber as *anything that contains, is connected to, or controlled by computers and computer networks*. Computer networks are used by almost everyone on a daily basis. People are able to conduct banking; make purchases; communicate with others by email and social media; and control their TV, phone system, alarm systems, thermostats, lights, home entrances, and many more modern conveniences using their computer or cell phone. Our local, state, and national critical infrastructure rely on cyber technology. FEMA defines critical infrastructure as *the assets, systems and networks, whether physical or virtual, so vital to the United States that their incapacitation or destruction would have a debilitating effect on security, national economic security, national public health or safety, or any combination thereof*. Critical infrastructure sectors include:

- Banking and Finance
- Chemical
- Commercial Facilities
- Critical Manufacturing
- Dams
- Defense Industrial base
- Emergency Services
- Energy
- Food and Agriculture
- Government Facilities
- Healthcare and Public Health
- Information Technology
- National Monuments and Icons
- Nuclear Reactors, Materials, and Waste
- Postal and Shipping
- Transportation Systems
- Water

Being online exposes us to cyber criminals and others who commit identity theft, fraud, and harassment. Every time we connect to the Internet at home, at school, at work, or on our mobile devices we make decisions that affect our cybersecurity. Emerging cyber threats require engagement from the entire

American community to create a safer cyber environment from government and law enforcement to the private sector and, most importantly, members of the public. (See: https://www.cisa.gov/cyber-safety)

On November 16, 2018, President Trump signed into the law the *Cybersecurity and Infrastructure Security Agency Act of 2018*. This legislation established the Cybersecurity and Infrastructure Security Agency (CISA). The agency is tasked with building the national capacity to defend against cyber attacks and works with the federal government to provide cybersecurity tool, incident response services, and assessment capabilities.

Information, guidance, and education may be found at:

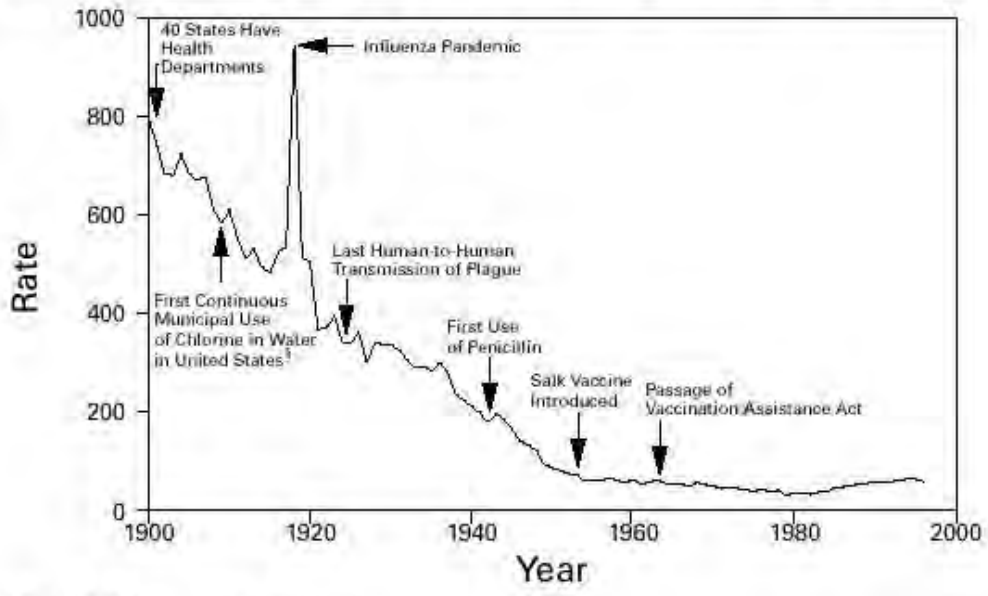
- Supporting Policy and Doctrine: https://www.cisa.gov/supporting-policy-and-doctrine
- Cyber Security Guidance: https://www.fema.gov/pdf/government/grant/hsgp/fy09_hsgp_cyber.pdf
- Cybersecurity Information: https://www.nsa.gov/Portals/70/documents/what-we-do/cybersecurity/professional-resources/csi-nsas-top10-cybersecurity-mitigation-strategies.pdf
- Cyber Incident Response: https://www.cisa.gov/cyber-incident-response
- Cyber Safety: https://www.cisa.gov/cyber-safety
- Be Prepared for a Cyberattack: https://www.fema.gov/media-library-data/1558564285012-6f81784140c5b5116240a804610eaf12/Cyberattack_InfoSheet_061418.pdf

PUBLIC HEALTH

Hazard Characterization

Public health issues typically bring to mind infectious disease epidemics. Up through the early 1900's, there was significant risk from diseases such as tuberculosis, typhoid fever, poliomyelitis, and measles. As the 1900's progressed, research brought about better sanitation, medical care, immunization, and new drugs that reduced the risks of epidemics. Public health services grew as methods of prevention of serious diseases were discovered.

FIGURE 1. Crude death rate* for infectious diseases — United States, 1900–1996†



*Per 100,000 population per year.
†Adapted from Armstrong GL, Conn LA, Pinner RW. Trends in infectious disease mortality in the United States during the 20th century. JAMA 1999:281;61–6.
§American Water Works Association. Water chlorination principles and practices: AWWA manual M20. Denver, Colorado: American Water Works Association, 1973.

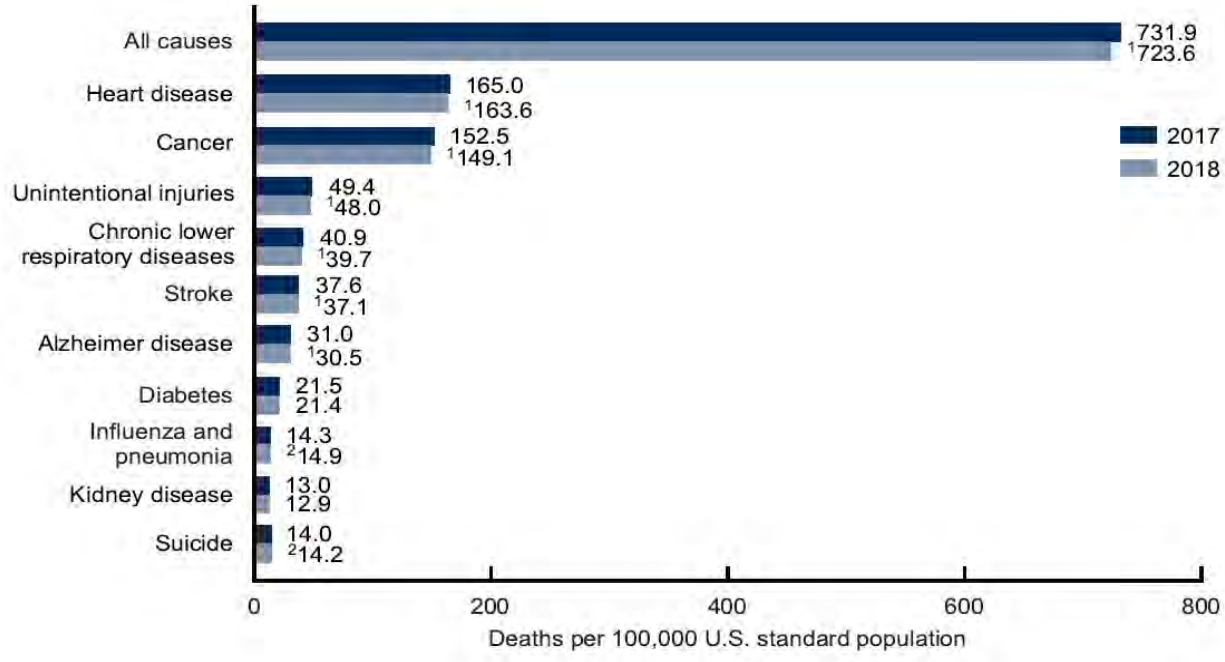
Source: CDC, "A Century of U.S. Water Chlorination and Treatment: One of the Ten Greatest Public Health Achievements of the 20th Century". Morbidity Mortal Weekly Rep., 1999; 48(29):621-9

Today, major epidemics are uncommon but still exist as a threat. The increase in life expectancy that grew during the 20th century was largely due to improvements in child survival resulting from reductions in infectious disease mortality. Immunizations were the primary impetus for these reductions with others being use of antibiotics, improvements in screening and testing guidelines, and improvements in diagnosis of infectious disease. Between 1980 and 2014, deaths from infectious disease dropped significantly. However, influenza and pneumonia are still included in the leading causes of death in the United States.[3]

Death Rates for Common Infectious Diseases in the United States in 1900, 1935, and 1970

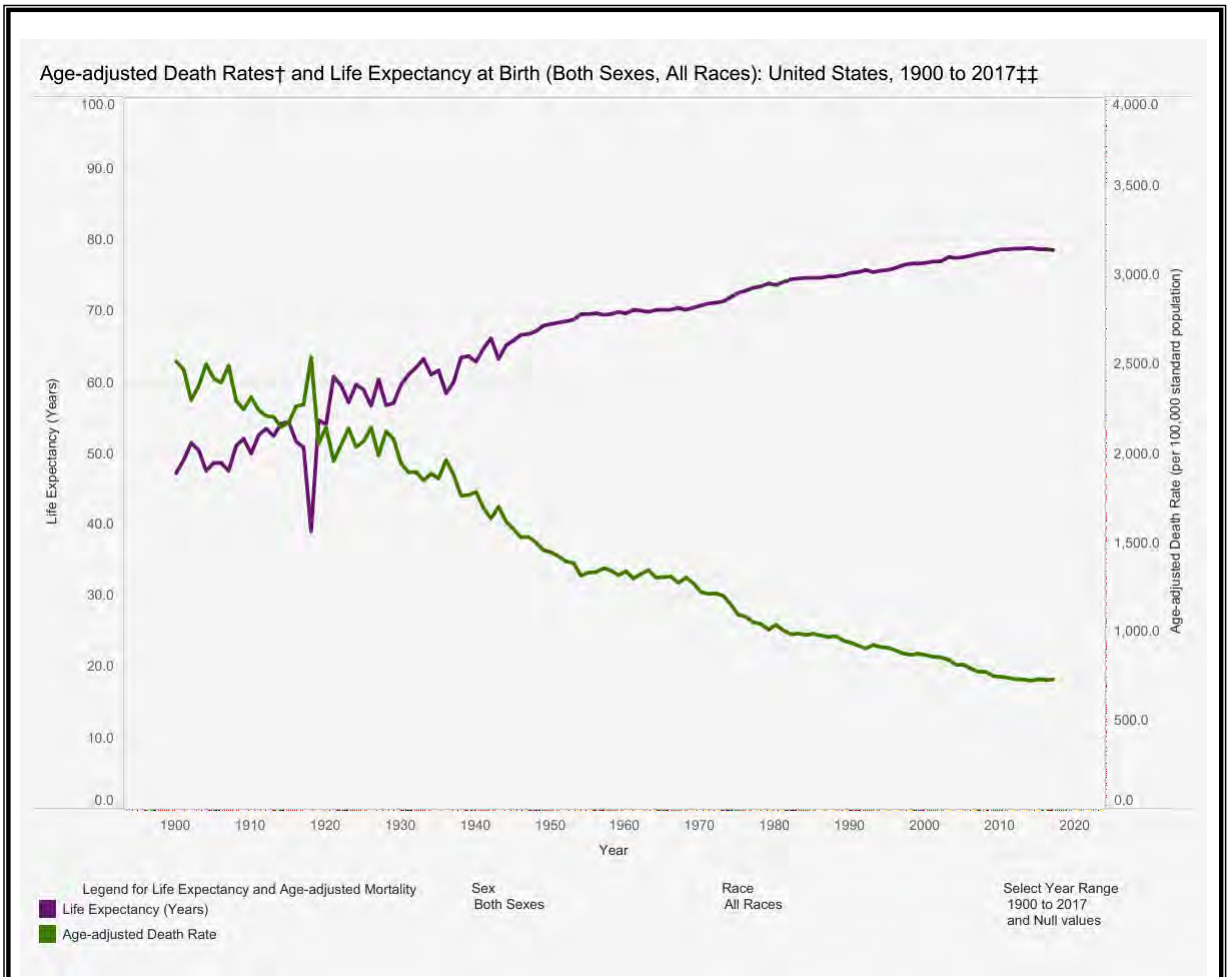
	Mortality rate per 100,000 population		
	1900	1935	1970
Influenza and pneumonia	202.2	103.9	30.9
Tuberculosis	194.4	55.1	2.6
Gastroenteritis	142.7	14.1	1.3
Diphtheria	40.3	3.1	0.0
Typhoid fever	31.3	2.7	0.0
Measles	13.3	3.1	0.0
Dysentery	12.0	1.9	0.0
Whooping cough	12.0	3.7	0.0
Scarlet fever (including streptococcal sore throat)	9.6	2.1	0.0
Meningococcal infections	6.8	2.1	0.3

Age-adjusted death rate for all causes and the 10 leading causes of death in 2018, United States:
Decreased 1.1% from 731.9 deaths per 100,000 standard population in 2017 to 723.6 in 2018.



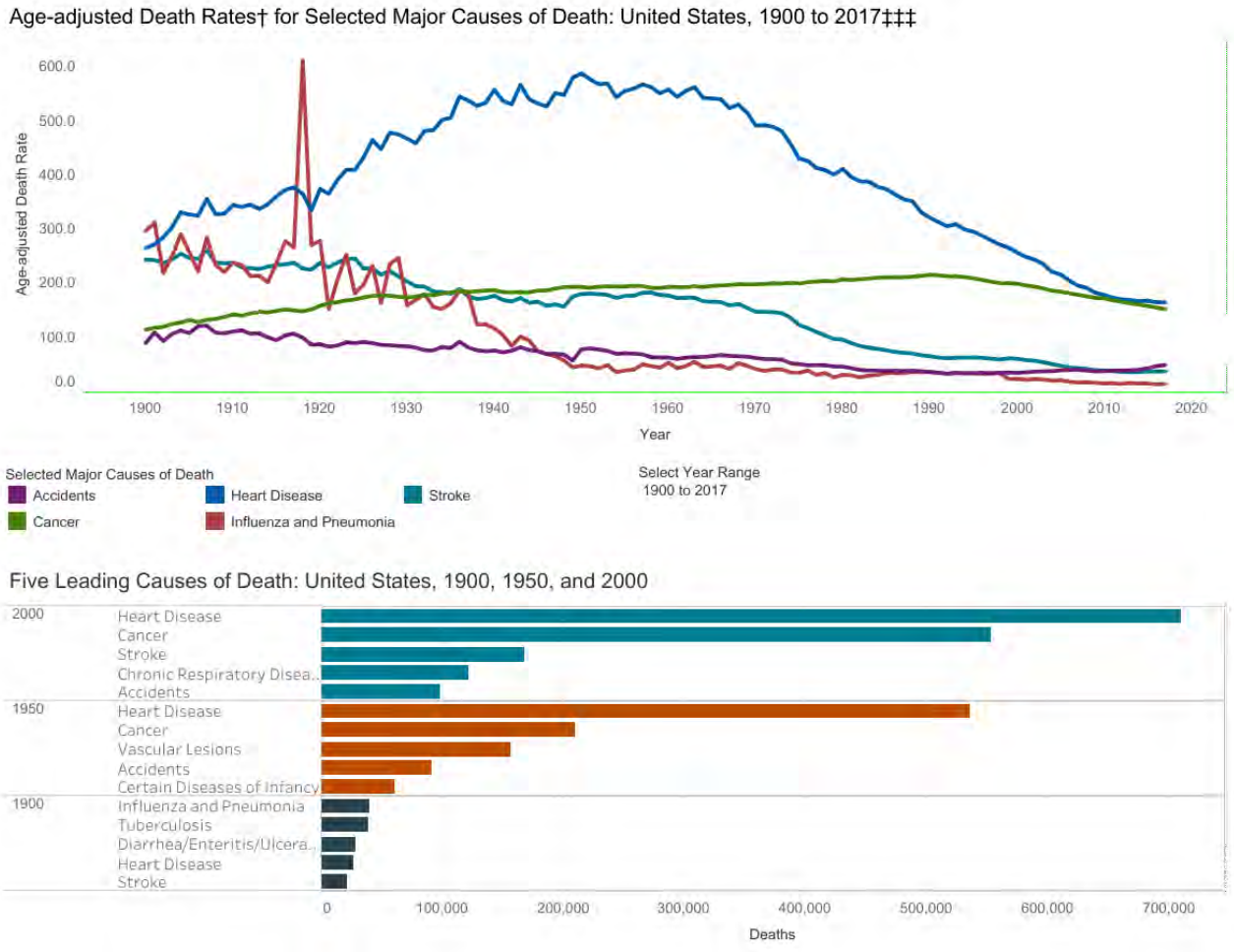
Available from: https://www.cdc.gov/nchs/data/databriefs/db355-h.pdf

[3] Center for Infectious Disease Research and Policy (CIDRAP) "Infectious Disease Deaths Decline Across US< But Not Evenly. CIDRAP News, March 27, 2018.



Available from: https://data.cdc.gov/NCHS/NCHS-Death-rates-and-life-expectancy-at-birth/w9j2-ggv5

Public Health Emergencies are defined as incidents that involve a widespread and/or severe epidemic, contamination, or other situations that present a danger to or otherwise negatively impact the general health and well-being of the public. Though diseases that were life threatening years ago are now under control, unexpected sources of infection do occur and can spread before the source of the problem can be contained. Foodborne illness, encephalitis, West Nile disease, hepatitis, tuberculosis (TB), pneumonia, and influenza, among others, are potential threats to Will County's residents.



Available from: https://www.cdc.gov/nchs/data-visualization/mortality-trends/index.htm

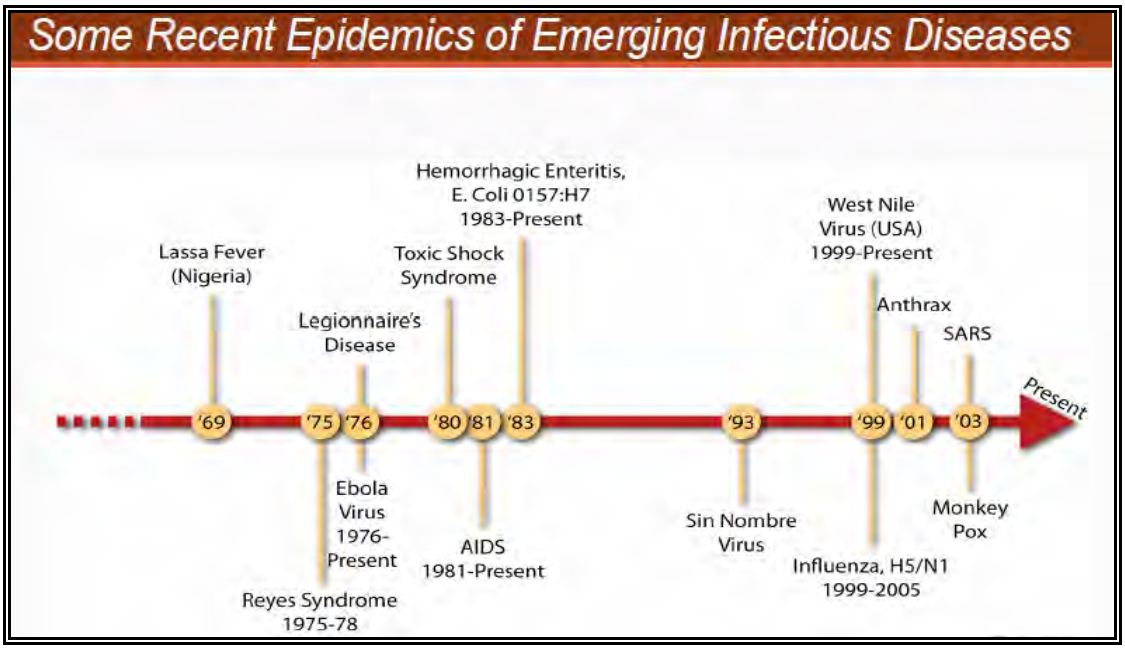
The Will County Health Department is prepared for potential disease threats and monitors unusual or suspect symptoms. The Health Department and other healthcare providers (hospitals, TB clinic, private labs, etc.) evaluate many factors in its response to a disease threat, including the mode of transmission, the route of entry, and the commonality of victims.

Indicators of unusual disease activity include:

- Rapidly increasing disease incidence
- Unusual increase in the number of people seeking care, especially with neurological, respiratory, dermal, and/or gastrointestinal symptoms
- Higher attack rates among persons who had attendance at similar activities or events

- Clusters of patients arriving from a single locale
- Large numbers of rapidly fatal cases
- Any patient presenting with symptoms and/or signs that suggest inhalation, ingestion, or dermal exposure to a toxic chemical agent
- Increased utilization of hotlines, such as "Poison Control"
- Unusual age distribution for common diseases
- Unexplained cluster of diseases or dead animals
- Unexplained evidence of disease or toxic exposure to the general environment, such as trees or plants

History



During the 20th Century, the emergence of several new Influenza A virus subtypes caused three pandemics, all of which spread around the world within a year of being detected. Influenza A viruses still circulate today after being re-introduced into the human population in 1977. Both the Asian Flu and Hong Kong Flu pandemics were caused by viruses containing a combination of genes from a human influenza virus and an avian influenza virus. The Spanish Flu pandemic virus appears to have an avian origin. Despite annual vaccinations, approximately 2,000 deaths occur in Illinois each year.

The Spanish Flu [A (H_1N_1)], 1918-1919, caused the highest number of known influenza deaths. More than 500,000 people died in the United States, and up to 50 million people may have died worldwide. Many people died within the first few days after infection, and others died of secondary complications.

The Asian Flu [A (H_2N_2)], 1957-1958, caused about 70,000 deaths in the United States. First identified in China in late February 1957, the Asian flu spread to the United States by June 1957.

The Hong Kong Flu [A (H_3N_2)], 1968-1969, caused about 34,000 deaths in the United States. This virus was first detected in Hong Kong in early 1968 and spread to the United States later that year.

The United States experienced its first wave of 2009 H1N1 activity in the spring of 2009, followed by a second wave in the fall, with the number of people infected peaking at the end of October. The novel influenza virus first caused illness in Mexico and then in the United States. It was not long after those initial reports that the "swine flu," so named because it was related to a respiratory disease in pigs, was reported in Illinois and around the country. Later renamed H1N1 flu, the virus was so prolific in its spread that by June, 2009, the World Health Organization signaled a global pandemic was underway.

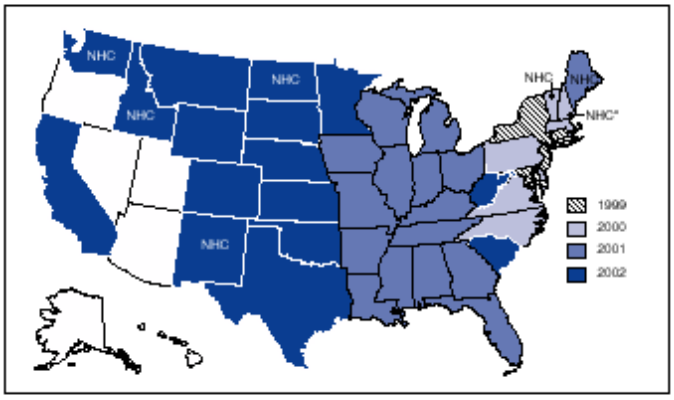
The first confirmed case of H1N1 flu in Illinois was reported in late April, 2009. Hundreds of cases of H1N1 flu followed and, for a period of time, the state had reported the highest number of cases in the U.S. Unlike seasonal flu, which is usually active in the fall and winter, H1N1 flu continued to circulate in the nation and in Illinois throughout the summer.

A second wave of H1N1 influenza began in the fall and the state's H1N1 caseload climbed to more than 2,500 cases and 79 deaths by the end of the 2009. The H1N1 influenza vaccine began arriving in Illinois in early October 2009, and the state started vaccinations of those identified as most at risk of the novel flu. Complicating the H1N1 flu resurgence in the fall was the threat of seasonal flu, which typically occurs between October and April. Illinois usually records about 2,600 seasonal flu and pneumonia deaths per year, making it the 10th leading cause of death. Will County experienced two deaths from the H1N1 virus.

Example

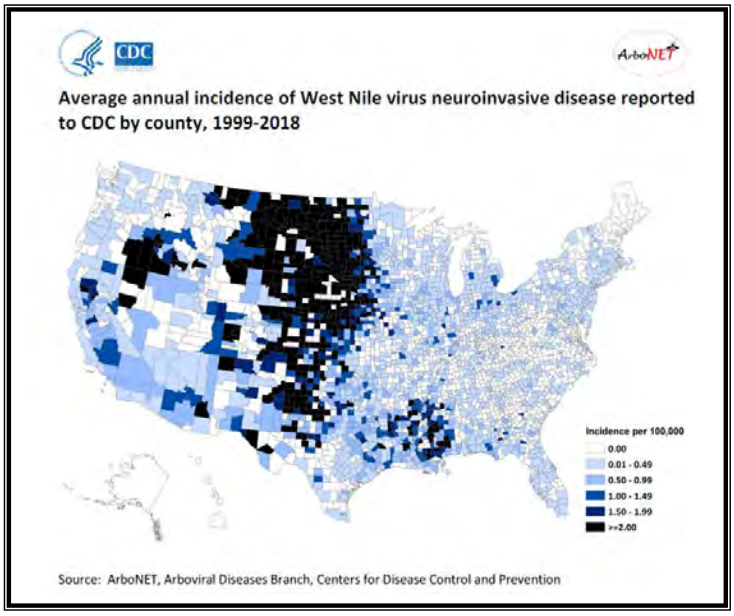
As an example of how infections can spread, outbreaks of West Nile virus began to occur in the New York metropolitan area in the fall of 1999. The virus, transmitted to humans by the bite of an infected mosquito, has quickly spread across the country. The West Nile virus was first documented in Illinois in September of 2001. By the end of 2002, Illinois led the country with over 800 confirmed cases of West Nile virus in humans and sixty-three deaths. Eighteen of the confirmed cases occurred in Will County. A West Nile Response Plan was adopted by the Will County Health Department in June, 2002.

FIGURE 1. West Nile virus activity, by state — United States, 1999–2002



*No human cases.

Available from:
https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5150a1.htm



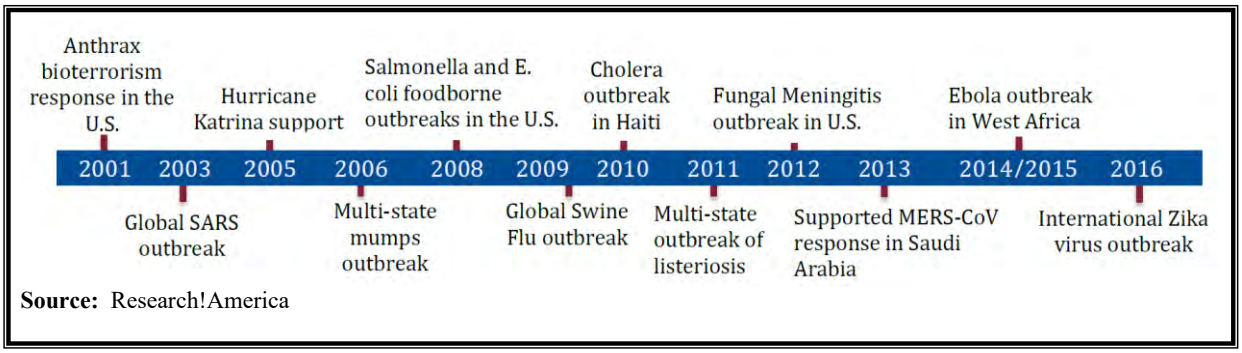
INCIDENCE of WEST NILE VIRUS in WILL COUNTY		
Year	**Cases**	**Deaths**
2019	0	
2018	4	
2017	1	
2016	0	
2015		
2014		
2013	0	0
2012	11	0
2011	1	0
2010	2	0
2009	0	0
2008	0	0
2007	3	0
2006	18	1
2005	8	1
2004	3	0
2003	3	0
2002	18	0

Risk Characterization

The common characteristic of most public health emergencies is that they adversely impact, or have the potential to adversely impact, a large number of people. Public health emergencies can be statewide, regional, or localized in scope and magnitude. These emergencies can occur as primary events by themselves, or they may be caused by another disaster or emergency. Along with infectious diseases, natural, technological, and societal hazardous occurrences can pose secondary hazards that threaten the public's health. Storms, floods, earthquakes, chemical spills, nuclear accidents, and sabotage can damage infrastructure disabling water, power, transportation, and communication facilities. This can lead to contaminated water and food supplies, subject the population to extreme temperatures, expose people to deadly toxins or radiation, delay the receipt of medical equipment or supplies, or prevent the public from receiving information important to their safety.

Assessment and planning are needed to identify public health concerns that could occur as a result of a hazard and to prepare mitigating steps to handle such concerns. It is through surveillance and population-based interventions that disease and injury are best prevented. Observation and monitoring systems are used to develop data related to health determinants. This information along with the process of developing policy options and planning are essential to prevent and avert community wide health problems before they spread.

Potential Public Health Events



Source: Research!America

WILL COUNTY HEALTH DEPARTMENT STATISTICS											
	Comm. Health Center Visits	Water Supply Inspect.	Sewage Inspect.	Food San. Inspect.	Flu Vaccines	Food Borne Illness	E. Coli	Salmonellosis	Hepatitis Incidents		
									A	B	C
2018											
2017											
2016	35,443	519	794	6,537							
2015	34,823	525	1,074	7,806	729		13	94	3	52	633
2014	33,163	351	688	7,633	1,409		15	82	2	75	575
2013											
2012		1,271	676	7,835	1,417			90	4	63	233
2011		1,264	702	7,771	1,827			107	1	58	268
2010		1,255	716	7,756	1,963			118	3	60	230
2009		1,461	831	7,431	3,217		3	78			
2008		1,367	1,190	7,262	2,788		7	83	19	168	319
2007		1,812	1,198	6,697	2,512		7	120	26	177	274
2006	25,374	1,648	1,281	6,610	2,669	1	8	98	2	94	261
2005	29,667	1,155	1,348	6,097	3,891	7	9	112	10	83	259
2004	25,828	959	1,250	5,560	3,784	7	8	100	6	93	282
2003	28,141	1,074	1,220	5,717	3,274	5	10	79	2	78	222
2002	24,145	1,344	1,205	5,303	2,752	2	7	75	17	98	212
2001	21,378	1,196	1,263	4,779	3,202	5	7	57	20	70	240
2000						22	9	78	17	58	169

Per the World Health Organization, approximately 40 infectious diseases have been discovered which include SARS, MERS, Ebola, chikungunya, avian flu, swine flu, and Zika. These emerging diseases are a concern as people travel farther around the world, live in denser populated areas, and come in closer contact with wild animals. The most common agents of infection are viruses or bacteria.

West Nile Virus: Usually spread by mosquitoes, a mild case of this virus will mimic the flu and most people fully recover from it. A severe case can be life threatening. No drugs or vaccines are available to treat West Nile Virus. In more severe cases, intensive supportive therapy is indicated, often involving hospitalization, intravenous fluids, airway management, respiratory support (ventilator), prevention of secondary infections (pneumonia, urinary tract), and good nursing care.

The virus is present in Will County; thus, WCHD continues to monitor, collect, and test mosquito traps throughout the county. They also monitor and collect viable dead birds that are submitted to the state lab for analysis. Through surveillance, education, and interagency coordination, WCHD hopes to prevent illness, disability, or possible death from West Nile Virus.

WCHD's Environmental Health Department promotes awareness of the effect of West Nile Virus through multiple communication sources. Information includes how to prevent the spread of the virus by reducing areas of stagnant water where mosquitoes breed and protection to prevent mosquito bites.

Ebola Virus Disease: This virus is a rare and deadly disease. It was first detected in 1976 in Zaire, Africa. Researchers have been unsuccessful in confirming the source of the virus and it may be that the virus existed before this outbreak. Since 1976, outbreaks have occurred in Central and Western Africa.

The 2014-2016 Ebola epidemic in West Africa is the largest outbreak in history. It began in a rural region of Guinea. For the first time, it quickly spread from isolated to urban areas and bordering countries as a result of insufficient surveillance and public health infrastructure. The World Health Organization (WHO) declared the epidemic a Public Health Emergency of International Concern (PHEIC) on August 8, 2014.

Will County Health Department responded to this potential threat by coordinating with partners at the local, regional, and national levels to develop response plans to handle evaluation, monitoring, and treatment of exposed patients; train staff in CDC procedures and guidance; and contain the spread of the virus.

Zika Virus: Located in the midwestern United States, Illinois is considered to be at low risk of widespread, year-long transmission of Zika virus. The *Aedes aegypti* mosquito, which is the primary vector for Zika virus transmission, is rarely found in Illinois. The primary risks to Illinois residents for becoming

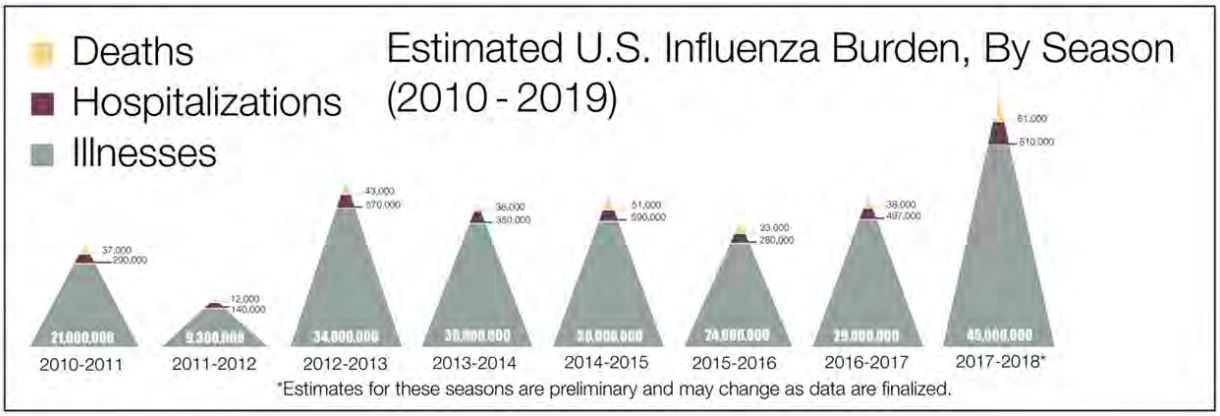
infected with Zika Virus are (1) from travel to and from areas with active Zika virus transmission or (2) individuals who have unprotected sex after one or both sexual partners have traveled to an area with active Zika virus transmission and been infected.

IDPH developed a robust vector surveillance program involving LHDs and Mosquito Abatement Districts (MAD) due to heavy West Nile virus activity in Illinois beginning in 2002. The vector surveillance program affords IDPH the ability to disseminate Zika virus educational materials quickly, along with recommendations for mosquito collection and disease surveillance as appropriate.

Currently, the only Zika virus cases in Illinois are travel associated. Transmission can occur sexually or congenitally. Although very unlikely, infected people who come to or return to Illinois from affected areas *could* infect mosquitoes if they are bitten while the virus is still circulating in their blood (viremic). However, because the Aedes aegypti is rarely present in Illinois, it is unlikely that locally sustained transmission would occur.

Influenza: On average, 3-11 percent of U.S. residents will have symptomatic flu illness. Flu is spread by person-to-person contact. This is commonly a result of respiratory droplets released during coughing and sneezing. Some of these influenza cases will be fatal. Each year, the flu claims on average 36,000 American lives. The 2017-2018 flu season experienced an estimated 80,000 deaths.

Healthy adults are usually not at risk for serious complications. Typically, the elderly, small children, those with weakened immune systems, and those affected by other illnesses are especially susceptible. Though, populations vulnerable to a specific influenza strain will vary. Vaccine is available each year for seasonal flu and vaccination is effective because the type of virus we are exposed to each winter can be reliably predicted.



Available from: https://www.cdc.gov/flu/about/burden/index.html

Pandemic:

A pandemic is a disease that attacks or affects the population of an extensive area. This is sometimes an entire country or continent. Each year, different strains of influenza are labeled as potential pandemic threats. Pandemics occur three to four times a century and can take place any season.

An influenza pandemic is a global outbreak of disease that occurs when a new Influenza A virus appears or "emerges" in the human population, causes serious illness, and spreads easily among people worldwide. Experts predict an infection rate of 25 to 50 percent of the population, depending on the severity of the virus strain.

Pandemics are different from seasonal outbreaks or "epidemics" of influenza. Seasonal outbreaks are caused by subtypes of influenza viruses that already circulate among people, whereas pandemic outbreaks are caused by new subtypes, by subtypes that have never circulated among people, or by subtypes that have not circulated among people for a long time. Pandemic influenza tends to occur in waves. The reasons for multiple waves of varying impact are not precisely understood, but they probably include adaptation of the virus to its new host, demographic or geographic variation, seasonality, and the overall immunity

of the population. Past influenza pandemics have led to high levels of illness, death, social disruption, and economic loss.

A vaccine against pandemic flu may not be available at the start of a pandemic. New types of viruses must be accurately identified, and producing an effective vaccine may take six months.

Swine and Avian Influenza:

Pigs may be infected with influenza viruses that are different from human flu viruses. Swine flu viruses spread among pigs and, while rare, they can spread from pigs to people too. The Centers for Disease Control and Prevention (CDC) is concerned about a new flu virus that has been found in U.S. pigs that has infected people too. This virus is called *H3N2v* when it infects people. Most cases have happened in people exhibiting pigs at fairs. Exposure to pigs, especially close contact with pigs, is the main risk factor for infection with this virus. While most illness has been mild, some people have been hospitalized.

Avian flu affects birds and is transmitted most commonly to humans by birds or through an intermediate host. Human infections with avian influenza (AI, or "bird flu") are rare but do occur, most commonly after exposure to infected poultry (bird-to-human spread). Limited person-to-person spread of bird flu is thought to have occurred rarely in the past.

H5N1 is a highly pathogenic, highly disease causing, avian (bird) flu virus that has caused serious outbreaks in domestic poultry in parts of Asia and the Middle East. Although H5N1 does not usually infect humans, nearly 700 cases of human cases of H5N1 have been reported from 15 countries since 2003.

- Most human cases of "highly pathogenic" H5N1 virus infection have occurred in people who had recent contact with sick or dead poultry that were infected with H5N1 viruses. About 60% of people infected with the virus died from their illness.
- Unlike other types of flu, H5N1 usually does not spread between people.
- There have been no reported infections with these viruses in birds, poultry, or people in the United States.

- You cannot get infected with these viruses from properly handled and cooked poultry or eggs.

Human infections with a new avian influenza virus, A (H7N9), continue to be reported in China. The virus has been detected in poultry in China as well. While mild illness in human cases has been seen, most patients have had severe respiratory illness and some people have died. No cases of H7N9 outside of China have been reported. Most important, however, is that this transmission not be sustained (ongoing). The new H7N9 virus has not been detected in people or birds in the United States.

Coronaviruses: The name coronavirus comes from its appearance under the microscope, the viruses have a spiky or crown-like (corona) appearance. Until recently, *SARS-CoV* was the only member of the coronavirus family known to cause death or severe respiratory disease in humans. The other viruses in this group cause mild upper-respiratory infections in humans and are associated with respiratory, gastrointestinal, and neurologic diseases in animals. One reason that SARS-CoV might have been more lethal than other coronaviruses is that it appears to interfere with an enzyme system in humans that is critical for regulating body fluid balance. Therefore, the virus could disrupt normal functioning of the lungs by blocking this enzyme system and allowing fluid to leak into the air sacs of the lungs resulting in severe respiratory illness.

A new member of the coronavirus family emerged in the fall of 2012 in the Arabian Peninsula. The new virus has been named Middle East respiratory syndrome coronavirus (*MERS-CoV*). Although MERS-CoV is distinct from SARS-CoV, the disease caused by the new virus Middle East respiratory syndrome (MERS) is similar to SARS in that it causes a severe respiratory illness that can be fatal in humans.

The first and vast majority of cases of MERS have occurred in Saudi Arabia. As of late July 2013, approximately 90 cases of MERS infection were reported to the

WHO, with about half of the cases resulting in death. MERS-CoV appears to spread between people who are in close contact.

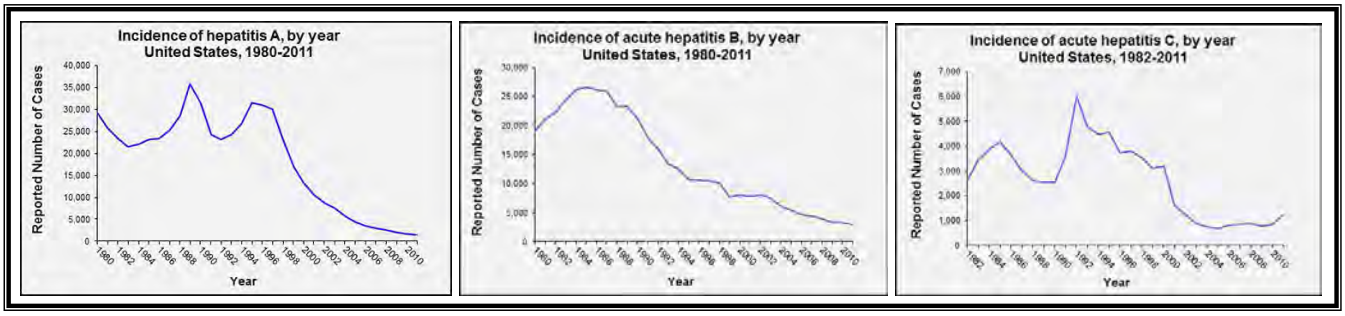
Now a global pandemic, the World Health Organization (WHO) has declared the novel coronavirus *Covid-19* to be a public health emergency of international concern. It is so new (December, 2019) and widespread, researchers around the world are rushing to learn about the virus, including exactly how easily it spreads and how deadly it is. Testing to identify infection has been developed and researchers now are working on treatments to effectively combat the symptoms and a vaccine to protect against the virus.

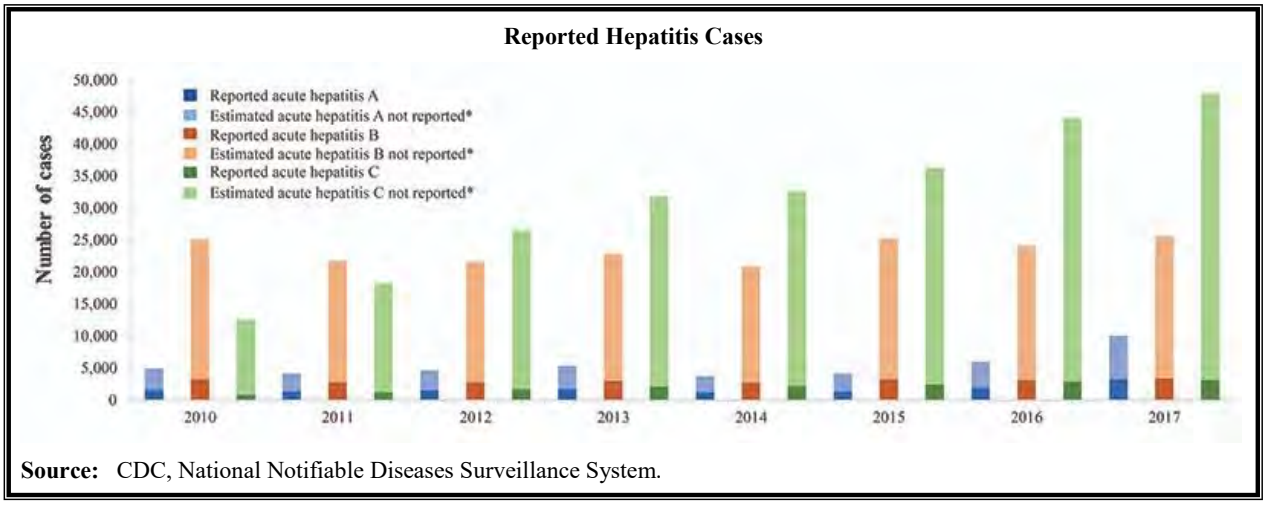
Centered in Wuhan, Hubei, China, it was originally suggested Covid-19 likely originated in bats but made it's "jump" to people through a yet-to-be-identified animal, which acted as a bridge between bats and humans. Now the U.S. and other countries are investigating the possibility that poor research lab procedures led to a worker being infected who then exposed others. The virus was then transmitted globally by international travel. Travel quarantines have been instituted by many countries including the U.S. and the outbreak has become a very dangerous situation. Information from China on the outbreak is limited and experts with WHO and the United States have not been admitted into the country.

The Covid-19 global pandemic is an example of the dangers of a new virus and its uncontrollable consequences. Covid-19 has impacted our daily life by demonstrating the catastrophic effect of an uncontrolled dangerous virus. It has halted the normal operations of our healthcare, economic, educational, manufacturing, and political systems. Because the virus is highly infectious and deadly to those with comorbidities, the U.S. along with many other countries closed non-essential businesses and required its citizens to shelter in place. Medical facilities delayed elective treatments and prioritized care for Covid-19 patients. Businesses closed or workers were directed to work from home. Schools closed and turned to online learning. Businesses and manufacturing retooled to provide medical personal protective equipment (PPE). Congress

released emergency funding to small businesses and workers to sustain them through the crisis. Trillions of dollars are being spent to develop testing, effective treatment, and a vaccine.

Hepatitis: A disease affecting the liver, hepatitis can affect anyone. Hepatitis is usually spread by person-to-person contact. Three types are common to the U.S.:





Source: CDC, National Notifiable Diseases Surveillance System.

Hepatitis A, B, and C with B and C being most prevalent.

- Hepatitis A (HAV) is a liver disease that can affect anyone. It lasts from a few weeks to several months. It does not lead to chronic infection. Transmission may occur through ingestion of fecal matter, even in microscopic amounts, from close person-to-person contact or ingestion of contaminated food or drinks.

- Hepatitis B (HBV) ranges in severity from a mild illness, lasting a few weeks (acute), to a serious long-term (chronic) illness that can lead to liver disease or liver cancer. Transmission is through contact with infected bodily fluids.
- Hepatitis C is caused by the Hepatitis C virus (HCV). HCV infection sometimes results in an acute illness, but most often becomes a chronic condition that can lead to cirrhosis of the liver and liver cancer. HCV is spread by contact with the blood of an infected person.

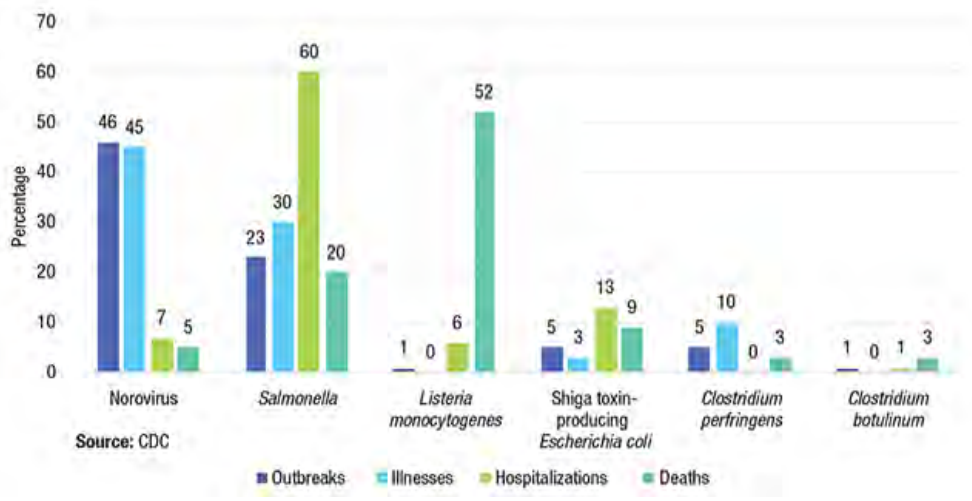
Foodborne Illness: Each year, approximately 800 foodborne disease outbreaks are reported resulting in 15,000 cases of illness and 20 deaths. Common culprits include bacteria, parasites, and viruses.

Symptoms range from mild to serious. They include:

- Upset stomach
- Abdominal cramps
- Nausea and vomiting
- Diarrhea
- Fever
- Dehydration

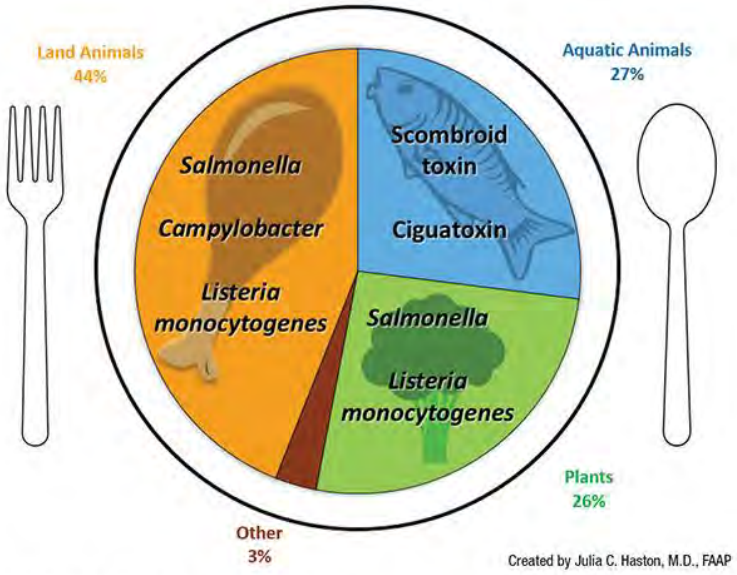
Harmful bacteria are the most common cause of foodborne illness. Foods may have some bacteria on them when you buy them. Raw meat may become contaminated during slaughter. Fruits and vegetables may become contaminated when they are growing or when they are processed. But it can also happen in your kitchen if you leave food out for more than 2 hours at room temperature or power outages knock out refrigeration units.

Most Common Organisms Associated with Foodborne Disease Outbreaks, 2009-2015



Source: Haston, J., Pickering, L. "Foodborne Disease Outbreaks: An Ongoing Public Health Problem." *American Academy of Pediatrics*, Oct. 2, 2018

Most Common Pathogens Associated with Foodborne Outbreaks



Foods included in the above categories:
Land animals: dairy, chicken, beef, pork, turkey, eggs
Aquatic animals: fish, mollusks
Plants: vegetable row crops, fruits, seeded vegetables, grains and beans, sprouts, root and underground vegetables

Source: Haston, J. , Pickering, L. "Foodborne Disease Outbreaks: An Ongoing Public Health Problem." *American Academy of Pediatrics*, Oct. 2, 2018

Contamination: Water sources may become contaminated due to natural hazards. Flood, tornadoes/thunderstorms, ice storms, ice jams or melting ice, etc. can cause contaminated run-off from floods or debris to filter into water sources. Because of an extensive flood area and the speed and direction of ground water flow, wells may not be a safe source of water for many months after a flood. The well can become contaminated with bacteria or other contaminants. Using contaminated water for drinking, cooking, or bathing can cause severe illness.

Waste water from malfunctioning septic tanks or chemicals seeping into the ground can contaminate the ground water even after well water is tested and found to be safe. It is necessary to take long range precautions, including repeated testing, to protect the safety of drinking water.

Bioterrorism: A Bioterrorism attack is the deliberate release of viruses, bacteria, or other germs (agents) used to cause illness or death in people, animals, or plants. These agents are typically found in nature, but it is possible that they could be changed to increase their ability to cause disease, make them resistant to current medicines, or to increase their ability to spread into the environment. Biological agents can be spread through the air, through water, or in food. Terrorists may use biological agents because they can be extremely difficult to detect and do not cause illness for several hours to several days.

Surveillance is the cornerstone for Bioterrorism and Pandemic Influenza Preparedness. Early recognition and reporting of any disease outbreak, along with rapid implementation of post-attack prophylaxis (preventive medicine/vaccination), are the two most critical means of reducing losses. In the event of a public health emergency, the Will County Pharmaceutical Distribution Plan provides a multi-jurisdictional response for mass distribution of pharmaceuticals (antibiotic medications) to the entirety of Will County and any other areas of responsibility.

Agroterrorism:

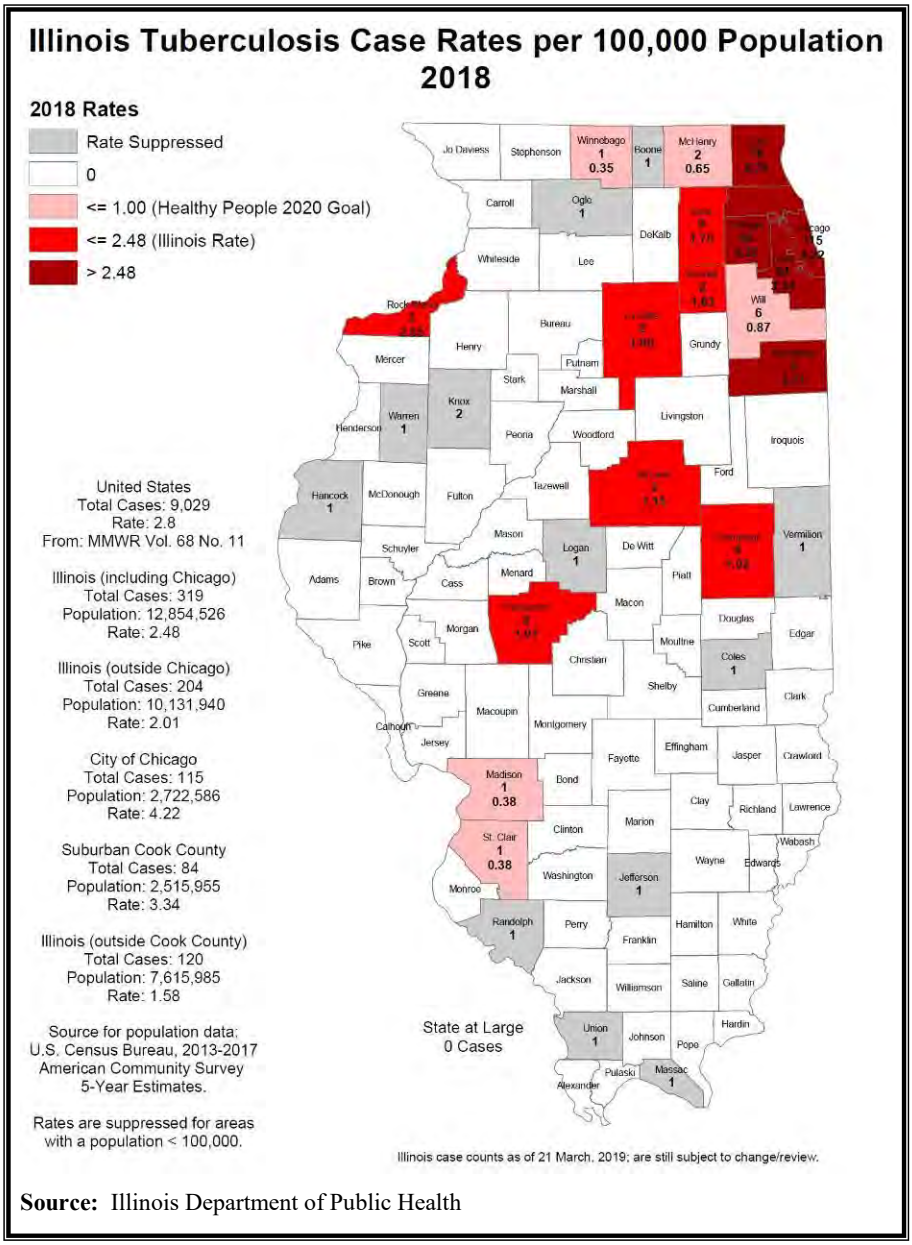
A*groterrorism* is defined as "the deliberate introduction of an animal or plant disease for the purpose of generating fear, causing economic losses, or undermining social stability." It represents a tactic to attack the economic stability of the United States. Killing livestock and plants or contaminating food can help terrorists cause economic crises in the agriculture and food industries. Secondary goals include social unrest and loss of confidence in government. Because it lacks the drama and spectacle of more common terrorist violence, such as bombings and murders, agroterrorism has remained a secondary consideration, and no documented attacks in the homeland have occurred since 9/11.

Within Will County, potential targets for agroterrorism exist through its farming and transportation industry

Tuberculosis:

Tuberculosis (TB) is a contagious and potentially life-threatening disease caused by a bacterium called *Mycobacterium tuberculosis* being transmitted through the air. While it can affect any part of the body (such as the brain, the kidneys or the spine), TB usually affects the lungs.

Although both preventable and curable, tuberculosis once was the leading cause of death in the United States. Today in Illinois, less than 30 deaths a year are attributed to tuberculosis and the number of cases in the state has fallen more than 40 percent in the past 10 years, reaching an all-time low of 320 in 2014.



Source: Illinois Department of Public Health

Public Health Mitigation:

- Surveillance of communicable disease and environmental disease
  - Monitoring systems through schools and hospitals
  - Biowatch, EpiX, and other surveillance tools
  - Inspection of food handling facilities
  - Testing of wells and septic systems
  - Mosquito traps
- Public Education
  - Disease agents
  - Prophylactic intervention (anti-viral medication, anti-biotics, and/or immunization if available)
  - Safe food handling
  - Sanitation, good hygiene, and other protective measures
  - Boil water orders
- Emergency preparedness plans and resources to address protection, response, and recovery issues
  - Pandemic Influenza Plan
  - Strategic National Stockpile – Mass Dispensing Plan
  - Personal Protective Equipment (PPE) caches
- Mutual aid agreements with surrounding health departments and community partners

Impact: High

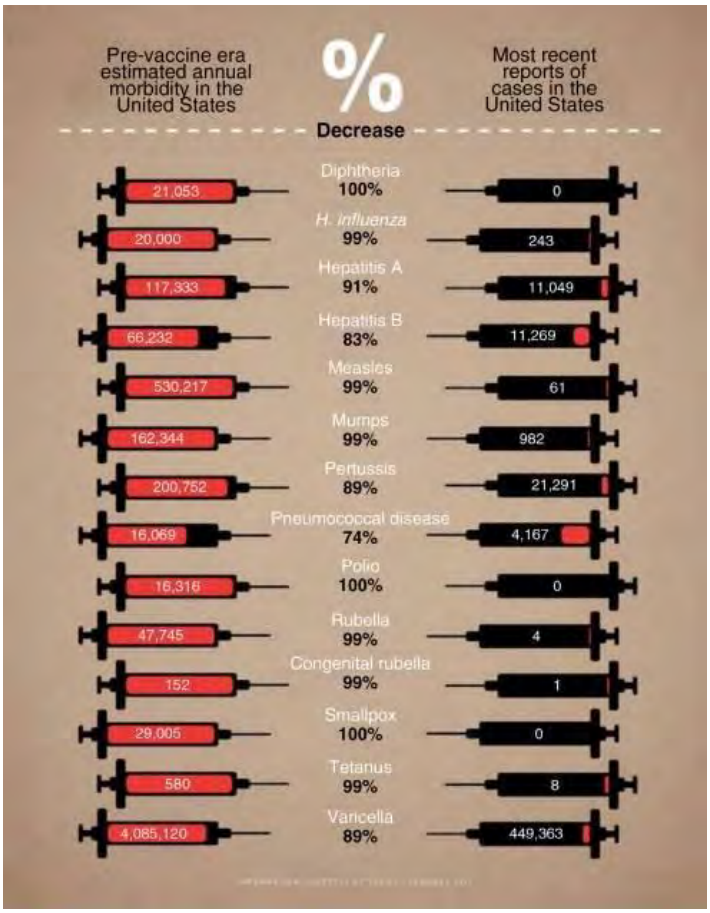
Critical Facilities

Critical facilities could be impacted because of the loss of people to run them by a widespread infectious agent occurring naturally or intentially/unintentially spread by terrorist, animals/insects, or people traveling the world. Between 15-35 percent of the U.S. population could be affected by the influenza pandemic. Workers may be unable to work because they are ill, may have died from the infection, or may need to care for infected family members. Accordingly, the ability of critical facilities to provide service will be seriously affected due to the severe reduction in workforce capacity.

Health and Safety

Many scientists believe it is only a matter of time until the next influenza pandemic occurs. The severity of the next pandemic cannot be predicted, but modeling studies suggest the impact of a pandemic on the United States could be substantial. In the absence of any control measures (vaccination or drugs), it has been estimated that in the United States, a "medium-level" pandemic could cause 89,000-207,000 deaths, 314,000-734,000 hospitalizations, 18-42 million outpatient visits, and another 20-47 million sick people.

Comparison of the Estimated Annual Morbidity in the U.S. in the Pre- and Post-vaccine Eras



Available from:
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4802703/

Immunizations are a cost-effective method in preventing infectious disease and childhood immunization programs provide a high return on investment. Routine childhood immunization schedule saves thousands of lives, prevents millions of cases of disease, reduces direct health care costs by billions, and saves billions in indirect healthcare costs.

Economic Impact

Trust for America's Health's (TFAH) March 2007 report *Pandemic Flu and Potential for U.S. Economic Recession* finds a severe pandemic flu outbreak could result in the second worst recession in the U.S. since World War II. The U.S. Gross Domestic Product (GDP) could drop over 5.5 percent, leading to an estimated $683 billion loss.

The current coronavirus 2019-nCoV is not only having a health effect on the world but also an economic effect as travel is restricted and work places are closed to prevent the spread of the virus. This influences the rest of the world impacting travel, import/export of raw materials and goods, manufacturing, demand for services, and increased healthcare costs as countries take precautions to prevent the spread of the virus.

Per the CDC:

> *The U.S. economy is better protected when public health threats are quickly identified and contained. CDC's global health security efforts to stop outbreaks where they start protects the health of people worldwide. This, in turn, protects demand for U.S. exports and the jobs they support. Strategic investments in capacity building and preparedness for health security purposes must remain a national priority of governments and a key commitment for multilateral agencies, development banks, non-governmental organizations, and private sector stakeholders worldwide.*
>
> Available from: https://www.cdc.gov/globalhealth/security/ghsareport/2017/economic.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fglobalhealth%2Fsecurity%2Fghsareport%2Feconomic.html

Future Occurrence

The world is seeing an increase in infectious disease outbreaks as world-wide trade and travel increases. This has an impact on health as well as economics. The World Bank estimates severe pandemics cost approximately $570 billion or 0.7% of global income.

Available from: https://www.weforum.org/agenda/2018/05/how-epidemics-infect-the-global-economy-and-what-to-do-about-it/

Will County is a major hub for transportation of raw materials and products which could act as a potential method for transporting in an infectious agent. New infectious diseases continue to be detected and infectious disease must be studied in a global context because of increased international travel and migration, import of foods and agricultural practices, and continued threat of bioterrorism.

Studying previous outbreaks, five elements emerge as ways to mitigate their impact on social, economic, and business disruptions:

Preparedness: Strengthen partnerships and develop pro-active measures based on past outcomes to ensure a rapid, coordinated response to future outbreaks.

Value: Create long-term value by joining private-sector business objectives with public-sector needs in the development of mitigation measures.

Trust: Build trustworthy relationships before an incident to increase effectiveness in response during an outbreak.

Agility: Develop flexible plans and communication channels that allow partners to quickly work together in an incident

Innovation: Continue to collaborate with partners to bring new ideas and solutions to emergency management of public health incidents.

Available from: https://www.weforum.org/agenda/2018/05/how-epidemics-infect-the-global-economy-and-what-to-do-about-it/

ENEMY ATTACK

Hazard Characterization

Enemy attack is any hostile action taken against the United States by foreign forces that result in the destruction of military and/or civilian targets. It is conventional war as seen in WWII that could occur through accident, miscalculation, an irrational act, or a deliberate act. The attacking foreign forces are more clearly defined than in a terrorist attack. Foreign forces are identified as an organized government with military forces rather than a pocket of militants or extremists. The methods of attack could include explosives, nuclear arms, or chemical or biological weapons.

History

No occurrence has occurred in the U.S. since September 11, 2001; however, all areas of the U.S. are at risk at any time for direct or secondary effects.

Risk Characterization

Explosives would be life threatening and damaging to public and private structures. Nuclear weapons would have devastating and far-reaching effects. The blast overpressure, fire, and radioactive fallout could affect millions of lives and completely destroy property and infrastructure. The effects of chemical and/or biological weapons would differ depending on the agent used. Chemical agents include blister, blood gases, lung irritants, and nerve agents. Biological weapons contain living organisms that can cause disease or death but are dependent on their ability to reproduce. The threat of nuclear, chemical, and biological weapons is worrisome as their development and delivery systems are improved by Third World nations desiring more control.

The above reflects our common vision of enemy attack which conjures a "war" type scenario. Since 9/11, computer technology has evolved and advanced to become a necessary part of everyday life for communication, finance, manufacturing, education, research, etc. Through cyber-technology, people are able to communicate and access data systems from around the world. Information is now held electronically on the "cloud" which is storage of data on remote servers accessible from the internet. The dark side of this technology is that our enemies may be able to access or "hack" into the stored data to attack and disrupt everyday systems.

Back in 2016, U.S. non-essential diplomatic staff were called home from Havana, Cuba. American and Canadian diplomatic personnel were experiencing the sudden onset of concussion like problems that included hearing loss, memory loss and nausea. Many theories as to the cause were considered including a sonic attack or toxins by the Cuban government but were never proved.

Another form of "attack" may be the spread of disinformation to manipulate our political system. Much focus was placed on our 2016 presidential election and the attempt of Russians to disrupt that election. There are many social media platforms on the internet which are not censured in our country. Thus, it is easy for attackers to post information, true or untrue, that can influence the thinking of the public.

As technology grows, enemy attack may look quite different from war tactics of the past. Our government and business entities must work continually to protect and secure their stored data. This new source of attack may be against financial institutions, government, communication systems, research labs, manufacturers, etc. So today's enemy attack may be a shutdown of our banking system, a disruption of communication systems, drone attacks, sonic attacks, theft of intellectual property or highly classified government documents, or an interruption of power and water/wastewater utilities.

Impact: Medium

Future Occurrence

The events of September 11th are evidence that the threat of enemy attack is real. Local law enforcement must work closely with state and federal agencies to identify and coordinate response to potential threats from enemies. Local law enforcement must be watchful of individuals or groups who may be:

- Recording or monitoring activities
- Attempts to access and manipulate electronic or social media systems
- Trying to obtain information about military operations
- Testing security barriers or procedures
- Acquiring supplies for use as weapons, uniforms, or other controlled items
- Acting suspiciously or appearing to be out of place
- Attempting dry or trial runs to test their plan of attack
- Deploying assets to be used in an attack

Potential targets within Will County are an army training facility, raceway venue, numerous manufacturing/refining companies, intermodal sites and warehouses, and nuclear facilities that may draw the interest of an enemy. Electronic information systems are now another potential target. Careful observance of suspicious activities and coordination with federal law enforcement may prevent attacks from happening in the future.

TERRORIST ATTACK

Hazard Characterization

The Code of Federal Regulations defines terrorism as "... an intentional, unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives." The Federal Bureau of Investigation (FBI) adds that terrorism can be domestic or international. FEMA's definition of terrorism incorporates the use of Weapons of Mass Destruction (WMD) which would include biological, chemical, nuclear, and radiological weapons; arson, incendiary, explosive, and armed attacks; industrial sabotage and intentional hazardous materials releases; agro-terrorism; and cyberterrorism. The intent of these activities is to instill fear into a community and cause death or serious injury to people or significant damage to property or information systems.

Terrorism Components	Description
Violence/ Force	Violence/Force only needs to be threatened as long as the act is perceived to be real. Violence is utilized to achieve maximum publicity in order to create psychological effects beyond the immediate physical damage.
Victims as Pawns	Victims are not necessarily the direct targets but are used as pawns to cause fear in those who witness the attack. The plight of the victim is intended to frighten onlookers into a course of political or social action. The randomness of the choice of victim increases fear and anxiety.
Fear/Terror	Psychological techniques are used to bring about conformity of behavior. Fear is the actual agent of change. Fear erodes people's trust in the government to protect them and they push officials to fulfill the terrorist's demands.
Observers as Audience	Terrorists are trying to gain the attention of society, not necessarily the victim. Those who observe the act are the targets or "audience". Media coverage can further the terrorist's cause by broadcasting the act and the terrorist's agenda.
Political or Social Change	The intention of the act is to generate the public's fear or distrust in the government in order to force change in political, social, economic, religious, or ideological beliefs in order to facilitate the terrorist's desired change.

According to the Federal Emergency Management Agency (FEMA), there is no universal definition of terrorism, despite decades of debate, and the term can be interpreted in many ways. Common usage of the term has become a catchall that includes political violence and non-political criminals. Complicating the issue of defining terrorism even further, U.S. statutes do not include terrorism as a crime. Accordingly, terrorists are arrested for elements of their terrorist acts, such as murder or weapons violations.

Definition

In order to assess vulnerability to terrorism, a common understanding of what terrorism is must be deciphered. It is probably best to agree that the meaning of terrorism changes over time as political and social settings change. The meaning of terrorism may need to be adaptable just as terrorists are adaptable to events and surroundings in order to further their cause.

Most definitions studied incorporate the key elements of violence, victims, fear, observers, and political/social causes. By accepting these five elements as a basis for the meaning of terrorism, it will allow us to move forward to assess potential vulnerability to terrorist acts.

Types of Terrorists	Description
International	Violent acts that violate criminal laws of the U.S. or of any state; appear to be intended to coerce, influence policy, or affect conduct of a government by mass destruction, assassination, or kidnapping; occur primarily outside the territorial jurisdiction of the U.S.
Domestic	Local, national terrorist acts by individuals or groups acting independently of any government support to further ideological goals such as political, social, racial, or environmental in nature.
Left or Right-wing	Left-wing groups strive to reform or overthrow the established government for the greater freedom or well-being of the common man. Their actions tend to be symbolic; rarely do they act to cause widespread, arbitrary casualties. Right-wing groups endeavor to maintain the power of the state or to preserve the advantages held by a certain group. There is often a religious, racial, or politically paranoid survivalist dimension to their ideas. They can be extremely violent.
Special Interests	Groups may support "liberal" or "conservative" issues; like left-wing groups, less lethal in their actions. Special interest groups include those who may oppose legalized abortion or nuclear power, radical environmentalists, and militant animal rights activists.
Anarchists	Perceives themselves as the purest of terrorists, live to destroy state's authority and strive for complete freedom. Their politics are the most extreme.
Neo-Fascists	Share characteristics with communism. They are revolutionary, look to overturn the entire order and create a new order of the most far-reaching sort.

Many state and local law enforcement agencies have a broader definition of terrorism than the FBI whose statistics point to low levels of terrorist activity. Unlike the FBI, these agencies recognize right-wing extremists (Neo-Nazi, anti-Semitic, anti-federalist) and identify specific organizations

(anti-abortion, animal right, environmentalist) as the most likely sources of terrorism within their communities.

A broader definition of terrorism at the local level may be a good thing. In the assessment process, a broader definition of terrorism may allow planners to identify a more expansive range of potential terrorists, targets, methods, weapons, etc. A wider range of terrorist possibilities requires local planners to prepare a more comprehensive plan to avert or mitigate such disasters. Terrorists tend to prefer situations that maximize the element of surprise. A community that has carefully identified its most likely targets and instituted protective measures against terrorism is a less desirable victim to terrorists. By having an understanding of the broader range of possible terrorist methods, more expansive methods of detection, aversion, training, response, and recovery can be developed in order to secure the safety of the community and avert the potential of terrorism.

Per the FBI, terrorism has evolved since September 11, 2001. International terrorism is still a serious threat and domestic terrorism threats persist. Since then, factors contributing to the changes in terrorist threats include:

Lone Offenders: *Threats have evolved from large group attacks to lone-offender attacks. Individuals tend to radicalized online and quickly evolve towards violence. Lone-offenders are difficult to identify, investigate, and disrupt because they have no clear group affiliation or guidance. The FBI relies on partnerships and tips from the public to identify and thwart lone-offender attacks.*

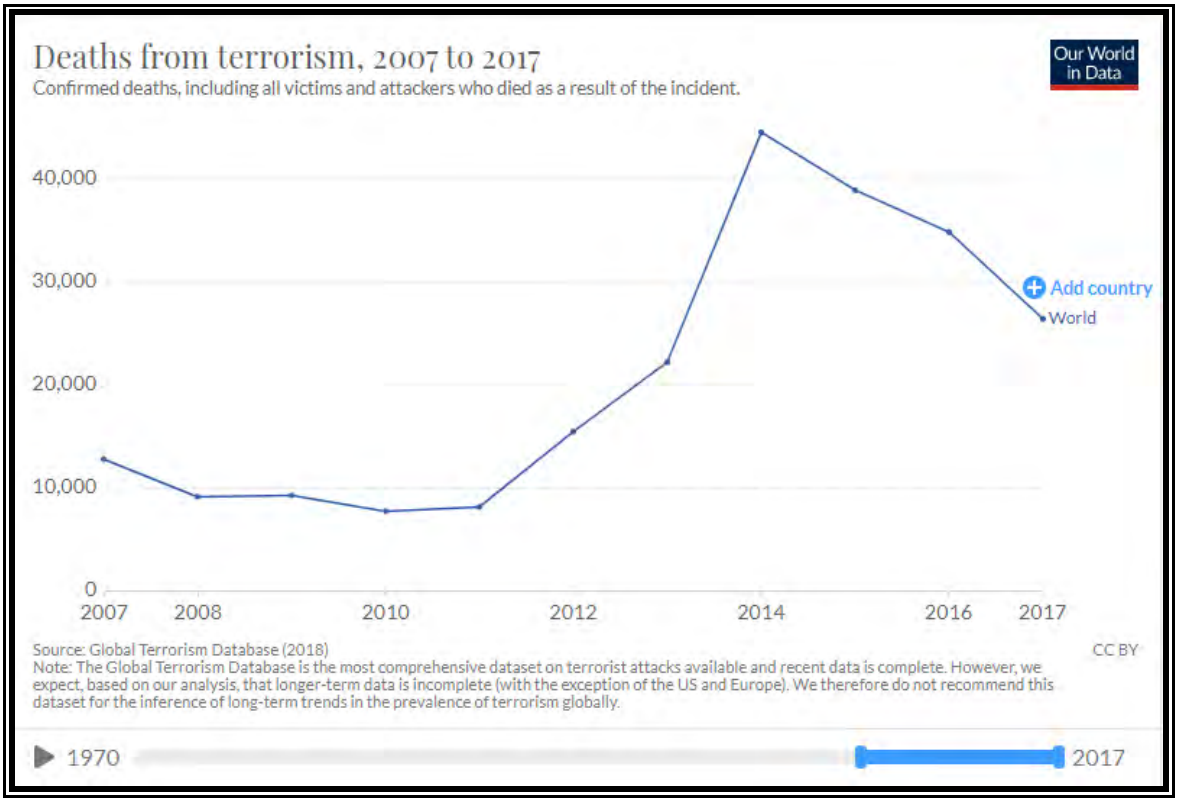
Internet and Social Media: *International and domestic violent extremists have a large presence on the internet through messaging platforms and online images, videos, and publications. Extremist groups are now able to recruit and radicalize individuals receptive to their messaging. Through the internet and social media, terrorists now have access to individuals to carry out attacks on the U.S. This allows groups, amongst others, like the Islamic State of Iraq and ash-Sham (ISIS) embolden sympathizers in the U.S. or abroad to attack in their location or join the group as foreign fighters.*

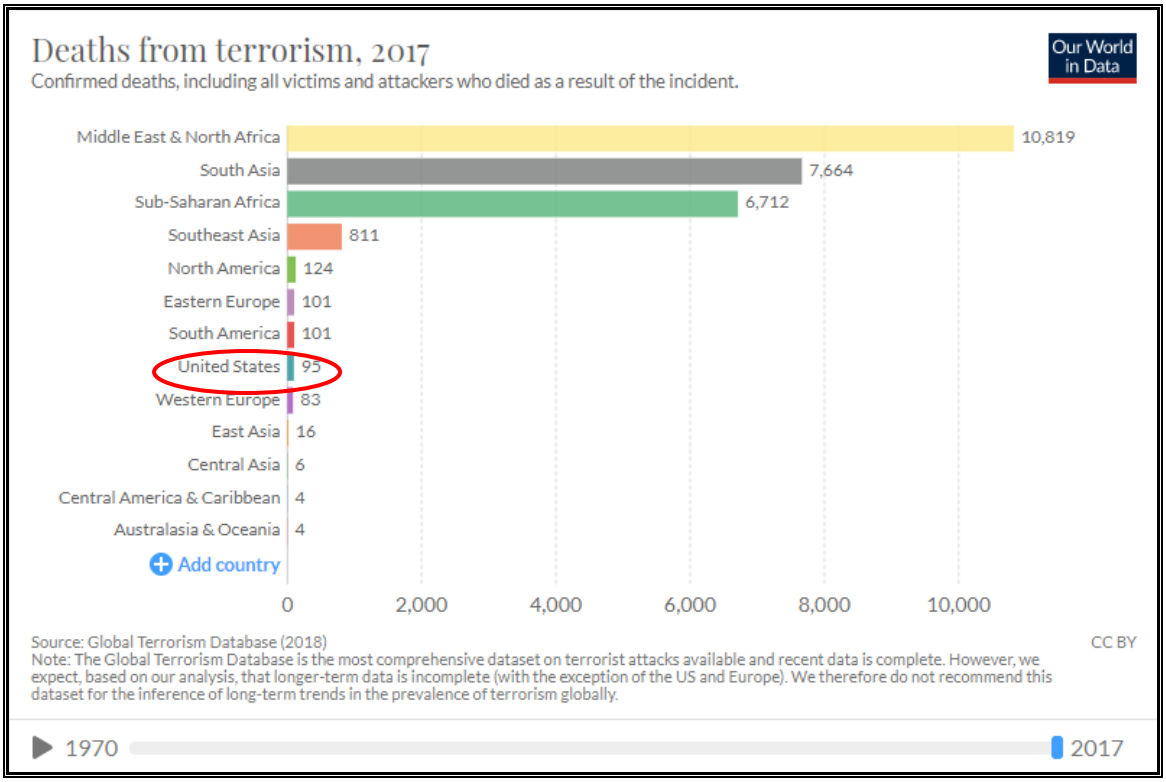
Weapons

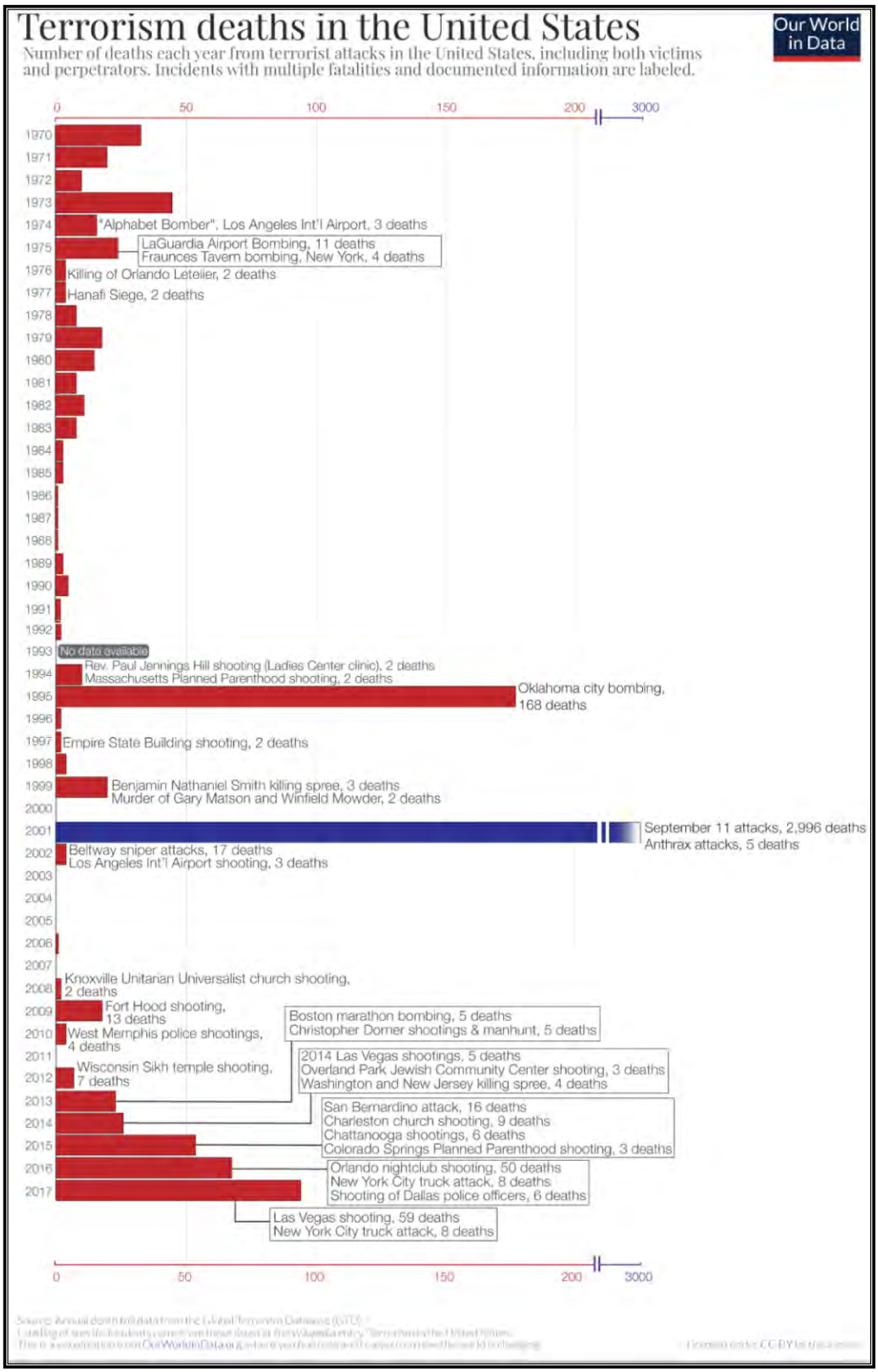
Bombs, firearms, and limited range rockets continue to be the most common weapons used by today's terrorists. These weapons are easy to obtain, transport, and use. Occurring more frequently is the use of secondary explosives to increase casualties. The concern is the growing use of unconventional weapons. These include chemical, biological, and radiological weapons, more commonly referred to as Weapons of Mass Destruction (WMD). These weapons have increased capacity to kill large numbers of people. The use of WMDs is limited because they are more difficult to obtain and handle. Just the thought of their use creates massive fear and may make the use of such weapons more appealing to terrorists.

Targets

Terrorists target infrastructure that are more critical to daily operations and are harder to restore to service. Interrupting and disabling services that the public depends on for health, economic, and social activities brings attention and recognition that terrorist groups seek. The impact of the attack is furthered when critical infrastructures are interconnected. With advances in communication and technology, more and more critical infrastructures are becoming dependent upon the others. The literature on terrorism shows that some critical infrastructures are targeted more often than others because of the nature of the services they provide. Areas most vulnerable to terrorism include transportation systems, industry, utilities, and entertainment/recreation venues. Attacking these critical infrastructures disables important services the public depends on or may cause further damage to the population and structures surrounding the attack area.


Deaths from terrorism, 2007 to 2017
Confirmed deaths, including all victims and attackers who died as a result of the incident.
Our World in Data
40,000
30,000
20,000
10,000
0
2007
2008
2010
2012
2014
2016
2017
Add country
World
Source: Global Terrorism Database (2018)
Note: The Global Terrorism Database is the most comprehensive dataset on terrorist attacks available and recent data is complete. However, we expect, based on our analysis, that longer-term data is incomplete (with the exception of the US and Europe). We therefore do not recommend this dataset for the inference of long-term trends in the prevalence of terrorism globally.
CC BY
1970
2017


Deaths from terrorism, 2017
Confirmed deaths, including all victims and attackers who died as a result of the incident.
Our World in Data
Middle East & North Africa 10,819
South Asia 7,664
Sub-Saharan Africa 6,712
Southeast Asia 811
North America 124
Eastern Europe 101
South America 101
United States 95
Western Europe 83
East Asia 16
Central Asia 6
Central America & Caribbean 4
Australasia & Oceania 4
Add country
0
2,000
4,000
6,000
8,000
10,000
Source: Global Terrorism Database (2018)
Note: The Global Terrorism Database is the most comprehensive dataset on terrorist attacks available and recent data is complete. However, we expect, based on our analysis, that longer-term data is incomplete (with the exception of the US and Europe). We therefore do not recommend this dataset for the inference of long-term trends in the prevalence of terrorism globally.
CC BY
1970
2017


Terrorism deaths in the United States
Number of deaths each year from terrorist attacks in the United States, including both victims and perpetrators. Incidents with multiple fatalities and documented information are labeled.
Our World in Data
0
50
100
150
200
3000
1970
1971
1972
1973
1974
"Alphabet Bomber", Los Angeles Int'l Airport, 3 deaths
1975
LaGuardia Airport Bombing, 11 deaths
Fraunces Tavern bombing, New York, 4 deaths
1976
Killing of Orlando Letelier, 2 deaths
1977
Hanafi Siege, 2 deaths
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
No data available
1994
Rev. Paul Jennings Hill shooting (Ladies Center clinic), 2 deaths
Massachusetts Planned Parenthood shooting, 2 deaths
1995
Oklahoma city bombing, 168 deaths
1996
1997
Empire State Building shooting, 2 deaths
1998
1999
Benjamin Nathaniel Smith killing spree, 3 deaths
Murder of Gary Matson and Winfield Mowder, 2 deaths
2000
2001
September 11 attacks, 2,996 deaths
Anthrax attacks, 5 deaths
2002
Beltway sniper attacks, 17 deaths
Los Angeles Int'l Airport shooting, 3 deaths
2003
2004
2005
2006
2007
2008
Knoxville Unitarian Universalist church shooting, 2 deaths
2009
Fort Hood shooting, 13 deaths
2010
West Memphis police shootings, 4 deaths
2011
2012
Wisconsin Sikh temple shooting, 7 deaths
2013
Boston marathon bombing, 5 deaths
Christopher Dorner shootings & manhunt, 5 deaths
2014
2014 Las Vegas shootings, 5 deaths
Overland Park Jewish Community Center shooting, 3 deaths
Washington and New Jersey killing spree, 4 deaths
2015
San Bernardino attack, 16 deaths
Charleston church shooting, 9 deaths
Chattanooga shootings, 6 deaths
Colorado Springs Planned Parenthood shooting, 3 deaths
2016
Orlando nightclub shooting, 50 deaths
New York City truck attack, 8 deaths
2017
Shooting of Dallas police officers, 6 deaths
Las Vegas shooting, 59 deaths
New York City truck attack, 8 deaths
0
50
100
150
200
3000

History

The *Our World in Data* website describes the occurrence of deaths from terrorism as very few in most years, usually below 0.01% of all deaths. However, 2001 was the exception where 9/11 was the world's most fatal terrorist event of recent times accounting for 0.12% of all deaths that year. They point out that "having a few deaths from terrorism in one year is not a predictor for the next." [4]

The Global Terrorism Database (GTD) has a comprehensive database of terrorist incidents. It identifies over 2,900 incidents within the U.S. since 1970. Incidents in the U.S. was relatively high in the 1970s and quiet in the following decades except in 1995 and 2001. The last five years shows a small but steady increase in U.S. terrorist deaths.[5]

Since 2014, there has been a significant increase in the number of terror attacks against religious figures and institutions in North America. Attacks by Earth Liberation Front (ELF) and Animal Liberation Front (ALF) have carried out over 300 attacks since 2002 and account for 40% of all attacks in North America but none of these attacks resulted in deaths. The deadliest attacks, though fewer, have been carried out by jihadi-inspired extremist organizations resulting in 96 fatalities since 2002.[6]

In 2018, 57 incidents occurred in the U.S. with 28 committed by far-right extremists, 27 by unknown perpetrators, and 2 by jihadi-extremist. Five deaths occurred in those 57 attacks. The deadliest attack occurred in a synagogue in Pittsburgh, PA. An anti-Semitic extremist killed 11 and wounded 7 others.[7]

Incidents of terrorism have been minimal within Will County. Two groups are known to operate within Will County. One is the Animal Liberation Front (ALF) whose cause is to support animal rights. ALF is described by their founder, Ronnie Lee, as a "...non-violent guerilla organization, dedicated to the liberation of animals from all forms of cruelty and persecution at the hands of mankind." Activists turned from legal tactics of hunt disruption to illegal tactics of sabotage when they grew weary of being assaulted and jailed and sought more effective tactics. ALF migrated to the U.S. in the early 1980s and is now an international movement in over twenty countries.

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[4] *Our World in Data – Terrorism*. Website available from: https://ourworldindata.org/terrorism
[5] Global Terrorism Database. Website available from: https://www.start.umd.edu/gtd/
[6] Institute for Economics & Peace (2019). *Global Terrorism Index 2019, Measuring the Impact of Terrorism*. Available from: http://visionofhumanity.org/app/uploads/2017/11/Global-Terrorism-Index-2017.pdf
[7] Institute for Economics & Peace (2019). *Global Terrorism Index 2019, Measuring the Impact of Terrorism*. Available from: http://visionofhumanity.org/app/uploads/2019/11/GTI-2019web.pdf

ALF is a loosely associated collection of cells of people who go underground and violate the law on behalf of animals. They break and enter into rescue animals, and they also destroy property in order to prevent further harm done to animals and to weaken exploitation industries economically. Official ALF guidelines are: (1) to liberate animals from places of abuse; (2) to inflict economic damage to industries that profit from animal exploitation; (3) to reveal the horrors and atrocities committed against animals behind locked doors, and (4) to take all necessary precautions against harming any human or nonhuman animals. ALF claimed responsibility for the April, 2003, fire at an exotic meat market located in Lockport.

The other terrorist group operating within Will County reported by law enforcement officials is a right-wing white supremacist group. In the recent past, they have staged rallies and demonstrations in support of their ideas.

Potentially threatening incidents have occurred that involve transportation sites. These occurrences include photographic surveillance within Will County, bomb threats to locks and dams, suspicious aircraft flights, and suspicious individuals/vehicles identified within Illinois.

Risk Characterization

There are many variations within the types of terrorist activities. While natural hazards may be readily identifiable and somewhat predictable, terrorist activities cannot be reliably predicted. Terrorists are not under any one person or nation's control, but identify with various national or international communities, religions, cults, or philosophies. Thus, terrorist type activities can occur anywhere at any time. As a nation, we have experienced occurrences of terrorism. The Boston Marathon bombing, Columbine High School shootings, attacks of 9/11, anthrax mailings, Washington, D.C. area sniper shootings, and the Pittsburgh, PA synagogue shooting are examples of how difficult it is to anticipate when and where such random acts of human-caused disasters may occur. As the population of Will County grows and more industrial and sports/entertainment complexes are developed, the threat and incident of a terrorist attack may become more attractive, more probable.

Specific threats of terrorism have not been made against any critical infrastructure within Will County. Federal officials have issued warnings of potential attacks against the chemical, oil and gas, nuclear, electrical power, and agricultural industries. International and domestic terrorist groups tend to strike at poorly defended targets.

Environmental activist groups are very active throughout Illinois. They have committed numerous criminal acts including arson and criminal damage to property. Groups, such as the Earth Liberation Front (ELF), target any commercial or industrial venture that would disrupt land, water, or other environmental features. They are highly organized and practice leaderless resistance principles. Members are hardcore fanatics some of who are accomplished arsonists, vandals, and saboteurs.

The Department of Homeland Security communicates timely, detailed information about terrorist threats to the American public through the National Terrorism Advisory System (NTAS). (See: https://www.dhs.gov/national-terrorism-advisory-system)

Will County EMA participates in the Illinois Terrorism Task Force (ITTF). The ITTF is a partnership between local, state, and federal government entities along with private and non-governmental organizations. Their purpose is to develop long-term solutions to the threats and realities of terrorism and all hazards. Annually the ITTF publishes a report detailing the accomplishments of the year and detailing the initiatives for the coming year. A sample of their work is the *Recommendations of the Illinois Terrorism Task Force School Safety Working Group* to provide school with a guide to deal with active shooter threats.

(See: https://www.iasaedu.org/cms/lib/IL01923163/Centricity/Domain/4/ITTF%20School%20Safety%20Working%20Group%20Recommendations%20-%20Final%20draft%20040318.pdf)

Impact: Medium

Damage to Buildings

Bombs are terrorists' weapon of choice. Bombs, along with incendiary devices, can cause serious damage or destruction to buildings.

Critical Facilities

Terrorists are drawn to critical facilities. They are highly visible or vulnerable targets, which can attract attention to the terrorists' cause and instill fear into the public witnessing the act. Terrorists can damage or destroy these facilities with bombs or incendiary devices, but they also can disrupt the function of critical facilities by infiltrating the electronic infrastructure of these facilities. Cyberterrorism threatens the inter-connected networks that regulate the flow of power, water, financial services, medical care, telecommunication networks, and transportation systems.

Health and Safety

The threat of harm to the health and safety of human beings is part of the psychology of terrorism. The mere threat of harm may be sufficient for the terrorists to further their cause.

Economic Impact

Impairing the economic structure of a society can be the intent of the terrorist act. By damaging the business and critical infrastructure directly or by threat, the terrorist gain the attention they seek to promote their cause.

Future Occurrence

Will County is vulnerable to terrorism. Its location in the Chicago metropolitan area and the infrastructure that supports the function of that metropolitan area make it a potentially attractive target to terrorists. Transportation systems, manufacturing industries, power plants, pipeline systems, and entertainment venues are some of the potential targets that terrorists may to drawn to for publicizing their cause. Details of the critical infrastructure that may be at risk by terrorism may be found in the *Will County Terrorism Vulnerability Assessment*.

CIVIL DISTURBANCE

Hazard Characterization

Civil disturbances are incidents that intend to disrupt a community to the degree that police intervention is required to maintain public safety. Civil disturbances can include prison or institutional rebellions, disruptive political gatherings, violent labor disputes, urban protests or riots, demonstrations, or problems at large-scale events resulting in police intervention and arrests. Civil disturbances can occur anytime but tend to be more frequent during summer months when the hot, humid weather places a stress on the public.

People in the U.S. have the right to assemble in protest. Most protesters respect the laws and are nonviolent. Civil disturbance may be spontaneous or may erupt because of rising tensions. Some civil disturbances may even be planned to gain more attention to their cause. The threat from a disturbance varies by the type, severity, and range of the event. Public welfare and property are at risk along with infrastructure services such as electricity, water supply, public transportation, communications, etc. Government buildings, universities, military bases, nuclear power plants, and correctional facilities tend to be targeted the most. As the profile of Will County points out, Will County has all of these types of facilities and entities. Thus, preparation to effectively deal with civil disturbances is important.

History

No documentation of recent civil disturbances is available.

Risk Characterization

The economic impact to urban areas during civil unrest and following such events can be profound. Direct impacts include looting and smashed windows as well as endangering shop owners and customers. Indirect economic impacts result from the loss of business when potential customers do not approach businesses for extended periods of time. Customer impressions and habits can change from the experience of a single threatening event.

Civil Disturbances or Demonstrations can be identified in three (3) categories:

- Peaceful, Non-Obstructive Demonstrations
- Non-Violent, Disruptive Demonstrations
- Violent, Disruptive Demonstrations

The severity of civil disturbance depends on the nature of the disturbance. A localized civil disturbance involves a small segment of the population, for instance, workers who choose to strike and establish a picket line, or some other small scale demonstration, have a low severity rating. In the instance of a low severity civil disturbance, police might be called upon to ensure that protestors did not block traffic corridors or intrude on private property. A moderately severe civil disturbance would be one wherein the protests disrupt nearby businesses and possibly cause some property damage. In this instance, police intervention would be required to restore order without employing chemical agents or physical force. A severe civil disturbance would involve rioting, arson, looting, and assault.

Violent behavior is frequently focused on civil values that include property, industry, and services. Being in a crowd may influence an individual's behavior causing them to act in ways they normally would not.

- Crowds may make an individual feel anonymous and invulnerable
- A large crowd may overpower an individual's more reasonable behavior and encourage them to act out with the group in a violent or destructive manner
- A crowd's disorderly behavior may influence the behavior of the authorities causing them to react aggressively to the crowd's behavior

Civil disturbance can, in extreme cases, cause extensive social disruption, loss of jobs, death, and property damage. These may result either from those involved in the action or initiated by those in higher authority in response to what they perceive as a threat to either the status quo or their own authority. In addition, the government may also curtail certain civil liberties even to the eventual imposition of martial law. Looting and general vandalism are the most common activities associated with civil disturbance. Arson is also quite common and can quickly spread due to slow response times of overwhelmed fire departments. Transportation routes can become blocked making it difficult for non-rioters to leave the area and difficult for the emergency response personnel to arrive. Long-term effects may include a local depressed economy, environmental damage, social disruption, and long lasting animosity between the contending groups.

Civil disturbance is difficult to mitigate because its occurrence can be intense, destructive, and spontaneous. The best way to mitigate is to prepare.

- Identify needed preparations before an emergency situation occurs – who are potential demonstrators and their capabilities, what are the controversial issues, where are the sites crowds may gather, and expect crowds to gather at "trigger events"
- Create a plan that coordinates with existing laws, responders, resources, and plans
- Develop a communication plan and work with the community to avoid civil unrest
- Ensure plans accommodate the needs of individuals with disabilities or access/functional needs
- Encourage the public to register for local emergency alerts
- Educate the public to be aware of their environment and recognize and report concerns
- Encourage the public to learn first aid
- Exercise the plan and use lessons learned to amend the plan as needed
- Identify how to assess damage, salvage undamaged goods, and cleanup the location following an incident.

Impact: Low

Damage to Buildings

Buildings and property can be damaged or destroyed by participants of civil disturbances or fire if it ensues.

Critical Facilities

Disruption of services such as electricity, water supply, public transportation, communications, etc., could result from civil disorder.

Health and Safety

Injury and loss of life can occur as a result of civil disturbance.

Economic Impact

Loss of life and property as well as fear can be a factor and interrupt the normal functioning of a community. The need for increased security for sites vulnerable to civil disorder places demands on local law enforcement organizations.

Future Occurrence

The occurrence of civil disorder is always a possibility, but the likelihood is low. The potential for civil disturbances exists within Will County because of:

- Large manufacturing enterprises and labor organizations that could result in public demonstration over labor disputes
- Will County Jail, River Valley Juvenile Detention Center, and Stateville Correctional facilities that could face uprisings due to overcrowding or jail conditions
- Three universities and a junior college that could experience student demonstrations or crowd disturbances

CHAPTER 5: MITIGATION GOALS, OBJECTIVES, & STRATEGIES

Will County Emergency Management Agency (EMA), with the collaboration of participating jurisdictions, has identified the expectations of the *Will County County-Wide All Hazard Mitigation Plan* and the strategies to meet these goals and objectives. The expectations of this planning document are defined as the Mitigation Goals and Objectives. The mitigation plan's goals are broad statements that describe the principles that will guide the suggested mitigation. The objectives are targeted statements that define strategies and implementation procedures to attain the mitigation plan's goals. The Committee developed the goals, objectives, and strategies based upon the findings of the All Hazard Risk Assessment, previously prepared by the county, individual expertise, knowledge of existing and planned county-wide programs and projects, and collaboration with participating jurisdictions. The Mitigation Steering Committee held a workshop on January 15, 2020, with participating jurisdictions to review/update, further define, and finalize the goals and objectives of the 2020 plan.

Goals and Objectives

Goal #1: ***Protect and secure life and property***.

Objectives:

- *Increase public education and awareness of all hazards and what they can do to protect and secure their community.*
- *Implement effective approaches to protect neighborhoods, buildings, and critical facilities and infrastructure from all hazards.*
- *Nurture and support local and regional organizations that have missions that fulfill this goal.*
- *Increase capabilities to disseminate pre-event and post-event information.*
- *Increase readiness of the public and all levels of government within Will County.*

Goal #2: ***Continue to improve and enhance county-wide emergency management programs and develop relationships county-wide.***

Objectives:

- *Support and promote the integration of efficient emergency management and homeland security operations, functions, and tools with local, state, and federal governments, private industry, non-governmental organizations, community groups, and other emergency management partners.*
- *Identify essential government functions and develop back-up plans to ensure reliable services during a time of emergency.*
- *Leverage existing opportunities to upgrade aging equipment and infrastructure that are critical to emergency management.*
- *Encourage and support the professional development fields relevant to Emergency Management.*
- *Educate the community on the function of Emergency Management and of the support provided to all levels of the community for planning, mitigating, responding, and recovery.*

Goal #3: ***Ensure economic stability, preserve cultural resources, and improve quality of life throughout Will County.***

Objectives:

- *Nurture and support strategic local and regional private/public partnerships to limit or minimize the impact from a disaster to key employers and from market sectors.*
- *Work with local universities, private/non-profit organizations, and other organizations to identify opportunities to implement mitigation.*
- *Promote and nurture mitigation actions that facilitate security to private and public sectors while leveraging available funding.*
- *Increase readiness of the private sector within Will County and promote private sector readiness within the region.*

Goal #4: ***Develop, promote, and integrate mitigation actions.***

Objectives:

- *Assist Will County and its participating jurisdictions in the development of mitigation proposals and identify sources of federal funding.*
- *Identify and facilitate mitigation opportunities pertinent to the locale with internal, neighboring, and regional partners.*
- *Assist essential and critical facilities (hospitals, universities, utilities, and eligible private/non-profits) to identify mitigation opportunities.*
- *Engrain mitigation strategies and actions into everyday planning and project development.*
- *Integrate mitigation projects with other federal funding sources (FEMA, DHS, US EPA, HUD, etc.) and projects in order to maximize efficiency and program eligibility.*

Goal #5: ***Take advantage of opportunities offered by growth while also protecting natural systems and natural resources.***

Objectives:

- *Incorporate hazard mitigation practices into the activities of other county departments, Will County units of government, and local park districts.*
- *Integrate mitigation actions into existing and future opportunities, projects, and developments.*
- *Focus on flood hazard mitigation actions that can increase open space and meet targets for natural environment sustainability.*

Mitigation Implementation Strategies

The Mitigation Implementation Strategies section of this plan addresses the action plan to reduce loss from future hazard events throughout Will County. The specific projects, responsible agencies, potential funding sources, and priorities are listed in the pages that follow.

Prioritization

Mitigation strategies in the original plan were defined and prioritized primarily through a formalized workshop with participating jurisdictions. The initial selection and prioritization of these strategies was drafted by the mitigation project planning team, using the following criteria to identify mitigation strategies and actions that:

- Address the plan's goals and objectives.
- Take advantage of opportunities presented by on-going or future initiatives, programs, and activities related to emergency management, public safety, homeland security, planning, growth management, community development, transportation, utilities, and other capital improvements, facilities maintenance, code revisions, and other programs to build mitigation opportunities into on-going functions of government to the maximum extent possible.
- Are within the capabilities of Will County and/or local jurisdiction that find the mitigation strategy and action to be pertinent to their locale to execute the mitigation action.
- Offer a significant benefit in relation to its cost.

- Have an identified funding source or sources.
- Have an identified lead agency with appropriate jurisdictional authority to coordinate implementation.
- Have an identified schedule for implementation.

The team devised a worksheet (Appendix D) to organize all mitigation ideas and priorities. The participants were encouraged to identify mitigation strategies that had an all-hazards approach and that targeted select hazards that were determined to have a significant risk to communities in Will County. These criteria and the process continue to be supported by this plan update.

The participants were persuaded to consider evaluation criteria as indicated in the *State and Local Mitigation Planning How-To-Guides* developed by FEMA. These evaluation criteria consist of public support, technical feasibility, staffing, funding, maintenance requirements, political support, legal authority, and cost effectiveness. The workgroup that met January 15, 2020, used these criteria found in FEMA's STAPLE+E (see FEMA's *Developing the Mitigation Plan*, FEMA 396-3, worksheet #4) tool to update the evaluation and prioritize the mitigation actions to ensure they are beneficial and cost efficient. Information from this evaluation is incorporated into the matrix shown on pages 5-17 through 5-24.

A detailed benefit-cost analysis (BCA) with FEMA's tool was not conducted during the mitigation strategy development phase. A detailed BCA will be done when the mitigation action strategy's defined scope of work is developed and supported. Although the benefits of a mitigation action can be determined, an accurate cost could not be determined at this meeting because of too many unknown variables. It is felt that the evaluation and discussion generated by the use of the STAPLE+E tool which includes an economic criterion supported a sufficient general analysis of benefit-cost for the inclusion of each mitigation action reviewed.

Integrating Mitigation

Some of the mitigation strategies suggested are more accurately defined as preparedness, response, and recovery actions. Although the purpose of a hazard mitigation plan is to address mitigation actions, the communities of Will County recognized the importance of integrating overlapping functions of all phases of emergency management. The preparedness, response, and recovery actions identified support the goals and objectives of this plan. Although FEMA mitigation funds may not be able to fund these actions, the communities of Will County consider these actions as important in achieving the overall goals and objectives of this plan. Will County EMA also recognizes that hazard risks, vulnerabilities, and disasters

often transcend beyond political boundaries. Therefore, the plan also addresses strategies for long term planning and coordination purposes as neighboring jurisdictions develop hazard mitigation plans.

The results of this plan will be incorporated into ongoing planning efforts for Will County and its jurisdictions. At this time, there is limited reference in planning documents and ordinances that specifically mention the *Will County County-Wide Hazard Mitigation Plan*. A recent example is the *Village of Shorewood, Illinois Loss Avoidance Study*. However, many existing elements of the county's plans and ordinances regarding stormwater management, building codes, zoning, land use, transportation, and others address and help to mitigate the hazards identified in this plan. As this plan is reviewed and evolves, effort will be made to educate county departments and municipalities about the benefits of the plan and to develop a strategy for integration of this plan into other plans and ordinances.

Funding opportunities to implement a variety of the mitigation action items identified in the plan are identified within each mitigation action item found on pages 6-6 thru 6-38 in Chapter 6. Funding avenues for these action items varies dependent on the potential funding opportunities and the identified responsible organizations. The identified Mitigation Action Items and Goals within the *Will County County-wide All Hazard Mitigation Plan* will be integrated into the following ongoing planning efforts when applicable.

PLANNING ELEMENTS	
National Response Framework	Establishes the framework for Federal, State, and local emergency planning addressing preparedness, response, mitigation, and recovery efforts. It is built on scalable, flexible, and adaptable concepts identified in the National Incident Management System to align key roles and responsibilities across the Nation. This Framework describes specific authorities and best practices for managing incidents that range from the serious but purely local to large-scale terrorist attacks or catastrophic natural disasters. The National Response Framework describes the principles, roles and responsibilities, and coordinating structures for delivering the core capabilities required to respond to an incident and further describes how response efforts integrate with those of the other mission areas.
Community Status Book Report Illinois	FEMA listing of communities participating in the National Flood Program, published 2/22/2020
2018 Illinois Natural Hazard Mitigation Plan	Statewide hazard mitigation plan developed by the Illinois Emergency Management Agency in 2018
Will County Emergency Operations Plan	The WC EOP describes the County's disaster management system which conforms to the National Incident Management System (NIMS). It is used by all county government agencies when implemented for response or recovery operation in any part of the county affected by a major emergency or disaster.

PLANNING ELEMENTS (cont.)	
Will County Land Resource Management Plan	Presents a regional vision for the general form and shape of future growth within the county. Identifies guidelines for development which can be incorporated into local plans and regulations.
Will COnnects 2040	A long range transportation planning document and serves as an update to the Will County 2030 Transportation Plan. Provides a comprehensive look at our unique transportation issues and needs now through the year 2040. It forecasts available funding for transportation investment in county roadways and identifies a set of strategic, financially constrained investment recommendations to meet our future travel needs.
Will County Community Friendly Freight Mobility Plan	This Freight Plan identifies and provides guidance for local freight policies, programs, and investments, while also creating a mechanism for evaluating and prioritizing freight-related projects, recognizing six key areas: safety, mobility, preservation enhancement, workforce, economic competitiveness, and community livability.
Illinois Route 53 Corridor Plan	A corridor plan for a 25 mile section of IL Route 53 / Historic Route 66, stretching from Joliet to Braidwood. Acts as a roadmap to reach the long term goal to create a major vacation and recreation destination here for Chicago and the Midwest.
Will County I-355 Area Trail Plan	An un-official document collaboratively developed by the I-355 communities to identify trail linkages between the communities.
Illinois Plan for Radiological Accidents (IPRA)	A comprehensive emergency response plan for radiological accidents. It outlines responsibilities for state, county, and municipal jurisdictions that might be affected by an accident at a nuclear facility and sets state-wide policy for our emergency response efforts. Will County is in the emergency protective zones of the Braidwood and Dresden Nuclear Power Plants.
Will County LEPC Plan	Implements Superfund Amendments and Reauthorization Act (SARA) of 1986 within Will County to promote chemical and emergency preparedness and prevention.
Will County Stormwater Management Plan & Technical Guidance Manual	Consolidates and coordinates existing stormwater management programs and activities into an effective, unified county-wide structure. Purpose is to prevent increases in stormwater related problems associated with development, re-development and other watershed activities; remediate existing problems related to improper management of stormwater runoff and encroachment into flood prone areas; and ensure maintenance, management, and sustainable operation of natural and manmade stormwater drainage and storage features.
Will County 2030 Transportation Framework Plan	Describes the planning process to establish a transportation plan capable of supporting development in Will County. The report also highlights the effects of transportation improvements and provides an implementation plan, including revenue and expenditure forecasts, to assist in the determination of projects to be incorporated in the county's fiscal program.

Planning and its implementation must be conducted within the authority of the governing body. The primary laws, regulations, programs and policies that have an impact on mitigation programs in Will County are listed below.

LEGAL AUTHORITIES	
Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100-707	Provides the legal authority for the federal government to provide assistance to states during declared major disasters and emergencies. Outlines the actions Federal agencies are likely to take to assist State, tribal, and local governments that are affected by a major disaster or emergency. Authorizes the delivery of federal technical, financial, logistical, and other assistance to states and localities during declared major disasters or emergencies. The Federal Emergency Management Agency (FEMA) coordinates administration of disaster relief resources and assistance to states. Federal assistance is provided under the Stafford Act if an event is beyond the combined response capabilities of state and local governments.
Superfund Amendments and Reauthorization Act (SARA) of 1986	Title III of SARA establishes the "Emergency Planning and Community Right to Know Act" which includes: 1. Procedures for emergency planning in states and localities. 2. Building a framework of community awareness concerning potential chemical hazards and requirements for submission of MSDS chemical inventory forms and toxic release forms. 3. Trade secrets protections, citizen petitions, and information availability. A State Emergency Response Commission (SERC) is appointed by the Governor and is under the Illinois Emergency Management Agency and supports Local Emergency Planning Committees (LEPC), assists in chemical emergency planning, provides public access to chemical data, raises public awareness of chemical risks, and encourages public participation in local chemical safety issues.
(20 ILCS 3305) Illinois Emergency Management Agency Act	Outlines the responsibilities and actions performed by the State of Illinois during, before and after a disaster but also provides legal authority and guidance to "local political subdivisions" i.e. Local governments on emergency management issues. In chapter 127 paragraph 1060, the IEMA Act authorizes and guides local governments to establish "Emergency Service and Disaster Agencies (ESDA)" in their perspective jurisdictions. Paragraph 1061, provides the legal authority for local governments regarding local disaster declarations. Mutual Aid requirements and guidelines are discusses in Chapter 127 paragraph 1063 for local governments.
(50 ILCS 752) Illinois Public Safety Agency Network Act	This act promotes intergovernmental cooperation between public safety agencies of local government, i.e. Sheriff, Fire, and Police. It also promotes interoperability among all public safety disciplines.
(50 ILCS 805 Section 4) Land Resource Management Planning Act	Encourages municipalities and counties to protect the land, air, water, natural resources and environment of the State and to encourage the use of such resources in a manner which is socially and economically desirable through the adoption of joint or compatible Local Land Resource Management Plans.
(765 ILCS 77/) Residential Real Property Disclosure Act	Requires a seller to tell a potential buyer, if they are aware of any basement flooding, if the property is in the floodplain, or if the seller has flood insurance.
(425 ILCS 25/9 Section 9) Fire Investigation Act	Enables the State Fire Marshal to make, or cause to be made, inspections of buildings, structures and premises to determine their conformity with the provisions in this Act and their safety to life and property from fire or other emergency requiring evacuation of the building (such as presence of explosive or flammable gasses, fume hazard, and power failure).

LEGAL AUTHORITIES (cont.)	
(50 ILCS 815 Section 2) Flood Damage Prevention Act	Enables local governments to issue building permits in relation to infrastructure for runoff water. Any county or municipality may, by ordinance, adopt requirements that all applications for building permits contain a statement that such buildings and appurtenances connected therewith include facilities for the orderly runoff or retention of rain and melting snow. The governing body of the county or municipality shall determine rain and snowfalls taking into consideration such factors as the permeability and water absorbing quality of the soil and adequacy of existing water-ways.
(210 ILCS 120/) Illinois Mobile Home Tie down Act	Indicates that the owner of each mobile home installed in Illinois on or after January 1, 1980, or which is moved from one lot to another after that date, shall be responsible to ensure that approved tied down equipment is obtained and used to secure the mobile home to the surface upon which it is to rest when occupied. After January 1, 1990, the owner of each mobile home park shall make available to the owner of any mobile home moved within or into their mobile home park with a copy of the Mobile Home Owner's Tie Down Guide pamphlet prepared by the Department.
School Safety Drill Act (PA 094-0600)	Develops, maintains and administers the minimum standards for 876 Illinois public school districts to follow when conducting school safety drills and the minimum standards for reviewing school emergency and crisis response plans, and the standards and procedures for ensuring compliance with the minimum standards.
School Safety Drill Act Administration Title 29 Part 1500	Joint Rules of the Office of the State Fire Marshal and the Illinois State Board of Education: School Emergency and Crisis Response. The Act establishes the requirements for the annual review and updating of the protocols and procedures in each school's emergency and crisis response plan.
Rivers, Lakes and Streams Act, 615 ILCS 5 (Dam Safety Program)	Illinois Department of Natural Resources, Division of Resource Management regulates the construction, operation and maintenance of new dams and the modification, operation and maintenance of existing dams. Dams are classified by the Division based on hazard potential into one of three hazard classifications. All dams in the two higher classifications are required to have a permit under Dam Safety rules promulgated by the Department. Dams in the lower hazard classification require a permit for construction or modification if they meet certain size criteria.
The Capital Development Board Act	Establishes a model building code for all areas throughout the State that currently have no code. The bill provides minimum code(s) for commercial construction. The bill provides for a qualified inspection of construction. The Division primarily acts as an informational resource to be used by the various building industry elements, the general public and various governmental units.
(815 ILCS 670/) Illinois Residential Building Code Act	Provides minimum requirements for safety and to safeguard property and the public welfare by regulating and controlling the design, construction, installation, and quality of materials of new residential construction as regulated by this Act.
Will County Building and Zoning Ordinances	Regulations and standards that delineate the minimum standards for building construction practices and guidance for development within unincorporated Will County.
County-Wide Stormwater Ordinance	Regulates stormwater management and governs the location, width, course, and release rate of all stormwater runoff channels, streams, and basins in the county, in accordance with the Will County Comprehensive County-Wide Stormwater Management Plan.
Water Resource Ordinance for Unincorporated Will County	Promotes effective, equitable, acceptable, and legal water resource management measures by establishing reasonable rules and regulations for development.

LEGAL AUTHORITIES (cont.)	
Will County Subdivision Ordinance	Purpose is to protect and promote public health, safety, and general welfare by implementing adopted plans and policies through the promotion of environmentally responsible development practices; provision of adequate public facilities and improvements; maintaining a range of housing choices; safeguarding against flood damage, soil erosion, and sedimentation; prescribing reasonable rules governing subdividing and platting; and providing remedies for violations and a means for enforcement.
Will County Mobile Home Ordinance	Sets the standards for mobile home parks within the county.
Will County Historic Preservation Ordinance	Identifies, designates, protects, preserves, and encourages the restoration, rehabilitation, and adaptation for continued use of those properties and structures which represent or reflect the historical, cultural, artistic, social, economic, ethnic or political heritage of the United States of America, State of Illinois, or county of Will or which may be representative of an architectural or engineering type inherently valuable for the study of style, period, craftsmanship, method of construction or use of indigenous materials.
Will County Resource Recovery & Energy Ordinances	Consists of the Pollution Facility Siting Ordinance, CCDD Fee Ordinance, Hauler Reporting Ordinance, Nuisance (Burning) Ordinance, and 1991 Assessment & Collection of Landfill Fees
Local Plans and Ordinances	Adopts county-wide plans and ordinances as minimum standards and tailors them to fit local needs and priorities.

PLANNING DOCUMENTS by JURISDICTION																																							
PLANNING DOCUMENT TYPE	**Will County**	**City of Aurora**	**Village of Beecher**	**Village of Bolingbrook**	**Village of Braceville**	**City of Braidwood**	**Village of Channahon**	**Village of Coal City**	**City of Crest Hill**	**Village of Crete**	**Village of Diamond**	**Village of Elwood**	**Village of Frankfort**	**Village of Godley**	**Village of Homer Glen**	**City of Joliet**	**Village of Lemont**	**City of Lockport**	**Village of Manhattan**	**Village of Minooka**	**Village of Mokena**	**Village of Monee**	**City of Naperville**	**Village of New Lenox**	**Village of Orland Park**	**Village of Park Forest**	**Village of Peotone**	**Village of Plainfield**	**Village of Rockdale**	**Village of Romeoville**	**Village of Sauk Village**	**Village of Shorewood**	**Village of Steger***	**Village of Symerton**	**Village of Tinley Park**	**Village of Univ. Park**	**City of Wilmington**	**Village of Woodridge**
Plans																																							
Comprehensive Plan	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦		♦			♦	♦	♦	♦
Emergency Management Plan	♦		♦	♦					♦	♦	♦					♦					♦	♦	♦	♦		♦		♦		♦		♦				♦			
Land Use Plan	♦		♦	♦			♦	♦		♦	♦	♦	♦			♦		♦	♦		♦	♦		♦	♦	♦	♦	♦		♦		♦					♦	
Transportation Plan	♦						♦	♦		♦	♦		♦		♦		♦	♦	♦		♦		♦	♦	♦			♦		♦						♦	
Capital Improvement Plan			♦	♦						♦			♦						♦			♦					♦	♦		♦		♦				♦	
Economic Development Plan				♦		♦				♦	♦		♦			♦			♦									♦		♦						♦	
Regional All Hazards Risk Assessment Plan	♦			♦						♦	♦																											
Continuity of Operations Plan			♦	♦			♦			♦	♦		♦						♦									♦		♦		♦				♦	
Codes & Ordinances																																							
Building Codes	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦
Historic Preservation Ordinance	♦									♦			♦			♦		♦				♦	♦	♦	♦		♦	♦										
Subdivision Ordinances	♦		♦	♦		♦	♦	♦		♦	♦	♦			♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦	♦			♦	♦	♦	♦
Zoning Ordinances	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦	♦	♦		♦	♦	♦	♦
Maps																																							
Land Use Maps	♦		♦	♦		♦	♦			♦	♦	♦	♦			♦	♦		♦	♦		♦	♦	♦	♦		♦	♦		♦		♦			♦			♦
Infrastructure Maps	♦		♦	♦					♦	♦	♦	♦	♦		♦	♦	♦		♦	♦	♦	♦	♦	♦	♦		♦	♦		♦		♦			♦			
Zoning Maps	♦		♦	♦		♦	♦	♦	♦	♦	♦	♦	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦		♦			♦	♦	♦	♦
Flood Related																																							
Flood /Drainage Ordinance (County-Wide)	♦	♦	♦	♦		♦	♦	♦	♦	♦	♦	♦	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦	♦	♦
Flood Insurance Rate Maps	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
Technical Guidelines Manual	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦	♦	♦	♦	♦		

♦ Jurisdictional ordinance meets or exceeds Will County-Wide stormwater ordinance ☐ Opted for another County's stormwater ordinance

ADMINISTRATION, RESOURCE, & EDUCATION by JURISDICTION

PLANNING DOCUMENT TYPE	Will County	City of Aurora *	Village of Beecher	Village of Bolingbrook	Village of Braceville *	City of Braidwood	Village of Channahon	Village of Coal City *	City of Crest Hill	Village of Crete	Village of Diamond *	Village of Elwood	Village of Frankfort	Village of Godley*	Village of Homer Glen	City of Joliet	Village of Lemont *	City of Lockport	Village of Manhattan	Village of Minooka *	Village of Mokena	Village of Monee	City of Naperville *	Village of New Lenox	Village of Orland Park *	Village of Park Forest *	Village of Peotone	Village of Plainfield	Village of Rockdale	Village of Romeoville	Village of Sauk Village *	Village of Shorewood	Village of Steger*	Village of Symerton	Village of Tinley Park *	Village of Univ. Park *	City of Wilmington	Village of Woodridge *
Planning Commission	♦		♦	♦		♦	♦			♦	♦	♦	♦			♦			♦		♦	♦					♦	♦		♦		♦					♦	
Acquisition of land for open space & public recreation use	♦		♦	♦							♦	♦	♦						♦		♦	♦						♦				♦					♦	
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)			♦	♦		♦	♦			♦	♦	♦	♦			♦			♦		♦	♦						♦		♦		♦					♦	
Warning Systems/ Service (Reverse 911, outdoor warning signals)	♦		♦	♦		♦				♦	♦	♦	♦			♦			♦		♦	♦						♦		♦		♦					♦	
Grant Writing	♦		♦			♦	♦			♦	♦								♦									♦		♦		♦					♦	
Capital Improvements project funding	♦		♦	♦		♦	♦			♦			♦						♦		♦	♦					♦	♦		♦		♦					♦	
Authority to levy taxes for specific purposes	♦		♦			♦	♦			♦			♦			♦			♦			♦						♦		♦		♦					♦	
Fees for water, sewer, gas, or electric services			♦	♦		♦	♦			♦	♦	♦	♦			♦			♦		♦	♦					♦	♦		♦		♦					♦	
Impact fees for new development	♦		♦	♦			♦			♦	♦	♦	♦						♦		♦						♦	♦		♦		♦					♦	
Stormwater Utility Fee			♦									♦																		♦							♦	
Community Development Block Grant (CDBG)	♦			♦		♦					♦					♦														♦		♦					♦	
Emergency Preparedness Education Outreach	♦		♦	♦		♦	♦			♦			♦						♦			♦						♦		♦		♦					♦	
Storm Ready Certification	♦			♦						♦						♦												♦		♦							♦	

BUILDING CODES ADOPTION by JURISDICTION

BUILDING CODE	Will County	City of Aurora *	Village of Beecher	Village of Bolingbrook	Village of Braceville *	City of Braidwood	Village of Channahon	Village of Coal City *	City of Crest Hill	Village of Crete	Village of Diamond *	Village of Elwood	Village of Frankfort	Village of Godley*	Village of Homer Glen	City of Joliet	Village of Lemont *	City of Lockport	Village of Manhattan	Village of Minooka *	Village of Mokena	Village of Monee	City of Naperville *	Village of New Lenox	Village of Orland Park *	Village of Park Forest *	Village of Peotone	Village of Plainfield	Village of Rockdale	Village of Romeoville	Village of Sauk Village *	Village of Shorewood	Village of Steger*	Village of Symerton	Village of Tinley Park *	Village of Univ. Park *	City of Wilmington	Village of Woodridge *
Will County Adopted Building Ordinance	♦																																					
International Building Code	♦	♦	♦	♦		♦	♦	♦	♦	♦	♦	♦	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦		♦					♦	♦
National Building Code																																				♦		
International Residential Code	♦	♦	♦	♦		♦	♦	♦	♦	♦	♦	♦	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦		♦			♦		♦	♦
International Fire Code	♦	♦	♦	♦		♦		♦	♦	♦	♦	♦	♦		♦	♦	♦	♦	♦	♦		♦	♦	♦	♦	♦	♦	♦		♦							♦	♦
National Electric Code	♦		♦	♦		♦	♦	♦		♦	♦	♦	♦		♦	♦	♦	♦			♦	♦	♦	♦	♦	♦		♦		♦		♦				♦	♦	♦
International Electric Code										♦									♦																				
International Mechanical Code	♦	♦	♦	♦		♦	♦		♦	♦	♦	♦	♦		♦	♦	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦		♦	♦			♦	♦	♦
International Plumbing Code	♦	♦						♦															♦									♦							
National Plumbing Code																																				♦		
State Plumbing Code			♦	♦		♦	♦			♦	♦	♦			♦	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦		♦					♦	♦
International Energy Conservation Code with Illinois amendments	♦		♦	♦			♦	♦	♦	♦	♦	♦			♦		♦				♦	♦						♦				♦						
International Energy Conservation Code	♦			♦		♦				♦		♦			♦	♦	♦		♦	♦	♦			♦	♦	♦		♦		♦		♦			♦			
International Private Sewage Disposal Code									♦	♦										♦																		

BUILDING CODES ADOPTION by JURISDICTION (cont.)																																							
BUILDING CODE	**Will County**	**City of Aurora ***	**Village of Beecher**	**Village of Bolingbrook**	**Village of Braceville ***	**City of Braidwood**	**Village of Channahon**	**Village of Coal City ***	**City of Crest Hill**	**Village of Crete**	**Village of Diamond ***	**Village of Elwood**	**Village of Frankfort**	**Village of Godley***	**Village of Homer Glen**	**City of Joliet**	**Village of Lemont ***	**City of Lockport**	**Village of Manhattan**	**Village of Minooka ***	**Village of Mokena**	**Village of Monee**	**City of Naperville ***	**Village of New Lenox**	**Village of Orland Park ***	**Village of Park Forest ***	**Village of Peotone**	**Village of Plainfield**	**Village of Rockdale**	**Village of Romeoville**	**Village of Sauk Village ***	**Village of Shorewood**	**Village of Steger***	**Village of Symerton**	**Village of Tinley Park ***	**Village of Univ. Park ***	**City of Wilmington**	**Village of Woodridge ***
National Private Sewage Disposal Code																																			♦		
State Private Sewage Disposal Code																												♦		♦								
International Fuel Gas Code	♦	♦	♦	♦			♦		♦	♦	♦	♦	♦		♦	♦	♦		♦	♦		♦	♦	♦	♦	♦		♦		♦		♦			♦		♦	
International Existing Building Code				♦						♦	♦	♦			♦	♦			♦	♦		♦	♦					♦		♦		♦					♦	
International Property Maintenance Code	♦	♦	♦	♦		♦		♦	♦	♦	♦	♦	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦		♦					♦	♦
International Accessibility Code	♦		♦													♦										♦													
State Accessibility Code				♦							♦	♦							♦	♦		♦	♦	♦			♦	♦				♦							
State Energy Code			♦	♦						♦			♦								♦	♦	♦					♦				♦							
Life Safety Code			♦	♦																♦		♦	♦																	
International Code Council Performance Code										♦																														

Mitigation Actions

The mitigation plan identifies mitigation actions that were developed from the risk assessment, the Steering Committee, collaboration with participating jurisdictions, and the public participation process. Each mitigation strategy describes the opportunity, how to implement it, funding sources, and responsible agencies.

The matrix on pages 5-17 through 5-24 provides a guide of the mitigation actions that were identified and where, in Chapter 6, further detail can be found. The matrix describes:

- The hazard that the strategy addresses.
- The implementation timeline for the project. Short-term mitigation items are either 1) crucial to the life safety of Will County residents, or 2) relatively easy to implement because funding has already been secured or is readily available. Any project noted as on-going should be implemented early in the planning cycle, but will be a continuous project once implementation has occurred.
- The agency that will take the lead in implementing the strategy.
- Potential sources of funding.
- References to detailed information about the strategy in Chapter 6.
- The plan goal(s) the strategy addresses.

The Mitigation Actions identified in Chapter 6 address the following:

Problem/Opportunity: This describes either a problem or a possible opportunity to reduce risk.

Implementation Strategy: Each mitigation strategy includes ideas to implement and accomplish the specific project and potential resources, which may include grant programs or human resources.

Lead Agency: This is the agency or agencies that will organize resources, find appropriate funding, or oversee project implementation, monitoring and evaluation.

Funding: This offers suggestions on potential financial resources for implementing the mitigation strategy. This includes funding from government agencies as well as various different types of grants.

Timeline: This estimates the amount of time it will take to begin implementation of each strategy.

IMPLEMENTATION OF MITIGATION ACTION ITEMS

	MITIGATION ACTION ITEM	Action Item to be Implemented by:						
		Will County Board	Will County Stormwater Management Planning Committee	Will County EMA	Will Land Use Department	Municipal Boards & Councils	Municipal Staff	Other Stakeholders
1	Adoption of plan update	♦				♦		
2	NIMS compliance & integration	♦		♦			♦	♦
3	Regional Collaboration expansion			♦			♦	
4	Risk/hazard incorporation into comprehensive plans, programs & projects	♦	♦	♦	♦	♦	♦	♦
5	Public awareness & education to promote understanding of risks & ways to prepare & mitigate			♦			♦	
6	Plan for vulnerable population needs			♦	♦		♦	♦
7	Promote professional development education for improved planning		♦	♦	♦		♦	♦
8	Critical facilities retrofits for facilities located within high-hazard areas				♦		♦	
9	Utilize GIS to track community vulnerability to hazards		♦	♦	♦		♦	
10	Maintain county-wide floodplain ordinance	♦	♦			♦	♦	
11	Participate in the Community Rating System to reduce flood damage		♦		♦		♦	
12	Integrate FHMP with GIS		♦					
13	Use GIS for database of flood controlled areas, purchased floodplain properties, & flood prone properties to be acquired		♦					
14	Continue storm water management planning to improve storm drainage systems		♦		♦		♦	
15	Complete/maintain maps of shallow flooding/ponding areas to prioritize storm water infrastructure improvements		♦		♦			
16	Increase open space in high flood areas		♦		♦		♦	
17	Capitalize on opportunities to acquire/relocate flood prone properties		♦		♦		♦	
18	Improve flood warning system & integrate into county-wide emergency communication strategy		♦	♦			♦	
19	Utilize inventory of non-federal dams/levees, identify deficiencies, & guide non-compliant owners to make improvements			♦	♦			♦
20	Encourage/support shelters for all hazards			♦			♦	♦
21	Coordinate Tier II facilities emergency planning with development/maintenance of applicable community emergency plans			♦			♦	♦
22	Encourage continuity planning in public & private sectors			♦			♦	♦
23	Develop drought contingency plans & public education			♦			♦	
24	Develop Post-Disaster Recovery ordinance & planning document	♦		♦		♦	♦	
25	Implement/conduct public health surveillance to identify/mitigate emergencies & develop partnerships to coordinate planning & response	.		♦				♦
26	Review and update Hazard Modeling conducted by The Polis Center for the original hazard mitigation plan.			♦	♦			♦
27	Collaborate with local municipalities to develop and adopt a county-wide regional emergency operations plan.			♦		♦	♦	

2020 Action Item	Mitigation Action by Jurisdiction	Hazard Addressed				Timeline ST – Short Term (≤ 5 yr.) LT – Long Term (>5 yr.) Ongoing	County Lead	Jurisdiction Lead(s) / Primary Partner(s)	Potential Funding Opportunities	Mitigation Action Description and Implementation Strategy (Chapter 6 page #)	Emergency Management Function	Prioritization – STAPLE+E	Plan Goals Addressed				
		Natural Hazards	Technological Hazards	Societal Hazards	Specific Hazard								Life & Property	Enhance Emergency Management	Economic Stability	Develop, Promote, Integrate Mitigation	Protect Natural Systems
1	Revise and adopt the *Will County County-Wide All Hazard Mitigation Plan* by resolution of the County Board, City Councils, Boards of Trustees, and other governing boards as appropriate. The municipal, fire protection districts, colleges, and other agencies' resolutions should adopt each action item that is pertinent to the community and designate staff responsible for implementation.	X	X	X	All	ST	Will County EMA	County Board, Village Boards, City Councils, & Stakeholders	Operating Budget	6-6	Prevent / Protect Prepare Mitigate Respond Recover	H	X	X	X	X	X
2	Ensure that plans maintained by the County and local jurisdictions are NIMS compliant and are regularly reviewed to ensure that the concept of emergency operations described in these plans ensure a combined unity of effort among the respective jurisdictions, adjacent jurisdictions, and the State.	X	X	X	All	LT - Ongoing	Will County EMA	County Board, WC EMA, Municipal Staff, & Stakeholders	DHS – EMPG, Operating Budget	6-7	Prevent / Protect Prepare Mitigate Respond Recover	M	X	X		X	
3	Expand regional collaboration by developing outreach programs and coordinating with neighboring jurisdictions, regional partnerships, businesses, non-profit, and universities.	X	X	X	All	Ongoing	Will County EMA	WC EMA & Jurisdictional EMAs	Operating Budget, Private Funds	6-8	Prevent / Protect Prepare Mitigate Respond Recover	M	X	X	X	X	X

2020 Action Item	Mitigation Action by Jurisdiction	Hazard Addressed				Timeline ST – Short Term (≤ 5 yr.) LT – Long Term (>5 yr.) Ongoing	County Lead	Jurisdiction Lead(s) / Primary Partner(s)	Potential Funding Opportunities	Mitigation Action Description and Implementation Strategy (Chapter 6 page #)	Emergency Management Function	Prioritization – STAPLE+E	Plan Goals Addressed				
		Natural Hazards	Technological Hazards	Societal Hazards	Specific Hazard								Life & Property	Enhance Emergency Management	Economic Stability	Develop, Promote, Integrate Mitigation	Protect Natural Systems
4	Incorporate risk assessment and hazard mitigation principles into comprehensive planning efforts, programs, and projects in order to secure communities from all hazards.	X	X	X	All	Ongoing	Will County EMA	WC Boards, WC EMA, WC SMPC, WC Land Use, Municipal Boards/ Councils/Staff & Chambers of Commerce	Operating Budget	6-9	Prevent / Protect Prepare Mitigate	M	X	X		X	X
5	Expand the county-wide public awareness and education programs and promote the understanding of each community's risks, vulnerabilities, what to do during and after a disaster, and how to mitigate the effects of disasters.	X	X	X	All	Ongoing	Will County EMA	WC EMA, Jurisdictional EMAs, & Local Gov	Operating Budget	6-10	Prevent / Protect Prepare	H	X	X	X	X	
6	Continue to strengthen infrastructure, build redundancies, and implement contingency plans for vulnerable populations and essential services and networks.	X	X		Infrastructure Failure	LT - Ongoing	Will County EMA, Dept. of Highway, & Land Use	Will County Dept. of Highways, Will County Land Use, Jurisdictional Public Works Departments, Local Utilities, IDOT, & ISP	Operating Budget / Capital Improvement Budgets	6-12	Prevent / Protect Prepare Mitigate	M	X		X	X	

2020 Action Item	Mitigation Action by Jurisdiction	Hazard Addressed				Timeline ST – Short Term (≤ 5 yr.) LT – Long Term (>5 yr.) Ongoing	County Lead	Jurisdiction Lead(s) / Primary Partner(s)	Potential Funding Opportunities	Mitigation Action Description and Implementation Strategy (Chapter 6 page #)	Emergency Management Function	Prioritization – STAPLE+E	Plan Goals Addressed				
		Natural Hazards	Technological Hazards	Societal Hazards	Specific Hazard								Life & Property	Enhance Emergency Management	Economic Stability	Develop, Promote, Integrate Mitigation	Protect Natural Systems
7	Continue to support the delivery of education for existing and free training platforms to educate officials, critical personnel, first responders, and communities on risks and vulnerabilities, fundamental operations of emergency management, and mitigation for the purpose of strengthening planning and advancing professional development.	X	X	X	All	Ongoing	Will County EMA	Will County EMA, Will County SMPC, Will County Land Use, & Jurisdictional Staff & EMAs	Collaboration between colleges, state/local funding, & private partnerships offering training	6-13	Prevent / Protect Prepare Mitigate Respond Recover	M		X	X	X	X
8	Identify critical facilities that are located within flood hazard areas and relocate them or incorporate mitigation retrofits to protect them from future floods.	X	X		Attention to flooding	LT - Ongoing	Will County Land Use	Will County GIS, Will County Land Use, & Affected Jurisdictional/ Municipal Staff	FEMA – HMGP & PDM	6-14	Prevent / Protect Prepare Mitigate	H	X	X	X	X	X
9	Support the use, development, and implementation of Geographic Information Systems (GIS) throughout the County to track community vulnerability to hazards.	X	X	X	All	Ongoing	Will County GIS	Will County GIS & Jurisdictions with GIS	Operating Budget	6-16	Prevent / Protect Prepare Mitigate Respond Recover	M	X	X		X	
	#10, 2013 - COMPLETED																

2020 Action Item	Mitigation Action by Jurisdiction	Hazard Addressed				Timeline ST – Short Term (≤ 5 yr.) LT – Long Term (>5 yr.) Ongoing	County Lead	Jurisdiction Lead(s) / Primary Partner(s)	Potential Funding Opportunities	Mitigation Action Description and Implementation Strategy (Chapter 6 page #)	Emergency Management Function	Prioritization – STAPLE+E	Plan Goals Addressed				
		Natural Hazards	Technological Hazards	Societal Hazards	Specific Hazard								Life & Property	Enhance Emergency Management	Economic Stability	Develop, Promote, Integrate Mitigation	Protect Natural Systems
10	Maintain or amend, as needed, the county-wide floodplain ordinance.	X			Flooding	Ongoing	Will County Land Use & Will County SMPC	Will County Board, Will County SMPC, & Jurisdictional Boards/ Councils & Staff	Operating Budget	6-17	Prevent / Protect Prepare Mitigate Recover	H	X			X	X
11	Participate in aspects of the Community Rating System to further reduce flood damage in the communities of Will County.	X			Flooding	Ongoing	Will County Land Use	Will County SMPC, Will County Land Use & Jurisdictional Staff	Operating Budget	6-18	Prepare / Prevent Mitigate	M	X		X	X	X
12	Integrate Flood Hazard Mapping Program updates with improved county-wide GIS capabilities.	X			Flooding	LT - Ongoing	Will County GIS & Will County SMPC	Will County GIS, Will County SMPC, & Jurisdictional Staff	Operating Budget	6-19	Prevent / Protect Prepare Mitigate	H	X	X	X	X	X
13	Utilizing GIS, develop and maintain a county-wide database of flood controlled areas, purchased flood plain properties, and flood prone properties to be acquired.	X			Flooding	LT - Ongoing	Will County GIS & Will County SMPC	Will County GIS & Will County SMPC	Operating Budget	6-21	Prevent / Protect Prepare Mitigate Recover	M	X	X	X	X	X

2020 Action Item	Mitigation Action by Jurisdiction	Hazard Addressed				Timeline ST – Short Term (≤ 5 yr.) LT – Long Term (>5 yr.) Ongoing	County Lead	Jurisdiction Lead(s) / Primary Partner(s)	Potential Funding Opportunities	Mitigation Action Description and Implementation Strategy (Chapter 6 page #)	Emergency Management Function	Prioritization – STAPLE+E	Plan Goals Addressed				
		Natural Hazards	Technological Hazards	Societal Hazards	Specific Hazard								Life & Property	Enhance Emergency Management	Economic Stability	Develop, Promote, Integrate Mitigation	Protect Natural Systems
14	Continue stormwater management planning and ordinances to improve existing storm capacity and drainage systems. Utilize watershed studies and mapping to identify and prioritize mitigation needs in each watershed. Potential projects include retention basins improvement, culvert enlargement/improvement, stream maintenance, erosion/sedimentation control, water quality assessment, watershed and flood risks education, infrastructure maintenance, agency coordination, property/infrastructure protection, roadway elevations correction, and data for improved emergency planning/response.	X	X		Flooding and Infrastructure Failure	LT - Ongoing	Will County Dept. of Highways, Will County Land Use, & Will County SMPC	Will County Dept. of Highways, Will County Land Use, Will County SMPC, Will County EMA, & Jurisdictional Planning Departments & Public Works See p. 4-69 to 4-72 for watershed jurisdictions	FEMA - HMGP, US EPA, Operating Budget	6-22	Prevent / Protect Prepare Mitigate	H	X			X	X
15	Complete and maintain maps of shallow flooding and urban ponding areas to prioritize stormwater infrastructure improvements.	X			Flooding	ST	Will County Land Use & Will County SMPC	Will County Land Use & Will County SMPC	Operating Budget	6-24	Prevent / Protect Prepare Mitigate	H	X			X	X
16	Increase open space and conservation easements, as well as incorporate natural mitigation features, in high flood hazard areas throughout the County.	X			Attention to flooding	Ongoing	Will County Land Use	Will County Land Use & Jurisdictional Staff See p. 4-69 to 4-72 for watershed jurisdictions	Federal Clean Water Act 319 funds, FEMA – HMGP & PDM, Private Developer Incentive Programs	6-25	Prevent / Protect Prepare Mitigate	M	X			X	X

2020 Action Item	Mitigation Action by Jurisdiction	Hazard Addressed				Timeline ST – Short Term (≤ 5 yr.) LT – Long Term (>5 yr.) Ongoing	County Lead	Jurisdiction Lead(s) / Primary Partner(s)	Potential Funding Opportunities	Mitigation Action Description and Implementation Strategy (Chapter 6 page #)	Emergency Management Function	Prioritization – STAPLE+E	Plan Goals Addressed				
		Natural Hazards	Technological Hazards	Societal Hazards	Specific Hazard								Life & Property	Enhance Emergency Management	Economic Stability	Develop, Promote, Integrate Mitigation	Protect Natural Systems
17	Continue to capitalize on opportunities to acquire, relocate, or elevate flood prone properties.	X			Flooding	LT - Ongoing	Will County Land Use & Will County SMPC	Will County Land Use, Will County SMPC, & Affected Jurisdictional Staff See p. 4-69 to 4-72 for watershed jurisdictions	FEMA – HMGP. Army Corp of Eng.	6-27	Prevent / Protect Prepare Mitigate	M	X		X	X	X
18	Expand and improve existing flood warning system capability and integrate it with a county-wide emergency communication strategy.	X			Flooding	LT	Will County EMA	Will County EMA, Will Count SMPC, & Jurisdictional EMAs	DHS – EMPG IEMA	6-28	Prepare Respond	H	X	X		X	
19	Utilize inventory of non-federal dams/levees subject to high and significant hazard to determine current status and to notify owners of any deficiencies. Provide non-compliant owners with direction on complying with state planning and inspection requirements.	X	X		Dams & Flooding	LT	Will County EMA & Will County Land Use	Will County EMA, Will County Land Use, & Dam/Levee Owners	Operating Budget	6-29	Prevent / Protect Prepare Mitigate	M	X	X		X	
20	Encourage & support shelters for all types of hazards in public spaces and high risk locations.	X			Tornado	LT - Ongoing	Will County EMA	Will County EMA, Will County Building & Zoning, & Jurisdictional EMAs & Staff	FEMA – HMGP Operating Budgets	6-30	Prevent / Protect Prepare Mitigate	M	X			X	X

2020 Action Item	Mitigation Action by Jurisdiction	Hazard Addressed				Timeline ST – Short Term (≤ 5 yr.) LT – Long Term (>5 yr.) Ongoing	County Lead	Jurisdiction Lead(s) / Primary Partner(s)	Potential Funding Opportunities	Mitigation Action Description and Implementation Strategy (Chapter 6 page #)	Emergency Management Function	Prioritization – STAPLE+E	Plan Goals Addressed				
		Natural Hazards	Technological Hazards	Societal Hazards	Specific Hazard								Life & Property	Enhance Emergency Management	Economic Stability	Develop, Promote, Integrate Mitigation	Protect Natural Systems
21	Target regulatory, development, and preparedness efforts of Tier II hazardous material facilities and coordinate the development and maintenance of applicable community and facility emergency plans.		X		Hazardous Materials Release	LT - Ongoing	Will County EMA	Will County EMA, Will County ELPC, & Jurisdictional EMAs	Illinois EPA, US EPA Operating Budget, & Private Funds	6-31	Prevent / Protect Prepare Mitigate Respond Recover	H	X	X	X		
22	Encourage the development of continuity planning for both public and private sectors.	X	X	X	All	ST - Ongoing	Will County EMA & Center for Economic Development	Will County EMA, Jurisdictional EMAs & Staff, Center for Economic Development, Health Dept., Police, Fire, Park Districts, Libraries, & private sector entities	Operating Budget & Private Funds	6-32	Prevent / Protect Prepare Mitigate Respond Recover	M	X	X	X	X	
23	Develop a drought contingency plan that educates the public on water saving techniques and identifies criteria/triggers for drought related actions.	X			Drought	LT/ Ongoing	Will County EMA	Will County EMA & Jurisdictional EMAs & Staff, Fire, Forest Preserve, & Health Dept.	US Dept of Ag. & Operating Budget	6-33	Prevent / Protect Prepare Mitigate	M	X		X		X

2020 Action Item	Mitigation Action by Jurisdiction	Hazard Addressed				Timeline ST – Short Term (≤ 5 yr.) LT – Long Term (>5 yr.) Ongoing	County Lead	Jurisdiction Lead(s) / Primary Partner(s)	Potential Funding Opportunities	Mitigation Action Description and Implementation Strategy (Chapter 6 page #)	Emergency Management Function	Prioritization – STAPLE+E	Plan Goals Addressed				
		Natural Hazards	Technological Hazards	Societal Hazards	Specific Hazard								Life & Property	Enhance Emergency Management	Economic Stability	Develop, Promote, Integrate Mitigation	Protect Natural Systems
24	Develop a "Post-Disaster Recovery" ordinance and planning document to prepare a community for an orderly recovery operation.	X	X	X	All	ST	Will County EMA	Will County Board, Will County EMA, & Jurisdictional Boards/ Councils, EMAs, & Staff	DHS – EMPG & FEMA – HMGP, Operating Budget, IEMA 404 Mitigation Funds	6-34	Prepare Respond Recover	M	X	X	X	X	
25	Implement and conduct surveillance programs to identify or mitigate emerging public health emergencies. Develop partnerships and coordinate emergency plans with public and private sectors to effectively prepare, mitigate, respond, and recover from public health emergencies.	X	X	X	All	LT / Ongoing	WCHD	WCHD, Will County EMA, IDPH, & CDC	CDC, HRSA, Operating Budget	6-36	Prevent / Protect Prepare Mitigate Respond Recover	H	X	X	X	X	
26	Review and update Hazard Modeling (see Appendix B) conducted by The Polis Center for the original hazard mitigation plan.	X	X	X	Flood, Tornado, Earthquake, Hazardous Material Transportation , & Explosion	ST	WC EMA	WC Land Use & WC GIS	FEMA – HMGP and Operating Budgets	6-37	Prevent / Protect Prepare Mitigate Respond Recover		X		X	X	
27	Collaborate with local municipalities to develop and adopt a county-wide regional emergency operations plan.	X	X	X	All	ST	WC EMA	Jurisdictional EMAs	FEMA – HMGP and Operating Budgets	6-38	Prevent / Protect Prepare Mitigate Respond Recover		X		X	X	

CHAPTER 6: MITIGATION ACTIONS

Overview

The communities of Will County have numerous natural, technological, and societal hazards that pose a threat to the residents, businesses, infrastructure, property, and community assets. Identifying and prioritizing mitigation actions are the fundamental component of the *Will County County-Wide All Hazard Mitigation Plan*. Analyzing mitigation actions that address all or multiple hazards will improve the effectiveness and benefits. However, mitigation actions that address one hazard category (i.e., natural hazards) or a specific hazard (flooding) are also identified in this section.

A detailed cost-benefit analysis was not developed due to the open scope of many of these items. A cost-benefit analysis based on FEMA's methodology will be developed when the actions are implemented. The cost benefit analysis will help in prioritizing actions by describing appropriate benefit-cost methodologies for evaluating the effectiveness of a range of potential mitigation actions. As part of the plan update, FEMA's STAPLE+E (see FEMA's *Developing the Mitigation Plan*, FEMA 396-3, worksheet #4) tool was used to evaluate and prioritize the mitigation actions to ensure they are beneficial and cost efficient.

Mitigation actions are prioritized by whether they address the target hazards identified in the risk assessment or by the number of hazards that they address. To complement state initiatives, mitigation actions that address relative "National Priorities", as dictated by DHS doctrines, are also identified. The intent of this section is to identify actions that will accurately articulate the communities of Will County's needs for mitigating the consequence of high risk events and to improve emergency services.

Common Themes and Issues

Rapid Growth and Urban Sprawl

Between 1990 and 2010, Will County's population grew by 89% or over 320,000 people. Annual estimates and future projections show the growth trend will continue with population totals exceeding 1.0 million people. Currently, there is a population of 692,310, which makes Will County's population the fourth largest in the state and the 98th largest in the country.

The nation has witnessed an alarming increase in the number and severity of natural disasters. Experts believe that this trend will continue, with the potential of larger and more devastating disasters occurring. While geophysical disasters, such as earthquakes, have remained relatively constant in this country over the past 50 years, weather-related disasters have increased. In addition, our technological advances have further increased our vulnerabilities and potential for impacts are exacerbated with the growing presence of societal hazards such as terrorism.

Population growth and urbanization are major contributors to a community's increase in vulnerability, as well as exacerbating the potential impacts of a disaster. Urban sprawl and our desire to control our environment with engineered structures have led to more development in high-risk areas. This encouragement of developing high-risk areas, coupled with aging infrastructure, makes the potential impact of a disaster even greater. In addition, growing populations combined with increased risks require a greater need for identifying evacuation routes. Larger populations and a higher concentration of people living in urban areas will result in disasters that affect a larger number of individuals.

One of the Will County's larger risks is flooding. *No Adverse Impact Floodplain Management* is a managing principle being offered by the Association of State Floodplain Managers (ASFPM) that is easy to communicate and from a policy perspective tough to challenge. In essence, a no impact floodplain is one where the action of one property owner does not adversely impact the rights of other properties, as measured by increased flood peaks, flood stage, flood velocity, and erosion and sedimentation potentials. While Will County participates in the National Flood Insurance Program (NFIP) guidelines, many structures remain at risk simply because they are in the floodplain. By joining the Community Rating System (CRS), the county:

- Will reduce insurance premiums of those policy holders located in the floodplain.
- Would have a process in place to enable the county to tailor future development.
- Would better allow communities to incorporate environmental concerns into floodplain management.

Digital Flood Insurance Rate Maps (DFIRM) for Will County have been completed and provide a digital version of the FEMA flood insurance rate maps designed for use with digital mapping and analysis software. Flood Insurance Studies (FIS) date back to the late 1970's and early 1980's. As a result, the flood elevations associated with various flood events may not be indicative of expected flood inundation.

This discrepancy, coupled with the current increase in population density may now be resolved with the final DFIRMS.

Additionally, the location and conditions of Will County non-federal dams should be re-assessed since increased population density downstream of a dam and changes in flood plains identified in the new DFIRMS could result in increased destruction during a dam failure.

Local and Regional Partnerships

Like all emergency management functions, hazard mitigation begins at the local level. Individual properties and businesses can be the most vulnerable to hazards. Therefore, it is important for businesses, industry representatives, and local governments to form partnerships and work together to plan for disasters. This partnership would create a more thorough response and initiate the framework and resources needed for post-disaster recovery. Partnerships will bring mitigation into the forefront. Development of local and regional partnerships was identified by FEMA as a National Priority.

Crisis Management vs. Consequence Management

Since September 11th, there has been much debate on the roles and responsibilities of emergency management. Although there is a close relationship between crisis and consequence management, there are defined differences. Crisis management is predominately a law enforcement function and includes measures to identify, acquire, and plan the use of resources needed to anticipate, prevent and/or resolve a threat or act of terrorism. Consequence management is predominately an emergency management function and includes measures to protect public health and safety, restore essential government services, and provide emergency relief to governments, businesses, and individuals affected by the consequences of an event. For this reason, the hazard mitigation actions are focused on alleviating the impacts or consequences of a hazard, whether it is a natural or man-made event.

By definition, mitigation actions are:

> "Any *action* taken to eliminate or reduce long-term risk to human life and property from the *consequences* of natural and human-caused hazards. Such actions are taken to reduce the *consequences* of disasters and break the vicious cycle of destruction, repair, destruction, repair, etc. Mitigation actions are the foundation of a truly effective emergency management program."

Leveraging Available Funds

In recent years, the financial resources for mitigation activities have declined with the reduction in funds for the FEMA Pre-Disaster Mitigation Program (PDM) and the Hazard Mitigation Grant Program (HMGP). However, leveraging Department of Homeland Security (DHS) initiatives to address natural, technological, and societal hazards, as well as potentially funding mitigation actions, will ensure efficiency in public funding. The 2005 Emergency Management Performance Grants – Program Guidance and Application Kit states that "emergency managers at all levels should leverage all available funding and resources from multiple sources wherever possible…(and)…should not restrict their activities to only Federal funding to achieve the goals outlined within their strategies. Rather, special attention should be given to leveraging relevant funding sources and resources that support"… mitigation activities.[1]

FEMA administers three funding programs for mitigation planning and projects:

- The Hazard Mitigation Grant Program (HMPG) assists in long-term hazard mitigation plan and projects following a Presidential major disaster declaration.
- The Pre-Disaster Mitigation (PDM) program assists with hazard mitigation planning and projects on an annual basis.
- The Flood Mitigation Assistance (FMA) provides fund for planning and projects to reduce or eliminate risk of flood damage.

Additional sources include other Federal preparedness programs:

- Department of Health and Human Services (HHS) through CDC
- Department of Health and Human Services (HRSA)
- U.S. Food and Drug Administration
- Department of Agriculture (USDA)
- Department of Justice (DOJ
- Department of Transportation

[1] "The Subcommittee on Economic Development, Public Buildings, & Emergency Management Hearing on The National Preparedness System: What are we preparing for?" April 14, 2005. https://babel.hathitrust.org/cgi/pt?id=pst.000058149270&view=1up&seq=6

- DHS Science and Technology Directorate
- DHS Information Analysis and Infrastructure Protection Directorate
- Advisory Council on Historic Preservation
- National Endowment for the Humanities
- U.S. Department of Commerce
- U.S. Army Corps of Engineers (USACE)
- U.S. Department of Education
- U.S. Department of Energy (DOE)
- U.S. Department of Housing and Urban Development (HUD)
- U.S. Department of Labor
- U.S. Department of the Interior
- U.S. Department of Transportation (DOT)
- U.S. Environmental Protection Agency (EPA)
- Small Business Administration (SBA)

In addition to federal programs, State homeland security and preparedness programs and resources may be available to meet the objectives outlined in the *Will County County-Wide All Hazard Mitigation Plan*.

Regardless of the mitigation activities and the corresponding jurisdictions and potential funding mechanisms that have been identified, it is not the intent of this plan to convey any specific commitment or obligation to carry out a specific project. It is understood that the completion of mitigation actions identified in this plan are contingent upon further planning and review, specific endorsement or approval from appropriate agencies and governing bodies, and financial, technical, and other necessary resources.

Hazard Mitigation Actions and Implementation

Mitigation Action #1:	Revise and adopt the *Will County-Wide All Hazard Mitigation Plan* by resolution of the County Board, City Councils, Boards of Trustees, and other governing boards as appropriate. The municipal, fire protection districts, colleges, and other agencies' resolutions should adopt each action item that is pertinent to the community and assign a person responsible for it.
Goals Addressed:	Goal #1 - Protect and secure life and property. Goal #2 - Continue to improve and enhance county-wide emergency management programs and develop relationships county-wide. Goal #3 - Ensure economic stability, preserve cultural resources, and improve quality of life throughout Will County. Goal #4 - Develop, promote, and integrate mitigation actions. Goal #5 - Take advantage of opportunities offered by growth while also protecting natural systems and resources.
Problem/Opportunity:	Formal adoption of this *Plan* ensures that county and municipal staffs are authorized and instructed to implement its action items. Adoption is also a requirement for recognition of the *Plan* by mitigation funding programs and the Community Rating System.
Implementation Strategy:	Educate government officials and public on the importance of hazard mitigation and the benefits of having a Hazard Mitigation Plan. Gain public and political support to adopt the plan.
Jurisdictions:	County Board, Village Boards, City Councils, and Other Stakeholder Boards
Lead Agency:	Will County Emergency Management Agency (EMA)
Funding:	Operating Budget
Timeline:	Short-term (≤ 5 yr.)

Mitigation Action #2:	Ensure that plans maintained by the county and local jurisdictions are NIMS compliant and are regularly reviewed to confirm that the concept of emergency operations described in these plans provides a combined unity of effort among the respective jurisdictions, adjacent jurisdictions, and the State.
Goals Addressed:	Goal #1 - Protect and secure life and property. Goal #2 - Continue to improve and enhance county-wide emergency management programs and develop relationships county-wide. Goal #4 - Develop, promote, and integrate mitigation actions.
Problem/Opportunity:	Local emergency management agencies have worked tirelessly to secure the community and to keep up to date on revolving threats, as well as the evolution of emergency management. There have been significant changes within the field of emergency management following the events of September 11th and recent hurricanes/tornadoes, as well as the introduction of new directives, changes to the National Federal Response Plan, and the development of the National Incident Management System. It is essential to ensure that emergency management doctrine, operational systems, and programs at all levels of government within Will County are thorough and integrated.
Implementation Strategy:	Execute a gap analysis of emergency planning documents and operational systems throughout Will County at all levels of government. Develop a system to gather this information for evaluation. Identify needs and actions to ensure thoroughness and integration of emergency management operations and functions at all levels of government. For example, in order to be compliant with the National Response Plan, Will County EMA should develop a Recovery Operations Plan that addresses all hazards and integrates federal and state directives.
Jurisdictions:	Will County Board, Will County EMA, Municipal Staff, and other Stakeholder Boards
Lead Agency:	Will County Emergency Management Agency
Funding:	FEMA - Hazard Mitigation Grant Program (HMGP), Operating Budget
Timeline:	Long-term (> 5 yr.)/Ongoing

Mitigation Action #3:	Expand regional collaboration by developing outreach programs and coordinating with neighboring jurisdictions, regional partnerships, businesses, non-profit, and universities.
Goals Addressed:	Goal #1 - Protect and secure life and property. Goal #2 - Continue to improve and enhance county-wide emergency management programs and develop relationships county-wide. Goal #3 - Ensure economic stability, preserve cultural resources, and improve quality of life throughout Will County. Goal #4 - Develop, promote, and integrate mitigation actions. Goal #5 - Take advantage of opportunities offered by growth while also protecting natural systems and resources.
Problem/Opportunity:	Major events will have cross-geographic consequences and impacts. There is a large need within emergency management for embracing partnerships across multiple jurisdictions, regions, and States in building capabilities cooperatively. Successful regional collaboration would allow for multi-jurisdictional and multi-disciplinary approach to increase efficiency and leverage local and regional capabilities.
Implementation Strategy:	Formalize, update, and expand mutual aid agreements with surrounding communities, regional partnerships, and other organizations for the purposes of sharing equipment, personnel, and facilities during an emergency. Exercise the execution of mutual aid agreements to identify challenges and familiarize officials with regional resources. Coordinate preparedness assistance expenditures and planning efforts on a regional basis to avoid duplicative or inconsistent investments.
Jurisdictions:	Will County EMA and Jurisdictional EMAs
Lead Agency:	Will County Emergency Management Agency
Funding:	Operating Budget, Private Funds
Timeline:	Ongoing

Mitigation Action #4:	Incorporate risk assessment and hazard mitigation principles into comprehensive planning efforts, programs, and projects in order to secure communities from all hazards.
Goals Addressed:	Goal #1 - Protect and secure life and property. Goal #2 - Continue to improve and enhance county-wide emergency management programs and develop relationships county-wide. Goal #4 - Develop, promote, and integrate mitigation actions. Goal #5 - Take advantage of opportunities offered by growth while also protecting natural systems and resources.
Problem/Opportunity:	Will County has been one of the nation's fastest growing communities. Population growth and urbanization are major contributors to a community's increase in vulnerability, as well as exacerbates the potential impacts of a disaster. Urban sprawl and our desire to control our environment with engineered structures have led to more development in high-risk areas.
Implementation Strategy:	Support, promote, and expand the development of the Hazard Mitigation Steering Committee into a permanent component throughout the County. Implement annual workshops and roundtables to educate others on the need for and benefits of mitigation, identify opportunities, and integrate developments into revisions of the All Hazard Mitigation Plan along with local plans and ordinances.
Jurisdictions:	Will County Boards, Will County EMA, Will County Stormwater Management Planning Committee, Will County Land Use, Local Municipal Boards/Councils and Staff, and Chambers of Commerce
Lead:	Will County EMA
Funding:	Operating Budget
Timeline:	Ongoing

Mitigation Action #5: Expand the county-wide public awareness and education programs and promote the understanding of each community's risks, vulnerabilities, what to do during and after a disaster, and how to mitigate the effects of disasters.

Goals Addressed:

Goal #1 - Protect and secure life and property.

Goal #2 - Continue to improve and enhance county-wide emergency management programs and develop relationships county-wide.

Goal #3 - Ensure economic stability, preserve cultural resources, and improve quality of life throughout Will County.

Goal #4 - Develop, promote, and integrate mitigation actions.

Problem/Opportunity: When a disaster occurs, it affects everyone living in the community. Therefore, it is essential to ensure public awareness of the community's threats and what they can do to prepare and measures they can take to reduce the consequences of a disaster. During and after a hazard event, emergency responders may be either overwhelmed with emergency calls or unable to access some residential areas. It is important that individual households are prepared for a period of self-sufficiency while responders deal with more immediate and life-threatening situations. Disasters also open a window of opportunity following a disastrous event of local, national, or international significance in which citizens will take action to improve their own safety and preparedness. This strategy supports response and recovery.

Implementation Strategy: Evaluate existing public education efforts and identify opportunities to expand or develop new programs that present the risks that face the community and measures they can take to prepare and mitigate. Leverage existing forums such as public meetings, universities, workshops, public radio, podcasts, and social media to deliver these programs.

Following a disaster, provide rapid information to the public on disaster preparedness and mitigation measures. Follow up with sustained education campaign for the following two months.

- Develop and index a mitigation/preparedness packet for the public and for the media to have ready for each type of hazard.
- Develop customized recovery packets for each hazard to have ready for the public and media when a disaster occurs.

- Draft a campaign strategy to deploy the information strategically.
- Expand current advertising/public service announcements (PSA) outlet information.
- Promote the development of Citizen Corps Councils and Community Emergency Response Teams (CERT).
- Utilize the latest communication technology for public education outreach.

Jurisdictions:	Will County EMA, Jurisdictional EMAs, and Local Governments
Lead Agency:	Will County EMA
Funding:	Operating Budget, free communication platforms, and social media
Timeline:	Ongoing

Mitigation Action #6:	Continue to strengthen infrastructure, build redundancies, and implement contingency plans for vulnerable populations and essential services and networks.
Goals Addressed:	Goal #1 - Protect and secure life and property. Goal #3 - Ensure economic stability, preserve cultural resources, and improve quality of life throughout Will County. Goal #4 - Develop, promote, and integrate mitigation actions.
Problem/Opportunity:	Hazard events can cause power outages, obstruct roads, and disrupt essential services. This can have a devastating impact on isolated communities and select populations.
Implementation Strategy:	Continue an analysis utilizing GIS applications to identify areas that lack redundancy. Focus should be given on essential utility systems, road networks, and critical facility service areas. Develop a system of priority routes, facilities, and systems for hazard events and their associated needs. Work with other departments and work with utilities in order to identify needs and actions to cost effectively implement redundancies.
Jurisdictions:	WC Department of Highways, WC Land Use, Jurisdictional Public Works Departments, local utilities, IDOT, and ISP
Lead Agency:	Will County EMA, Will County Department of Highways, and Will County Land Use
Funding:	Operating and capital improvement budgets, grants, and private/public partnerships
Timeline:	Long-term (> 5 yr.)/Ongoing

Mitigation Action #7:	Continue to support the delivery of existing and free training platforms to educate officials, critical personnel, first responders, and communities on risks, fundamental operations of emergency management, and mitigation for the purpose of improving community preparedness and advancement of professional development.
Goals Addressed:	Goal #2 - Continue to improve and enhance county-wide emergency management programs and develop relationships county-wide. Goal #3 - Ensure economic stability, preserve cultural resources, and improve quality of life throughout Will County. Goal #4 - Develop, promote, and integrate mitigation actions. Goal #5 - Take advantage of opportunities offered by growth while also protecting natural systems and resources.
Problem/Opportunity:	It is essential to have political and peer support prior to, during, and following a disaster by establishing, cultivating, and maintaining relationships throughout the county, between communities, local officials and department liaisons prior to an event. In addition, the field of Emergency Management has grown rapidly over the past few decades. The challenges and complexities of the relationship between our environment, global politics and their impacts on our infrastructure, economics, and sustainability have required the need for a vast array of specialty.
Implementation Strategy:	Continue county-wide emergency management workshops and training for communities, department liaisons, and local officials that focus on their community's risks, vulnerabilities, and opportunities to protect and mitigate. Also, encourage and support emergency management and other related professionals throughout the county to obtain higher education degrees, certifications, and membership in professional organizations.
Jurisdictions:	Will County EMA, Will County Stormwater Management Planning Committee, Will County Land Use, and Jurisdictional staff and EMAs
Lead Agency:	Will County EMA
Funding:	Collaboration between local colleges and universities, state, local funding, and private partnerships offering training
Timeline:	Ongoing

Mitigation Action #8: Identify critical facilities that are located within flood hazard areas and relocate them or incorporate mitigation retrofits to protect them from future floods.

Goals Addressed:

Goal #1 - Protect and secure life and property.

Goal #2 - Continue to improve and enhance county-wide emergency management programs and develop relationships county-wide.

Goal #3 - Ensure economic stability, preserve cultural resources, and improve quality of life throughout Will County.

Goal #4 - Develop, promote, and integrate mitigation actions.

Goal #5 - Take advantage of opportunities offered by growth while also protecting natural systems and resources.

Problem/Opportunity: The flood modeling conducted for this plan (see Appendix B) identified several fire stations and schools that were located within or near the 100 year floodplain. NFIP regulations encourage communities to have critical facilities outside of the 500 year floodplain. In addition, the Water Resource Ordinance for Unincorporated Will County requires that all critical facilities are located outside the 500 year floodplain.

FEMA now provides the Standard Digital Flood Insurance Rate Map (DFIRM) Database which is a digital version of the FEMA flood insurance rate map that is designed for use with digital mapping and analysis software. Will County received updated DFIRMs in 2019 which allows planners to more accurately identify critical facilities located in flood-prone areas.

The new DFIRMS now identify a large area of the City of Joliet's downtown within the 100-year floodplain. The City is actively working with the Army Corps of Engineers to raise lower existing ground elevations to mitigate the potential flooding problem.

Implementation Strategy: Utilizing the DFIRM database provided by FEMA, conduct a detailed study of each facility to evaluate the potential impacts to each facility, and identify mitigation options to protect it from future damages and to ensure operations during an event. Conduct a benefit-cost analysis and implement the best mitigation alternative.

Jurisdictions:	Will County GIS, Will County Land Use, and affected Jurisdictional/Municipal Staff
Lead Agency:	Will County Land Use
Funding:	FEMA - HMGP & Pre-Disaster Mitigation (PDM)
Timeline:	Long-term (> 5 yr.)/Ongoing

Mitigation Action #9:	Support the use, development, and implementation of Geographic Information Systems (GIS) throughout the County to track communities' vulnerability to hazards.
Goals Addressed:	Goal #1 - Protect and secure life and property. Goal #2 - Continue to improve and enhance county-wide emergency management programs and develop relationships county-wide. Goal #4 - Develop, promote, and integrate mitigation actions.
Problem/Opportunity:	Will County communities are increasingly incorporating geospatial technologies and data into their daily operations. Geospatial technologies and data have become a valued asset in preparedness, protection, response, and recovery emergency management operations. In the preparedness phase, emergency management planners, as well as responders, need current, accurate, and easily accessible information to ensure the readiness of teams to respond. The mapping and analysis of critical infrastructure vulnerabilities and public health surveillance capabilities is an important component of strategy development including response and recovery in order to provide a dynamic common operating picture, coordinate and track emergency assets, enhance capabilities, understand event impacts, accurately estimate damage, locate safety zones for quarantine or detention, and facilitate recovery. Through the mitigation planning process, the Will County communities have identified the benefit of integrating HAZUS technology and the benefits of robust, accurate, and detailed data.
Implementation Strategy:	Continue to encourage communities to invest in GIS technology by training staff, obtaining and updating detailed geospatial data, and incorporating GIS technology and modeling programs into community decisions. Data sharing agreements have been made with twenty-eight communities throughout Will County along with many other tax districts and agencies.
Jurisdictions:	Will County GIS and Jurisdictions with GIS
Lead Agency:	Will County GIS
Funding:	Operating Budget
Timeline:	Ongoing

Mitigation Action #10:	Maintain or amend, as needed, the county-wide floodplain ordinance.
Goals Addressed:	Goal #1 - Protect and secure life and property. Goal #4 - Develop, promote, and integrate mitigation actions. Goal #5 - Take advantage of opportunities offered by growth while also protecting natural systems and resources.
Problem/Opportunity:	A community's agreement to adopt and enforce floodplain management ordinances, particularly with respect to new construction is an important element in making flood insurance available to home and businesses owners. Currently over 20,000 communities voluntarily adopt and enforce local floodplain management ordinances that provide flood loss reduction building standards for new and existing development. Will County has adopted a Countywide Ordinance to incorporate more stringent regulations that can be used and adopted as a base ordinance for communities in Will County. Supporting the ordinance is the County's *Stormwater Management Plan* and *Technical Guidance Manual for County-Wide Stormwater Ordinance*.
Implementation Strategy:	Maintain or amend the ordinance as needed. All communities in Will County have adopted the county's ordinance or implemented more stringent measures.
Jurisdictions:	Will County Board, Will County Stormwater Management Planning Committee, and all Municipal Boards/Councils & Staff
Lead Agency:	Will County Land Use and Stormwater Management Planning Committee
Funding:	Operating Budget
Timeline:	Ongoing

Mitigation Action #11:	Participate in aspects of the Community Rating System to further reduce flood damage in the communities of Will County.
Goals Addressed:	Goal #1 - Protect and secure life and property. Goal #3 - Ensure economic stability, preserve cultural resources, and improve quality of life throughout Will County. Goal #4 - Develop, promote, and integrate mitigation actions. Goal #5 - Take advantage of opportunities offered by growth while also protecting natural systems and resources.
Problem/Opportunity:	Currently, the county and jurisdictions do not participate in the Community Rating System (CRS). The CRS is part of the National Flood Insurance Program and can provide discounts of up to 45% off flood insurance premiums for residents of communities that participate. Communities apply for a CRS classification and are given credit points that reflect the impact of their activities on reducing flood losses, insurance rating, and promoting awareness. CRS process includes ten steps: 1) organize, 2) involve the public, 3) coordinate with agencies and organizations, 4) assess the hazard, 5) evaluate the problem, 6) set goals, 7) review mitigation strategies, 8) draft action plan, 9) adopt the plan, 10) implement, evaluate, and revise.
Implementation Strategy:	Leverage the *Will County County-Wide All Hazard Mitigation Plan* to fulfill some of the requirements identified in the CRS process.
Jurisdictions:	Will County Stormwater Management Planning Committee, Will County Land Use, and Jurisdictional Staff
Lead Agency:	Will County Land Use
Funding:	Operating Budget
Timeline:	Ongoing

Mitigation Action #12: Integrate Flood Hazard Mapping Program updates with improved county-wide GIS capabilities.

Goals Addressed:

Goal #1 - Protect and secure life and property.

Goal #2 - Continue to improve and enhance county-wide emergency management programs and develop relationships county-wide.

Goal #3 - Ensure economic stability, preserve cultural resources, and improve quality of life throughout Will County.

Goal #4 - Develop, promote, and integrate mitigation actions.

Goal #5 - Take advantage of opportunities offered by growth while also protecting natural systems and resources.

Problem/Opportunity: Will County GIS Division is currently working closely with jurisdictions to improve GIS capabilities and develop measures to protect communities from flooding. County-wide GIS capabilities have been steadily increasing; however, there is a limitation in the amount of data available. The County would like to utilize the existing technology and to leverage FEMA's current Risk Map Program initiative to map flood hazards. The Risk Map Program will:

- Create new maps that take advantage of revised data and improved technologies for identifying flood hazards.
- Create up-to-date maps to support a flood insurance program that is more closely aligned with actual risk, encourage wise floodplain management, and increase the public's flood hazard awareness.
- Provide local communities and various stakeholders who desire more timely updates of floodplain maps and easier access to the data.
- Map Modernization is a cornerstone for helping communities to be better prepared for flood disasters. The NFIP currently serves 4.5 million policyholders and provides $650 billion in coverage.

Implementation Strategy: Maintain Data Sharing Agreements or Data Licensing Agreements between Will County GIS and participating jurisdictions and taxing/agency bodies

	throughout the county. Provide training to staff on the use of GIS technologies and supporting models.
Jurisdictions:	Will County GIS, Will County Stormwater Management Planning committee, and local Jurisdictions
Lead Agency:	Will County GIS and Stormwater Management Planning Committee
Funding:	Operating Budget
Timeline:	Ongoing

Mitigation Action #13:	Utilizing GIS, develop and maintain a county-wide database of flood controlled areas, purchased flood plain properties, and flood prone properties to be acquired.
Goals Addressed:	Goal #1 - Protect and secure life and property. Goal #2 - Continue to improve and enhance county-wide emergency management programs and develop relationships county-wide. Goal #3 - Ensure economic stability, preserve cultural resources, and improve quality of life throughout Will County. Goal #4 - Develop, promote, and integrate mitigation actions. Goal #5 - Take advantage of opportunities offered by growth while also protecting natural systems and resources.
Problem/Opportunity:	As budgets shrink and the need grows for managing mitigation and recovery projects within rapidly growing communities, efficiency in managing information on flood prone areas is essential. GIS provides management of data and mapping capabilities that allows analysis of the information for planning, mitigation, and recovery purposes. Mitigation funding of approximately $10.6 million has been spent in securing repetitive loss properties in Will County from the 1996 and 2008 floods. Data on flood controlled areas, previously purchased flood plain properties, and flood prone properties to be purchased can be integrated into useable formats for planners. This will improve efficiency in flood plain management projects and maximize limited budgets.
Implementation Strategy:	Use improved GIS capabilities and completed DFIRMs for Will County to integrate flood plain data on flood controlled areas, purchased flood plain properties, and flood prone properties to be acquired. This will allow planners to be more efficient in data analysis and budgeting for planning, mitigation, and recovery projects.
Jurisdictions:	Will County GIS and Stormwater Management Planning Committee
Lead Agency:	Will County GIS and Stormwater Management Planning Committee
Funding:	Operating Budget
Timeline:	Long-term (> 5 yr.)/Ongoing

Mitigation Action #14: Continue stormwater management planning and ordinances to improve existing storm capacity and drainage systems. Utilize watershed studies and mapping to identify and prioritize mitigation needs in each watershed. Potential projects include retention basins improvement, culvert enlargement/improvement, stream maintenance, erosion/sedimentation control, water quality assessment, watershed and flood risks education, infrastructure maintenance, agency coordination, property/infrastructure protection, roadway elevations correction, and data for improved emergency planning/response.

Goals Addressed:

Goal #1 - Protect and secure life and property.

Goal #4 - Develop, promote, and integrate mitigation actions.

Goal #5 - Take advantage of opportunities offered by growth while also protecting natural systems and resources.

Problem/Opportunity: Current watershed concerns have been identified through existing studies, community recommendations, and past flood incident data. There is a concern that some of the drainage systems throughout the county are undersized due to the rapid development within the county from rural farm fields to suburbanized communities. As the county developed, farm field tiles that once controlled flooding were abandoned as developments were built on neighboring land. Growing communities increase the need for effective stream maintenance, proper sizing of retention basins and culverts, erosion/sedimentation control, and protection of property and infrastructure from flooding.

Watershed studies would assist the WCSMPC to identify, prioritize, and address flooding issues; thus, these studies would provide a cost-effective approach to addressing existing and future flood problems. Staffing and funding are obstacles for the development of the studies and implementing recommended flood control measures.

Implementation Strategy: Utilize Will County Stormwater Plan and Technical Guidance to:

- Employ studies by a licensed professional engineer to re-evaluate watersheds and determine the true flood areas and issues causing flooding.
- Assess problematic areas where field tiles were once the primary method of flood control.

- Perform an enhancement capability assessment of the stormwater facility to handle the increase of flood waters.
- Have the stormwater facilities fixed or re-sized to the appropriate capacity.
- Address erosion and sedimentation control issues.
- Identify and address infrastructure maintenance issues.
- Coordinate flood projects with neighboring counties where watersheds cross jurisdictions.
- Continue education of public on watershed and flood risk issues
- Review available data to improve emergency planning and response.

Jurisdictions:	Will County Land Use Department, Will County Stormwater Management Planning Committee, Will County Department of Highways, Will County EMA, and Jurisdictional Planning Departments and Public Works (see pages 4-110 to 4-118 for watershed concerns and specific municipalities in watersheds)
Lead Agency:	Will County Land Use Department, Will County Stormwater Management Planning Committee, and Will County Department of Highways
Funding:	FEMA - HMGP, US EPA Local - Operating Budget
Timeline:	Long-term (> 5 yr.)/Ongoing

Mitigation Action #15:	Complete and maintain maps of shallow flooding and urban ponding areas to prioritize stormwater infrastructure improvements.
Goals Addressed:	Goal #1 - Protect and secure life and property. Goal #4 - Develop, promote, and integrate mitigation actions. Goal #5 - Take advantage of opportunities offered by growth while also protecting natural systems and resources.
Problem/Opportunity:	Some areas throughout the county are subject to flooding that occurs as a result of poor drainage rather than proximity to a river or stream. Major developments have been constructed in these shallow flooding areas and more are proposed. Flooding can occur well outside of mapped floodplains and the number of flood insurance policy holders outside of identified flood-prone areas demonstrates the need to map shallow flooding areas. Identifying shallow flooding areas would help reduce future problems and future surprises to residents, and provide a prioritized list of needed capital improvements. Tools, such as GIS and Light Detection and Ranging (LIDAR) maps, are available to identify shallow flooding areas.
Implementation Strategy:	Identify past occurrences of shallow flooding, urban ponding, and high ground water areas using LIDAR and county-wide aerial photography of historical floods. Incorporate these into flood maps to monitor and prioritize infrastructure improvements throughout the county.
Jurisdictions:	Will County Land Use and Will County Stormwater Management Planning Committee
Lead Agency:	Will County Land Use and Stormwater Management Planning Committee
Funding:	Operating Budget
Timeline:	Short-term (≤ 5 yr.)

Mitigation Action #16: Increase open space and conservation easements, as well as incorporate natural features, in high flood hazard areas throughout the county.

Goals Addressed:

Goal #1 - Protect and secure life and property.

Goal #4 - Develop, promote, and integrate mitigation actions.

Goal #5 - Take advantage of opportunities offered by growth while also protecting natural systems and resources.

Problem/Opportunity: Extensive new development could greatly alter the natural hydrology throughout the county. Each new development adds impervious surfaces, such as sidewalks, driveways, foundations or others. This means that, because less water filters through the ground and into the water table, rain drains more rapidly into stormwater management systems, streams and rivers. This situation increases the risk of flooding, adds sediment and toxins to run off, and slows aquifer replenishment. Furthermore, the cumulative affect of rapid growth throughout the county degrades environmental quality and increases the risk of flooding.

Low impact development (LID) has the potential to alleviate these adverse impacts through the creation of appropriately placed green space, landscaping, grading, streetscapes, roads and parking lots. LID can achieve multifunctional objectives and help to reduce stormwater impacts, and provide and maintain the beneficial hydrologic functions of a natural drainage system.

Implementation Strategy: Coordinate the existing *Will County Stormwater Management Plan* into overall flood hazard mitigation activities. This could achieve several objectives:

- Ensure coordination of other planning efforts with those of the Will County Stormwater Management Plan Committee.
- Ensure coordination with the Will County Stormwater Management Planning Committee on issues pertaining to floodplain development, stormwater control, and other related matters.
- Ensure a wider understanding of and adherence to the Stormwater Management Plan and Stormwater Ordinance.

Coordinate and implement efforts to increase open space in high hazard areas throughout the county with the Will County Land Use Plan. The use of LID could achieve several objectives:

- LID measures can result in no net increase in run off thereby maintaining the current flood risk without affecting development potential.
- It recharges the aquifer. Groundwater supplies at least 95% of the drinking water supply and water critical for commerce in Will County.
- It supports the hydrologic regime, in turn supporting a healthy ecosystem and demanding less cost for maintenance and energy.
- It results in open space.

Develop county/jurisdiction regulations and guidelines that implement LID objectives to:

- Minimize impacts to the extent practicable by reducing imperviousness, conserving natural resources and ecosystems, maintaining natural drainage courses, reducing the use of pipes and minimizing clearing/grading.
- Recreate detention and retention storage dispersed and evenly distributed throughout a site with the use of open swales, fatter slopes, depressions, storage rain gardens (bio-retention), water use (rain barrels) and others.
- Maintain the predevelopment time of concentration by strategically routing flows to maintain travel time.
- Provide effective public education and socioeconomic incentives to ensure property owners use effective pollution prevention measures and maintain management measures.

Jurisdictions:	Will County Land Use and local Jurisdictional Staff (Aurora, Bolingbrook, Braceville, Channahon, Crest Hill, Diamond, Elwood, Frankfort, Homer Glen, Joliet, Lemont, Lemont, Lockport, Manhattan, Minooka, Naperville, New Lenox, Park Forest, Plainfield, Rockdale, Romeoville, Shorewood, Steger, Wilmington, Woodridge)
Lead Agency:	Will County Land Use
Funding:	Federal Clean Water Act Section 319 Funds, FEMA – HMGP & PDM, county/jurisdiction operating budgets, private developers incentive programs
Timeline:	Ongoing

Mitigation Action #17:	Continue to capitalize on opportunities to acquire, relocate, or elevate flood prone properties.
Goals Addressed:	Goal #1 - Protect and secure life and property. Goal #3 - Ensure economic stability, preserve cultural resources, and improve quality of life throughout Will County. Goal #4 - Develop, promote, and integrate mitigation actions. Goal #5 - Take advantage of opportunities offered by growth while also protecting natural systems and resources.
Problem/Opportunity:	Use current FEMA DFIRMS to overlay onto aerial photographs identifying structures that are within a flood zone and providing information for mitigation opportunities.
Implementation Strategy:	Identify structures within the flood zones and evaluate these locations for accuracy. Often flood maps do not reflect changes of the site due to new development, new elevations caused by placed fill, or flood control and stormwater infrastructure. Compare the findings of the strategy above to existing inventory of repetitive loss structures. Educate the public of this risk and promote potential opportunities to mitigate such as buy-out programs, relocation, or elevation.
Jurisdictions:	Will County Land Use, Will County Stormwater Management Planning Committee, and local Jurisdictions in the Des Plaines River, DuPage River, and Kankakee River Watersheds (see pages 4-110 to 4-118 for municipalities within those watersheds).
Lead Agency:	Will County Land Use and Stormwater Management Planning Committee
Funding:	FEMA - HMGP and Army Corps of Engineers
Timeline:	Long-term (> 5 yr.)/Ongoing

Mitigation Action #18:	Expand and improve existing flood warning system capability and integrate it with a county-wide emergency communication strategy.
Goals Addressed:	Goal #1 - Protect and secure life and property. Goal #2 - Continue to improve and enhance county-wide emergency management programs and develop relationships county-wide. Goal #4 - Develop, promote, and integrate mitigation actions.
Problem/Opportunity:	Will County has improved its flood monitoring resources to assist in notifying communities quickly and accurately of a flood threat. A flood warning system may consist of people or machines monitoring water level with stream gauges. Although a flood warning system does not provide long term damage reduction, it can alleviate health and safety risk by providing citizens time to remove belongings that could be damaged. Additionally, Will County has successfully issued approximately 800 NOAA weather radios throughout the county as part of improving the emergency communication system.
Implementation Strategy:	Continue to expand flood warning systems that monitor water levels of rivers, streams, creeks, and other bodies of water that threaten properties throughout the county and incorporate these systems into the county-wide emergency communication strategy.
Jurisdictions:	Will County EMA, Will County Stormwater Management Planning Committee, and Jurisdictional EMAs (Bolingbrook, Channahon, Frankfort, Homer Glen, Joliet, Lockport, Manhattan, Naperville, New Lenox, Romeoville, Shorewood, Wilmington)
Lead Agency:	Will County EMA
Funding:	DHS Emergency Performance Grants (EMPG), Illinois Emergency Management Agency (IEMA)
Timeline:	Long-term (> 5 yr.)

Mitigation Action #19:	Utilize inventory of non-federal dams/levees subject to high and significant hazard to determine current status and to notify owners of any deficiencies. Provide non-compliant owners with direction on complying with state planning and inspection requirements.
Goals Addressed:	Goal #1 - Protect and secure life and property. Goal #2 - Continue to improve and enhance county-wide emergency management programs and develop relationships county-wide. Goal #4 - Develop, promote, and integrate mitigation actions.
Problem/Opportunity:	Failure of significant and high hazard dams would cause significant loss of life and property damage. Determine the potential of the Will County Emergency Management Agency to flood.
Implementation Strategy:	Focus on category 1 (potential loss of life) and 2 (potential loss of infrastructure) dams/levees to determine current status of structure and emergency plan. Collaborate with the Illinois Department of Natural Resources – Office of Water Resources to determine inspection status of non-compliant dam owners.
Jurisdictions:	Will County EMA, Will County Land Use, and Dam/Levee Owners
Lead Agency:	Will County EMA and Land Use Department
Funding:	Operating Budget
Timeline:	Long-term (> 5 yr.)

Mitigation Action #20:	Encourage & support shelters for all types of hazards in public spaces and high risk locations.
Goals Addressed:	Goal #1 - Protect and secure life and property. Goal #4 - Develop, promote, and integrate mitigation actions. Goal #5 - Take advantage of opportunities offered by growth while also protecting natural systems and resources.
Problem/Opportunity:	The exponential growth throughout the county has resulted in the inadequacies of providing enough shelter space. Community recreational and residential parks, golf courses, and nature preserves do not have adequate shelters for residents during a severe storm or tornado. Furthermore, many of the public buildings, schools, and critical facilities were built before advancements in shelter construction. Temperature extremes occasionally require the need to provide heating or cooling centers for public use, particularly for populations most susceptible to temperature extremes. Mobile home parks and manufactured home communities are vulnerable to high winds and tornados.
Implementation Strategy:	Encourage and support the increase of shelters through the construction of dual use, multi-hazard shelters in the community's most popular parks, golf courses, and other public venues. Community facilities should incorporate technological advancements for sheltering purposes and double as heating and cooling centers during severe temperatures. Evaluate the existing shelters in public buildings county-wide to determine needs and improvements necessary to adequately shelter inhabitants during a storm or tornado.
Jurisdictions:	Will County EMA, Will County Building and Zoning, and Jurisdictional EMAs and Zoning Staff
Lead Agency:	Will County EMA
Funding:	FEMA - HMGP; county/jurisdiction operating budgets
Timeline:	Long-term (> 5 yr.)/Ongoing

Mitigation Action #21:	Target regulatory, development, and preparedness efforts of Tier II hazardous material facilities and coordinate the development and maintenance of applicable community and facility emergency plans.
Goals Addressed:	Goal #1 - Protect and secure life and property. Goal #2 - Continue to improve and enhance county-wide emergency management programs and develop relationships county-wide. Goal #3 - Ensure economic stability, preserve cultural resources, and improve quality of life throughout Will County.
Problem/Opportunity:	Will County has many oil refineries, chemical manufacturers, and other businesses that use hazardous materials in their processing. Chemicals and materials in use vary in toxicity. There are a large number of known facilities that store large quantities of reportable hazardous materials that are required for their industrial process. Communities should be aware of the hazardous materials being used for industrial processes within their jurisdiction. By working together, industry and communities can coordinate emergency plans to identify the location of facilities, transportation routes of hazardous materials, procedures for immediate response, a community-wide evacuation plan, a public notification plan, facility point of contacts, and a plan for exercising simulations.
Implementation Strategy:	Continue to support efforts to assess and monitor Tier II facility release contingency plans by using geospatial data to help manage information on Tier II facilities, on-site hazardous material types and quantities, site configuration, and compliance status. At least annually, support these facilities in emergency planning and information sharing by conducting a review. Incorporate Risk Management Plans developed by those facilities that are required by U.S. EPA regulations for sites that manufacture, store, or handle hazardous materials into the community's emergency plan to ensure the safety of the public.
Jurisdictions:	Will County EMA, Will County LEPC, and Jurisdictional EMAs
Lead Agency:	Will County EMA
Funding:	IEPA, US EPA, Operating Budget, and Private Funds
Timeline:	Long-term (> 5 yr.)/Ongoing

Mitigation Action #22:	Encourage the development of continuity planning for both public and private sectors.
Goals Addressed:	Goal #1 - Protect and secure life and property. Goal #2 - Continue to improve and enhance county-wide emergency management programs and develop relationships county-wide. Goal #3 - Ensure economic stability, preserve cultural resources, and improve quality of life throughout Will County. Goal #4 - Develop, promote, and integrate mitigation actions.
Problem/Opportunity:	Planning for continuity before an event and developing strong partnerships have enabled businesses to alleviate damage and to recover from disasters quickly and ensure economic stability throughout Will County and the region.
Implementation Strategy:	Execute a Continuity of Operations Plan for Will County to ensure that essential functions of Will County and its communities can be performed and are not interrupted during an emergency or disaster. The Continuity of Operations Plan will identify alternate facilities, delegations of authority, orders of succession, and notification and check-in procedures. Develop and/or support a business contingency organization, such as the Great Lakes Partnership. Secure chambers of commerce and business associations' support and identify potential business participants. Develop a forum to educate, provide technical assistance, and encourage development of business continuity plans.
Jurisdictions:	Will County EMA, Jurisdictional EMAs and Staff, as well as Police, Fire, Health, Park Districts, Libraries, and private sector entities.
Lead:	Will County EMA and Center for Economic Development
Funding:	Operating Budgets and Private Funds
Timeline:	Short-term (≤ 5 yr.)/Ongoing

Mitigation Action #23:	Develop a drought contingency plan that educates the public on water saving techniques and identifies criteria/triggers for drought related actions.
Goals Addressed:	Goal #1 - Protect and secure life and property. Goal #3 - Ensure economic stability, preserve cultural resources, and improve quality of life throughout Will County. Goal #5 - Take advantage of opportunities offered by growth while also protecting natural systems and resources.
Problem/Opportunity:	In the summer of 2005, Will County experienced a severe drought that created severe hardships on the farming community throughout the county. A drought contingency plan can help anticipate the needs and actions to take during future droughts. Additionally, public education on water saving techniques and identifying criteria/triggers for drought for implementing drought response measures can help minimize problems during droughts.
Implementation Strategy:	Leverage the experience of the 2005 drought to develop a county-wide drought contingency plan with fire prevention strategies and public education for future events.
Jurisdictions:	Will County EMA, Jurisdictional EMAs and Staff, Municipalities, Fire, Forest Preserve, and Health Department
Lead Agency:	Will County EMA
Funding:	US Department of Agriculture, Operating Budget, and disaster grants
Timeline:	Long-term (> 5 yr.)/Ongoing

Mitigation Action #24: Develop a "Post-Disaster Recovery" ordinance and planning document to prepare communities for an orderly recovery operation.

Goals Addressed:

Goal #1 - Protect and secure life and property.

Goal #2 - Continue to improve and enhance county-wide emergency management programs and develop relationships county-wide.

Goal #3 - Ensure economic stability, preserve cultural resources, and improve quality of life throughout Will County.

Goal #4 - Develop, promote, and integrate mitigation actions.

Problem/Opportunity: Post-disaster recovery is an arduous process that can have a heavy toll on communities. Disasters can often destroy the community's fundamental markets. Disasters can also create a severe loss of income, unemployment, a disruption of life, a reduction in property values, and cause communities to fail. A quick and orderly recovery process is essential to ensure a community's future.

A post disaster recovery ordinance regulates repair activity, generally depending on property location. It prepares a community to respond to a disaster in an orderly fashion by requiring citizens to: 1) obtain permits for repairs, 2) refrain from making repairs, or 3) make repairs using standard methods.

A post disaster recovery plan outlines the roles and responsibilities during the recovery efforts, identifies needs for debris management operations, incorporates pre-identified mitigation measures, and integrates other mechanisms to adequately manage the local recovery efforts of a disaster.

Implementation Strategy: Educate public officials on the need for a "Post Disaster Recovery" ordinance by citing past examples of where lack of ordinances restricted recovery efforts and where ordinances expedited the recovery process.

Develop and pass a Post Disaster Recovery ordinance.

Develop a county-wide Post Disaster Recovery Plan that integrates other county-wide emergency planning doctrine.

Jurisdictions:	Will County Board, Will County EMA, and Jurisdictional Boards/Councils, EMAs and Staff
Lead Agency:	Will County EMA
Funding:	Operating budget, DHS – EMPG, FEMA – HMGP, and IEMA 404 Mitigation funds
Timeline:	Short-term (≤ 5 yr.)

Mitigation Action #25:	Implement and conduct surveillance programs to identify or mitigate emerging public health emergencies. Develop partnerships and coordinate emergency plans with public and private sectors to effectively prepare, mitigate, respond, and recover from public health emergencies.
Goals Addressed:	Goal #1 - Protect and secure life and property. Goal #2 - Continue to improve and enhance county-wide emergency management programs and develop relationships county-wide. Goal #3 - Ensure economic stability, preserve cultural resources, and improve quality of life throughout Will County. Goal #4 - Develop, promote, and integrate mitigation actions.
Problem/Opportunity:	If left unchecked, various diseases or environmental conditions can result in widespread illness and threats to life. Public health emergencies can occur as a result of natural, technological and societal hazards. Systems for surveillance and communication are required to identify public health emergencies and warn the public of potential threats to life. Along with surveillance, public health programs must be in place to prevent or mitigate occurrences. Partnerships with private and public sectors are necessary to coordinate plans, educate the public, and implement emergency plan strategies.
Implementation Strategy:	Maintain and enhance emergency plans that address public health hazards and partnerships with public and private sectors to implement emergency plans that safeguard lives and enhance healthy lifestyles.
Jurisdictions:	Will County Health Department, EMA, State Health Department (IDPH/CDC)
Lead Agency:	Will County Health Department
Funding:	CDC, HRSA, and Operating Budget
Timeline:	Long-term (> 5 yr.)/Ongoing

Mitigation Action #26:	Review and update Hazard Modeling (see Appendix B) conducted by The Polis Center.
Goals Addressed:	Goal #1 - Protect and secure life and property. Goal #3 - Ensure economic stability, preserve cultural resources, and improve quality of life throughout Will County. Goal #4 - Develop, promote, and integrate mitigation actions.
Problem/Opportunity:	Many changes within Will County have occurred since the original hazard mitigation plan was adopted by the county. Using HAZUS-MH, GIS, and other risk assessment tools, The Polis Center provided risk assessment for flood, tornado, earthquake, hazardous materials, and bombing in the original hazard mitigation plan for Will County. Since then, the county has grown in population, industry has increased, and intermodal transportation of raw materials and goods has flourished along with warehousing. This leads to a larger population to protect from natural hazards and an increase in serious transportation accidents and potential hazardous material releases. Updating the risk assessments conducted by The Polis Center would assist planners and responders in identifying any potential increases in the risks assessed in their studies to the county population.
Implementation Strategy:	Identify resources within the county that have appropriate assessment tools, provide staff with the necessary training to conduct the reassessments, and identify outside resources as needed to conduct an update of the original risk assessments provided by The Polis Center.
Jurisdictions:	Will County Emergency Management Agency, Will County Land Use, Will County GIS
Lead Agency:	Will County Emergency Management Agency
Funding:	FEMA – HMGP and Operating Budget
Timeline:	Short-term (≤ 5 yr.)

Mitigation Action #27:	Collaborate with local municipalities to develop and adopt a county-wide regional emergency operations plan.
Goals Addressed:	Goal #1 - Protect and secure life and property. Goal #2 - Continue to improve and enhance county-wide emergency management programs and develop relationships county-wide. Goal #3 - Ensure economic stability, preserve cultural resources, and improve quality of life throughout Will County.
Problem/Opportunity:	Many, particularly smaller local jurisdictions, struggle to develop and maintain local emergency operations plans for their communities. Issues include time, expertise, and resources that make it difficult for local jurisdictions to develop and maintain a comprehensive emergency operations plan. In the event of a widespread incident, coordinating county and local jurisdictions to respond to an incident can be cumbersome when each jurisdiction has different priorities, response procedures, and resources prohibiting smooth collaboration. If a county-wide regional emergency operations plan was developed, it would allow county and local jurisdictions to interact and collaborate in all phases of emergency management as an efficient and effective system.
Implementation Strategy:	Form a county and local jurisdiction coalition to develop a county-wide regional emergency operations plan that provides a comprehensive plan that is effectively useful at the local level and allows cohesive partnership in all phases of emergency management to address regional occurrences.
Jurisdictions:	Will County EMA and Jurisdictional EMAs
Lead Agency:	Will County EMA
Funding:	FEMA – HMGP and Operating Budgets
Timeline:	Short-term (≤ 5 yr.)

CHAPTER 7: MITIGATION PLAN MAINTENANCE

Will County and the participating jurisdictions and communities will ensure that goals, objectives, and action items described in this document will remain relevant by maintaining, monitoring, evaluating, and updating the *Will County County-Wide All Hazard Mitigation Plan*.

Monitoring, Evaluation, and Updating the Plan

To assure that the All Hazard Mitigation Plan continues to provide an appropriate path for risk reduction throughout the county, it is necessary to regularly evaluate and update it. A committee will be formed from Will County Departments and community partners to convene on an annual basis to determine the progress of the *Will County County-Wide All Hazard Mitigation Plan*. Will County EMA is responsible for contacting committee members and organizing the annual meeting. The committee will be responsible for:

- Re-assessing hazards and risks to ensure emerging hazards are identified and addressed.
- Annually reviewing each goal and objective to determine its relevance to the changing situation.
- Monitoring and evaluating the mitigation strategies in this plan to assure that the document reflects current hazard analyses, development trends, code changes, and risk analyses and perceptions.
- Assuring the appropriate implementation of the 5-year action plan described below. The committee will hear progress reports from the parties responsible for the various implementation actions to monitor progress.
- Creating future action plans and mitigation strategies. These should be carefully assessed and prioritized using FEMA's STAPLE+E. A benefit-cost analysis (BCA) developed by FEMA will be conducted for specific projects arising from the mitigation actions. More information about FEMA's BCA is provided in Appendix C.
- Assuring a continuing role for public comment and involvement as the mitigation plan evolves.
- Reassessing the plan in light of any major hazard event. The Committee will convene within 45 days of any major event to review all applicable data and to consider the risk assessment, plan goals, objectives, and action items given the effects of the hazard event. Applicable hazard-dependent action items, which are listed below, should be implemented at that time.
- Review the hazard mitigation plan in connection to other plans, projects, developments, and other significant initiatives.

- Coordinate with internal departments, neighboring municipalities, and local authorities to incorporate regional initiatives that transcend the boundaries of the county.
- Update the plan every five years and submit to IEMA for FEMA approval.

The Five-Year Action Plan

This section outlines the implementation agenda that the Hazard Mitigation Committee should follow for the five years following adoption of this plan.

The mitigation action items summarized in Chapter 5 from pages 5-17 through 5-24 have been identified based on input from the Committee and other participants. More information about each of the action items listed can be found in Chapter 6 which identifies the risks they address and their potential to reduce loss. The benefit to cost was not done for the mitigation strategies listed in this plan. Rather, this analysis using the Department of Homeland Security/Federal Emergency Management Agency (DHS/FEMA) approved Benefit Cost Methods shall be used at the time of a given strategy's development and implementation. The decision to do the benefit to cost analysis at the time of a strategy's development is due to the fact of the unknown variables for each listed strategy. The Hazard Mitigation Committee will consider the following an action plan for the 5-year planning cycle.

Criteria for Evaluation

In addition to implementing the action plan described above, the Hazard Mitigation Committee will be responsible for evaluating the plan. One of the first tasks of the committee will be to determine the criteria to be used for evaluation of the plan. Included among these criteria should be:

- Are the goals and objectives still relevant?
- Is the risk assessment still appropriate, or has the nature or magnitude of the hazard and/or vulnerability changed over time?
- Are current resources appropriate for implementing this plan?
- Have lead agencies participated as originally proposed?
- Have outcomes been adequate?
- What problems have occurred in the implementation process?
- Have members of the public been adequately involved in the process? Are their comments being heard?

Implementation through Existing Programs

The communities of Will County have recognized the importance of incorporating hazard mitigation practices within existing plans, projects, and programs. The Committee will strive to involve all jurisdictions and departments, as well as local non-participating jurisdictions and neighboring counties to find mitigation opportunities with existing or planned projects and programs. To execute this, Will County EMA will provide strategic outreach to coordinate activities and implement mitigation actions that meet the goals and objectives identified in this plan.

Some of the mitigation strategies suggested are more accurately defined as preparedness, response, and recovery actions. Although a hazard mitigation plan is to address mitigation actions, participating jurisdictions recognize the importance of integrating overlapping functions into all phases of emergency management. The preparedness, response, and recovery actions identified support the goals and objectives of this plan. Emergency management agencies throughout the county recognize that DHS/FEMA mitigation funds may not be used to fund these actions. However, these actions are considered important in achieving the overall goals and objectives of this plan.

The purpose of the *Will County County-wide All Hazard Mitigation Plan* is to provide a guide to protect the county's communities through eliminating or reducing risk from hazards and building resiliency within our communities to quickly respond and recover when hazards occur. DHS's National Preparedness Goal (NPG) lends itself the opportunity to be integrated into *Will County County-Wide All Hazard Mitigation Plan*. DHS's National Preparedness Goal:

> *A secure and resilient Nation with the capabilities required across the whole community to prevent, protect against, mitigate, respond to, and recover from the threats and hazards that pose the greatest risk.*[1]

The National Preparedness Goal is achieved through the use of these core capabilities that support the above mission to:

- Prevent, avoid, or stop a threatened or an actual act of terrorism.

[1] "National Preparedness Goal" September, 2015. Department of Homeland Security. Available from: https://www.fema.gov/media-library-data/1443799615171-2aae90be55041740f97e8532fc680d40/National_Preparedness_Goal_2nd_Edition.pdf

- Protect our citizens, residents, visitors, assets, systems, and networks against the greatest threats and hazards in a manner that allows our interests, aspirations, and way of life to thrive
- Mitigate the loss of life and property by lessening the impact of future disasters.
- Respond quickly to save lives, protect property and the environment, and meet basic human needs in the aftermath of an incident.
- Recovering through a focus on the timely restoration, strengthening, and revitalization of infrastructure, housing, and the economy, as well as the health, social, cultural, historic, and environmental fabric of communities affected by an incident.

Additionally, guidance for our local plan can be found in FEMA's mission – *helping people before, during, and after disaster*. Found in FEMA's strategic plan are these goals:

- Building a culture of preparedness
  - Incentivize investments that reduce risk, including pre-disaster mitigation, and reduce disaster costs at all levels.
  - Close the insurance gap
  - Help people prepare for disasters
  - Better learn from past disasters, improve continuously, and innovate
- Ready the nation for the catastrophic disasters
  - Organize the BEST (Build, Empower, Sustain, and Train) scalable and capable incident workforce
  - Enhance intergovernmental coordination through FEMA Integration Teams
  - Posture FEMA and the whole community to provide life-saving and life-sustaining commodities, equipment, and personnel from all available sources
  - Improve continuity and resilient communications capabilities[2]

Continued Public Involvement

Although the Disaster Mitigation Act of 2000 requires local governments to only address natural hazards, the county thought it was imperative to address all hazards, including technological and societal hazards. Despite the security issues, public involvement is critical to the success of any strategic planning process, including hazard mitigation. It is important for hazard mitigation plans to target concerns, comments, and

[2] "2018-2022 Strategic Plan: Helping People, Together", 2018. Federal Emergency Management Agency. Available from: https://www.fema.gov/sites/default/files/2020-03/fema-strategic-plan_2018-2022.pdf

perception of risk as factors in the creation of mitigation strategies. To facilitate the goal of continued public involvement in the planning process, the Committee will assure that the following steps are taken:

- The public will be directly involved in the update and review of the plan along with the All Hazard Mitigation Planning Committee.
- Copies of the plan will be catalogued and kept on hand at appropriate agencies throughout the county. Will County EMA will also post portions of the plan on Will County EMA maintained websites. Sensitive information on technological and political hazards will be "For Official Use Only – Not for Public Distribution".
- Will County EMA will initiate a forum to educate public officials, jurisdiction officials, and the public on hazard mitigation.
- A meeting with jurisdictions will be held annually to provide the public with a forum for discussing concerns, opinions, and ideas with the All Hazard Mitigation Steering Committee.

APPENDIX A

RESOLUTION OF ADOPTION

RESOLUTION OF ADOPTION

RESOLUTION

ADOPTING THE EMERGENCY MANAGEMENT
COUNTY-WIDE ALL HAZARD MITIGATION PLAN, NOVEMBER, 2020 EDITION

WHEREAS, The County of Will, in conjunction with its municipalities, desires to minimize the impacts caused by disasters; and,

WHEREAS, the process of identifying hazards, risks, and mitigation opportunities is an important part of the County's Emergency Management posture; and,

WHEREAS, County, municipal, and other governmental agencies and organizations have participated in this process in order to develop a County-wide All Hazard Mitigation Plan; and,

WHEREAS, the County of Will originally adopted an initial Plan in 2006; and,

WHEREAS, the Plan requires periodic review and revision in order to reflect the changing needs of the County and to ensure continued compliance with the Federal Disaster Mitigation Act of 2000; and,

WHEREAS, maintenance of the plan in accordance with Federal mitigation planning requirements will ensure that the County of Will and participating municipalities may remain eligible for Federal pre-disaster and post-disaster mitigation funds; and,

WHEREAS, municipalities in Will County that have participated in the development of the Plan and that adopt the Plan by municipal resolution may also fulfill their mitigation planning requirements. Now, therefore, be it

RESOLVED, that the County-wide All Hazard Mitigation Plan, November, 2020 Edition be adopted by the County of Will. And, be it further

RESOLVED, that this resolution be made part of the Plan.

Adopted by the Will County Board this XXth day of Month, 2021

Vote: Yes _____ No _____ Pass _____

(SEAL)

_____
Lauren Staley Ferry
Will County Clerk

Approved this _____ day of Month, 2020 _____
Denise Winfrey
Will County Executive

Fact Sheet

Adopting the Will County County-wide All Hazard Mitigation Plan

Adoption of Hazard Mitigation Plan

- The adoption of a hazard mitigation plan demonstrates a jurisdiction's commitment to reduce the vulnerability to future hazards.

The bottom line: Hazard mitigation strategies help us build safer, stronger, smarter, and more resilient communities better prepared to withstand future disasters.

Funding - *One of the most direct benefits and motivating factors for communities:*

- FEMA requires state, tribal, territorial, and local governments to develop/update and adopt hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance, including funding for mitigation projects.
    - Hazard Mitigation Grant Program
    - Pre-Disaster Mitigation
    - Flood Mitigation Assistance
- Allows communities to pre-identify risk reduction activities that can be partially or wholly funded when funds become available through existing mitigation grant programs, including but not limited to FEMA's Hazard Mitigation Assistance (HMA) programs, in addition to leveraging other financial assistance to support multi-objective projects.

Defining Hazard Mitigation Planning

- Process used by state and local leaders to understand risks from **hazards** and develop long-term strategies to reduce the impacts of disasters on people, property, and the environment.
- While **hazards** cannot be prevented from occurring, **mitigation** planning focuses on reducing the impact of such events when they do occur. This is achieved through risk analysis, identifying, evaluating, and prioritizing potential risk reduction measures, which results in information that provides a foundation for mitigation activities and policy alternatives that reduce risk.
- **Mitigation** strategies that are agreed upon by stakeholders and the public include actions taken in the form of projects that will substantially reduce or eliminate repetitive losses due to the occurrence of the same **hazard.**

Purpose

- **Hazard mitigation plans** are prepared and **adopted** by communities with the primary purpose of identifying, assessing, and reducing the long-term **risk** to life and property from **hazard** events.
- Effective **mitigation planning** can break the cycle of **disaster** damage, reconstruction, and repeated damage.

Adopting the Will County County-wide All Hazard Mitigation Plan

Importance of Hazard Mitigation Planning

- Reduces the time and cost of recovering from a **disaster**
- Helps **communities** become more sustainable and **disaster**-resistant by focusing efforts on the **hazards**, **disaster**-prone areas, and identifying appropriate **mitigation** actions
- Identifies cost-effective mitigation actions that focus resources on the greatest risks and vulnerabilities

OTHER BENEFITS INCLUDE:

Partnerships

- Builds partnerships by involving government, citizens, organizations, and businesses to more comprehensively address disaster risk reduction
- Develops strong partnerships between planners and emergency managers to fully integrate land use and hazard planning efforts

Communication/Education

- Increases education and awareness around natural hazards, their impacts, community vulnerabilities, as well as existing mitigation capabilities and activities
- Engages and communicates with the public, community leaders, and other stakeholders on the assessment and mitigation of known hazards
- Communicates local risk reduction priorities to state and federal officials
- Communicates priorities to potential funders

Cohesive Planning

Mitigation planning is most powerful when it is combined with other planning processes, regulations, policies, and decisions.

- Aligns risk reduction strategies with other State, Tribal, or community objectives
- Integrates planning efforts and risk reduction with other community planning efforts leading to efficiencies when implementing projects and making long-term planning more holistic
- Makes the hazard mitigation plan a meaningful planning document rather than a requirement that simply needs to be submitted to FEMA for approval

APPENDIX B

HAZARD MODELING

Will County Hazard Risk Assessment Overbank Flooding Results

Disclaimer:
The estimates of social and economic impacts contained in this report were produced using HAZUS loss estimation methodology software and which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific hazard. This analysis is intended to provide conceptual information that can be used to identify mitigation opportunities. These information.

January 6, 2006

Submitted to:
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The Polis Center
We bring things into perspective.℠

Overbank Flood Hazards

The HAZUS-MH Flood Model determines the flood risk to a community based on nationwide GIS data sets. The model allows users to characterize flood levels and estimate the expected amounts of damage to buildings and infrastructure as well as the amount of displaced population, shelter requirements, and a variety of other outputs. The FEMA Flood Insurance Rate Maps (FIRM) indicate that most of Will County's built environment is outside of the Base Flood Elevation area. The Base Flood Elevation (BFE) is defined as the area that has a 1% chance of flooding in any given year. Overbank flooding of Will County was modeled using FEMA's GIS-based HAZUS-MH risk assessment application. The flood hazard modeling was based on areas that are potentially vulnerable to flooding as indicated on the digital flood maps provided by Will County.

Review Existing Information

Existing maps were used to identify the areas of study. Will County has digitized copies of the hardcopy FEMA Flood Insurance Rate Maps (FIRMS). Hydrologic analysis was performed for all reaches identified in the Will County flood GIS data.

Analysis

The HAZUS-MH Flood model can be used in a variety of ways for the purpose of predicting flooding and assessing the impacts of that flooding. Model options range from having HAZUS perform all necessary hydrologic and hydraulic calculations based solely upon a user provided digital elevation model to integrating selected output from other flood models for the purpose of developing what are typically more accurate flood depth grids.

The analysis conducted for Will County used two different approaches that took advantage of the capabilities of the HAZUS model. In both cases, we studied the potential impacts of overbank flooding along the Calumet River which were based upon the Base Flood Elevation (BFE) defined on the flood maps for that area. The BFE is defined as the area that has a 1% chance of flooding in any given year. For the first type of analysis we applied a level 2 methodology which used discharges from the Will County FEMA Flood Insurance Study, Revised March 2003. This study utilized discharges for streams studied in detail.

For the second type of HAZUS-MH analysis, a Level I methodology was applied for the remaining flood prone stream segments. A Level I methodology performs the entire hydrologic and hydraulic analysis based upon a user provided digital elevation

model. For this project we used the elevation model obtained from Will County. This digital elevation model consists of elevation points at approximately 1 meter intervals.

Assumptions:

HAZUS generates a combination of site specific and aggregated loss estimates depending upon the analysis options that are selected and upon the input that is provided by the user. Aggregate inventory loss estimates – which include building stock analysis - are based upon the assumption that building stock is evenly distributed across census blocks. Therefore, it is possible that overestimates of damage will occur in some areas while underestimates will occur in other areas. With this in mind, total losses tend to be more reliable over larger geographic areas than for individual census blocks.

Site specific analysis is based upon loss estimations for individual structures. Analysis of site specific structures takes into account the depth of water in relation to the structure. It also takes into account the actual dollar exposure to the structure for the costs of building reconstruction, content, and inventory. However, damages are based upon the assumption that each structure falls into a structural class – for example, small versus large hospitals - and that structures in each class will respond in similar fashion to a specific depth of flooding. Site specific analysis is also based upon a point location rather than a polygon and therefore the model does not account for the percentage of a building that is inundated. These assumptions suggest that the loss estimates for site specific structures as well as for aggregate structural losses need to be viewed as approximations of losses that are subject to considerable variability rather than as exact engineering estimates of losses to individual structures.

Results

The total economic loss is included in Table 1 and depicted by census block in Figures 1 and 2. The majority of the estimated building losses, 88%, were related to flooding of residential structures. As expected, the majority of the flood damage occurs in the western half of the county in the urban areas near the City of Joliet. Figures 3, 4, and 5 include five flood prone areas with orthophotos the HAZUS-MH calculated flood boundary (in red), Will County digitized flood map boundary (in blue), and census block outlines (in black) shown. These census blocks have the highest calculated economic losses. These 9 census blocks had estimated total losses exceeding $6 million each**.** The two census blocks in Figure 3 are located near Route 59 in the Village of Plainfield, and are impacted by flooding from the DuPage River. Figure 4 shows a census block in Joliet near the intersection of I-55 and Caton Farm. A number of the residential units are within both the digitized and calculated flood boundary areas, and are also impacted by flooding

from the DuPage River. Figure 5 census blocks are located on the banks of the Kankakee River NW of Lorenzo near County Line Road and Blodgett.

Table 1. Will County Total Economic Loss - 100-Year Flood

General Occupancy	Estimated Total Buildings	Total Damaged Buildings	Total Building Exposure X $1,000	Total Economic Loss X $1,000	Building Loss X $1,000
Commercial	1,004	6	$2,549,025	$100,806	$10,482
Education	20	0	$230,858	$14,191	$405
Government	37	0	$47,902	$32,956	$708
Industrial	246	0	$772,712	$10,495	$3,162
Religious/Non-Profit	36	0	$132,948	$3,608	$119
Residential	147,744	1,485	$27,315,338	$179,631	$114,572
Total	**149,087**	**1,491**	**$31,048,783**	**$341,687**	**$129,448**

Note: The estimated total buildings number is a calculated value based on total square footage of damage in each census block. For a given census block damage, the number of buildings can equal 0 and incur damage if the total square footage of damage does not add up to one equivalent structure.

***Building Losses (see above table)**
Building losses (structural and non structural repair costs for damaged and destroyed buildings)
Content Losses (Costs of damage to building contents)
Inventory losses (Losses of building inventory contents related to business activities)

***Total Economic Losses (see above table)**

Building losses
Wage losses (consistent with income loss)
Capital-related income losses (a measure of the loss of productivity, services or sales)
Rental income losses (to building owners)
Relocation expenses (for businesses and institutions)

Figure 1. Will County Total Economic Loss – 100-Year Flood

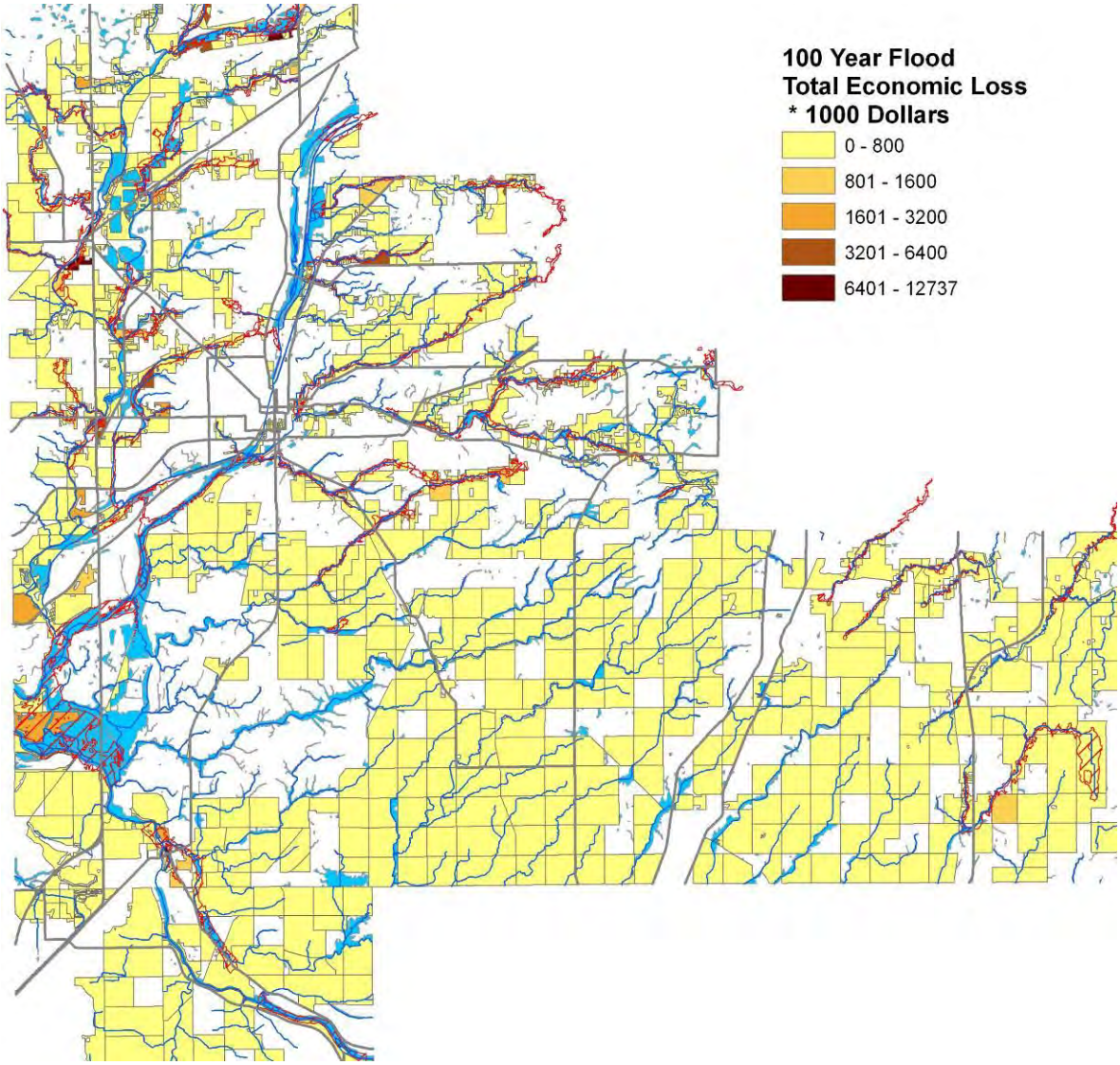


Figure 2. Will County Urban Areas (Joliet) Total Economic Loss - 100-Year Flood

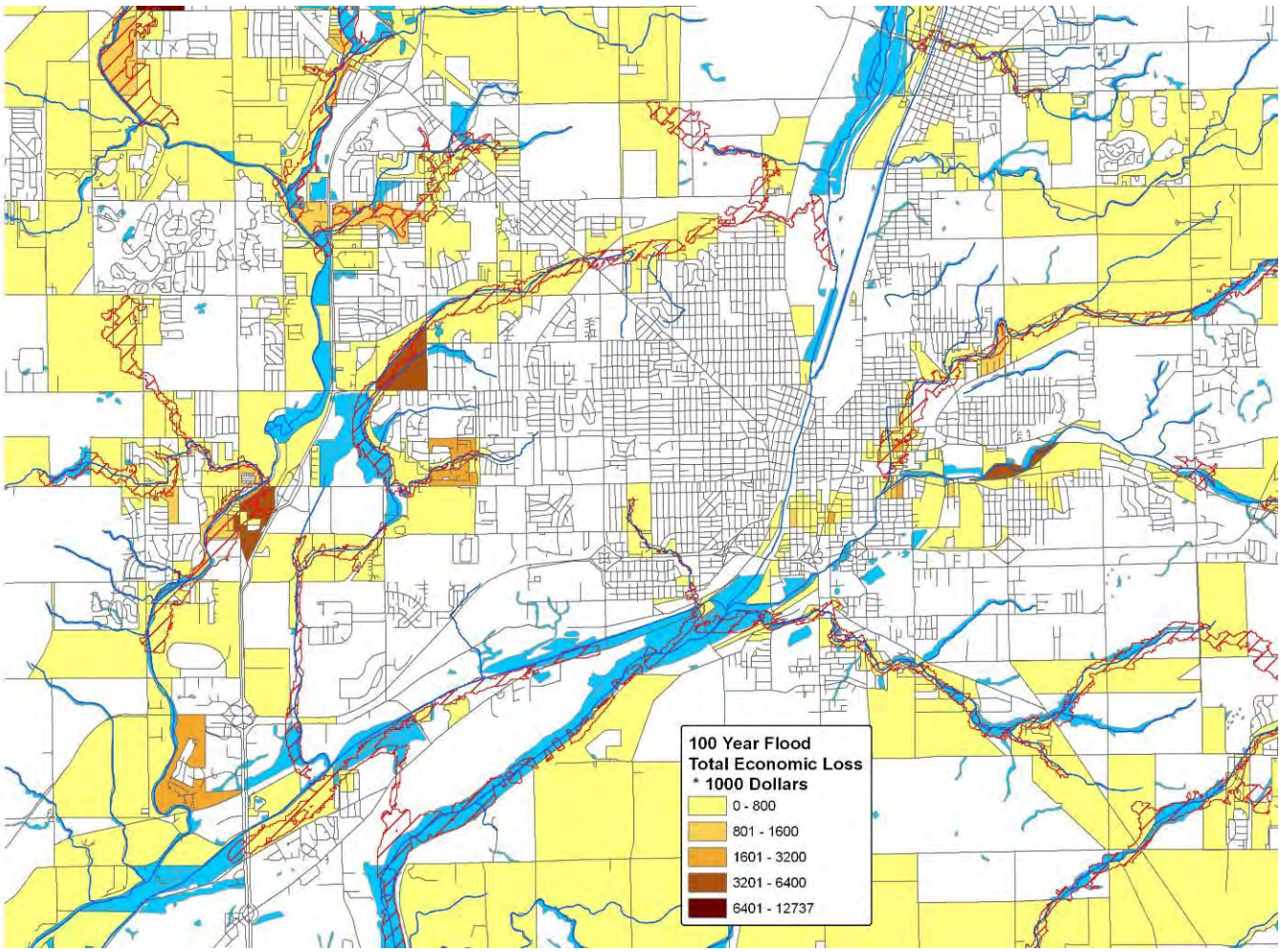


Figure 3. Detail census blocks (Plainfield) identified as having significant damage

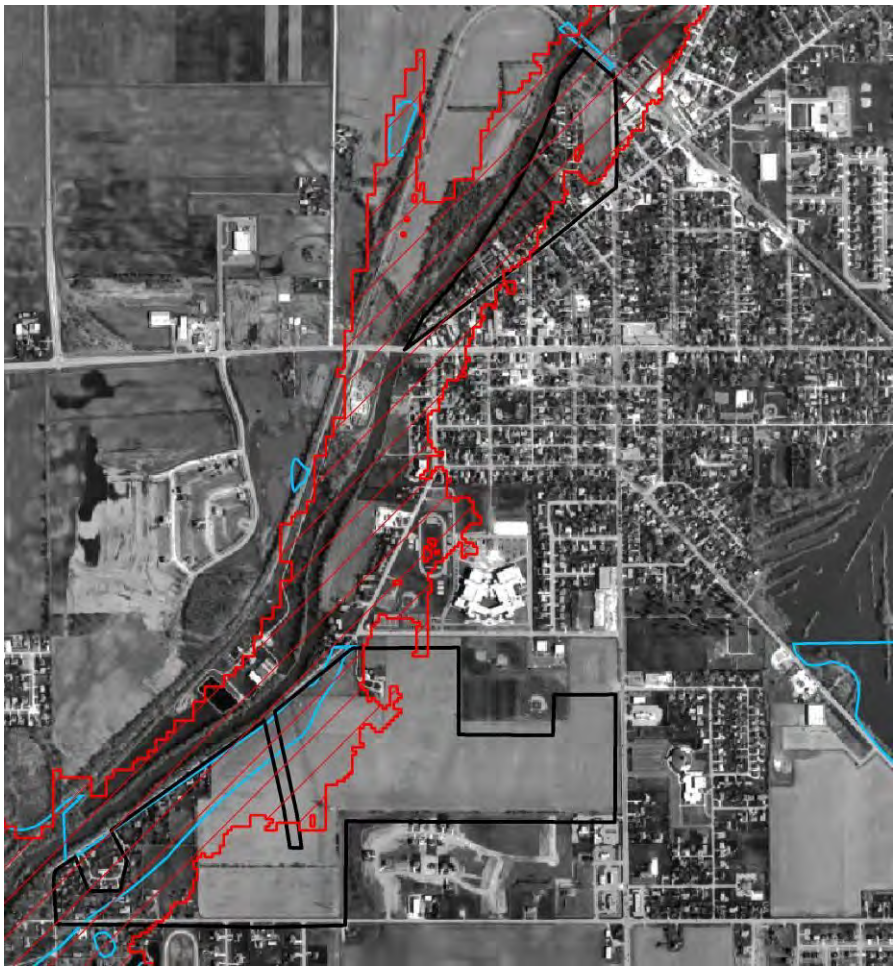


Figure 4. Detail census block (Joliet) identified as having significant damage

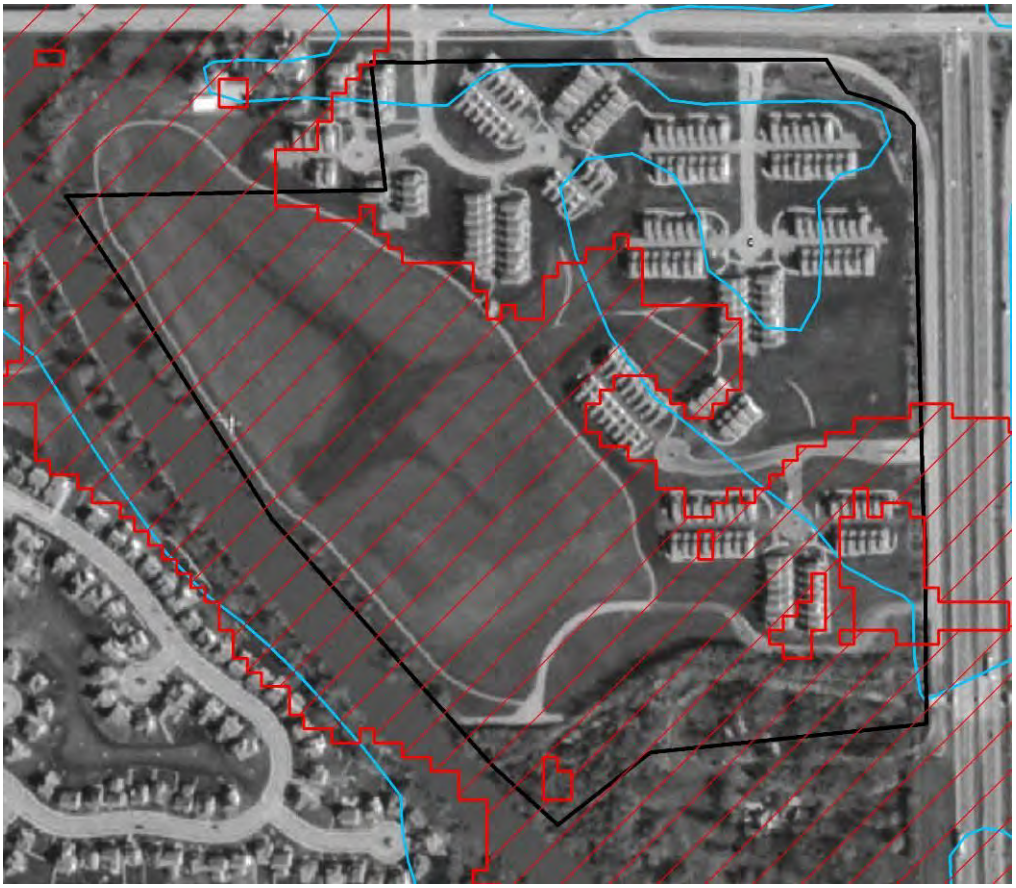
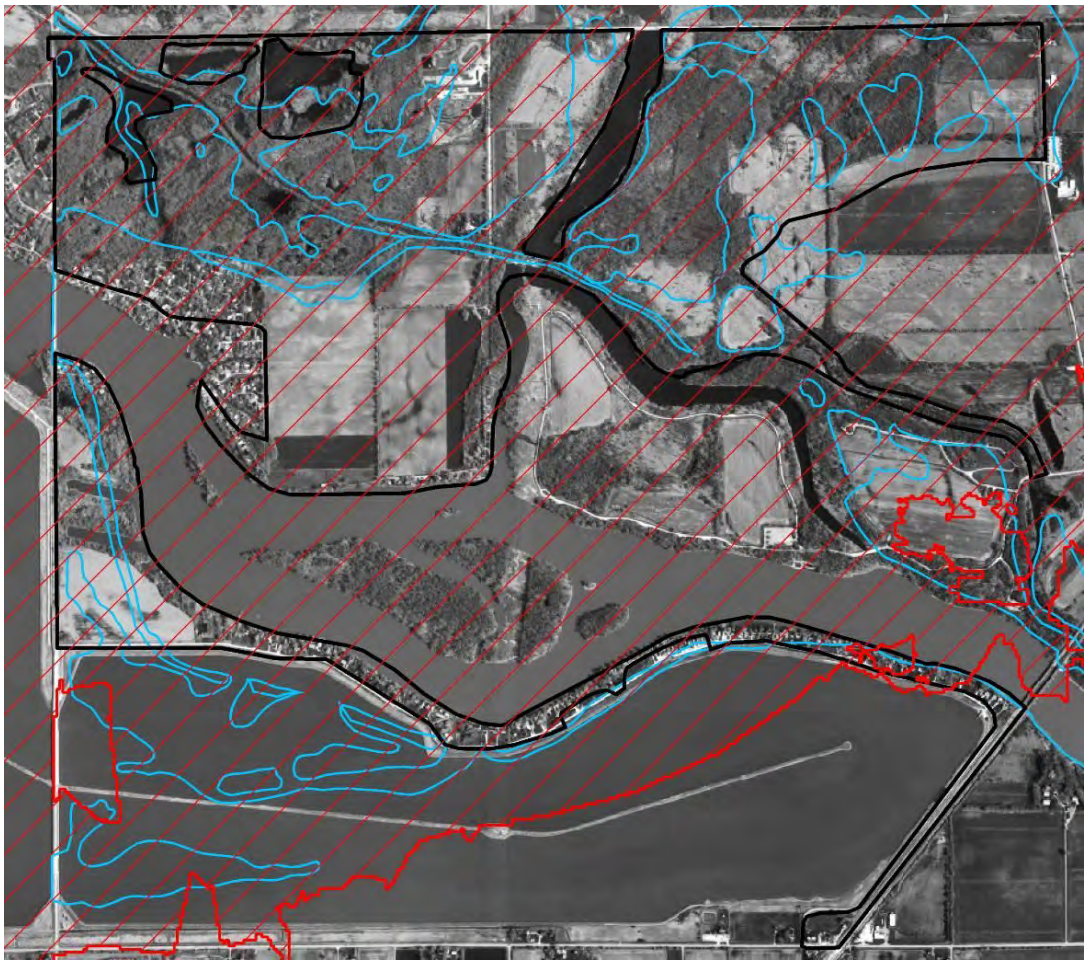


Figure 5. Detail census blocks (Lorenzo) identified as having significant damage



Essential Facility Losses

The HAZUS analysis identified essential facilities that may be subject to flooding. These are identified in table 2. An additional analysis was performed to identify essential facilities within the digitized flood map boundaries. This analysis identified Joliet FD #4, Crete Township FPD #2, Custer Park FPD, Liberty Elementary, and Three Rivers School as possibly prone to flood damage.

Table 2. Will County Essential Facilities – 100-Year Flood

TYPE	NAME	ADDRESS	HAZUS_ID
Fire Stations	Beecher FPD #1	711 Penfield St	IL001022
Fire Stations	Channahon FPD #1	24929 S Center St	IL001029
Fire Stations	Crete Township FPD #2	25048 S Klemme Rd	IL001056
Fire Stations	Custer Park FPD	21750 Highway 113	IL001031
Fire Stations	Joliet FD #3	319 Grover St	IL001063
Fire Stations	Joliet FD #4	868 Draper Ave	IL001062
Fire Stations	Joliet FD #8	2293 Essington Rd	IL001058
Schools	B Noonans Child Care (Lockport)	947 Division St	IL005440
Schools	Crete-Monee Alt. Prgm. CAP JR/CAP	1500 Sangamon St	IL005368
Schools	Crete-Monee Ed. Center	1500 Sangamon St	IL005367
Schools	Liberty Elem.	1401 Essington Rd	IL005375
Schools	Shorewood	210 School Rd	IL005291
Schools	Three Rivers	24150 S Minooka Rd	IL005286

Will County Hazard Risk Assessment
Historical Tornado Scenario Results

Disclaimer:
The estimates of social and economic impacts contained in this report were produced using limited GIS and HAZUS loss estimation data. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific hazard. This analysis is intended to provide conceptual information that can be used to identify mitigation opportunities. These results can be improved by using enhanced inventory data and h

January 9, 2006

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Tornado Hazards

GIS analysis was utilized to determine the impacts of the 1990 Plainfield, Illinois F4 tornado that skipped through Will County during mid afternoon. Although the track of this tornado was identified, detailed information on the area damaged could not be determined. HAZUS-MH data, updated with GIS data provided by Will County, was utilized to identify structures within the damaged area. The potential loss from this event was projected based on today's built environment and in today's economy.

Review Existing Information

GIS analysis was used to determine the potential impacts of an F4 tornado similar to the 1990 tornado, the path of which was determined from a map provided in the 2003 Will County Hazard Analysis. The tornado path is shown in Figure 1.

This analysis used tornado widths determined by the Fujita-Pearson Tornado Rating scale. These tornado widths were based on guidelines developed by Impact Forecasting, a wholly owned subsidiary of Aon Corporation. It should be noted that these numbers and descriptions are just guidelines and are based on conceptual wind speeds, path widths, and path lengths. There is no guarantee that every tornado will fit exactly into one of these six categories. Table 1 is a recreation of the Fujita-Pearson Number table developed by Impact Forecasting.

Figure 1: Historical tornado path

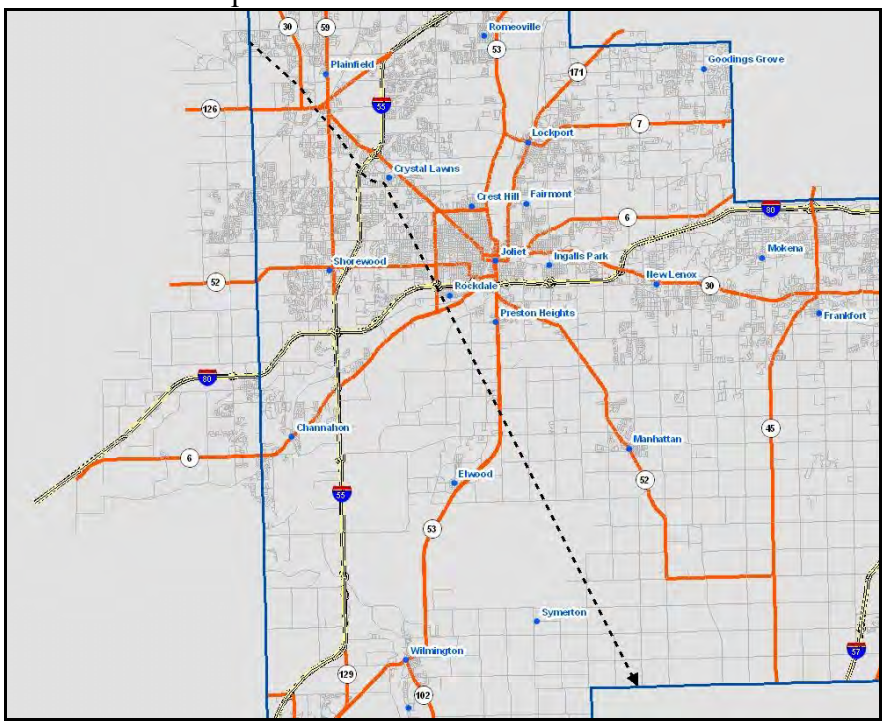


Table 1: Fujita-Pearson Tornado Rating

Fujita-Pearson Number	Estimated Wind Speed	Path Width	Path Length	Description of Destruction
0 (Gale)	40 -72 mph	6 - 17 yards	0.3 - 0.9 miles	Light damage, some damage to chimneys, branches broken, sign boards damaged, shallow-rooted trees blown over.
1 (Moderate)	73 - 112 mph	18 - 55 yards	1.0 - 3.1 miles	Moderate damage, roof surfaces peeled off, mobile homes pushed off foundations, attached garages damaged.
2 (Significant)	113 - 157 mph	56 - 175 yards	3.2 - 9.9 miles	Considerable damage, entire roofs torn from frame houses, mobile homes demolished, boxcars pushed over, large trees snapped or uprooted.
3 (Severe)	158 - 206 mph	176 - 566 yards	10 - 31 miles	Severe damage, walls torn from well-constructed houses, trains overturned, most trees in forests uprooted, heavy cars thrown about.
4 (Devastating)	207 - 260 mph	0.3 - 0.9 miles	32 - 99 miles	Complete damage, well-constructed houses leveled, structures with weak foundations blown off for some distance, large missiles generated.
5 (Incredible)	261 - 318 mph	1.0 - 3.1 miles	100 - 315 miles	Foundations swept clean, automobiles become missiles and thrown for 100 yards or more, steel-reinforced concrete structures badly damaged.

Analysis

According to the Impact Forecast methodology, a F4 tornado will have a width of 0.3 to 0.9 miles. The Fujita-Pearson scale describes the impact as "Complete damage, well-constructed houses leveled, structures with weak foundations blown off for some distance, large missiles generated." Once the historical path was digitized, two buffers were created. The first was 0.3 miles in width (the yellow buffer) and the second was 0.9 miles in width (the orange buffer).The buffers are depicted in Figure 2.

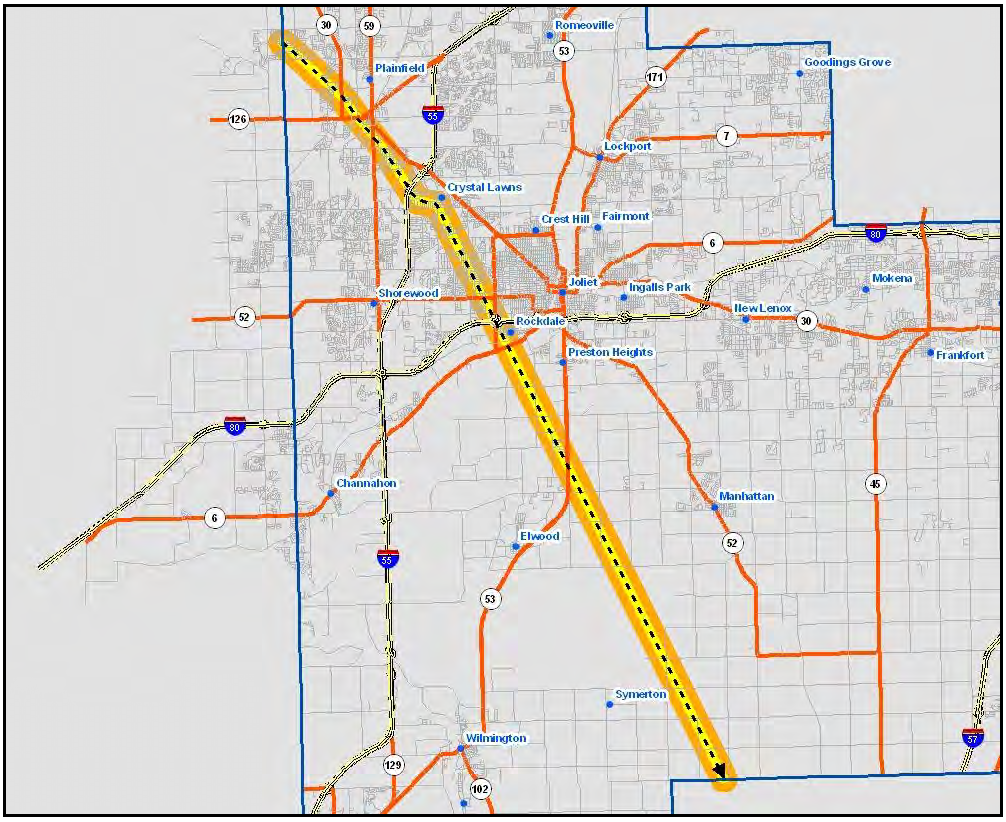
The 2000 Census Block layer that is provided with HAZUS was then added to ArcMap. For each of the two buffers, HAZUS-MH data consisting of the 2000 Census Block layer, the building count layer, and the building dollar exposure were "clipped" thus creating two new layers, each one the same geometric size and shape as the buffer. For each of these new layers, the shape's area field was updated.

A field was added to the table to denote the percentage of each Census Block that fell inside the buffer. To populate this field, the area of each clipped Census Block was divided by the area of the original Census Block. The percentages were then multiplied by the original building count, exposure, and population values.

Assumptions:

- It was assumed that all buildings and population were evenly distributed across each census block. Thus, if 50% of a census block fell within the buffer area, it was assumed that 50% of the structures and population also fell within that area.

Figure 2: F4 tornado path and buffer



Results

The results of the analysis are depicted in Tables 2, 3, and 4. The figures for exposure are an estimate of building replacement costs and assume the buildings are completely destroyed.

Table 2 shows the estimated building damage by type and dollar loss within 0.3 miles of the tornado path. An estimated 2,413 buildings would be damaged, totaling over 574 million. Of the buildings damaged, 2,368 are residential structures, totaling almost 486 million.

Table 3 shows the estimated building damage by type and dollar loss within 0.9 miles of the tornado path. An estimated 6,718 buildings would be damaged, totaling almost 1.6 billion. Of the buildings damaged, 6,590 are residential structures, totaling over 1.3 billion.

Table 4 shows the estimated number of people affected. Within 0.3 miles of the tornado path, there would be almost 9,000 people. Within 0.9 miles of the tornado path, there would be over 23,000 people.

It is important to note that these estimates are based on an area weighted analysis. In this analysis it was assumed that all buildings and population were evenly distributed across each census block. Thus, if 50% of a census block fell within the buffer area, it was assumed that 50% of the structures and population also fell within that area. In reality, the actual number of buildings and people could be much higher or lower than estimated.

Table 2: Estimate of Damage within 0.3 Miles

Occupancy Type	Building Counts	Exposure (thousands of dollars)
Residential	2,368	485,896
Commercial	44	77,249
Industrial	1	6,901
Agriculture	0	276
Religious	0	1,956
Government	0	58
Education	0	2,015
Total	2,413	574,351

Table 3: Estimate of Damage within 0.9 Miles

Occupancy Type	Building Counts	Exposure (thousands of dollars)
Residential	6,590	1,319,027
Commercial	115	218,931
Industrial	9	28,020
Agriculture	0	1,296
Religious	2	12,143
Government	2	3,070
Education	0	4,414
Total	6,718	1,586,901

Table 4: Estimated Number of People Affected

Distance	Within 0.3 Miles	Within 0.9 Miles
Population	8,638	23,341

Essential Facilities Damage

Within 0.3 miles of this historical tornado path, there is one care facility, one fire station, and four schools. The name, address, and HAZUS ID of these facilities are provided in Table 5. Within the 0.3 to 0.9 miles, there is one emergency center, three fire stations, and eight schools. The name, address, and HAZUS ID of these facilities are provided in Table 6. Based on the Fujita-Pearson Number table, facilities located within 0.3 to 0.9 miles of this tornado path would be completely destroyed. The locations of these facilities in relation to the tornado path and width are depicted in Figure 3.

Table 5: Essential Facilities within 0.3 Miles of Historical Tornado Path

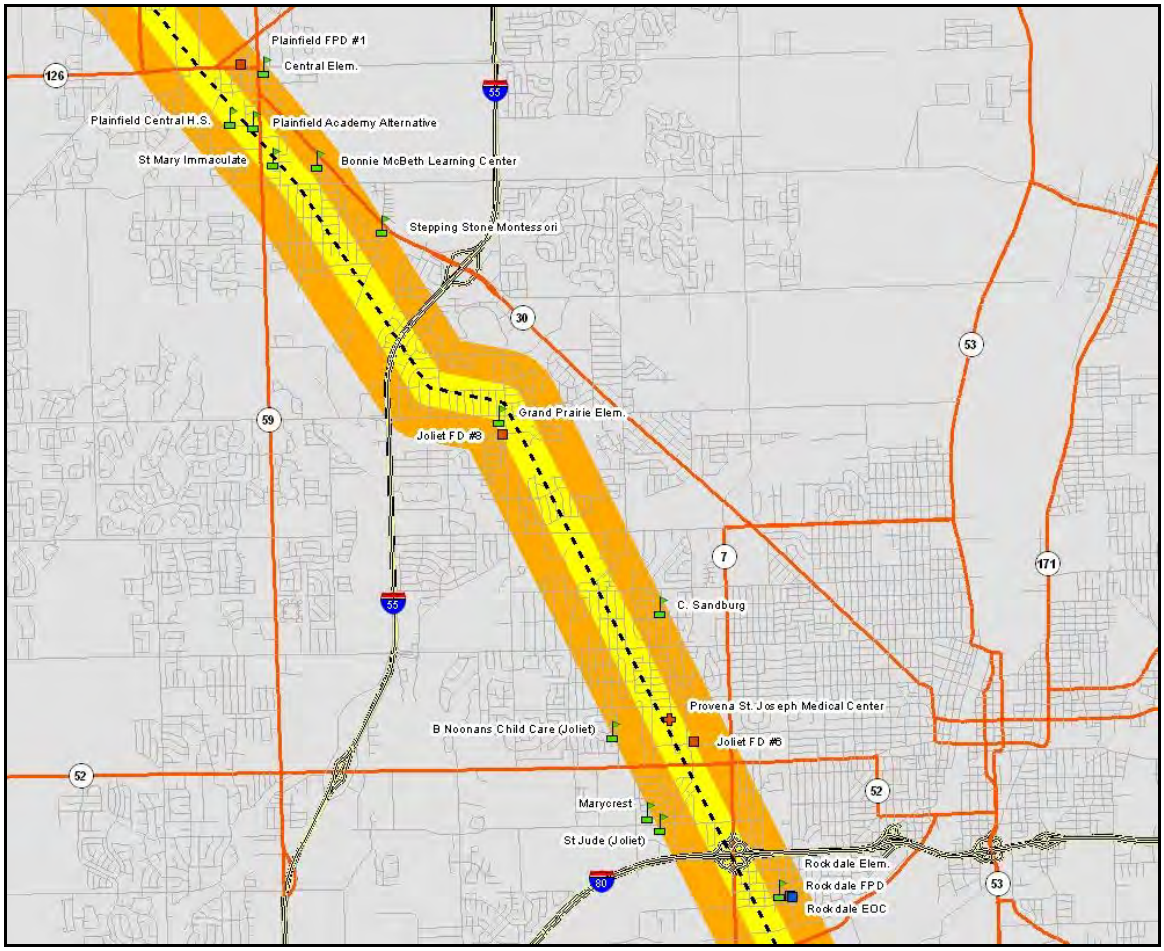
TYPE	NAME	ADDRESS	HAZUS_ID
Care Facilities	Provena St. Joseph Medical Center	333 N Madison St	IL000228
Fire Stations	Joliet FD #8	2293 Essington Rd	IL001058
Schools	Grand Prairie Elem.	3100 Caton Farm Rd	IL005373
Schools	Plainfield Academy Alternative	500 W Fort Beggs Dr	IL005392
Schools	Plainfield Central H.S.	611 W Fort Beggs Dr	IL005389
Schools	St Mary Immaculate	15629 S Route 59	IL005472

Table 6: Essential Facilities within 0.3 to 0.9 Miles of Historical Tornado Path

TYPE	NAME	ADDRESS	HAZUS_ID
Emergency Centers	Rockdale EOC	603 Otis Ave	IL000168
Fire Stations	Joliet FD #6	2049 Oneida St	IL001060
Fire Stations	Plainfield FPD #1	703 N Des Plaines St	IL001011
Fire Stations	Rockdale FPD	603 Otis Avenue	IL001012
Schools	B Noonans Child Care (Joliet)	2504 Fairway Dr	IL005441
Schools	Bonnie McBeth Learning Center	15730 Howard St	IL005377
Schools	C. Sandburg	1100 Lilac Lane	IL005313

Schools	Central Elem.	305 W Lockport St	IL005369
Schools	Marycrest	303 Purdue Ct	IL005309
Schools	Rockdale Elem.	715 Meadow Ave	IL005300
Schools	St Jude (Joliet)	2204 McDonough	IL005467
Schools	Stepping Stone Montessori	23145 W Lincoln Hwy	IL005479

Figure 3: Essential Facilities within Historical Tornado Path Buffer



Will County Earthquake Risk Assessment Results

Disclaimer:
The estimates of social and economic impacts contained in this report were produced using HAZUS loss estimation methodology software and which is based on current scientific and engineering knowledge. . There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific hazard. This analysis is intended to provide conceptual information that can be used to identify mitigation opportunities. These results can be improved by using enhanced inventory data and hazard information.

January 6, 2006

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Introduction

The CTE team contacted Dr. Robert Bauer of the Illinois State Geological Survey (ISGS) to obtain existing geological information and recommendations for earthquake scenarios. Three earthquake scenarios were developed to provide a reasonable basis for earthquake planning in Will County.

These included one deterministic scenario based upon input from the ISGS. A deterministic scenario is based on a specific event without explicit consideration of the probability of its occurrence. The scenario for this study was based on the June 26, 1909 5.1 magnitude Aurora, Illinois (41.6N 88.1W) earthquake. According to the ISGS web site, this earthquake has been related to the La Salle anticline in the Illinois Basin. During the earthquake, many chimneys fell, a stove overturned, and gas line connections broke at Aurora. Several chimneys were downed at Forreston, Naperville, Streator, Triumph, and Troy Grove, and one fell at Waukegan. Brick walls cracked at Bloomington, and sidewalks cracked and many chimneys were damaged at Freeport. At Platteville, Wis., about 130 km northwest of Chicago, an old building was cracked; houses were jostled out of plumb at Beloit, Wisconsin about 240 km northwest of Chicago.

Additionally, the analysis included two different types of probabilistic scenarios. These types of scenarios are based on ground shaking parameters derived from U.S. Geological Survey probabilistic seismic hazard curves.

The first selected probabilistic scenario was a 500 year return period scenario. This scenario evaluates the average impacts of a multitude of possible earthquake epicenters with a magnitude that would be typical of that expected for a 500 year return period.

The second probabilistic scenario was one that allowed us to calculate an annualized loss. The annualized loss analysis in HAZUS-MH provides a means for averaging potential losses from future scenarios while considering their probabilities of occurrence. The HAZUS-MH earthquake model evaluates 8 different return period scenarios including those for the 100, 250, 500 750, 1000 1500, 2000, and 2500 year return period earthquake events. It then calculates the probabilities of these events as well as the interim events, calculates their associated losses, and sums these losses to calculate an annualized loss. These analysis options were chosen because they are useful for prioritization of seismic reduction measures and for simulating mitigation strategies.

Earthquake hazard modeling scenarios performed consisted of:

- A 5.3 magnitude earthquake in Aurora, Illinois (deterministic scenario)
- 500 year return period event (probabilistic scenario)
- Annualized Earthquake Loss (probabilistic scenario)

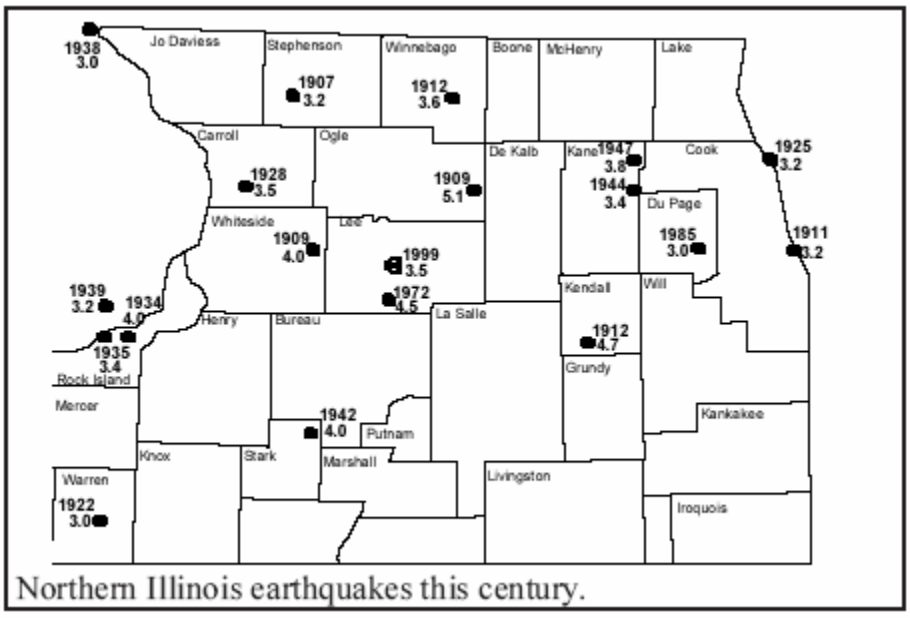
Review Existing Information

The ISGS team desires to model a large magnitude earthquake from the New Madrid fault in order to ascertain the potential impact on high rise structures in the Will County area. However, it was determined that such a model could not be run for the following reasons.

- First, HAZUS-MH will not model earthquakes whose epicenter occurs greater than 200 kilometers from the study region. While it is possible to provide ground motion maps to HAZUS which can then model the impact of such an earthquake event on the exposed inventory, such maps are not available for the Will County region at this time.
- Second, while this study did include updating of selected inventory components; additional detailed building data would be required to model these structures since the default HAZUS building mapping schemes assume all buildings are low-rise (1-3 stories) structures, distributed according to a default classification of structural materials (wood, concrete, steel, etc.) and designed to code. Because of the lack of detailed building data, HAZUS will likely assume greater damage to high rise structures than will realistically be produced given that it will assume that the maximum height of the structures is 3 stories and that the entire assumed exposure to the structures will be contained within that part of the structure

Given the limitations described above, the ISGS recommended modeling a magnitude 5.0- 5.5 earthquake at the location of a historic magnitude 5.1 epicenter in Aurora, Illinois that occurred in 1909. The coordinates of this earthquake were 41.6N 88.1W longitude as shown in the figure 1 below.

Figure1. Earthquakes in Northern Illinois



Analysis

To model a deterministic scenario, such as the historical event based in Aurora, Illinois, the user must input a variety of parameters. The parameters include the following:

One of the most critical sources of information that is required for accurate assessment of earthquake risk is soils. Unfortunately, NEHRP (National Earthquake Hazards Reduction Program) soil classification maps only exist for the southern portion of Illinois. NEHRP soil classifications portray the degree of

shear-wave amplification that can occur during ground shaking. Because of the lack of soils data, the analysis used a default scenario with D class soils.

Dr. Bauer indicated that Will County and the surrounding area do not have a map for liquefaction potential that could be used by HAZUS-MH. However, according to literature, historical (moment magnitude 5.1-5.5) earthquakes should not generate liquefaction and therefore it was determined that no additional effort would be put forth to assess liquefaction potential for this study.

Will County has seasonal water table depths of 2 to 3 meters. These probably should not matter since liquefaction should not be expected with earthquake magnitudes below magnitudes of about 6.5. For the analysis we used a depth to water table of 3 meters. ISGS recommended an earthquake depth of 5.0 kilometers for the deterministic Aurora earthquake. The historical earthquake depths identified by ISGS ranged from 5 to 10 km.

HAZUS-MH also requires the user to define an attenuation (amplitude of the waves) function unless ground motion maps are supplied. Because Will County has experienced smaller earthquakes, ISGS made the decision to use the Toro et al. (1997) attenuation function for calculation of ground motion.

Assumptions:

The probabilistic analysis and the annualized loss analysis do not require user input of the variables listed above. The assumptions of the annualized loss analysis are as follows:

- Census tract-based analyses with the assumption that all aggregate inventory is concentrated at the centroid of the census tract for purposes of performing loss analysis
- HAZUS uses USGS probabilistic hazard maps
- Default soft soil (NEHRP Class D) conditions
- No ground failure effects
- 2000 demographic information
- 2002 square footage data for building occupancies
- 2002 Means Data for Building Replacement Cost
- Building-related economic losses only. Losses to lifelines not included Long term or indirect losses not considered

HAZUS-MH is a planning tool. The application is not intended as a substitute for detailed engineering analysis. The estimates of social and economic impacts contained in this report were produced using HAZUS loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a

specific hazard event. These results can be improved by using enhanced inventory data and hazard information.

5.3 Magnitude with an Epicenter in Aurora, Illinois

HAZUS-MH Earthquake Risk Module provides estimates of damage and loss to buildings, essential facilities, transportation and utility lifelines, and population based on scenario or probabilistic earthquakes. In addition, the Earthquake Risk Module estimates the debris generated, fire, casualties, and shelter requirements following the disaster. Based on consultation with the Illinois State Geologic Survey, the May 26, 1909 5.1 magnitude earthquake that occurred in near Aurora, Illinois is the best scenario to model with the limitations on available data.

Results:

The results of the initial analysis, the 5.3 magnitude Earthquake with an Epicenter in Aurora, Illinois are depicted in Table 1 and 2 and Figure 1. Table 1 identifies the calculated number of damaged buildings by general occupancy classification. HAZUS estimates that about 12,369 buildings will be at least moderately damaged. This is over 8.00 % of the total number of buildings in the region. There are an estimated 405 buildings that will be damaged beyond repair.

Table 2 represents building economic losses in millions of dollars. The losses include capital losses as well as income losses. A description of the losses is included in the table. The total building-related losses were 1,137.82 (millions of dollars); 6 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 81 % of the total loss.

Figure 1 represents the building economic losses by census tracts in thousands of dollars. Analysis of this figure indicates that the most substantial damage would occur in the north part of the county. This is consistent with the area that is currently developed in the county.

Essential Facility Losses Aurora Event

The HAZUS analysis calculated no essential facility losses for this event. Essential facilities include police stations, fire stations, schools, medical care facilities, and emergency operation centers and are analyzed on a site by site basis.

Table 1 Aurora, Illinois Earthquake 5.3 Magnitude Building Count Damages by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	701	0.62	164	0.67	106	1.07	30	1.42	4	1.08
Education	14	0.01	3	0.01	2	0.02	1	0.03	0	0.03
Government	27	0.02	5	0.02	4	0.04	1	0.04	0	0.04
Industrial	181	0.16	33	0.13	24	0.24	7	0.33	1	0.18
Other Residential	4,828	4.30	1,034	4.22	518	5.25	90	4.28	15	3.63
Religion	24	0.02	6	0.02	4	0.04	1	0.06	0	0.05
Single Family	106,419	94.85	23,279	94.92	9,206	93.33	1,971	93.85	385	94.99
Total	**112,195**		**24,525**		**9,864**		**2,100**		**405**	

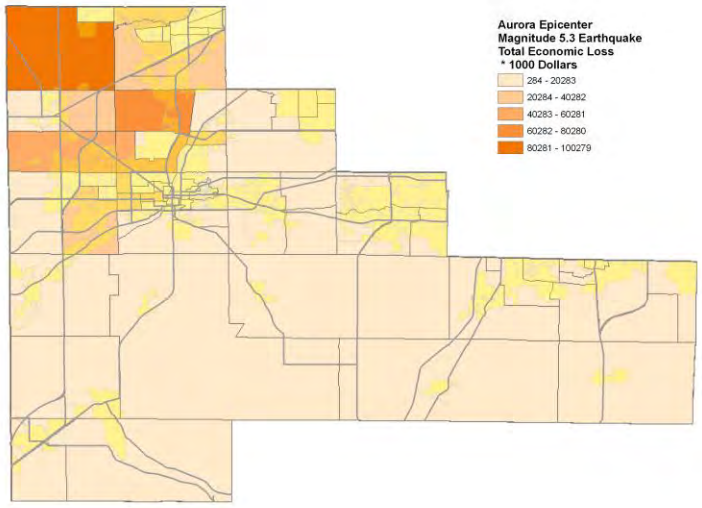
Table 2 Aurora, Illinois Earthquake 5.3 Magnitude Building Economic losses in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Loses							
	Wage	0.00	0.67	13.01	0.68	0.88	15.24
	Capital-Related	0.00	0.29	11.39	0.41	0.26	12.34
	Rental	17.63	8.43	7.78	0.24	0.31	34.39
	Relocation	1.82	0.19	0.43	0.02	0.12	2.58
	Subtotal	**19.45**	**9.58**	**32.61**	**1.36**	**1.56**	**64.55**
Capital Stock Loses							
	Structural	110.65	12.47	19.15	3.58	2.77	148.61
	Non_Structural	464.50	81.47	57.50	16.70	10.38	630.56
	Content	200.61	27.78	40.27	12.71	8.34	289.70
	Inventory	0.00	0.00	1.70	2.63	0.08	4.41
	Subtotal	**775.76**	**121.72**	**118.61**	**35.62**	**21.57**	**1,073.27**
	Total	**795.20**	**131.29**	**151.22**	**36.98**	**23.13**	**1,137.82**

***Income Losses (see above table)**
Wage losses (consistent with income loss)
Capital-related income losses (a measure of the loss of productivity, services or sales)
Rental income losses (to building owners)
Relocation expenses (for businesses and institutions)

*** Capital Stock Losses (see above table)**
Structural losses (structural repair costs for damaged and destroyed buildings)
Non_structural Losses (non structural repair costs for damaged and destroyed buildings)
Content Losses (Costs of damage to building contents)
Inventory losses (Losses of building inventory contents related to business activities)

Figure 1. Aurora Earthquake 5.3 Magnitude Building Economic losses in Thousands of Dollars



500 Year Probabilistic Event

HAZUS-MH Earthquake Risk Module provides estimates of damage and loss to buildings, essential facilities, transportation and utility lifelines, and population based on scenario or probabilistic earthquakes. In addition, the Earthquake Risk Module estimates the debris generated, fire, casualties, and shelter requirements following the disaster. This scenario evaluates the average impacts of a multitude of possible earthquake epicenters with a magnitude that would be typical of that expected for a 500 year return period.

Results:

The results of the 500 year probabilistic analysis are depicted in Table 3 and 4 and Figure 2. Table 3 identifies the calculated number of damaged buildings by general occupancy classification. HAZUS estimates that about 1,524 buildings will be at least moderately damaged. This is over 1.00 % of the total number of buildings in the region. There are an estimated 18 buildings that will be damaged beyond repair.

Table 4 represents building economic losses in millions of dollars. The losses include capital losses as well as income losses. A description of the losses is included in the table. The total building-related losses were 66.46 (millions of dollars); 12 % of the estimated losses were related to the business interruption of the region.

Figure 2 represents the building economic losses by census tracts in thousands of dollars. Analysis of this figure indicates that the majority of damage is predicted to occur in only one census tract in the far northwest part of the county

Essential Facility Losses 2500 Year Probabilistic Event

The HAZUS analysis calculated no essential facilities losses for this event

Table 3. 500 Year Probabilistic Building Count Damages by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	934	0.65	48	1.04	18	1.40	3	1.52	0	1.02
Education	19	0.01	1	0.02	0	0.03	0	0.03	0	0.03
Government	35	0.02	2	0.04	1	0.05	0	0.05	0	0.05
Industrial	228	0.16	12	0.26	5	0.38	1	0.41	0	0.16
Other Residential	6,013	4.21	340	7.35	124	9.41	8	4.05	1	2.65
Religion	33	0.02	2	0.04	1	0.05	0	0.06	0	0.05
Single Family	135,673	94.92	4,224	91.26	1,168	88.68	175	93.88	18	96.04
Total	**142,936**		**4,629**		**1,318**		**187**		**19**	

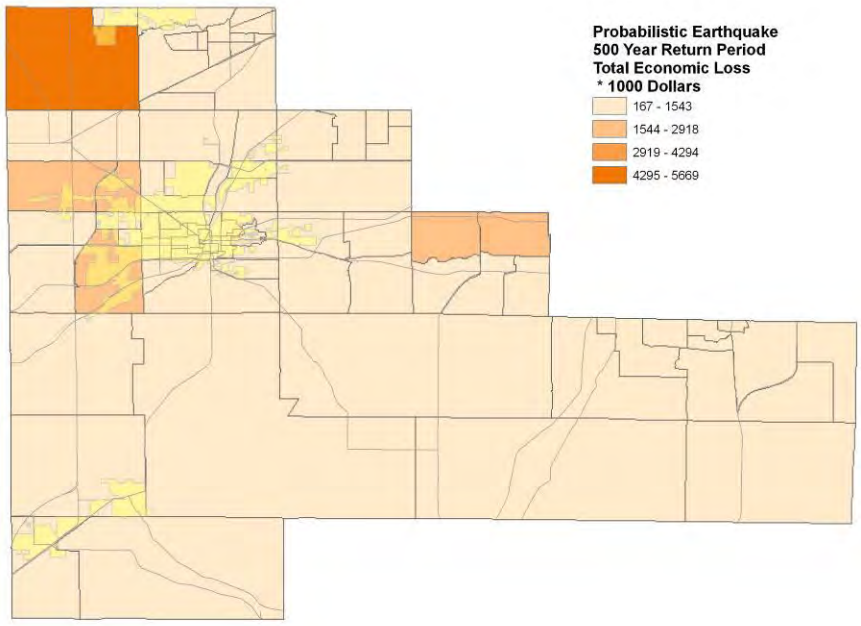
Table 4. 500 Year Probabilistic Building Economic losses in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Loses							
	Wage	0.00	0.09	1.69	0.12	0.14	2.04
	Capital-Related	0.00	0.04	1.49	0.07	0.04	1.64
	Rental	1.88	0.78	0.97	0.03	0.03	3.69
	Relocation	0.19	0.02	0.06	0.00	0.02	0.28
	Subtotal	**2.07**	**0.92**	**4.21**	**0.22**	**0.23**	**7.65**
Capital Stock Loses							
	Structural	12.58	1.36	2.56	0.60	0.42	17.52
	Non_Structural	25.45	3.52	3.21	0.89	0.73	33.79
	Content	4.69	0.58	1.25	0.52	0.29	7.34
	Inventory	0.00	0.00	0.05	0.11	0.00	0.17
	Subtotal	**42.72**	**5.45**	**7.07**	**2.13**	**1.43**	**58.82**
	Total	**44.79**	**6.37**	**11.29**	**2.35**	**1.66**	**66.46**

*** Income Losses (see above table)**
Wage losses (consistent with income loss)
Capital-related income losses (a measure of the loss of productivity, services or sales)
Rental income losses (to building owners)
Relocation expenses (for businesses and institutions)

***Capital Stock Losses (see above table)**
Structural losses (structural repair costs for damaged and destroyed buildings)
Non_structural Losses (non structural repair costs for damaged and destroyed buildings)
Content Losses (Costs of damage to building contents)
Inventory losses (Losses of building inventory contents related to business activities)

Figure 2. 500 year Probabilistic Building Economic losses in Thousands of Dollars



Annualized Loss

HAZUS-MH Earthquake Risk Module provides estimates of damage and loss to buildings, essential facilities, transportation and utility lifelines, and population based on scenario or probabilistic earthquakes. In addition, the Earthquake Risk Module estimates the debris generated, fire, casualties, and shelter requirements following the disaster. The annualized loss analysis in HAZUS-MH provides a means for averaging potential losses from future scenarios while considering their probabilities of occurrence. The HAZUS-MH earthquake model evaluates 8 different return period scenarios including those for the 100, 250, 500 750, 1000 1500, 2000, and 2500 year return period earthquake events. It then calculates the probabilities of these events as well as the interim events, calculates their associated losses, and sums these losses to calculate an annualized loss.

Results:

The results of the annualized analysis are depicted in Table 5 and 6 and Figure 3. Table 5 indicates identifies the average annual estimated number of buildings at risk to be damaged by general occupancy classification. HAZUS estimates that about 1,202 buildings will be at least moderately damaged. This is over 1.00 % of the total number of buildings in the region. There are an estimated 1 buildings that will be damaged beyond repair.

Table 6 identifies the average annual estimated economic risk in millions of dollars. The risk includes capital losses as well as income losses. A description of the

losses is included in the table. The total building-related losses were 0.25 (millions of dollars); 27 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 55 % of the total loss.

Figure 3 represents the average annual estimated building economic risk by census tracts in thousands of dollars. As expected the losses reflect the same distribution as the 500 year probabilistic analysis.

Essential Facility Losses Annualized

The HAZUS analysis calculated no essential facility losses for this event.

Table 5. Annualized Building Count Damages by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	224	0.16	0	0.00	0	0.00	0	0.00	0	0.00
Education	3	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	2	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	29	0.02	0	0.00	0	0.00	0	0.00	0	0.00
Other Residential	5,625	3.98	222	5.18	72	6.56	0	0.00	0	0.00
Religion	2	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Single Family	135,508	95.84	4,061	94.82	1,025	93.44	104	100.00	1	00.00
Total	**141,393**		**4,283**		**1,097**		**104**		**1**	

Table 6. Annualized Building Economic losses in Millions of Dollars

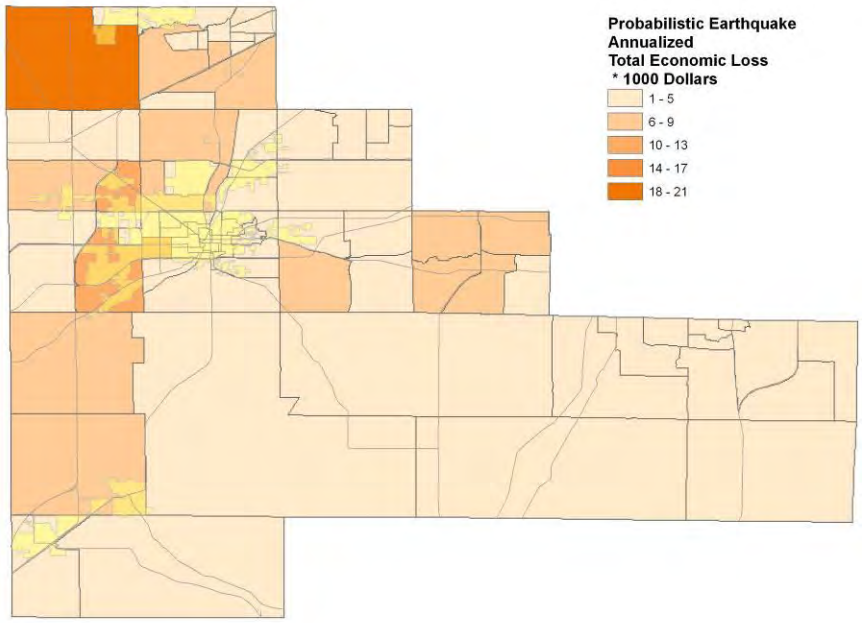
Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Loses							
	Wage	0.00	0.00	0.03	0.00	0.00	0.03
	Capital-Related	0.00	0.00	0.02	0.00	0.00	0.02
	Rental	0.01	0.00	0.00	0.00	0.00	0.01
	Relocation	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.01**	**0.00**	**0.05**	**0.00**	**0.00**	**0.07**
Capital Stock Loses							
	Structural	0.11	0.01	0.04	0.01	0.01	0.18
	Non_Structural	0.00	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.11**	**0.01**	**0.04**	**0.01**	**0.01**	**0.18**
	Total	**0.12**	**0.02**	**0.09**	**0.01**	**0.01**	**0.25**

*** Income Losses (see above table)**
Wage losses (consistent with income loss)
Capital-related income losses (a measure of the loss of productivity, services or sales)
Rental income losses (to building owners)
Relocation expenses (for businesses and institutions)

***Capital Stock Losses (see above table)**
Structural losses (structural repair costs for damaged and destroyed buildings)
Non_structural Losses (non structural repair costs for damaged and destroyed buildings)
Content Losses (Costs of damage to building contents)
Inventory losses (Losses of building inventory contents related to business activities)

Figure 3. Annualized Building Economic losses in Thousands of Dollars

.



Will County Hazard Risk Assessment
Hazardous Materials Results (Arsenal Rd & I-55)

Disclaimer:
The estimates of social and economic impacts contained in this report were produced using limited GIS and HAZUS loss estimation data. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific hazard. This analysis is intended to provide conceptual information that can be used to identify mitigation opportunities. These results can be improved by using enhanced inventory data and hazard information.

December 20, 2005

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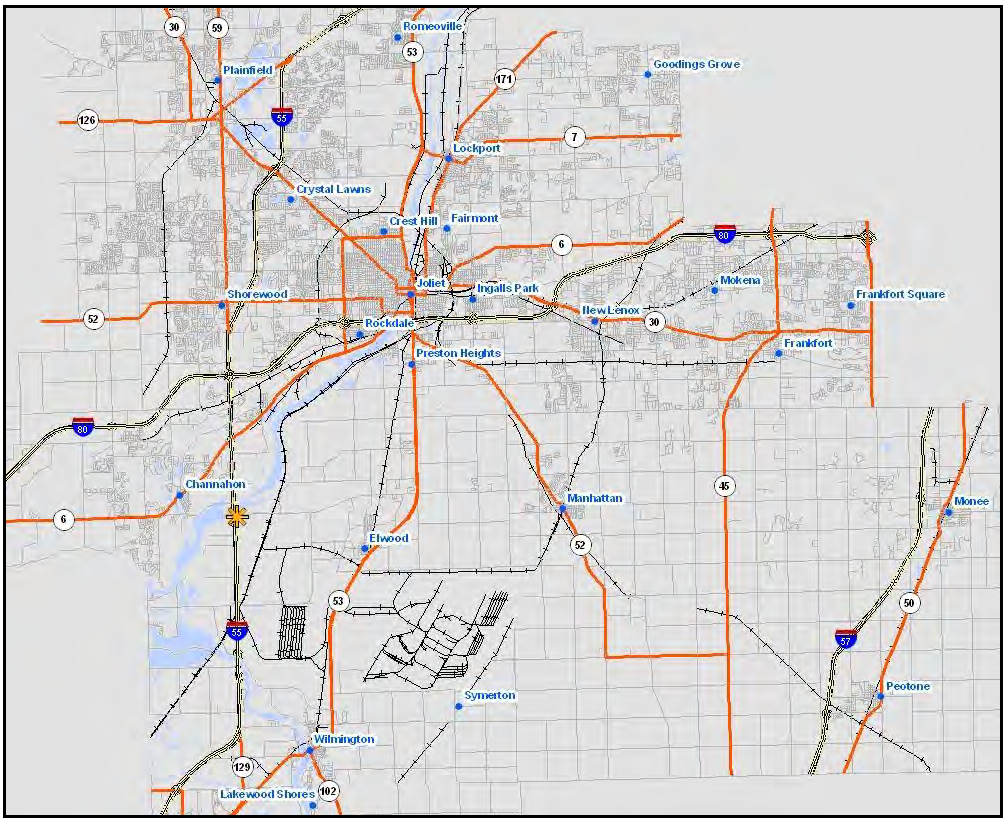
Hazardous Materials (Arsenal Rd & I-55)

The U.S. EPA's ALOHA (Areal Locations of Hazardous Atmospheres) model was utilized to assess the area of impact for a chlorine release near a large industrial facility located southwest of Joliet near Arsenal Road and Interstate 55. ALOHA is a computer program designed especially for use by people responding to chemical accidents, as well as for emergency planning and training. Chlorine is a common chemical used in industrial operations that can be found in either liquid or gas form. Rail, truck tankers, and barges commonly haul chlorine, as well as other hazardous materials, to and from facilities. For this scenario, moderate atmospheric and climatic conditions with a slight breeze from the west were assumed. The target area of Arsenal Rd and I-55 was chosen due to its large industrial facilities, rail and truck hubs, and the presence of a large number of large quantity hazardous material generators.

Review Existing Information

The 2000 Census Block boundaries and population figures, as well as the values for building counts and building replacement cost were extracted from the HAZUS-MH provided inventory. The geographic area covered in this analysis is depicted in Figure 1.

Figure 1: Location of Chlorine Release



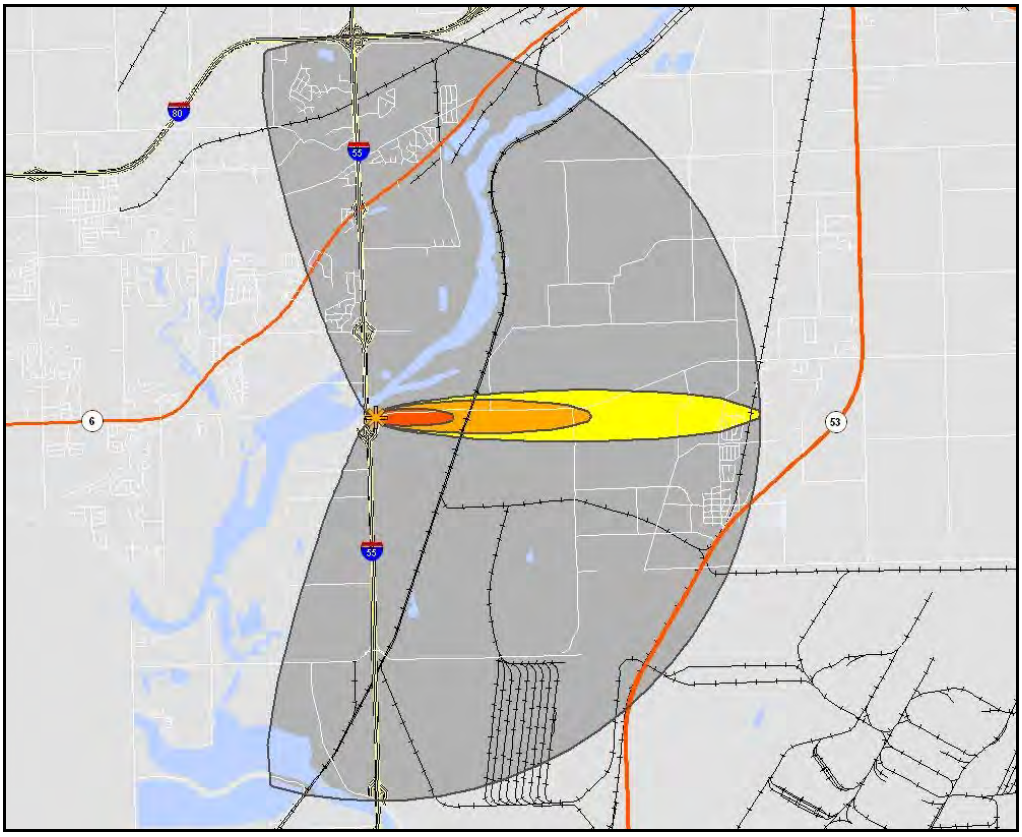
Analysis

In terms of the atmospheric conditions, ALOHA was setup with a wind speed of 5 mph at a westerly direction. The temperature was set for 68° F with a medium level of humidity and partly cloudy skies.

In terms of the source conditions, a horizontal, cylindrical-shaped tank was selected. The diameter of the tank was set to 9 feet. The length of the tank was set to 66 feet. These settings created a tank with a volume of 31,409 gallons. At the time of this release, the tank was estimated to be 80% full. The chlorine in this tank is in its liquid state. This release was based on a leak from a hole, a little less than ½" in diameter and 12 inches above the bottom of the tank.

Using the settings above, approximately 20,450 pounds of material would be released. The image in Figure 2 depicts the plume footprint generated by ALOHA. As the substance moves away from the source, the level of concentration of that substance decreases. Each color-coded area depicts a level of concentration. These concentrations are measured in parts per million, or ppm.

Figure 2: Plume Footprint Generated by ALOHA



The area in red, at 20 ppm, would extend no more than 1,647 yards out from the point of release. The area in orange, at 3 ppm, would extend no more than 2.6 miles out from the point of release. The area in yellow, at 1 ppm, would extend no more than 4.6 miles out from the point of release. The gray area depicts what ALOHA refers to as "uncertainty lines", which means that within the confines of the entire plume footprint, the ALOHA model is 95% confident that the release will stay within this boundary.

The 2000 Census Block layer was added to ArcMap and overlaid with the plume footprint. The 2000 Census Block layer was then clipped against each of the four footprint areas. Clipping could be defined as the process of extracting features from one layer, in this case the 2000 Census Block layer, based on the boundary of another layer, in this case one of the four footprint areas. Figures 3 and 4 depict the 2000 Census Block areas before and after the "clipping" process.

Figure 3: The 2000 Census Block Areas before the "Clipping" Process

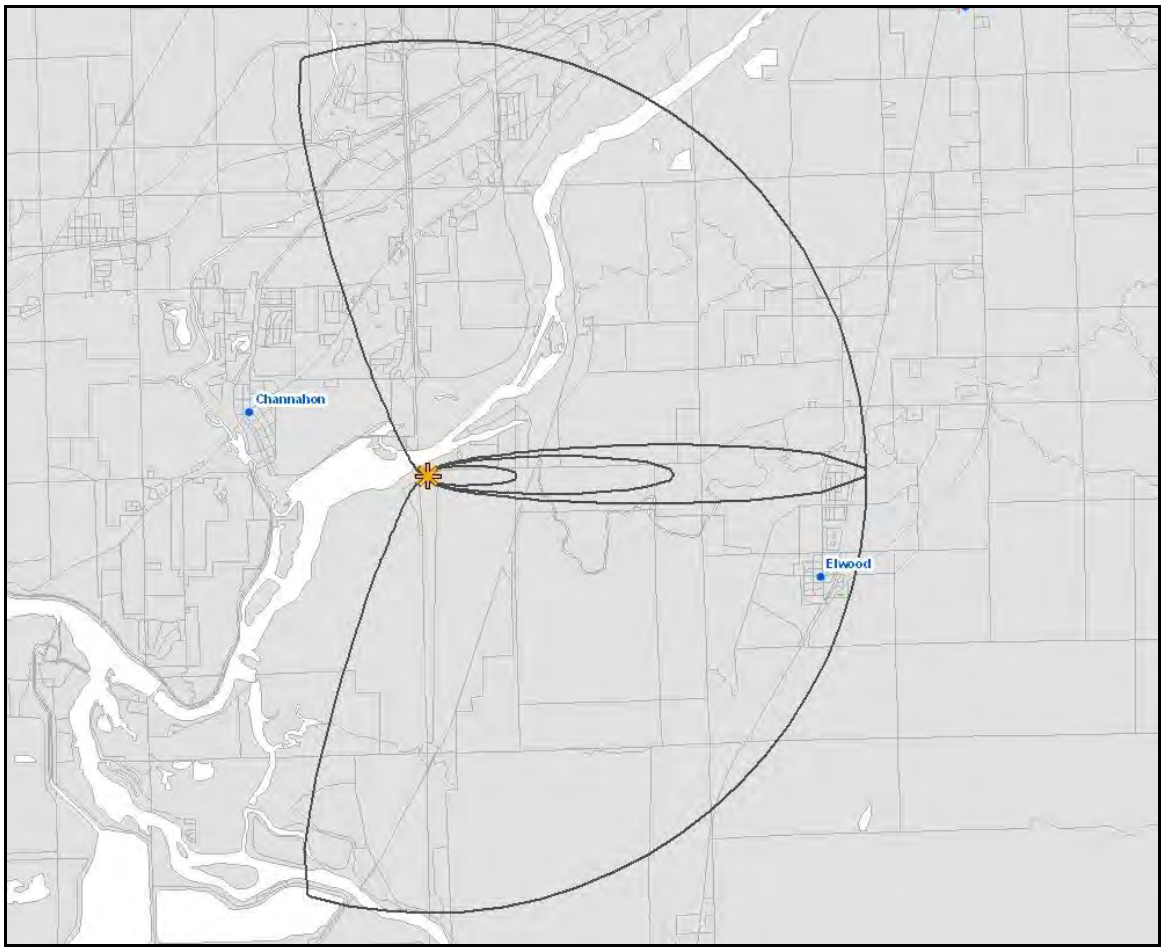
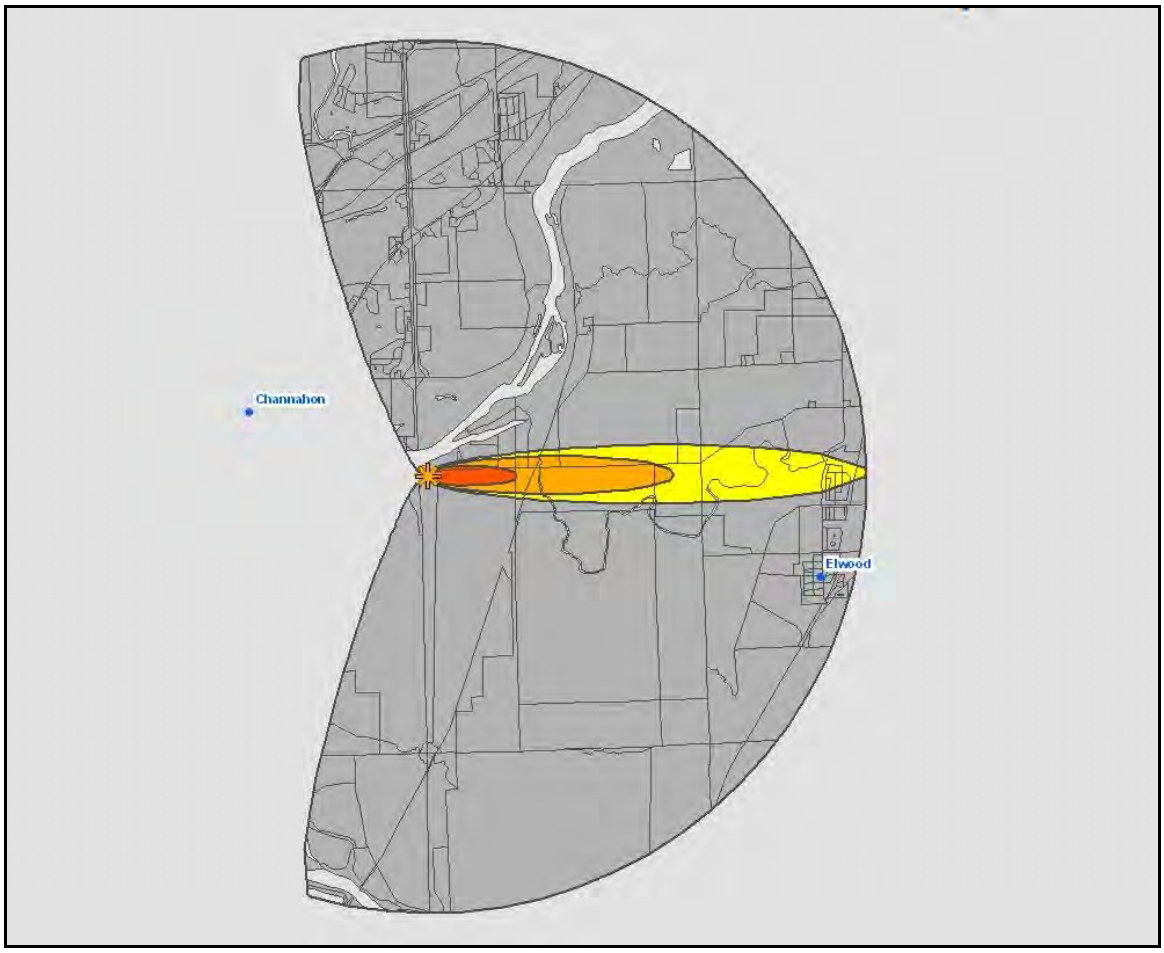


Figure 4: The 2000 Census Block Areas after the "Clipping" Process



A field was added to the table to denote the percentage of each Census Block that fell inside each of the four footprint areas. To populate this field, the area of each clipped Census Block was divided by the area of the original Census Block. The percentages were then multiplied by the building count and exposure values.

Assumptions:

- For this analysis it was assumed that all buildings and population were evenly distributed across each census block. Thus, if 50% of a census block fell within the buffer area, it was assumed that 50% of the structures and population also fell within that area.

Results

By summarizing the results of each of the four footprint areas, the GIS analysis estimates that as many as 1,783 buildings could be exposed. The inventory data upon which these estimates are based was obtained from the HAZUS-MH provided dataset. This dataset was compiled through a combination of 2000 Census data and information compiled by Dun and Bradstreet for the HAZUS-MH application. Based on population figures from the 2000 Census, approximately 5,427 people would be affected.

As noted earlier, it is important to note that these estimates are based on an area weighted analysis. In this analysis it was assumed that all buildings were evenly distributed across each census block. Thus, if 50% of a census block fell within the buffer area, it was assumed that 50% of the structures and population also fell within that area. In reality, the actual number of buildings could be much higher or lower than estimated.

The results of the analysis are depicted in Tables 1 through 6. Table 1 summarizes the results of the four footprint areas in terms of buildings counts and replacement costs. Table 2 summarizes the results of the four footprint areas in terms of population. Tables 3 through 6 depict the results for each of the four footprint areas.

Table 1: Estimated Number of Buildings Exposed and Replacement Cost (Total)

Occupancy Type	Building Counts	Exposure (thousands)
Residential	1,771	292,350
Commercial	9	21,360
Industrial	3	13,549
Agriculture	0	263
Religious	0	1,965
Government	0	99
Education	0	0
Total	1,783	329,586

Table 2: Estimated Population (By Area and Total)

Plume Area	Population
Red	0
Orange	0
Yellow	155
Gray	5,272
Total	5,427

Table 3: Estimated Number of Buildings Exposed and Replacement Cost (Red Area)

Occupancy Type	Building Counts	Exposure (thousands)
Residential	0	13
Commercial	0	228
Industrial	0	0
Agriculture	0	0
Religious	0	0
Government	0	0
Education	0	0
Total	0	241

Table 4: Estimated Number of Buildings Exposed and Replacement Cost (Orange Area)

Occupancy Type	Building Counts	Exposure (thousands)
Residential	0	6
Commercial	0	101
Industrial	0	0
Agriculture	0	0
Religious	0	0
Government	0	0
Education	0	0
Total	0	107

Table 5: Estimated Number of Buildings Exposed and Replacement Cost (Yellow Area)

Occupancy Type	Building Counts	Exposure (thousands)
Residential	43	6,495
Commercial	0	135
Industrial	0	134
Agriculture	0	42
Religious	0	0
Government	0	0
Education	0	0
Total	43	6,806

Table 6: Estimated Number of Buildings Exposed and Replacement Cost (Gray Area)

Occupancy Type	Building Counts	Exposure (thousands)
Residential	1,728	285,836
Commercial	9	20,896
Industrial	3	13,415
Agriculture	0	221
Religious	0	1,965
Government	0	99
Education	0	0
Total	1,740	322,432

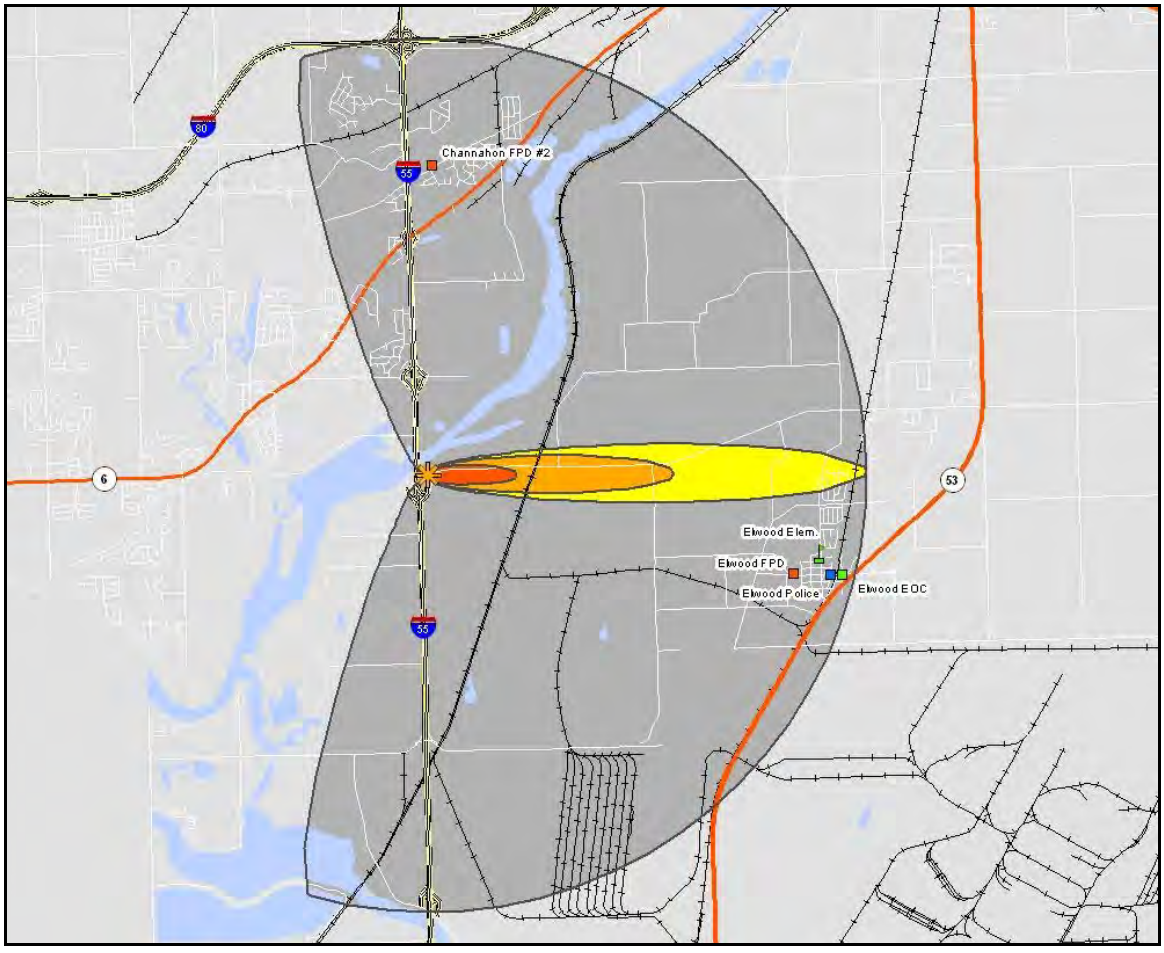
Essential Facilities Damage

Fortunately, in this scenario, there are no essential facilities that fall within any of the concentration areas (i.e., the red, orange, or yellow areas); all of the affected essential facilities fall within the confines of the confidence boundary. Within this area, there is one emergency center, two fire stations, one police station, and one school. The affected facilities are identified in Table 7. Their geographic locations are depicted in Figure 5.

Table 7: Essential Facilities within Plume Footprint

TYPE	NAME	ADDRESS	HAZUS_ID
Emergency Centers	Elwood EOC	309 W Mississippi St	IL000156
Police Stations	Elwood Police	201 E Mississippi Ave	IL000873
Fire Stations	Channahon FPD #2	23341 W McClintock Rd	IL001030
Fire Stations	Elwood FPD	309 W Mississippi St	IL001057
Schools	Elwood Elem.	409 N Chicago Ave	IL005393

Figure 5: Essential Facilities within Plume Footprint



Will County Hazard Risk Assessment
Hazardous Materials Results (Barge)

Disclaimer:
The estimates of social and economic impacts contained in this report were produced using limited GIS and HAZUS loss estimation data. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific hazard. This analysis is intended to provide conceptual information that can be used to identify mitigation opportunities. These results can be improved by using enhanced inventory data and hazard information.

January 9, 2006

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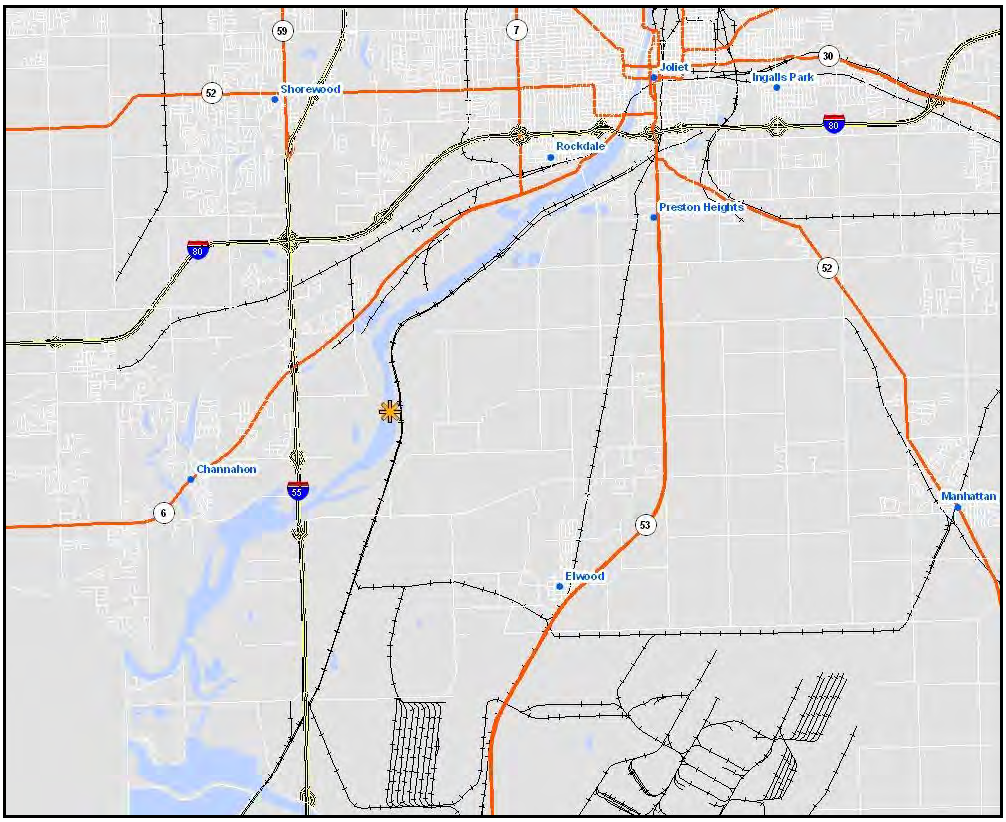
Hazardous Materials (Barge)

The U.S. EPA's ALOHA (Arial Locations of Hazardous Atmospheres) model was utilized to assess the area of impact for a chlorine release from a barge traveling on the Des Plaines River near US Route 6 and I-55. ALOHA is a computer program designed especially for use by people responding to chemical accidents, as well as for emergency planning and training. Chlorine is a common chemical used in industrial operations that can be found in either liquid or gas form. Rail, truck tankers, and barges commonly haul chlorine, as well as other hazardous materials, to and from facilities. For this scenario, moderate atmospheric and climatic conditions with a slight breeze from the west were assumed. The target area of the US Route 6, I-55, and the Des Plaines River was chosen due to its heavy barge traffic, large rail and truck hubs, as well as the presence of a large number of large quantity hazardous material generators.

Review Existing Information

The 2000 Census Block boundaries and population figures, as well as the values for building counts and building replacement cost were extracted from the HAZUS-MH provided inventory. The geographic area covered in this analysis is depicted in Figure 1.

Figure 1: Location of Chlorine Release

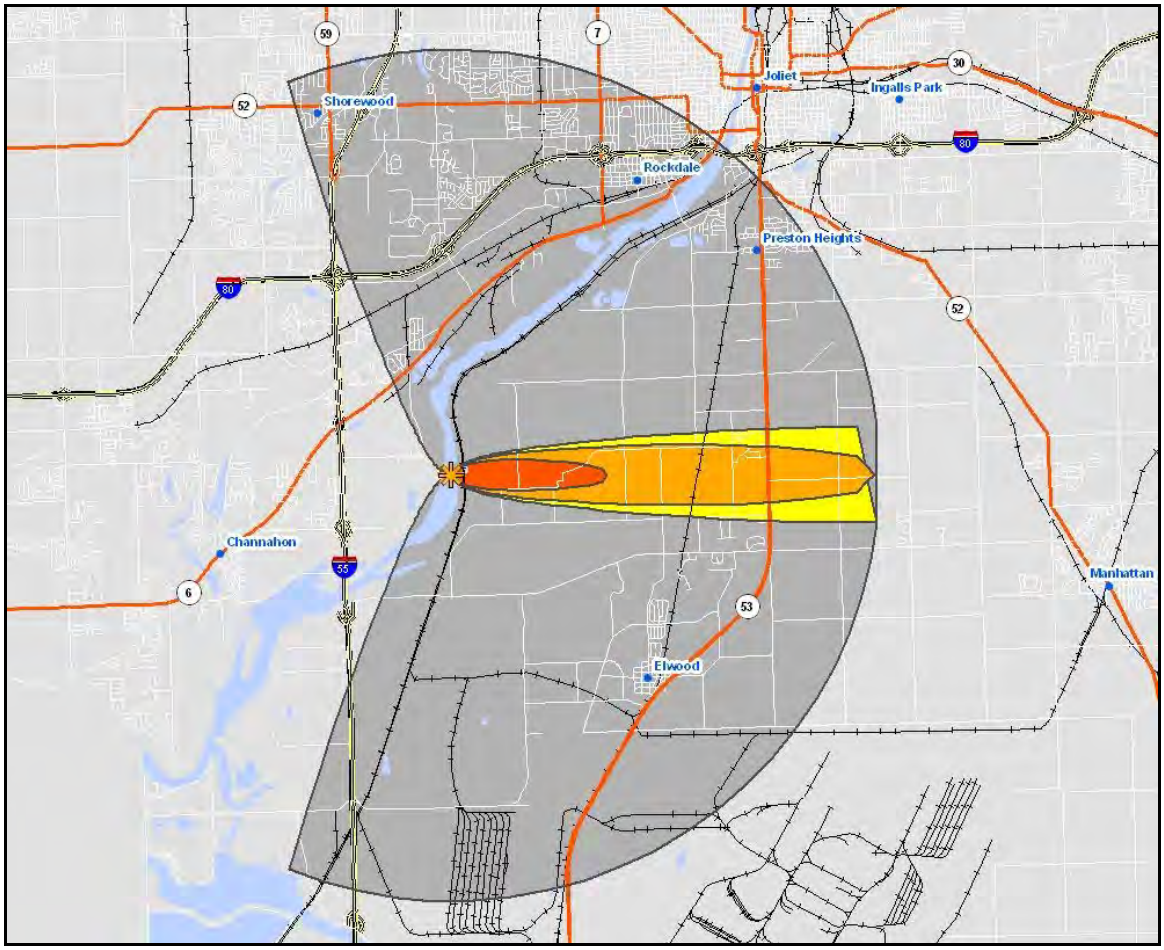


Analysis

In terms of the atmospheric conditions, ALOHA was setup with a wind speed of 5 mph at a westerly direction. The temperature was set for 68° F with a medium level of humidity and partly cloudy skies.

This scenario was setup as a direct release at a rate of 50 tons per hour for a period (i.e., duration) of 60 minutes. The source height for this release was set to 0. Using these settings, approximately 100,000 pounds of material would be released at a rate of 1,670 pounds per minute. The image in Figure 2 depicts the plume footprint generated by ALOHA. As the substance moves away from the source, the level of concentration of that substance decreases. Each color-coded area depicts a level of concentration. These concentrations are measured in parts per million, or ppm.

Figure 2: Plume Footprint Generated by ALOHA



The area in red, at 20 ppm, would extend no more than 2.2 miles out from the point of release. The area in orange, at 3 ppm, would extend no more than 6 miles out from the point of release. The area in yellow, at 1 ppm, would extend more than 6 miles out from the point of release. The gray area depicts what ALOHA refers to as "uncertainty lines", which means that within the confines of the entire plume footprint, the ALOHA model is 95% confident that the release will stay within this boundary.

The 2000 Census Block layer was added to ArcMap and overlaid with the plume footprint. The 2000 Census Block layer was then clipped against each of the four footprint areas. Clipping could be defined as the process of extracting features from one layer, in this case the 2000 Census Block layer, based on the boundary of another layer, in this case one of the four footprint areas. Figures 3 and 4 depict the 2000 Census Block areas before and after the "clipping" process.

Figure 3: The 2000 Census Block Areas before the "Clipping" Process

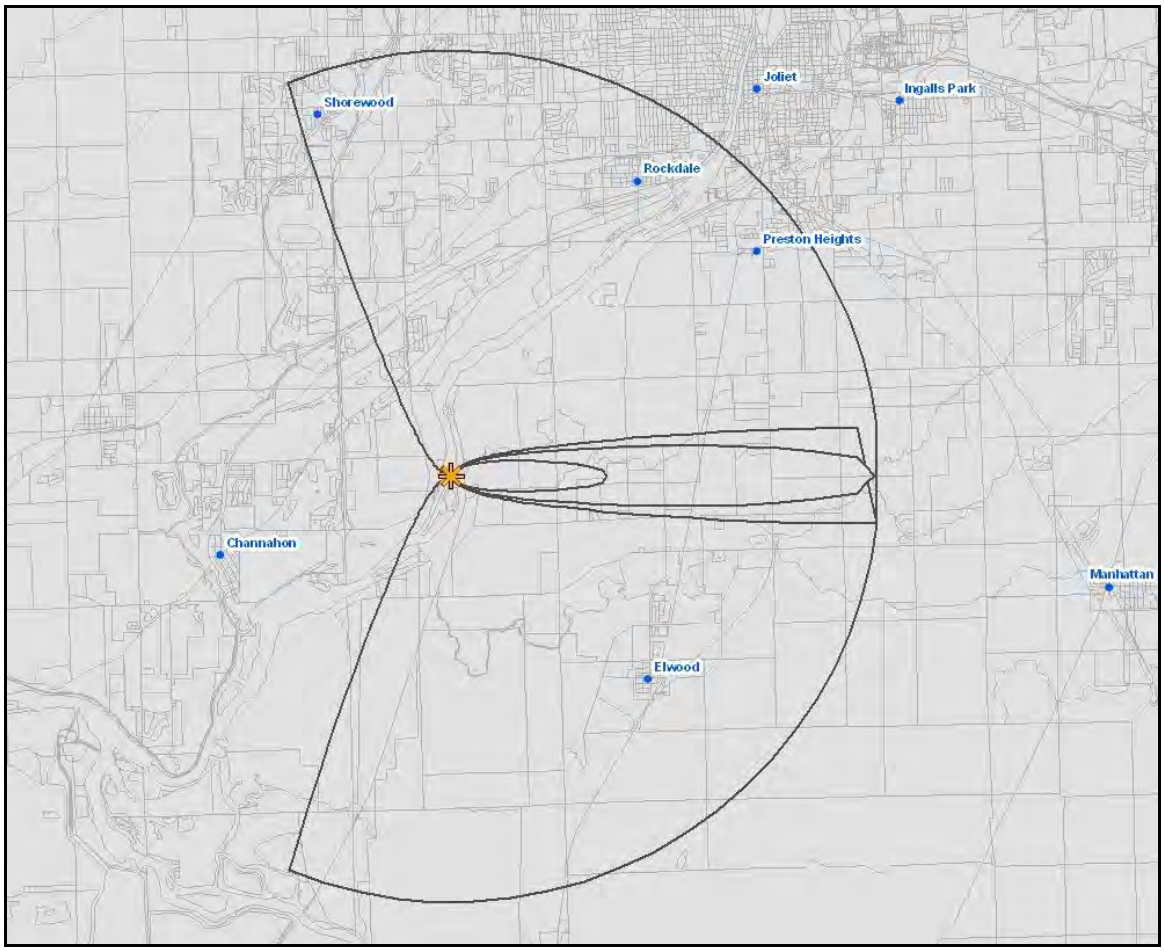
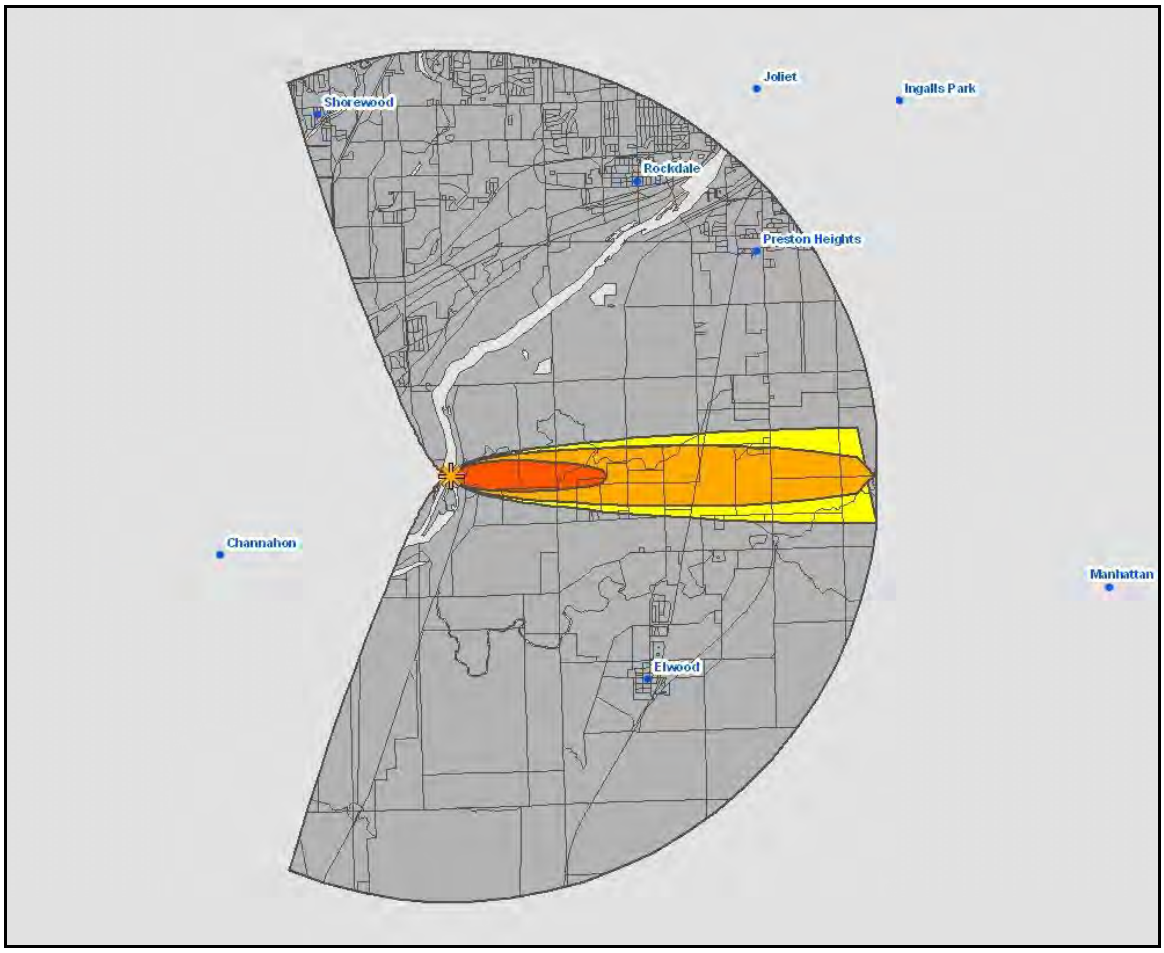


Figure 4: The 2000 Census Block Areas after the "Clipping" Process



A field was added to the table to denote the percentage of each Census Block that fell inside each of the four footprint areas. To populate this field, the area of each clipped Census Block was divided by the area of the original Census Block. The percentages were then multiplied by the building count and exposure values.

Assumptions:

- For this analysis it was assumed that all buildings and population were evenly distributed across each census block. Thus, if 50% of a census block fell within the buffer area, it was assumed that 50% of the structures and population also fell within that area.

Results

By summarizing the results of each of the four footprint areas, the GIS analysis estimates that as many as 8,205 buildings could be exposed. The inventory data upon which these estimates are based was obtained from the HAZUS-MH provided dataset. This dataset was compiled through a combination of 2000 Census data and information

compiled by Dun and Bradstreet for the HAZUS-MH application. Based on population figures from the 2000 Census, approximately 27,722 people would be affected.

As noted earlier, it is important to note that these estimates are based on an area weighted analysis. In this analysis it was assumed that all buildings were evenly distributed across each census block. Thus, if 50% of a census block fell within the buffer area, it was assumed that 50% of the structures and population also fell within that area. In reality, the actual number of buildings could be much higher or lower than estimated.

The results of the analysis are depicted in Tables 1 through 6. Table 1 summarizes the results of the four footprint areas in terms of buildings counts and replacement costs. Table 2 summarizes the results of the four footprint areas in terms of population. Tables 3 through 6 depict the results for each of the four footprint areas.

Table 1: Estimated Number of Buildings Exposed and Replacement Cost (Total)

Occupancy Type	Building Counts	Exposure (thousands)
Residential	8,024	1,545,565
Commercial	144	386,566
Industrial	13	51,382
Agriculture	0	1,954
Religious	4	15,049
Government	10	11,965
Education	10	69,448
Total	8,205	2,081,929

Table 2: Estimated Population (By Area and Total)

Plume Area	Population
Red	18
Orange	288
Yellow	180
Gray	27,236
Total	27,722

Table 3: Estimated Number of Buildings Exposed and Replacement Cost (Red Area)

Occupancy Type	Building Counts	Exposure (thousands)
Residential	6	1,093
Commercial	0	0
Industrial	0	0
Agriculture	0	0
Religious	0	0
Government	0	0
Education	0	0
Total	6	1,093

Table 4: Estimated Number of Buildings Exposed and Replacement Cost (Orange Area)

Occupancy Type	Building Counts	Exposure (thousands)
Residential	95	16,090
Commercial	0	818
Industrial	0	786
Agriculture	0	47
Religious	0	0
Government	0	0
Education	0	0
Total	95	17,741

Table 5: Estimated Number of Buildings Exposed and Replacement Cost (Yellow Area)

Occupancy Type	Building Counts	Exposure (thousands)
Residential	59	10,139
Commercial	0	446
Industrial	0	287
Agriculture	0	39
Religious	0	0
Government	0	0
Education	0	0
Total	59	10,911

Table 6: Estimated Number of Buildings Exposed and Replacement Cost (Gray Area)

Occupancy Type	Building Counts	Exposure (thousands)
Residential	7,864	1,518,243
Commercial	144	385,302
Industrial	13	50,309
Agriculture	0	1,868
Religious	4	15,049
Government	10	11,965
Education	10	69,448
Total	8,045	2,052,184

Essential Facilities Damage

Fortunately, in this scenario, there are no essential facilities that fall within any of the concentration areas (i.e., the red, orange, or yellow areas); all of the affected essential facilities fall within the confines of the confidence boundary. Within this area, there is one care facility, two emergency centers, six fire stations, three police stations, and fifteen schools. The affected facilities are identified in Table 7. Their geographic locations are depicted in Figures 5 (Care Facilities, Emergency Centers, and Police Stations), 6 (Fire Stations), and 7 (Schools).

Table 7: Essential Facilities within Plume Footprint

TYPE	NAME	ADDRESS	HAZUS_ID
Care Facilities	Provena St. Joseph Medical Center	333 N Madison St	IL000228
Emergency Centers	Elwood EOC	309 W Mississippi St	IL000156
Emergency Centers	Rockdale EOC	603 Otis Ave	IL000168
Fire Stations	East Joliet FPD #2	102 E Zarley Blvd	IL001033
Fire Stations	Elwood FPD	309 W Mississippi St	IL001057
Fire Stations	Joliet FD #6	2049 Oneida St	IL001060
Fire Stations	Joliet FD #7	125 S Houbolt Rd	IL001059
Fire Stations	Rockdale FPD	603 Otis Avenue	IL001012
Fire Stations	Troy FPD	107 W Jefferson St	IL001017
Police Stations	Elwood Police	201 E Mississippi Ave	IL000873
Police Stations	Joliet Junior College Police	1215 Houbolt Rd	IL000888
Police Stations	Rockdale Police	79 Moen Ave	IL000881
Schools	B Noonans Child Care (Joliet)	2504 Fairway Dr	IL005441
Schools	Dirksen Jr. High	203 S Midland Ave	IL005318
Schools	Elwood Elem.	409 N Chicago Ave	IL005393
Schools	Heritage Trail	3389 Longford Dr	IL005290
Schools	Laraway Elem.	275 W Laraway Rd	IL005298
Schools	Lynne Thigpen Elem.	207 S Midland	IL005315
Schools	Marycrest	303 Purdue Ct	IL005309
Schools	Oak Valley	1705 Richards St	IL005299
Schools	Rockdale Elem.	715 Meadow Ave	IL005300
Schools	Shorewood	210 School Rd	IL005291
Schools	SOWIC Ed. Center	1705 Richards St	IL005436
Schools	St. Jude (Joliet)	2204 McDonough	IL005467
Schools	St. Paul the Apostle	130 N Woodlawn Ave	IL005476
Schools	Thomas Jefferson	2651 W Glenwood Ave	IL005306
Schools	United Cerebral Palsy of Will County	311 S Reed St	IL005483

Figure 5: Essential Facilities within Plume Footprint (Care, Emergency, and Police)

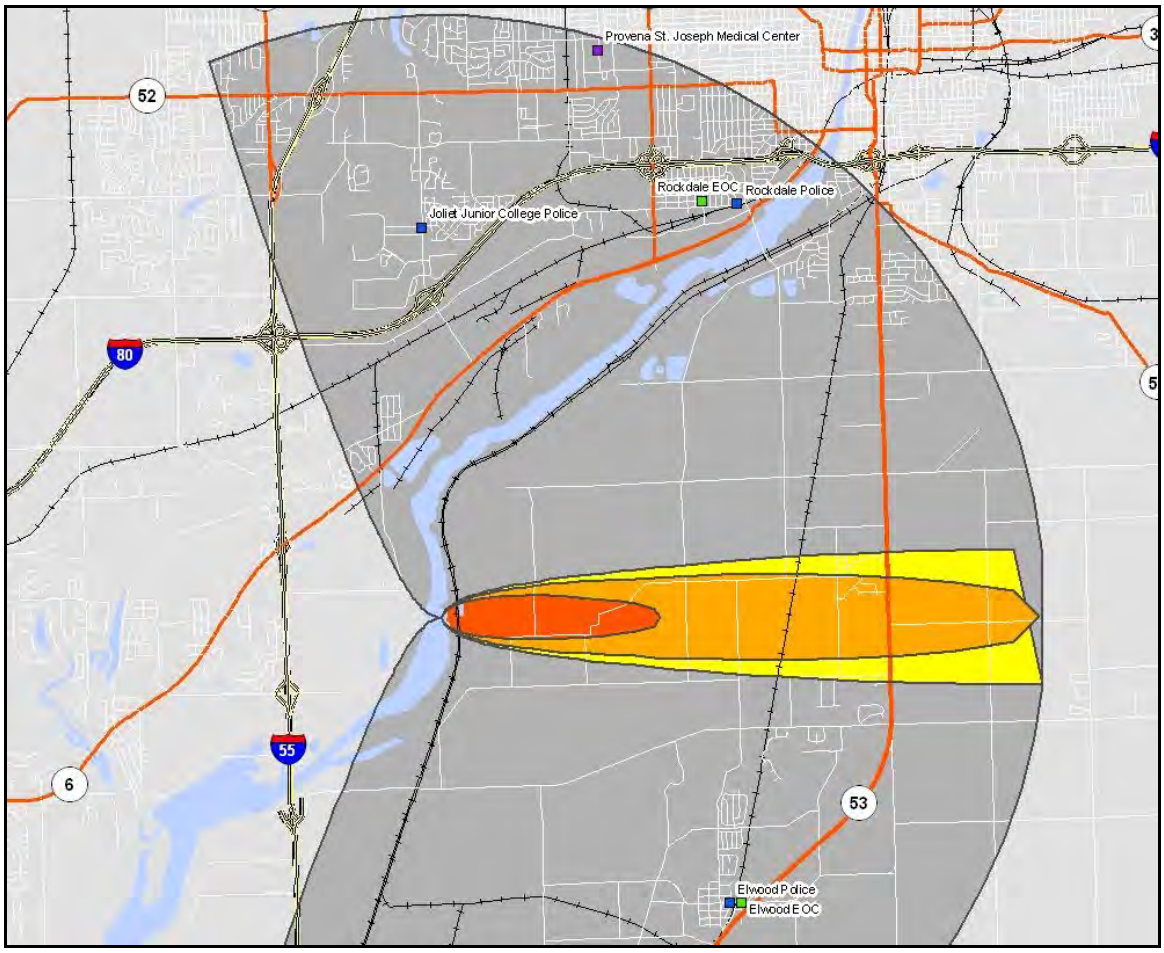


Figure 5: Essential Facilities within Plume Footprint (Fire)

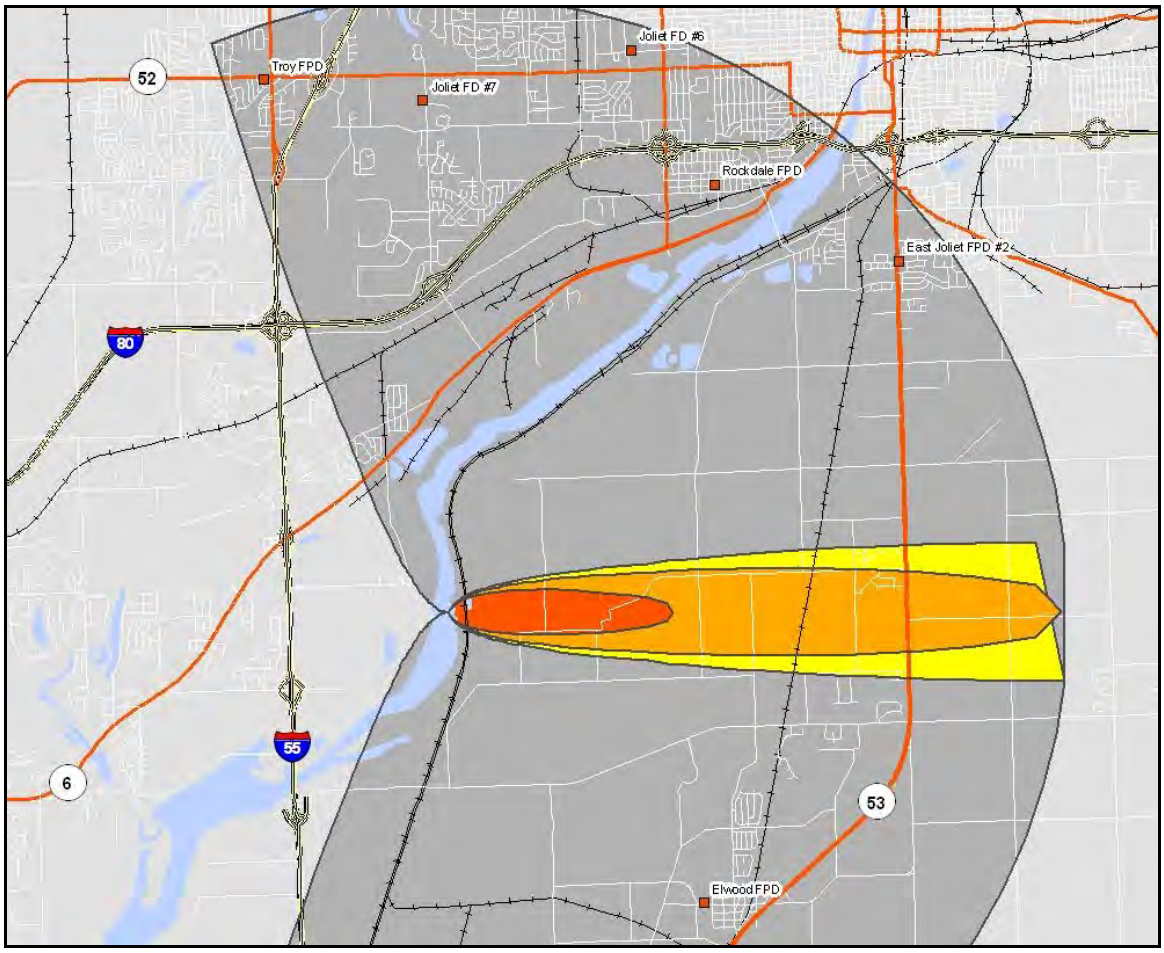
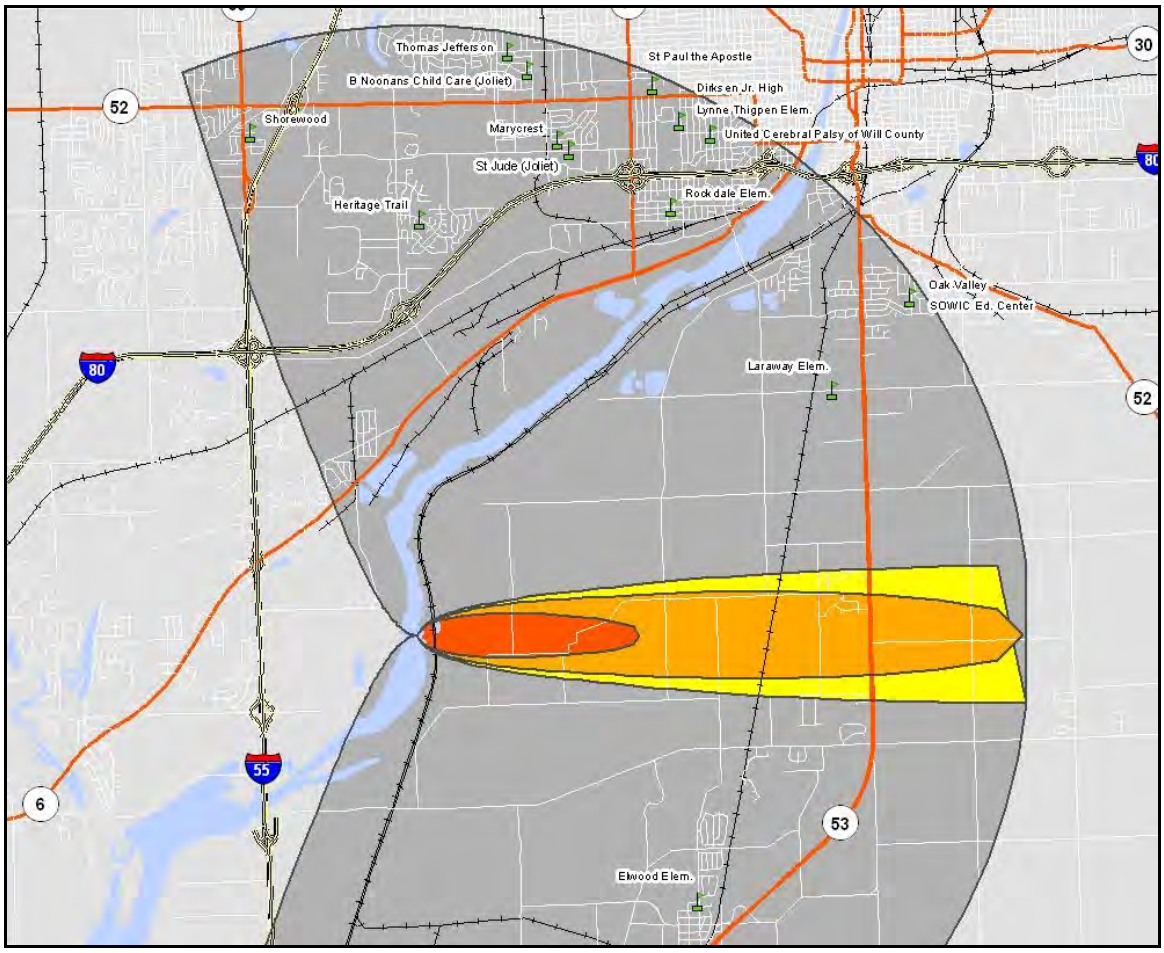


Figure 5: Essential Facilities within Plume Footprint (Schools)



Will County Hazard Risk Assessment
Munitions Results

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December 19, 2005

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We bring things into perspective.℠

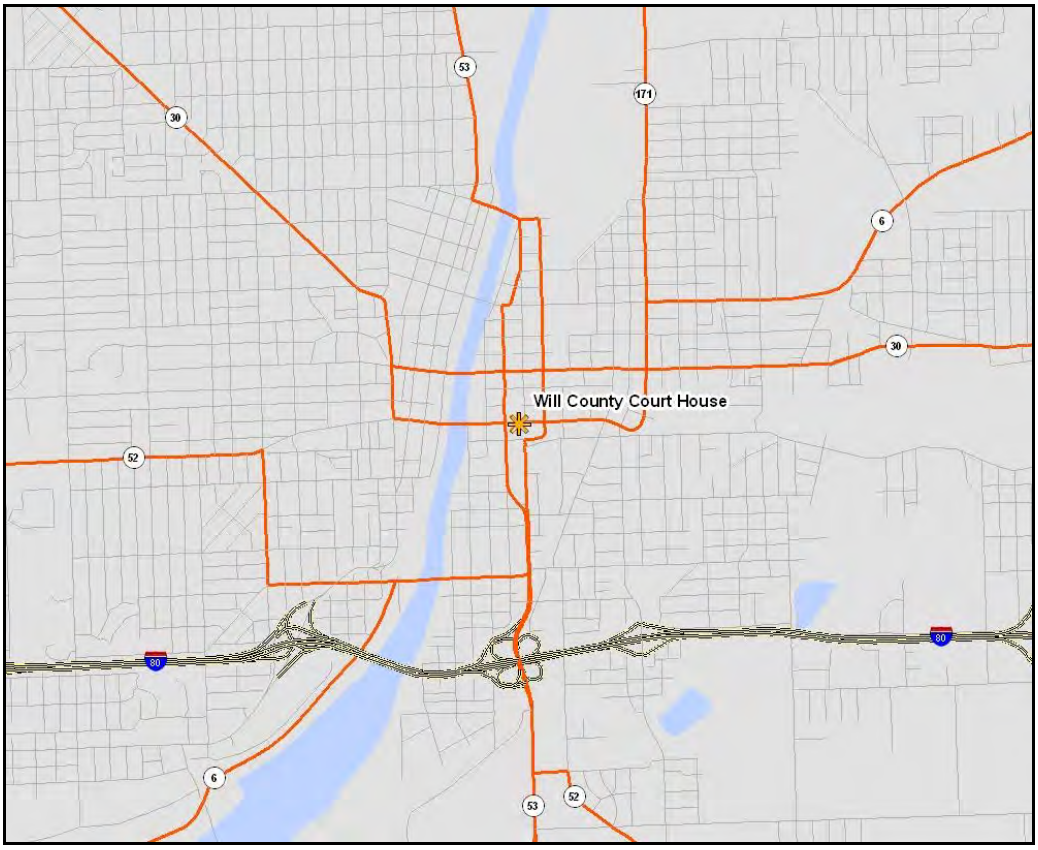
Munitions

GIS analysis was utilized to determine the impacts of a bombing near a critical piece of county government infrastructure, similar in magnitude to the April 19, 1995 Oklahoma City Bombing. In the Oklahoma City Bombing, a Ryder rental truck was loaded with approximately 5,000 pounds of ammonium nitrate fertilizer and detonated outside of the Murrah Federal Building. The explosion generated a pressure blast of 500,000 psi, destroyed one-third of the Murrah Federal Building, and created a crater thirty feet wide and eight feet deep. The target analyzed in this hazard modeling is the Will County Court House. This identified target is consistent with Will County's Infrastructure Security Buffer Zone Protection Plan, which utilizes the Carver Scoring system to identify high-profile targets.

Review Existing Information

The 2000 Census Block boundaries and population figures, as well as the values for building counts and building replacement cost were extracted from the HAZUS-MH provided inventory. The geographic area covered in this analysis is depicted in Figure 1.

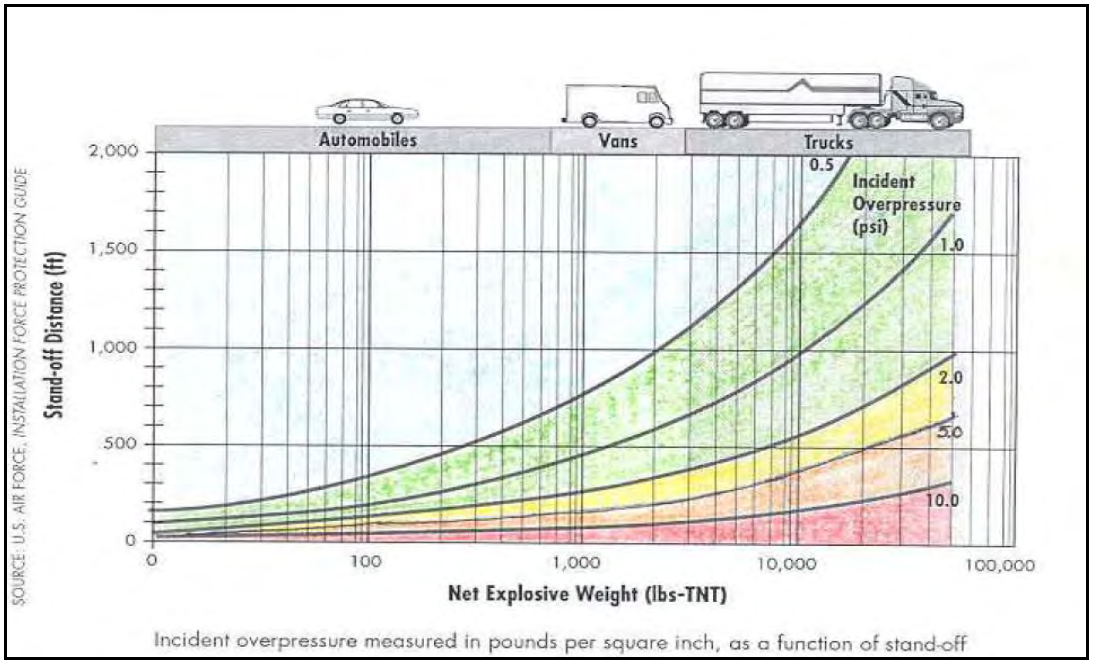
Figure 1: Location of the Will County Court House Building



Analysis

Buffers were created at 100 feet, 200 feet, 350 feet, 650 feet, and 1,150 feet, using the Will County Court House as the point-of-origin. These distances were selected based on the diagram in Figure 2. The distances listed above are where 5,000 pounds of explosives intersect the incident overpressure curves.

Figure 2: Damage Impact as a Function of Distance and Weight



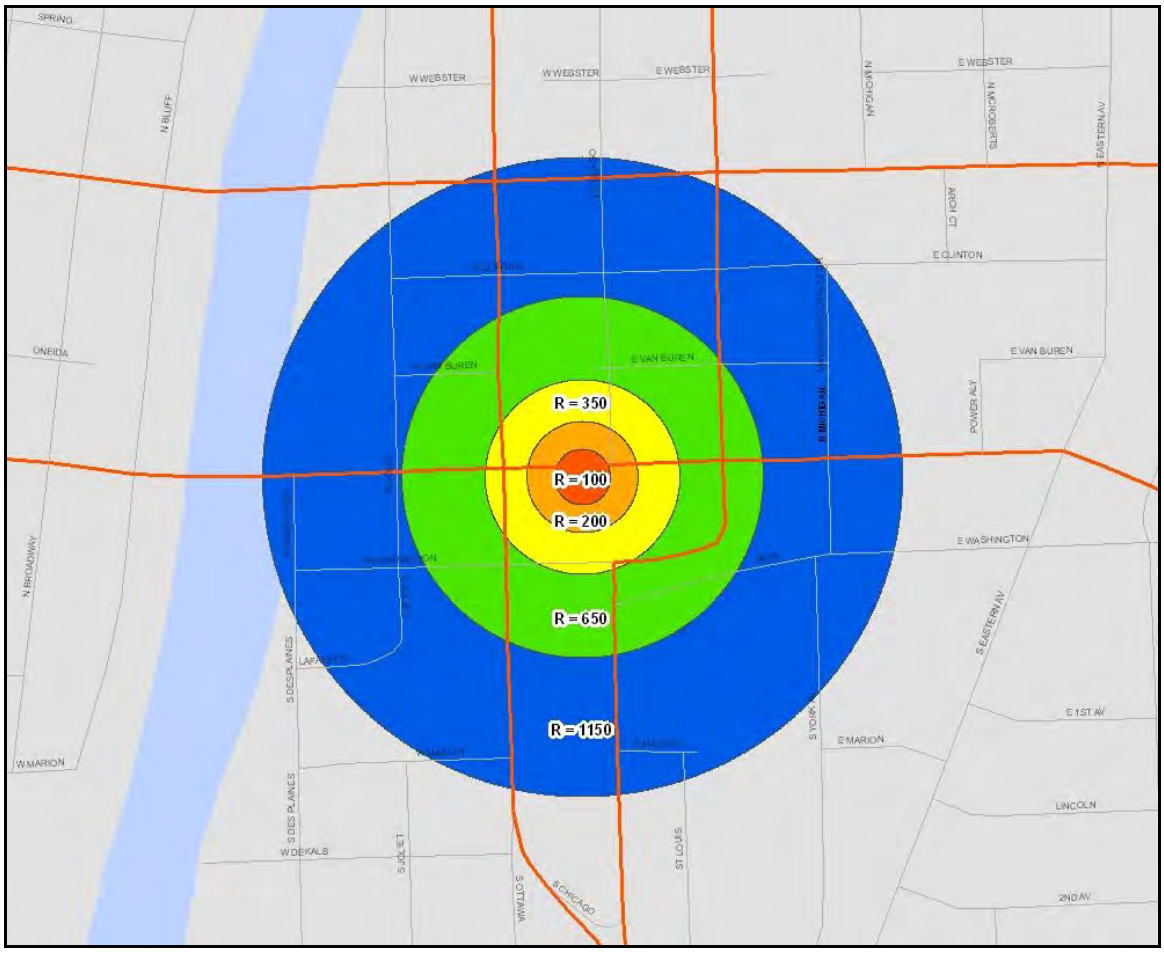
Each incident overpressure curve represents the amount of blast pressure emitted from an explosive device. The area between each curve represents the amount of damage that can be expected. As the incident overpressure increases (stated in pounds per square inch or PSI), so too does the amount of damage. For each level of potential damage, a percentage was applied when calculating the number of buildings damaged and replacement cost. Those percentages are depicted in Table 1.

Table 1: Percent Damage Factor per Amount of Damage

Damage Type	Percent Damaged	Description
Severe Damage	100%	Total destruction of most buildings
Heavy Damage	75%	Over 50% of major structural and secondary
Unrepairable Damage	50%	Sections of structure may collapse or lose structural capacity
Repairable Damage	25%	Minor to major structural and non-structural deformation
Minimal Damage	5%	No permanent deformation, minor damage

As stated above, buffers were created at 100 feet, 200 feet, 350 feet, 650 feet, and 1,150 feet, using the Will County Court House as the point-of-origin. The image in Figure 3 depicts the Will County Court House building and its surroundings, with the five buffer regions emanating outward.

Figure 3: Affected Area around the Will County Court House Building



The 2000 Census Block layer was added to ArcMap and overlaid with the five buffer areas. The 2000 Census Block layer was then clipped against each of the five buffer areas. Clipping could be defined as the process of extracting features from one layer, in this case the 2000 Census Block layer, based on the boundary of another layer, in this case one of the five buffer areas. Figures 4 and 5 depict the 2000 Census Block areas before and after the "clipping" process.

Figure 4: The 2000 Census Block Areas before the "Clipping" Process

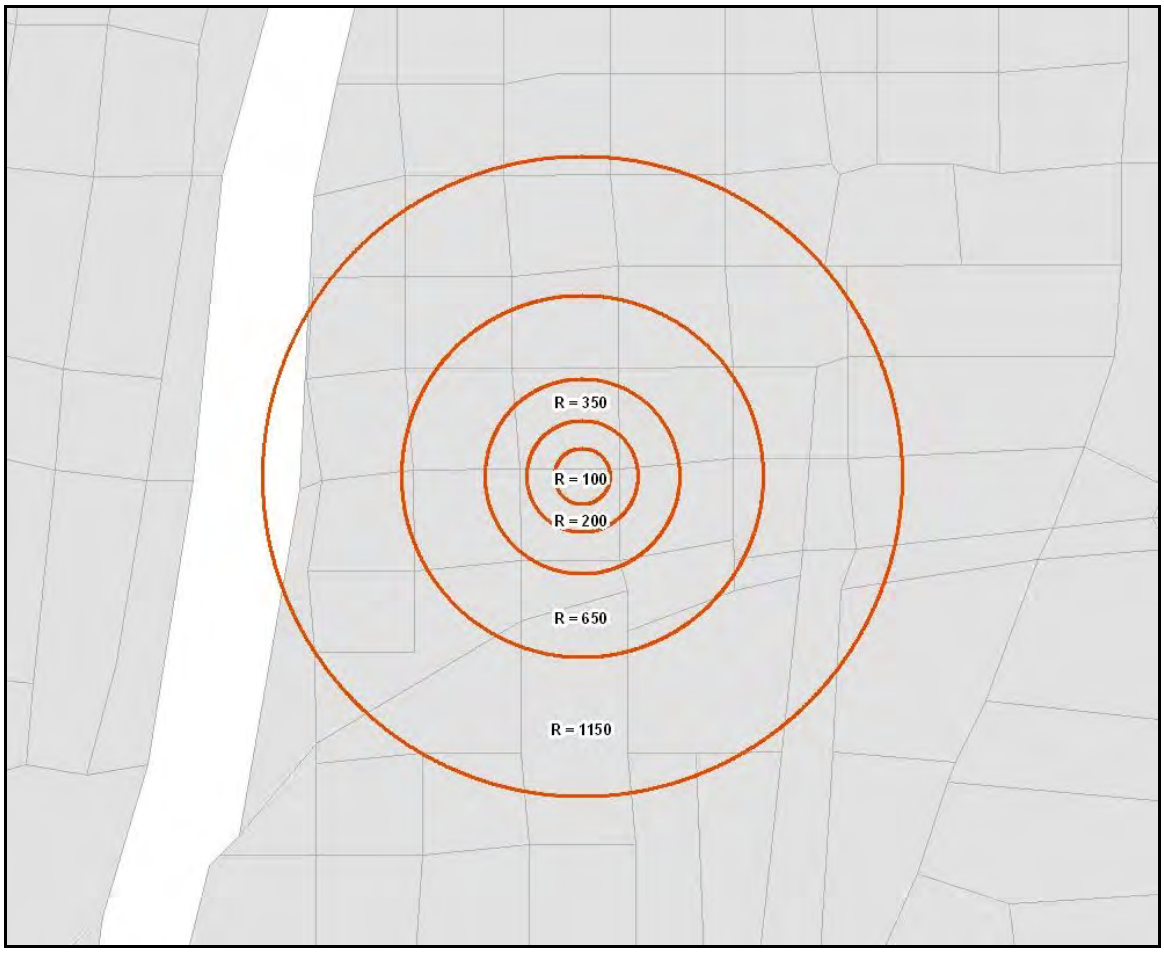
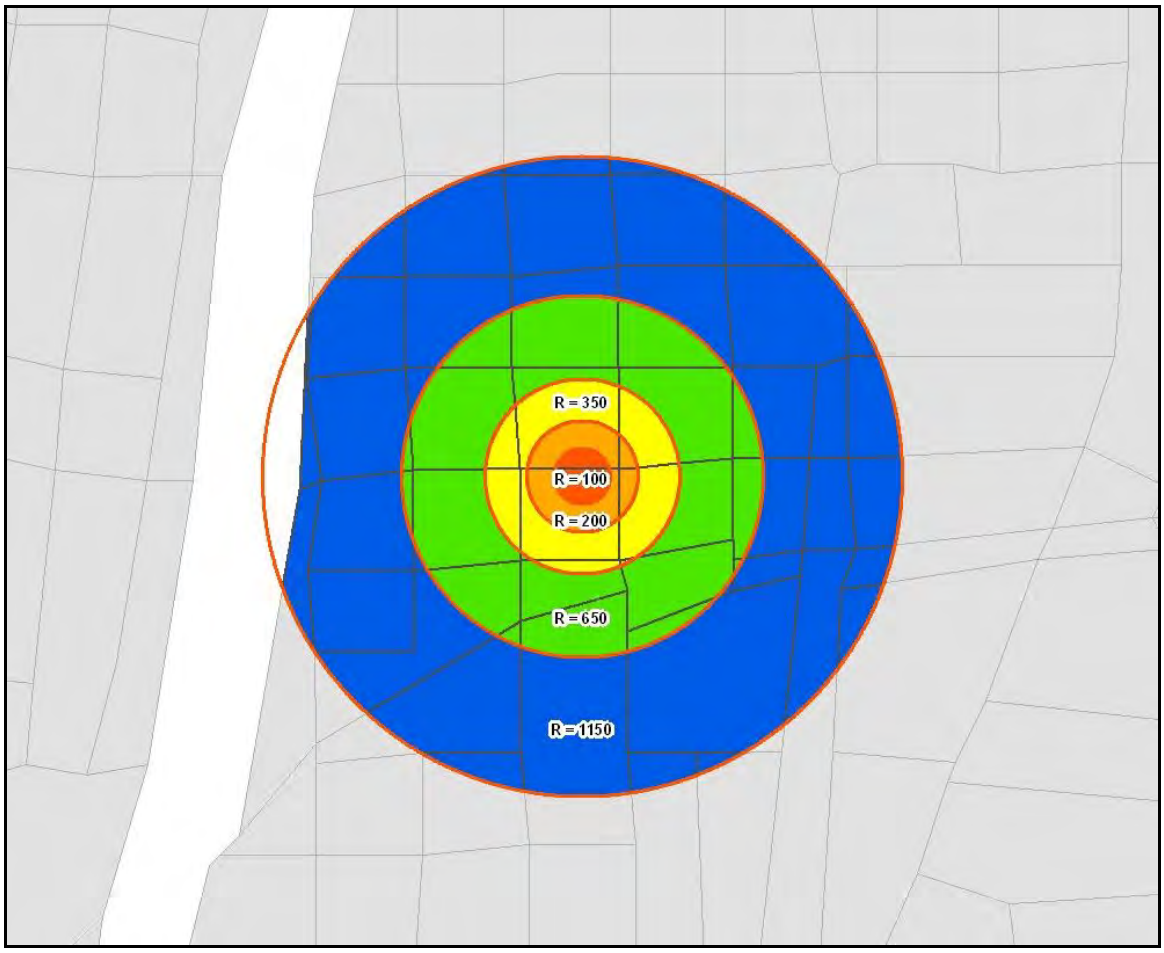


Figure 5: The 2000 Census Block Areas after the "Clipping" Process



A field was added to the table to denote the percentage of each Census Block that fell inside each of the five buffer areas. To populate this field, the area of each clipped Census Block was divided by the area of the original Census Block. The percentages were then multiplied by the building count and exposure values.

Assumptions:

- For this analysis it was assumed that all buildings and population were evenly distributed across each census block. Thus, if 50% of a census block fell within the buffer area, it was assumed that 50% of the structures and population also fell within that area.

Results

By summarizing the results of each of the five buffer areas, the GIS analysis estimates that as many as 19 buildings could be damaged at a replacement cost of $53,590,000. The inventory data upon which these estimates are based was obtained from the HAZUS-MH provided dataset. This dataset was compiled through a combination of 2000 Census data and information compiled by Dun and Brandstreet for the HAZUS-MH application. The building exposure is an estimate of building replacement costs.

As noted earlier, it is important to note that these estimates are based on an area weighted analysis. In this analysis it was assumed that all buildings were evenly distributed across each census block. Thus, if 50% of a census block fell within the buffer area, it was assumed that 50% of the structures and population also fell within that area. In reality, the actual number of buildings could be much higher or lower than estimated.

The results of the analysis are depicted in Tables 2 through 7. Table 2 summarizes the results of the five buffer areas. Tables 3 through 7 depict the results for each of the five buffer areas.

Table 2: Estimated Number of Buildings Damaged and Replacement Cost (Total)

	Building Counts	Exposure (thousands)
Residential	3	9,135
Commercial	13	33,634
Industrial	0	847
Agriculture	0	116
Religious	1	1,959
Government	2	4,615
Education	0	3,284
Total	19	53,590

Table 3: Estimated Number of Buildings Damaged and Replacement Cost (Within 100 ft)

	Building Counts	Exposure (thousands)
Residential	0	0
Commercial	1	1,586
Industrial	0	64
Agriculture	0	9
Religious	0	56
Government	0	125
Education	0	0
Total	1	1,840

Table 4: Estimated Number of Buildings Damaged and Replacement Cost (Within 200 ft)

	Building Counts	Exposure (thousands)
Residential	0	0
Commercial	2	5,540
Industrial	0	225
Agriculture	0	31
Religious	0	195
Government	0	436
Education	0	0
Total	2	6,427

Table 5: Estimated Number of Buildings Damaged and Replacement Cost (Within 350 ft)

	Building Counts	Exposure (thousands)
Residential	0	0
Commercial	4	9,804
Industrial	0	391
Agriculture	0	55
Religious	0	338
Government	0	756
Education	0	0
Total	4	11,344

Table 6: Estimated Number of Buildings Damaged and Replacement Cost (Within 650 ft)

	Building Counts	Exposure (thousands)
Residential	0	885
Commercial	2	4,805
Industrial	0	150
Agriculture	0	21
Religious	0	130
Government	0	771
Education	0	0
Total	2	6,762

Table 7: Estimated Number of Buildings Damaged and Replacement Cost (Within 1,150 ft)

	Building Counts	Exposure (thousands)
Residential	3	8,250
Commercial	4	11,899
Industrial	0	17
Agriculture	0	0
Religious	1	1,240
Government	2	2,527
Education	0	3,284
Total	10	27,217

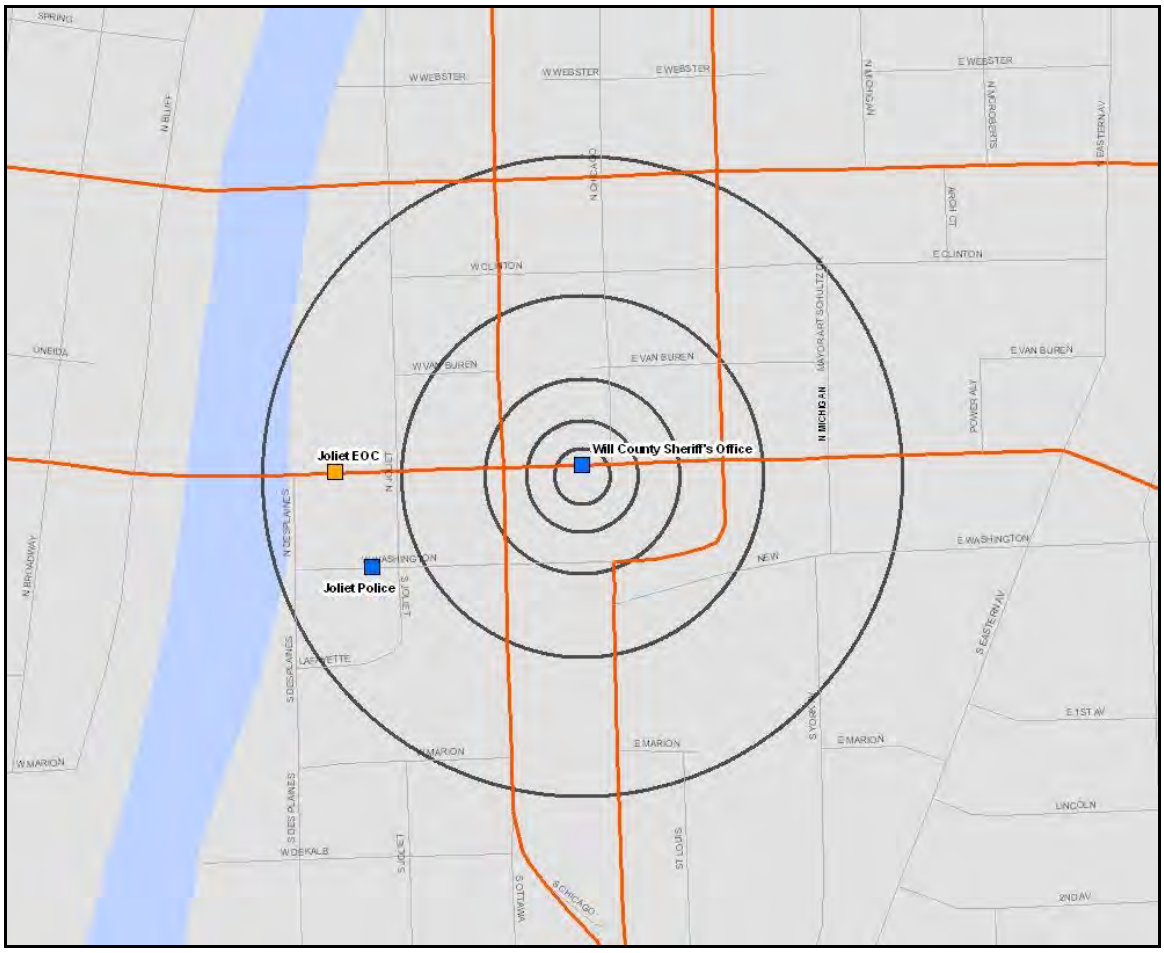
Essential Facilities Damage

Within 100 feet of the blast point, there is one Police Station, the Will County's Sheriff's Office. Within the last buffer area, or from 651 feet out to 1,150 feet from the blast point, there are one emergency center and one police station, the Joliet EOC and the Joliet Police respectively. The affected facilities and their addresses are identified in Table 8. Their geographic locations are depicted in Figure 6.

Table 8: Essential Facilities within Defined Blast Radius

TYPE	NAME	ADDRESS	HAZUS_ID
Emergency Centers	Joliet EOC	150 W Jefferson St	IL000160
Police Stations	Joliet Police	150 W Washington St	IL000874
Police Stations	Will County Sheriff's Office	14 W Jefferson St	IL000891

Figure 6: Essential Facilities within Defined Blast Radius



APPENDIX C

BENEFIT COST ANALYSIS GUIDANCE

BENEFIT COST ANALYSIS GUIDANCE

The following FEMA provided document provides an overview of the FEMA Benefit-Cost Analysis (BCA) process, its benefits, and the FEMA BCA Software available online.

May, 2019, FEMA released the Benefit Cost Analysis Tool version 6.0 which is available to be used to demonstrate cost-effectiveness for FEMA's HMA grant programs. A link is provided below to download the software.

- Tool available from: https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis
- Training in the Benefit Cost Analysis process is available online from: https://training.fema.gov/is/courseoverview.aspx?code=IS-276.a

APPENDIX D

HAZARD MITIGATION ACTION FORM

HAZARD MITIGATION ACTION FORM

The following form was provided at the Mitigation Steering Committee Workshop to facilitate the creation and organization of potential hazard mitigation actions that could be submitted by any of the meeting participants.

New Hazard Mitigation Action Recommendation

Hazard Category	☐ Natural ☐ Technological ☐ Societal	***Hazard Type***	☐ All Hazards ☐ If not All Hazards, Specify Hazard(s):	
Priority	☐ High ☐ Medium ☐ Low	***Implementation Timeline***	☐ Short Term (ST) - ≦ 5yr ☐ Long Term (LT) - +5 yr ☐ Ongoing	(estimate amount of time it will take to begin implementation of action item)
Mitigation Action	Title: Brief Description:			
Goal Addressed	☐ #1 - Life & Property Protection ☐ #2 - Enhance Emergency Management ☐ #3 - Economic Stability		☐ #4 - Develop, Promote, Integrate Mitigation ☐ #5 - Protect Natural Systems	
Problem/ Opportunity	Describe either the problem or possible opportunity to reduce risk:			
Implementation Strategy	Describe ideas to implement and accomplish the project and potential resources that may be needed:			
Lead Agency	List:			
Support Agency	List:			
Funding Opportunities	(i.e., grants, resources, operating budget, etc.)			

APPENDIX E

PUBLIC INVOLVEMENT

PUBLIC INVOLVEMENT

This appendix describes the sources of all information in this plan that came from the public through meetings, forms, individual personal contact, or web postings. The project team held three stakeholder committee meetings with representatives of the county, regional authorities, and local organizations. In addition, two workshops were held to review and update the Hazard Analysis and Hazard Mitigation Plan Goals, Objectives, and Mitigation Actions. The project team also met with subject matter experts, private and public sector professionals, and organizations.

All-Hazard Mitigation Steering Committee for the Update

The County-Wide All Hazard Mitigation Steering Committee is comprised of representatives from County departments with expertise ranging from emergency management and floodplain management to engineering and planning. Periodic emails were sent to the Committee throughout the duration of the development and update of the *Will County County-Wide All Hazard Mitigation Plan*. Although invitations were extended to the entire Committee, attendance to meetings was variable. After each meeting, a follow up email was sent updating the Committee on the material covered. The absent Committee members were encouraged to contact Will County EMA if there were any questions, comments, or concerns. *NOTE:* A list of jurisdictional participants meeting participation requirements and their representatives is found on pages 1-7 through 1-9.

Steering Committee Members:

Harold Damron, Will County Emergency Management Agency
Allison Anderson, Will County Emergency Management Agency
Domingo Kaller, Will County Emergency Management Agency
Nicole Roedl, Will County Land Use Department
Owen Needhan, Will County Land Use Department
Tim Anderson, Will County Land Use Department
Tim Helmer, Will County Land Use Department
Rebecca Colwell, Will County ICT, GIS Division
Jayne Ballun, Project Coordinator

Organizational Outreach and Input

Will County Land Use Department – Representatives of the Will County Land Use Department were actively involved in the All Hazard Mitigation planning, activities, and development of the project. In 1993, the Will County Board authorized creation of a county Stormwater Management Planning Committee. In 1996, a full complement of 18 municipal and county representatives began meeting regularly and working with local planning commissions to develop a stormwater management plan.

Stakeholder Meetings and Workshop Summaries

Workshop #1: November 20, 2019 – Hazard Analysis

This meeting was a 3 hour meeting with Will Emergency Management Agency and Mitigation Project stakeholders to review and update the Hazard Analysis included in the *County-Wide All Hazard Mitigation Plan* update. Additional stakeholders participated by completing the Hazard Analysis Workbook and submitting it to the agency for inclusion in the data. The Hazard Analysis review was led by Domingo Kaller, Planning Officer of the Will County Emergency Management Agency, and Jayne Ballun, Project Coordinator. The review focused on the following:

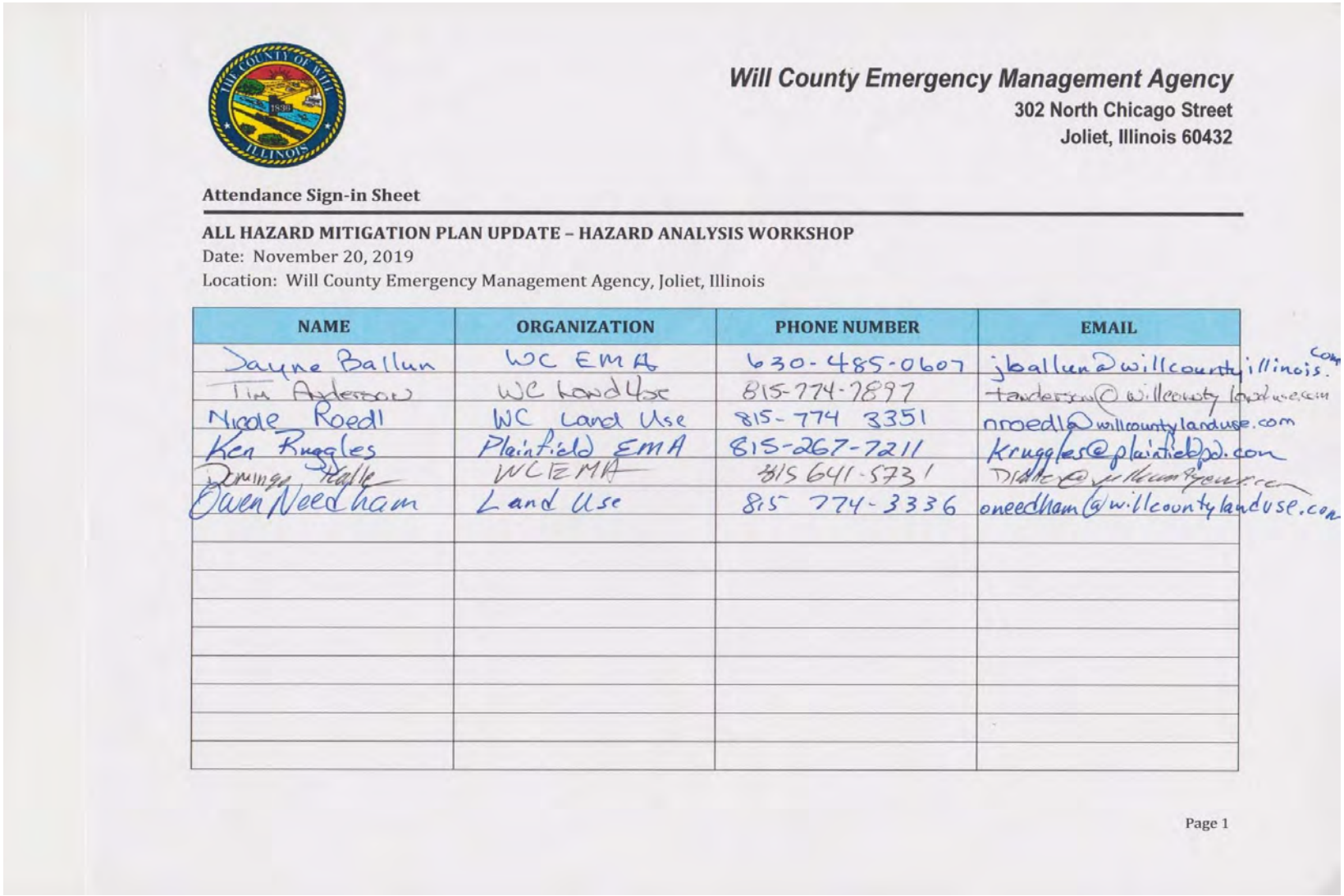
- Introduction to the Hazard Mitigation Plan Update
- Overview of the hazard analysis process
- Analysis of each hazard
  - Hazard Analysis Workbook
    - Description of the Risk Analysis Process
    - County Data – Population counts, Workforce jobs and salaries, Structures by type and value, and risk loss history
    - Ranking worksheet for each hazard evaluating History, Vulnerability, Severity of Impact, and Probability
- Compilation of hazard analysis data
- Goals and Objectives Workgroup Meeting Date
  - January 15, 2020, 9:00 to Noon

    Will County EMA Office, 302 N. Chicago, St., Joliet, IL

Review of Hazard Mitigation Plan – Goals and Objectives

Please bring your community's planners

- All County/Communities - Hazard Mitigation Plan Update Meetings
  - December 11, 2019, 10 am to 11:30 am
  - January 29, 2020, 10 am to 11:30 am
  - February 26, 2020, 10 am to 11:30 am
- Questions



Will County Emergency Management Agency
302 North Chicago Street
Joliet, Illinois 60432

Attendance Sign-in Sheet

ALL HAZARD MITIGATION PLAN UPDATE – HAZARD ANALYSIS WORKSHOP
Date: November 20, 2019
Location: Will County Emergency Management Agency, Joliet, Illinois

NAME	ORGANIZATION	PHONE NUMBER	EMAIL
Dayne Ballun	WC EMA	630-485-0607	jballun@willcountyillinois.com
Tim Anderson	WC Land Use	815-774-7897	tanderson@willcountylanduse.com
Nicole Roedl	WC Land Use	815-774 3351	nroedl@willcountylanduse.com
Ken Ruggles	Plainfield EMA	815-267-7211	kruggles@plainfieldpd.com
Dominga Tralle	WC EMA	815 641-5731	Dtralle@willcountyillinois.com
Owen Needham	Land Use	815 774-3336	oneedham@willcountylanduse.com

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Will County Emergency Management Agency
302 North Chicago Street
Joliet, Illinois 60432

Attendance Sign-in Sheet

ALL HAZARD MITIGATION PLAN UPDATE – HAZARD ANALYSIS WORKSHOP
Hazard Analysis Workbooks Completed by Stakeholders
Location: Will County Emergency Management Agency, Joliet, Illinois

NAME	ORGANIZATION	PHONE NUMBER	EMAIL
Troy Kirch	Bolingbrook FD	630-226-8531	tkirch@bolingbrook.com
Jeff Toepper	Channahon FD	815-467-6767	jtoepper@channahonfire.com
Brad Hertzmann	Crest Hill PD	815-741-5115	bhertzmann@cityofcresthill.com
Marty Braccio	Crete EMA	708-672-1437	mbraccio@villageofcrete.org
Greg Blaskey	Joliet EMA	815-724-3520	gblaskey@jolietcity.org
Mike Littrell	Romeoville EMA	815-886-6108	mlittrell@romeoville.org
Lisa Anderson	IEMA	815-433-7161	lisa.d.anderson@illinois.gov

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Stakeholders Meeting #1: December 11, 2019

This meeting was a 1½ hour kick-off meeting with Will Emergency Management Agency and the Mitigation Project Stakeholders to inform participants about the *County-Wide All Hazard Mitigation Plan* update and identify expectations of the project. The meeting was led by Domingo Kaller, Planning Officer of the Will County Emergency Management Agency, and Jayne Ballun, Project Coordinator. The project kick-off focused on the following:

- Welcome & Introductions
- Hazard Mitigation Defined
- Will County: *County-wide All Hazard Mitigation Plan* – 2013
- What's in the 2013 Plan?
  - All Hazard Risk Assessment
- Results of Hazard Analysis
  - Hazard Profiles & Vulnerability Assessment
- Begin identifying goals to achieve for your community
  - Mitigation Goals, Objectives & Strategies
  - Mitigation Actions
- What Does It Mean to Participate?
- Public Input
- Benefits & Adoption of the Plan
- Future Meeting Dates
  - Second Meeting: Goals, Objectives & Mitigation Actions
    January 29, 2020
  - Third Meeting: Draft & Final Steps
    February 26, 2020
- Questions

Will County Emergency Management Agency
302 North Chicago Street
Joliet, Illinois 60432

Attendance Sign-in Sheet

ALL HAZARD MITIGATION PLAN UPDATE
Date: December 11, 2019
Location: Will County Emergency Management Agency

NAME	ORGANIZATION	PHONE NUMBER	EMAIL
Roxanne Alton	Godley Asst. Coord. ESDA	815 405 1906	vofgodley1@yahoo.com
Dennis Housman	Wilmington ESDA	815 405-0008	dhousman@wilmington-il.com
Michael Slaviero	Homer Township Fire	815-838-5006	mslaviero@homerfire.org
BRADLEY HERTZMANN	CREST HILL P.D.	815-741-5115	BHERTZMANN@CITYOFCRESTHILL.com
Ken Ruggles	Plainfield PD + EMA	815-267-7211	kruggles@plainfieldema.org
Terry Doyle	Manhattan EMA	815-955-5076	tdoyle@villageofmanhattan.org
AARON KLIMA	S HOLEWOOD	815-791-0714	
DAN MARTIN	VILLAGE OF NEWARK	815-466-6493	dmartin@newlenox.net
Joel Werner	Manhattan EMA	708 935 2083	jwerner@villageofmanhattan.org

First Name	Last Name	Agency	Signature
Dennis	Housman	Wilmington EMA	
Terry	Doyle	Manhattan EMA	
Dave	Bricker		
James	Dykstra		
Daniel	Martin		
Jeff	Toepper		
Nicholas	Cole		
Evelyn	Clark-Kula		
Tami	Burnum		
Larry	Lohmar		
Jim	Planinsek	Village of Rockdale	
Owen	Needham	Will County Land Use	
Jeff	Barrett		
Howard	Stephens	Mokena Fire	
Kent	Adams		
John	Konopek		
Troy	Kirch	Bolingbrook EMA	
Josh	Bolatto	Braidwood ESDA	
Dan	Nelson	Naperville	
Maria	Pergi	WCEMA	
Mark	Detloff		
Aaron	Klima		
Greg	Blaskey		
Todd	Fonfara		
Bradley	Hertzmann	Crest Hill P.D.	
Domingo	Kaller		
John	Grimmer	Channahon ESDA	
Michael	Sguriero	Homer Township Fire	
Rick	Campbell	Mokena Fire	
Jayne	Ballum	WC EMA	

Workshop #2: January 15, 2020 – Goals, Objectives, and Mitigation Actions

This was a three hour meeting, focused primarily on reviewing and updating the Goals, Objectives, and Mitigation Actions of the *Will County County-Wide All Hazard Mitigation Plan.* Input, comments, and recommendations were solicited on changes and additions to the mitigation goals, objectives, and action items. The workshop was led by Domingo Kaller, Planning Officer of the Will County Emergency Management Agency; Harold Damron, Director of Will County EMA; and Jayne Ballun, Project Coordinator. The workshop covered:

- Introduction to the Hazard Mitigation Plan Update
- Overview of the Goals, Objectives, and Mitigation Actions update process
- Samples of Goals, Objectives, and Mitigation Actions
- Analysis of Goals, Objectives, and Mitigation Actions
- Results of Goals, Objectives, and Mitigation Actions
- All County/Communities - Hazard Mitigation Plan Update Meetings
  - January 29, 2020, 10 am to 11:30 am
  - February 26, 2020, 10 am to 11:30 am
- Questions

A workbook was provided for the review of the plan's Goals, Objectives, and Mitigation Actions. First, participants were asked to review the mitigation goals which were found to be consistent with those in the 2018 Illinois Natural Hazard Mitigation Plan. The workbook tool asked participants to identify if goals and objectives should be retained, amended, or removed. The review of goals resulted in all five goals being retained with minor changes to the objectives.

Next, FEMA's STAPLE+E method was used to prioritize mitigation actions. Each mitigation action was evaluated using the criteria of Social, Technical, Administrative, Political, Legal, Economic, and Environmental. For all the hazards, each of these criteria was assigned a rating point:

- Highly Effective or Feasible 1 point
- Neutral 0 points
- Ineffective or Not Feasible - 1 point

The criteria were totaled for each hazard and a priority of High, Medium, or Low accordingly assigned.

Will County Emergency Management Agency

302 North Chicago Street
Joliet, Illinois 60432

Attendance Sign-in Sheet

ALL HAZARD MITIGATION PLAN UPDATE – GOALS, OBJECTIVES, AND MITIGATION ACTIONS WORKSHOP

Date: January 15, 2020

Location: Will County Emergency Management Agency, Joliet, Illinois

NAME	ORGANIZATION	PHONE NUMBER	EMAIL
JEHN GRIMMENGA	CHANNAHON ESDA	815 954 6093	JGRIMMENGA@CHANNAHON.ORG
Lisa Anderson	IEMA	815 433 7161	lisa.d.anderson@illinois.gov
Troy Kirch	Bolingbrook EMA	630-226-8531	tkirch@bolingbrook.com
Mike Littrell	Romeoville EMA	815-886-6108	mLittrell@Romeoville.org
MARTY BRACCIO	CRETE EMA	708-672-2737	MBRACCIO@VILLAGEOFCRETE.ORG
Domingo Valle	WCEMA	815 641 5737	DValle@willcountyillinois.com
Tim Anderson	Will County Land Use	815-774-7897	tanderson@willcountylanduse.com
Scott Killinger	Will County Land Use		skillinger@baxterwoodman.com
Jayne Ballen	WCEMA	630-485-0607	jballen@willcountyil.com
Jeff Toppen	Channahon FPD	815 922 8793	jtoppen@channahonfire.com
Nicole Roedl	Land Use	815-774-3351	nroedl@willcountylanduse.com
Maria Pergi	Will Co. EMA	815-740-8353	mariapergi@willcountyillinois.com
Allison Anderson	Will County EMA	815-723-2411	canderson@willcountyillinois.com
Ken Ruggles	Plainfield EMA	815-267-7211	kruggles@plainfieldpd.com
HAROLD DAMRON	WILL CO EMA	815 740 8351	HDAMRON@WILLCOUNTYILLINOIS.COM

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Stakeholder Meeting #2: January 29, 2020

The intent of this 1½ hour stakeholder meeting was to finalize the review of the plan's mitigation actions. Prior to this meeting, workshop attendees reviewed the plan's goals and objectives. They used FEMA's STAPLE+E tool to prioritize the plan's mitigation goals.

The meeting was guided by Harold Damron, Director of Will County EMA; Allison Anderson, Deputy Director; and Jayne Ballun, Project Coordinator

- Introductions
- December 11, 2019 meeting
  - All Hazard Risk Assessment Review
- Public Survey Progress
- Community Worksheets
- *Adopting the Hazard Mitigation Plan FACT SHEET*
- Mitigation Goals, Objectives, and Actions Workshop
  - Goals Review
  - Mitigation Actions Review using STAPLE+E
- Group Activity: Review/Update of Mitigation Actions
- Future Meeting Date
  - February 26, 2020
    10:00 am to 11:30 am
    Will County Emergency Management Agency
- Questions

At this meeting, attendees first reviewed and approved a draft fact sheet meant to assist communities in understanding the importance of adopting the update of this plan. Next, they broke into groups and were provided a tool to assist them in reviewing mitigation actions. The tool guided them to categorize each mitigation action as completed, retain as is, or remove. If the mitigation action was to be retained, then they evaluated the remaining elements and noted any necessary changes.

Stakeholders were updated on the schedule of the *County-wide All Hazard Mitigation Plan* update and their next steps as participants. All jurisdictions were asked to link the public survey to their websites, Facebook, and social media pages as appropriate**.**

Will County Emergency Management Agency
302 North Chicago Street
Joliet, Illinois 60432

Attendance Sign-in Sheet

ALL HAZARD MITIGATION PLAN UPDATE – COMMUNITY MEETING #2
Date: January 29, 2020, 10:00 am TO 11:30 am
Location: Will County Emergency Management Agency, Joliet, Illinois

NAME	SIGNATURE	ORGANIZATION	PHONE NUMBER	EMAIL
Roxanne Alton	Roxanne Alton	Village of Godley	815 405 1906	vofgodley1@yahoo.com
Tim Anderson	Tim Anderson	WC Land Use	815 774 7897	tanderson@willcountylanduse.com
Jayne Ballun	Jayne Ballun	WC EMA		
Elizabeth Bilotta	E Bilotta	WC Health Dept.	8155304783	ebilotta@willcountyhealth.org
Eric Bjork		Romeoville		
Marty Braccio		Crete	708-258-1587	MBRACCIO@VILLAGEOFCRETE.US
Tami Branum	Tami Branum	Godley	815-693-6907	
Darrell Byther		University Park		
~~Harold Damron~~		~~WC EMA~~		
Todd Fonfara	TODD F	NW Homer	708 906-6947	fonfara@Newhomer.org
Carl Groth		Romeoville		
Dennis Houseman	Dennis Houseman	Wilmington	815-405-0006	dhouseman@wilmington-il.com
Domingo Kaller		WC EMA		
~~Teresa Kerne~~		~~Diamond~~		
Mike Littrell		Romeoville		

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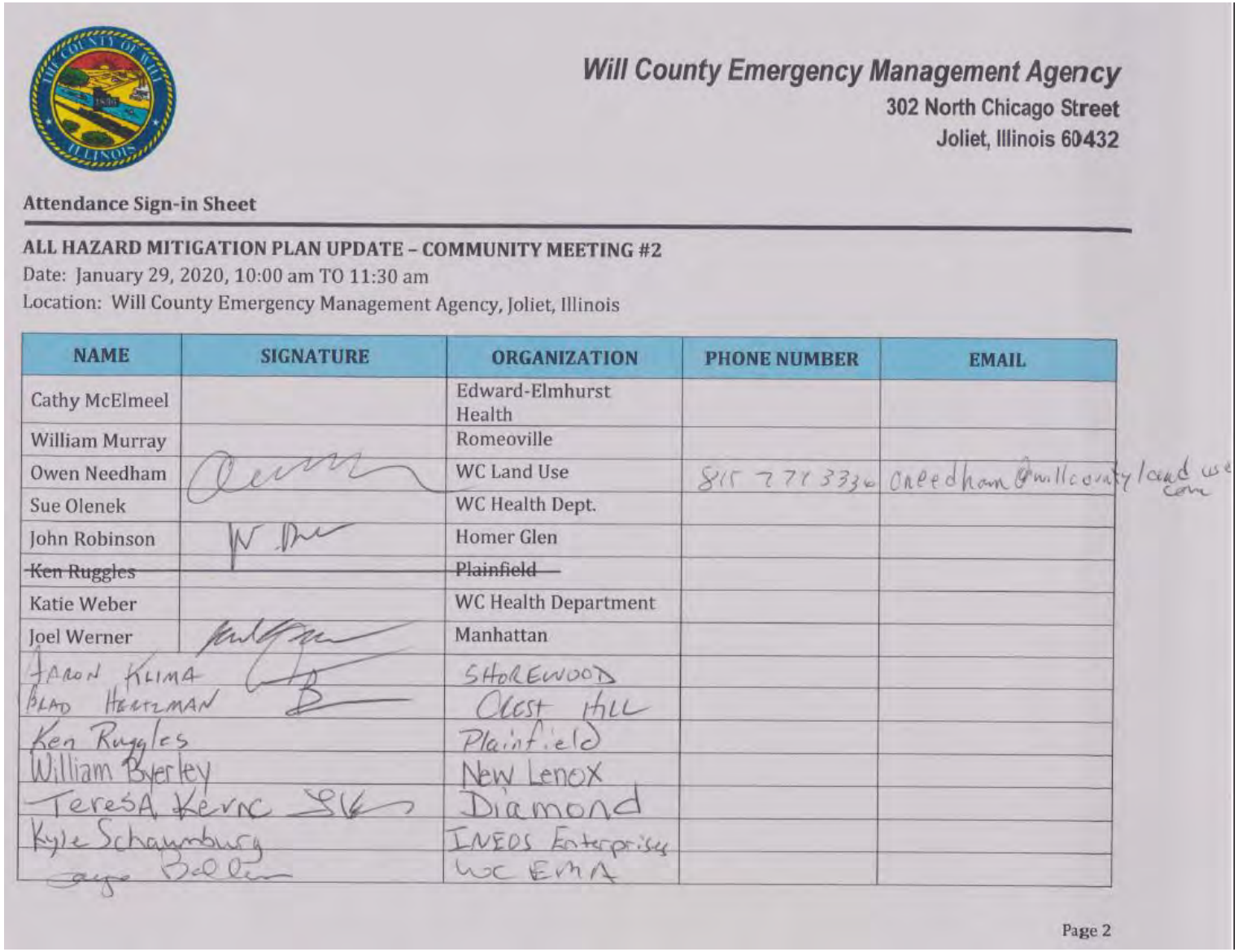

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302 North Chicago Street
Joliet, Illinois 60432

Attendance Sign-in Sheet

ALL HAZARD MITIGATION PLAN UPDATE – COMMUNITY MEETING #2
Date: January 29, 2020, 10:00 am TO 11:30 am
Location: Will County Emergency Management Agency, Joliet, Illinois

NAME	SIGNATURE	ORGANIZATION	PHONE NUMBER	EMAIL
Cathy McElmeel		Edward-Elmhurst Health		
William Murray		Romeoville		
Owen Needham		WC Land Use	815 727 3336	oneedham@willcountylandusecom
Sue Olenek		WC Health Dept.		
John Robinson		Homer Glen		
~~Ken Ruggles~~		~~Plainfield~~		
Katie Weber		WC Health Department		
Joel Werner		Manhattan		
AARON KLIMA		SHOREWOOD		
BRAD HERTZMAN		CREST HILL		
Ken Ruggles		Plainfield		
William Byerley		New Lenox		
TERESA KERNC		Diamond		
Kyle Schaumburg		INEOS Enterprises		
[illegible]		WC EMA		

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Will County Emergency Management Agency
302 North Chicago Street
Joliet, Illinois 60432

Attendance Sign-in Sheet

ALL HAZARD MITIGATION PLAN UPDATE – COMMUNITY MEETING #2
Date: January 29, 2020, 10:00 am TO 11:30 am
Location: Will County Emergency Management Agency, Joliet, Illinois

NAME	ORGANIZATION	PHONE NUMBER	EMAIL
Barbara Agar	Will Co. H.D.	815-727-8902	bagar@willcountyhealth.org
Megan Lynch	Silver Cross Hospital	815-300-3955	Mlynch@silvercross.org
Peter Fattore	New Lenox ESDA	815-263-4988	pfattore@newlenox.net
BILL MORT	PEOTONE POLICE	708 259-4767	WMORT@VOP.COM
Nicole Roegall	Land Use	815-774-3351	nroegal@willcountylanduse.com
Kent Adams	Romeoville F.D	815-886-7729	kadams@romeoville.org
DAN Nelson	Naperville	630 420 6009	nelsond@naperville.illinois
Kathryn Fajfar	Will County EMA	815-740-8354	KFajfar@willcountyillinois.com
Allison Anderson	Will County EMA		
Scott Killinger	Will County Chief Subdivision Engineer		skillinger@boartlongman.com
Tom Murray	will CO EMA	815-740-8351	tmurray@willcountyillinois.com
HARALD DAMRAU	" " "	815-740-8351	HDAMRAU@WILLCOUNTYILLINOIS.COM
Howard Stephens	mokena FPD	708-479-5371	HStephens@mokenafire.org
Rick Campbell	" "	" "	rCampbell@mokenafire.org

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Stakeholder Meeting #3: February 26, 2020

In this 1½ hour workshop, an overall summary of the plan update process and progress was given.

- Hazard Mitigation Plan Updates
  - Executive Summary –summary of the plan
  - Chapter 1 – Mitigation Process –summary of the update process and jurisdictional participation
  - Chapter 2 – Community Overview – summary of the update of the community profile
  - Presented helpful websites that can be used for planning
    - https://willcountyhealth.org/data/
    - https://www.eia.gov
    - https://www.nist.gov/news-events/news/2016/08/nist-study-provides-voice-evacuation-needs-mobility-impaired
  - Chapter 3 – Hazard Risk Assessment Summary & Capability Assessment – summary of the updated risk assessment completed by committee
  - Chapter 4 – Hazard Profiles – profile for each hazard is updated and includes hazard characterization, loss history, community impact, mitigation measures, and risk potential
  - Chapter 5 – Mitigation Goals, Objectives & Strategies – summary of update results
  - Chapter 6 – Mitigation Actions – summary of update result
  - Chapter 7 – Mitigation Plan Updates & Maintenance – process for monitoring, evaluation, and updating of the plan
- Draft is to be posted on WC EMA website for review by jurisdictions & public
- Submission of draft to IEMA for approval – then to FEMA
- Once approved by FEMA, submit for adoption by boards
- Review results of the public survey
- Group Activity – participants reviewed the mitigation actions to identify actions taken by their communities to meet the action or actions they would like to take if funding was available
- Questions

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302 North Chicago Street
Joliet, Illinois 60432

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ALL HAZARD MITIGATION PLAN UPDATE – WORKSHOP
Date: February 26, 2020
Location: Will County Emergency Management Agency, Joliet, Illinois

NAME	ORGANIZATION	PHONE NUMBER	EMAIL
Teresa Kerne	Diamond	815/671-0617	mayor@villageofdiamond.org
Josh Balatto	Braidwood E.S.D.A.	815-791-8093	jbalatto@braidwood.us
Tami Branum	Godley ESDA	815-693-6907	vofgodley@yahoo.com
PHIL RITTENHOUSE	LOCKPORT EMA	815 671 9498	[illegible]@Americech.net
RANDY ULASKAS	VILLAGE OF MONEE EMA	708-534-8301	RULASKAS@VILLAGEOFMONEE.OR
Joel Werner	Manhattan EMA	708 935 2983	jwerner@villageofmanhattan.org
Denis TATGENHORST	Beecher PD-EMA	708-296-1715	dTATGENHORST@Beecher.ORG
Robert HEIM	Beecher EMA	708-220-5877	hdbob55@Comcast.net
Aaron KLIMA	SHOREWOOD	815-791-6714	
Dennis Housman	Wilmington ESDA	815-405-0008	dhousman@wilmington-il.com
MARTY BRACCIO	CRETE EMA	708-259-1987	MBRACCIO@[illegible].ORG
Tom BALLARD	LEMONT EMA	630-816-2830	tBALLARD@LEMONT.ILUS
Ken Ruggles	Plainfield EMA	815-267-7211	Kruggles@plainfieldema.org
Terry Doyle	Manhattan EMA	815-418-2100	tdoyle@village of manhattan.org
John Robinson	HomerGlen EMA	708-301-0632	JRobinson@HomerglenIL.org

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302 North Chicago Street
Joliet, Illinois 60432

Attendance Sign-in Sheet

ALL HAZARD MITIGATION PLAN UPDATE – WORKSHOP
Date: February 26, 2020
Location: Will County Emergency Management Agency, Joliet, Illinois

NAME	ORGANIZATION	PHONE NUMBER	EMAIL
MARK D DETLOFF	MOKENA PW	708-372-7427	MDETLOFF@MOKENA.ORG
PAT HISEL	PARK FOREST FIRE DEPT	708-481-4549	PHISEL@VOPF.COM
Tony Altiery	City Of Braidwood	815-693-5174	TAltiery@Braidwood.US
Barbara Agar	WCHD	815-727-8902	bagar@willcountyhealth.org
BRUCE GRAHAM	River Valley Detention	815 730-7070	bgraham@willcountyillinois.com
Nicole Roedl	Land Use	815 774 3351	nroedl@willcountylandusc.com
Tim Anderson	Land Use		tanderson@willcountylandusc.com
Peter Fattore	New Lenox ESDA	815 263 4988	pfattore@newlenox.net
Dan Martin	New Lenox	815 462 6493	dmartin@newlenox.net
Elizabeth Bilotta	WCHD	815 530 4783	ebilotta@willcountyhealth.org
Todd Fonfara	Nwhomer Fire	815 838 0180	Fonfara@nwhomer.org
DAN NELSON	Naperville	63~~740~~ 6303356400	nelsond@naperville.il.us
Scott Killinger	Will County Land Use		skillinger@baxterwoodman.com
Kathryn Fajfar	Will County EMA	815-740-8354	kfajfar@willcountyillinois.com
Jayne Ballun	WC EMA Consultant	630-485-0607	jballun@willcountyillinois.com

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ALL HAZARD MITIGATION PLAN UPDATE – WORKSHOP
Date: February 26, 2020
Location: Will County Emergency Management Agency, Joliet, Illinois

NAME	ORGANIZATION	PHONE NUMBER	EMAIL
Dominga Kuyler	WCEMA		
Allison Anderson	WCEMA		
Mike Littrell	Romeoville EMA	815-886-6108	mlittrell@romeoville.org

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JURISDICTIONAL PARTICIPATION

PARTICIPATION CRITERIA	City of Aurora *	Village of Beecher	Village of Bolingbrook	Village of Braceville *	City of Braidwood	Village of Channahon	Village of Coal City *	City of Crest Hill	Village of Crete	Village of Diamond *	Village of Elwood	Village of Frankfort	Village of Godley*	Village of Homer Glen	City of Joliet	Village of Lemont *	City of Lockport	Village of Manhattan	Village of Minooka *	Village of Mokena	Village of Monee	City of Naperville *	Village of New Lenox	Village of Orland Park *	Village of Park Forest *	Village of Peotone	Village of Plainfield	Village of Rockdale	Village of Romeoville	Village of Sauk Village *	Village of Shorewood	Village of Steger *	Village of Symerton **	Village of Tinley Park *	Village of Univ. Park *	City of Wilmington	Village of Woodridge *	Will County
NOTE: A list of jurisdictional participants, meeting participation requirements, and their representatives is found on pages 1-5 through 1-9.																																					
Provide representation during at least one planning meeting		♦	♦		♦	♦		♦	♦	♦			♦	♦	♦	♦	♦	♦		♦	♦	♦	♦		♦	♦	♦	♦	♦		♦					♦		♦
Submit an inventory of plans, data, and reports relevant to hazard mitigation planning		♦	♦		♦	♦			♦	♦	♦	♦			♦			♦		♦	♦					♦	♦		♦		♦					♦		♦
Review and complete the Hazard Mitigation Action form																																					♦
Identify and delineate natural, technological, and societal hazards throughout Will County			♦			♦		♦	♦						♦												♦		♦									♦
Identify critical "at risk" structures and facilities																																					♦
Develop community wide mitigation goals			♦			♦		♦	♦	♦			♦	♦				♦		♦		♦	♦			♦	♦		♦		♦						♦
Submit techniques to plan for, reduce, and manage expected losses																																					♦
Provide technical and financial assistance and incentives to facilitate loss reduction projects																																					♦
Review and comment on the draft plan																																					♦
Incorporate the plan into existing planning efforts		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦		♦	♦	♦	♦	♦	♦		♦
Formally adopt the plan																																					
Participate in plan maintenance through yearly reviews and five year updates																																					♦

* Jurisdictions that border or have only a portion of their corporate limits in Will County and may choose not to adopt this *Plan*
** Population just over 100, plan participation limited due to minimal staff (if any) for participation

After the third stakeholder meeting, the progress completed on the *Will County County-Wide All-Hazard Mitigation Plan* update consisted of:

- Review of all plan chapters and appendices of the *Will County County-Wide All-Hazard Mitigation Plan* updating the County profile, maps, hazard incident history, and other pertinent reference material.
- Review with each jurisdiction their plans and ordinances
- Provide to each jurisdiction a website link to the draft plan update for final review by jurisdiction and public comment.

Target Expertise Input and Correspondence Summaries

HAZUS Installation and Integration

For the original plan, the Mitigation Project Team held a working meeting with Will County EMA and Will County GIS Division. The Polis Center installed and implemented the HAZUS-MH software on Will County equipment. To validate the installation and demonstrate the HAZUS-MH capabilities, the Mitigation Project Team performed an Earthquake risk assessment using the HAZUS-MH default data. Following the validation, the Mitigation Project Team demonstrated the software, data, and HAZUS-MH risk assessment reports to the staff.

A mitigation action has been added to update the HAZUS models in this plan and to obtain a copy of the HAZUS model for flood completed by the Illinois Emergency Management Agency for the 2018 Illinois Natural Hazard Mitigation Plan for comparison.

Correspondence with FEMA on Past Disaster Declaration Information

For the original plan, the Mitigation Project Team contacted FEMA Mitigation Officer to provide input and data on past declarations in Will County. The Mitigation Project Team was soliciting information on the type of disaster, eligible federal costs reimbursed, types of Public Assistance project categories, and other pertinent information for this project. FEMA could not readily access this information and requested the Mitigation Project Team to contact IEMA.

Correspondence with IEMA on Past Disaster Declarations for Will County

For the original plan, the Mitigation Project Team contacted IEMA Mitigation Officer to provide input and data on past declarations in the county. IEMA provided data on all state declarations by county, the type of federal assistance received, and the federal costs. IEMA also provided weather data of past events.

For the update of the plan, information on past declarations was obtained from the IEMA Hazard Mitigation Plan and FEMA's website: http://www.fema.gov/disasters.

Correspondence with US Army Corps of Engineers

For the original plan, the Mitigation Project Team contacted the US Army Corps of Engineers to obtain information on hazardous material that is transported through the county via U.S Waterways, Harbors, and the Great Lakes. The US Army Corps of Engineers provided detailed historical information, type of materials, and insight on the county's busiest waterways.

For the update of the plan, much of this information is now available online through various websites of the US Army Corps of Engineers and National Transportation Safety Board.

GIS Integration Working Meeting and Correspondence

For the original plan, the intent of this meeting was to provide a brief tutorial on HAZUS-MH to Will county GIS Division staff and to identify county GIS data that will be incorporated into the HAZUS-MH model and GIS Analysis. The Polis Center provided the strategy of updating and integrating county GIS data and the data documentation that will be required. A review was conducted of each attribute (field) in the databases and identified the attributes that will be updated. The attributes are of four major types listed below.

- Mandatory for HAZUS to run correctly (i.e. building classes)
- Required for reports (i.e. number of beds)
- Not required (i.e. American hospital Association (AHA) ID)
- Data and information will come from another source (soil type from Illinois Geological Survey)

Will County Stormwater Management Committee Coordination

For the original plan, a coordination meeting was held with representatives of the Will County Stormwater Management Committee. This meeting was lead by a Mitigation Steering Committee member who is also a member of the Will County Stormwater Management Committee. A brief overview of FEMA's Mitigation Program and the requirements of the Disaster Mitigation Act of 2000 were provided. An overview of the All-Hazard Mitigation Plan was discussed, outlining the goals, strategies, and progress of the *Will County County-Wide All Hazard Mitigation Plan*. The Mitigation Project Team solicited guidance from the Will County Stormwater Management Committee on what their greatest risks were and requested their input.

For the plan update, a team of staff from the Will County Land Use Department included Nicole Roedl, Engineering Technician; Owen Needham, Building Department; Tim Anderson, Certified IEPA Inspector; and Scott Killinger, Chief Subdivision Engineer provided technical assistance in the review and update of the *Will County County-Wide All Hazard Mitigation Plan.*

Email and Telephone Correspondence with Dr. Bauer (Illinois State Geologic Survey)

For the original plan, the Mitigation Project Team began correspondence with Dr. Bauer with the Illinois State Geologic Survey to identify and quantify the risk of an earthquake to the communities of Will County. Dr. Bauer provided a plethora of input on the impacts of an earthquake originating from the New Madrid fault system, the Des Plaines impact structure, or the assorted fault traces in Northern Illinois. Dr. Bauer also provided input on the hazard modeling scenario most likely to occur and what would truly represent an event that would significantly impact the county.

Great Lakes Partnership (GLP) Coordination and General Meeting Attendance

For the original plan, the Mitigation Team held periodic meetings with representatives of the Great Lakes Partnership and attended their annual conference in October of 2005. GLP's mission is to bring business and government leaders together for cross-sector collaboration to address critical infrastructure interdependencies and related homeland and economic security challenges. Their goal is to proactively promote business continuity planning through the use of best practices, information sharing, and innovation.

The Mitigation Team attended the Great Lakes Partnership's General Meeting on October 20, 2005. The GLP General Meeting had the theme "Sustainable Preparedness" and was a day-long session attended by subject matter experts and representatives of the private and public sector. The Mitigation Project Team solicited input, recommendations, and ideas from private and public sector professionals, as well as subject matter experts.

Local Emergency Planning Commission (LEPC) Solicitation

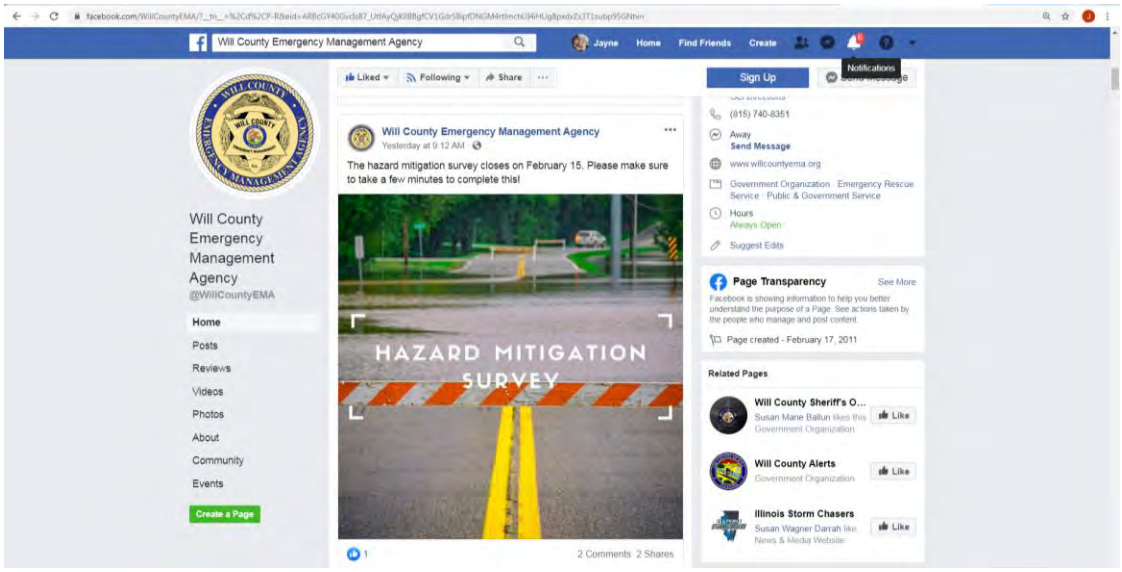
Will County EMA solicited input from the Will County LEPC and extended invitations to attend the Committee Meetings. The Will County LEPC is an organization of industrial, governmental and citizen groups whose purpose is to provide a forum in which the local community and facilities can discuss issues related to hazardous substances.

Will County EMA Website and Social Media

Since the last plan update, websites and social media platforms have become key in providing information to the public and receiving input from them. The public survey is an example of the effectiveness of using social media to interact with the public. For the previous plan update, under 100 responses were received for the public survey. For this plan update, over 1,100 responses were received with 36 communities represented. The sophistication of the social media platform data feedback and comments of the survey participants provided an abundance of information to direct the use of these tools for educating and communicating with the public.

Will County EMA Website

Will County EMA Facebook



Public Outreach and Input on Hazard Mitigation

Public involvement is critical to the success of any strategic planning process, including hazard mitigation. It is important for hazard mitigation plans to target public concerns, comments, and perception of risk as factors in the creation of mitigation strategies. To ensure consensus with the public, the Mitigation Team developed several mechanisms to secure sensitive information and to still reach out to the public to participate in the *Will County County-Wide All Hazard Mitigation Plan*. Public input was incorporated into the plan through various efforts.

For the original plan, Will County EMA held a public meeting to allow the public to participate in the 2008 *Will County County-Wide All Hazard Mitigation Plan*. This public meeting enabled the community to learn about their hazards and the mitigation planning process.

CERTIFICATE OF PUBLICATION

STATE OF ILLINOIS
County of Will SS

I, Michael J. Cleary, do hereby certify that I am the publisher of the FARMERS WEEKLY REVIEW, which is now and has been for more than one year prior to the first publication of this notice hereto annexed, a weekly newspaper of general circulation, printed and published in the city of Joliet in said County, and that the said advertisement or notice relating to the matter of Notice of Public Meeting about the FEMA Mitigation Program on February 15, 2006

has been published in said paper every week consecutively of the issues commencing February 9, A.D. 2006 and ending February 9, A.D. 2006 which are the dates of the first and last papers containing the same.

Given under my hand this February 9, 2006.

Printer's Fee: $55.00

Date Paid: , 2006.

By:

Michael J. Cleary, Editor/Publisher, Farmers Weekly Review

Copy of Notice Herein Referred to

NOTICE OF PUBLIC MEETING

The County of Will is providing opportunity for the public to learn about the Federal Emergency Management Agency's (FEMA) Mitigation Program, Will County's Hazard Mitigation Planning process, and to provide input on the draft Will County All Hazard Mitigation Plan. This plan is designed to meet the requirements of federal Public Law 106-390, the Disaster Mitigation Act of 2000 (DMA2K) that requires jurisdictions to have an adopted, FEMA-approved Natural Hazard Mitigation Plan in order to be eligible for future hazard mitigation grant funds. The County of Will has expanded the scope of this requirement to include all hazards.

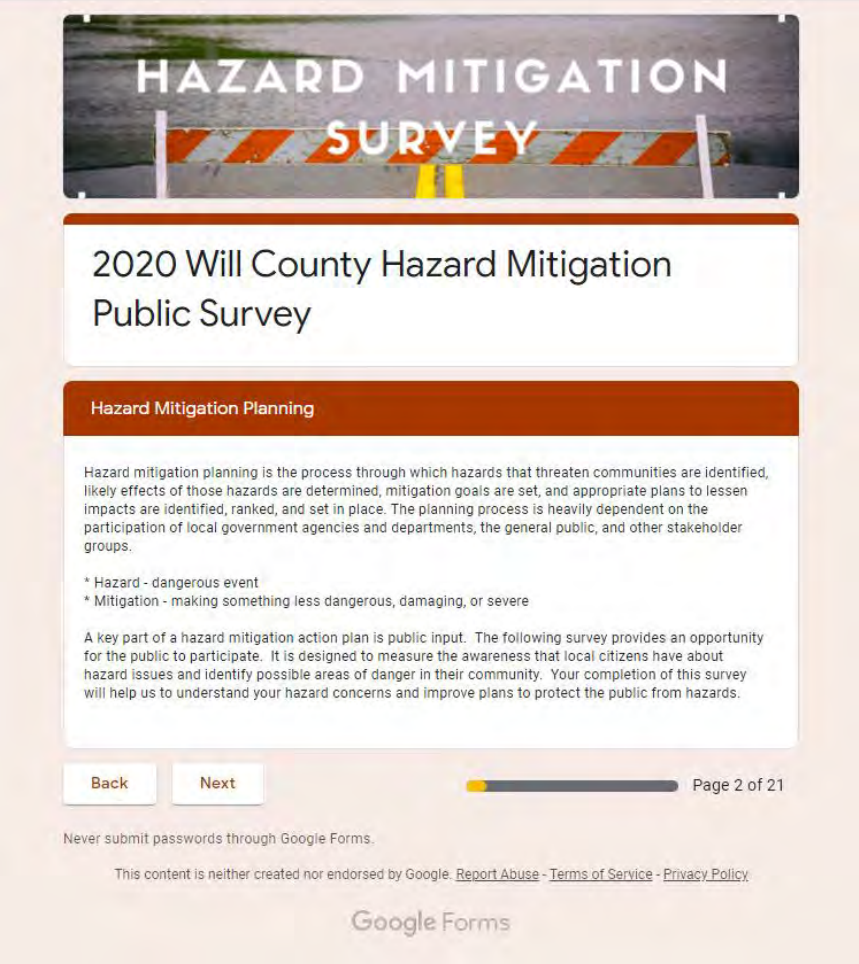
The Will County All Hazard Mitigation Plan fulfills the DMA2K requirements for Will County and participating municipalities. This plan represents the first step towards the community being disaster resilient specific to the hazards assessed in Will County. The plan defines each hazard, assesses the risk of the hazard, and defines the specific mitigation actions the county can take to reduce loss in the event of a hazard event.

You can learn about the All-Hazard Mitigation Planning project and provide input before the public meeting by visiting the Will County Emergency Management Agency website at www.willcountyema.org. The public meeting will be held at the Will County Office Building, 302 North Chicago Street, Joliet, Illinois on Wednesday, February 15th, 2006 at 1:00 PM.

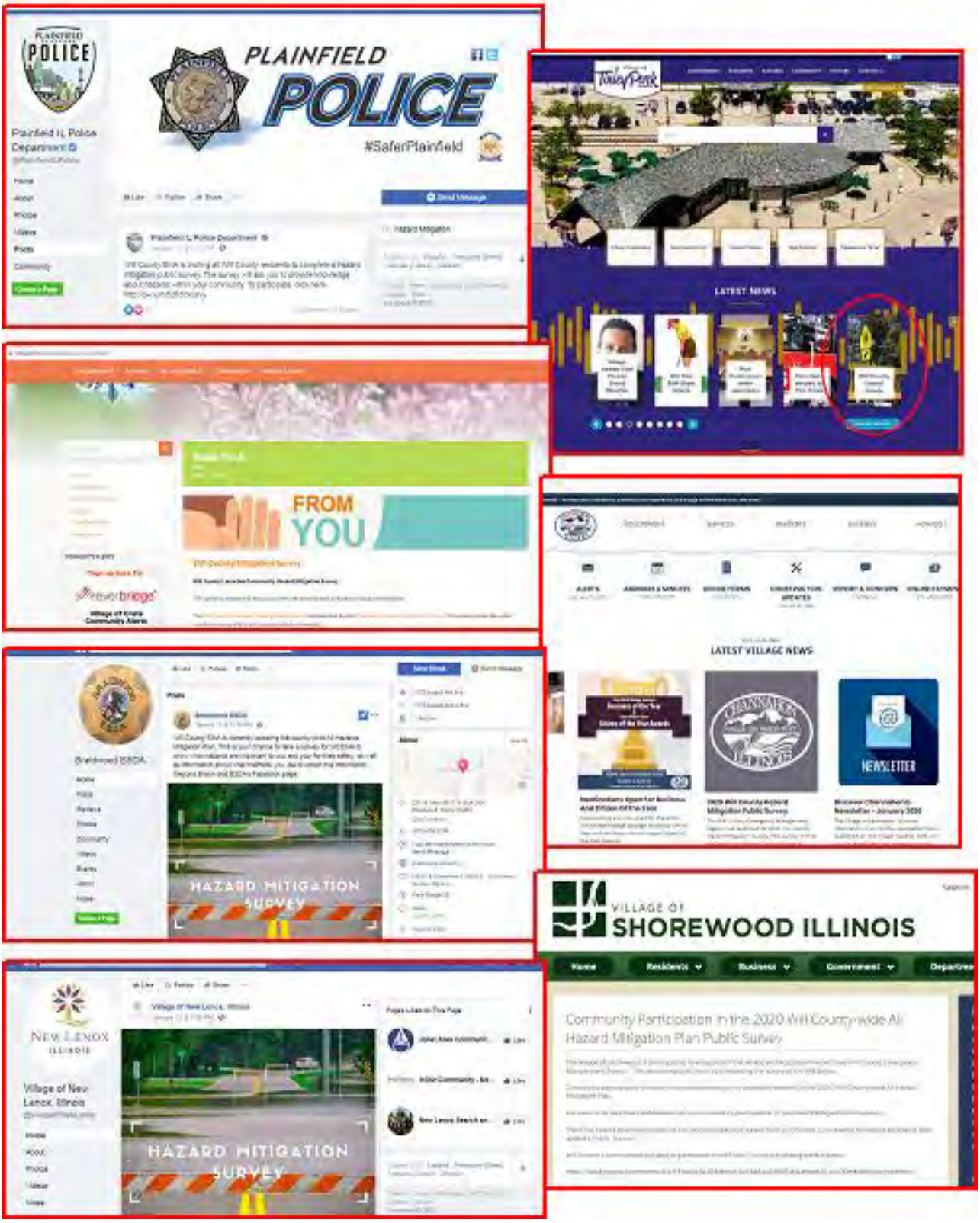
Will County
Emergency Management Agency
302 North Chicago Street
Joliet, IL 60432
(815) 740-8351

Public Survey

For the plan update, the Mitigation Team developed a public survey to gauge the concerns of the public, as well as provide feedback to help guide the Committee in identifying potential mitigation actions. The questionnaire targeted the public's thought on what their and their community's greatest risk is, what they have done to mitigate their home, and what they would do when a disaster strikes. This questionnaire was made available on the Will County EMA website (http://www.willcountyema.org), Facebook, Twitter, Nextdoor, and other social media. Jurisdictions also participated in posting the survey. This allowed the public to communicate their concerns, comments, and ideas on what their community and/or Will County can do to mitigate from all hazards.



Some of our communities posting the Public Survey:



Section 1 of 21

2020 Will County Hazard Mitigation Public Survey

Form description

Section 2 of 21

Hazard Mitigation Planning

Hazard mitigation planning is the process through which hazards that threaten communities are identified, likely effects of those hazards are determined, mitigation goals are set, and appropriate plans to lessen impacts are identified, ranked, and set in place. The planning process is heavily dependent on the participation of local government agencies and departments, the general public, and other stakeholder groups.

* Hazard - dangerous event
* Mitigation - making something less dangerous, damaging, or severe

A key part of a hazard mitigation action plan is public input. The following survey provides an opportunity for the public to participate. It is designed to measure the awareness that local citizens have about hazard issues and identify possible areas of danger in their community. Your completion of this survey will help us to understand your hazard concerns and improve plans to protect the public from hazards.

Residency

Do you live or work in Will County?

1,120 responses

Section 1 of 21

2020 Will County Hazard Mitigation Public Survey

Form description

Section 2 of 21

Hazard Mitigation Planning

Hazard mitigation planning is the process through which hazards that threaten communities are identified, likely effects of those hazards are determined, mitigation goals are set, and appropriate plans to lessen impacts are identified, ranked, and set in place. The planning process is heavily dependent on the participation of local government agencies and departments, the general public, and other stakeholder groups.

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Residency

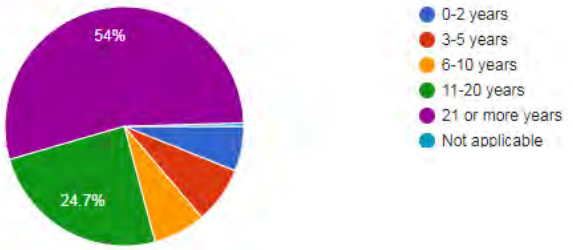
Do you live or work in Will County?

1,120 responses

Residency Information

Approximately how many years have you lived in Will County?

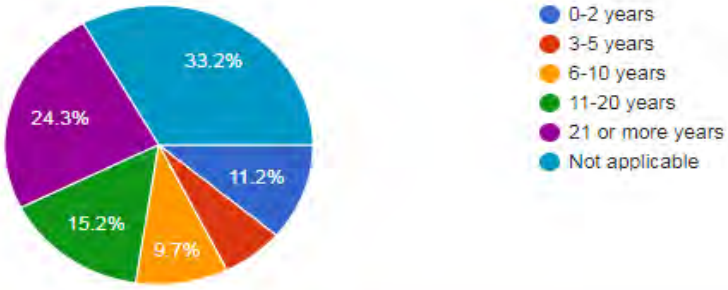
1,103 responses



Employment Information

Approximately how many years have you worked in Will County?

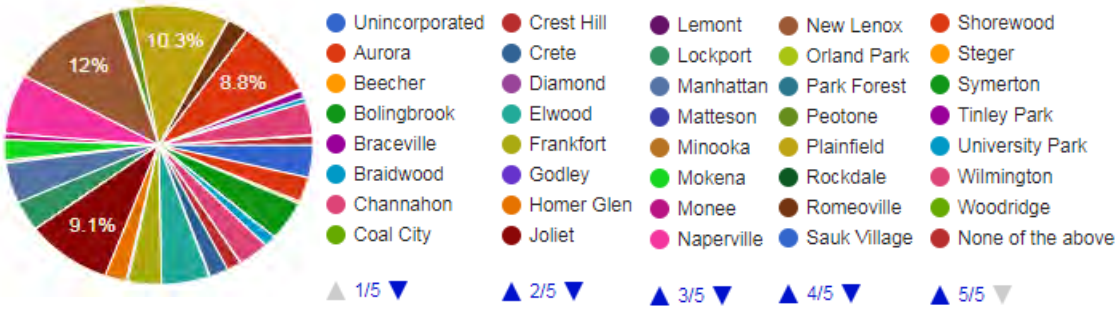
1,125 responses



Residency Location

What Will County municipality do you live in?

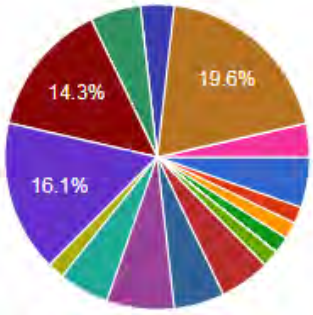
1,113 responses



Township Residency Location

Which Township do you live in:

56 responses

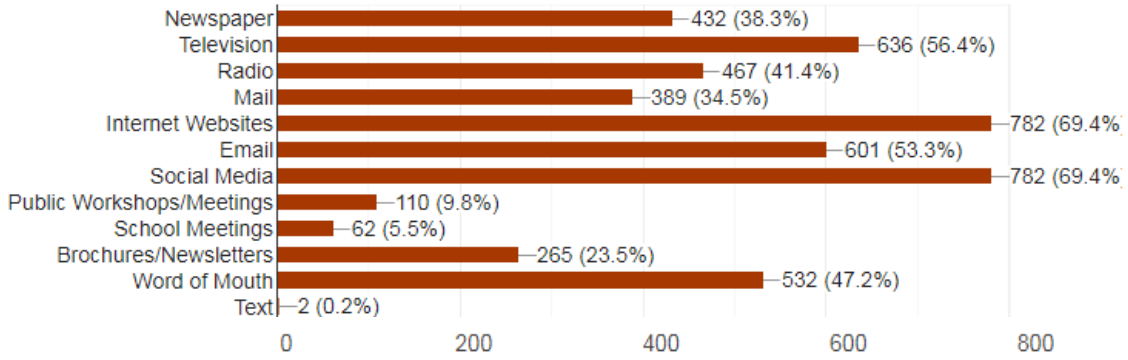


Crete
Channahon
Custer
DuPage
Florence
Frankfort
Green Garden
Homer
1/3
Jackson
Joliet
Lockport
Manhattan
Monee
New Lenox
Peotone
Plainfield
2/3
Reed
Troy
Washington
Wesley
Wheatland
Will
Wilmington
Wilton
3/3

Information

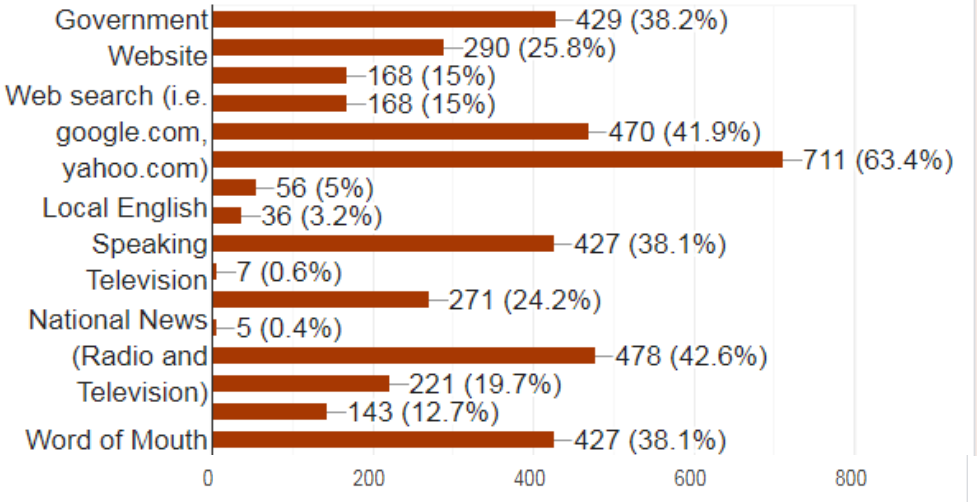
How do you receive information about current events? (Check all that apply)

1,127 responses



How do you obtain emergency and disaster related information? (Check all that apply)

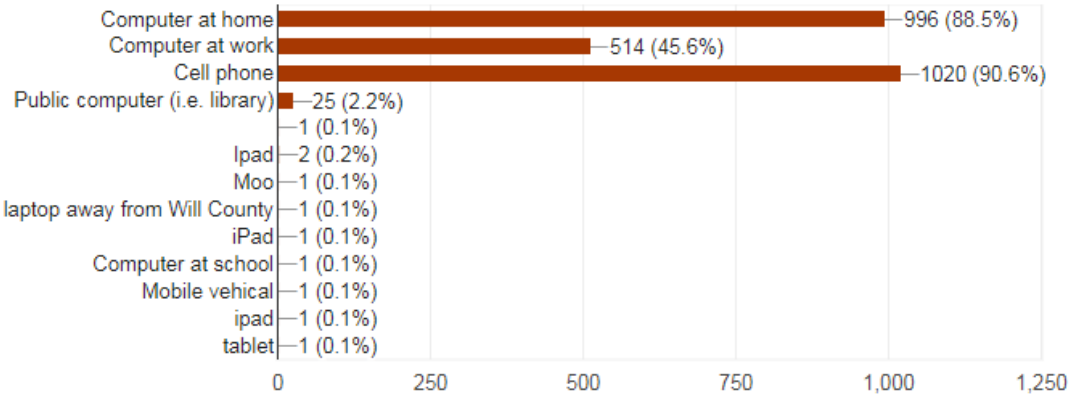
1,122 responses



Internet

How do you access the internet? (Check all that apply)

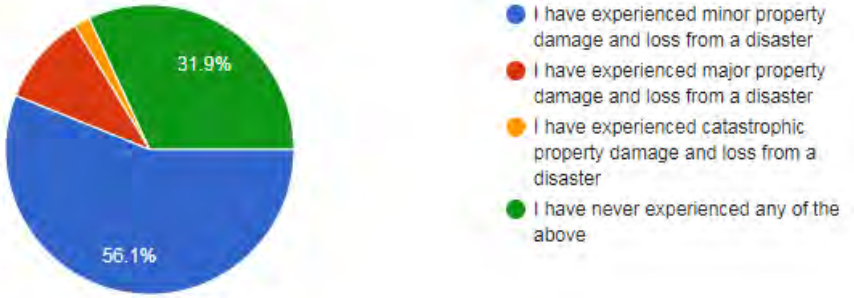
1,126 responses



Impacted by Disaster

Have you ever experienced or been impacted by a disaster (i.e., tornado, flood, severe winter storm, etc.)?

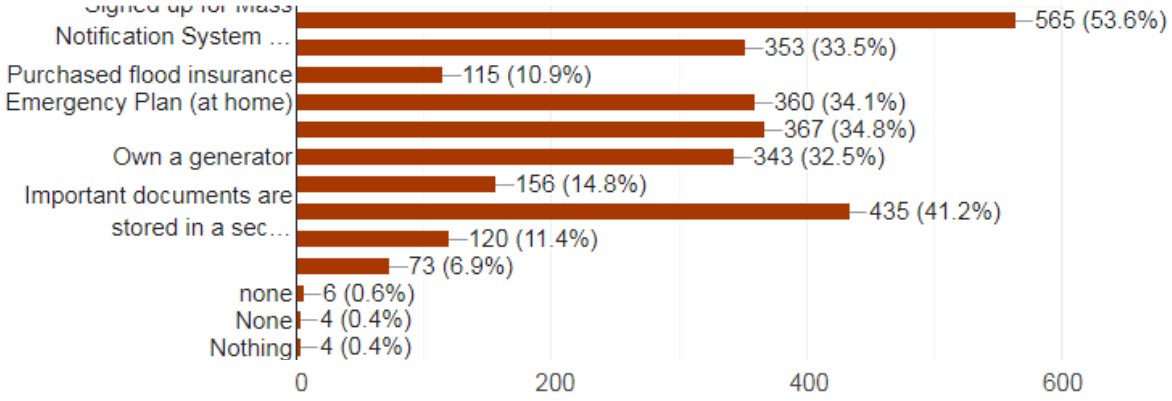
1,125 responses



Personal Preparedness

Which of the following have you done to become better prepared at home? (Check all that apply):

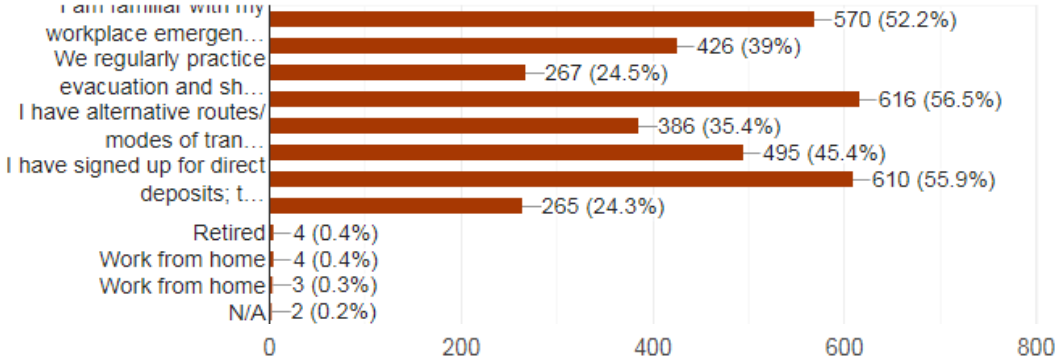
1,055 responses



Workplace Preparedness

Which of the following have you done to become better prepared at work? (Check all that apply):

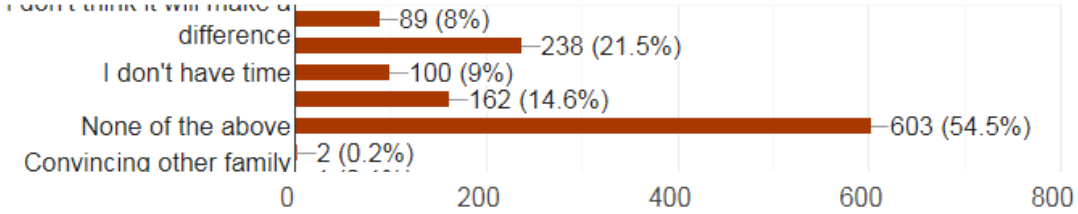
1,091 responses



Being Prepared

What are some challenges to preparing your family for emergencies or disasters? (Check all that apply).

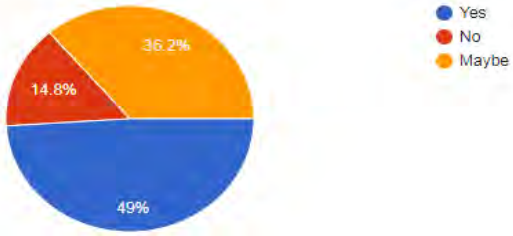
1,106 responses



Evacuation

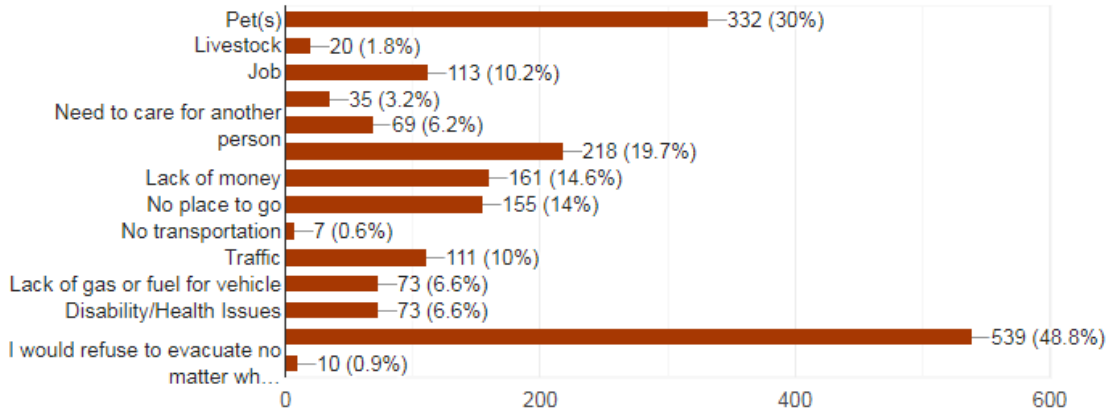
If a Disaster impacted your community knocking out electricity and running water, would your household be able to manage on its own for 3 days?

1,123 responses



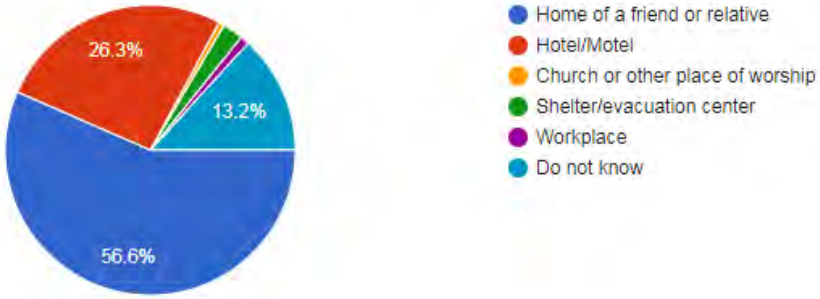
What challenges would prevent you from leaving your home if an evacuation was recommended?

1,105 responses



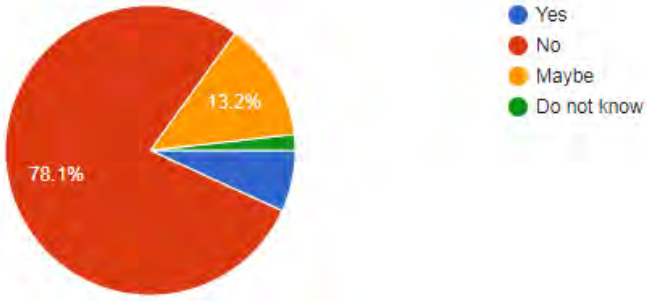
If you were to evacuate because of a disaster, where would you most likely stay?

1,126 responses



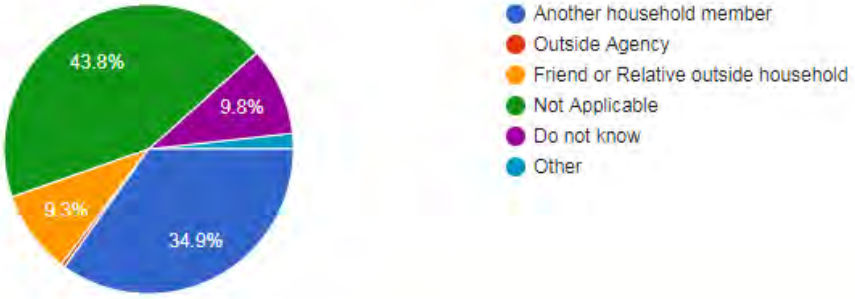
In an evacuation, would you or anyone in your household require special assistance?

1,125 responses



If a household member needs assistance during an evacuation, who would provide the assistance?

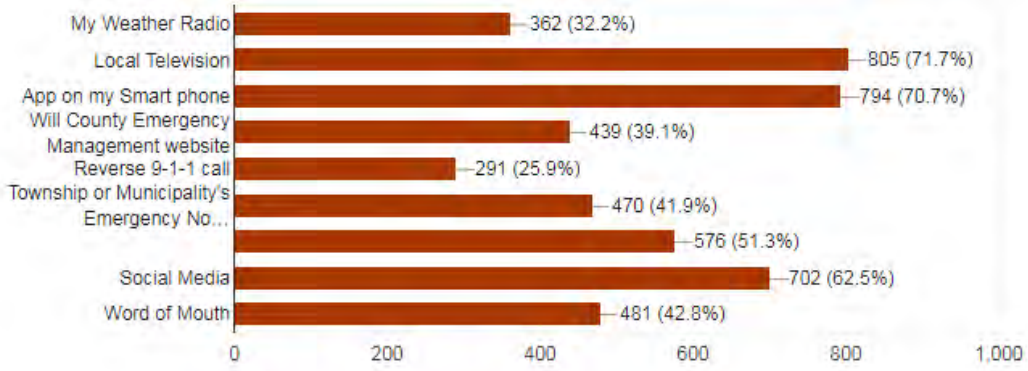
1,087 responses



Receiving Emergency Alerts

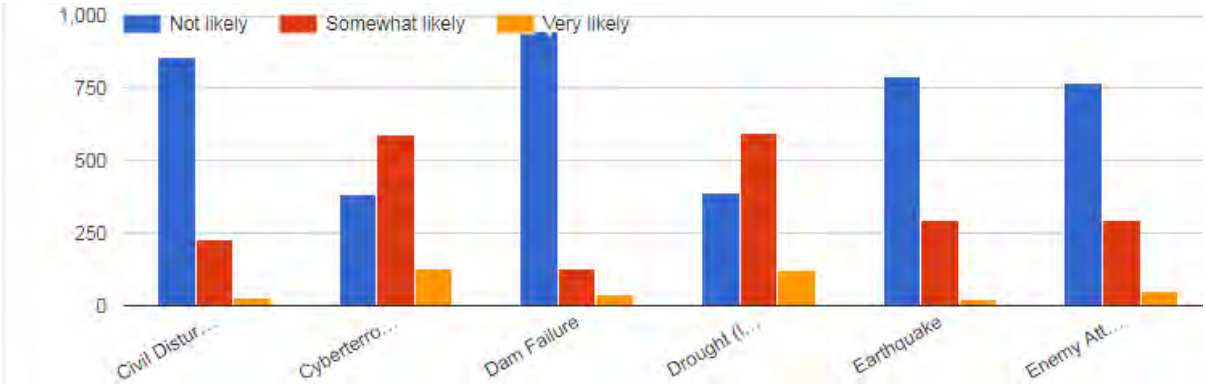
How do you expect to receive alerts and information during an emergency (Check all that apply)

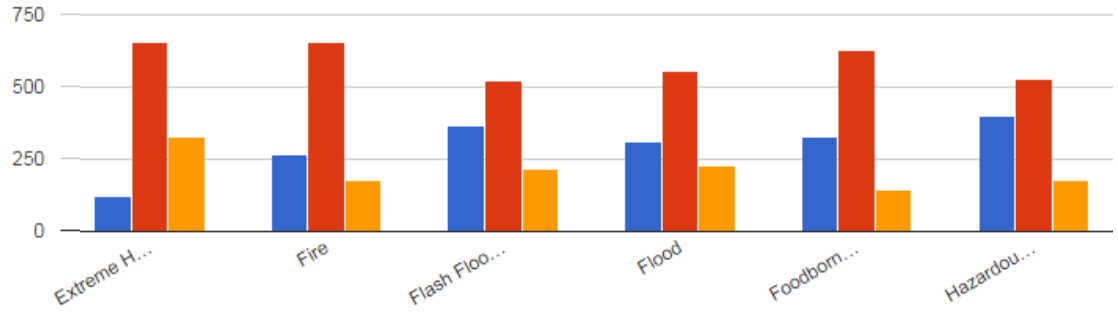
1,123 responses

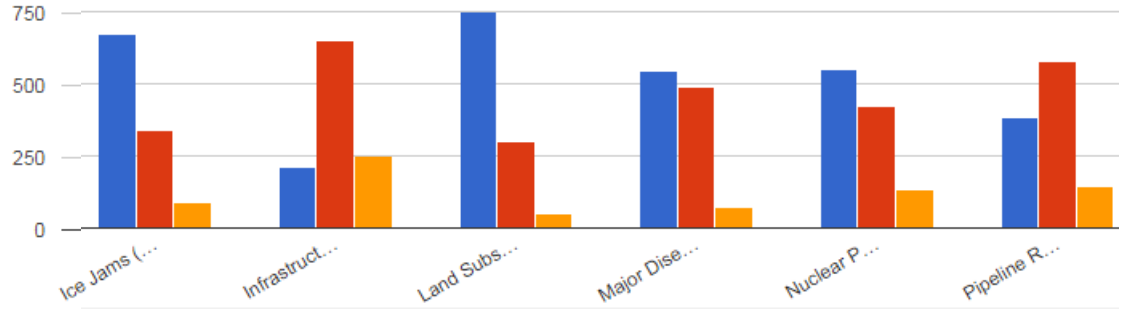


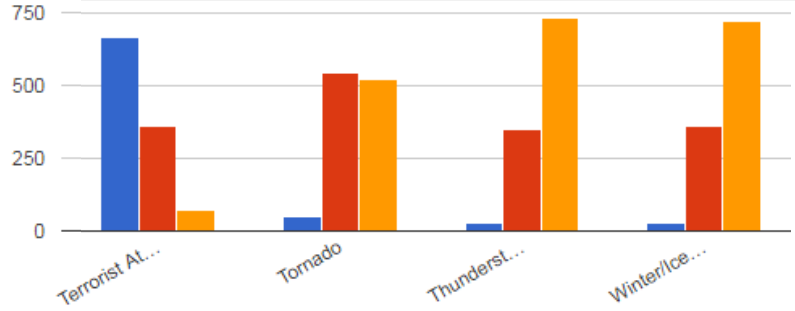
Likelihood of Hazard

The hazards addressed in the Will County Countywide All Hazard Mitigation Plan are listed below. Indicate your opinion on the likelihood of the hazard occurring in your community. Please rate each of the following hazards:



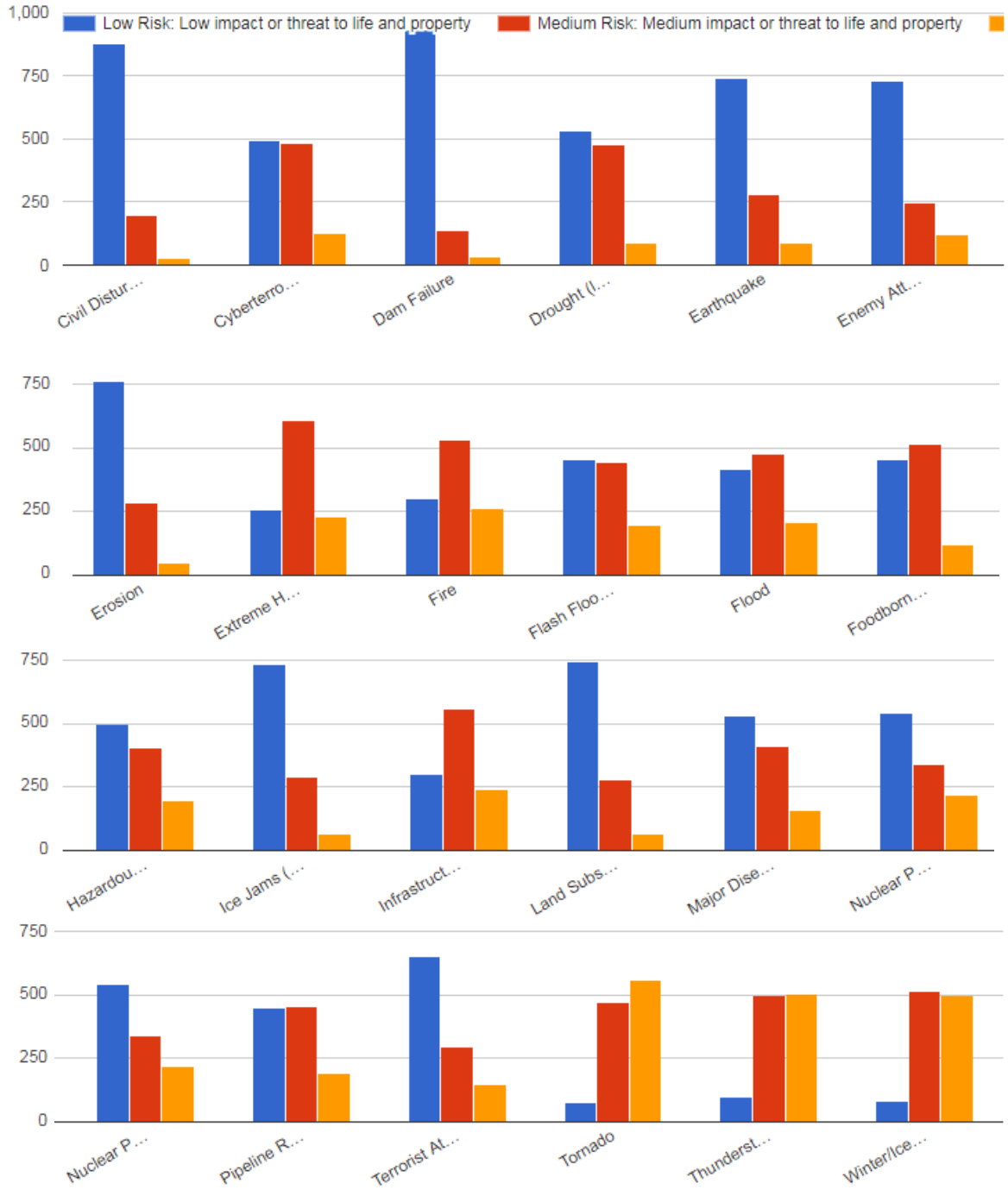






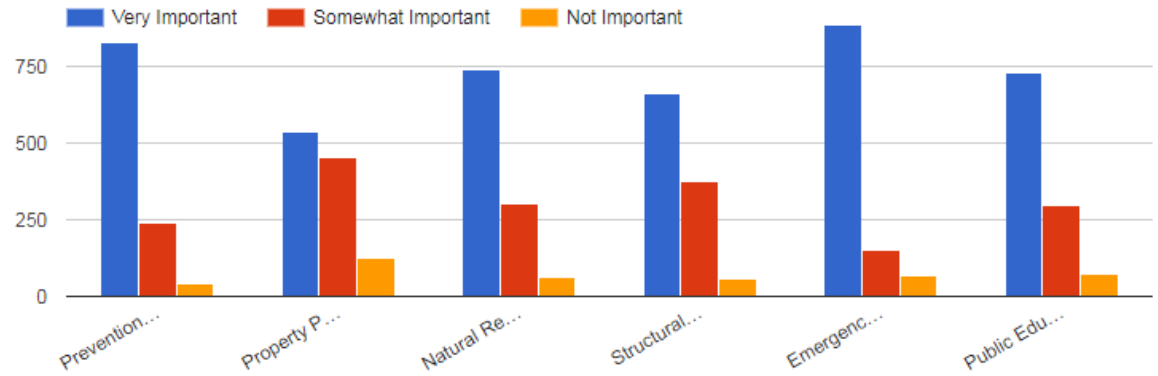
Risk to You

The hazards addressed in the Will County Countywide All Hazard Mitigation Plan are listed below. Indicate your opinion of the amount of risk to you.



Hazard Mitigation Activities

A number of community wide activities can reduce our risk from hazards. In general, these categories fall into one of the following six broad categories. Please tell us how important you think each one is for your community to consider pursuing.



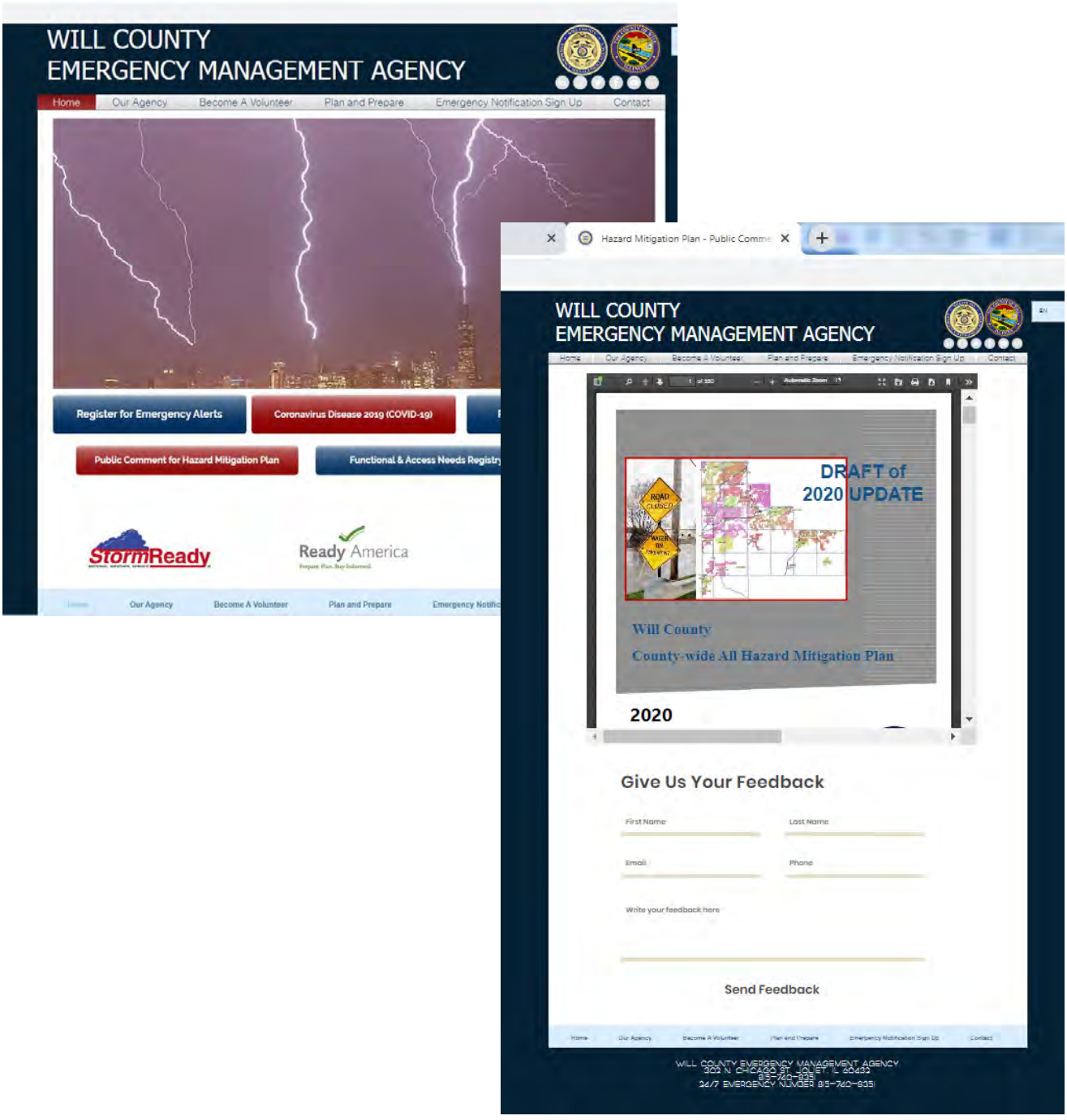
Will County County-wide All Hazard Mitigation Plan of 2013

Additional Links

We Appreciate Your Participation

***Will County County-Wide All Hazard Mitigation Plan* 2020 Update**

As part of the plan update process, the draft plan was posted for review on the Will County EMA website as well as multiple social media sites. Additionally, the draft was shared with partners for their input and dissemination to their community. This provided an opportunity for the public and partners to review the update and submit their input for the draft.



APPENDIX F

UPDATES TO 2013
Will County County-Wide All Hazard Mitigation Plan

UPDATES TO 2013 WILL COUNTY COUNTY-WIDE ALL HAZARD MITIGATION PLAN

The update of the *2013 Will County County-Wide All Hazard Mitigation Plan* consisted of a review of the data, hazards, and hazard incidents that have occurred over the last five years. The Will County Hazard Mitigation Planning Committee reviewed, analyzed and commented on each section of the 2013 Plan. Edits and comments were made to the introductory and profile sections. The Committee used Census 2010 data, where available, or the most current information in updating the demographics and land use in Will County. Occurrence and probability data were updated as part of the plan's risk assessment.

For the vulnerability assessment, critical facilities, building counts, and losses were updated to reflect changes over the past five years. The overall goals and objectives of the 2013 plan were reviewed and workshop participants provided revisions for the Plan Update. Plan maintenance procedures were also reviewed and updated to reflect current changes in staff and annual/bi-annual meetings. A review of the mitigation actions by the Planning Committee and workshop participants was conducted of the actions in the 2013 Plan. Mitigation Action #10 was identified as completed, the remaining were identified as ongoing with the progress of each noted, and two new mitigation actions were added. A status of each has been provided in this appendix.

The following factors were taken into consideration when reviewing the 2013 Plan:

- Whether the goals address current and expected conditions;
- If the nature/magnitude of risks has changed;
- If there are current resources appropriate for implementing the Plan;
- Whether implementation problems such as technical, political, legal or coordination issues hinder development;
- If outcomes have occurred as expected; and
- How communities, agencies and partners participated in the implementation process.

SUMMARY OF CHANGES IN WILL COUNTY COUNTY-WIDE ALL HAZARD MITIGATION PLAN		
2013 AHMP	**2020 AHMP UPDATE**	**Summary of Changes**
Executive Summary	Executive Summary	Updated to reflect plan updates and modified goals
Chapter 1 - Introduction	Chapter 1 - Introduction	Updated to reflect changes in the plan and Federal Declarations
Chapter 2 – Will County Community Overview	Chapter 2 – Will County Community Overview	Updated community overview to reflect most current data and community changes along with other pertinent community information
Chapter 3 – All Hazard Risk Assessment	Chapter 3 – All Hazard Risk Assessment	Workshop was held to review and analyze county-wide risk assessment and plan was updated with revisions
Chapter 4 – Hazard Profiles & Vulnerability Assessment	Chapter 4 – Hazard Profiles & Vulnerability Assessment	Updated data, historical events, maps, census material, watersheds, and flood concerns along with other information as necessary
Chapter 5 – Mitigation Goals, Objectives, & Strategies	Chapter 5 – Mitigation Goals, Objectives, & Strategies	Updated to reflect modifications in goals, objectives, and mitigation actions made during workshops
Chapter 6 – Mitigation Actions	Chapter 6 – Mitigation Actions	Updated to reflect modifications in goals, objectives, and mitigation actions made during workshops
Chapter 7 – Mitigation Plan Maintenance	Chapter 7 – Mitigation Plan Maintenance	Minor updates made to reflect current FEMA guidance
Appendices A through F	Appendices A through F	Reviewed and updated appendices which provide supporting information to the plan. Outlined results of workshops, community meetings, public survey, and public comments on draft HMP update. Noted changes made to the plan.

Representatives from Will County departments, local jurisdictions, and community partners came together in workshops to review the 2013 Goals, Objectives, and Mitigation Actions developed to determine current status of actions items, current needs, and changes within the counties communities. The result of the workshops and update of these Goals, Objectives, and Mitigation Actions is summarized in the following table.

Mitigation Success Stories

Will County endeavors to improve planning and implement effective mitigation actions for the safety of the public it serves and for the development of an inviting and successful place to live, work, and play. County and local jurisdictions have come together to develop and implement the mitigation actions identified in the *2020 Will County County-Wide All Hazard Mitigation Plan*. Progress is being made daily with jurisdictions coming together to identify and address the identified issues. Highlights include:

Flood Mitigation

- Adopted DFIRMS as of February 14, 2019
- Adopted the updated Bulletin 70 Rainfall data, revised March, 2019
- Set the cumulative damage limit to a 10 year term, which aligns with FEMA insurance claims
- Adopted additional freeboard beyond the Base Flood Elevation which is the minimum elevation required for the Flood Protection Elevation (Base Flood Elevation plus one foot)
- Incorporated density bonuses for subdivisions that utilized a conservation approach to development
- Continue to revisit participation in CRS based on leadership interest
- GIS has been utilized to analyze the Kankakee River flooding after multiple flood events
- The county is currently participating in the DuPage River study which has identified flood prone areas for purchase or mitigation
- The Subdivision Ordinance for Unincorporated Will County provided for density bonuses for subdivisions that are designed as a conservation subdivision, including placing special hazard areas into easements

- Loss Avoidance Study was completed for the Village of Shorewood which estimated flood damages along the DuPage River what would have occurred if at-risk properties had not been mitigated. Results of the study show that 56 properties along the DuPage River were acquired and demolished between 1996 and 2010. The study showed that for every dollar invested in the purchase and removal of the properties, $2.24 of losses were avoided. The mitigation benefits, or return on investment, have surpassed the initial investment.
  (See: https://www.ideals.illinois.edu/handle/2142/108397)

Collaborative Efforts

- Utilizing Web EOC to connect Emergency Services (EMAs, Police, Fire, etc.) during evolving situations, provide them with current/past information, access resource information, and document actions
- A major effort to consolidate 9-1-1 dispatching was completed. Most notably, this consolidated the dispatching functions of 32 public safety agencies that were previously dispatched in four different locations into one new center. This greatly improves information sharing during severe weather and other hazardous situations.
- Developed and adopted FEMA approved Debris Management Plan
- Participated on statewide steering committee to update the Illinois Plan for Radiological Accidents (IPRA)
- Participants from the IL-IN-WI Combined Statistical Area (CSA) came together to participate in Whole Community conferences that provided training and opportunities to discuss issues.

Training and Public Awareness

- The Emergency Management Agency has joined the National Weather Service's Weather Ready Nation Ambassador program to enhance our efforts to inform and educate the public on weather-related hazards and preparedness.
- Since 2013 – 32 people have obtained their Professional Development Series Certificate (PDS) from IEMA; 24 people have obtained or renewed their Illinois Professional Emergency Manager (IPEM) designation from IEMA; 3 people have received their Certified Emergency Manager (CEM) from the International Association of Emergency Managers.
- Public education has increased with the use of websites, social media, newsletters, and video/radio PSAs. WC EMA utilizes and supports a speaker's bureau and county-wide PIO group as outreach for public education.
- The WC EMA Public Preparedness Group (PPG) and local jurisdictions are active in community events for public education and have reached thousands of people through safety fairs and Community Engagement Events.
- Community Emergency Response Training (CERT) has been provided to prepare the public for emergencies in their communities.

- WC EMA supports the Higher Education Committee for developing emergency preparedness programs and training.
- WC EMA has remodeled the county's Emergency Operations Center (EOC) providing upgraded technology assets and a flexible set-up for emergency operations and training.
- The county completed construction of a new Emergency Response Facility which includes enhanced response and training facilities for training first responders and other officials.

GIS Use

- The county continues to expand and integrate the use of GIS technology for planning, response, and recovery activities. With the acceptance of the updated DFIRMS, additional floodplain management projects will be implemented using this technology.
- Tools were developed for use by field teams and for the general public to report and assess damage following flooding or other events that cause damage. This has allowed for the collection and analysis of information more quickly and thoroughly.
- WC EMA staff attended FEMA HAZUS training.

Hazard Monitoring and Warning

- The county has adopted the StormReady program and also has encouraged local jurisdictions to participate. StormReady is a nationwide community preparedness program to help community develop plans to handle all types of severe weather through the implementation of guidelines that improve their hazardous weather operations.
- Will County implemented a new radio communications system which supports the real-time coordination of monitoring and alerting communities during severe weather and other hazardous situations.
- The Emergency Management Agency began use of a severe weather monitoring service which increases the capability to receive timely and precise information on severe weather, flooding, and other hazardous weather situations.
- WC EMA has worked with the school districts to help them prepare for weather hazards and has distributed 800 weather radios throughout the county as part of this program.

The following chart provides additional status reports on all of the 2013 Mitigation Actions along with revisions and potential future projects/plans for the 2020 Mitigation Actions.

Action #	2013 Mitigation Actions	Action #	2020 Updated Mitigation Actions	2013 Mitigation Actions Status	
1	Revise and adopt the *Will County County-Wide All Hazard Mitigation Plan* by resolution of the County Board, City Councils, Boards of Trustees, and other governing boards as appropriate. The municipal, fire protection districts, colleges, and other agencies' resolutions should adopt each action item that is pertinent to the community and designate staff responsible for implementation.	1	Revise and adopt the *Will County County-Wide All Hazard Mitigation Plan* by resolution of the County Board, City Councils, Boards of Trustees, and other governing boards as appropriate. The municipal, fire protection districts, colleges, and other agencies' resolutions should adopt each action item that is pertinent to the community and designate staff responsible for implementation.	Updated	• Fifteen municipalities adopted the 2013 WC Hazard Mitigation Plan • Developed a fact sheet to assist municipalities in understanding the benefits of adopting the plan • Updated 2020 *Will County County-Wide All Hazard Mitigation Plan* to be submitted for adoption by the county and local jurisdictions
		Future Projects/Plans for Implementation			• Continue to educate communities on the benefits of hazard mitigation and adoption of the Hazard Mitigation Plan

Action #	2013 Mitigation Actions	Action #	2020 Updated Mitigation Actions	2013 Mitigation Actions Status	
2	Ensure the thoroughness and NIMS compliance of emergency management planning documents, operations, and functions and integrate emergency management operations, functions, and initiatives with all levels of government and neighboring jurisdictions.	2	Ensure that plans maintained by the county and local jurisdictions are NIMS compliant and are regularly reviewed so that the concept of emergency operations described in these plans encourages a combined unity of effort among the respective county jurisdictions, adjacent jurisdictions, and the State.	Updated	• All county plans and planning documents are aligned with the National Incident Management System (NIMS) and the National Response Plan (NRP) • Considerable NIMS training has been conducted throughout the county • Since 2013 – 32 people have obtained their Professional Development Series Certificate (PDS) from IEMA; 24 people have obtained or renewed their Illinois Professional Emergency Manager (IPEM) designation from IEMA; 3 people have received their Certified Emergency Manager (CEM) from the International Association of Emergency Managers • Maintaining coordination of numerous county and state plans in County EOP • Connected Emergency Services through access to Web EOC - EMAs, Police, Fire, etc. • Developing County-wide Recovery Operations Plan • Developed and adopted FEMA accepted Debris Management Plan
			Future Projects/Plans for Implementation		• Offer additional NIMS/NRP classes to local agencies • Local jurisdictions will assist by supporting continued training opportunities in their communities and applying what is learned in their emergency planning • Develop or implement a tracking system within Web EOC to assist municipalities in identifying their NIMS/NRP compliance and progress

Action #	2013 Mitigation Actions	Action #	2020 Updated Mitigation Actions	2013 Mitigation Actions Status	
3	Expand regional collaboration by developing outreach programs and coordinating with neighboring jurisdictions, regional partnerships, businesses, non-profit, and universities.	3	Expand regional collaboration by developing outreach programs and coordinating with neighboring jurisdictions, regional partnerships, businesses, non-profit, and universities.	Updated	• Collaboration of sectors has been facilitated through WC EMA. Whole Community Conferences provided the CSA training & opportunities for collaboration • WC EMA has worked to create regional plans for jurisdictions throughout the county • The county and local jurisdictions participate in a number of local, regional, and statewide collaborative efforts and programs, including: – Greater Will County Mutual Aid Association (EMAs) – Will County K-12 Task Force – Suburban Mutual Aid Response Team (SMART) – Mutual Aid Box Alarm System (MABAS) – Emergency Management Assistance Compact (EMAC) – Illinois Law Enforcement Aid System (ILEAS) – Illinois Public Works Mutual Aid Network (IPWMAN) – Illinois Emergency Services Management Association (IESMA) – Illinois Plan for Radiological Accidents (IPRA) – Illinois Public Health Mutual Aid System (IPHMAS) • WC EMA continues to be a member of the Illinois Terrorism Task Force (ITTF) to address terrorism risks & implement protective measures within the county • WC Health Department participates in NIPHC (consortium of PH in northern IL) to collaborate on PH issues • WC Health Department works with mobile food pantries • Local PDs work with schools - DARE program to ensure children's safety, preparedness drills, active shooter drills

Action #	2013 Mitigation Actions	Action #	2020 Updated Mitigation Actions		2013 Mitigation Actions Status
3		3	Continued		• Multiple counties w/EMA, Sheriffs, PDs, FDs, HDs, colleges, etc. participate in monthly StarCom radio call downs • In conjunction with the Regional Office of Education, hosted first K-12 School Safety Symposium
		Future Projects/Plans for Implementation			• Working with local/regional emergency management, develop outreach programs utilizing existing educational materials on preparedness tailoring them for business, non-profit, special needs providers, and other non-response entities
4	Incorporate risk assessment and hazard mitigation principles into comprehensive planning efforts, programs, and projects in order to secure communities from all hazards.	4	Incorporate risk assessment and hazard mitigation principles into comprehensive planning efforts, programs, and projects in order to secure communities from all hazards.	Updated	• An updated HVA has been completed for the county. Additionally, a Public Health HVA has been conducted. Both with input from stakeholders • FEMA/IEMA training/plans incorporated into county and local emergency planning • Private partners participate in HMP update – INEOS Enterprises, Silver Cross Hosp., River Valley Justice Center • Shorewood has worked on reduction of flood occurrences, property buyouts, & completed post flood analysis after major floods resulting in a positive return on investment
		Future Projects/Plans for Implementation			• Continue to ensure the latest hazard mitigation and risk assessment principles are reflected in: – Stormwater Plans – Building Codes – Subdivision & Zoning Ordinances • Evaluate the effect of hazards on responders and equipment to improve response and recovery planning • Develop a system to capture HMP review/revisions and mitigation actions activities from county department staff and local partners

Action #	2013 Mitigation Actions	Action #	2020 Updated Mitigation Actions	2013 Mitigation Actions Status	
5	Expand the county-wide public awareness and education programs and promote the understanding of each community's risks, vulnerabilities, what to do during and after a disaster, and how to mitigate the effects of disasters.	5	Expand the county-wide public awareness and education programs to promote the understanding of each community's risks, vulnerabilities, what to do during and after a disaster, and how to mitigate the effects of disasters.	Ongoing	County & Local Jurisdictions promote public education through: • Increased use of websites, Facebook, Nextdoor, twitter, & other social media by county & communities. Utilizing an app. (Ready Will County) to advise people of the hazards within their community • Community outreach through WC EMA Public Preparedness Group (PPG) & local jurisdictions participate in safety fairs – 37 orgs received PPG info in 2013 – 17 orgs received PPG info in 2014 – 25 orgs received PPG info in 2015 – 40 orgs received PPG info in 2016 – 22 orgs received PPG info in 2017 – 2 orgs received PPG info in 2018 • Community Engagement Events – 2013: 26 Events - 4097 Citizens reached, 103 Total event Hours 270, Total Volunteer Hours – 2014: 18 Events - 3304 Citizens reached, 75.5 Total event Hours, 212.5 Total Volunteer Hours – 2015: 17 Events - 2638 Citizens reached, 60.5 Total event Hours, 201 Total Volunteer Hours – 2016: 18 Events - 4009 Citizens reached, 81 Total event Hours, 216 Total Volunteer Hours – 2017: 38 Events - 8047 Citizens reached, 166.75 Total event Hours, 371.5 Total Volunteer Hours – 2018: 19 Events - 2726 Citizens reached, 79.75 Total event Hours, 199.75 Total Volunteer Hours – 2019: 28 Events - 8300 Citizens reached, 149.5 Total event Hours, 410 Total Volunteer Hours • WC EMA supports county & local Citizens Corps councils & provides CERT training to prepare the public • WC EMA supports Higher Education Committee for developing emergency preparedness programs & training

Action #	2013 Mitigation Actions	Action #	2020 Updated Mitigation Actions	2013 Mitigation Actions Status
5		5	Continued	• Weather radio events at local hardware/department stores • Support of Weather Spotting classes presented by National Weather Service • Developed speakers bureau • County-wide PIO group Distribution of weather radios & weather awareness training • Local communities (PDs & FDs) sponsor CERT teams to educate public on how to help themselves during an emergency until responders arrive • WC Health Department coordinates a local MRC – volunteers assist with outreach to the public & during PH emergencies • EMAs, PDs, FDs, WCHD, county & local services participate in local school fairs, health fairs, career days, community night out events to promote safety to inform pubic of safety & preparedness issues • Storm Ready community designations
			Future Projects/Plans for Implementation	• Provide Social Media Class • Create standard messaging templates in Web EOC • Research the availability and implement the use of Google Translate for messaging as available • Utilize Federal and state education materials to educate the public about the availability of flood insurance as well as flood risk and mitigation techniques

Action #	2013 Mitigation Actions	Action #	2020 Updated Mitigation Actions	2013 Mitigation Actions Status	
6	Continue to strengthen infrastructure, build redundancies, and implement contingency plans for vulnerable populations and essential services and networks.	6	Continue to strengthen infrastructure, build redundancies, and implement contingency plans for vulnerable populations and essential services and networks.	Ongoing	• Ongoing planning efforts are made to identify and prioritize critical infrastructure and vulnerable populations and facilities • Hazard–specific plans for fixed chemical facilities and nuclear power stations include provisions for identifying and prioritizing vulnerable populations and facilities. • Remodeled WC EMA EOC and built new Emergency Response Facility • Updated County-wide radio system • Participated in steering committee to complete comprehensive revisions of State and County IPRA emergency plans • County population and social data found on WC Health Department webpage – translation available in multiple languages • WC EMA, Red Cross, & all school districts work to maintain an active list of shelters • Beecher has ID'd 2 shelters • Promotion of weather radios by NWS, WC EMA & communities in all schools, public buildings, homes, etc. • Local communities work with Senior homes, elderly, hospitals, dialysis centers, nursing homes to ensure their safety • In conjunction with the Regional Office of Education, hosted first K-12 School Safety Symposium
		Future Projects/Plans for Implementation			• Continue mapping critical infrastructures • Geo-locating vulnerable populations for outreach during emergencies

Action #	2013 Mitigation Actions	Action #	2020 Updated Mitigation Actions	2013 Mitigation Actions Status	
7	Continue to support the delivery of education for existing and free training platforms to educate officials, critical personnel, first responders, and communities on risks and vulnerabilities, fundamental operations of emergency management, and mitigation for the purpose of strengthening planning and advancing professional development.	7	Continue to support the delivery of existing and free training platforms to educate officials, critical personnel, first responders, and communities on risks, fundamental operations of emergency management, and mitigation for the purpose of improving community preparedness and advancement of professional development.	Ongoing	• Hosted ICS class for elected officials • FEMA on campus classes • IPRA exercises • Hosted IEMA classes • WC EMA & local communities have sponsored classes in Stop the Bleed, Active Shooter, CPR, NARCAN, Severe Weather Spotter Training, MRC & CERT trainings, multi-functional training – PDs, FDs, EMA, etc. • River Valley Justice Center – monthly drills, NIMS training, first aid • In conjunction with the Regional Office of Education, hosted first K-12 School Safety Symposium
		Future Projects/Plans for implementation			• Continue hosting classes available free online or onsite • Expand the audience by inviting private partners
8	Relocate and/or incorporate mitigation retrofits for critical facilities that are located within high-hazard areas.	8	Identify critical facilities that are located within flood hazard areas and relocate them or incorporate mitigation retrofits to protect them from future floods.	Ongoing	• Adopted DFIRMS as of February 14, 2019 • DFIRMS have been added/made more readily available to Land Use, local community development planners, and emergency planners through continued enhancements and access to GIS

Action #	2013 Mitigation Actions	Action #	2020 Updated Mitigation Actions		2013 Mitigation Actions Status
		8	Future Projects/Plans for Implementation		• Utilize DFIRM database provided by FEMA to evaluate potential impacts to critical facilities located within flood hazard areas • Identify county and municipal critical infrastructure projects to protect the infrastructure from flood damage • Seek Federal funding for the Des Plaines River and Kankakee and Lake Michigan/Calumet watersheds to identify critical facilities at potential risk • City of Joliet and Army Corps of Engineers are jointly working to design and approve a plan to raise the lower ground elevations along the Des Plaines River above the 100-year floodplain
9	Support the use, development, and implementation of Geographic Information Systems (GIS) throughout the county to track community vulnerability to hazards.	9	Support the use, development, and implementation of Geographic Information Systems (GIS) throughout the county to track communities' vulnerability to hazards.	Ongoing	• EMA staff attended HAZUS training • The county continues to expand and integrate the use of GIS technology • Access to Population and Social data through WC Health Department website - WC Health Department using MAPPS w/GIS mapped: wells, restaurants, food pantries, micro-pantries, demographic data • Shorewood worked with WC GIS to map hazards, vulnerabilities, & infrastructure • Shorewood has promoted community JULIE education
		Future Projects/Plans for Implementation			• Continue to utilize GIS to track hazard impact • Continue to provide HAZUS training to EMA and municipal staff

Action #	2013 Mitigation Actions	Action #	2020 Updated Mitigation Actions	2013 Mitigation Actions Status	
10	Update base flood elevations (BFE) throughout the county in accordance with the Flood Hazard Mapping Program.			Completed	Completed - DFIRMS accepted February14, 2019
11	Maintain or amend, as needed, the county-wide floodplain ordinance.	10	Maintain or amend, as needed, the county-wide floodplain ordinance.	Updated	• DFIRMS accepted February14, 2019 • Adopted updated Bulletin 70 Rainfall data, revised March, 2019 • Set the cumulative damage limit to a 10-year term, aligns with FEMA insurance claims
		Future Projects/Plans for Implementation			• Continue to update countywide Ordinance as needed • Improve enforcement of the ordinance • Improve WCSMPC planning and project prioritization by conducting watershed studies
12	Participate in the Community Rating System to further reduce flood damage in the communities of Will County.	11	Participate in the Community Rating System to further reduce flood damage in the communities of Will County.	Unchanged	• Adopted additional freeboard beyond the Base Flood Elevation which is the minimum elevation required for the Flood Protection Elevation (Base Flood Elevation plus one foot) • Incorporated density bonuses for subdivisions that utilized a conservation approach to development

Action #	2013 Mitigation Actions	Action #	2020 Updated Mitigation Actions		2013 Mitigation Actions Status
		11	Future Projects/Plans for Implementation		• Continue to revisit CRS participation based on leadership interest and re-evaluate the benefit of participation in the CRS program • Continue to identify and relocate or mitigate critical facilities to outside the 500 year floodplain • Continue to incorporate CRS action steps into the countywide ordinance • Educate the communities on the benefits of participation in the CRS program
13	Integrate Flood Hazard Mapping Program updates with improved county-wide GIS capabilities.	12	Integrate Flood Hazard Mapping Program updates with improved county-wide GIS capabilities.	Ongoing	• DFIRMS accepted February14, 2019, have been integrated into the county's GIS system for use in planning and mitigating • The county is currently participating in the DuPage River study • GIS has been utilized to analyze the Kankakee River flooding after multiple flood events
			Future Projects/Plans for Implementation		• Continue to incorporate CRS action steps into the countywide ordinance • Utilize additional stream gauges which can be used by GIS to predict flood events on a live feed • The USACE DuPage River Feasibility Study Final Report is dated July 2019. The report recommends future projects in the DuPage River watershed • Implement recommendations from studies of the DuPage and DesPlaines Rivers as funding, partnerships, and staffing permit

Action #	2013 Mitigation Actions	Action #	2020 Updated Mitigation Actions	2013 Mitigation Actions Status	
14	Utilizing GIS, develop and maintain a county-wide database of flood controlled areas, purchased flood plain properties, and flood prone properties to be acquired.	13	Utilizing GIS, develop and maintain a county-wide database of flood controlled areas, purchased flood plain properties, and flood prone properties to be acquired.	Ongoing	• The county is currently participating in the DuPage River study which has identified flood prone areas for purchase or mitigation
		Future Projects/Plans for Implementation		• Seek Federal funding for Engineering and Implementation phase of the recommendations in the DuPage River report • Seek Federal funding of the Des Plaines River and Kankakee and Lake Michigan/Calumet watersheds to identify and justify areas of potential buy-outs/mitigation • Develop, map, and prioritize the county's list of flood road overtopping issues to include problem areas within the municipalities	

Action #	2013 Mitigation Actions	Action #	2020 Updated Mitigation Actions	2013 Mitigation Actions Status	
15	Continue stormwater management planning and ordinances to improve existing storm drainage systems.	14	Continue stormwater management planning and ordinances to improve existing storm capacity and drainage systems. Utilize watershed studies and mapping to identify and prioritize mitigation needs in each watershed. Potential projects include retention basins improvement, culvert enlargement/improvement, stream maintenance, erosion/sedimentation control, water quality assessment, watershed and flood risks education, infrastructure maintenance, agency coordination, property/infrastructure protection, roadway elevations correction, and data for improved emergency planning/response.	Ongoing	• Utilizes the 50%/50% program under the Stormwater Committee • Encourages Best Management Practices (BMP) through density bonuses, etc.

Action #	2013 Mitigation Actions	Action #	2020 Updated Mitigation Actions		2013 Mitigation Actions Status
		14	Future Projects/Plans for Implementation		• Continue to utilize the 50%/50% program under the Stormwater Committee • Evaluate the potential funding sources identified in Increasing Funding and Financing Options for Sustainable Stormwater Infrastructure (See: https://www.cnt.org/sites/default/files/publications/Increasing%20Funding%20and%20Financing%20Options%20for%20Sustainable%20Stormwater%20Management.pdf) • Update the 2009 Watershed Districts Survey to identify current issues/problems within the watersheds and successes since that survey • WC Land Use and Godley to work together to determine the feasibility of the community to participate in the NFIP
16	Complete and maintain maps of shallow flooding and urban ponding areas to prioritize stormwater infrastructure improvements.	15	Complete and maintain maps of shallow flooding and urban ponding areas to prioritize stormwater infrastructure improvements.	Ongoing	• Will County participated in CMAP's Flood Risk Susceptibility project in 2018. The Final report is available on the CMAP web site • Utilizes the 50%/50% program under the Stormwater Committee to eliminate neighborhood stormwater problems
		Future Projects/Plans for Implementation			• Continue to utilize the 50%/50% program under the Stormwater Committee
17	Increase open space and conservation easements, as well as incorporate natural mitigation features in high flood hazard areas throughout the county.	16	Increase open space and conservation easements, as well as incorporate natural features in high flood hazard areas throughout the county.	Ongoing	• The Subdivision Ordinance for unincorporated Will County provided for density bonuses for subdivisions that are designed as a conservation subdivision, including placing special hazard areas into easements

Action #	2013 Mitigation Actions	Action #	2020 Updated Mitigation Actions		2013 Mitigation Actions Status
		16	Future Projects/Plans for Implementation		• Continue to analyze and encourage the use of Best Management Practices (BMP) as an alternative to traditional developments
18	Capitalize on opportunities to acquire, relocate, or elevate flood prone properties.	17	Continue to capitalize on opportunities to acquire, relocate, or elevate flood prone properties.	Ongoing	• The USACE DuPage River Feasibility Study Final Report is dated July 2019. The report recommends future projects in the DuPage River watershed. • Recently published *Village of Shorewood, Illinois Loss Avoidance Study* reports a 224% return on investment for 56 properties along the DuPage River that were acquired and demolished between 1996 and 2011
		Future Projects/Plans for Implementation			• Seek Federal funding for Engineering and Implementation phase of the recommendations in the DuPage River report • Seek Federal funding of the Des Plaines River and Kankakee and Lake Michigan/Calumet watersheds to identify and justify areas of potential buy-outs/mitigation • Secure available funding for flood road overtopping issues within the county and municipalities • Update the 2009 survey of Will County watershed districts to identify problems that have been resolved, new problems, needed surveys, or problems awaiting funding

Action #	2013 Mitigation Actions	Action #	2020 Updated Mitigation Actions	2013 Mitigation Actions Status	
19	Expand and improve existing flood warning system capability and integrate it with a county-wide emergency communication strategy.	18	Expand and improve existing flood warning system capability and integrate it with a county-wide emergency communication strategy.	Ongoing	• Expansion of services provided by the National Weather Service (NWS) to electronically monitor weather and flooding • Training by NWS to access weather data for planning and responding during special events • Emergency Management Agency uses the NWS as the primary method of receiving flood warnings. Monitoring river and stream conditions is conducted through the US Geological Survey's network of stream gauges. In specific situations, such as increased threats of flooding on the Kankakee River due to ice jams, NWS flood warnings would be supplemented with on-site monitoring as warranted.
		Future Projects/Plans for Implementation			• Develop ability to tap into the NWS reporting through Web EOC
20	Utilize inventory of non-federal dams/levees subject to high and significant hazard to determine current status and to notify owners of any deficiencies. Provide non-compliant owners with direction on complying with state planning and inspection requirements.	19	Utilize inventory of non-federal dams/levees subject to high and significant hazard to determine current status and to notify owners of any deficiencies. Provide non-compliant owners with direction on complying with state planning and inspection requirements.	Ongoing	• Continuing work to review all non-federal dams and work with owners to address any issues. WC EMA has a list of dams/levees & is focusing on dam levels 1 (potential loss of life) & 2 (potential loss of infrastructure).
		Future Projects/Plans for Implementation			• Continue to monitor for non-federal dams/levees in unincorporated Will County • Develop an evaluation system and work with IDNR & WC Forest Preserve to identify status of these dams/levees & accompanying emergency plans.

Action #	2013 Mitigation Actions	Action #	2020 Updated Mitigation Actions	2013 Mitigation Actions Status	
21	Encourage & support shelters for all types of hazards in public spaces and high risk locations.	20	Encourage & support shelters for all types of hazards in public spaces and high risk locations.	Ongoing	• WC EMA continues to work with the American Red Cross to update and develop community shelters. • WC EMA, WC Regional Office of Education, and WC Sheriff's Office work collaboratively to maintain ARC agreements, shelter profiles, and site maps. • Other facilities are identified for warming/cooling centers. Local jurisdictions will focus on integrating shelters into new construction where possible.
		Future Projects/Plans for Implementation			• Identify potential shelter sites beyond school district facilities
22	Target regulatory, development, and preparedness efforts of Tier II hazardous material facilities and coordinate the development and maintenance of applicable community and facility emergency plans.	21	Target regulatory, development, and preparedness efforts of Tier II hazardous material facilities and coordinate the development and maintenance of applicable community and facility emergency plans.	Ongoing	• Ongoing progress with the support of the Will County Local Emergency Planning Committee (LEPC) • Will County has an active LEPC composed of state and local officials, fire, police, emergency management, emergency medical service, hospitals, media, and industry • The function of the WC LEPC is to develop emergency plans to protect the public in the event of chemical accidents and to communicate these plans to the public • The LEPC works closely with industry and includes industry representatives with their primary goal being to protect the public • The Risk Management Plan information for each facility has been woven into the LEPCs Comprehensive Chemical Contingency Plan to increase our effectiveness • Tier II facilities are mapped in Cameo

Action #	2013 Mitigation Actions	Action #	2020 Updated Mitigation Actions		2013 Mitigation Actions Status
		21	Future Projects/Plans for Implementation		• Move CAMEO maps of Tier II facilities into GIS and Web EOC • Develop maps identifying potential hazard zones of Tier II facilities
23	Encourage the development of continuity planning for both public and private sectors.	22	Encourage the development of continuity planning for both public and private sectors.	Ongoing	• Maintaining County COOP • Ongoing progress requiring professional development of county and local emergency planners and collaboration with governing and private sector partners • WC Health Department has completed a COOP & Succession plan
		22	Future Projects/Plans for Implementation		• Ensure regular schedule for reviewing/revising COOP Plan • Train county staff on COOP • Provide COOP training to community jurisdictions and private partners
24	Develop a drought contingency plan that educates the public on water saving techniques and identifies criteria/triggers for drought related actions.	23	Develop a drought contingency plan that educates the public on water saving techniques and identifies criteria/triggers for drought related actions.	Unchanged	Limited progress
			Future Projects/Plans for Implementation		• Educate staff and county officials on drought issues and plan development • Research and develop Drought Contingency Plan

Action #	2013 Mitigation Actions	Action #	2020 Updated Mitigation Actions	2013 Mitigation Actions Status	
25	Develop a "Post-Disaster Recovery" ordinance and planning document to prepare a community for an orderly recovery operation.	24	Develop a "Post-Disaster Recovery" ordinance and planning document to prepare a community for an orderly recovery operation.	Ongoing	• In-progress/underway
		Future Projects/Plans for Implementation			• Obtain training on Post Disaster Recovery issues and need for ordinance and county-side plan • Develop ordinance and county-wide plan
26	Implement and conduct surveillance programs to identify or mitigate emerging public health emergencies. Develop partnerships and coordinate emergency plans with public and private sectors to effectively prepare, mitigate, respond, and recover from public health emergencies.	25	Implement and conduct surveillance programs to identify or mitigate emerging public health emergencies. Develop partnerships and coordinate emergency plans with public and private sectors to effectively prepare, mitigate, respond, and recover from public health emergencies.	Ongoing	• Will County Health Department (WCHD) is tasked with surveillance of potential public health emergencies and has been working with responder partners and the communities since 2003 to develop emergency plans • This action item addresses their continued work to improve planning, improve capabilities, and collaborate with community partners • Emergency Management continues to support WCHD in the maintenance and improvement of plans for public health emergencies, addressing WCHD's role and responsibilities during an emergency, and mitigating public health threats before, during, and after an emergency • Worked collaboratively with local, regional, State, & CDC partners to address Ebola to protect the public • Worked collaboratively with local, regional, State, & CDC partners to address Zika to protect the public • Worked collaboratively with local, regional, State, & CDC partners to address COVID-19 to protect the public • Continues participation in regular IPHMAS drills • Implemented population and social data availability on WCHD website

Action #	2013 Mitigation Actions	Action #	2020 Updated Mitigation Actions		2013 Mitigation Actions Status
		25	Future Projects/Plans for Implementation		• Coordinate messaging with Will County Health Department to link to important messages sent by them during flu season, extreme weather, flood occurrences, foodborne illness outbreaks, immunization clinics, etc. • Post onsite and on media fact sheets on how to reduce exposure to flu/illness, mold remediation, West Nile Virus, Lyme Disease, Radon exposure, Well testing, etc.
		26	Review and update Hazard Modeling (see Appendix B) conducted originally by the Polis Center.	New	
		Future Projects/Plans for Implementation			• Provide additional HAZUS training to staff • Coordinate with GIS and other experts to update HMP Hazard Modeling
		27	Collaborate with local municipalities to develop and adopt a county-wide regional Emergency Operations Plan.	New	• Will County EMA has been facilitating joint planning efforts with geographically-related local jurisdictions to develop regional emergency plans • Success has been achieved in having individual jurisdictions conduct planning together to ensure their respective plans have similar concepts of operation wherever possible and coordinate interrelated functions, such as warning, evacuation, and sheltering
		Future Projects/Plans for Implementation			• An ultimate vision is that individual jurisdictions will actually adopt a joint plan produced under a single cover, similar to IPRA

U.S. Department of Homeland Security
FEMA Region V
536 S. Clark St., Floor 6
Chicago, IL 60605-1509

FEMA

July 15, 2021

Mr. Sam Al-Basha
State Hazard Mitigation Officer
Illinois Emergency Management Agency
1035 Outer Park Drive
Springfield, IL 62704

Dear Mr. Al-Basha:

Thank you for submitting the Will County County-wide All Hazards Mitigation Plan for our review. The Plan was reviewed based on the local plan criteria contained in 44 CFR Part 201, as authorized by the Disaster Mitigation Act of 2000. The plan met the required criteria for a multi-jurisdiction hazard mitigation plan. Formal approval of this plan is contingent upon the adoption by the participating jurisdictions of this plan. Once FEMA Region 5 receives documentation of adoption from the participating jurisdictions, we will send a letter of official approval to your office.

We look forward to receiving the adoption documentation and completing the approval process for the Will County County-wide All Hazards Mitigation Plan.

If there are any questions from either you or the communities, please contact Lorena Reyes, at (312) 408-5270 or email at Lorena.reyes@fema.dhs.gov.

Sincerely,

John Wethington
Acting Chief, Risk Analysis Branch
Mitigation Division

City Council

Agenda Memorandum

Item # PW-1

To: **Mayor & City Council**

From: **Brent Cann, Public Works Director**

Subject: **Installation of Emergency Vehicle Preemption Devices at Four Intersections for a Total Cost of $86,798.00**

Date: **Wednesday, April 6, 2022**

BACKGROUND/HISTORY

Emergency vehicle preemption devices (EVPs) allow the manipulation of traffic signals in the path of an emergency vehicle. They work by halting conflicting traffic and allowing the emergency vehicle the right-of-way which reduces response times and enhances traffic safety.

The City of Lockport seeks to install EVPs at four intersections:
- 159th Street and I-355 southbound off-ramp
- 159th Street and I-355 northbound off-ramp
- 159th Street and Gougar Road
- Cedar Road and Division Street

To achieve this, the City of Lockport has entered into intergovernmental agreements with Will County and the Lockport Township Fire Protection District. The intergovernmental agreement with Will County allows the installation of an EVP at the intersection of Cedar Road and Division Street, and the intergovernmental agreement with the Lockport Township Fire Protection District (LTFPD) established a 50/50 cost-sharing agreement between the City and LTFPD for the installation, repairs, and maintenance of EVPs located in the City.

PROS/CONS/ALTERNATIVES

The installation of emergency vehicle preemption devices will promote the general welfare of residents, motorists, and first responders. A sole source award for this work is recommended as the City of Lockport currently has a maintenance agreement with Meade, Inc.

RECOMMENDATION

Approve Resolution No. 22-027 authorizing Meade, Inc. to install emergency vehicle preemption devices at four intersections for a total cost of $86,798.00, which will be shared 50/50 with the Lockport Township Fire Protection District for a total City contribution cost of $43,399.00.

ATTACHMENTS

Resolution No. 22-027 Authorize the Installation of Emergency Vehicle Preemption Devices at Four Intersections

IGA - Lockport Township Fire Protection District

IGA - Will County

Quote - Meade, Inc.

SPECIFIC CITY COUNCIL ACTION REQUIRED

Approve Resolution No. 22-027 authorizing the installation of Emergency Vehicle Preemption Devices at four intersections.

RESOLUTION NO. 22-027

A RESOLUTION AUTHORIZING THE INSTALLATION OF EMERGENCY VEHICLE PREEMPTION DEVICES AT FOUR INTERSECTIONS

WHEREAS, in the opinion of the corporate authorities of the City of Lockport that the installation of emergency vehicle preemption devices (EVPs) at four intersections will promote the general welfare of residents, motorists, and first responders; and

WHEREAS, City staff recommends a sole source award since the City of Lockport currently has a maintenance agreement with Meade, Inc; and

WHEREAS, the City has entered into an intergovernmental agreement with Will County allowing the installation of an EVP at the intersection of Cedar Road and Division Street; and

WHEREAS, the City has entered into an intergovernmental agreement with the Lockport Township Fire Protection District (LTFPD) establishing a 50/50 cost-sharing agreement between the City and LTFPD for the installation, repairs, and maintenance of EVPs located in the City.

NOW, THEREFORE, be it resolved by the Mayor and City Council of the City of Lockport, Will County, Illinois, as follows:

SECTION 1: The City finds that installing emergency vehicle preemption devices (EVPs) at four intersections will promote the general welfare of residents, motorists, and first responders.

SECTION 2: The City Administrator and staff are authorized to accept the quote from Meade, Inc. to install emergency vehicle preemption devices at four intersections for a total cost of $86,798.00, which will be shared 50/50 with the Lockport Township Fire Protection District for a total City contribution cost of $43,399.00.

SECTION 3: This Resolution shall be in full force and effect from and after its passage and approval as provided by law.

PASSED and APPROVED this _____ day of _____, 2022, with:

_____ALDERMEN voting aye _____ALDERMEN abstaining

_____ALDERMEN voting nay _____ALDERMEN absent

The MAYOR voting aye _____, voting nay _____, not voting _____

_____ KAIRIS _____ KOSTECKI _____ SCHREIBER _____ GILLOGLY

_____ BERGBOWER _____ LOBES _____ SABAN _____ BARTELSEN

_____ MAYOR

_____
Steven Streit, Mayor

ATTEST:

_____

Kathleen Gentile, City Clerk

RESOLUTION NO. 21-020

A RESOLUTION APPROVING THE FIRST AMENDMENT TO AGREEMENT NO. 15-004: AN INTERGOVERNMENTAL AGREEMENT BETWEEN THE CITY OF LOCKPORT AND THE LOCKPORT TOWNSHIP FIRE PROTECTION DISTRICT, WILL COUNTY, ILLINOIS, FOR TRAFFIC SIGNAL PREEMPTION SYSTEM AND REPEAL OF AGREEMENT NO. 15-003 AS DUPLICATIVE

WHEREAS, on October 28, 2015, the City of Lockport ("CITY") and the Lockport Township Fire Protection District ("DISTRICT") entered into Intergovernmental Agreement for the cost-sharing for the repair and maintenance of several traffic signal preemption devices on traffic signals located in the City ("Agreement No. 15-004"); and

WHEREAS, the CITY, after due and careful consideration, conclude that the payment of the costs of repairs, maintenance, and now installation will promote the proper growth, general welfare and best interests of the CITY; and

WHEREAS, said parties desire to amend Agreement No. 15-004 to include the cost of installation of said traffic signal preemption system devices on a 50-50 basis with future locations of the devices to be agreed upon by the parties; and

WHEREAS, Agreement No. 15-003 that was entered on December 14, 2015, by the parties regarding the IGA with the Fire District is duplicative to Agreement No. 15-004 and should be repealed.

NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND CITY COUNCIL OF THE CITY OF LOCKPORT AS FOLLOWS:

Section 1: Approve attached Amendment to Agreement No. 15-004 to include the cost of installation of said traffic signal preemption system devices on a 50-50 basis.

Section 2: Authorize the Mayor and City staff to execute the Amendment to Agreement No. 15-005;

Section 3: Repeal Agreement No. 15-003, IGA between the CITY and the DISTRICT, as duplicative.

Section 4: Effective Date: This Resolution shall become effective upon passage and approval as provided by law.

PASSED this 17th **day of** February **, 2021, with**

8 **ALDERMEN voting aye** 0 **ALDERMEN abstaining**

0 **ALDERMEN voting nay** 0 **ALDERMEN absent**

The MAYOR voting aye _____**, voting nay** _____**, not voting** X

AYE **BARTELSEN** AYE **BERGBOWER** AYE **DESKIN** AYE **GILLOGLY**

AYE ____ LOBES AYE ____ PERRETTA AYE ____ SABAN AYE ____ SCHREIBER

____ MAYOR

Steven Streit, Mayor

ATTEST:

Kathleen Gentile, City Clerk

**FIRST AMENDMENT TO AGREEMENT NO. 15-004:
AN INTERGOVERNMENTAL AGREEMENT BETWEEN THE CITY OF LOCKPORT, A MUNICIPAL CORPORATION IN WILL COUNTY, ILLINOIS, AND THE LOCKPORT TOWNSHIP FIRE PROTECTION DISTRICT, WILL COUNTY, ILLINOIS, FOR TRAFFIC SIGNAL PREEMPTION SYSTEM**

[City of Lockport Resolution No. 21-020]

This First Amendment to the Intergovernmental Agreement between the City of Lockport ("CITY"), a municipal corporation in Will County, Illinois, and the Lockport Township Fire Protection District ("FIRE DISTRICT"), Will County, Illinois, for traffic signal preemption system, is entered this_____day of_____2021.

WHEREAS, on October 28, 2015, the FIRE DISTRICT and CITY entered into Intergovernmental Agreement for the cost-sharing for the repair and maintenance of several traffic signal preemption devices (commonly known by the brand name of "Opticom") on traffic signals located in the City ("Agreement No. 15-004"); and

WHEREAS, the Illinois Intergovernmental Cooperation Act, (Illinois Compiled Statutes, Chapter 5, Section 220/1 et seq.) authorizes municipalities to exercise jointly with any public agency of the State, including other units of local government and any power, privilege, or authority, which may be exercised by a unit of local government individually, and to enter into contracts for the performance of governmental services, activities and undertakings; and

WHEREAS, pursuant to Article 7, Section 10 of the 1970 Constitution of the State of Illinois, the CITY and the FIRE DISTRICT are empowered to contract for the purposes set forth therein; and

WHEREAS, in said Agreement No. 15-004, the CITY, after due and careful consideration, concluded that the payment of the costs of repairs, maintenance, and installation will promote the proper growth, general welfare and best interests of the CITY; and

WHEREAS, said parties desire to amend Agreement No. 15-004 to include the cost of installation of said traffic signal preemption system devices on a 50-50 basis.

NOW, THEREFORE, THE PARTIES AGREE TO THE FOLLOWING:

1. **Incorporation and Preamble and Exhibits**

The Preamble to this Agreement is incorporated herein as if fully set forth in Paragraph 1.

2. **Mutual Agreement**

The CITY and the FIRE DISTRICT, in consideration of the mutual agreements contained herein, the sufficiency of which consideration is hereby acknowledged, agree that from and after the execution of this Agreement, they will share the cost of installation, maintenance and repairs of the traffic signal preemption system devices on a 50-50 basis for all such devices on traffic signals located within the corporate limits of the City of Lockport, with the billing of the repairs and maintenance to be made to the party requesting the repairs and the non-requesting party reimbursing the other for 50% of the repair charges within 30 days of billing. The location, and subsequent installation, of any new traffic signal preemption system devices must be agreed to by both parties.

3. **Remedies**

This Agreement shall be enforceable in any court of competent jurisdiction by either the CITY or the FIRE DISTRICT, individually or collectively, or any successor or successors in title or interest in any manner or assigns of the parties. Enforcement may be sought by any appropriate action at law or in equity to secure the performance of the covenants, agreements, conditions and obligations contained herein.

a. In the event of a material breach of this Agreement, the parties agree that the CITY or the FIRE DISTRICT shall have thirty (30) days after written notice from the

non-breaching party to correct the same prior to the non-breaching party seeking of any remedy provided for herein; provided, however, that said thirty (30) day period shall be extended so long as the breaching party has initiated the cure of said breach and is diligently pursuing cure of same.

b. If any party to this Agreement shall fail to perform any of its obligations hereunder, and the party or parties affected by such failure shall have given written notice of such default to the defaulting party, and such defaulting party shall have failed to cure such default within the time period provided in subparagraph "a" above, then, in addition to any and all other remedies that may be available, either in law or equity, and subject to subparagraph "a" hereof, the party or parties affected by such default shall have the right (but not the obligation) to take such action as in its or their reasonable discretion and judgment shall be necessary to cure such default. In such event, the defaulting party hereby agrees to pay and reimburse the party or parties affected by such default for all reasonable costs and expenses, including reasonable attorney's fees, incurred by it or them in connection with action taken to cure such default.

c. Any of the parties hereto or its successors in interest or assigns, may, by civil action, mandamus or other proceeding, enforce each of the terms, conditions and provisions hereof.

4. <u>Benefit</u>

This Agreement shall inure to the benefit of and be binding upon the FIRE DISTRICT, and their successors in any manner in title, and assigns, and shall be binding upon the CITY and the successor corporate authorities of the CITY and any successor municipality.

5. Recording

This Agreement may be recorded in the Office of the Recorder of Will County, Illinois, if both parties deem a need to record the document.

6. Term

This Agreement shall be valid for a period of twenty (20) years from October 28, 2015, the date of entry of Agreement No. 15-004.

7. Enforceability and Severability

This Agreement shall be enforceable in any Court of competent jurisdiction by any of the parties hereto by any appropriate action at law or in equity to secure the performance of the covenants herein contained. If any provision of this Agreement is held invalid, such provisions shall be deemed to be exercised here from and the invalidity thereof shall not affect any of the other provisions contained herein.

8. Notice

Any Notice or demand hereunder form any party hereto to another party hereto shall be in writing and shall be deemed duly serviced if mailed by prepaid registered or certified mail, return receipt requested, or personally delivered with evidence of receipt addressed as follows:

TO THE CITY: **City Administrator**
City of Lockport
222 East 9th Street
Lockport, IL 60441

TO THE DISTRICT: **Fire Chief**
Lockport Township Fire Protection District
19623 Renwick Road
Lockport, IL 60441

Or to such address as any party may from time to time designate by notice to the other parties.

9. Corporate Authorities

The parties acknowledge and agree that the individuals who are members of the group that constitutes the Corporate Authority approving and/or signing this Agreement on behalf of the each of the parties are entering into this Agreement in their corporate capacity as members of such group and shall have no personal liability in their individual capacities.

10. Counterparts

This Agreement may be executed in two or more counterparts, each of which, taken together, shall constitute one and the same instrument.

[Signatures to follow]

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their duly authorized officers.

CITY OF LOCKPORT
A Municipal Corporation

BY: _____
Steven Streit, Mayor

ATTEST:

_____
Kathleen Gentile, City Clerk

LOCKPORT TOWNSHIP FIRE PROTECTION DISTRICT

BY: _____
Todd Randich, President

ATTEST:

_____
Henry Meader, Secretary

RESOLUTION NO. 2021 - 03

A RESOLUTION APPROVING AN ADMENDED INTERGOVERNMENTAL AGREEMENT BETWEEN THE CITY OF LOCKPORT AND THE LOCKPORT TOWNSHIP FIRE PROTECTION DISTRICT FOR TRAFFIC SIGNAL PREEMPTION SYSTEM

WHEREAS, the Lockport Township Fire Protection District (the "District"), Will County, Illinois, is a fire protection district duly incorporated under the laws of the State of Illinois, including the Illinois Fire Protection District Act (the "Act"), 70 ILCS 705/0.01 et seq); and

WHEREAS, Article VII, Section 10 of the Illinois Constitution of 1970 authorizes units of local government to cooperate with each other in order to accomplish common goals and objectives; and

WHEREAS, the Intergovernmental Cooperation Act, 5 ILCS 220/3, provides that any power or powers, privilege or authority exercised or which may be exercised by a public agency may be exercised, transferred, combined and enjoyed jointly with any other public agency; and

WHEREAS, the District and the City of Lockport, as units of local government, are both public agencies as defined under the Intergovernmental Cooperation Act; and

WHEREAS, the District and the City of Lockport previously entered into an Intergovernmental Agreement with respect to the maintenance and repair of certain traffic signal preemption system devices known as Opticom transmitters or devices installed on traffic signals located within the City; and

WHEREAS, the parties desire to enter into a subsequent Intergovernmental Agreement to add cost sharing provisions with respect to the installation of Opticom devices on traffic signals located within the City; and

WHEREAS, the Board of Trustees of the District has determined that it is in the best interest of the District to enter into a subsequent Intergovernmental Agreement with

the City of Lockport to further share in the cost of installation, maintenance and repairs of Opticom devices within the City of Lockport.

NOW THEREFORE, BE IT RESOLVED, by the Board of Trustees of the Lockport Township Fire Protection District, Will County, Illinois, as follows:

Section One: The recitals in the preambles to this Resolution are incorporated into this Section 1 as if fully set forth herein.

Section Two: The Intergovernmental Agreement between the City of Lockport, a municipal corporation in Will County, Illinois, and the Lockport Township Fire Protection District, Will County, Illinois, for Traffic Signal Preemption System, attached hereto and made a part hereof as **Exhibit 1**, is hereby approved.

Section Three: The President and Secretary of the District's Board of Trustees are hereby authorized to execute and deliver said Agreement and undertake any and all actions as may be required to implement its terms on behalf of the District.

Section Four: This Resolution shall be in full force and effect upon its passage and shall supersede any agreement, resolution, or motion in conflict with any part herein, and any such agreement, resolution, or motion or part thereof is hereby repealed.

ADOPTED this 24th day of February 2021, by a roll call vote as follows:

AYES: Trustee Kendziora, Meader, Batusich, Randich

NAYS: 0

ABSENT: Trustee Siegel

Todd Randich, President, Board of Trustees
Lockport Township Fire Protection District

ATTEST:

Henry Meader, Secretary, Board of Trustees
Lockport Township Fire Protection District

STATE OF ILLINOIS)
) SS.
COUNTY OF WILL)

SECRETARY'S CERTIFICATE

I, HENRY MEADER, the duly qualified and acting Secretary of the Board of Trustees of the Lockport Township Fire Protection District, Will County, Illinois, do hereby certify that attached hereto is a true and correct copy of a Resolution entitled:

RESOLUTION NO. 2021-03

A RESOLUTION AUTHORIZING THE EXECUTION OF AN AMENDED INTERGOVERNMENTAL AGREEMENT BETWEEN THE CITY OF LOCKPORT AND THE LOCKPORT TOWNSHIP FIRE PROTECTION DISTRICT FOR TRAFFIC SIGNAL PREEMPTION SYSTEM

which Resolution was duly adopted by said Board of Trustees at a meeting held on the 24th day of February, 2021. I do further certify that a quorum of said Board of Trustees was present at said meeting, or by electronic means at said meeting, and the Board met all the requirements of the Illinois Open Meetings Act.

IN WITNESS WHEREOF, I have hereunto set my hand this 24th day of February, 2021.

Henry Meader, Secretary, Board of Trustees
Lockport Township Fire Protection District

INTERGOVERNMENTAL AGREEMENT

This Agreement made and entered into this _____ day of _____, 20__, by and between the COUNTY OF WILL, acting by and through its County Board (hereinafter referred to as the "County") and the CITY OF LOCKPORT, an Illinois Municipal Corporation, acting by and through its City Council (hereinafter referred to as the "City").

WITNESSETH

WHEREAS, the City and the County are public agencies as that term is defined in the Intergovernmental Cooperation Act (5 ILCS 220/1 et. Seq.); and

WHEREAS, Article VII, Section 10 of the Illinois Constitution of 1970 and 5 ILCS 220/1 et. Seq., authorizes units of local government to contract or otherwise associate among themselves to obtain or share services, to exercise, combine or transfer any power or function, in any manner not prohibited by law, to use their credit, revenues and other reserves to pay costs and to service debt related to intergovernmental activities; and

WHEREAS, the City in order to facilitate the free flow of traffic and ensure safety to the motoring public, is desirous of installing an emergency vehicle preemption system at the intersection of C.H. 04 (Cedar Road) at C.H. 75 (Division Street) in Will County; and

WHEREAS, the City and County believe and hereby declare that said project will be of immediate benefit to County residents; and

NOW, THEREFORE, in consideration of the mutual promises and covenants hereinafter set forth and other good and valuable consideration, receipt of which is hereby acknowledged, and pursuant to the powers of intergovernmental cooperation, it is agreed by and between the parties hereto as follows:

1. The recitals hereinabove set forth are hereby incorporated in this Paragraph 1 as if said recitals were fully set forth herein.

2. Upon completion of the project, the County will retain maintenance responsibility for the County routes, including traffic signals, and shall retain the right to control the sequence and timing of the traffic signals.

3. The City, its successors and assigns shall at its sole expense be responsible for the installation and future maintenance of the emergency vehicle preemption system to be installed at the intersection of C.H. 04 (Cedar Road) at C.H. 75 (Division Street).

4. The City agrees to indemnify and hold harmless the County from any liability, action, claim, costs, including reasonable attorneys' fees, judgment or award relating to its performance under this agreement or the maintenance or use of said emergency vehicle preemption system.

5. This agreement may be assigned only with written consent by the both parties. Any assignments without bilateral written consent are void.

6. This Agreement shall be governed by Illinois law. The venue for any legal action arising out of this Agreement, whether in law or equity, shall be the Circuit Court of the Twelfth Judicial Circuit, Will County, Illinois.

7. This Agreement shall be binding upon and inure to the benefit of the parties hereto, and their successors and assigns.

8. In the event that a court of competent jurisdiction shall hold any provision of this Agreement invalid or unenforceable, such holding shall not invalidate or render unenforceable any other provision hereto.

9. This document shall be the final embodiment of Agreement by and between the City and the County. No oral changes or modifications to this Agreement shall be permitted or allowed. Changes or modifications to this Agreement shall be made only in writing and upon the necessary and proper signatures of the City and the County.

10. Any notices under this Agreement shall be sent as follows:

If to the County:

Will County Engineer
Director of Transportation
Will County Division of Transportation
16841 West Laraway Road
Joliet, Illinois 60433

Will County State's Attorney
Attn: Civil Division
57 N. Ottawa Street, 5th Floor
Joliet, Illinois 60432

If to the City:

City Administrator
City of Lockport
222 E. 9th St.
Lockport, IL 60441

Copy to:
City Attorney

City of Lockport
222 E. 9th St.
Lockport, IL 60441

The parties agree that each shall be responsible to notify the other of any changes in notification procedures or addresses.

11. This Agreement may be executed in one or more counterparts, each of which will be deemed an original, but all of which will constitute one instrument.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed as of the date set forth hereinabove.

Dated at Joliet, Illinois this 20 day of January, 2022

ATTEST:

By _____ By _____
Will County Clerk Will County Executive

(Seal)

Dated at Lockport, Illinois, this 2nd day of December, 2021 Approved by Resolution No. 21-114.

ATTEST:

By _____ By _____
City Clerk Mayor

(Seal)

EMERGENCY VEHICLE PREEMPTION INSTALLATION
(4) INTERSECTIONS IN LOCKPORT

ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE $$$ US	ITEM AMOUNT $$$ US
MOBILIZATION	LSUM	1	$ 1,000.00	$ 1,000.00
TRAFFIC CONTROL AND PROTECTION	LSUM	1	$ 500.00	$ 500.00
UNDERGROUND CONDUIT, GALVANIZED STEEL 4" DIA	FOOT	576	$ 77.00	$ 44,352.00
MAINTENANCE OF EXISTING TRAFFIC SIGNAL	EACH	4	$ 500.00	$ 2,000.00
ELECTRIC CABLE IN CONDUIT, SIGNAL #14 3/C	FOOT	1259	$ 5.00	$ 6,295.00
DRILL EX HANDHOLE	EACH	10	$ 350.00	$ 3,500.00
LIGHT DETECTOR	EACH	8	$ 1,500.00	$ 12,000.00
LIGHT DETECTOR AMP	EACH	4	$ 2,400.00	$ 9,600.00
MODIFY EX CONTROLLER	EACH	4	$ 575.00	$ 2,300.00
EVP SYSTEM LINE SENSOR CABLE NO. 20 3/C	FOOT	1259	$ 4.00	$ 5,036.00
ROD AND CLEAN EXISTING CONDUIT	FOOT	215	$ 1.00	$ 215.00
				$ 86,798.00

Thank You

Bryan Knutson
Project Manager

City Council

Agenda Memorandum

Item # FN-1

To: **Mayor & City Council**

From: **Lisa Heglund, Finance Director**

Subject: **Bills Through March 29, 2022**

Date: **Wednesday, April 6, 2022**

BACKGROUND/HISTORY

Attached is a list of various bills and invoices through March 29, 2022.

PROS/CONS/ALTERNATIVES

N/A

RECOMMENDATION

Approve the various bills through March 29, 2022.

ATTACHMENTS

Bill Summary Through March 29, 2022

Bills List Through March 29, 2022

SPECIFIC CITY COUNCIL ACTION REQUIRED

Approve the various bills through March 29, 2022 as presented.

To: City Council
From: Lisa Heglund
RE: Various Bills
Date: April 6, 2022

Below is a list of some of the invoices that are in your packet. I have included some additional information to further explain the expense. The amounts listed below are based on the invoice amount.

1. Austin Tyler (Capital Outlay) – Pay request for following projects
    a. Kelvin Grove water main replacement $112,702.50
2. Baxter & Woodman (Capital Outlay) – Engineering for following projects
    a. Division St WWTP $8,535
    b. Chevron sewer pipe sizing $7,523.75
    c. Chevron water pipe sizing $10,588.75
3. Cellebrite Inc $13,355 (Police) – Purchase cell phone analyzer for investigations
4. Chamlin Assoc. (Various) – Engineering for following projects
    a. Lockport Square Lot 9 $5,244
    b. Redwood Apartments $5,262.50
    c. Silo Bend $7,768
    d. Kelvin Grove water main $43,145.50
5. Concentric Integration $8,376 & $5,584 (Water/Sewer) – Annual Scada support services
6. Core & Main $6,401 (Water) – Purchase of water meters
7. Currie Motors $30,065 (Sewer) – Ford F250 pickup truck
8. Elliott Electric $5,725 (Administration) – City hall HVAC electric clocks
9. General Machine & Tool $6,960 (Capital Outlay) – Bike racks for downtown streetscape
10. HR Green $10,562.26 (Capital Outlay) – Engineering for I&M Canal study
11. Illinois EPA $50,806.67 (Water) – Semi-annual loan payment
12. Landscape Forms $13,810 (Capital Outlay) – Bollards & Litters for downtown streetscape
13. Lockport Square LLC $32,200.95 (Administration) – Sales tax reimbursement July-December 2021
14. Macon County Law Enforcement $25,876 (Police) – Academy for 4 new officers
15. Metropolitan Industries $17,664 (Sewer) – Emergency repairs to non-pot pumps and motors
16. Midwest Office Interiors $14,823.32 (Police) – Front office furniture for PD front office
17. Monroe Truck Equipment $15,207 (Sewer) – Custom truck bed for new pickup truck
18. Todd's Techies $7,312.50 (Administration) – February IT consulting
19. V3 Companies (Capital Outlay) – Engineering for following projects
    a. IL171 Slip Lane $20,002.50
    b. IL7 bike path over bridge $31,101.25

VENDOR NAME / INVOICE NUMBER	INVOICE DATE	DESCRIPTION	ACCOUNT #	DEPARTMENT	ITEM AMOUNT
911 TECH INC.					
1359	03/29/2022	COPFTO ANNUAL SOFTWARE	01-01-00-53600	CITY ADMINISTRATION	$2,840.00
				VENDOR TOTAL:	**$2,840.00**
A BEEP, LLC					
106355	03/23/2022	REPAIR LOOSE VOLUME SWITCH & REPROGRAM	01-04-00-52300	POLICE DEPARTMENT	$494.12
107854	03/29/2022	RADIO REPAIRS FOR TRUCK #117 & #118	01-18-00-52000	STREET DEPARTMENT	$204.40
108037	03/29/2022	RADIO REPAIR - REPLACING BOARD ASSEMBLY & F	01-04-00-52300	POLICE DEPARTMENT	$494.12
				VENDOR TOTAL:	**$1,192.64**
A.M. LEONARD INC.					
CS22011532	03/23/2022	LEONARD POLE SAW KIT	01-18-00-51900	STREET DEPARTMENT	$121.47
				VENDOR TOTAL:	**$121.47**
ACCURATE BACKGROUND					
AUR2088525	03/29/2022	EMPLOYMENT SCREENING - HENNEMAN, NEIGHBO	01-18-00-52800	STREET DEPARTMENT	$133.00
				VENDOR TOTAL:	**$133.00**
ACCURATE DOCUMENT DESTRUCTION					
8512893T095	03/29/2022	SHRED SERVICE-2/7/2022	01-04-00-52200	POLICE DEPARTMENT	$156.33
				VENDOR TOTAL:	**$156.33**
AIRGAS USA, LLC.					
9122548494	03/29/2022	OXYGEN AND ACETYLENE FOR SHOP TORCHES	01-15-00-68000	PUBLIC WORKS	$505.85
				VENDOR TOTAL:	**$505.85**
AL WARREN OIL CO., INC.					
W1460258	03/29/2022	GAS/DIESEL	01-00-00-12060	CTY ADMIN OR CPTL OUTLY	$14,102.95
				VENDOR TOTAL:	**$14,102.95**
AMAZON CAPITAL SERVICES					
1F9G-CKTM-V1QK	02/28/2022	MINI STRETCHED CANVAS EASEL SET	01-01-00-56310	CITY ADMINISTRATION	$318.25
1Q7R-CGXT-V9T6	02/28/2022	UNIFORM ALLOWANCE FOR W. RYAN, M. JANES, K.	20-15-00-51600	PUBLIC WORKS	$389.70
1MWY-6G9G-KMKW	02/28/2022	* CREDIT * DIPOLMA COVERS -ORIGINAL INVOICE	01-01-00-51000	CITY ADMINISTRATION	$(49.98)
1C4C-GGLG-VTJD	02/28/2022	IL LABOR LAW POSTERS	01-04-00-51000	POLICE DEPARTMENT	$99.96
				VENDOR TOTAL:	**$757.93**
AMAZON, INC.					
DISPUTE PURCHASI	03/23/2022	** DISPUTED PURCHASE ** HAVE A FRAUD CALL INT	01-07-00-56800	PLANNING/ECONOMIC DEV	$18.35
				VENDOR TOTAL:	**$18.35**
AMERICAN LEGAL PUBLISHING CORP					
15193	03/29/2022	2022 S-33 FOLIO/INTERNET EDITING	01-01-00-52600	CITY ADMINISTRATION	$37.05
15328	03/29/2022	FEBRUARY 2022 S-33 EDITING	01-01-00-52600	CITY ADMINISTRATION	$418.00
				VENDOR TOTAL:	**$455.05**
ARTHUR J. GALLAGHER & CO.					

VENDOR NAME / INVOICE NUMBER	INVOICE DATE	DESCRIPTION	ACCOUNT #	DEPARTMENT	ITEM AMOUNT
4181713	12/31/2021	AUTO POLICY AUDIT - 2021	01-01-00-54000	CITY ADMINISTRATION	$1,388.00
				VENDOR TOTAL:	**$1,388.00**
AUSTIN TYLER CONSTRUCTION LLC					
2205-02	03/29/2022	KELVIN GROVE REAR YARD WATER MAIN REPLACE	20-24-00-67100	WATER/SEWER CAPITAL	$112,702.50
				VENDOR TOTAL:	**$112,702.50**
BAXTER AND WOODMAN, INC					
232027	03/29/2022	FRANCES ST & MAY ST WATER & SEWER - FEB	20-24-00-67000	WATER/SEWER CAPITAL	$790.00
232026	03/29/2022	SLOYAN BUILDING LIFT STATION - FEB	20-16-00-53200	PUBLIC WORKS	$272.50
232904	03/29/2022	SEWER SYSTEM - CHEVRON PIPE SIZING & CAPACI	20-24-00-67000	WATER/SEWER CAPITAL	$155.00
232906	03/29/2022	WATER GIS UPDATES FOR CAPACITY MODEL - FEB	20-24-00-67000	WATER/SEWER CAPITAL	$840.00
232907	03/29/2022	SLOYAN BUILDING LIFT STATION - MARCH	20-16-00-53200	PUBLIC WORKS	$787.50
232908	03/29/2022	FRANCES ST & MAY ST WATER & SEWER IMPROVEI	20-24-00-67000	WATER/SEWER CAPITAL	$743.75
232903	03/29/2022	DIVISION STREET WWTP IMPROVMENTS PHASE I - I	20-24-00-67000	WATER/SEWER CAPITAL	$8,535.00
232905	03/29/2022	SEWER GIS UPDATES FOR CHEVRON & WEST SIDE	20-24-00-67000	WATER/SEWER CAPITAL	$270.00
232902	03/29/2022	SEWER SYSTEM - CHEVRON PIPE SIZING & CAPACI	20-24-00-67000	WATER/SEWER CAPITAL	$7,523.75
232901	03/29/2022	WATER SYSTEM - CHEVRON PIPE SIZING & CAPACI	20-24-00-67000	WATER/SEWER CAPITAL	$10,588.75
232909	03/29/2022	CAPACITY EVALUATION FOR DIVISION STREET WW	20-24-00-67000	WATER/SEWER CAPITAL	$1,129.73
				VENDOR TOTAL:	**$31,635.98**
BEST BUY #307					
624864	03/23/2022	WIRELESS MOUSE FOR LAPTOP/ PRESENTATION R	01-07-00-51000	PLANNING/ECONOMIC DEV	$52.18
				VENDOR TOTAL:	**$52.18**
BLAIN'S FARM AND FLEET					
86	03/29/2022	HARD HAT - CODE ENFORCEMENT OFFICER - C. LE	01-04-00-51600	POLICE DEPARTMENT	$11.29
				VENDOR TOTAL:	**$11.29**
BLUE COLLAR SUPPLY					
20967	03/29/2022	CODE ENFORCEMENT UNIFORM ITEMS - C LEGG	01-04-00-51600	POLICE DEPARTMENT	$79.99
				VENDOR TOTAL:	**$79.99**
BONNIE BRAE FOREST MANOR					
TAP ON FEE 2021	12/31/2021	TAP ON FEE REBATE - 2021 - CHIPOTLE / POPEYES	20-24-00-52310	WATER/SEWER CAPITAL	$3,930.40
				VENDOR TOTAL:	**$3,930.40**
BRITTNI CALDERON					
2022 TUITION	03/23/2022	2022 GRAD SCHOOL TUITION	01-01-00-56200	CITY ADMINISTRATION	$2,432.81
				VENDOR TOTAL:	**$2,432.81**
BURRIS EQUIPMENT CO.					
PS3007186-1	03/29/2022	1 CARBORATOR FOR WEED EATER #1023	01-18-00-52200	STREET DEPARTMENT	$54.57
PS3007362-1	03/29/2022	STRAPS FOR BLOWER #1008 & #1009	01-06-00-52200	YARD WASTE	$126.30
				VENDOR TOTAL:	**$180.87**
CAMZ COMMUNICATIONS,INC.					

VENDOR NAME / INVOICE NUMBER	INVOICE DATE	DESCRIPTION	ACCOUNT #	DEPARTMENT		ITEM AMOUNT
22-151	03/29/2022	SQUAD 509 GUN RACK	01-04-00-52000	POLICE DEPARTMENT		$235.00
22-153	03/29/2022	GUN RACK - #513	01-04-00-52000	POLICE DEPARTMENT		$235.00
					VENDOR TOTAL:	**$470.00**
CASH REWARDS						
** CREDIT **	03/23/2022	** CREDIT ** OVERLIMIT FEE REIMBURSEMENT	01-01-00-56800	CITY ADMINISTRATION		$(39.00)
					VENDOR TOTAL:	**$(39.00)**
CCP INDUSTRIES INC.						
2974911	03/29/2022	30 SAFETY VESTS	01-18-00-51610	STREET DEPARTMENT		$492.85
					VENDOR TOTAL:	**$492.85**
CELLEBRITE, INC.						
INVUS239162	03/29/2022	CELL PHONE ANALYZER	01-04-00-51670	POLICE DEPARTMENT		$13,355.00
					VENDOR TOTAL:	**$13,355.00**
CENTRAL CLEANERS						
FEB 2022	03/29/2022	UNIFORM CLEANING@P.D. - FEB 2022	01-04-00-52810	POLICE DEPARTMENT		$388.43
					VENDOR TOTAL:	**$388.43**
CENTRIFUGE CHICAGO CORPORATION						
22-15955	03/29/2022	CENTRIFUGE INSPECTION	20-16-00-52260	PUBLIC WORKS		$785.00
					VENDOR TOTAL:	**$785.00**
CHAMLIN ASSOCIATES INC.						
3022095	03/29/2022	HOMER TREE SERVICE - ARCHER EXPANSION - JAN	01-09-00-53200	ENGINEERING		$217.50
3022083	03/29/2022	LAGO VISTA PHASE 5 SOUTH- ENGINEERING REVIE	01-09-00-53200	ENGINEERING		$113.00
3022097	03/29/2022	WENDYS/NOODLES/CRUMBL @ LOCKPORT SQUARI	01-09-00-53200	ENGINEERING		$690.00
3022187	03/29/2022	KELVIN GROVE WATER MAIN CONSTRUCTION ENG	20-24-00-67000	WATER/SEWER CAPITAL		$43,145.50
3022166	03/29/2022	GRADING - LAGO VISTA PH 5	01-09-00-53200	ENGINEERING		$276.00
3022170	03/29/2022	PROLOGIS BUILDING 6 - FEB	01-09-00-53200	ENGINEERING		$323.50
3022171	03/29/2022	PROLOGIS BUILDING 7 - FEB	01-09-00-53200	ENGINEERING		$323.50
3022172	03/29/2022	GRADING - CLOVER RIDGE THS PH 3	01-09-00-53200	ENGINEERING		$69.00
3022173	03/29/2022	CLOVER RIDGE TOWNHOMES PHASE 3 - FEB	01-09-00-53200	ENGINEERING		$618.50
3022175	03/29/2022	REDWOOD APARTMENT HOMES - FEB	01-09-00-53200	ENGINEERING		$5,262.50
3022177	03/29/2022	GRADING - SILO BEND SUBDIVISION	01-09-00-53200	ENGINEERING		$2,346.00
3022178	03/29/2022	SILO BEND - FEB	01-09-00-53200	ENGINEERING		$7,768.00
3022181	03/29/2022	PROLOGIS BUILDING 4 FINAL PLANS - FEB	01-09-00-53200	ENGINEERING		$2,893.00
3022182	03/29/2022	WENDYS/NOODLES/CRUMBL @ LOCKPORT SQUARI	01-09-00-53200	ENGINEERING		$5,244.00
3022183	03/29/2022	LOCKPORT SQUARE LOT 18 - LIFE STORAGE - FEB	01-09-00-53200	ENGINEERING		$1,104.00
3022186	03/29/2022	GRADING - 1423 JOHNSON STREET	01-09-00-53200	ENGINEERING		$279.50
					VENDOR TOTAL:	**$70,673.50**
CHICAGO TRIBUNE						
2/25/2022	03/23/2022	CHICAGO TRIBUNE SUBSCRIPTION	01-01-00-51400	CITY ADMINISTRATION		$15.96

VENDOR NAME / INVOICE NUMBER	INVOICE DATE	DESCRIPTION	ACCOUNT #	DEPARTMENT	ITEM AMOUNT
				VENDOR TOTAL:	**$15.96**
CHRISTOPHER B. BURKE ENG., LTD.					
173096	03/29/2022	2021 NPDES COMPLIANCE OVERSIGHT - FEB	20-16-00-53200	PUBLIC WORKS	$935.00
				VENDOR TOTAL:	**$935.00**
CINTAS					
4114481357	03/29/2022	GRAY MAT SERVICE@P.D.	01-04-00-52200	POLICE DEPARTMENT	$140.44
				VENDOR TOTAL:	**$140.44**
COM ED					
1423092032-U	03/29/2022	MONTHLY ELEC-PARKING LOTS,TRAIN STN, WELL,L	01-18-00-53700	STREET DEPARTMENT	$1,483.84
2181120134-L	03/29/2022	SLOYAN LIFT STATION - FEB	20-16-00-53700	PUBLIC WORKS	$23.28
0440033081-I	03/29/2022	1000 S STATE ST - LIGHT CABINET - FEB	01-18-00-53700	STREET DEPARTMENT	$57.22
0402116036-O	03/29/2022	WELL 15 - FEB	20-15-00-53700	PUBLIC WORKS	$918.26
				VENDOR TOTAL:	**$2,482.60**
COMCAST					
INTERNET@P.D-MAI	03/16/2022	INTERNET SERVICE@P.D.- MARCH	01-01-00-53600	CITY ADMINISTRATION	$286.96
INTERNET@C.H. - M	03/23/2022	INTERNET SERVICE@CITY HALL - MARCH	01-01-00-53600	CITY ADMINISTRATION	$218.90
INTERNET@STP - M.	03/23/2022	INTERNET SERVICE@STP - MARCH	01-01-00-53600	CITY ADMINISTRATION	$183.35
				VENDOR TOTAL:	**$689.21**
COMPASS MINERALS AMERICA INC.					
973027	03/29/2022	BULK WHITE ROAD SALT - DELIVERED TO PW SALT	02-00-00-52440	CTY ADMIN OR CPTL OUTLY	$30,452.19
				VENDOR TOTAL:	**$30,452.19**
CONCENTRIC INTEGRATION, LLC					
232457	03/29/2022	SEWER 2021-2022 SCADA SUPPORT SERVICES	20-16-00-52300	PUBLIC WORKS	$5,584.00
232458	03/29/2022	WATER 2021-2022 SCADA SUPPORT SERVICES	20-15-00-52300	PUBLIC WORKS	$8,376.00
				VENDOR TOTAL:	**$13,960.00**
CONSTELLATION NEW ENERGY, INC.					
61098160901	12/31/2021	ELECTRIC-LIFT STATIONS, PRV 'S - NOV & DEC	20-16-00-53700	PUBLIC WORKS	$823.85
61624546901	03/29/2022	MONTHLY ELECTRIC@BOOSTER, LIFT STATIONS, W	20-16-00-53700	PUBLIC WORKS	$46,473.97
61645323601	03/29/2022	ELECTRIC-LIFT STATIONS, PRV 'S - FEB	20-16-00-53700	PUBLIC WORKS	$958.02
				VENDOR TOTAL:	**$48,255.84**
CONTINENTAL FARMS, INC.					
4777	03/29/2022	REPAIR USEPA ANNUAL REPORT - LOCKPORT STP	20-16-00-52800	PUBLIC WORKS	$1,500.00
				VENDOR TOTAL:	**$1,500.00**
CORE & MAIN					
P689188	03/29/2022	1" IPERL METERS	20-15-00-52230	PUBLIC WORKS	$6,401.00
Q491412	03/29/2022	** CREDIT ** WIRE FLEXNET - ORIGINAL INVOICE #F	20-15-00-52230	PUBLIC WORKS	$(3,510.00)
Q464955	03/29/2022	24 - METERS	20-15-00-52230	PUBLIC WORKS	$4,819.92
				VENDOR TOTAL:	**$7,71**

VENDOR NAME / INVOICE NUMBER	INVOICE DATE	DESCRIPTION	ACCOUNT #	DEPARTMENT	ITEM AMOUNT
COSTAR REALTY INFORMATION, INC.					
115790756-1	03/29/2022	MONTHLY SITE RESEARCH - MARCH 2022	01-01-00-53200	CITY ADMINISTRATION	$432.00
				VENDOR TOTAL:	**$432.00**
CRESCENT ELECTRIC SUPPLY CO.					
S509650558.002	03/29/2022	CITY HALL LIGHTING PHASE 2 FIXTURES	01-01-00-52700	CITY ADMINISTRATION	$3,967.74
				VENDOR TOTAL:	**$3,967.74**
CURRIE MOTORS FRANKFORT					
H14567	12/31/2021	FORD F-250 PICKUP TRUCK / MUNICIPAL PLATES	20-24-00-67250	WATER/SEWER CAPITAL	$30,065.00
				VENDOR TOTAL:	**$30,065.00**
DELLWOOD TIRE & AUTO					
2-62039	03/29/2022	#130 - 2 REAR TIRES & 2 VALVES ON SWEEPER	01-18-00-52200	STREET DEPARTMENT	$831.60
				VENDOR TOTAL:	**$831.60**
DONUT SHOP					
115286	03/23/2022	EMPLOYEE APPRECIATION DAY	01-01-00-56801	CITY ADMINISTRATION	$45.76
				VENDOR TOTAL:	**$45.76**
DONUT SHOP LLC					
10613	03/23/2022	EMPLOYEE APPRECIATION DAY	01-01-00-56801	CITY ADMINISTRATION	$30.50
				VENDOR TOTAL:	**$30.50**
EJ USA, INC.					
110220013822	03/29/2022	FIRE HYDRANT FOR HIT HYDRANT @ 16700 MERC L	20-15-00-56800	PUBLIC WORKS	$3,172.42
				VENDOR TOTAL:	**$3,172.42**
EL BURRITO LOCO					
784247	03/23/2022	WELCOME NEW CED EMPLOUYEE-BENSON, LEGG,	01-01-00-56800	CITY ADMINISTRATION	$58.69
				VENDOR TOTAL:	**$58.69**
ELLIOTT ELECTRIC					
26300	03/29/2022	CITY HALL ELECTRIC CLOCKS FOR HVAC	01-01-00-52700	CITY ADMINISTRATION	$5,725.00
				VENDOR TOTAL:	**$5,725.00**
FACEBOOK					
DGMCXCBNJ2	03/23/2022	STAR BUSINESS PLAN / LOCKPORT REST.WEEK CA	01-01-00-56301	CITY ADMINISTRATION	$46.08
RXSYQC3MJ2	03/23/2022	LOCKPORT REST.WEEK / ROAD CLOSURES CAMPA	01-01-00-56301	CITY ADMINISTRATION	$50.00
9P3BWC3NJ2	03/23/2022	LOCKPORT REST WEEK CAMPAIGN	01-01-00-56301	CITY ADMINISTRATION	$50.00
				VENDOR TOTAL:	**$146.08**
FERGUSON ENTERPRISES LLC #3099					
208121	03/29/2022	WATER SEWER LOCATOR **TOTAL IS AN EST** INTE	01-18-00-51900	STREET DEPARTMENT	$4,721.81
				VENDOR TOTAL:	**$4,721.81**
FERGUSON ENTERPRISES LLC #3326					
419517-1	03/29/2022	BRASS FITTINGS	20-15-00-52260	PUBLIC WORKS	$51

VENDOR NAME / INVOICE NUMBER	INVOICE DATE	DESCRIPTION	ACCOUNT #	DEPARTMENT	ITEM AMOUNT
				VENDOR TOTAL:	**$518.48**
FISHER AUTO PARTS, INC.					
341-054843	03/29/2022	#546 - WIPER BLADES	01-04-00-52000	POLICE DEPARTMENT	$34.00
341-054972	03/29/2022	#610 - REAR BRAKE ROTORS	20-16-00-52000	PUBLIC WORKS	$367.68
341-055450	03/29/2022	#503- - WIPER BLADES	01-04-00-52000	POLICE DEPARTMENT	$34.00
341-055546	03/29/2022	#516 - WIPER BLADES / AIR FILTER	01-04-00-52000	POLICE DEPARTMENT	$45.09
341-055276	03/29/2022	#119-AIR FILTER	01-18-00-52000	STREET DEPARTMENT	$51.86
341-055277	03/29/2022	#119-WIPER BLADES	01-18-00-52000	STREET DEPARTMENT	$17.98
				VENDOR TOTAL:	**$550.61**
FISHER SCIENTIFIC					
374787	03/29/2022	LAB SUPPLIES - PIPETS	20-16-00-51810	PUBLIC WORKS	$246.56
				VENDOR TOTAL:	**$246.56**
GENERAL MACHINE & TOOL INC.					
54397	03/29/2022	BIKE RACKS FOR 2022 STREETSCAPE	14-00-00-52311	CTY ADMIN OR CPTL OUTLY	$6,960.00
				VENDOR TOTAL:	**$6,960.00**
GENUINE PARTS COMPANY					
3104-763214	03/29/2022	SHOP - (2) SETS HEX KEYS	01-15-00-51900	PUBLIC WORKS	$15.98
3104-762733	03/29/2022	#129 - GEAR OIL	01-18-00-52000	STREET DEPARTMENT	$13.18
3104-762823	03/29/2022	SHOP - SPRING TO REPAIR PLIERS	01-15-00-51900	PUBLIC WORKS	$5.10
3104-762346	03/29/2022	#303 - 4 OXYGEN SENSORS FOR BUILDING TRUCK	01-08-00-52000	BUILDING DEPARTMENT	$176.38
3104-762455	03/29/2022	1 - OXYGEN SENSORS FOR BUILDING TRUCK #303	01-08-00-52000	BUILDING DEPARTMENT	$63.83
3104-762499	03/29/2022	#117 - EXHAUST SPOUT / CLAMP	01-18-00-52000	STREET DEPARTMENT	$37.39
3104-762454	03/29/2022	1 - OXYGEN SENSORS FOR BUILDING TRUCK #303	01-08-00-52000	BUILDING DEPARTMENT	$112.55
3104-762659	03/29/2022	#610 - SET REAR BRAKE PADS	20-16-00-52000	PUBLIC WORKS	$87.16
3104-762621	03/29/2022	#610 - SET REAR PARKING BRAKE SHOES/ HARDWA	20-16-00-52000	PUBLIC WORKS	$73.98
3104-763340	03/29/2022	#144 - AIR FILTERS	01-06-00-52200	YARD WASTE	$74.12
3104-763947	03/29/2022	SHOP - WIRE CUTTERS	01-15-00-51900	PUBLIC WORKS	$22.55
3104-763698	03/29/2022	#125 - OIL FILTER	01-18-00-52000	STREET DEPARTMENT	$62.44
3104-763358	03/29/2022	20-TON BOTTLE JACK	01-15-00-51900	PUBLIC WORKS	$199.00
3104-764004	03/29/2022	#126 - TOUCH UP PAINT	01-18-00-52000	STREET DEPARTMENT	$19.65
3104-763003	03/29/2022	* CREDIT * CORE DEPOSIT - ORIGINAL INVOICE #31(	20-16-00-52000	PUBLIC WORKS	$(6.30)
3104-763109	03/29/2022	#702 - 4 IGNITION COILS (PASSENGER SIDE)	20-15-00-52000	PUBLIC WORKS	$334.04
3104-763123	03/29/2022	#702 - 3-DRIVER SIDE IGN.COILS/ SEA FOAM CLEAN	20-15-00-52000	PUBLIC WORKS	$245.25
3104-763167	03/29/2022	#119 - OIL FILTER	01-18-00-52000	STREET DEPARTMENT	$26.53
				VENDOR TOTAL:	**$1,562.83**
GEORGE'S RESTAURANT					
867760	03/23/2022	LTHS DISCUSSION	01-01-00-56200	CITY ADMINISTRATION	$27.79
494904	03/23/2022	LOCKPORT PD MEETING	01-01-00-56200	CITY ADMINISTRATION	$46.99
				VENDOR TOTAL:	**$74.78**

VENDOR NAME / INVOICE NUMBER	INVOICE DATE	DESCRIPTION	ACCOUNT #	DEPARTMENT	ITEM AMOUNT
GRAINGER					
9241203117	03/29/2022	CIGARETTE LIGHTER CHARGE CORD	20-15-00-51900	PUBLIC WORKS	$43.59
				VENDOR TOTAL:	**$43.59**
GREG KURINEC					
WATER BILL REFUN	02/28/2022	WATER BILL REFUND / 0042153500	20-00-00-12500	CTY ADMIN OR CPTL OUTLY	$35.00
				VENDOR TOTAL:	**$35.00**
GREGG SHISLER					
PLBG LICENSE REN	03/09/2022	PLUMBING LICENSE RENEWAL	01-08-00-56200	BUILDING DEPARTMENT	$253.38
				VENDOR TOTAL:	**$253.38**
HAMPTON, LENZINI AND RENWICK					
20220390	03/29/2022	WATER SHED PLAN - FEB	14-00-00-53200	CTY ADMIN OR CPTL OUTLY	$1,767.50
				VENDOR TOTAL:	**$1,767.50**
HANSON LANDSCAPE & DESIGN INC					
29118	03/29/2022	LAWN MAINTENANCE CONTRACT - WELL HOUSE @	01-18-00-52800	STREET DEPARTMENT	$183.75
				VENDOR TOTAL:	**$183.75**
HAWKINS, INC.					
6131876	03/29/2022	CHLORINE/HYDROFLUOSILICIC ACID/FREIGHT	20-15-00-51820	PUBLIC WORKS	$6,961.05
6144044	03/29/2022	POLYMER	20-16-00-51830	PUBLIC WORKS	$5,928.00
				VENDOR TOTAL:	**$12,889.05**
HERITAGE CORRIDOR CVB					
11720	03/29/2022	TRAVEL GUIDE 2 PAGE SPREAD (CANAL TOWNS)	01-01-00-56301	CITY ADMINISTRATION	$3,250.00
				VENDOR TOTAL:	**$3,250.00**
HOME DEPOT CREDIT SERVICES					
1970606	03/23/2022	TUBING, LIGHT BULBS & WD40 ETC.	20-16-00-51900	PUBLIC WORKS	$170.62
8023842	03/23/2022	TOOLS FOR WATER DEPT.	20-15-00-51900	PUBLIC WORKS	$168.61
				VENDOR TOTAL:	**$339.23**
HOMER INDUSTRIES, LLC					
S172008	03/29/2022	DRIP CHARGE - CHIPS - MARCH	01-06-00-52210	YARD WASTE	$25.00
				VENDOR TOTAL:	**$25.00**
HOMER TREE CARE INC.					
47587	03/29/2022	STUMP REMOVAL - 321 S JEFFERSON	01-18-00-52420	STREET DEPARTMENT	$950.00
47586	03/29/2022	TREE REMOVALS - PRIVATE PROPERTY - 321 S JEF	01-18-00-52420	STREET DEPARTMENT	$3,750.00
				VENDOR TOTAL:	**$4,700.00**
HOSTGATOR.COM					
82575655	03/23/2022	RENEWAL FOR DOMAIN-OLDCANALDAYS	01-01-00-53600	CITY ADMINISTRATION	$18.99
2/27/2022	03/23/2022	HOSTGATOR DOMAIN	01-01-00-53600	CITY ADMINISTRATION	$24.00
				VENDOR TOTAL:	**$4**

VENDOR NAME / INVOICE NUMBER	INVOICE DATE	DESCRIPTION	ACCOUNT #	DEPARTMENT	ITEM AMOUNT
HR GREEN, INC.					
151055	03/29/2022	I & M CANAL STUDY - FEB	14-00-00-53200	CTY ADMIN OR CPTL OUTLY	$10,562.26
				VENDOR TOTAL:	**$10,562.26**
ICSC					
355222	03/23/2022	ICSC 2022 LAS VEGAS FULL PROGRAM - S STREIT	01-01-00-56200	CITY ADMINISTRATION	$165.00
				VENDOR TOTAL:	**$165.00**
ILLINOIS ARBORIST ASSOCIATION					
TUITION - C. BATIZ	03/23/2022	TUITION - C. BATIZ	01-18-00-56200	STREET DEPARTMENT	$315.00
				VENDOR TOTAL:	**$315.00**
ILLINOIS ENVIRONMENTAL					
L17-5225 / #8	03/14/2022	WATER REVOLVING FUND	20-00-00-20200	CTY ADMIN OR CPTL OUTLY	$50,806.67
				VENDOR TOTAL:	**$50,806.67**
ILLINOIS PUBLIC RISK FUND					
74612	03/23/2022	WORKERS COMP INSURANCE - APRIL	01-01-00-54000	CITY ADMINISTRATION	$22,765.00
				VENDOR TOTAL:	**$22,765.00**
ILLINOIS RECYCLING FOUNDATION					
2022030	03/29/2022	MEMBERSHIP DUES - 2022	01-01-00-51400	CITY ADMINISTRATION	$175.00
				VENDOR TOTAL:	**$175.00**
ILLINOIS STATE TOLL HIGHWAY					
532898	03/23/2022	I PASS REPLENISH	01-01-00-51500	CITY ADMINISTRATION	$40.00
				VENDOR TOTAL:	**$40.00**
INDUSTRIAL & UTILITY SUPPLY LTD					
S100009506.002	03/29/2022	REPLACE 1 STREETLIGHT - 16700 MERC - STREETLI	01-18-00-52210	STREET DEPARTMENT	$1,461.78
				VENDOR TOTAL:	**$1,461.78**
INTEGRITY FIRE EQUIPMENT, INC.					
67659	03/29/2022	INSPECTION OF FIRE EXTINGUISHERS@P.D.	01-04-00-52200	POLICE DEPARTMENT	$30.00
				VENDOR TOTAL:	**$30.00**
INTERSTATE BATTERIES OF					
50912699	03/29/2022	#543 - - BATTERY	01-04-00-52000	POLICE DEPARTMENT	$140.95
				VENDOR TOTAL:	**$140.95**
INVOICE CLOUD					
1358-2022-	02/28/2022	MONTHLY PROCESSING OF ONLINE BILL PRESENTI	20-01-00-53200	CITY ADMINISTRATION	$274.10
				VENDOR TOTAL:	**$274.10**
JENNIFER KEARNEY					
MARCH 2022	03/29/2022	PREPARATION/PROSECUTION - 03/02, 03/09, 03/22	01-01-00-53200	CITY ADMINISTRATION	$1,700.00
				VENDOR TOTAL:	**$1,700.00**
JIM'S TRUCK INSPECTION LLC					

VENDOR NAME / INVOICE NUMBER	INVOICE DATE	DESCRIPTION	ACCOUNT #	DEPARTMENT	ITEM AMOUNT
188543	10/31/2021	#124 - SAFETY LANE INSPECTION	01-18-00-52000	STREET DEPARTMENT	$56.00
188564	10/31/2021	#704 - SAFETY LANE INSPECTION	20-15-00-52000	PUBLIC WORKS	$37.00
190650	03/29/2022	#118 - SAFETY LANE INSPECTION	01-18-00-52000	STREET DEPARTMENT	$37.00
190936	03/29/2022	#117 SAFETY LANE INSPECTION	01-18-00-52000	STREET DEPARTMENT	$37.00
190929	03/29/2022	#604 - SAFETY LANE INSPECTION	20-16-00-52000	PUBLIC WORKS	$35.00
				VENDOR TOTAL:	**$202.00**
JOLIET ASPHALT LLC					
21-S1730	03/29/2022	COLDPATCH	01-18-00-52310	STREET DEPARTMENT	$821.10
				VENDOR TOTAL:	**$821.10**
JSN CONTRACTORS SUPPLY					
85209	03/29/2022	BLUE MARKING PAINT	20-15-00-56500	PUBLIC WORKS	$54.60
85210	03/29/2022	GLOVES (24 PAIRS)	01-18-00-51610	STREET DEPARTMENT	$106.80
85255	03/29/2022	GREEN MARKING PAINT	20-15-00-56500	PUBLIC WORKS	$273.00
				VENDOR TOTAL:	**$434.40**
JULIE INC.					
2022-1019	03/29/2022	2022 ANNUAL ASSESSMENT - QUARTERLY PAYMEI	20-15-00-56500	PUBLIC WORKS	$3,310.26
				VENDOR TOTAL:	**$3,310.26**
JX TRUCK CENTER-BOLINGBROOK					
22182112P	03/29/2022	#118 - AIR HOSE	01-18-00-52000	STREET DEPARTMENT	$27.36
				VENDOR TOTAL:	**$27.36**
KFC/LJS #055002					
1685	03/23/2022	HERITAGE CORRIDOR CVB MEETING	01-07-00-56200	PLANNING/ECONOMIC DEV	$8.49
				VENDOR TOTAL:	**$8.49**
KIN-KO ACE HARDWARE					
577602	03/29/2022	ELBOW PIPING / COUPLINGS / FLUX NOKORODE	20-15-00-52100	PUBLIC WORKS	$26.27
577630	03/29/2022	O RINGS / FASTENERS	20-15-00-51900	PUBLIC WORKS	$6.31
577557	03/29/2022	FLOOR GLUE / UTILITY KNIFE	01-04-00-52100	POLICE DEPARTMENT	$24.98
577558	03/29/2022	NOTCH TROWEL	01-04-00-52100	POLICE DEPARTMENT	$4.99
577560	03/29/2022	FLOOR GLUE	01-04-00-52100	POLICE DEPARTMENT	$56.97
577573	03/29/2022	INSERT JACK	01-04-00-52100	POLICE DEPARTMENT	$25.77
577570	03/29/2022	MINI CABLE SNAKE / LUBE WIRE PULLING	01-04-00-52100	POLICE DEPARTMENT	$20.98
577556	03/29/2022	NOTCH TROWEL / FLOOR GLUE	01-04-00-52100	POLICE DEPARTMENT	$14.58
577595	03/29/2022	GOO GONE / GRAFFITI REMOVER / GARMENT HOOK	01-04-00-52100	POLICE DEPARTMENT	$32.95
577569	03/29/2022	** CREDIT ** FLOOR GLUE - ORIGINAL INVOICE #577	01-04-00-52100	POLICE DEPARTMENT	$(18.99)
577672	03/29/2022	RAKE BOW FIBER	01-18-00-51900	STREET DEPARTMENT	$43.98
577694/5	03/29/2022	LIME RUST REMOVER / DUAL AERATOR	01-16-00-52100	PUBLIC WORKS	$47.98
577680/5	03/29/2022	LINK CHAIN QUICK / ROPE	20-15-00-52100	PUBLIC WORKS	$18.58
				VENDOR TOTAL:	**$305.35**
KONICA MINOLTA BUSINESS					

VENDOR NAME / INVOICE NUMBER	INVOICE DATE	DESCRIPTION	ACCOUNT #	DEPARTMENT	ITEM AMOUNT
9008448349	03/23/2022	PRINTER COPIES - CITY HALL/P.D./BLDG/PLNG/PW/S	01-01-00-51000	CITY ADMINISTRATION	$687.20
				VENDOR TOTAL:	**$687.20**
KONICA MINOLTA PREMIER FINANCE					
467600680	03/23/2022	DESIGNJET COPIER@ENG.DEPT - APRIL 2022	01-09-00-52200	ENGINEERING	$268.27
				VENDOR TOTAL:	**$268.27**
LANDSCAPE FORMS INC.					
140846	03/29/2022	BOLLARDS & LITTERS FOR DOWNTOWN STREETSC	14-00-00-52311	CTY ADMIN OR CPTL OUTLY	$13,810.00
				VENDOR TOTAL:	**$13,810.00**
LEXISNEXIS RISK DATA MGMT, INC					
1463850-20220131	03/29/2022	REAL TIME PHONE SEARCHES - JAN	01-04-00-52200	POLICE DEPARTMENT	$268.00
1463850-20220228	03/29/2022	REAL TIME PHONE SEARCHES - FEB	01-04-00-52200	POLICE DEPARTMENT	$263.50
				VENDOR TOTAL:	**$531.50**
LOCKPORT ROTARY CLUB					
2021 COFFIN RACE	09/29/2021	2021 COFFIN RACE	01-04-00-56800	POLICE DEPARTMENT	$75.00
				VENDOR TOTAL:	**$75.00**
LOCKPORT SQUARE LLC					
JULY - DEC 2021	12/31/2021	SALES TAX REIMBURSEMENT - JULY - DEC 2021	01-01-00-57200	CITY ADMINISTRATION	$32,200.95
				VENDOR TOTAL:	**$32,200.95**
LOTS OF FLOWERS, INC.					
NOV-MARCH	03/23/2022	BENSON / GROSSI / BARTELSEN	01-01-00-56800	CITY ADMINISTRATION	$289.82
				VENDOR TOTAL:	**$289.82**
LYFT RIDE					
2/14/2022	03/23/2022	LYFT RIDE ** SEE NOTES **	01-07-00-56800	PLANNING/ECONOMIC DEV	$67.93
				VENDOR TOTAL:	**$67.93**
MACON COUNTY LAW ENFORCEMENT TRNG					
22-758	03/29/2022	ACADEMY TRAINING - DERMODY,LALLKY,WARD,WH	01-04-00-56200	POLICE DEPARTMENT	$25,876.00
				VENDOR TOTAL:	**$25,876.00**
MAILCHIMP					
MARCH	03/23/2022	RENTAL PROGRAM - MARCH	01-01-00-56301	CITY ADMINISTRATION	$11.69
				VENDOR TOTAL:	**$11.69**
MCDONALD'S					
134844	03/23/2022	HCVB LUNCH BOARD MEETING	01-07-00-56800	PLANNING/ECONOMIC DEV	$6.61
				VENDOR TOTAL:	**$6.61**
METRO POWER INC.					
13578	03/29/2022	GENERATOR REPAIR	20-16-00-52200	PUBLIC WORKS	$434.52
				VENDOR TOTAL:	**$434.52**
METROPOLITAN INDUSTRIES,INC.					

VENDOR NAME / INVOICE NUMBER	INVOICE DATE	DESCRIPTION	ACCOUNT #	DEPARTMENT	ITEM AMOUNT
36950	03/29/2022	EMERGENCY REPAIR - LOCKPORT STP NON POT PL	20-16-00-52240	PUBLIC WORKS	$17,664.00
				VENDOR TOTAL:	**$17,664.00**
MICHAEL J. KNICK LLC					
FEB 2022	03/29/2022	ADJ HEARING - FEB 2022	01-04-00-56100	POLICE DEPARTMENT	$350.00
JAN 2022	03/29/2022	ADJ HEARING - JAN 2022	01-04-00-56100	POLICE DEPARTMENT	$350.00
				VENDOR TOTAL:	**$700.00**
MIDWEST OFFICE INTERIORS, INC.					
263199	03/29/2022	FRONT OFFICE FURNITURE@P.D.	01-04-00-52100	POLICE DEPARTMENT	$14,823.32
				VENDOR TOTAL:	**$14,823.32**
Miles Construction					
559 E 17th St	02/28/2022	BD Bond Refund	01-00-00-21600	CTY ADMIN OR CPTL OUTLY	$100.00
				VENDOR TOTAL:	**$100.00**
MONROE TRUCK EQUIPMENT					
79024	03/23/2022	CUSTOM TRUCK BED - FOR NEW FORD F-250 PICKU	20-24-00-67250	WATER/SEWER CAPITAL	$15,207.00
337160	03/29/2022	#610 - SNOW PLOW PARTS	20-16-00-52000	PUBLIC WORKS	$72.30
336145	03/29/2022	SNOW PLOW PARTS	01-18-00-52000	STREET DEPARTMENT	$68.43
336154	03/29/2022	FITTING,PLUG - SNOW PLOW PARTS	01-18-00-52000	STREET DEPARTMENT	$35.32
				VENDOR TOTAL:	**$15,383.05**
MUNICIPAL EMERGENCY SERVICES					
1687440	03/29/2022	CALIBRATION OF GAS METERS	20-16-00-52200	PUBLIC WORKS	$110.00
				VENDOR TOTAL:	**$110.00**
NEW ERA SPREADING INC					
322	03/29/2022	SLUDGE HAUL	20-16-00-52810	PUBLIC WORKS	$4,560.00
				VENDOR TOTAL:	**$4,560.00**
NEWCASTLE ELECTRIC, INC.					
20501	03/29/2022	WELL 15 ADDITIONAL ENGINEERING SERVICES - FE	20-24-00-67000	WATER/SEWER CAPITAL	$2,375.00
				VENDOR TOTAL:	**$2,375.00**
NICOR					
89 89 62 7843 2-106	03/29/2022	17112 S PRIME BLVD - P.W. - FEB	01-16-00-53200	PUBLIC WORKS	$3,259.10
04 03 29 1000 4-120	03/29/2022	133 W 13TH ST-TRAIN STATION - FEB	01-03-00-53800	COMMUTER LOT	$49.25
22 61 72 4574 5-78	03/29/2022	15051 S ARCHER AVE - GENERATOR - FEB	20-16-00-53800	PUBLIC WORKS	$50.16
69 31 29 1000 8-125	03/29/2022	425 W DIVISION STREET - STP - FEB	20-16-00-53800	PUBLIC WORKS	$3,003.10
47 22 25 7997 2-79	03/29/2022	221 N HAMILTON - GENERATOR - FEB	20-16-00-53800	PUBLIC WORKS	$51.05
07 45 59 5129 8-108	03/29/2022	133 W 13TH STREET- TRAIN STATION - FEB	01-03-00-53800	COMMUTER LOT	$221.27
42 98 01 1961 6-78	03/29/2022	1289 DAVIESS ST-GENERATOR - FEB	20-16-00-53800	PUBLIC WORKS	$51.07
97 30 72 9093 8-127	03/29/2022	1805 PRAIRIE - BLOWER ROOM - FEB	20-16-00-53800	PUBLIC WORKS	$49.25
99 69 18 7539 9-37	03/29/2022	222 E 9TH STREET- CITY HALL - FEB	01-01-00-52700	CITY ADMINISTRATION	$1,954.61
84 94 92 1714 9-74	03/29/2022	15160 NEW AVE - GENERATOR - FEB	20-16-00-53800	PUBLIC WORKS	$5

VENDOR NAME / INVOICE NUMBER	INVOICE DATE	DESCRIPTION	ACCOUNT #	DEPARTMENT	ITEM AMOUNT
96 78 14 6672 5-119	03/29/2022	OAK CREEK LIFT STATION - FEB	20-16-00-53800	PUBLIC WORKS	$54.91
72 87 20 2000 2-132	03/29/2022	1212 S FARRELL RD- P.D. - FEB	01-04-00-53800	POLICE DEPARTMENT	$1,429.50
19 27 30 2000 8-113	03/29/2022	1212 S FARRELL RD- MAINT BLDG - FEB	01-04-00-53800	POLICE DEPARTMENT	$358.39
10 37 54 0942 1-W	03/29/2022	141ST LIFT STATION - FEB	20-16-00-53800	PUBLIC WORKS	$55.55
71 85 89 1000 4-129	03/29/2022	16624 WEIS LANE - BOOSTER STATION - FEB	20-15-00-53800	PUBLIC WORKS	$373.95
				VENDOR TOTAL:	**$11,012.21**
OESTREICH SALES & SERVICE, INC					
235818	03/29/2022	KEYS	20-16-00-52100	PUBLIC WORKS	$102.50
				VENDOR TOTAL:	**$102.50**
O'REILLY AUTO PARTS					
5866-123114	03/29/2022	#546 - 1 BELT & 1 TENSIONER	01-04-00-52000	POLICE DEPARTMENT	$77.24
				VENDOR TOTAL:	**$77.24**
PAPA JOE'S OF LOCKPORT					
14	03/23/2022	CED/PW COORD. MEETING	01-07-00-56800	PLANNING/ECONOMIC DEV	$31.83
				VENDOR TOTAL:	**$31.83**
PARAMONT-EO, INC.					
S701138311.001	03/29/2022	30 - LIGHT BULBS	01-04-00-52100	POLICE DEPARTMENT	$123.00
				VENDOR TOTAL:	**$123.00**
PEERLESS NETWORK					
505135	03/23/2022	TELEPHONE-CITY ADMIN,WATER ADMIN, P.D.,P.W.,S	01-01-00-53900	CITY ADMINISTRATION	$2,097.41
				VENDOR TOTAL:	**$2,097.41**
PITNEY BOWES GLOBAL FINANCIAL					
3105259479	02/28/2022	MAIL MACHINE RENTAL!@P.D. - JAN-MARCH	01-04-00-52200	POLICE DEPARTMENT	$180.06
				VENDOR TOTAL:	**$180.06**
PLAINFIELD SIGNS, INC.					
18321	03/29/2022	LETTER/STRIPE EMA SQUADS #483/#481	01-19-00-52000	ESDA	$1,096.00
				VENDOR TOTAL:	**$1,096.00**
POLICE DEPT PETTY CASH					
JAN - MAR 2022	02/28/2022	WILL COUNTY CHIEFS MEETING/FBI ACADEMY DINN	01-04-00-56200	POLICE DEPARTMENT	$433.32
				VENDOR TOTAL:	**$433.32**
POWERDMS, INC.					
ILEAP 2022	03/29/2022	ILEAP 2022	01-01-00-53600	CITY ADMINISTRATION	$550.00
				VENDOR TOTAL:	**$550.00**
PRECISION PRINTING					
22706	03/29/2022	WINDOWS, REGULAR ENVELOPES	01-01-00-52700	CITY ADMINISTRATION	$255.00
22699	03/29/2022	BUSINESS CARDS - C. LEGG	01-08-00-51000	BUILDING DEPARTMENT	$50.00
				VENDOR TOTAL:	**$30**

VENDOR NAME / INVOICE NUMBER	INVOICE DATE	DESCRIPTION	ACCOUNT #	DEPARTMENT	ITEM AMOUNT
PRODUCT STEWARDSHIP INSTITUTE, INC.					
300002613	03/29/2022	MEMBERSHIP DUES 2022	01-01-00-51400	CITY ADMINISTRATION	$600.00
				VENDOR TOTAL:	**$600.00**
PURCHASE POWER					
POSTAGE REFILL/FE	02/28/2022	ADD POSTAGE TO POSTAGE MACHINE AT PW-FEB	01-16-00-51200	PUBLIC WORKS	$200.00
REFILL@C.H-P.D.-JA	02/28/2022	POSTAGE METER REFILL@CITY HALL & P.D. - JAN	01-04-00-51200	POLICE DEPARTMENT	$601.00
				VENDOR TOTAL:	**$801.00**
QUILL CORPORATION					
23478393	03/29/2022	PIN SOLE CLEANER / CFOLD TOWELS / KRAFT ENVE	01-04-00-51800	POLICE DEPARTMENT	$123.95
23478835	03/29/2022	DESK CLEAR TOP COVER	01-04-00-51000	POLICE DEPARTMENT	$99.96
23343758	03/29/2022	8 X 11 COPY PAPER	01-04-00-51000	POLICE DEPARTMENT	$78.98
23691899	03/29/2022	BLACK - TONER INK	01-04-00-51000	POLICE DEPARTMENT	$221.98
23173220	03/29/2022	11 X 17 PAPER / RED PENS / LETTER FOLDERS	01-16-00-51000	PUBLIC WORKS	$166.96
23171809	03/29/2022	STORAGE BOXES / BINDER CLIPS / BLACK PENS	01-04-00-51000	POLICE DEPARTMENT	$641.22
23343813	03/29/2022	8 X 11 COPY PAPER	01-16-00-51000	PUBLIC WORKS	$157.96
23655577	03/29/2022	SHEARS / ENVELOPES	01-04-00-51000	POLICE DEPARTMENT	$53.26
23699938	03/29/2022	RUBBERIZED BLACK ID BADGE	01-01-00-52700	CITY ADMINISTRATION	$19.17
23720886	03/29/2022	RUBBERIZED BLACK ID BADGE	01-01-00-52700	CITY ADMINISTRATION	$12.78
23693463	03/29/2022	8X11 PAPER/RULED PADS/BINDER CLIPS/ POST IT N	01-01-00-52700	CITY ADMINISTRATION	$170.40
23691569	03/29/2022	8.5 X 11 COPY PAPER	01-04-00-51000	POLICE DEPARTMENT	$404.90
1618554	03/29/2022	* CREDIT * 2022 WALL CALENDARS - ORIGINAL INVC	01-01-00-52700	CITY ADMINISTRATION	$(75.11)
23706226	03/29/2022	MESH ORGANZER	01-04-00-51000	POLICE DEPARTMENT	$27.99
23775259	03/29/2022	SELF INKING STAMPER	01-04-00-51000	POLICE DEPARTMENT	$24.79
23694391	03/29/2022	PRE INKED "COPY" STAMPER	01-04-00-51000	POLICE DEPARTMENT	$22.58
23657606	03/29/2022	COIN WRAPPERS - QUARTER	01-04-00-51000	POLICE DEPARTMENT	$40.99
23863485	03/29/2022	ORGANIZER / SHEARS / STAPLER - NEW CEO SECR	01-08-00-51000	BUILDING DEPARTMENT	$41.17
23890674	03/29/2022	COFFEE CUPS / CUTLERY KEEPER	01-01-00-52700	CITY ADMINISTRATION	$41.77
23759460	03/29/2022	ERASER / ENVELOPES / SHEARS / 8.5 X 11 PAPER	01-04-00-51000	POLICE DEPARTMENT	$146.11
				VENDOR TOTAL:	**$2,421.81**
RAY O'HERRON					
2180077	03/29/2022	UNIFORM ALLOWANCE PANTS-BALHA	01-04-00-51600	POLICE DEPARTMENT	$194.97
2179735	03/29/2022	UNIFORM ALLOWANCE - POTTER	01-04-00-51600	POLICE DEPARTMENT	$591.92
2181967	03/29/2022	SERVICE BAR / TIE / AC/DC HOLDER / STINGER DUT	01-04-00-51600	POLICE DEPARTMENT	$184.46
				VENDOR TOTAL:	**$971.35**
READYREFRESH BY NESTLE'					
12B8103798040	03/09/2022	DISTILLED WATER - CBOD TESTING	20-16-00-51810	PUBLIC WORKS	$49.96
02B6701651081	02/28/2022	WATER DISPENSER@P.D. GYM-FEB	01-01-00-56801	CITY ADMINISTRATION	$24.99
02C0124774639	03/23/2022	WATER DISPENSER@STP	01-01-00-56801	CITY ADMINISTRATION	$47.99
02C0124774605	03/23/2022	WATER DISPENSER@P.D.-MARCH	01-01-00-56801	CITY ADMINISTRATION	$24.99
02C0124774613	03/23/2022	WATER DISPENSER@CITY HALL - MARCH	01-01-00-56801	CITY ADMINISTRATION	$16

VENDOR NAME / INVOICE NUMBER	INVOICE DATE	DESCRIPTION	ACCOUNT #	DEPARTMENT	ITEM AMOUNT
02C0124774589	03/23/2022	WATER DISPENSER@P.W - MARCH	01-01-00-56801	CITY ADMINISTRATION	$156.96
				VENDOR TOTAL:	**$469.83**
ROD BAKER FORD					
212336	03/29/2022	#538 - 1 SMART MODULE	01-04-00-52000	POLICE DEPARTMENT	$88.35
C46426	03/29/2022	#538 - PROGRAM DCL CONNECTOR	01-04-00-52000	POLICE DEPARTMENT	$160.90
				VENDOR TOTAL:	**$249.25**
RUETTIGER,TONELLI & ASSOCIATES					
279	03/29/2022	GIS DATA FOR CHAMLIN - FEB	20-24-00-67000	WATER/SEWER CAPITAL	$680.00
				VENDOR TOTAL:	**$680.00**
RUSH TRUCK CENTER					
3026895895	03/29/2022	#129 - TURBO EXHAUST PIP FOR TRUCK #117 & 1 A)	01-18-00-52000	STREET DEPARTMENT	$64.90
3026917738	03/29/2022	#129 - TURBO EXHAUST PIP FOR TRUCK #117 & 1 A)	01-18-00-52000	STREET DEPARTMENT	$1,010.00
3026784000	03/29/2022	#117 - AFTER TREATMENT CLAMPS & GASKETS	01-18-00-52000	STREET DEPARTMENT	$654.28
				VENDOR TOTAL:	**$1,729.18**
SEBIS DIRECT INC.-WATER BILLS					
35717	03/29/2022	UB PRINTING / REST.WEEK ATTACHMENT	20-01-00-53200	CITY ADMINISTRATION	$2,380.98
				VENDOR TOTAL:	**$2,380.98**
SEDGWICK					
964673	03/29/2022	CLAIM #4A211OF40AC 3RD PARTY CN	01-01-00-54000	CITY ADMINISTRATION	$2,300.36
				VENDOR TOTAL:	**$2,300.36**
SHAW SUBURBAN MEDIA GROUP,INC.					
1960407	03/29/2022	PUBLIC HEARING PUBLICATION FOR LUPINE MONTI	01-07-00-56300	PLANNING/ECONOMIC DEV	$97.28
1962448	03/29/2022	PZC SPECIAL MEETING PUBLIC HEARING FOR LOCI	01-07-00-56300	PLANNING/ECONOMIC DEV	$137.30
				VENDOR TOTAL:	**$234.58**
SHI INTERNATIONAL CORP					
B14911891	03/29/2022	BACK UP NAS	01-01-00-53400	CITY ADMINISTRATION	$4,399.31
B14891251	03/29/2022	HP 250 G8 & HP Z2 DESKTOP	01-01-00-53400	CITY ADMINISTRATION	$728.10
B14884550	03/29/2022	HP 250 G8 & HP Z2 DESKTOP	01-01-00-53400	CITY ADMINISTRATION	$2,091.68
B14922239	03/29/2022	BACK UP NAS	01-01-00-53400	CITY ADMINISTRATION	$2,415.96
B14866365	03/29/2022	CISCO FIREWALL UPGRADES	01-01-00-53400	CITY ADMINISTRATION	$1,424.50
				VENDOR TOTAL:	**$11,059.55**
SNAP ON INDUSTRIAL					
IMP-000908410	03/29/2022	CABLE FOR SCANNER	01-15-00-51900	PUBLIC WORKS	$61.53
				VENDOR TOTAL:	**$61.53**
STATE STREET AUTO BODY					
#549 REPAIR	03/23/2022	#549 - REPAIRS TO SQUAD	01-04-00-52000	POLICE DEPARTMENT	$2,161.67
				VENDOR TOTAL:	**$2,161.67**

VENDOR NAME / INVOICE NUMBER	INVOICE DATE	DESCRIPTION	ACCOUNT #	DEPARTMENT		ITEM AMOUNT
SURE-FIRE AUTO PARTS						
4784-721166	03/29/2022	#604 - FLOOR LINERS	20-16-00-52000	PUBLIC WORKS		$147.13
4784-720567	03/29/2022	SHOP EQUIPMENT REPAIR PARTS - OXYGEN REGUI	01-15-00-51900	PUBLIC WORKS		$119.99
					VENDOR TOTAL:	**$267.12**
TAPCO						
I720332	03/29/2022	SIGN BLANKS AND SUPPLIES	01-18-00-51630	STREET DEPARTMENT		$2,306.82
I721372	03/29/2022	SIGN SUPPLIES *KEEP OPEN, MULTIPLE ORDERS*	01-18-00-51630	STREET DEPARTMENT		$538.89
					VENDOR TOTAL:	**$2,845.71**
TEKLAB, INC.						
270218	03/29/2022	FIRST QUARTER SLUDGE & RADIUM TESTING - LO	20-16-00-52800	PUBLIC WORKS		$899.11
270219	03/29/2022	FIRST QUARTER SLUDGE & RADIUM TESTING - LOC	20-16-00-52800	PUBLIC WORKS		$883.86
270782	03/29/2022	BONNIE BRAE SPECIAL CONDITION 10 TESTING - M/	20-16-00-52800	PUBLIC WORKS		$496.40
270780	03/29/2022	MONTHLY NPDES TESTING - MARCH	20-16-00-52800	PUBLIC WORKS		$459.15
					VENDOR TOTAL:	**$2,738.52**
THE UPS STORE #5629						
MMZ4Q4VK310CS	03/29/2022	APPLIED CONCEPTS INC - POSTAGE	01-04-00-51200	POLICE DEPARTMENT		$12.96
MMZQ4QVJBKSSG	03/29/2022	STREAMLIGHT REPAIR DEPT - POSTAGE	01-04-00-51200	POLICE DEPARTMENT		$13.58
					VENDOR TOTAL:	**$26.54**
THOMSON REUTERS - WEST						
6147157383	03/29/2022	CRIMINAL LAW AND PROCEDURES 2022	01-04-00-51400	POLICE DEPARTMENT		$506.00
					VENDOR TOTAL:	**$506.00**
TKB ASSOCIATES, INC.						
14574	03/29/2022	REMOTE LASERFICHE INSTALLATION	01-01-00-53600	CITY ADMINISTRATION		$875.00
					VENDOR TOTAL:	**$875.00**
TODDS TECHIES INC.						
2122	03/29/2022	IT CONSULTING - FEB 2022	01-01-00-53600	CITY ADMINISTRATION		$7,312.50
2123	03/29/2022	IT CONSULTING@P.D. - FEB	01-01-00-53600	CITY ADMINISTRATION		$187.50
					VENDOR TOTAL:	**$7,500.00**
TOTAL PARKING SOLUTIONS, INC.						
105649	03/29/2022	MODEM UPGRADE	01-03-00-52010	COMMUTER LOT		$3,420.00
					VENDOR TOTAL:	**$3,420.00**
TRAFFIC CONTROL & PROTECTION INC.						
110981	03/29/2022	FILM ROLLS AND ALUMINUM BLANKS FOR SIGN SH(	01-18-00-51630	STREET DEPARTMENT		$2,735.60
					VENDOR TOTAL:	**$2,735.60**
TRANSPORTATION FINANCE CORP.						
30271	02/28/2022	#121 - CALL OUT FOR FORCE REGEN W/LAPTOP	01-18-00-52000	STREET DEPARTMENT		$445.00
					VENDOR TOTAL:	**$445.00**

VENDOR NAME / INVOICE NUMBER	INVOICE DATE	DESCRIPTION	ACCOUNT #	DEPARTMENT	ITEM AMOUNT
TRI-K SUPPLIES, INC.					
118264	03/29/2022	CITY HALL JANITORIAL SUPPLIES	01-01-00-52700	CITY ADMINISTRATION	$487.42
118365	03/29/2022	GARBAGE BAGS	01-01-00-52700	CITY ADMINISTRATION	$62.94
118509	03/29/2022	CITY HALL TOLIET TISSUE	01-01-00-52700	CITY ADMINISTRATION	$72.80
				VENDOR TOTAL:	**$623.16**
USA BLUE BOOK					
893643	03/29/2022	SLUDGE JUDGE & SWING SAMPLER	20-16-00-51900	PUBLIC WORKS	$627.53
910049	03/29/2022	DROPPERS / SETTLOMETERS	20-16-00-51810	PUBLIC WORKS	$141.82
				VENDOR TOTAL:	**$769.35**
V.I.P.SERVICES, INC.					
29224	02/28/2022	VALET SERVICES- 1/30,2/4,2/5/2022	01-01-00-56800	CITY ADMINISTRATION	$1,885.00
29363	03/29/2022	VALET SERVICES - 3/6, 3/11, 3/12	01-01-00-56800	CITY ADMINISTRATION	$1,800.00
29337	03/29/2022	VALET SERVICES - 2/27, 3/4, 3/5	01-01-00-56800	CITY ADMINISTRATION	$1,800.00
				VENDOR TOTAL:	**$5,485.00**
V3 COMPANIES					
222344	03/29/2022	9TH ST BIKE PATH & 10TH ST PED BRIDGE OVER I&I	14-00-00-53200	CTY ADMIN OR CPTL OUTLY	$31,101.25
222477	03/29/2022	IL171/NEW AVE ROUNDABOUT - PHASE I ENGINEER	14-00-00-53200	CTY ADMIN OR CPTL OUTLY	$20,002.50
22476RVSD	03/29/2022	EVP SYSTEM (159TH & 167TH) - FEB	14-00-00-53200	CTY ADMIN OR CPTL OUTLY	$235.30
				VENDOR TOTAL:	**$51,339.05**
VANCO PAYMENT SOLUTIONS, LLC					
FEB 2022	02/28/2022	VANCO FEES - FEB 2022	20-01-00-53200	CITY ADMINISTRATION	$334.48
				VENDOR TOTAL:	**$334.48**
VERIZON WIRELESS					
9900838432	03/14/2022	MONTHLY VERIZON CELLPHONES-WATER,STP,ADM	20-16-00-53900	PUBLIC WORKS	$3,236.55
9901142454	02/28/2022	SCADA TO SCADA MACHINE - FEB	20-15-00-53900	PUBLIC WORKS	$949.42
				VENDOR TOTAL:	**$4,185.97**
VERMEER-ILLINOIS, INC.					
PH5747	03/29/2022	TEETH FOR STUMP GRINDER #144	01-06-00-52200	YARD WASTE	$367.20
				VENDOR TOTAL:	**$367.20**
VILLAS OF CLOVER RIDGE					
228 Clover Ridge Dr	03/29/2022	BD BOND REFUND	01-00-00-21600	CTY ADMIN OR CPTL OUTLY	$300.00
				VENDOR TOTAL:	**$300.00**
VISTAPRINT NETHERLANDS BV					
VP_VCDBCMVO	03/23/2022	CUSTOM RACK CARDS	01-01-00-56301	CITY ADMINISTRATION	$97.99
				VENDOR TOTAL:	**$97.99**
VSA INC.					
CL2203-0855GREV	03/29/2022	LCTV ANALOG BOXES	01-01-00-52900	CITY ADMINISTRATION	$715.00

VENDOR NAME / INVOICE NUMBER	INVOICE DATE	DESCRIPTION	ACCOUNT #	DEPARTMENT		ITEM AMOUNT
					VENDOR TOTAL:	**$715.00**
WASTE MANAGEMENT						
3620016-2354-9	02/28/2022	SLOYAN PAD SERVICES - FEB	01-01-00-56800	CITY ADMINISTRATION		$240.00
					VENDOR TOTAL:	**$240.00**
WESCOM						
20220224	03/23/2022	FILTER FIRSTNET	01-04-00-52830	POLICE DEPARTMENT		$1,262.20
20220311	03/23/2022	DISPATCH SERVICE / AIRTIME FEES - MARCH 2022	01-04-00-52830	POLICE DEPARTMENT		$37,339.91
					VENDOR TOTAL:	**$38,602.11**
WEX BANK						
78297156	02/28/2022	GAS - NEW OFFICER TRAINING - JAN	01-04-00-51500	POLICE DEPARTMENT		$49.38
79226151	02/28/2022	GAS - OUT OF TOWN WORK	01-04-00-51500	POLICE DEPARTMENT		$137.26
					VENDOR TOTAL:	**$186.64**
WILL COUNTY 9-1-1 SYSTEM						
211116-1	11/30/2021	911 TELEPHONE SYSTEM	01-01-00-53600	CITY ADMINISTRATION		$445.50
					VENDOR TOTAL:	**$445.50**
WILL COUNTY GOVERNMENTAL LEAGU						
2022-1140	03/29/2022	LOBBY DAY REGISTRATION- 2022	01-01-00-51400	CITY ADMINISTRATION		$300.00
					VENDOR TOTAL:	**$300.00**
WILL COUNTY RECORDER OF DEED						
40607379	03/29/2022	WEED/GRASS LIEN - RECORDING FEE - FEB	01-01-00-53300	CITY ADMINISTRATION		$41.00
40608186	03/29/2022	GRASS/WEED LIEN - RECORDING FEE - FEB	01-01-00-53300	CITY ADMINISTRATION		$369.00
40610060	03/29/2022	WATER LIEN RELEASE - RECORDING FEE - FEB	20-01-00-53300	CITY ADMINISTRATION		$82.00
40610627	03/29/2022	EASEMENT RECORDING FEE - M/I HOMES - FEB	01-01-00-53300	CITY ADMINISTRATION		$42.00
40606545	03/29/2022	PLAT RECORDING FEE - LOCKPORT SQUARE - FEB	01-01-00-53300	CITY ADMINISTRATION		$101.00
					VENDOR TOTAL:	**$635.00**
WILL COUNTY SHERIFF'S OFFICE						
LOCKPORT PD TAC1	03/29/2022	TACTICAL OPERATOR FEE	01-04-00-51400	POLICE DEPARTMENT		$1,000.00
					VENDOR TOTAL:	**$1,000.00**
WORLDPAY MERCHANT SERVICES						
FEB 2022	02/28/2022	CREDIT CARD TRANSACTIONS - FEB 2022	01-01-00-53200	CITY ADMINISTRATION		$377.29
					VENDOR TOTAL:	**$377.29**
					GRAND TOTALS:	**$840,617.35**

City Council

Agenda Memorandum

Item # CA-1

To: **Mayor & City Council**

From: **Ben Benson, City Administrator**

Subject: **Professional Service Agreement with EPI, Environmental Protection Industries for an Amount Not to Exceed $60,000 for Environmental Assessments of 1728 S. State Street and 1801-1821 S. State Street (f/k/a Tessone Properties) from the Downtown TIF Funds**

Date: **Wednesday, April 6, 2022**

BACKGROUND/HISTORY

In 2020, Bob Gomolski of Build the Best Properties, Inc purchased and received approved plans by the City of Lockport for a mixed use development consisting of 6,150 SF of commercial space and 1,180 SF residential lobby on the ground floor and approximately 33,400 SF of residential space consisting of 24 apartment units on the 2nd and 3rd floors on the east side of State Street, located at 1812 S. State Street (a vacant Tessone Property). The Developer is also planning to seek additional approvals for a development on the west side of State St, including Tessone-owned parcels already purchased and others under contract. However, before the developer closes on the properties under contract, they have concerns about existing environmental related to the presence of underground storage tanks (USTs) and potential contamination that was caused by USTs that were removed in 1991 but found to be leaking. City administration shares these concerns. In order to move forward with the closing, the developer is requesting the use of $57,790 in TIF Funds for the Due Diligence of the environmental situation at these additional parcels.

PROS/CONS/ALTERNATIVES

TIF Funds are perfect for this kind of use because regardless of who the future developer may end up being, the City will need to know the status of the environmental situation. If the report shows that it is clear to proceed, the developer will close on the property. In case the closing does not occur, the City will obtain consent from the current owner that a lien for the cost of the environmental study will be recorded against the property. If the environmental assessment results are acceptable, the developer is also requesting support or 50% share of the No Further Remediation (NFR) process that follows, which could be another $25k-$50k from Lockport as an investment for all the parcels. The City and Developer can enter into a future development

agreement and utilize gaming funds for this if warranted or desired by the City Council.
UPDATE: THE DEVELOPERS HAVE NOT BEEN ABLE TO SECURE PERMSISION FROM THE SELLER REGARDING THE POTENTIAL LIEN, BUT DOES HAVEW ABOITY TO PERFROM THE ENVIRONEMTNAL STUDY. STAFF WOULD LIKE TO PROCEED REGARDLESS IN ORDER TO GAIN THE UNDERSTANDING OF THE ENVIRONMENTAL SITUATION FOR THE PROPERTY, IF IT ENDS UP NOT SELLING, THE IEPA CAN BE CONTACTED TO REMEDIATE THE SITUATION.

RECOMMENDATION

Approve Resolution No. 22-030 for a professional service agreement with EPI, Environmental Protection Industries for a contract not to exceed $60,000 in TIF funds for the due diligence on environmental impacts and remediation reports on both 1728 S. State and for multiple pins 1801-1821 S. State Street. City Administrator will report back to the City Council on findings and potential additional agreements for future development consideration.

ATTACHMENTS

Resolution No. 22-030 Approve EPI for Environmental Assessment Report on old Tessone Properties

Request letter

Gas Tank graphic

SPECIFIC CITY COUNCIL ACTION REQUIRED

Approve Resolution No. 22-030 to enter into a professional service agreement with EPI for an Environmental Assessment Report of Properties: 1728 S. State & 1801-1821 State. St. (f/k/a Tessone properties) in amount not to exceed $60,000.

RESOLUTION NO. 22-030

A RESOLUTION APPROVING ENVIRONMENTAL PROTECTION INDUSTRIES TO PROVIDE ENVIRONMENTAL ASSESSMENT REPORT OF PROPERTIES: 1728 S. STATE STREET AND 1801-1821 S. STATE STREET (FORMERLY KNOWN AS TESSONE PROPERTIES) IN THE AMOUNT NOT TO EXCEED $60,000

WHEREAS, the properties formerly known as the Tessone Properties located in the City of Lockport's downtown and one of the main entries into the city have been an eye-sore for a number of years; and

WHEREAS, the opportunity for a new developer, Build the Best Properties, Inc., to cleanup and develop these properties comes with the due diligence requirement for an environmental assessment report to determine what further remediation actions if any would be required to address the underground storage tanks (USTs) located in some of the old Tessone properties; and

WHEREAS, the Mayor and the corporate authorities of the City Council find that professional services provided by Environmental Protection Industries for the environmental assessment study of these properties is in the best interest of the City to encourage the redevelopment of these properties of the distressed properties and the cost of such study/report is an appropriate use of the TIF funds.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY MAYOR AND BY THE CITY COUNCIL OF THE CITY of LOCKPORT, WILL COUNTY, ILLINOIS AS FOLLOWS:

Section 1: Approve the City Administrator to enter into a professional service agreement with Environmental Protection Industries for an environmental assessment report of the properties formerly known as the Tessone Properties in the amount not to exceed $60,000.

Section 2: Effective Date: This Resolution shall become effective upon passage and approval as provided by law

PASSED this _____ day of _____, 2022.

_____ ALDERMEN VOTING AYE **_____ ALDERMEN VOTING NAY**

_____ ALDERMEN ABSTAINING **_____ ALDERMEN ABSENT**

the MAYOR voting aye _____ voting nay _____ not voting _____

_____ BARTELSEN _____ BERGBOWER _____ GILLOGLY _____ KAIRIS

_____ KOSTECKI _____ LOBES _____ SABAN _____ SCHREIBER

_____ MAYOR

_____
Steve Streit, Mayor

ATTEST:

_____
Kathleen Gentile, City Clerk

Lindell & Tessitore P.C. | ATTORNEYS AT LAW

1755 Park Street
Suite 200
Naperville, IL 60563

Phone: 630-225-8255
Fax: 630-701-1169

VINCENT TESSITORE
vince@ltlawoffice.com

February 16, 2022

Sent via Email on the Above Date

Mr. Ben Benson
City Administrator
City of Lockport
222 E. 9th Street
Lockport, IL 60441
bbenson@lockport.org

RE: **Subject Properties:** 1725, 1728, 1801, 1811, 1817, 1819, 1903, and 1915 S. State Street, and 135 W. 18th Street.
PIN's: 11-04-26-105-006, 11-04-26-105-007, 11-04-26-105-008, 11-04-26-105-013, 11-04-26-105-014, 11-04-26-106-001, 11-04-26-106-002, 11-04-26-106-003, 11-04-26-106-006, 11-04-26-104-009, and 11-04-26-109-004

We represent Building the Best Properties, Inc. in connection with their potential purchase of the above referenced properties. We appreciate the time you and Mr. Thies took to meet with us on February 10, 2022, and this correspondence is being sent as follow up to those discussions. As you know, our client recently purchased property adjacent to the Subject Properties referenced above, and from the same owner. The properties that our client currently owns are located at 1812, 1828, 1823, 1827, and 1829 S. State Street. Our client is currently under contract to purchase the above-referenced property, but the purchase is contingent upon due diligence items such as environmental matters.

Our client remains interested in purchasing the Subject Properties in furtherance of their plans for a residential development thereon. However, the environmental condition of the Subject Properties has led to an impasse whereby it is not economically feasible to move forward without assistance from the City of Lockport. We truly feel that such assistance is necessary for the development of the Subject Properties and is in the best interest of the City.

Our client's due diligence to date on environmental matters for the Subject Properties has revealed that further testing and analytics is necessary in order to determine the extent of any remediation necessary. We have provided you with two proposals from Environmental Protection Industries ("EPI"), both dated February 8, 2022, and we include a copy of them herein for your convenience. One of the proposals concerns that portion of the Subject Properties located on the west side of State Street. In discussing this proposal with EPI, it is our

understanding that the amount of $37,445.00 ($15,250 for testing and $22,195 for analytics) must be spent for testing and data analysis in order to determine what if any remediation is necessary in order to procure a no further remediation letter ("NFR") from the State Fire Marshall. Similarly, for the other proposal concerning the former gas station site at 1728 S. State Street, an amount of $16,145.00 must be spent in order to determine what if any remediation, beyond the removal of two existing 8,000 gallon underground storage tanks, is necessary in order to procure an NFR. This is in addition to $4,200.00 charged by EPI for their Phase I work.

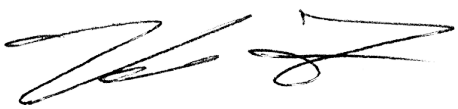
After the above work is done, it is our understanding that EPI will be able to provide our client with sufficient information for our client to know the cost of remediation. Until this time, our client does not have enough information to evaluate their development cost. Moreover, it does not make economic sense for our client to incur these costs for testing and analytics. As a result, given that this is a cost that must be incurred in order for anyone to develop the property, and the development of the property would benefit residents in the City, we are requesting that this cost totaling $57,790.00 be incurred by the City.

If the testing reveals that the remediation necessary for our client's development makes economic sense, then our client is willing to move forward in purchasing the Subject Properties, or perhaps a that portion of them that is not cost prohibitive. In the event that our client does purchase all or a portion of the Subject Properties, our client is requesting further Village assistance with the costs to obtain NFR letters for the purchased sites and costs for any remediation that needs to be done. The cost of remediation is unknown, but the additional cost for the NFR's for both sites are set forth in the enclosed proposals. Specifically, the proposals state that the additional costs for the NFR for the property on the west side of State Street is $27,890.00 - $29,890.00, and for the gas station site is $26,890.00 - $28,890.00 plus $12,000.00 - $18,000.00 for the removal of the two existing underground storage tanks.

In summary, we are requesting that the City fund the $57,790.00 for work required to determine the remediation necessary for these properties, with agreement by our client that they will purchase either one or both of the sites if: (1) the City contributes the additional costs for the NFR's after our client purchases the property; and (2) no clean-up is required, or if the City and our client come to an agreement on the costs for cleanup.

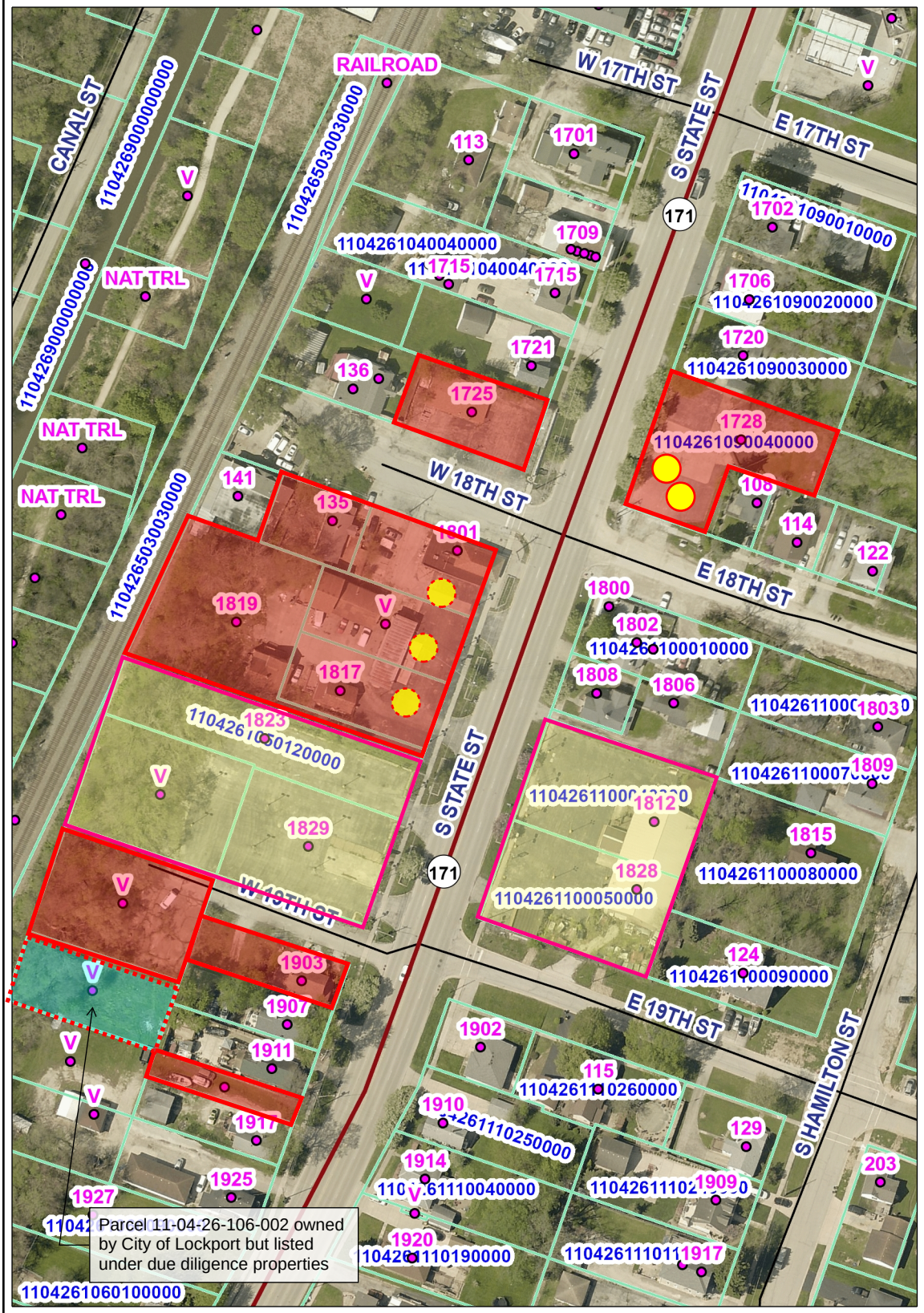
Please let me know whether the City agrees with the terms set forth herein. If so, we wish to move forward with a development agreement to memorialize the same. In the meantime, if you should have any questions or need additional information, do not hesitate to contact me.

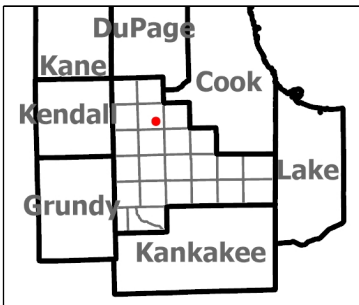
Very Truly Yours,



Vincent A. Tessitore

Cc: Building the Best Properties, Inc.





Legend

- Address Points
- Roadways
  - Federal
  - State
  - County
  - Local and Private
- Parcels LY
- Townships

- Due diligence properties
- Purchased properties
- City-owned but listed under due diligence properties
- Existing Tank
- Tank removed but recognized environmental condition remains

Notes

Date: 2/28/2022

1: 2,257

0 0.04 0.07 Miles

Projection

WGS_1984_Web_Mercator_Auxiliary_Sphere

Disclaimer of Warranties and Accuracy of Data: Although the data developed by Will County for its maps, websites, and Geographic Information System has been produced and processed from sources believed to be reliable, no warranty, expressed or implied, is made regarding accuracy, adequacy, completeness, legality, reliability or usefulness of any information. This disclaimer applies to both isolated and aggregate uses of the information. The County and elected officials provide this information on an "as is" basis. All warranties of any kind, express or implied, including but not limited to the implied warranties of merchantability, fitness for a particular purpose, freedom from contamination by computer viruses or hackers and non-infringement of proprietary rights are disclaimed. Changes may be periodically made to the information herein; these changes may or may not be incorporated in any new version of the publication. If you have obtained information from any of the County web pages from a source other than the County pages, be aware that electronic data can be altered subsequent to original distribution. Data can also quickly become out of date. It is recommended that careful attention be paid to the contents of any data, and that the originator of the data or information be contacted with any questions regarding appropriate use. Please direct any questions or issues via email to gis@willcountyillinois.com.

City Council

Agenda Memorandum

Item # PW-1

To: **Mayor & City Council**

From: **Brent Cann, Public Works Director**

Subject: **Award 2022 Roadway Resurfacing Project to PT Ferro in the Amount of $3,066,254.07**

Date: **Wednesday, April 6, 2022**

BACKGROUND/HISTORY

As discussed at the Committee of the Whole CIP presentation and during project budget discussions for 2022, the 2022 Resurfacing Project went out to bid in March and will include Farrell Rd from Oak Ave to 151st St, and 151st St from Farrell Rd to Gougar Rd.

The project letting was held on March 24th with 4 bidders in attendance. The apparent low bidder was PT Ferro in the amount of $3,066,254.07, of which about $400,000.00 will be reimbursed back to the City by Redwood Development and Lockport/Homer Townships leaving $2.6 million to be funded by the City. There may be some areas on the south end of Farrell Rd South of Bruce Road that will be removed from the project, further reducing the spend, but that will be determined in the upcoming weeks. The City budgeted $1,850,000.00 in MFT Funds for construction costs and the balance required can use additional MFT Funds for this project. There is currently $3 million available in the MFT Fund for 2022 resurfacing.

PROS/CONS/ALTERNATIVES

N/A

RECOMMENDATION

Approve Resolution No. 22-034 authorizing the award of the 2022 Resurfacing Project to PT Ferro Construction in the amount of $3,066,254.07.

ATTACHMENTS

Resolution No. 22-034 Authorizing the award of the 2022 Resurfacing Project to PT Ferro Const.

Bid tabulation

CBBEL Award recommendation

SPECIFIC CITY COUNCIL ACTION REQUIRED

Approve Resolution No. 22-034 authorizing the award of the 2022 Resurfacing Project to PT Ferro Construction in the amount of $3,066,254.07.

RESOLUTION NO. 22-034

A RESOLUTION AUTHORIZING THE AWARD OF THE 2022 RESURFACING PROJECT TO PT FERRO CONSTRUCTION IN THE AMOUNT OF $3,066,254.07.

WHEREAS, the City has determined the need for resurfacing on Farrell Rd from Oak Ave to 151st St and on 151st St from Farrell Rd to Gougar Rd; and

WHEREAS, the project letting was held on March 24, 2022 with 4 bidders in attendance; and

WHEREAS, the lowest responsible bidder was deemed to be PT Ferro Construction in the amount of $3,066,254.07.

NOW THEREFORE, BE IT RESOLVED BY THE MAYOR AND CITY COUNCIL OF THE CITY OF LOCKPORT, WILL COUNTY, ILLINOIS THAT:

Section 1: Approve PT Ferro Construction to execute the 2022 Resurfacing Project in the amount of $3,066,254.07.

Section 2: Authorize City Staff to execute the contract from PT Ferro Construction for the 2022 Resurfacing Project.

Section 3: This Resolution shall become effective upon passage and approval as provided by law.

PASSED AND APPROVED this _____day of _____, 2022, with:

_____**ALDERMEN** voting aye _____**ALDERMEN** absent

_____**ALDERMEN** voting nay _____**ALDERMEN** abstaining

the **MAYOR** voting aye _____ voting nay _____ not voting _____

_____ SABAN _____BARTELSEN _____ LOBES _____ BERGBOWER

_____ GILLOGLY _____ SCHREIBER _____KOSTECKI

_____KAIRIS

_____ ATTEST: _____

Steve Streit, Mayor Kathleen Gentile, City Clerk

Kathlen Gentile, City Clerk

CITY OF LOCKPORT

2022 RESURFACING PROJECT

Bid Tabulation - Base Bid

MFT Section # 22-00093-00-RS
CBBEL Project No. 210583
Bids Opened March 24, 2022 At 10:00 AM

Base Bid					Engineers Estimate		P.T. Ferro Construction		Austin Tyler Construction		Gallagher Asphalt Corporation		D Construction, Inc.	
Item	Code	Description	Unit	QUANTITY	Unit Price	COST	Unit Price	COST	Unit Price	COST	Unit Price	COST	Unit Price	COST
1	20101200	TREE ROOT PRUNING	EACH	15	$ 100.00	$ 1,500.00	$ 150.00	$ 2,250.00	$ 75.00	$ 1,125.00	$ 175.00	$ 2,625.00	$ 100.00	$ 1,500.00
2	20201200	REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL	CU YD	209	$ 40.00	$ 8,360.00	$ 30.00	$ 6,270.00	$ 25.00	$ 5,225.00	$ 50.00	$ 10,450.00	$ 70.00	$ 14,630.00
3	20700220	POROUS GRANULAR EMBANKMENT	CU YD	209	$ 70.00	$ 14,630.00	$ 45.00	$ 9,405.00	$ 22.00	$ 4,598.00	$ 60.00	$ 12,540.00	$ 70.00	$ 14,630.00
4	20800150	TRENCH BACKFILL	CU YD	30	$ 55.00	$ 1,650.00	$ 57.00	$ 1,710.00	$ 40.00	$ 1,200.00	$ 50.00	$ 1,500.00	$ 60.00	$ 1,800.00
5	21001000	GEOTECHNICAL FABRIC FOR GROUND STABILIZATION	SQ YD	627	$ 1.00	$ 627.00	$ 2.25	$ 1,410.75	$ 2.25	$ 1,410.75	$ 2.00	$ 1,254.00	$ 4.00	$ 2,508.00
6	21400100	GRADING AND SHAPING DITCHES	FOOT	450	$ 11.00	$ 4,950.00	$ 4.50	$ 2,025.00	$ 23.00	$ 10,350.00	$ 15.00	$ 6,750.00	$ 20.00	$ 9,000.00
7	25000210	SEEDING CLASS 2A	ACRE	0.3	$ 4,000.00	$ 1,200.00	$ 3,200.00	$ 960.00	$ 9,680.00	$ 2,904.00	$ 2,800.00	$ 840.00	$ 10,500.00	$ 3,150.00
8	25100630	EROSION CONTROL BLANKET	SQ YD	1000	$ 2.00	$ 2,000.00	$ 1.20	$ 1,200.00	$ 3.00	$ 3,000.00	$ 1.65	$ 1,650.00	$ 11.00	$ 11,000.00
9	25200200	SUPPLEMENTAL WATERING	UNIT	36	$ 80.00	$ 2,880.00	$ 0.01	$ 0.36	$ 1.00	$ 36.00	$ 125.00	$ 4,500.00	$ 27.50	$ 990.00
10	28000500	INLET AND PIPE PROTECTION	EACH	4	$ 200.00	$ 800.00	$ 95.00	$ 380.00	$ 200.00	$ 800.00	$ 150.00	$ 600.00	$ 165.00	$ 660.00
11	28000510	INLET FILTERS	EACH	176	$ 125.00	$ 22,000.00	$ 0.01	$ 1.76	$ 125.00	$ 22,000.00	$ 135.00	$ 23,760.00	$ 200.00	$ 35,200.00
12	28100105	STONE RIP RAP, CLASS A3	SQ YD	20	$ 100.00	$ 2,000.00	$ 55.00	$ 1,100.00	$ 45.00	$ 900.00	$ 150.00	$ 3,000.00	$ 50.00	$ 1,000.00
13	35800100	PREPARATION OF BASE	SQ YD	1152	$ 2.00	$ 2,304.00	$ 1.00	$ 1,152.00	$ 3.00	$ 3,456.00	$ 4.00	$ 4,608.00	$ 5.00	$ 5,760.00
14	35800200	AGGREGATE BASE REPAIR	TON	32	$ 25.00	$ 800.00	$ 15.00	$ 480.00	$ 20.00	$ 640.00	$ 20.00	$ 640.00	$ 50.00	$ 1,600.00
15	40600290	BITUMINOUS MATERIALS (TACK COAT)	POUND	66898	$ 0.50	$ 33,449.00	$ 0.01	$ 668.98	$ 0.01	$ 668.98	$ 0.01	$ 668.98	$ 0.01	$ 668.98
16	40600370	LONGITUDINAL JOINT SEALANT	FOOT	50182	$ 3.00	$ 150,546.00	$ 2.35	$ 117,927.70	$ 2.00	$ 100,364.00	$ 2.70	$ 135,491.40	$ 2.50	$ 125,455.00
17	40600982	HOT MIX ASPHALT SURFACE REMOVAL - BUTT JOINT	SQ YD	739	$ 15.00	$ 11,085.00	$ 0.01	$ 7.39	$ 0.01	$ 7.39	$ 0.01	$ 7.39	$ 20.00	$ 14,780.00
18	40603080	HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N50	TON	200	$ 100.00	$ 20,000.00	$ 83.00	$ 16,600.00	$ 77.00	$ 15,400.00	$ 95.00	$ 19,000.00	$ 75.00	$ 15,000.00
19	40603200	POLYMERIZED HOT-MIX ASPHALT BINDER COURSE, IL-4.75, N50	TON	5532	$ 105.00	$ 580,860.00	$ 105.00	$ 580,860.00	$ 99.00	$ 547,668.00	$ 105.00	$ 580,860.00	$ 92.00	$ 508,944.00
20	40604060	HOT-MIX ASPHALT SURFACE COURSE, IL-9.5, MIX "D", N50	TON	133	$ 110.00	$ 14,630.00	$ 89.00	$ 11,837.00	$ 82.00	$ 10,906.00	$ 120.00	$ 15,960.00	$ 80.00	$ 10,640.00
21	40604062	HOT-MIX ASPHALT SURFACE COURSE, IL-9.5, MIX "D", N70	TON	8137	$ 85.00	$ 691,645.00	$ 79.00	$ 642,823.00	$ 76.00	$ 618,412.00	$ 83.00	$ 675,371.00	$ 76.00	$ 618,412.00
22	42400800	DETECTABLE WARNINGS	SQ FT	717	$ 30.00	$ 21,510.00	$ 20.00	$ 14,340.00	$ 18.00	$ 12,906.00	$ 30.00	$ 21,510.00	$ 30.00	$ 21,510.00
23	44000158	HOT-MIX ASPHALT SURFACE REMOVAL, 2 1/4"	SQ YD	93993	$ 2.50	$ 234,982.50	$ 2.00	$ 187,986.00	$ 1.50	$ 140,989.50	$ 2.25	$ 211,484.25	$ 2.80	$ 263,180.40
24	44000600	SIDEWALK REMOVAL	SQ FT	8997	$ 2.00	$ 17,994.00	$ 3.00	$ 26,991.00	$ 2.50	$ 22,492.50	$ 2.70	$ 24,291.90	$ 3.00	$ 26,991.00
25	48101498	AGGREGATE SHOULDERS, TYPE B	TON	636	$ 25.00	$ 15,900.00	$ 30.00	$ 19,080.00	$ 30.00	$ 19,080.00	$ 36.00	$ 22,896.00	$ 25.00	$ 15,900.00
26	50105220	PIPE CULVERT REMOVAL	FOOT	90	$ 20.00	$ 1,800.00	$ 24.00	$ 2,160.00	$ 30.00	$ 2,700.00	$ 27.00	$ 2,430.00	$ 20.00	$ 1,800.00
27	54213663	PRECAST REINFORCED CONCRETE FLARED END SECTIONS 18"	EACH	4	$ 900.00	$ 3,600.00	$ 1,000.00	$ 4,000.00	$ 1,300.00	$ 5,200.00	$ 900.00	$ 3,600.00	$ 1,000.00	$ 4,000.00
28	542A0223	PIPE CULVERTS, CLASS A, TYPE 1, 18"	FOOT	80	$ 75.00	$ 6,000.00	$ 90.00	$ 7,200.00	$ 63.00	$ 5,040.00	$ 70.00	$ 5,600.00	$ 100.00	$ 8,000.00
29	550A0050	STORM SEWERS, CLASS A, TYPE 1 12"	FOOT	4	$ 120.00	$ 480.00	$ 80.00	$ 320.00	$ 62.00	$ 248.00	$ 135.00	$ 540.00	$ 300.00	$ 1,200.00
30	56500600	DOMESTIC WATER SERVICE BOX TO BE ADJUSTED	EACH	2	$ 200.00	$ 400.00	$ 180.00	$ 360.00	$ 200.00	$ 400.00	$ 325.00	$ 650.00	$ 800.00	$ 1,600.00
31	60238800	INLETS, TYPE A	EACH	1	$ 2,000.00	$ 2,000.00	$ 1,225.00	$ 1,225.00	$ 2,400.00	$ 2,400.00	$ 1,350.00	$ 1,350.00	$ 1,000.00	$ 1,000.00
32	60300410	VALVE BOX FRAMES TO BE ADJUSTED WITH NEW FRAMES	EACH	1	$ 200.00	$ 200.00	$ 425.00	$ 425.00	$ 300.00	$ 300.00	$ 900.00	$ 900.00	$ 1,000.00	$ 1,000.00
33	60404300	FRAMES AND GRATES, TYPE 3	EACH	48	$ 400.00	$ 19,200.00	$ 475.00	$ 22,800.00	$ 350.00	$ 16,800.00	$ 450.00	$ 21,600.00	$ 500.00	$ 24,000.00
34	60404800	FRAMES AND GRATES, TYPE 11	EACH	22	$ 400.00	$ 8,800.00	$ 475.00	$ 10,450.00	$ 350.00	$ 7,700.00	$ 450.00	$ 9,900.00	$ 500.00	$ 11,000.00
35	60406000	FRAMES AND LIDS, TYPE 1, OPEN LID	EACH	1	$ 300.00	$ 300.00	$ 325.00	$ 325.00	$ 300.00	$ 300.00	$ 450.00	$ 450.00	$ 500.00	$ 500.00
36	60406001	FRAMES AND LIDS, TYPE 1, ADA COMPLIANT, OPEN LID	EACH	6	$ 350.00	$ 2,100.00	$ 325.00	$ 1,950.00	$ 300.00	$ 1,800.00	$ 450.00	$ 2,700.00	$ 500.00	$ 3,000.00
37	60406100	FRAMES AND LIDS, TYPE 1, CLOSED LID	EACH	12	$ 300.00	$ 3,600.00	$ 325.00	$ 3,900.00	$ 300.00	$ 3,600.00	$ 450.00	$ 5,400.00	$ 500.00	$ 6,000.00
38	60600605	CONCRETE CURB, TYPE B	FOOT	289	$ 30.00	$ 8,670.00	$ 40.00	$ 11,560.00	$ 38.00	$ 10,982.00	$ 42.00	$ 12,138.00	$ 40.00	$ 11,560.00
39	67100100	MOBILIZATION	L SUM	1	$ 43,500.00	$ 43,500.00	$ 1.00	$ 1.00	$ 120,000.00	$ 120,000.00	$ 98,000.00	$ 98,000.00	$ 50,000.00	$ 50,000.00
40	70107025	CHANGEABLE MESSAGE SIGN	CAL DA	210	$ 30.00	$ 6,300.00	$ 45.00	$ 9,450.00	$ 35.00	$ 7,350.00	$ 45.00	$ 9,450.00	$ 50.00	$ 10,500.00
41	70300100	SHORT TERM PAVEMENT MARKING	FOOT	12979	$ 0.50	$ 6,489.50	$ 0.01	$ 129.79	$ 1.50	$ 19,468.50	$ 0.80	$ 10,383.20	$ 1.00	$ 12,979.00
42	70300150	SHORT TERM PAVEMENT MARKING REMOVAL	SQ FT	4330	$ 1.00	$ 4,330.00	$ 0.01	$ 43.30	$ 1.20	$ 5,196.00	$ 0.01	$ 43.30	$ 3.00	$ 12,990.00

Base Bid					Engineers Estimate		P.T. Ferro Construction		Austin Tyler Construction		Gallagher Asphalt Corporation		D Construction, Inc.	
Item	Code	Description	Unit	QUANTITY	Unit Price	COST	Unit Price	COST	Unit Price	COST	Unit Price	COST	Unit Price	COST
43	70300221	TEMPORARY PAVEMENT MARKING - LINE 4" - PAINT	FOOT	40811	$ 0.50	$ 20,405.50	$ 0.01	$ 408.11	$ 0.30	$ 12,243.30	$ 0.35	$ 14,283.85	$ 1.00	$ 40,811.00
44	70300241	TEMPORARY PAVEMENT MARKING - LINE 6" - PAINT	FOOT	3353	$ 0.50	$ 1,676.50	$ 0.45	$ 1,508.85	$ 0.30	$ 1,005.90	$ 0.45	$ 1,508.85	$ 2.00	$ 6,706.00
45	70300281	TEMPORARY PAVEMENT MARKING - LINE 24" - PAINT	FOOT	380	$ 3.00	$ 1,140.00	$ 2.70	$ 1,026.00	$ 2.50	$ 950.00	$ 2.70	$ 1,026.00	$ 6.00	$ 2,280.00
46	72000100	SIGN PANEL - TYPE 1	SQ FT	781	$ 18.00	$ 14,058.00	$ 20.00	$ 15,620.00	$ 30.00	$ 23,430.00	$ 20.00	$ 15,620.00	$ 30.00	$ 23,430.00
47	72400100	REMOVE SIGN PANEL ASSEMBLY - TYPE A	EACH	102	$ 15.00	$ 1,530.00	$ 50.00	$ 5,100.00	$ 125.00	$ 12,750.00	$ 50.00	$ 5,100.00	$ 30.00	$ 3,060.00
48	72400100	REMOVE SIGN PANEL - TYPE 1	SQ FT	110	$ 10.00	$ 1,100.00	$ 12.50	$ 1,375.00	$ 15.00	$ 1,650.00	$ 12.50	$ 1,375.00	$ 55.00	$ 6,050.00
49	72800100	TELESCOPING STEEL SIGN SUPPORT	FOOT	1149	$ 12.00	$ 13,788.00	$ 17.00	$ 19,533.00	$ 20.00	$ 22,980.00	$ 17.00	$ 19,533.00	$ 12.00	$ 13,788.00
50	73100100	BASE FOR TELESCOPING STEEL SIGN SUPPORT	EACH	2	$ 200.00	$ 400.00	$ 200.00	$ 400.00	$ 500.00	$ 1,000.00	$ 200.00	$ 400.00	$ 500.00	$ 1,000.00
51	78001100	THERMOPLASTIC PAVEMENT MARKING - LETTERS AND SYMBOLS	SQ FT	2222	$ 4.50	$ 9,999.00	$ 4.50	$ 9,999.00	$ 4.50	$ 9,999.00	$ 4.50	$ 9,999.00	$ 5.00	$ 11,110.00
52	78000200	THERMOPLASTIC PAVEMENT MARKING - LINE 4"	FOOT	63926	$ 0.70	$ 44,748.20	$ 0.60	$ 38,355.60	$ 0.60	$ 38,355.60	$ 0.65	$ 41,551.90	$ 0.75	$ 47,944.50
53	78000400	THERMOPLASTIC PAVEMENT MARKING - LINE 6"	FOOT	6792	$ 1.00	$ 6,792.00	$ 0.80	$ 5,433.60	$ 0.80	$ 5,433.60	$ 1.07	$ 7,267.44	$ 1.25	$ 8,490.00
54	78000400	THERMOPLASTIC PAVEMENT MARKING - LINE 8"	FOOT	142	$ 1.80	$ 255.60	$ 1.30	$ 184.60	$ 1.20	$ 170.40	$ 1.44	$ 204.48	$ 1.75	$ 248.50
55	78000600	THERMOPLASTIC PAVEMENT MARKING - LINE 12"	FOOT	4870	$ 2.50	$ 12,175.00	$ 2.00	$ 9,740.00	$ 2.00	$ 9,740.00	$ 2.20	$ 10,714.00	$ 2.50	$ 12,175.00
56	78000650	THERMOPLASTIC PAVEMENT MARKING - LINE 24"	FOOT	902	$ 5.00	$ 4,510.00	$ 4.00	$ 3,608.00	$ 4.00	$ 3,608.00	$ 4.50	$ 4,059.00	$ 5.00	$ 4,510.00
57	87900200	DRILL EXISTING HANDHOLE	EACH	6	$ 300.00	$ 1,800.00	$ 300.00	$ 1,800.00	$ 300.00	$ 1,800.00	$ 320.00	$ 1,920.00	$ 400.00	$ 2,400.00
58	88600600	DETECTOR LOOP REPLACEMENT	FOOT	2638	$ 17.00	$ 44,846.00	$ 15.25	$ 40,229.50	$ 16.00	$ 42,208.00	$ 16.00	$ 42,208.00	$ 20.00	$ 52,760.00
59	X0326806	WASHOUT BASIN	L SUM	1	$ 5,000.00	$ 5,000.00	$ 1.00	$ 1.00	$ 1,000.00	$ 1,000.00	$ 800.00	$ 800.00	$ 5,000.00	$ 5,000.00
60	X0326899	SOLAR-POWERED FLASHING BEACON ASSEMBLY (COMPLETE)	EACH	4	$ 6,000.00	$ 24,000.00	$ 5,900.00	$ 23,600.00	$ 6,000.00	$ 24,000.00	$ 6,000.00	$ 24,000.00	$ 10,000.00	$ 40,000.00
61	X0327036	BIKE PATH REMOVAL	SQ YD	139	$ 18.00	$ 2,502.00	$ 28.00	$ 3,892.00	$ 16.00	$ 2,224.00	$ 23.00	$ 3,197.00	$ 20.00	$ 2,780.00
62	X1200160	CONNECTION TO EXISTING DRAINAGE STRUCTURE	EACH	1	$ 1,200.00	$ 1,200.00	$ 500.00	$ 500.00	$ 500.00	$ 500.00	$ 500.00	$ 500.00	$ 1,000.00	$ 1,000.00
63	X2520700	SODDING, SPECIAL	SQ YD	2033	$ 18.00	$ 36,594.00	$ 15.00	$ 30,495.00	$ 15.00	$ 30,495.00	$ 22.50	$ 45,742.50	$ 33.00	$ 67,089.00
64	X4240430	PORTLAND CEMENT CONCRETE SIDEWALK 5 INCH, SPECIAL	SQ FT	9172	$ 7.75	$ 71,083.00	$ 9.00	$ 82,548.00	$ 7.25	$ 66,497.00	$ 8.00	$ 73,376.00	$ 11.00	$ 100,892.00
65	X6026052	SANITARY MANHOLES FRAME AND ADJUSTMENT SEALING	EACH	12	$ 700.00	$ 8,400.00	$ 1,150.00	$ 13,800.00	$ 575.00	$ 6,900.00	$ 700.00	$ 8,400.00	$ 1,200.00	$ 14,400.00
66	X6030310	FRAMES AND LIDS TO BE ADJUSTED (SPECIAL)	EACH	21	$ 900.00	$ 18,900.00	$ 1,000.00	$ 21,000.00	$ 1,200.00	$ 25,200.00	$ 900.00	$ 18,900.00	$ 800.00	$ 16,800.00
67	X6331009	REMOVE AND REPLACE STEEL PLATE BEAM GUARDRAIL, SPECIAL	FOOT	72	$ 60.00	$ 4,320.00	$ 85.00	$ 6,120.00	$ 85.00	$ 6,120.00	$ 110.00	$ 7,920.00	$ 100.00	$ 7,200.00
68	X7010216	TRAFFIC CONTROL AND PROTECTION, (SPECIAL)	L SUM	1	$ 87,000.00	$ 87,000.00	$ 60,000.00	$ 60,000.00	$ 65,000.00	$ 65,000.00	$ 14,500.00	$ 14,500.00	$ 50,000.00	$ 50,000.00
69	Z0013798	CONSTRUCTION LAYOUT	L SUM	1	$ 4,350.00	$ 4,350.00	$ 1.00	$ 1.00	$ 7,500.00	$ 7,500.00	$ 9,000.00	$ 9,000.00	$ 50,000.00	$ 50,000.00
70	Z0017400	DRAINAGE & UTILITY STRUCTURES TO BE ADJUSTED	EACH	84	$ 450.00	$ 37,800.00	$ 400.00	$ 33,600.00	$ 300.00	$ 25,200.00	$ 450.00	$ 37,800.00	$ 800.00	$ 67,200.00
71	Z0017800	DRAINAGE & UTILITY STRUCTURES TO BE RECONSTRUCTED (SPECIAL)	EACH	3	$ 1,800.00	$ 5,400.00	$ 725.00	$ 2,175.00	$ 500.00	$ 1,500.00	$ 1,100.00	$ 3,300.00	$ 1,500.00	$ 4,500.00
72	XX000406	BRICK PAVER REMOVAL AND REPLACEMENT	SQ FT	0	$ 30.00	$ -	$ 100.00	$ -	$ -	$ -	$ -	$ -	$ 33.00	$ -
73	XX008130	DRAINAGE STRUCTURES TO BE CLEANED AND GROUTED	EACH	52	$ 250.00	$ 13,000.00	$ 350.00	$ 18,200.00	$ 400.00	$ 20,800.00	$ 480.00	$ 24,960.00	$ 1,500.00	$ 78,000.00
74	XX009049	REMOVE AND REPLACE CURB AND GUTTER (SPECIAL)	FOOT	4104	$ 38.00	$ 155,952.00	$ 49.00	$ 201,096.00	$ 44.00	$ 180,576.00	$ 41.00	$ 168,264.00	$ 60.00	$ 246,240.00
75	N/A	PORTLAND CEMENT CONCRETE DRIVEWAY PAVEMENT REMOVAL AND	SQ YD	23	$ 90.00	$ 2,070.00	$ 135.00	$ 3,105.00	$ 80.00	$ 1,840.00	$ 80.00	$ 1,840.00	$ 90.00	$ 2,070.00
76	N/A	PORTLAND CEMENT CONCRETE DRIVEWAY PAVEMENT REMOVAL AND	SQ YD	362	$ 110.00	$ 39,820.00	$ 125.00	$ 45,250.00	$ 98.00	$ 35,476.00	$ 90.00	$ 32,580.00	$ 90.00	$ 32,580.00
77	N/A	HOT-MIX ASPHALT DRIVEWAY PAVEMENT REMOVAL AND REPLACEMEI	SQ YD	194	$ 60.00	$ 11,640.00	$ 60.00	$ 11,640.00	$ 45.00	$ 8,730.00	$ 110.00	$ 21,340.00	$ 20.00	$ 3,880.00
78	N/A	CLASS D PATCHES, 6 INCH (SPECIAL)	SQ YD	520	$ 50.00	$ 26,000.00	$ 38.00	$ 19,760.00	$ 52.00	$ 27,040.00	$ 40.00	$ 20,800.00	$ 60.00	$ 31,200.00
79	N/A	CLASS D PATCHES, 8 INCH (SPECIAL)	SQ YD	2072	$ 60.00	$ 124,320.00	$ 48.00	$ 99,456.00	$ 68.00	$ 140,896.00	$ 44.00	$ 91,168.00	$ 80.00	$ 165,760.00
80	N/A	CLASS D PATCHES, 10 INCH (SPECIAL)	SQ YD	583	$ 80.00	$ 46,640.00	$ 83.00	$ 48,389.00	$ 85.00	$ 49,555.00	$ 64.00	$ 37,312.00	$ 100.00	$ 58,300.00
81	N/A	MULTI-USER PATH	SQ YD	79	$ 35.00	$ 2,765.00	$ 82.00	$ 6,478.00	$ 18.00	$ 1,422.00	$ 78.00	$ 6,162.00	$ 70.00	$ 5,530.00
82	N/A	SUMP DISCHARGE CLEANOUT	EACH	4	$ 800.00	$ 3,200.00	$ 400.00	$ 1,600.00	$ 775.00	$ 3,100.00	$ 350.00	$ 1,400.00	$ 1,000.00	$ 4,000.00
83	N/A	SUMP DISCHARGE SERVICE LINE, 6"	FOOT	200	$ 40.00	$ 8,000.00	$ 45.00	$ 9,000.00	$ 32.00	$ 6,400.00	$ 40.00	$ 8,000.00	$ 40.00	$ 8,000.00
84	N/A	TREE, 2-1/2" CALIPER, BALLED AND BURLAPPED	EACH	50	$ 750.00	$ 37,500.00	$ 495.00	$ 24,750.00	$ 600.00	$ 30,000.00	$ 700.00	$ 35,000.00	$ 500.00	$ 25,000.00
		As Read Total (if Different):				**$ 2,932,751.80**		**$ 2,644,542.29**		**$ 2,711,318.42**		**$ 2,840,424.44**		**$ 3,210,222.38**

CITY OF LOCKPORT

2022 RESURFACING PROJECT

Bid Tabulation - **Alternate Bid**

MFT Section # 22-00093-00-RS
CBBEL Project No. 210583
Bids Opened March 24, 2022 At 10:00 AM

Alternate Bid					Engineers Estimate		P.T. Ferro Construction		Austin Tyler Construction		Gallagher Asphalt Corporation		D Construction, Inc.	
Item	Code	Description	Unit	QUANTITY	Unit Price	COST	Unit Price	COST	Unit Price	COST	Unit Price	COST	Unit Price	COST
1	20101200	TREE ROOT PRUNING	EACH	5	$ 100.00	$ 500.00	$ 150.00	$ 750.00	$ 75.00	$ 375.00	$ 175.00	$ 875.00	$ 100.00	$ 500.00
2	20201200	REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL	CU YD	12	$ 40.00	$ 480.00	$ 30.00	$ 360.00	$ 25.00	$ 300.00	$ 50.00	$ 600.00	$ 70.00	$ 840.00
3	20700220	POROUS GRANULAR EMBANKMENT	CU YD	12	$ 70.00	$ 840.00	$ 45.00	$ 540.00	$ 22.00	$ 264.00	$ 60.00	$ 720.00	$ 70.00	$ 840.00
4	20800150	TRENCH BACKFILL	CU YD	0	$ 55.00	$ -	$ 57.00	$ -	$ -	$ -	$ -	$ -	$ 60.00	$ -
5	21001000	GEOTECHNICAL FABRIC FOR GROUND STABILIZATION	SQ YD	36	$ 1.00	$ 36.00	$ 2.25	$ 81.00	$ 2.25	$ 81.00	$ 2.00	$ 72.00	$ 4.00	$ 144.00
6	21400100	GRADING AND SHAPING DITCHES	FOOT	0	$ 11.00	$ -	$ 4.50	$ -	$ -	$ -	$ -	$ -	$ 20.00	$ -
7	25000210	SEEDING CLASS 2A	ACRE	0	$ 4,000.00	$ -	$ 3,200.00	$ -	$ -	$ -	$ -	$ -	$ 10,500.00	$ -
8	25100630	EROSION CONTROL BLANKET	SQ YD	0	$ 2.00	$ -	$ 1.20	$ -	$ -	$ -	$ -	$ -	$ 11.00	$ -
9	25200200	SUPPLEMENTAL WATERING	UNIT	9	$ 80.00	$ 720.00	$ 0.01	$ 0.09	$ 1.00	$ 9.00	$ 125.00	$ 1,125.00	$ 27.50	$ 247.50
10	28000500	INLET AND PIPE PROTECTION	EACH	0	$ 200.00	$ -	$ 95.00	$ -	$ -	$ -	$ -	$ -	$ 165.00	$ -
11	28000510	INLET FILTERS	EACH	22	$ 125.00	$ 2,750.00	$ 0.01	$ 0.22	$ 125.00	$ 2,750.00	$ 135.00	$ 2,970.00	$ 200.00	$ 4,400.00
12	28100105	STONE RIP RAP, CLASS A3	SQ YD	0	$ 100.00	$ -	$ 55.00	$ -	$ -	$ -	$ -	$ -	$ 50.00	$ -
13	35800100	PREPARATION OF BASE	SQ YD	0	$ 2.00	$ -	$ 1.00	$ -	$ -	$ -	$ -	$ -	$ 5.00	$ -
14	35800200	AGGREGATE BASE REPAIR	TON	0	$ 25.00	$ -	$ 15.00	$ -	$ -	$ -	$ -	$ -	$ 50.00	$ -
15	40600290	BITUMINOUS MATERIALS (TACK COAT)	POUND	8683	$ 0.50	$ 4,341.50	$ 0.01	$ 86.83	$ 0.01	$ 86.83	$ 0.01	$ 86.83	$ 0.01	$ 86.83
16	40600370	LONGITUDINAL JOINT SEALANT	FOOT	5660	$ 3.00	$ 16,980.00	$ 2.35	$ 13,301.00	$ 2.00	$ 11,320.00	$ 2.70	$ 15,282.00	$ 2.00	$ 11,320.00
17	40600982	HOT MIX ASPHALT SURFACE REMOVAL - BUTT JOINT	SQ YD	74	$ 15.00	$ 1,110.00	$ 0.01	$ 0.74	$ 0.01	$ 0.74	$ 0.01	$ 0.74	$ 20.00	$ 1,480.00
18	40603080	HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N50	TON	0	$ 100.00	$ -	$ 83.00	$ -	$ -	$ -	$ -	$ -	$ 75.00	$ -
19	40603200	POLYMERIZED HOT-MIX ASPHALT BINDER COURSE, IL-4.75, N50	TON	721	$ 105.00	$ 75,705.00	$ 105.00	$ 75,705.00	$ 99.00	$ 71,379.00	$ 105.00	$ 75,705.00	$ 92.00	$ 66,332.00
20	40604060	HOT-MIX ASPHALT SURFACE COURSE, IL-9.5, MIX "D", N50	TON	0	$ 110.00	$ -	$ 89.00	$ -	$ -	$ -	$ -	$ -	$ 80.00	$ -
21	40604062	HOT-MIX ASPHALT SURFACE COURSE, IL-9.5, MIX "D", N70	TON	1061	$ 85.00	$ 90,185.00	$ 79.00	$ 83,819.00	$ 76.00	$ 80,636.00	$ 83.00	$ 88,063.00	$ 76.00	$ 80,636.00
22	42400800	DETECTABLE WARNINGS	SQ FT	220	$ 30.00	$ 6,600.00	$ 20.00	$ 4,400.00	$ 18.00	$ 3,960.00	$ 30.00	$ 6,600.00	$ 30.00	$ 6,600.00
23	44000158	HOT-MIX ASPHALT SURFACE REMOVAL, 2 1/4"	SQ YD	12250	$ 2.50	$ 30,625.00	$ 2.00	$ 24,500.00	$ 1.50	$ 18,375.00	$ 2.25	$ 27,562.50	$ 2.80	$ 34,300.00
24	44000600	SIDEWALK REMOVAL	SQ FT	4048	$ 2.00	$ 8,096.00	$ 3.00	$ 12,144.00	$ 2.50	$ 10,120.00	$ 2.70	$ 10,929.60	$ 3.00	$ 12,144.00
25	48101498	AGGREGATE SHOULDERS, TYPE B	TON	86	$ 25.00	$ 2,150.00	$ 30.00	$ 2,580.00	$ 30.00	$ 2,580.00	$ 36.00	$ 3,096.00	$ 25.00	$ 2,150.00
26	50105220	PIPE CULVERT REMOVAL	FOOT	0	$ 20.00	$ -	$ 24.00	$ -	$ -	$ -	$ -	$ -	$ 20.00	$ -
27	54213663	PRECAST REINFORCED CONCRETE FLARED END SECTIONS 18"	EACH	0	$ 900.00	$ -	$ 1,000.00	$ -	$ -	$ -	$ -	$ -	$ 1,000.00	$ -
28	542A0223	PIPE CULVERTS, CLASS A, TYPE 1, 18"	FOOT	0	$ 75.00	$ -	$ 90.00	$ -	$ -	$ -	$ -	$ -	$ 100.00	$ -
29	550A0050	STORM SEWERS, CLASS A, TYPE 1 12"	FOOT	14	$ 120.00	$ 1,680.00	$ 80.00	$ 1,120.00	$ 62.00	$ 868.00	$ 135.00	$ 1,890.00	$ 300.00	$ 4,200.00
30	56500600	DOMESTIC WATER SERVICE BOX TO BE ADJUSTED	EACH	2	$ 200.00	$ 400.00	$ 180.00	$ 360.00	$ 200.00	$ 400.00	$ 325.00	$ 650.00	$ 800.00	$ 1,600.00
31	60238800	INLETS, TYPE A	EACH	2	$ 2,000.00	$ 4,000.00	$ 1,225.00	$ 2,450.00	$ 2,400.00	$ 4,800.00	$ 1,350.00	$ 2,700.00	$ 1,000.00	$ 2,000.00
32	60300410	VALVE BOX FRAMES TO BE ADJUSTED WITH NEW FRAMES	EACH	2	$ 200.00	$ 400.00	$ 425.00	$ 850.00	$ 300.00	$ 600.00	$ 900.00	$ 1,800.00	$ 1,000.00	$ 2,000.00
33	60404300	FRAMES AND GRATES, TYPE 3	EACH	0	$ 400.00	$ -	$ 475.00	$ -	$ -	$ -	$ -	$ -	$ 500.00	$ -
34	60404800	FRAMES AND GRATES, TYPE 11	EACH	2	$ 400.00	$ 800.00	$ 475.00	$ 950.00	$ 350.00	$ 700.00	$ 450.00	$ 900.00	$ 500.00	$ 1,000.00
35	60406000	FRAMES AND LIDS, TYPE 1, OPEN LID	EACH	0	$ 300.00	$ -	$ 325.00	$ -	$ -	$ -	$ -	$ -	$ 500.00	$ -
36	60406001	FRAMES AND LIDS, TYPE 1, ADA COMPLIANT, OPEN LID	EACH	2	$ 350.00	$ 700.00	$ 325.00	$ 650.00	$ 300.00	$ 600.00	$ 450.00	$ 900.00	$ 500.00	$ 1,000.00
37	60406100	FRAMES AND LIDS, TYPE 1, CLOSED LID	EACH	10	$ 300.00	$ 3,000.00	$ 325.00	$ 3,250.00	$ 300.00	$ 3,000.00	$ 450.00	$ 4,500.00	$ 500.00	$ 5,000.00
38	60600605	CONCRETE CURB, TYPE B	FOOT	88	$ 30.00	$ 2,640.00	$ 40.00	$ 3,520.00	$ 38.00	$ 3,344.00	$ 46.00	$ 4,048.00	$ 40.00	$ 3,520.00
39	67100100	MOBILIZATION	L SUM	1	$ 6,500.00	$ 6,500.00	$ 1.00	$ 1.00	$ 10,000.00	$ 10,000.00	$ 14,500.00	$ 14,500.00	$ 50,000.00	$ 50,000.00
40	70107025	CHANGEABLE MESSAGE SIGN	CAL DA	0	$ 30.00	$ -	$ 45.00	$ -	$ -	$ -	$ -	$ -	$ 50.00	$ -
41	70300100	SHORT TERM PAVEMENT MARKING	FOOT	1627	$ 0.50	$ 813.50	$ 0.01	$ 16.27	$ 1.50	$ 2,440.50	$ 0.80	$ 1,301.60	$ 1.00	$ 1,627.00
42	70300150	SHORT TERM PAVEMENT MARKING REMOVAL	SQ FT	543	$ 1.00	$ 543.00	$ 0.01	$ 5.43	$ 1.20	$ 651.60	$ 0.01	$ 5.43	$ 3.00	$ 1,629.00
43	70300221	TEMPORARY PAVEMENT MARKING - LINE 4" - PAINT	FOOT	5460	$ 0.50	$ 2,730.00	$ 0.01	$ 54.60	$ 0.30	$ 1,638.00	$ 0.35	$ 1,911.00	$ 1.00	$ 5,460.00
44	70300241	TEMPORARY PAVEMENT MARKING - LINE 6" - PAINT	FOOT	0	$ 0.50	$ -	$ 0.45	$ -	$ -	$ -	$ -	$ -	$ 2.00	$ -
45	70300281	TEMPORARY PAVEMENT MARKING - LINE 24" - PAINT	FOOT	0	$ 3.00	$ -	$ 2.70	$ -	$ -	$ -	$ -	$ -	$ 6.00	$ -
46	72000100	SIGN PANEL - TYPE 1	SQ FT	100	$ 18.00	$ 1,800.00	$ 20.00	$ 2,000.00	$ 30.00	$ 3,000.00	$ 20.00	$ 2,000.00	$ 30.00	$ 3,000.00
47	72400100	REMOVE SIGN PANEL ASSEMBLY - TYPE A	EACH	13	$ 15.00	$ 195.00	$ 50.00	$ 650.00	$ 125.00	$ 1,625.00	$ 50.00	$ 650.00	$ 30.00	$ 390.00

Alternate Bid					Engineers Estimate		P.T. Ferro Construction		Austin Tyler Construction		Gallagher Asphalt Corporation		D Construction, Inc.	
Item	Code	Description	Unit	QUANTITY	Unit Price	COST	Unit Price	COST	Unit Price	COST	Unit Price	COST	Unit Price	COST
48	72400100	REMOVE SIGN PANEL - TYPE 1	SQ FT	23	$ 10.00	$ 230.00	$ 12.50	$ 287.50	$ 15.00	$ 345.00	$ 12.50	$ 287.50	$ 55.00	$ 1,265.00
49	72800100	TELESCOPING STEEL SIGN SUPPORT	FOOT	165	$ 12.00	$ 1,980.00	$ 17.00	$ 2,805.00	$ 20.00	$ 3,300.00	$ 17.00	$ 2,805.00	$ 12.00	$ 1,980.00
50	73100100	BASE FOR TELESCOPING STEEL SIGN SUPPORT	EACH	0	$ 200.00	$ -	$ 200.00	$ -	$ -	$ -	$ -	$ -	$ 500.00	$ -
51	78001100	THERMOPLASTIC PAVEMENT MARKING - LETTERS AND SYMBOLS	SQ FT	115	$ 4.50	$ 517.50	$ 4.50	$ 517.50	$ 4.50	$ 517.50	$ 4.50	$ 517.50	$ 5.00	$ 575.00
52	78000200	THERMOPLASTIC PAVEMENT MARKING - LINE 4"	FOOT	6792	$ 0.70	$ 4,754.40	$ 0.60	$ 4,075.20	$ 0.60	$ 4,075.20	$ 0.65	$ 4,414.80	$ 0.75	$ 5,094.00
53	78000400	THERMOPLASTIC PAVEMENT MARKING - LINE 6"	FOOT	643	$ 1.00	$ 643.00	$ 0.80	$ 514.40	$ 0.80	$ 514.40	$ 1.07	$ 688.01	$ 1.25	$ 803.75
54	78000400	THERMOPLASTIC PAVEMENT MARKING - LINE 8"	FOOT	0	$ 1.80	$ -	$ 1.30	$ -	$ -	$ -	$ -	$ -	$ 1.75	$ -
55	78000600	THERMOPLASTIC PAVEMENT MARKING - LINE 12"	FOOT	797	$ 2.50	$ 1,992.50	$ 2.00	$ 1,594.00	$ 2.00	$ 1,594.00	$ 2.20	$ 1,753.40	$ 2.50	$ 1,992.50
56	78000650	THERMOPLASTIC PAVEMENT MARKING - LINE 24"	FOOT	81	$ 5.00	$ 405.00	$ 4.00	$ 324.00	$ 4.00	$ 324.00	$ 4.50	$ 364.50	$ 5.00	$ 405.00
57	87900200	DRILL EXISTING HANDHOLE	EACH	0	$ 300.00	$ -	$ 300.00	$ -	$ -	$ -	$ -	$ -	$ 400.00	$ -
58	88600600	DETECTOR LOOP REPLACEMENT	FOOT	0	$ 17.00	$ -	$ 15.25	$ -	$ -	$ -	$ -	$ -	$ 20.00	$ -
59	X0326806	WASHOUT BASIN	L SUM	1	$ 5,000.00	$ 5,000.00	$ 1.00	$ 1.00	$ 500.00	$ 500.00	$ 400.00	$ 400.00	$ 5,000.00	$ 5,000.00
60	X0326899	SOLAR-POWERED FLASHING BEACON ASSEMBLY (COMPLETE)	EACH	2	$ 6,000.00	$ 12,000.00	$ 5,900.00	$ 11,800.00	$ 6,000.00	$ 12,000.00	$ 6,000.00	$ 12,000.00	$ 10,000.00	$ 20,000.00
61	X0327036	BIKE PATH REMOVAL	SQ YD	0	$ 18.00	$ -	$ 28.00	$ -	$ -	$ -	$ -	$ -	$ 20.00	$ -
62	X1200160	CONNECTION TO EXISTING DRAINAGE STRUCTURE	EACH	2	$ 1,200.00	$ 2,400.00	$ 500.00	$ 1,000.00	$ 500.00	$ 1,000.00	$ 500.00	$ 1,000.00	$ 1,000.00	$ 2,000.00
63	X2520700	SODDING, SPECIAL	SQ YD	591	$ 18.00	$ 10,638.00	$ 15.00	$ 8,865.00	$ 15.00	$ 8,865.00	$ 22.50	$ 13,297.50	$ 33.00	$ 19,503.00
64	X4240430	PORTLAND CEMENT CONCRETE SIDEWALK 5 INCH, SPECIAL	SQ FT	3889	$ 7.75	$ 30,139.75	$ 9.00	$ 35,001.00	$ 7.25	$ 28,195.25	$ 8.00	$ 31,112.00	$ 11.00	$ 42,779.00
65	X6026052	SANITARY MANHOLES FRAME AND ADJUSTMENT SEALING	EACH	11	$ 700.00	$ 7,700.00	$ 1,150.00	$ 12,650.00	$ 575.00	$ 6,325.00	$ 700.00	$ 7,700.00	$ 1,200.00	$ 13,200.00
66	X6030310	FRAMES AND LIDS TO BE ADJUSTED (SPECIAL)	EACH	20	$ 900.00	$ 18,000.00	$ 1,000.00	$ 20,000.00	$ 1,200.00	$ 24,000.00	$ 900.00	$ 18,000.00	$ 800.00	$ 16,000.00
67	X6331009	REMOVE AND REPLACE STEEL PLATE BEAM GUARDRAIL, SPECIAL	FOOT	0	$ 60.00	$ -	$ 85.00	$ -	$ -	$ -	$ -	$ -	$ 100.00	$ -
68	X7010216	TRAFFIC CONTROL AND PROTECTION, (SPECIAL)	L SUM	1	$ 13,000.00	$ 13,000.00	$ 4,090.00	$ 4,090.00	$ 10,000.00	$ 10,000.00	$ 6,200.00	$ 6,200.00	$ 50,000.00	$ 50,000.00
69	Z0013798	CONSTRUCTION LAYOUT	L SUM	1	$ 650.00	$ 650.00	$ 1.00	$ 1.00	$ 5,000.00	$ 5,000.00	$ 2,000.00	$ 2,000.00	$ 50,000.00	$ 50,000.00
70	Z0017400	DRAINAGE & UTILITY STRUCTURES TO BE ADJUSTED	EACH	9	$ 450.00	$ 4,050.00	$ 400.00	$ 3,600.00	$ 300.00	$ 2,700.00	$ 450.00	$ 4,050.00	$ 800.00	$ 7,200.00
71	Z0017800	DRAINAGE & UTILITY STRUCTURES TO BE RECONSTRUCTED (SPECIAL)	EACH	0	$ 1,800.00	$ -	$ 725.00	$ -	$ -	$ -	$ -	$ -	$ 1,500.00	$ -
72	XX000406	BRICK PAVER REMOVAL AND REPLACEMENT	SQ FT	102	$ 30.00	$ 3,060.00	$ 100.00	$ 10,200.00	$ 30.00	$ 3,060.00	$ 40.00	$ 4,080.00	$ 33.00	$ 3,366.00
73	XX008130	DRAINAGE STRUCTURES TO BE CLEANED AND GROUTED	EACH	12	$ 250.00	$ 3,000.00	$ 350.00	$ 4,200.00	$ 400.00	$ 4,800.00	$ 480.00	$ 5,760.00	$ 1,500.00	$ 18,000.00
74	XX009049	REMOVE AND REPLACE CURB AND GUTTER (SPECIAL)	FOOT	739	$ 38.00	$ 28,082.00	$ 49.00	$ 36,211.00	$ 44.00	$ 32,516.00	$ 44.00	$ 32,516.00	$ 60.00	$ 44,340.00
75	N/A	PORTLAND CEMENT CONCRETE DRIVEWAY PAVEMENT REMOVAL AND	SQ YD	90	$ 90.00	$ 8,100.00	$ 135.00	$ 12,150.00	$ 80.00	$ 7,200.00	$ 80.00	$ 7,200.00	$ 90.00	$ 8,100.00
76	N/A	PORTLAND CEMENT CONCRETE DRIVEWAY PAVEMENT REMOVAL AND	SQ YD	0	$ 110.00	$ -	$ 125.00	$ -	$ -	$ -	$ -	$ -	$ 90.00	$ -
77	N/A	HOT-MIX ASPHALT DRIVEWAY PAVEMENT REMOVAL AND REPLACEMEN	SQ YD	44	$ 60.00	$ 2,640.00	$ 60.00	$ 2,640.00	$ 45.00	$ 1,980.00	$ 110.00	$ 4,840.00	$ 20.00	$ 880.00
78	N/A	CLASS D PATCHES, 6 INCH (SPECIAL)	SQ YD	176	$ 50.00	$ 8,800.00	$ 38.00	$ 6,688.00	$ 52.00	$ 9,152.00	$ 40.00	$ 7,040.00	$ 60.00	$ 10,560.00
79	N/A	CLASS D PATCHES, 8 INCH (SPECIAL)	SQ YD	174	$ 60.00	$ 10,440.00	$ 48.00	$ 8,352.00	$ 68.00	$ 11,832.00	$ 44.00	$ 7,656.00	$ 80.00	$ 13,920.00
80	N/A	CLASS D PATCHES, 10 INCH (SPECIAL)	SQ YD	0	$ 80.00	$ -	$ 83.00	$ -	$ -	$ -	$ -	$ -	$ 100.00	$ -
81	N/A	MULTI-USER PATH	SQ YD	0	$ 35.00	$ -	$ 82.00	$ -	$ -	$ -	$ -	$ -	$ 70.00	$ -
82	N/A	SUMP DISCHARGE CLEANOUT	EACH	0	$ 800.00	$ -	$ 400.00	$ -	$ -	$ -	$ -	$ -	$ 1,000.00	$ -
83	N/A	SUMP DISCHARGE SERVICE LINE, 6"	FOOT	0	$ 40.00	$ -	$ 45.00	$ -	$ -	$ -	$ -	$ -	$ 40.00	$ -
84	N/A	TREE, 2-1/2" CALIPER, BALLED AND BURLAPPED	EACH	0	$ 750.00	$ -	$ 495.00	$ -	$ -	$ -	$ -	$ -	$ 500.00	$ -
		As Read Total (if Different):			**$ 445,542.15**		**$ 421,711.78**		**$ 415,699.02**		**$ 447,125.91**		**$ 641,409.58**	

CHRISTOPHER B. BURKE ENGINEERING, LTD.
16221 W. 159th Street Suite 201 Lockport, IL 60441 TEL (815) 770-2850 FAX (815) 770-2855

March 24, 2022

City of Lockport Public Works & Engineering
17112 Prime Blvd.
Lockport, Illinois 60441

Attention: Mr. Brent Cann
Director of Public Works & Engineering

Subject: 2022 Resurfacing Project
MFT Section Number 22-00093-00-RS
Letter of Recommendation

Dear Mr. Cann:

Bids were opened and read aloud for the subject project on March 24, 2022 at 10:00 AM at City Hall. Those bids have been reviewed and tabulated as follows:

Bidder	Base Bid	Alternate Bid	Alternate + Base Bid
P.T. Ferro Construction Co.	$2,644,542.29	$421,711.78	$3,066,254.07
Austin Tyler Construction	$2,711,318.42	$415,699.02	$3,127,017.44
Gallagher Asphalt Corporation	$2,840,424.44	$447,125.91	$3,287,550.35
D Construction, Inc.	$3,210,222.38	$641,409.58	$3,851,631.96
Engineers Estimate of Probable Cost	$2,932,751.80	$445,542.15	$3,378,293.95

The lowest responsive, responsible bidder for the 2022 Resurfacing Project was P.T. Ferro Construction Co. Pending financial agreement between the City of Lockport, Homer Township, and Lockport Township, we recommend awarding the 2022 Resurfacing Project Base + Alternate bid contract to P.T. Ferro Construction Co. in the amount of $3,066,254.07. CBBEL and the City of Lockport have worked with P.T. Ferro Construction Co. on past projects of similar scope and they have completed the work satisfactorily and are IDOT prequalified. Please call if you have any questions.

Sincerely,

Daniel Schroeder, PE

City Council

Agenda Memorandum

Item # PW-2

To: **Mayor & City Council**

From: **Phil Hyma, Engineer**

Subject: **2022 MS4 Presentation - Municipal Storm Sewer System**

Date: **Wednesday, April 6, 2022**

BACKGROUND/HISTORY

The City of Lockport is an MS4 (Municipal Separate Storm Sewer System) Community which means that the storm sewer system and the sanitary sewer system are separated. The IEPA regulates this by requiring communities to meet various guidelines to prevent pollution and erosion from entering the City waterways. This presentation covers the Illicit Discharge Detection and Elimination portion of the permit. This program is designed to identify pollutants, trace them back to their source, and eradicate them. This will also help inform residents of what is not allowed to be dumped into the storm sewers as well.

PROS/CONS/ALTERNATIVES

N/A

RECOMMENDATION

Presented as a matter of information only.

ATTACHMENTS

2022 MS4 Presentation

SPECIFIC CITY COUNCIL ACTION REQUIRED

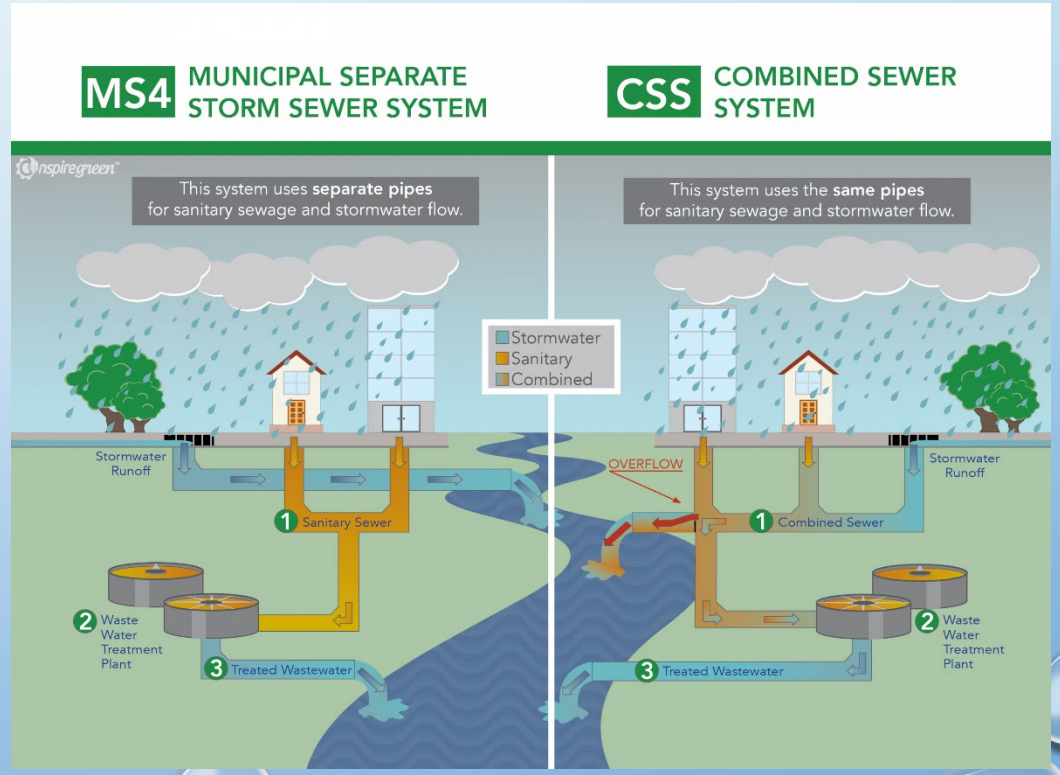
Information Only.

CITY OF LOCKPORT

2022 MS4 STORMWATER PRESENTATION

WHAT IS AN MS4?

- AN MS4 IS A CONVEYANCE OR SYSTEM OF CONVEYANCES THAT IS:
  - OWNED BY A STATE, CITY, TOWN, VILLAGE, OR OTHER PUBLIC ENTITY THAT DISCHARGES TO WATERS OF THE U.S.,
  - DESIGNED OR USED TO COLLECT OR CONVEY STORMWATER (E.G., STORM DRAINS, PIPES, DITCHES),
  - NOT A COMBINED SEWER, AND
  - NOT PART OF A SEWAGE TREATMENT PLANT, OR PUBLICLY OWNED TREATMENT WORKS (POTW).



ILLICIT DISCHARGE DETECTION & ELIMINATION (IDDE)

- THE PURPOSE OF THE ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PROGRAM IS TO IDENTIFY POTENTIAL ILLEGAL CONNECTIONS AND DISCHARGES TO THE MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) AND ERADICATE THEM AS QUICKLY AND WITH AS LITTLE DAMAGE AS POSSIBLE.
- EXAMPLES INCLUDE:
  - OIL/FUEL SPILLS
  - YARD WASTE
  - DETERGENT
  - SANITARY CONNECTIONS/DISCHARGES
  - PAINT

QUESTIONS OR COMMENTS?

City Council

Agenda Memorandum

Item # AT-1

To: **Mayor & City Council**

From: **Sonni Williams, City Attorney**

Subject: **Appointment of Alderman Mark Lobes as the City Council Representative for All Step 3 Grievances Governed Under the Agreement with MAP #75 and the City of Lockport**

Date: **Wednesday, April 6, 2022**

BACKGROUND/HISTORY

The Agreement with Metropolitan Alliance of Police Lockport Police Chapter #75 and the City of Lockport ("Agreement") calls for Step Three grievance appeal to be to the City Council which appoints an authorized representative to meet with the aggrieved employee and/or Union Officer to attempt to resolve the grievance to the satisfaction of all the parties.

Alderman Mark Lobes is already the City Council liaison to the Police Department and has served as the City Council's representative for prior Step 3 grievances with MAP #75 union officers. Therefore, it only makes sense to appoint Alderman Mark Lobes as the authorized representative of the City Council to handle all Step 3 grievance appeal process and/or hearings as prescribed under Agreement with MAP Chapter #75.

PROS/CONS/ALTERNATIVES

This would streamline the process and the City Council would not have to make a quick and hasty decision on who to appoint as the Representative in Step 3 grievance appeals. Alderman Lobes has the most experience in handling Step 3 grievances on behalf of the City Council.

RECOMMENDATION

Approve Resolution No. 22-039 appointing Alderman Lobes to be the Designated Representative for the City Council for all Step 3 Grievance Appeals covered under the Agreement with Map #75.

ATTACHMENTS

Resolution No. 22-039 Appointment of Alderman Lobes as authorized Representative for Step 3 Grievances

SPECIFIC CITY COUNCIL ACTION REQUIRED

Approve Resolution No. 22-039 appointing Alderman Lobes to be the Designated Representative for the City Council for all Step 3 Grievance Appeals covered under the Agreement with Map #75.

RESOLUTION NO. 22-039

A RESOLUTION APPROVING THE APPOINTMENT ALDERMAN MARK LOBES TO SERVE AS THE AUTHORIZED REPRESENTATIVE OF THE CITY COUNCIL OF THE CITY OF LOCKPORT FOR ALL STEP THREE GRIEVANCES BY EMPLOYEES AND/OR UNION POLICE OFFICERS GOVERNED UNDER THE AGREEMENT BETWEEN MAP CHAPTER #75 AND THE CITY OF LOCKPORT

WHEREAS, Section 11.1 of Article XI of the Agreement between Metropolitan Alliance of Police Lockport Police Chapter #75 and the City of Lockport ("Agreement") provides that Step Three grievance appeal is heard by the City Council which appoints an authorized representative to meet the aggrieved employee and/or Union Officer in order to attempt to resolve the grievance to the satisfaction of all the parties; and

WHEREAS, Alderman Mark Lobes is the City Council liaison to the Police Department and the City Council has indicated their confidence in his abilities to make sound determinations by appointing him to be the City Council's representative for prior Step 3 grievances; and

WHEREAS, the Mayor and the City Council desire to appoint Alderman Mark Lobes as the authorized representative of the City Council to handle all Step 3 grievance appeal process and/or hearings as prescribed under Agreement with MAP Chapter #75.

NOW, THEREFORE, be it resolved by the Mayor and City Council of the City of Lockport, Will County, Illinois, as follows:

SECTION 1: Approve the appointment of Alderman Mark Lobes to serve as authorized representative of the City Council for all Step 3 grievances as prescribed under Agreement with MAP Chapter #75 until the expiration of Alderman Lobes' term of office.

SECTION 2: This Resolution shall be in full force and effect from and after its passage and approval as provided by law.

PASSED and APPROVED this ____, day of 2022, with:

_____ALDERMEN voting aye _____ALDERMEN abstaining

_____ALDERMEN voting nay _____ALDERMEN absent

The MAYOR voting aye _____, voting nay _____, not voting _____

_____ BARTELSEN _____ BERGBOWER _____ GILLOGLY _____ KAIRIS

_____ KOSTECKI _____ LOBES _____ SABAN _____ SCHREIBER

_____ MAYOR

_____
Steven Streit, Mayor

ATTEST:

_____

Kathleen Gentile, City Clerk