



Village of River Forest



March 13, 2023

Stormwater Master Plan Presentation



What's in a Stormwater Master Plan?

The Stormwater Master Plan (SMP) is a comprehensive study of a community's stormwater system resulting in a series of recommended improvements designed to achieve a desired level of flood protection.

There are 3 main components:

- Sewer Modeling
- Capital Improvement Plan
- Administrative

SMP Goals

Every community has different goals and direction for their SMP.

River Forest SMP Goals:

- Create a Village-wide sewer model for all storm and combined sewer systems
- Evaluate the current **Level of Protection (LOP)** from basement flooding
- Develop a plan of improvements to achieve a typical **10-yr LOP** for sewer backup (basement flooding)
- Recommend ordinance and other procedural modifications to help achieve goals

Types of Flooding

Flooding can occur from many sources.

Let's define the type of flooding to be addressed in the SMP



SPEED
LIMIT
25

OVERLAND FLOODING

occurs when sewer capacity is exceeded and surface runoff enters a structure through an opening such as door, window well, etc.

The Village is fortunate to have few "depressional" areas that flood via overland flooding.



YARD FLOODING

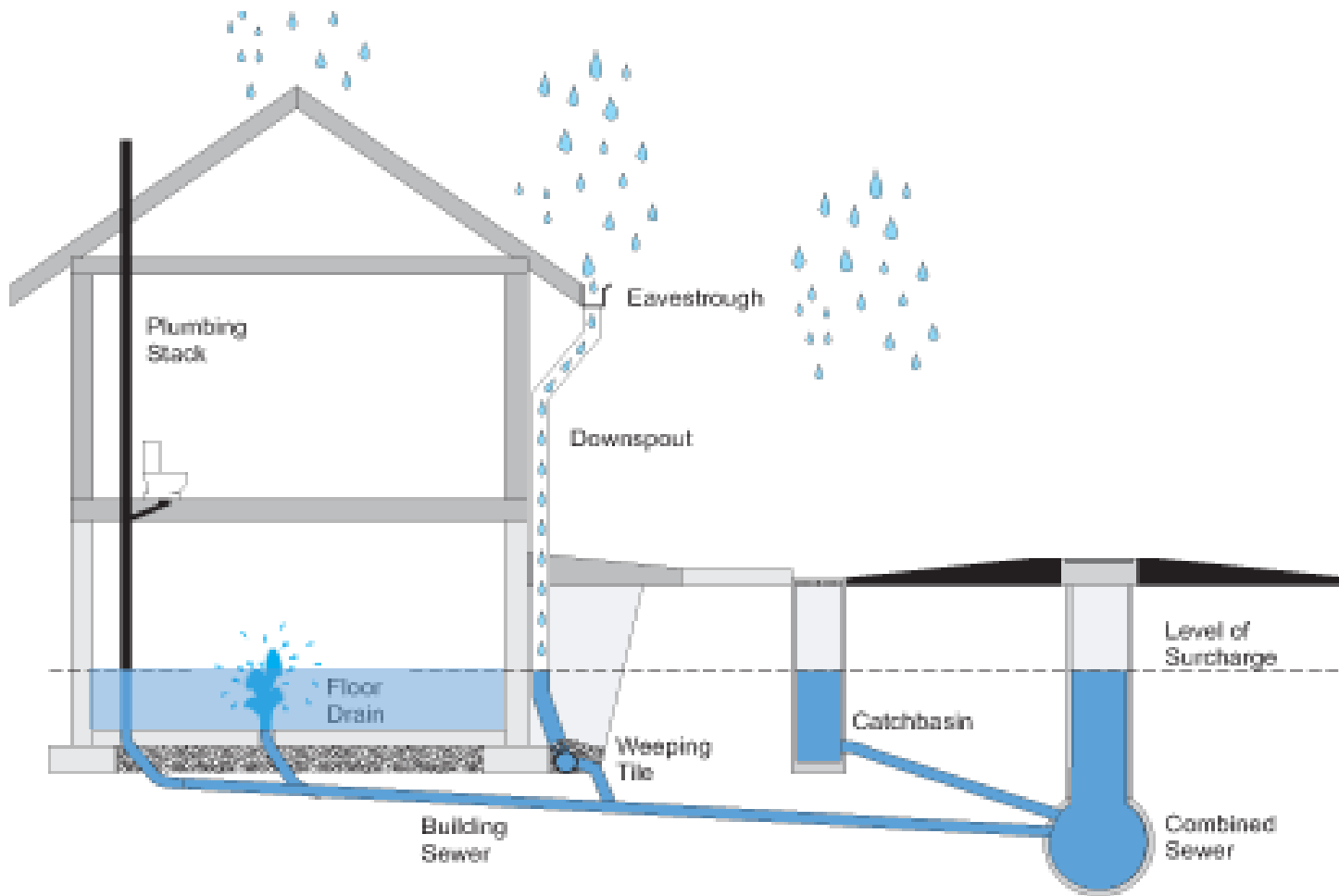
occurs when low-lying areas become inundated from runoff. It is typically not based on local sewer capacity.

Yard flooding was considered but ultimately not included in the SMP recommendations.



RIVERINE FLOODING

occurs when the Des Plaines River reaches flood stage and inundates adjacent land.



SEWER BACKUP can occur when the water level of the combined sewer in the street exceeds the basement elevation of an adjacent home with a gravity flow sewer connection.

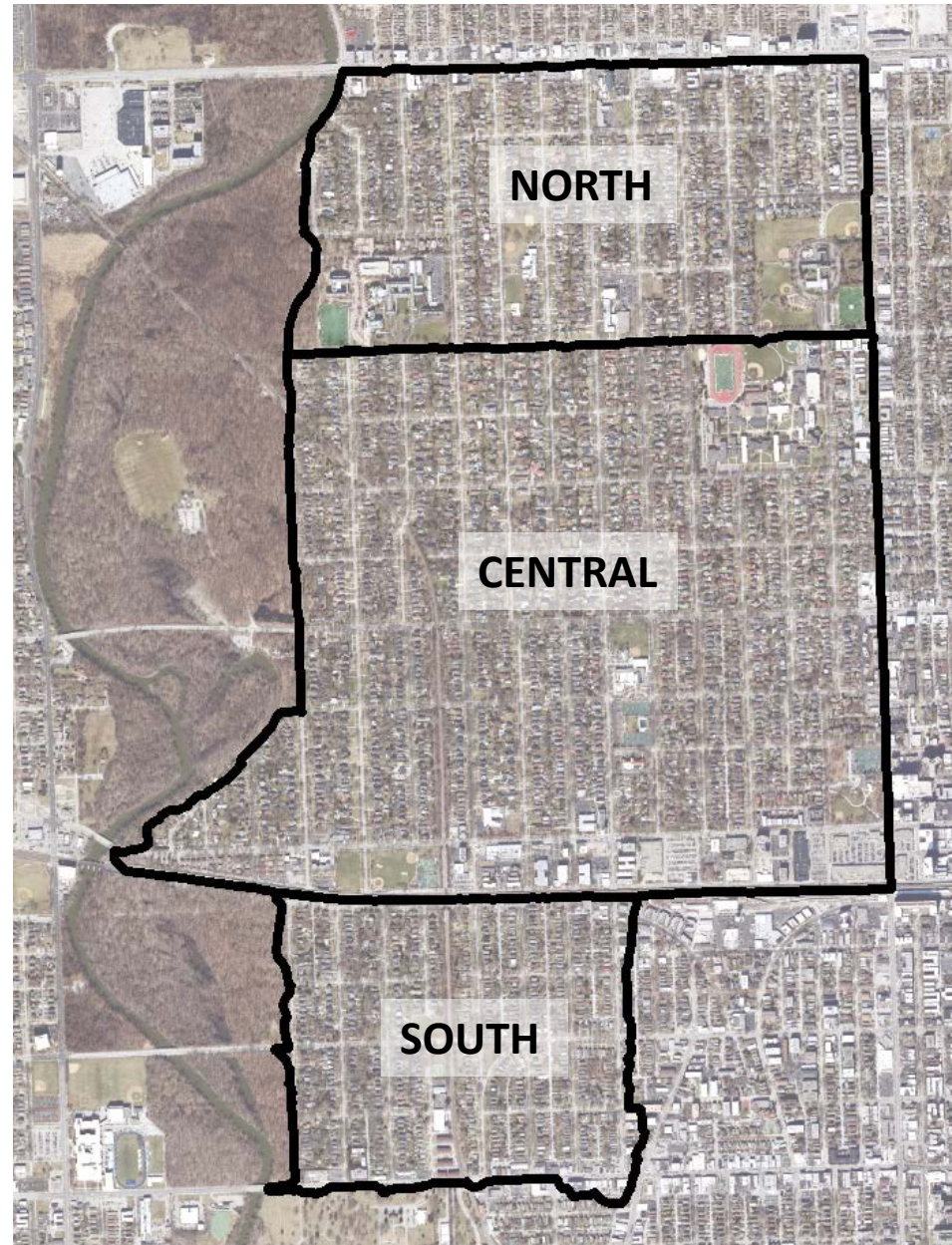
The SMP will focus on basement flooding from sewer backups.

Sewer Modeling

A sewer model (XP-SWMM) was created for the Village's storm and combined sewer systems.

The purpose was to determine the current LOP for basement flooding.

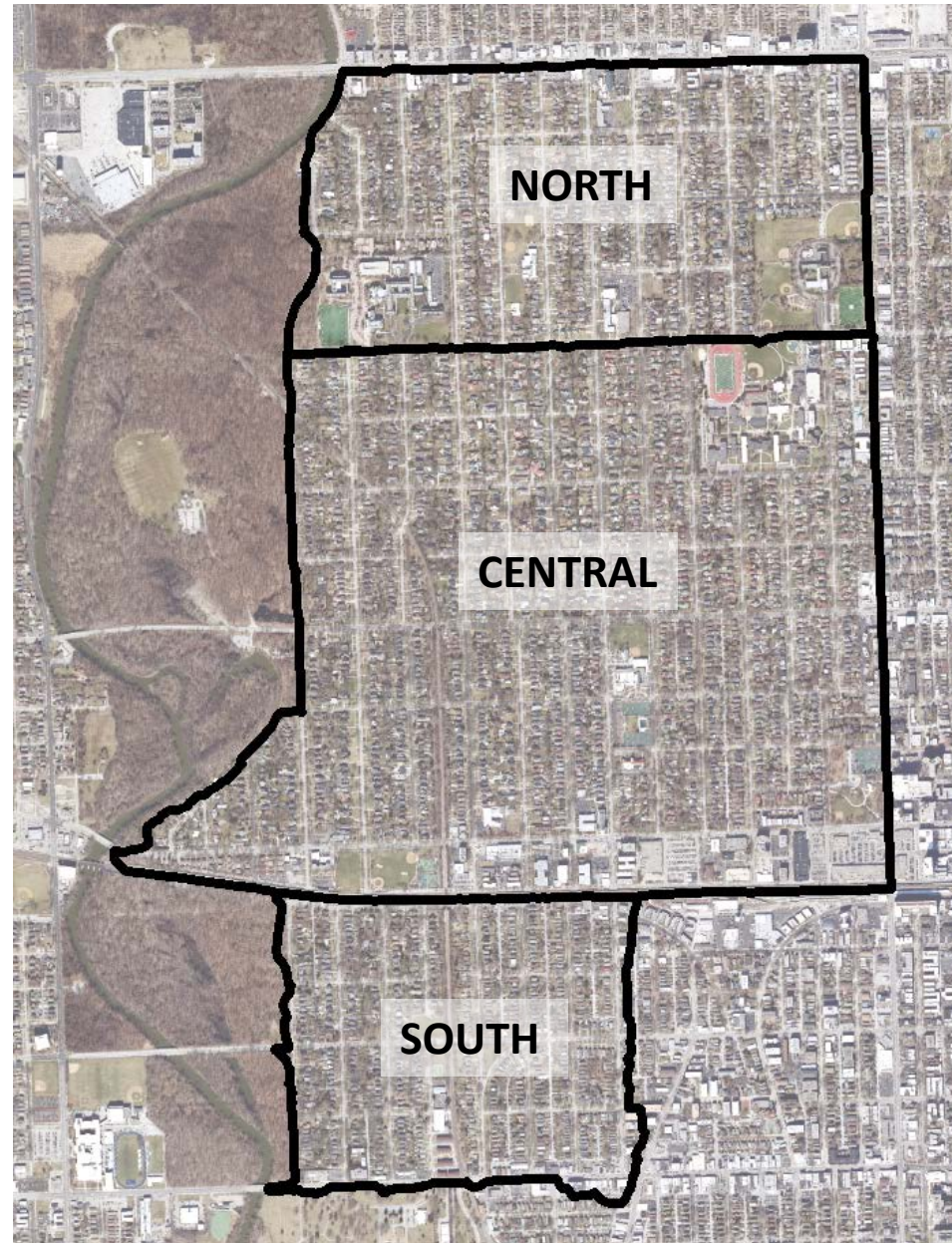
There are 3 main drainage systems in the Village:



Sewer Modeling

Various storms were simulated to estimate how high the water level reaches in the sewer system.

The results vary for each of the three areas.

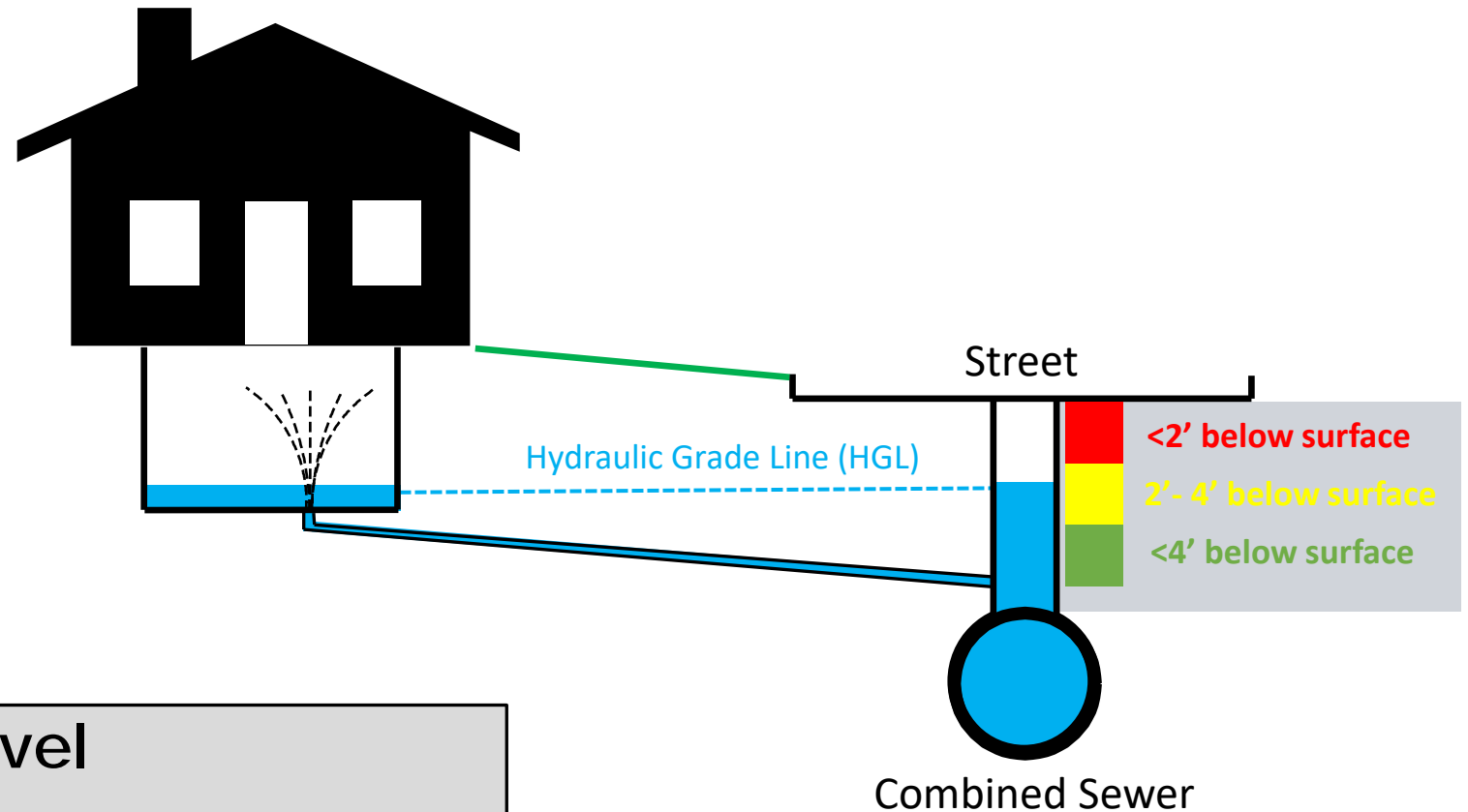


Sewer Modeling

Color Coding of Results:

Each manhole is colored Red, Yellow or Green based on water level in sewer.

Green = >4' below street level
Yellow = between 2'-4' below street level
Red = < 2' below street level



Sewer Modeling

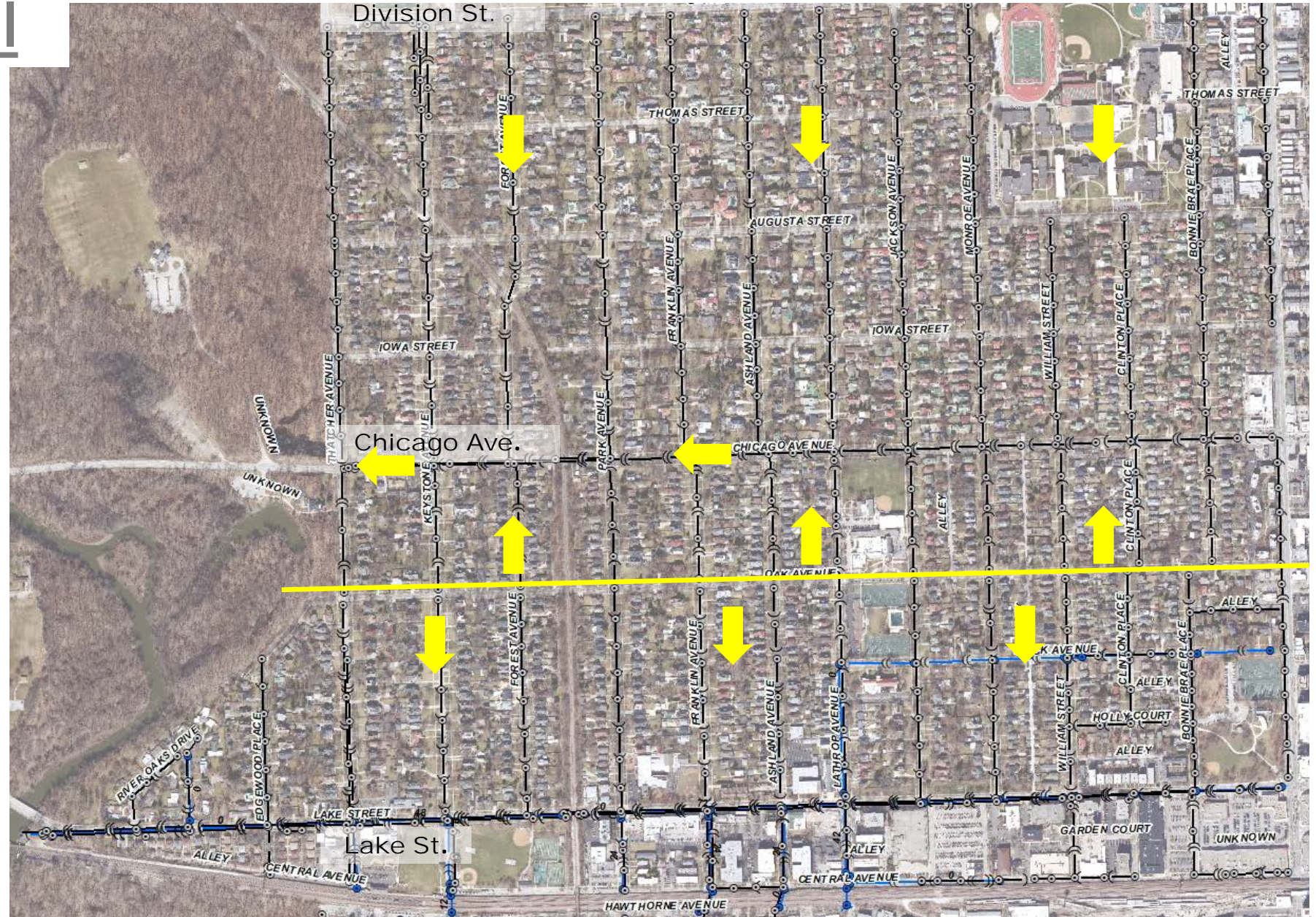
Design Rainfall Depths:

Storm Event	Rainfall Amount*
1-year	1.3" in 1-hour
2-year	1.6" in 1-hour
5-year	2.0" in 1-hour
10-year	2.4" in 1-hour

* From ISWS Bulletin 75

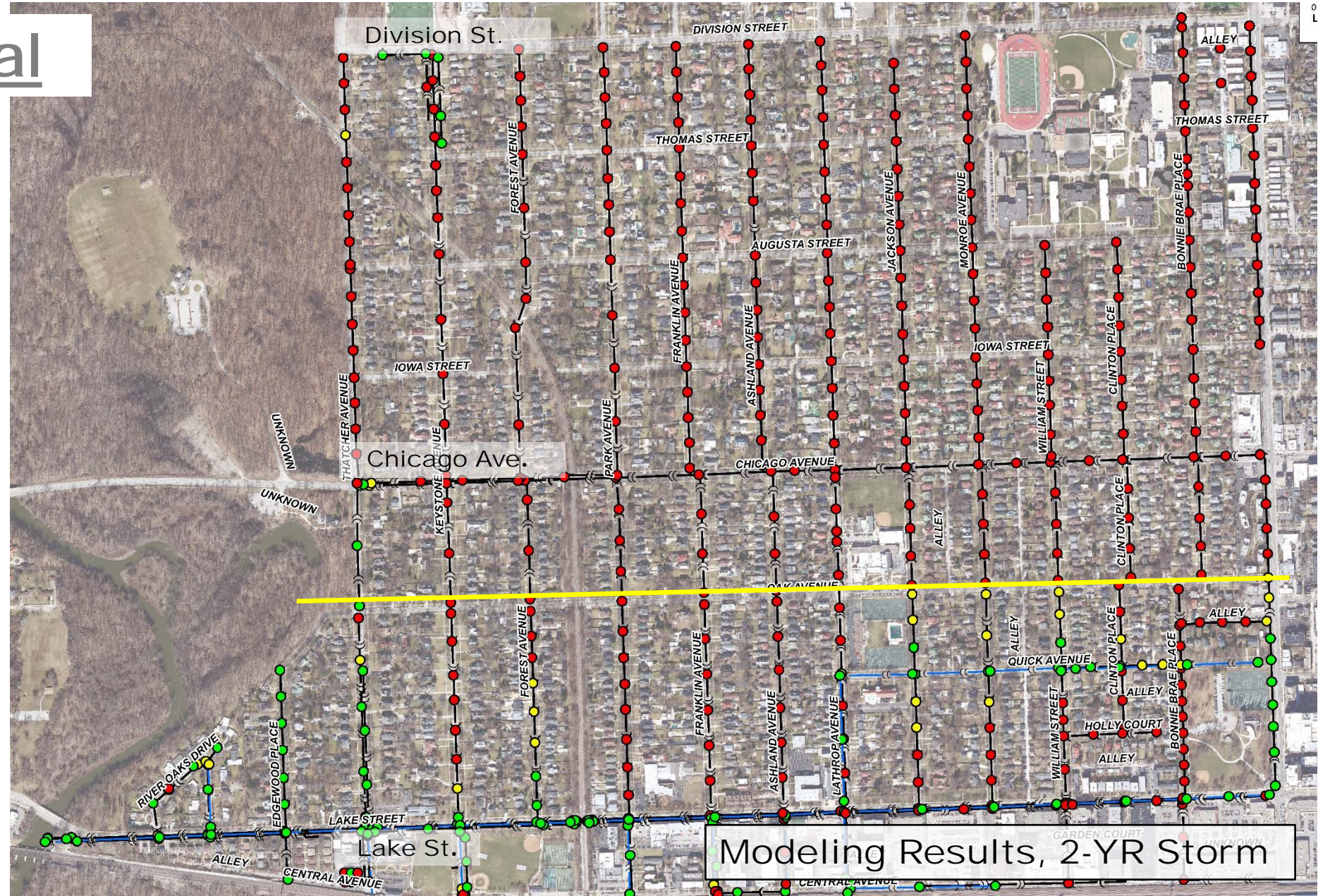
Results - Central

- Central area has traditional combined sewers with very limited capacity
- Lake Street area has relief sewers that improve capacity



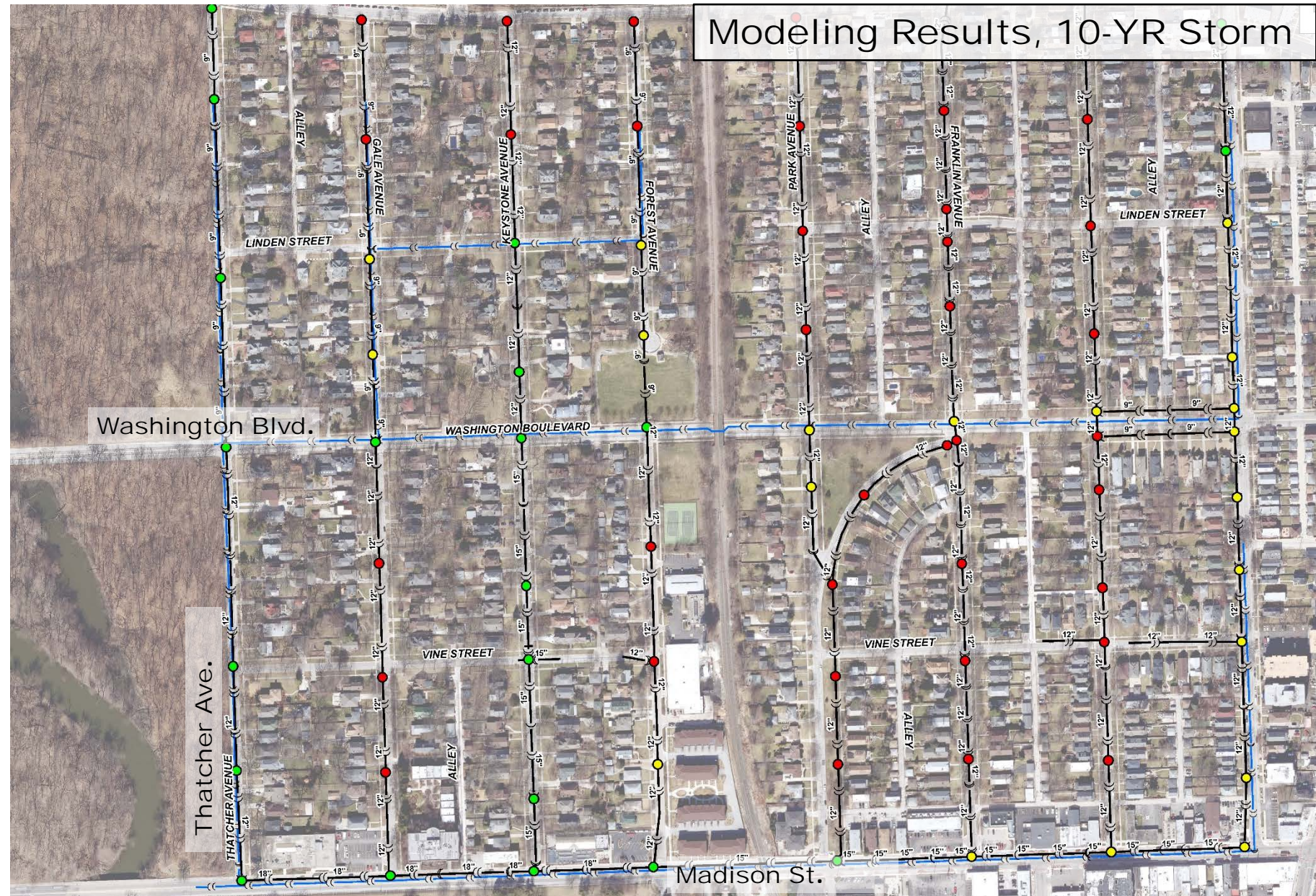
Results - Central

- 1-2yr LOP for basement flooding in most areas
- 2-5yr LOP in Lake Street area



Results - South

- South area has a system of relief sewers to supplement capacity
- Varied results, **2-10 yr LOP** for basement flooding depending on proximity to relief sewer

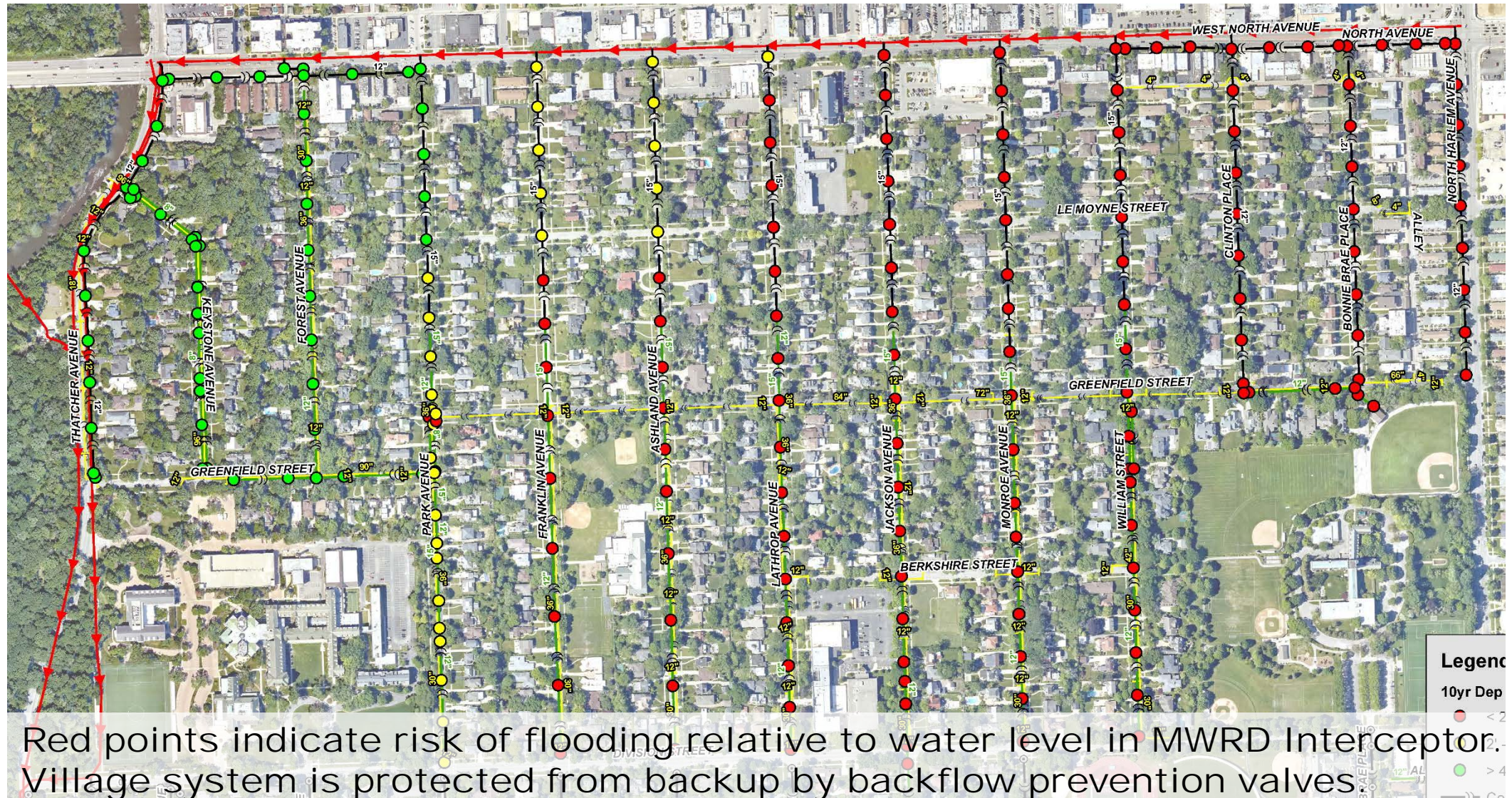


Results - North

- North area LOP results are difficult to characterize
- 2013 Northside Stormwater project created new separate sewer system for part of the area
 - Sanitary flow from separated area drains to North Avenue
 - Combined flow from non-separated area drains to North Avenue
- MWRD Interceptor could cause backup into North area but Village is protected by backflow prevention valves

Results - North

Modeling Results, 10-YR Storm



Modeling Results

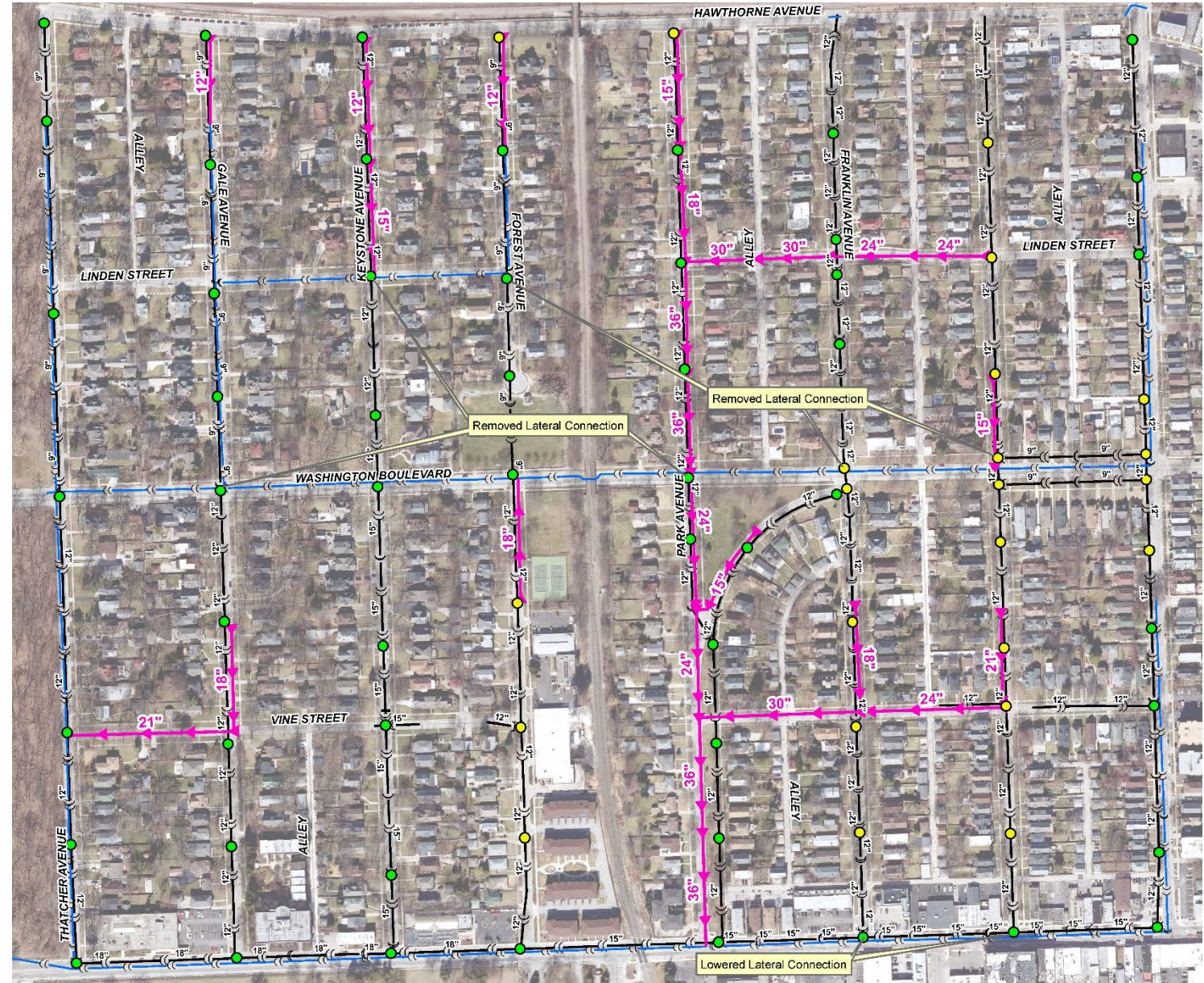
Overall, while the LOP for basement flooding varies throughout the Village, the majority does not meet a desired 10-yr LOP.

Therefore, potential improvement projects were evaluated to achieve the 10-yr LOP.

Potential Improvement Projects

SOUTH AREA:

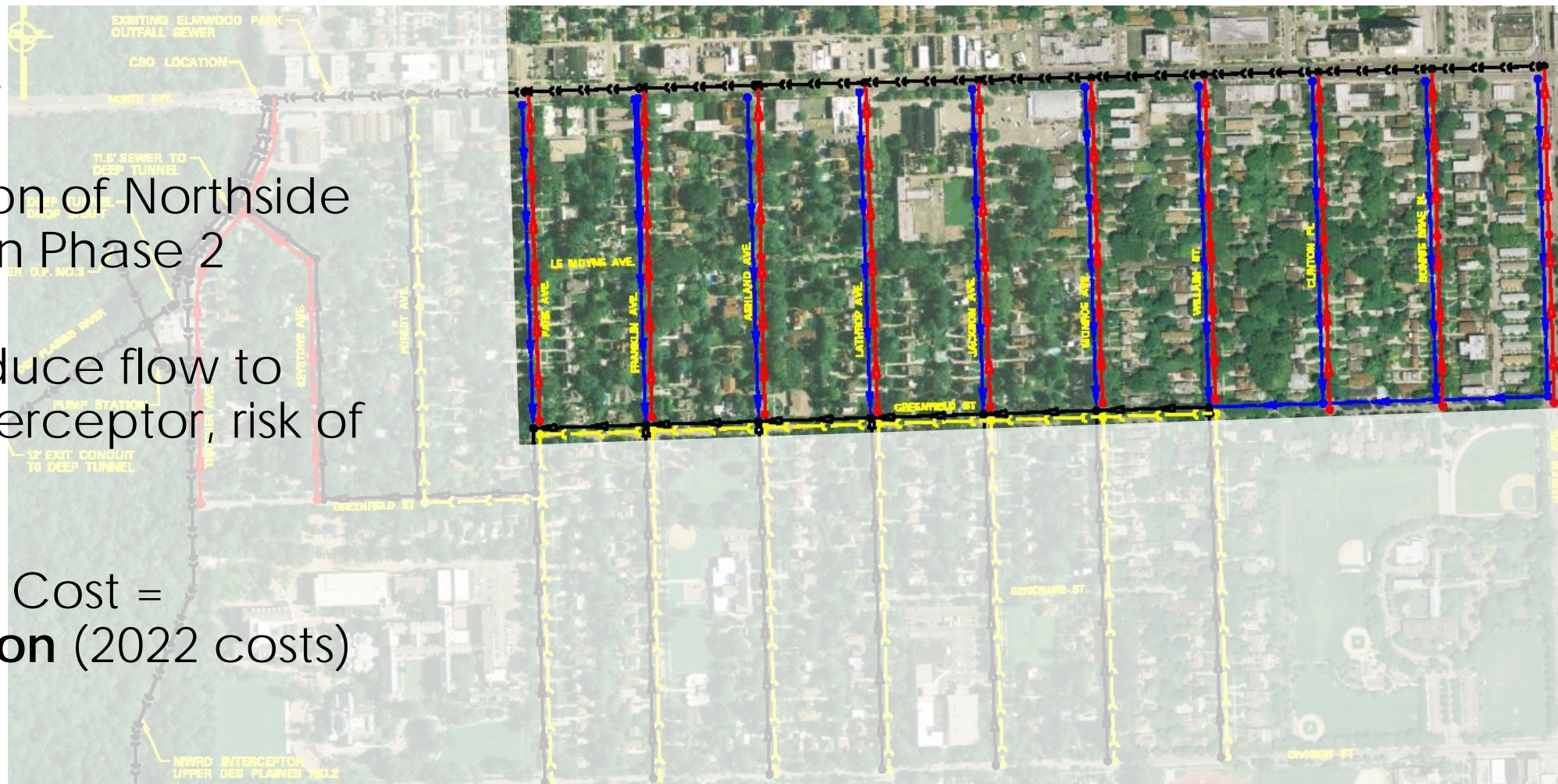
- Expansion of relief sewer network throughout area
- Designed to maximize lowering of water levels for 10-yr event
- Could be broken into several smaller projects
- Estimated cost = **\$6.9million**



Potential Improvement Projects

North Area:

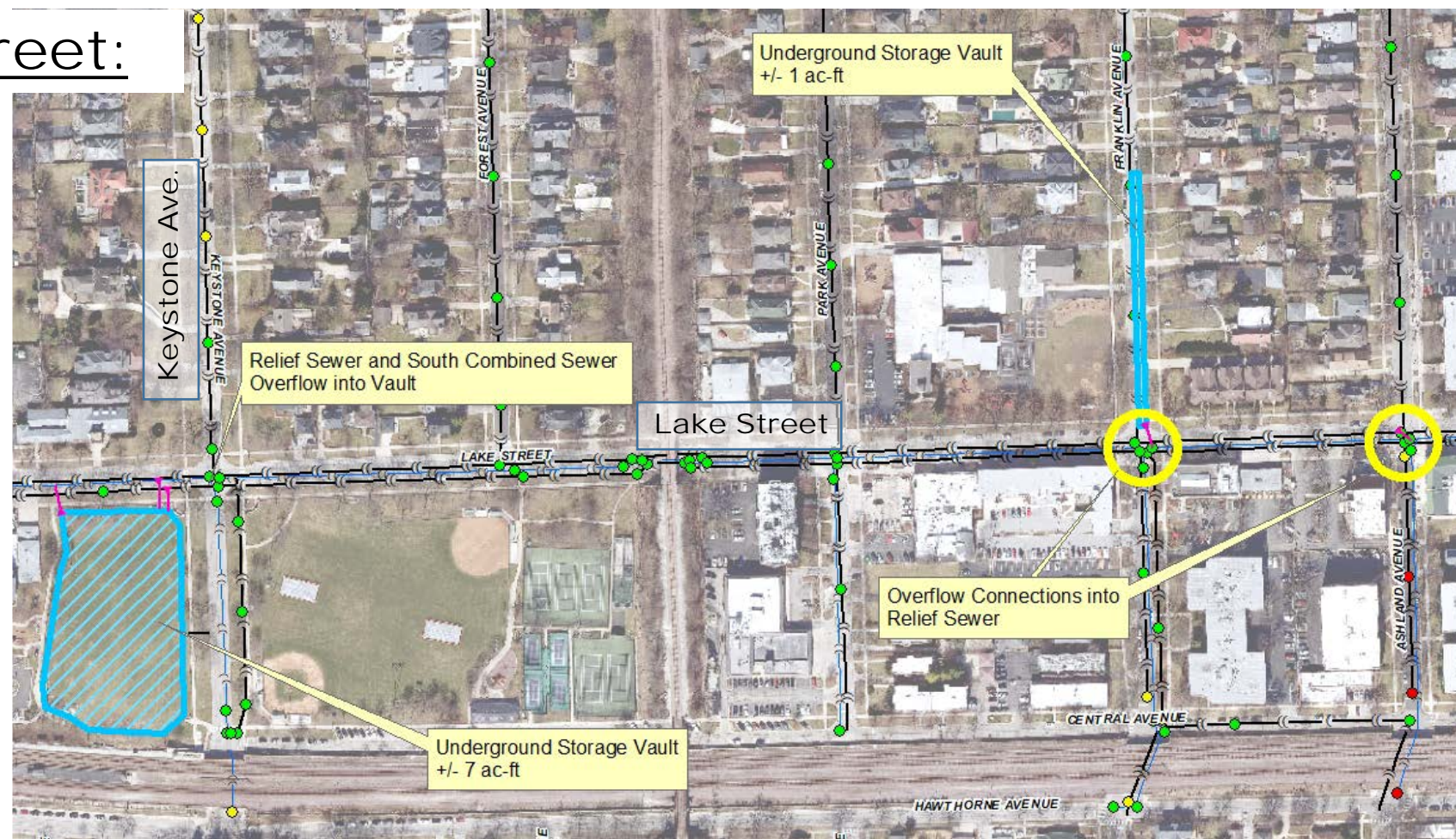
- Completion of Northside Separation Phase 2
- Would reduce flow to MWRD Interceptor, risk of flooding
- Estimated Cost = **\$11.4 million** (2022 costs)



Potential Improvement Projects

Central Area – Lake Street:

- Underground Storage Vaults in Keystone Park and Franklin Avenue
- Overflow connections to existing relief sewers
- Would achieve 10-yr LOP for areas in Lake Street system
- Estimated cost = **\$9.1 million**

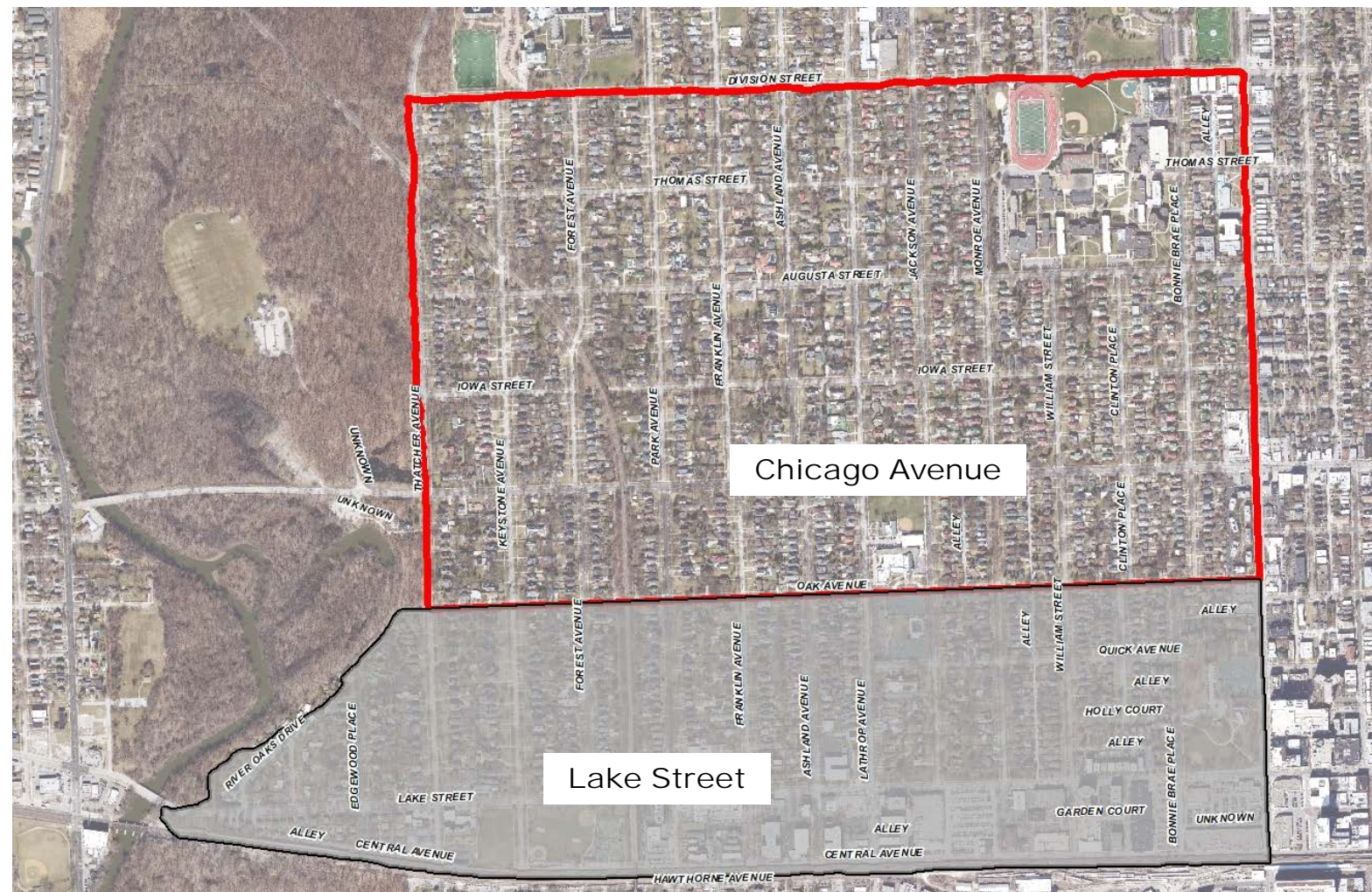


Potential Improvement Projects

CENTRAL AREA – CHICAGO AVENUE:

Very challenging area

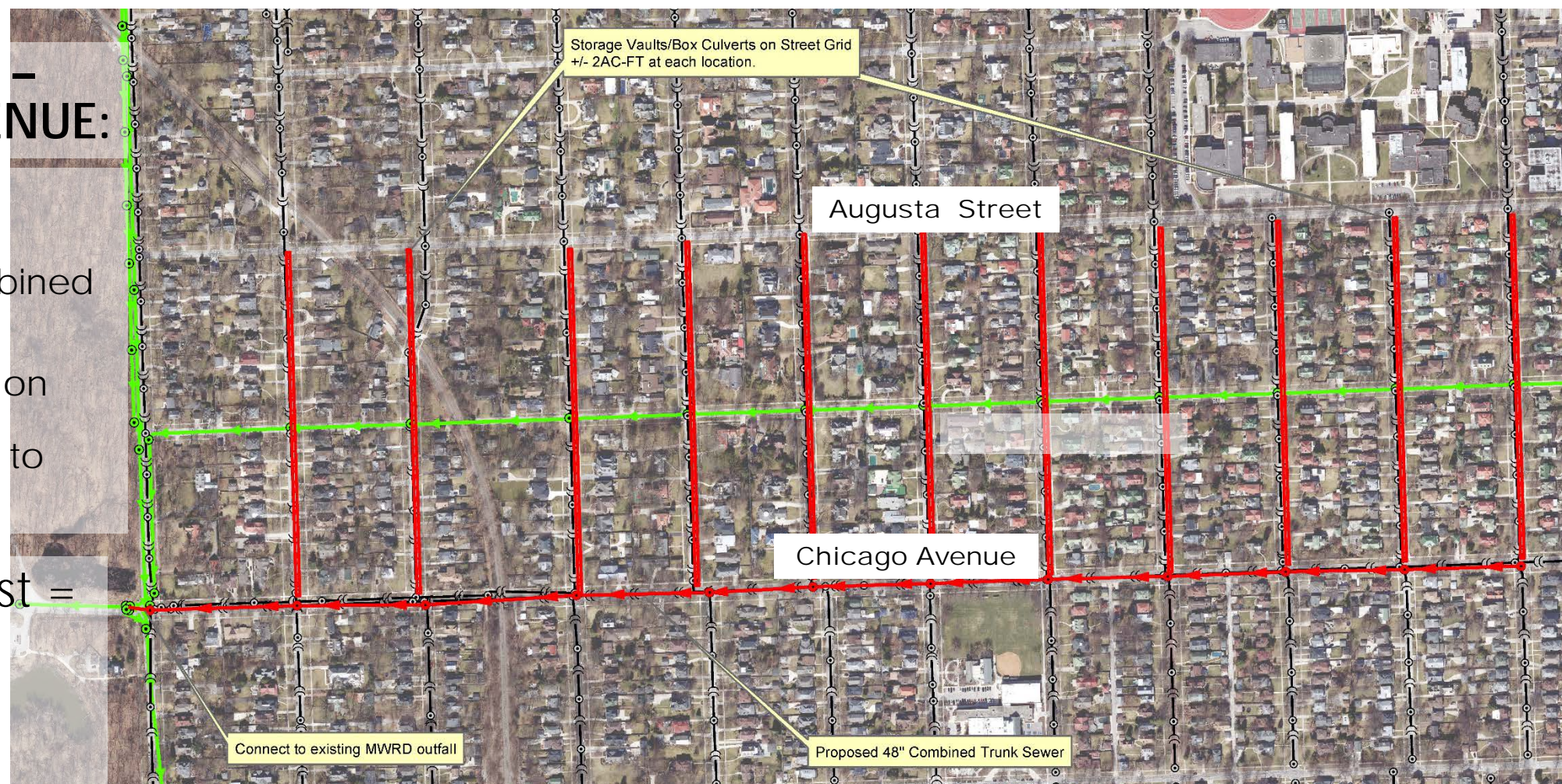
- Large drainage area
- Few open space opportunities
- Limited outfall capacity to MWRD
- Long distances for sewer separation



Potential Improvement Projects

CENTRAL AREA – CHICAGO AVENUE:

- Feasibility concept #1
 - Maintain combined sewers
 - Underground storage vaults on street grid
 - Maintain flows to MWRD system
- Estimated cost = **\$80 million** (2022 costs)



CENTRAL AREA – CHICAGO AVENUE:

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Next Steps

- Receive and incorporate any Council feedback
- Work on Administrative issues
 - Ordinance recommendations
 - Green Infrastructure analysis
 - Backflow prevention subsidy program
 - Staffing Level analysis
 - Other
- Study Completion

Questions?

