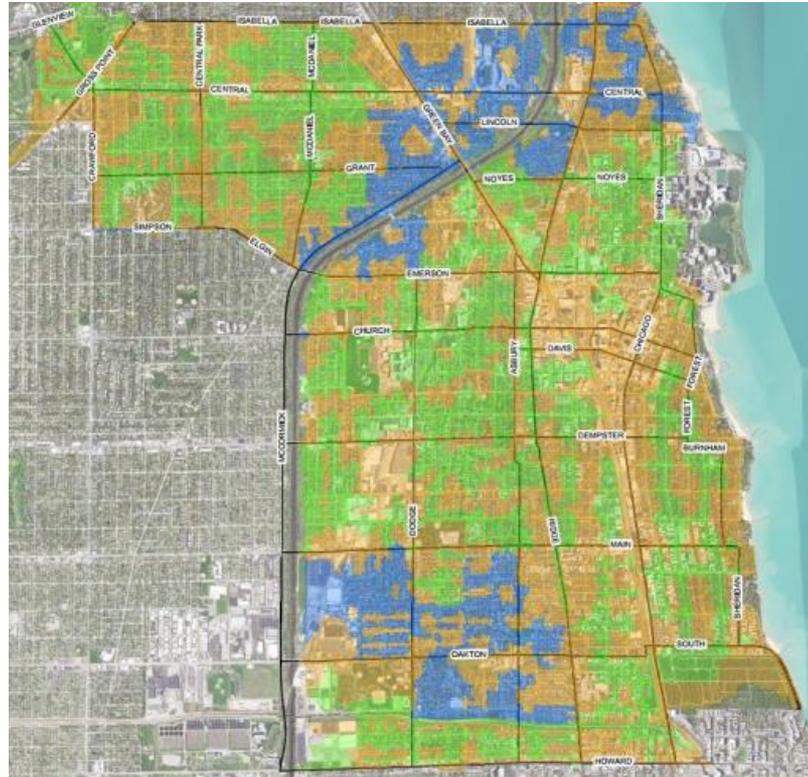


Stormwater Master Plan Update

City Council



City of Evanston
Bridget Nash, PE
Senior Project Manager

Hey and Associates, Inc.
Jeff Wickenkamp, PE
Anna Culcasi, PE

May 12, 2025

Background

- Long Range Sewer Improvement Program
 - Designed to reduce flow in combined sewer system
- Climate Action and Resilience Plan (CARP) - 2018
 - Addresses need for resilient stormwater management in the face of future climate change
- Stormwater Management Guide - 2019
 - Calls for development of Stormwater Master Plan
- Stormwater Master Plan (SWMP)
 - Awarded to Hey and Associates April 27, 2020

Study Objective

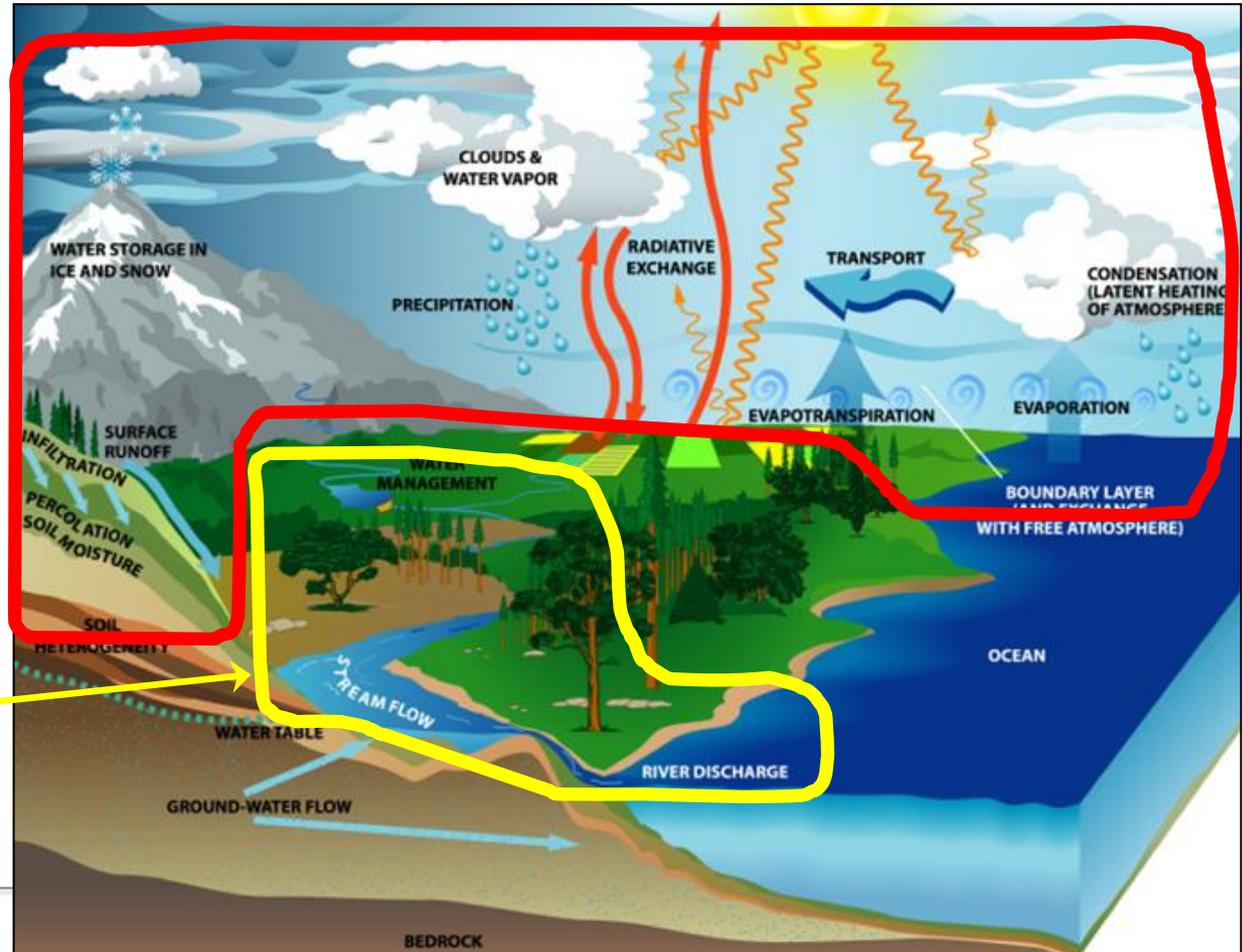
Develop hydrologic and hydraulic model of the City's stormwater system (combined, relief, and storm sewers) to identify and define needed system improvements under existing and future storm conditions.

The model is now used as a powerful tool to plan future improvements and analyze system problems should they occur.

Model Build

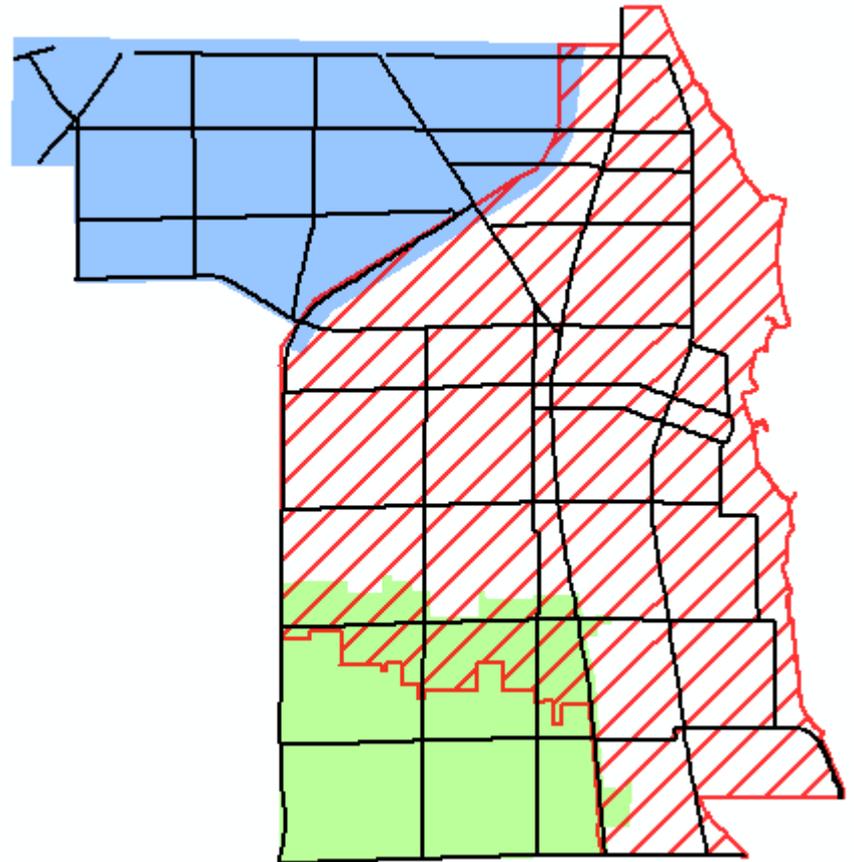
Hydrologic
Modeling

Hydraulic
Modeling



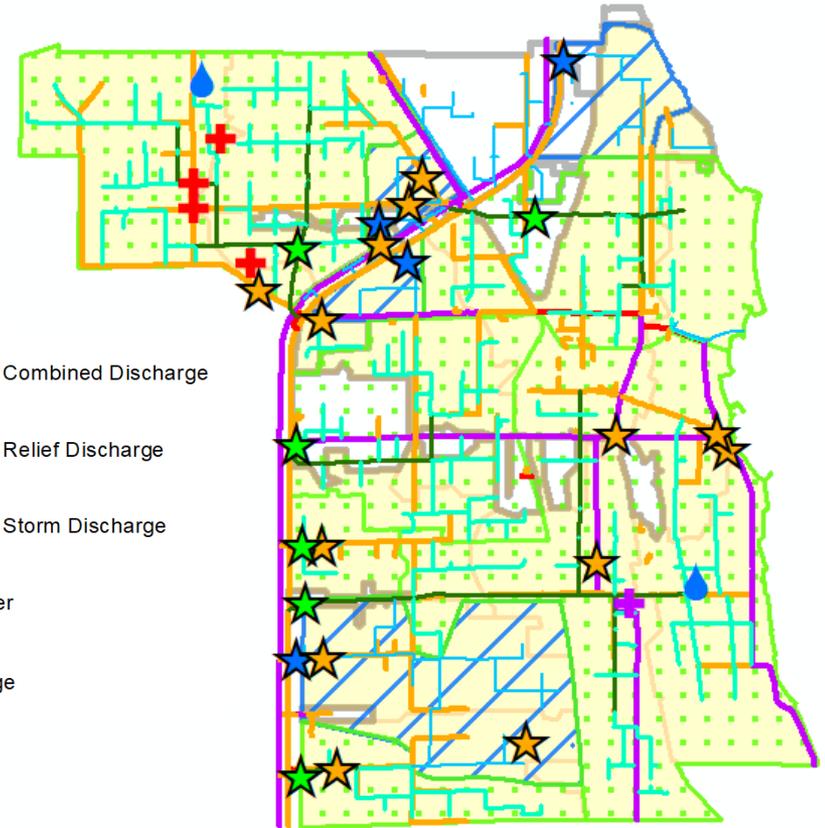
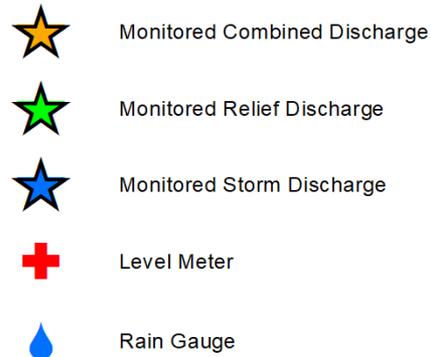
Model Build

- XP-SWMM 2D hydrologic and hydraulic model
- Hydrology
 - Catchment delineation (9,500 subbasins)
- Hydraulics
 - Pipe networks prepared from sources listed in data collection (12,149 pipes)



Flow Monitoring & Rain Gauges

- Temporary rain gauges at 2 locations
- Flow meters installed at 23 locations
- Level meters installed at 4 locations



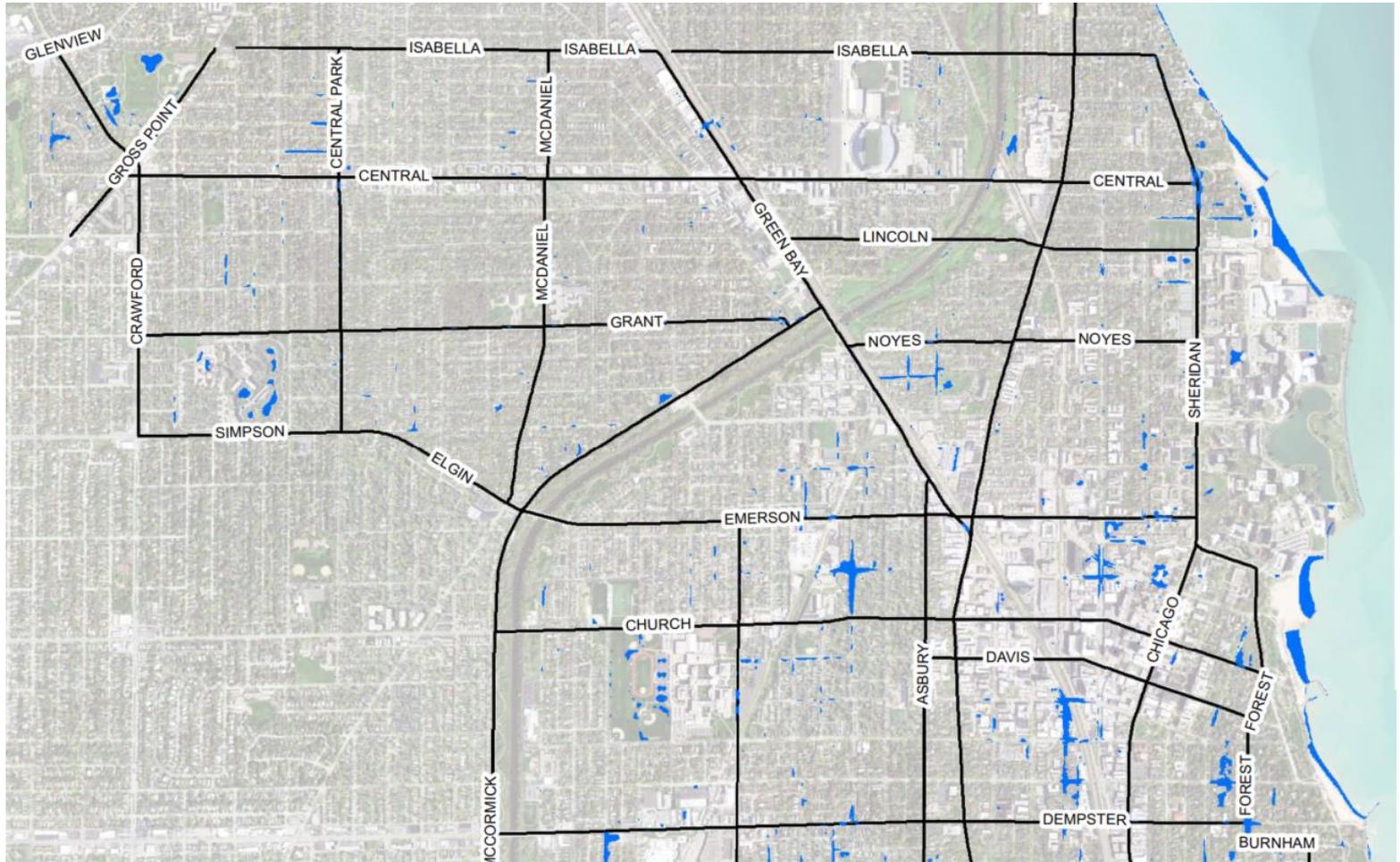
System Evaluation

Criteria	How is it Evaluated?
Sewer Surge Risk	Water levels from the model are compared to a “typical” basement depth.
Structure Flood Risk	Flooding boundaries are compared with structures.
Water Quality Protection	Determine risk of combined sewer overflows at outfall locations

Combined Sewer Performance: North



Surface Flooding Risk: 100-year Event



Recommendations

City of Evanston Stormwater Management Program Recommendations		
Regulatory	Private System	Public System
<ul style="list-style-type: none"> • Detention requirements • Private property plumbing code requirements • Property Transfer Inspections 	<ul style="list-style-type: none"> • Overhead sewers • Sanitary sewer backup prevention • Sump pumps • Lot drainage • Floodproofing 	<ul style="list-style-type: none"> • Capital Improvements • Combined Basin 07 Sewer Improvement Concept • Southwest Surface Flooding Concept • Green Infrastructure Program • Sewer System Monitoring

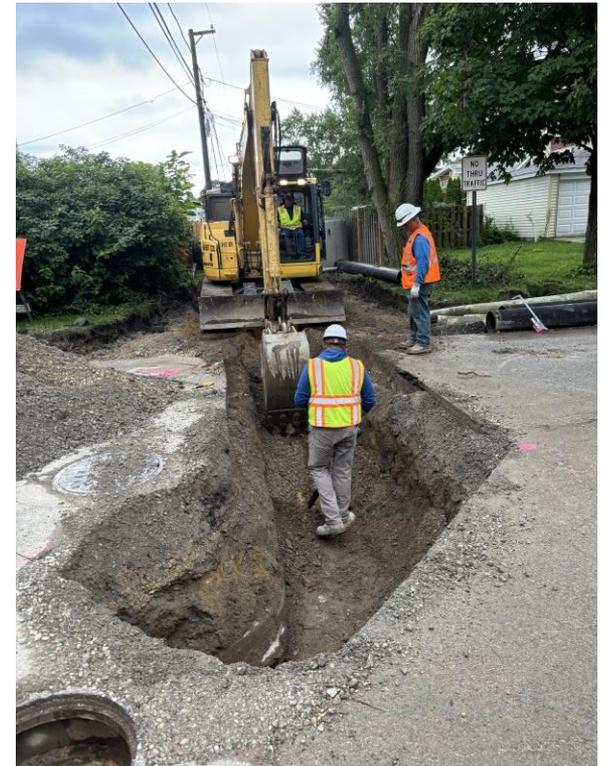
Capital Improvements

2024 Alley Improvements

N of Leonard, E of Green Bay	794 feet
N of Colfax, E of Bryant	722 feet
N of Lake, E of Darrow	408 feet
N of Simpson, E of Ashland	475 feet
	2,399 feet

Review of 2025 Annual Project Locations

Monitor Areas of Surface Flooding Risk



Green Infrastructure

Main Street - 2024

- Permeable Pavers

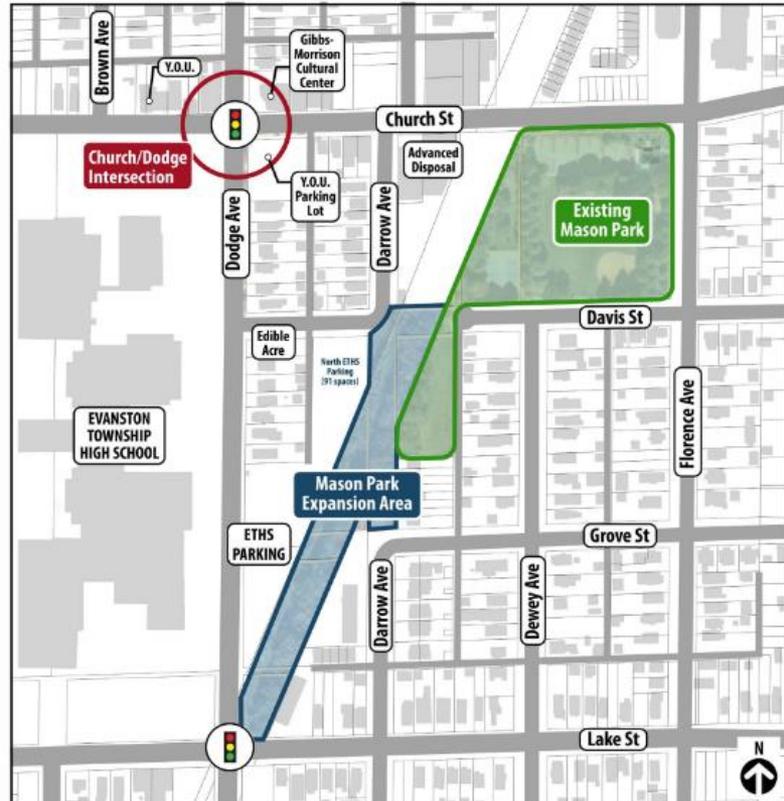
Independence and Larimer Parks - 2024

- Permeable Rubberized Play Lots



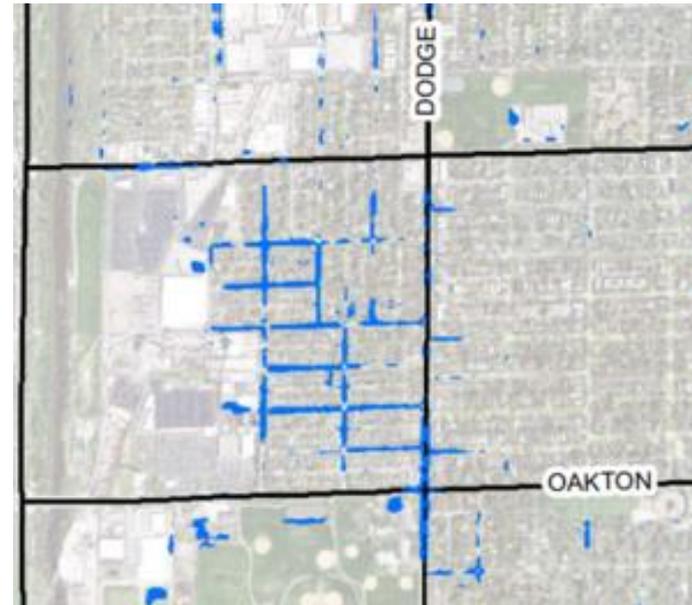
Mason Park Green Infrastructure Concept

- Current project in conceptual planning phase



Southwest Flooding Concept

- 100-year surface flooding risk
- Low lying and flat
- Lack of overland flow paths
- Need to provide overflow capacity to North Shore Channel
- Trunk sewer, local sewer, high capacity inlets

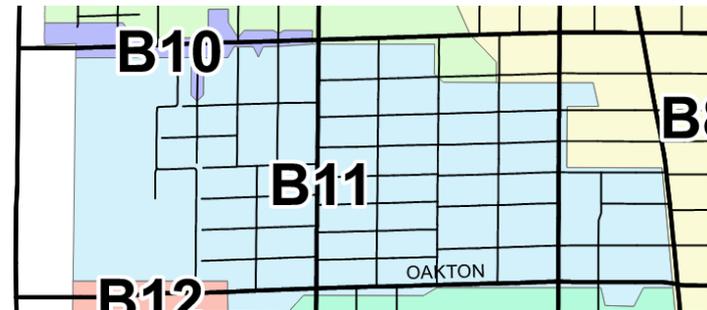


Sewer System Monitoring

Level Meters

- Tool to calibrate and verify model
- Install Spring through late Summer
- Church St. monitoring 2025

Model Updates



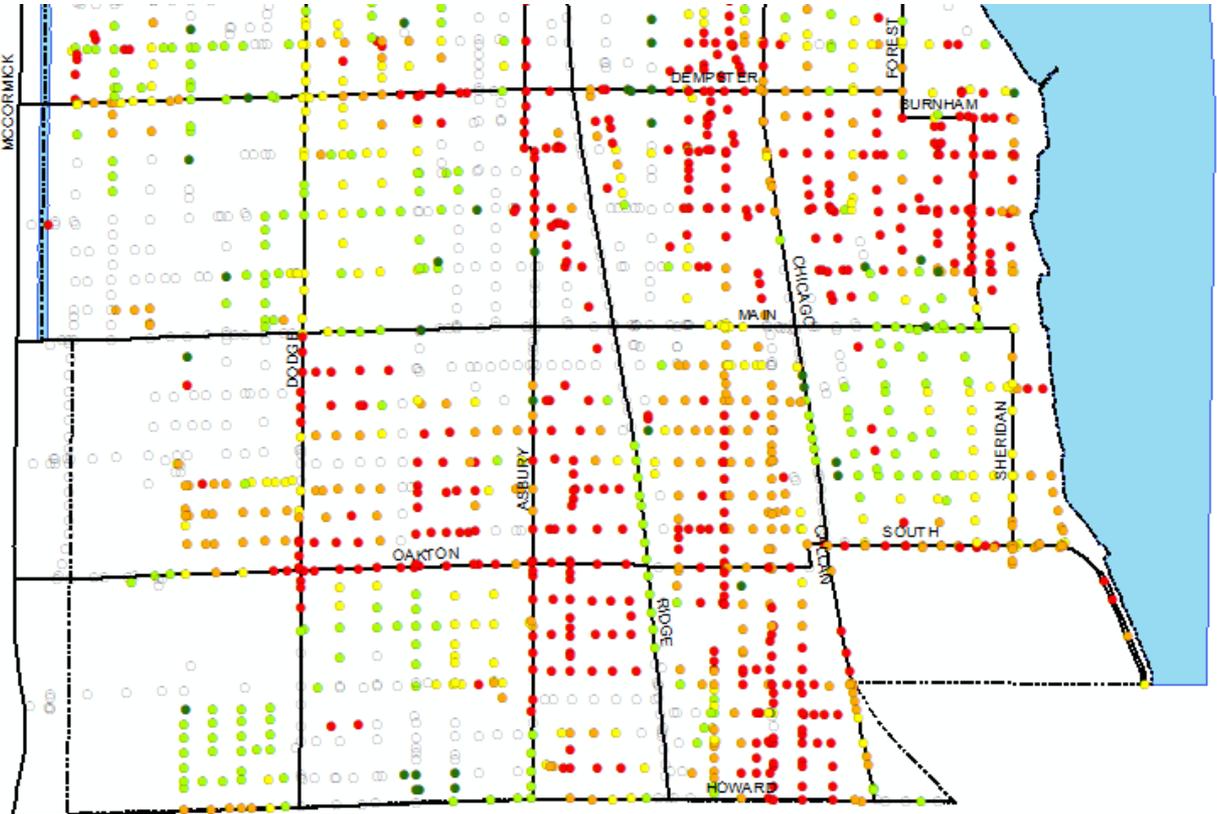
Combined Sewer Performance Potential for Sewer Surcharge

Model Area	% Nodes with Hydraulic Grade Line within 4' of Street Surface*				
	2-year Storm	5-year Storm	10-year Storm	50-year Storm	100-year Storm
Main	36%	54%	66%	75%	77%
Northwest	0%	14%	21%	37%	49%
Southwest	7%	10%	11%	21%	23%

*Percentage of locations where the existing combined sewer is underperforming. Properties with low basements and/or no private flood controls may have an increased risk of basement backups.

Combined Sewer Performance: South

- 2yr Flood Risk
- 5yr Flood Risk
- 10yr Flood Risk
- 50yr Flood Risk
- 100yr Flood Risk
- >100yr Flood Risk



Buildings with Surface Flooding Risk

	10-year Event	100-year Event
Northwest Model	32	138
Main Model	3	13
Southwest Model	6	16

Surface Flooding Risk: 100-year Event

