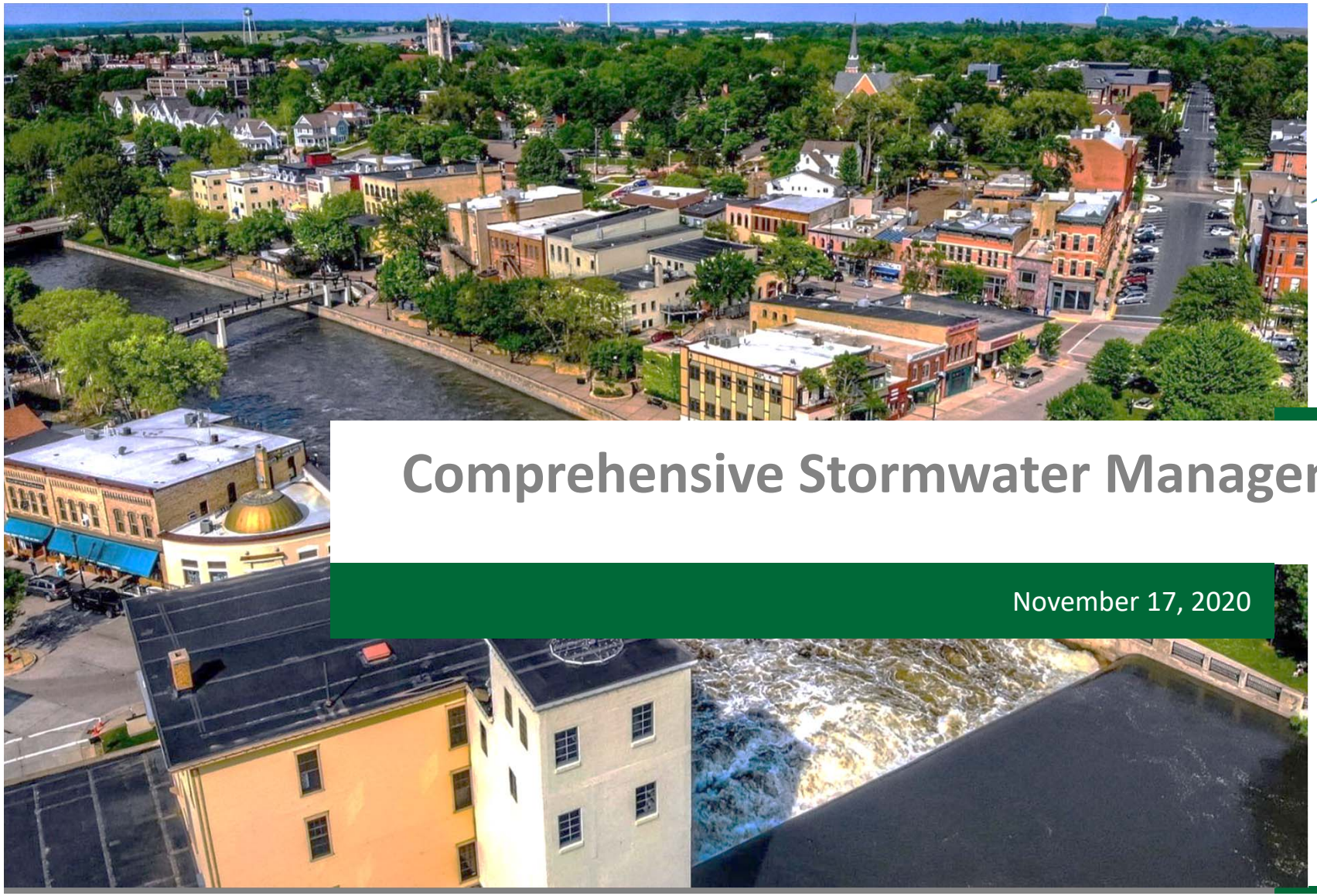

City Of Northfield Minnesota

Comprehensive Stormwater Management Plan

November 17, 2020

Stormwater Management Plan Goals

- Assess stormwater management system
  - Hydraulic modeling
  - Future urban expansion
  - Neighborhood and Lincoln Waterway assessments
- Effective plans evolve with the City
  - Expand/use model when conditions change
  - Capital improvement planning
- Framework for climate change resiliency and flood adaptation

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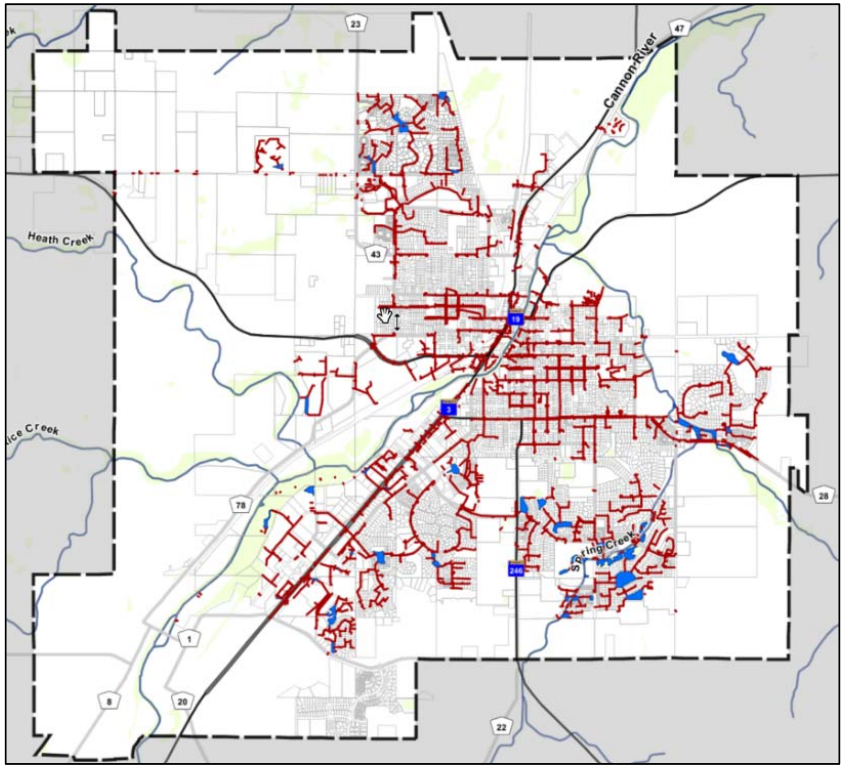
SWMP Components

- Background/introduction
- Current watershed and drainage conditions
- Future and proposed system improvements
- Neighborhood flooding assessments
- Lincoln Waterway assessment
- Climate adaptation, resiliency and funding



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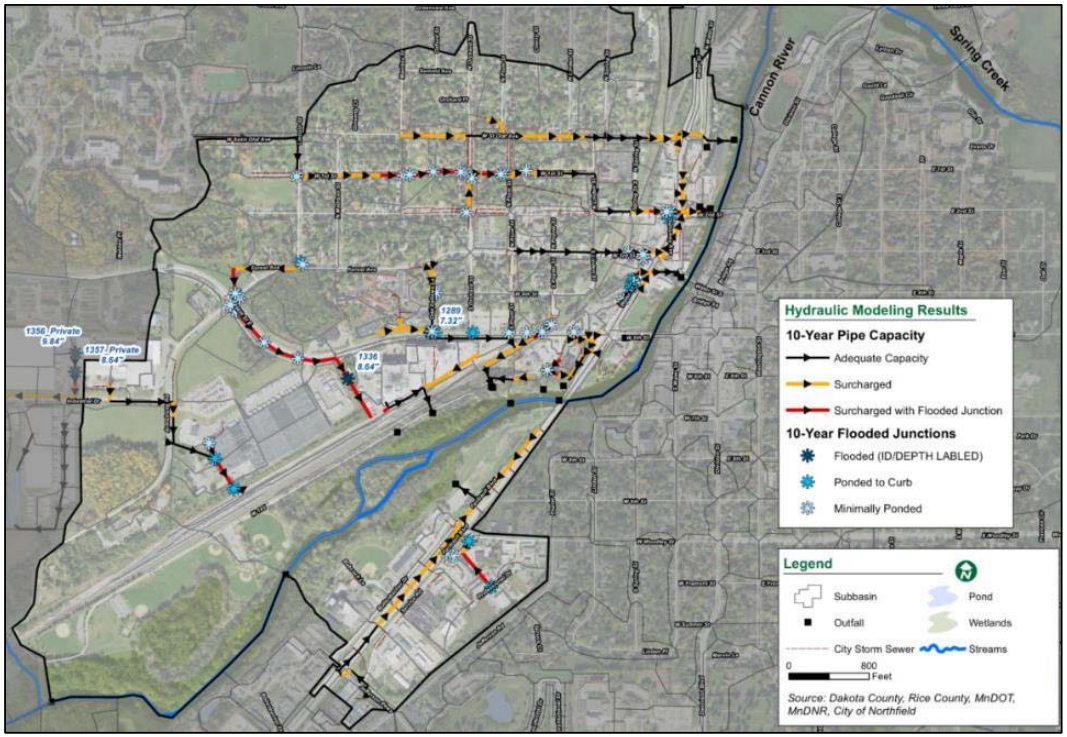
Current System – Pipe Size

- **Hydraulic model – 10-year Rainfall Event (4.2” in 24-hours)**
- **Classify pipes - capacity**
- **Classify structures – street ponding**

Conclusion:

- ***Current system generally accommodates the 10-year storm.***
- ***Flooded intersections not causing property damage.***



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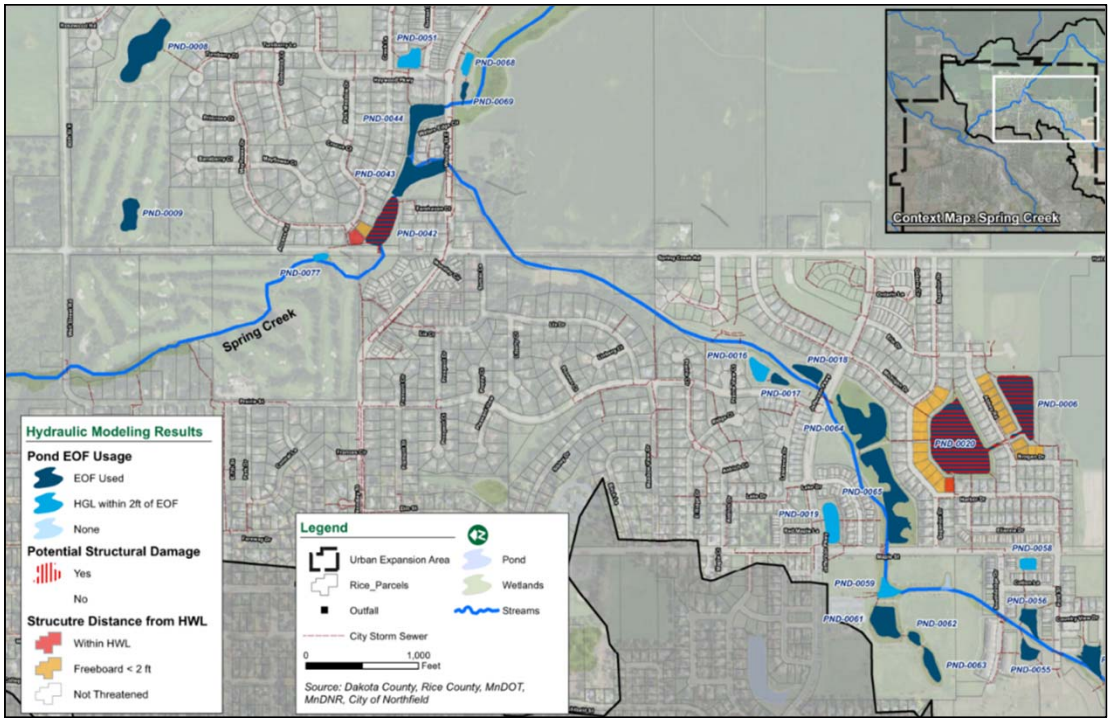
Current System – Ponds

- **Hydraulic model – 100-year Rainfall Event (7.3” in 24-hours)**
- **Classify ponds – peak elevation**
- **Classify properties – potential impacts**

Conclusion:

- ***Homes directly impacted – 2***
- ***Homes with limited freeboard - 41***



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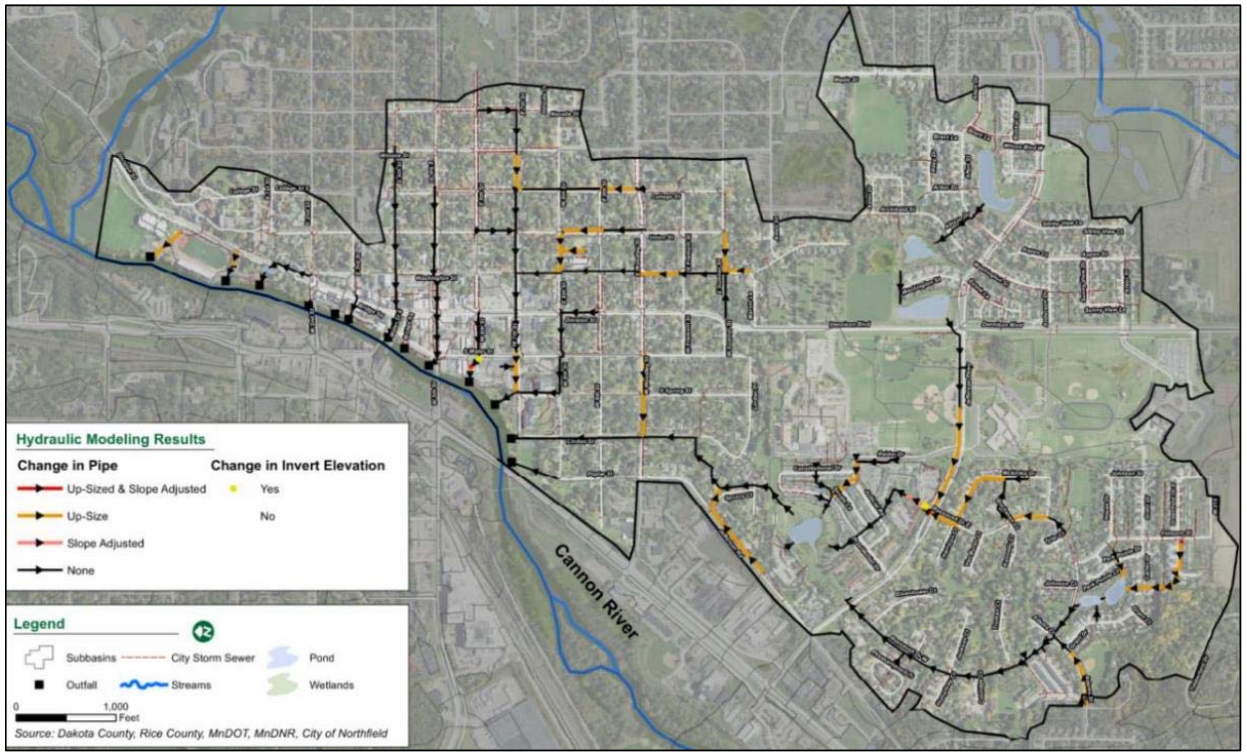
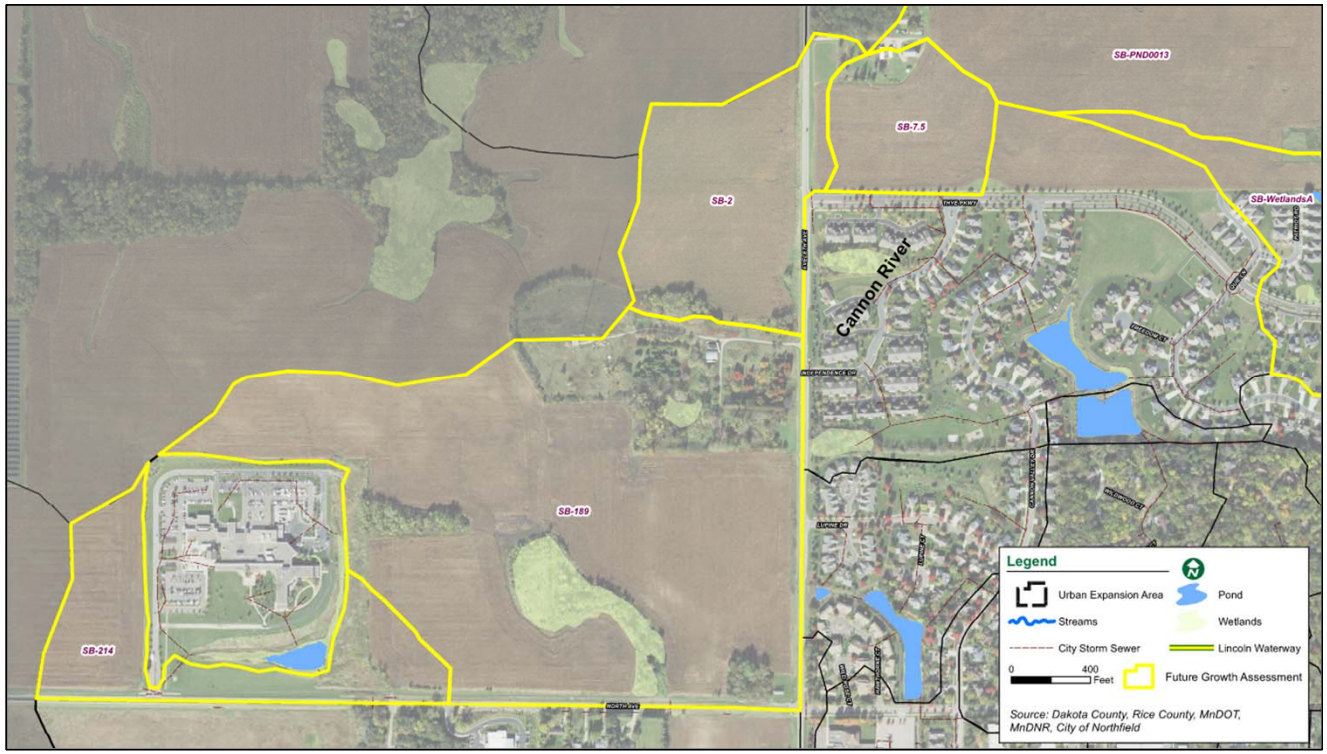
Proposed Improvements - Pipes

- **Use Hydraulic Modeling to:**
  - **Establish CIP projects**
  - **Identify pipes requiring upsize**
  - **Eliminate intersection flooding**
- **Improvement types include:**
  - **Upsize pipe and adjust slope**
  - **Upsize pipe**
  - **Adjust slope**
- ***Model should evolve with system changes***



Proposed Improvements – Future Ponding

- **Assess land use changes**
  - **2040 land use in Urban Expansion Area**
- **Compare runoff volumes**
  - **Predict increase in volume**
  - **Identify potential space needs for future ponding**
  - **Use to inform developers**



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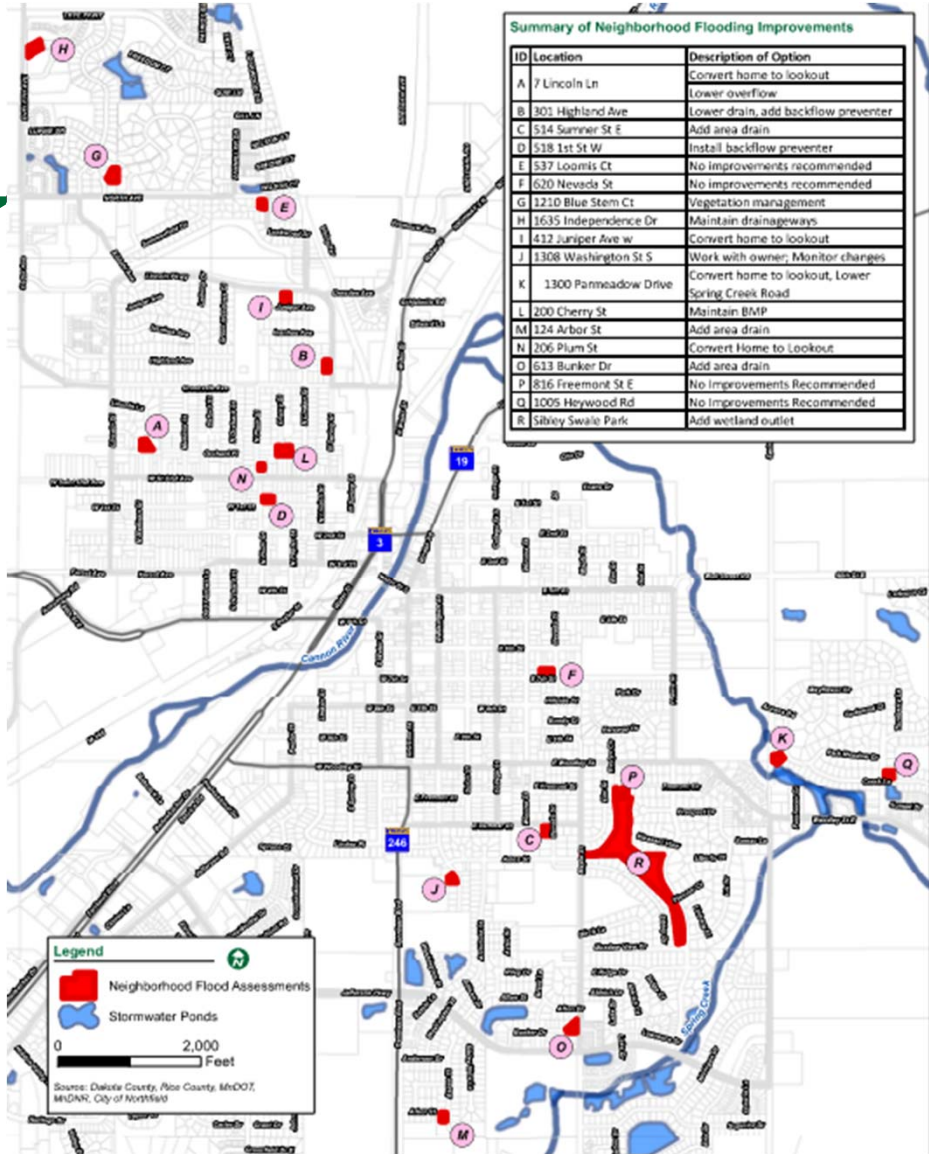
Neighborhood Assessments

- 18 total properties analyzed for flooding
- Properties surveyed for finished floor/overflow elevations
- Detail added to hydraulic model
- Determine improvements:
  - Drainage system (infrastructure)
  - Conversion from walk out to lookout
- Cost estimates for improvements



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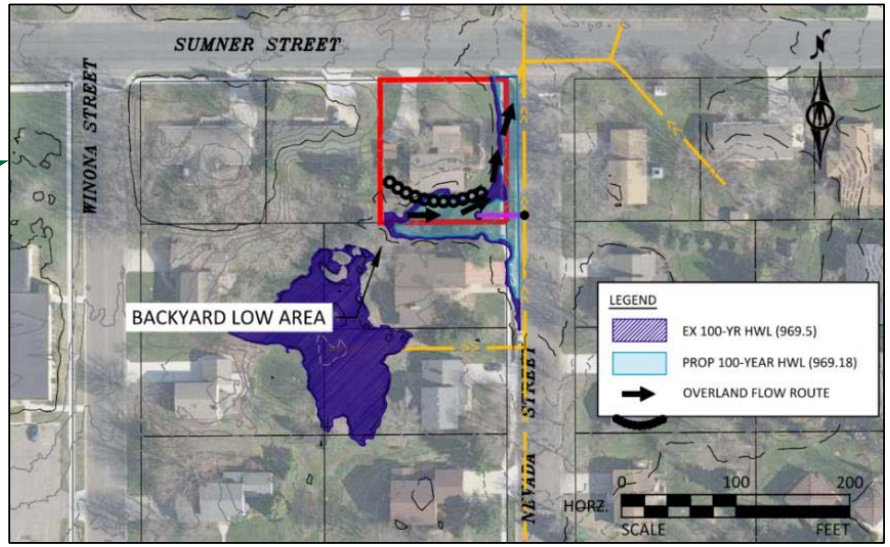
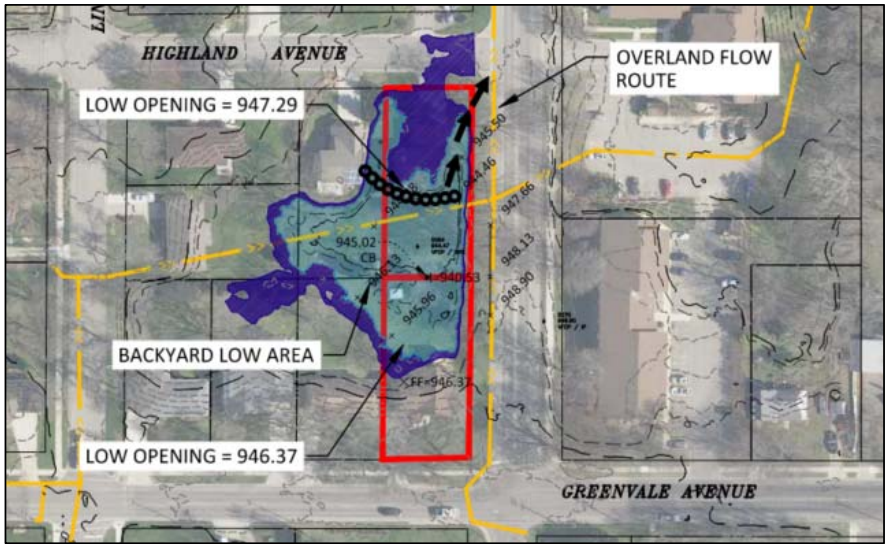
Neighborhood Assessments

Report ID	Location	Description of Option	Opinion of Probable Costs
A	7 Lincoln Ln	Convert Home to Lookout	$217,500
		Drain Improvement	$542,735
B	301 Highland Ave	Drain Improvement	$29,435
C	514 Sumner St E	Drain Improvement	$65,395
D	518 1st St W	Drain Improvement	$19,575
E	537 Loomis Ct	No Improvements Recommended	
F	620 Nevada St	Drain Improvement	$50,750
G	1210 Blue Stem Ct	Vegetation Management	
H	1635 Independence Dr	Maintain Drainageways	
I	412 Juniper Ave w	Convert Home to Lookout	$217,500
		Drain Improvement	$50,750
J	1308 Washington St S	Work with property owner; Monitor seasonal changes	
K	1300 Parmeadow Drive	Convert Home to Lookout	$217,500
		Lower spring Creek Road	$1,119,250
L	200 Cherry St	Maintain BMP	
M	124 Arbor St	Drain Improvement	$40,165
N	206 Plum St	Convert Home to Lookout	$217,500
O	613 Bunker Dr	Drain Improvement	$71,485
P	816 Freemont St E	No Improvements Recommended	
Q	1005 Heywood Rd	No Improvements Recommended	
R	Sibley Swale Park	Drain Improvement	$89,175





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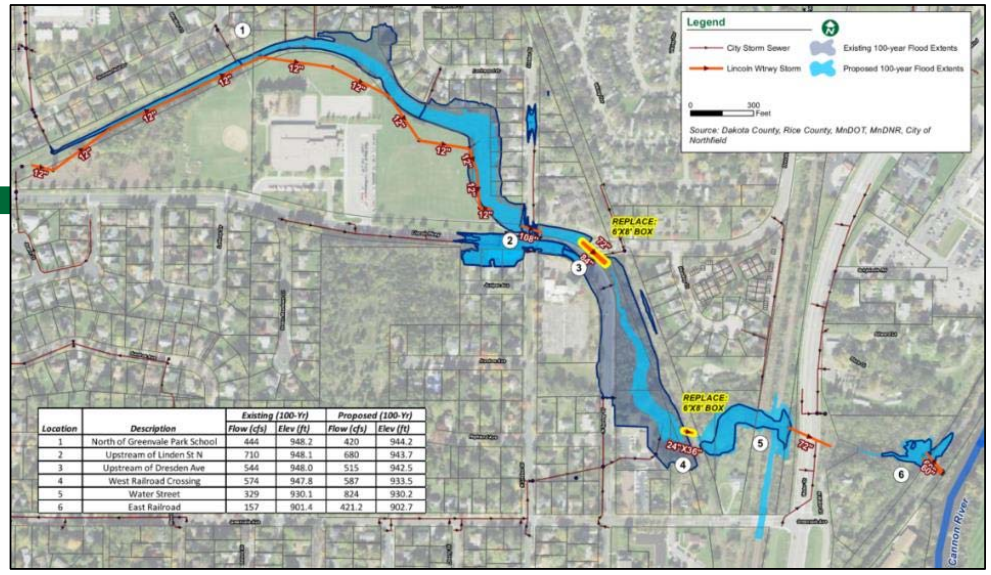
Lincoln Waterway Assessment

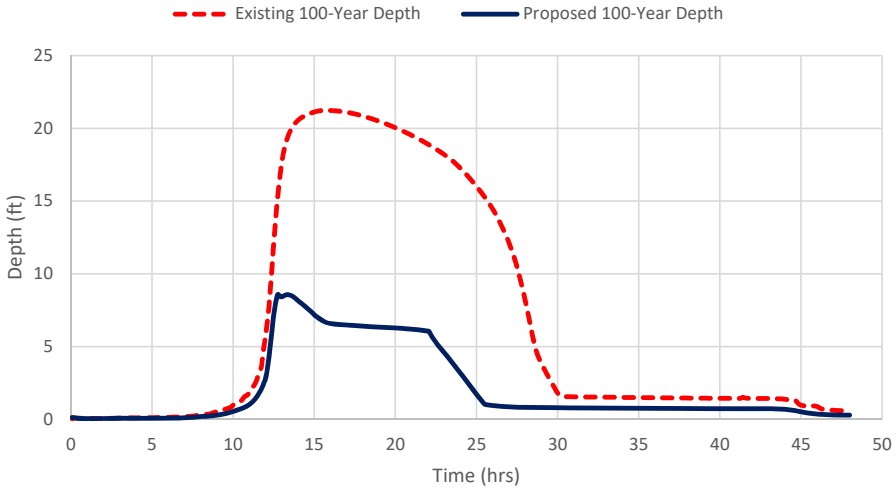
- **Known conveyance bottleneck at railroad**
- **Flood mitigation efforts:**
  - **Expand storage – not likely given space constraints**
  - **Reduce runoff in watershed – find locations upstream of waterway**
  - **Increase conveyance – increase discharge downstream**
- **Recommend upsize pipes between Linden and Hwy 3**

~ $450,000



Location	Description	Existing (100-Yr) Flow (cfs)	Existing (100-Yr) Elev (ft)	Proposed (100-Yr) Flow (cfs)	Proposed (100-Yr) Elev (ft)
1	North of Greenvale Park School	444	948.2	420	944.2
2	Upstream of Linden St N	710	948.1	680	943.7
3	Upstream of Dresden Ave	544	948.0	515	942.5
4	West Railroad Crossing	574	947.8	587	933.5
5	Water Street	329	930.1	824	930.2
6	East Railroad	157	901.4	421.2	902.7

Lincoln Waterway Assessment - West Railroad Crossing, 100-Year Depth



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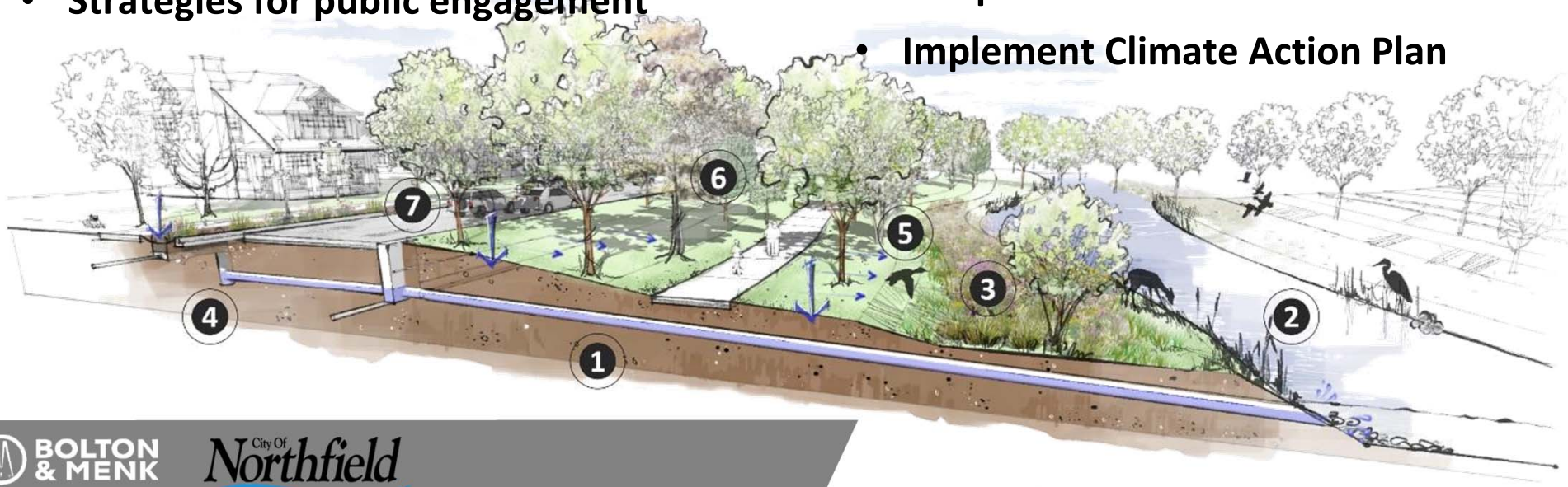
Climate Adaptation & Resiliency

- Assess larger rainfall events
- Critical EOFs and vehicle access
- Vegetation inventory and heat island
- Strategies for public engagement
- Encourage low impact development
- Assess open space planning
- Operations, maintenance and carbon footprint
- Implement Climate Action Plan



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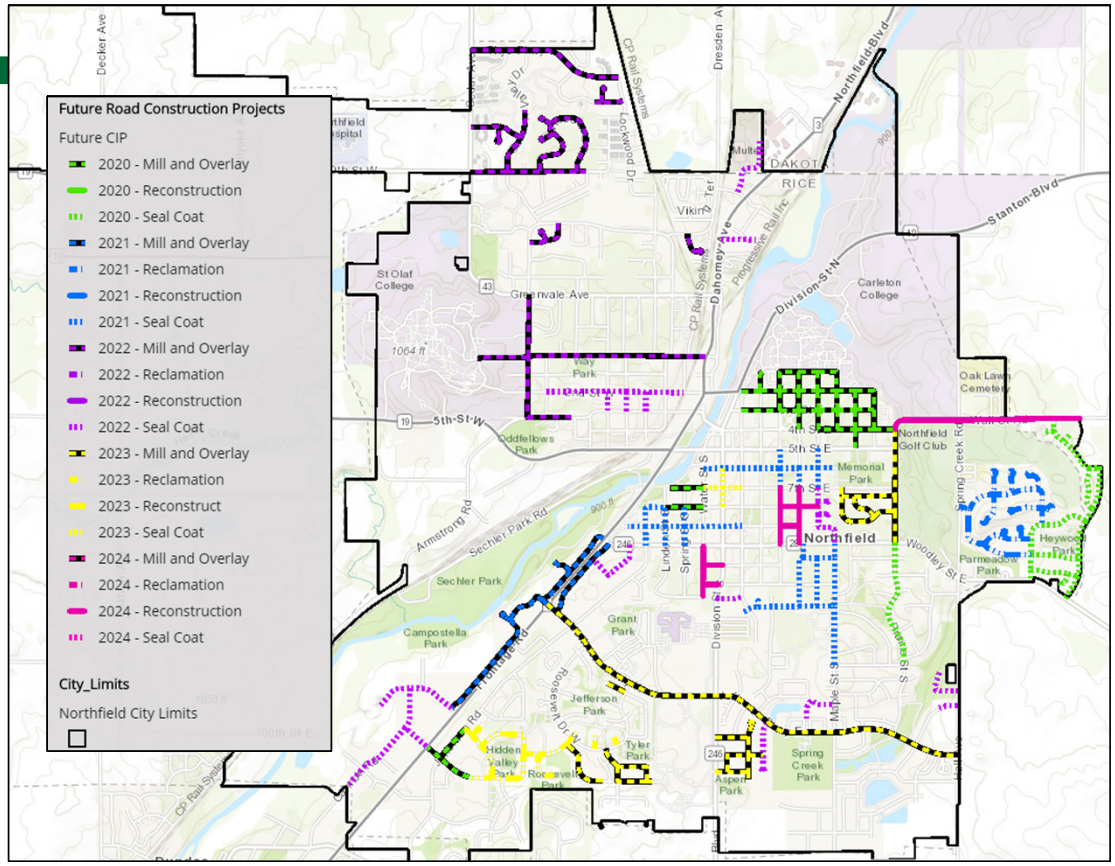
Next Steps

- Present study results to Environmental Quality Commission - November 18
- Present final report for Council Approval - December 1
- Align recommendations with CIP projects



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QUESTIONS?