

2017 ASFPM National Conference

Ladue, Missouri Stormwater Management Program

May 4th, 2017

Presented by: Josiah Holst, PE, CFM



City of Ladue, MO



- Located in St. Louis County
- Highest median income city in Missouri
- Population of ~10K
- Legacy of fine estates and large homes
- Fully developed
 - High levels of in-fill construction, aka “McMansions”

Who is the watershed authority?



- Metropolitan St. Louis Sewer District (MSD) is “umbrella” regulator



*St. Louis Area
Watersheds*

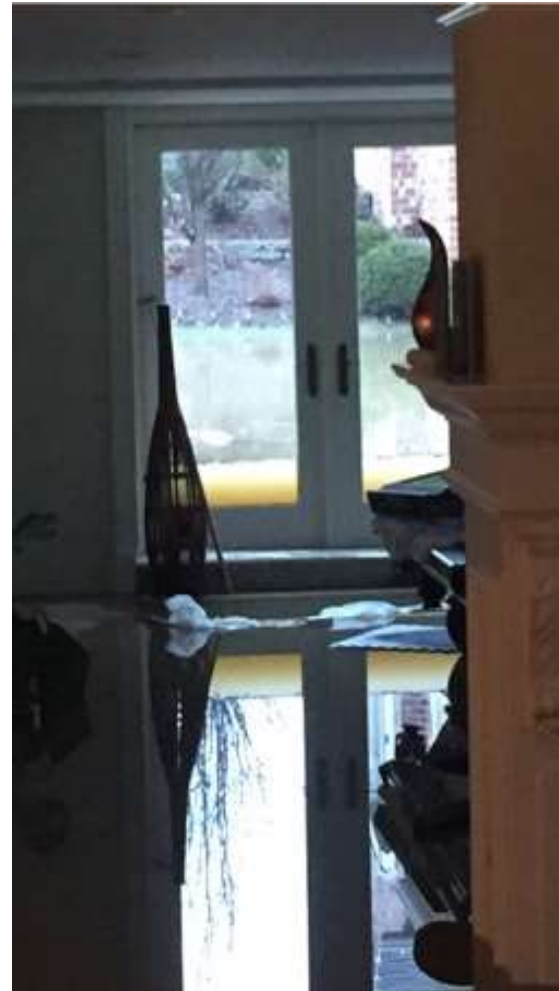
What is happening now (and in December 2015)?



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Why start a program?

1. Need is real
2. Residents support a program (1/2 cent sales tax)
3. City Leaders support a program, but...

Key Issues

Identify

- Where are the hot spots?
- Public vs. Private Property
- Right mix of projects
- How can we optimize solutions?

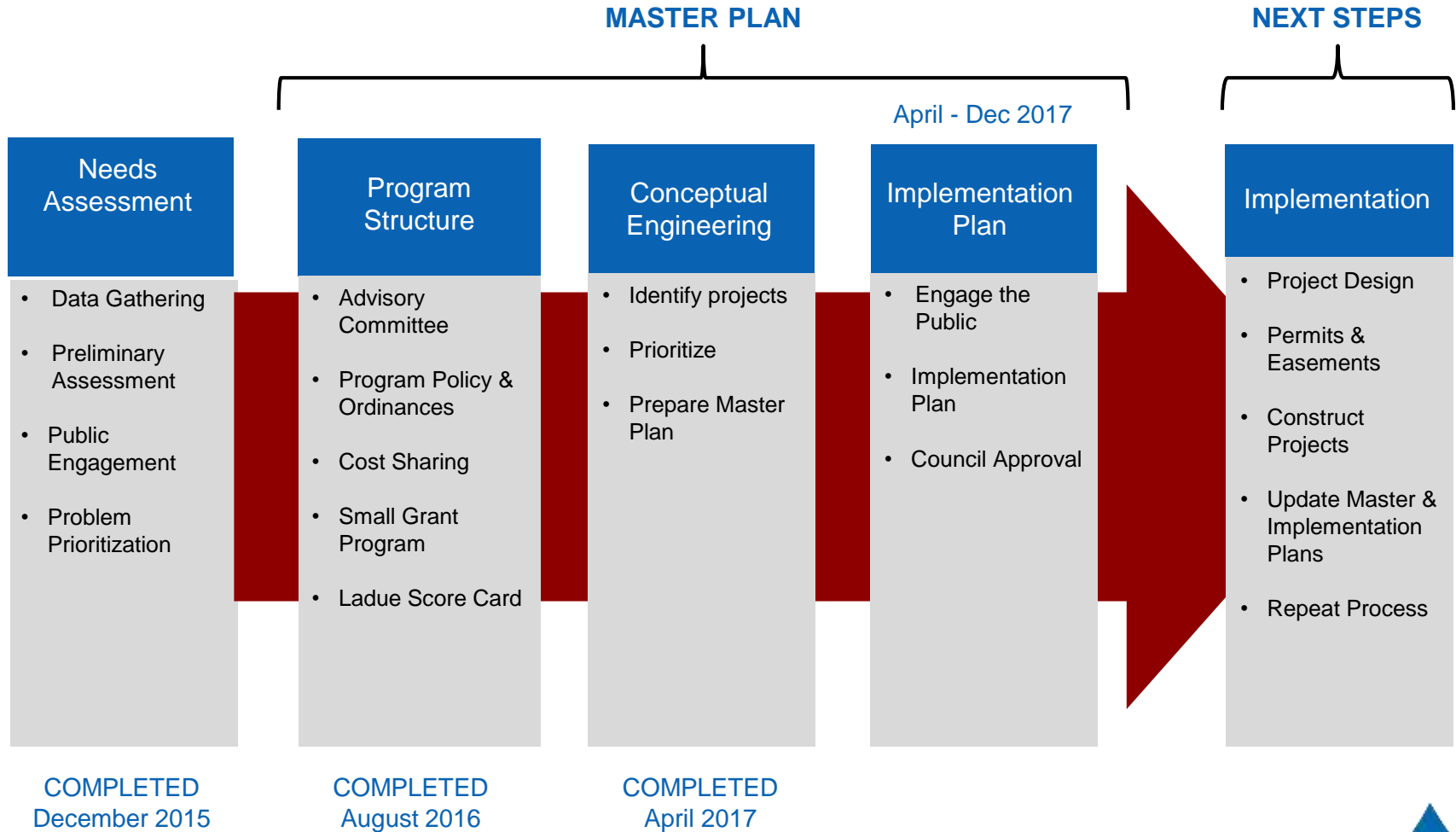
Prioritize

- Flooding Projects vs. Stream Projects
- What about water quality?
- Downstream impacts?

Implement

- Which projects are worth it?
- Maximize ROI

Program Timeline & Next Steps



Data Sources & Partners



Deer Creek Watershed Alliance

a project of  MISSOURI BOTANICAL GARDEN



FEMA



CITY OF
FRONTENAC



EAST-WEST GATEWAY
Council of Governments


USGS
science for a changing world


NRCS

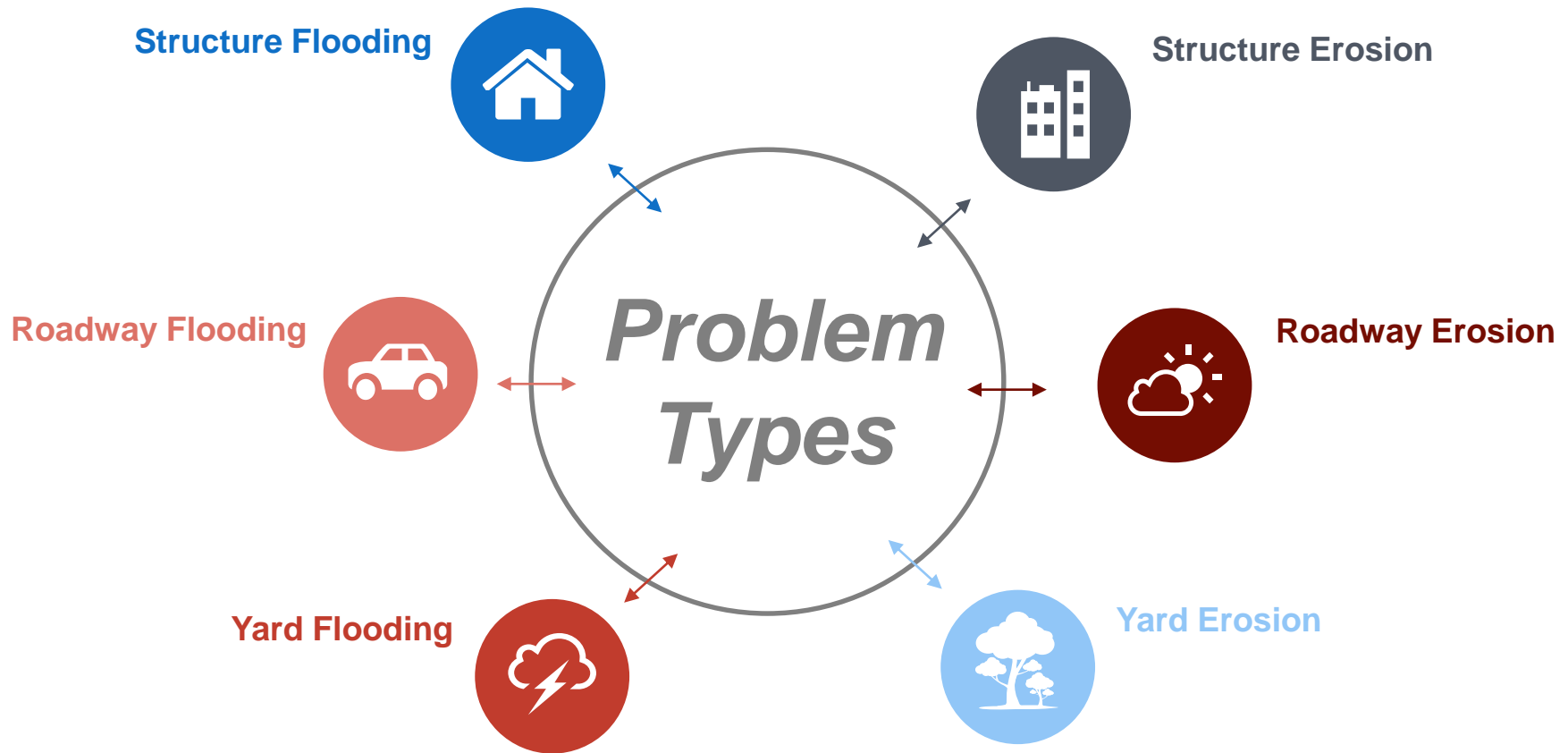


MIDLAND
GIS Solutions

MSDIS
Making
Missouri
Available
Digitally



What was assessed?



This is the model that MSD uses, allowing us to seamlessly integrate our program into theirs.



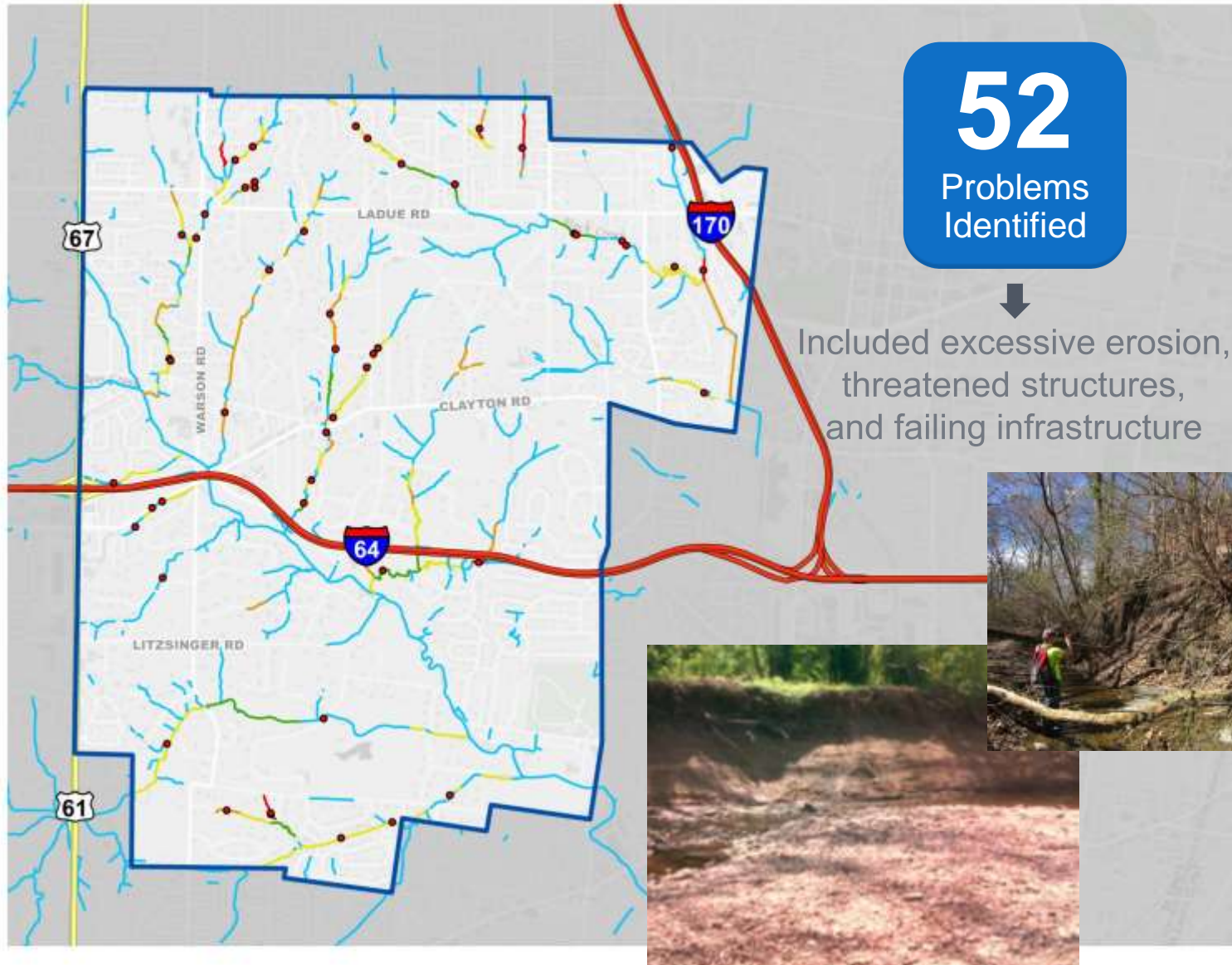
Stream Assessment



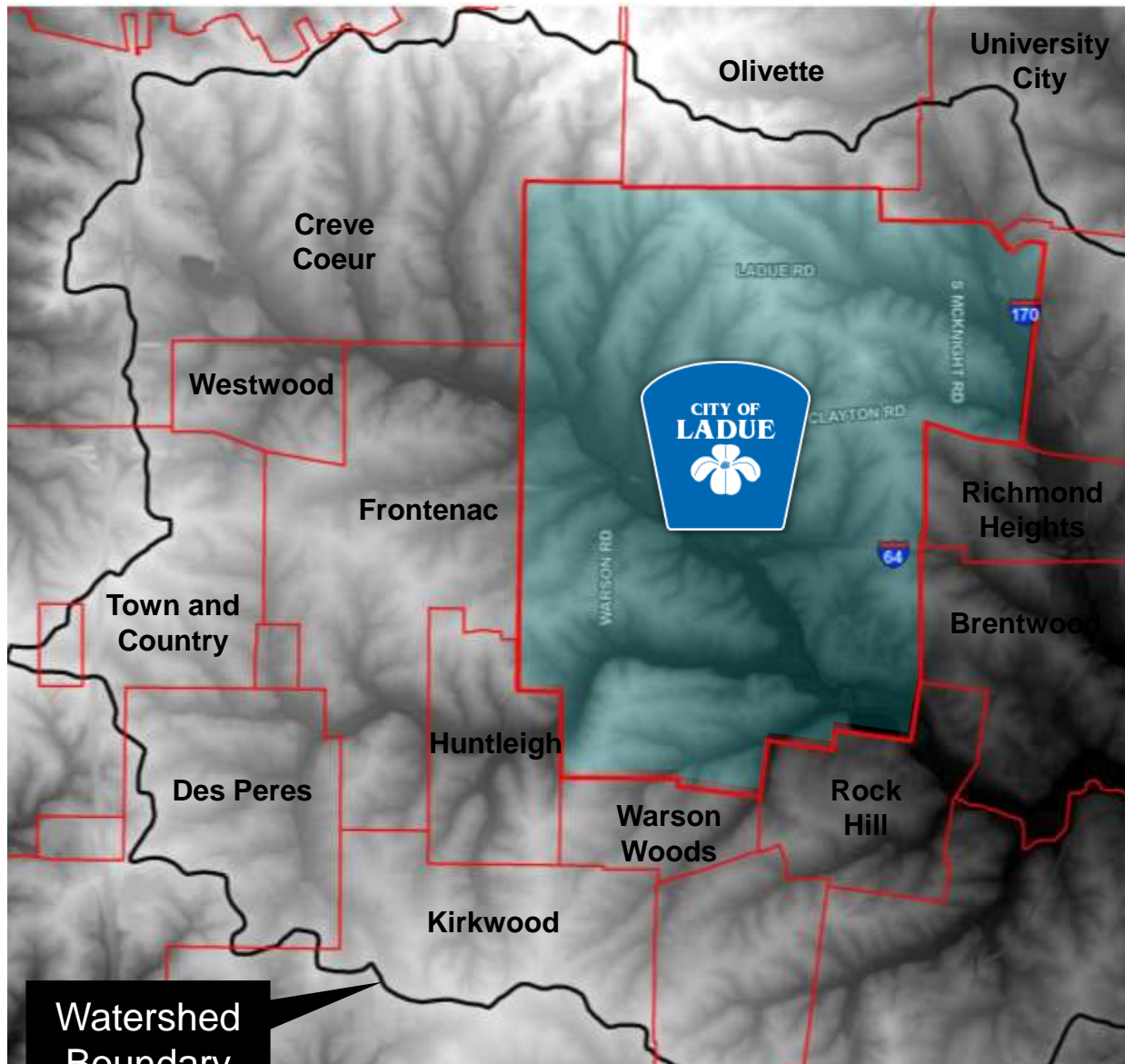
Stream Assessment Results



Stream Assessment Results



Deer Creek Watershed Limits



37

square miles
drained by the
Deer Creek
Watershed



21

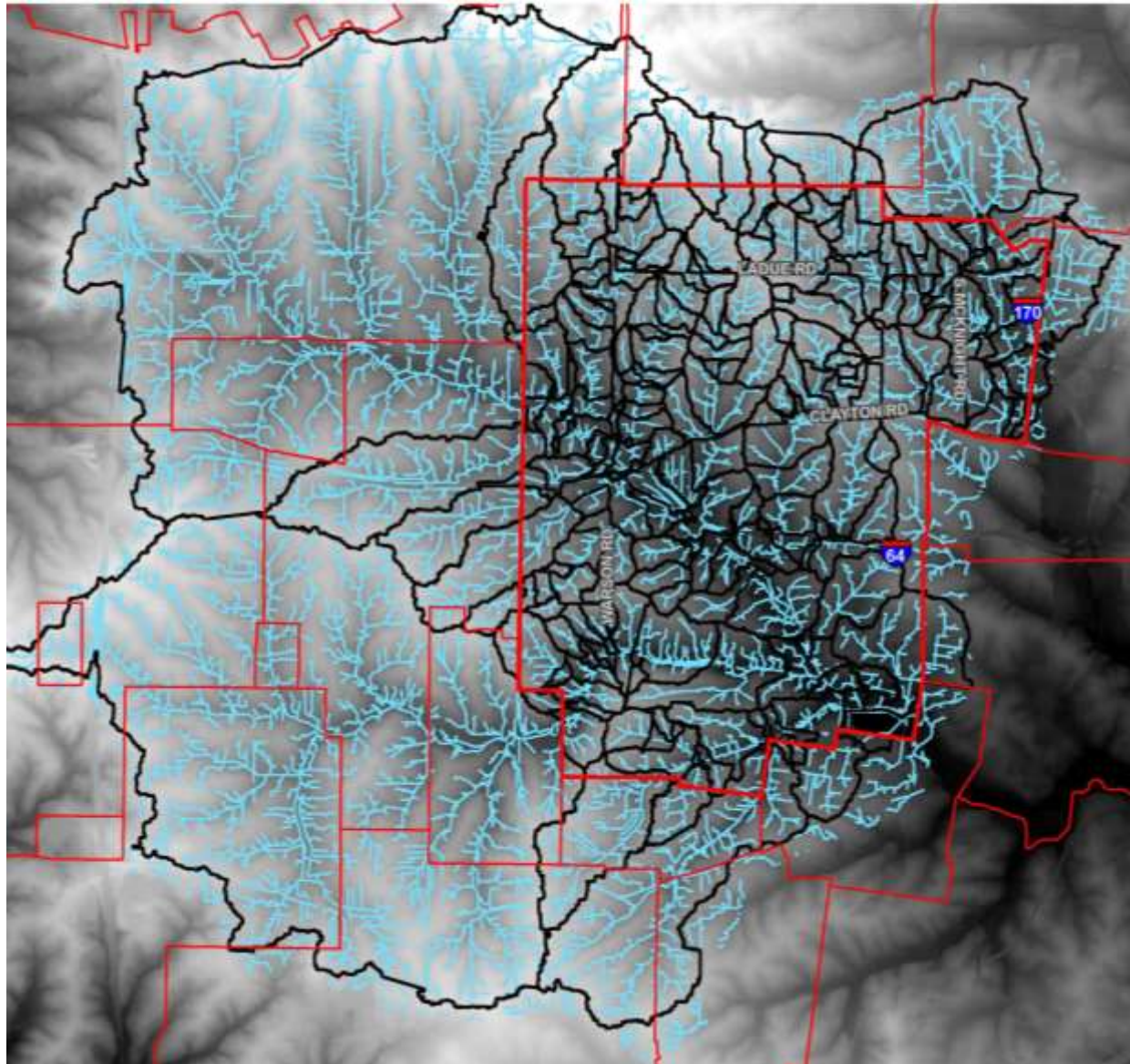
municipalities
included in the
Deer Creek
Watershed



100%

Ladue lies
completely
within the Deer
Creek
Watershed

Hydrologic Model



207

Number of individual drainage areas broken out of the overall watershed of the City of Ladue



25

Number of square miles of area that drain into the City of Ladue



467

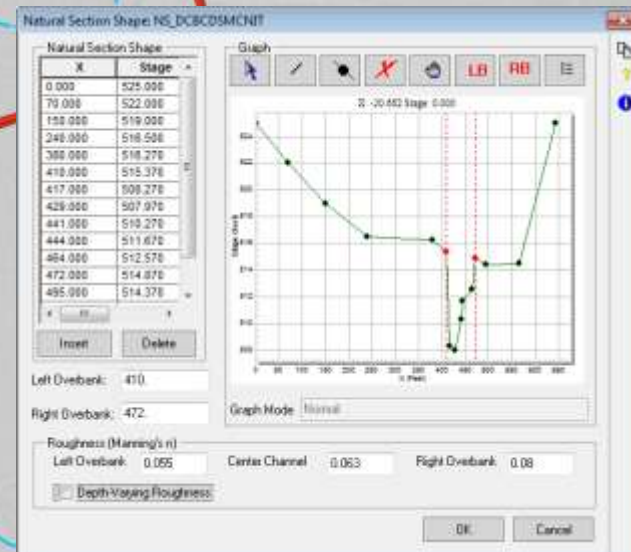
Number of miles of drainage lines created by HR Green in the modeling of the watersheds

Hydraulic Model

XPSWMM was used to model and analyze the hydraulics of the City's entire system

Links

Nodes



Engaging the Public

Project Website

#1 tool used to engage public and seek feedback. Very popular tool for the residents.



Project email

Over 130 emails were received or sent to this email address in addition to the other forms of communication available.



Phone

Many residents shared their concerns verbally over the phone to document problems.



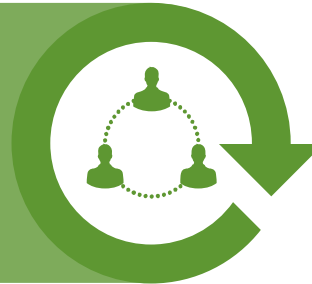
Open House Meetings

Over 100 residents met with our scientists and engineers to share information.



Dogwood Festival

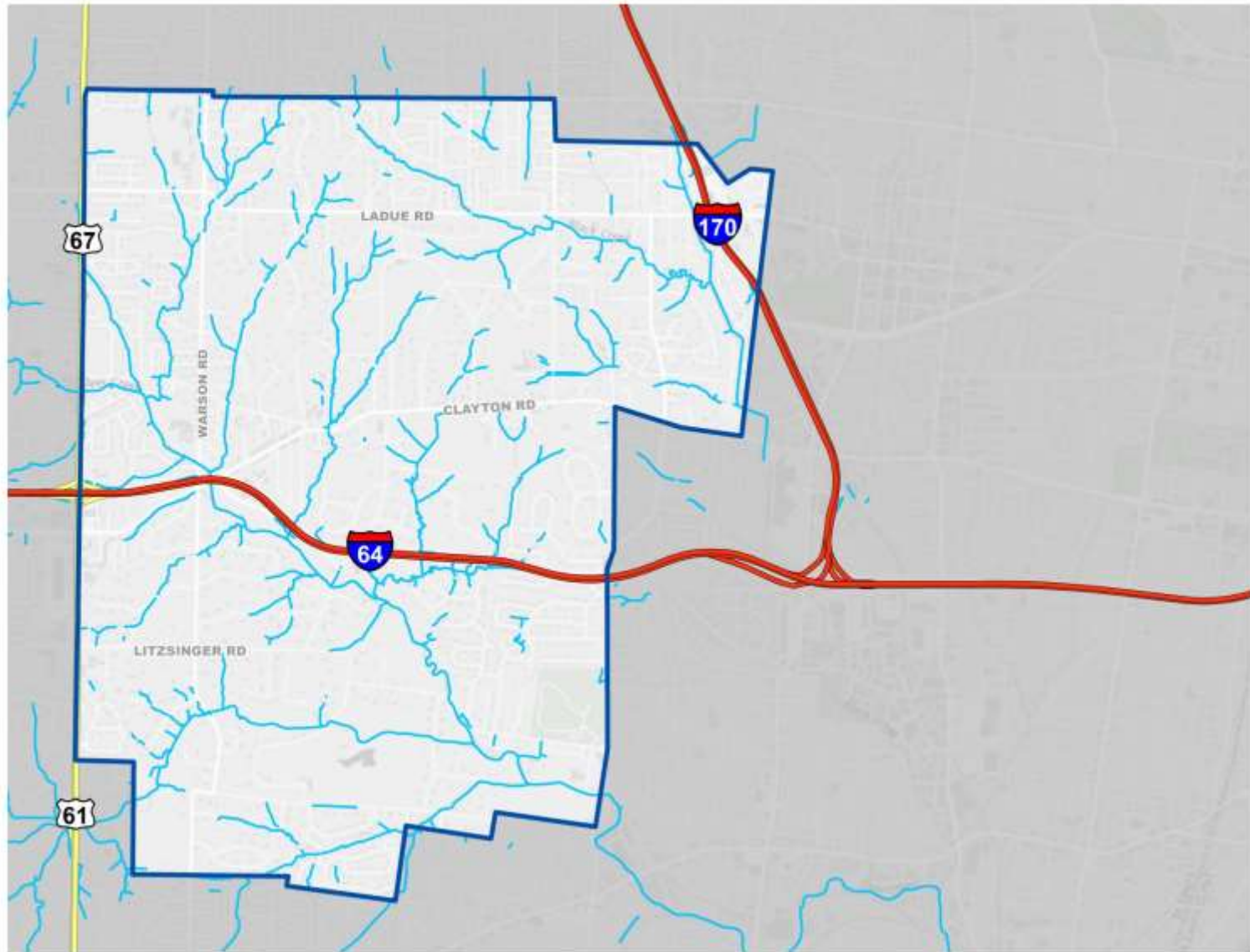
HR Green set up a booth at the Dogwood Festival to garner awareness for the program and the ways for residents to get involved.



Public Engagement

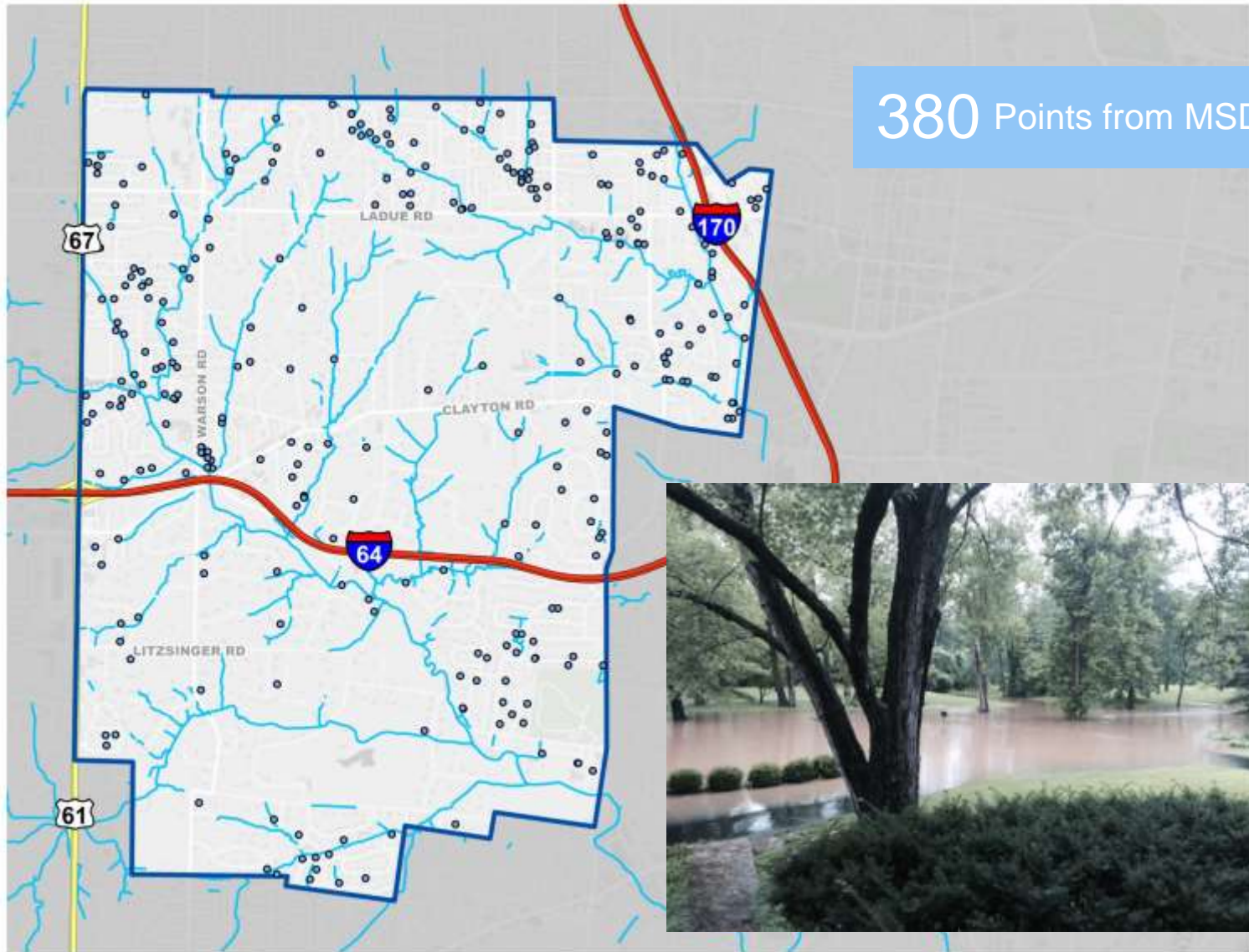
A variety tools and communication methods were used to invite the public to have their voice heard and their concerns documented.

Resident Concerns

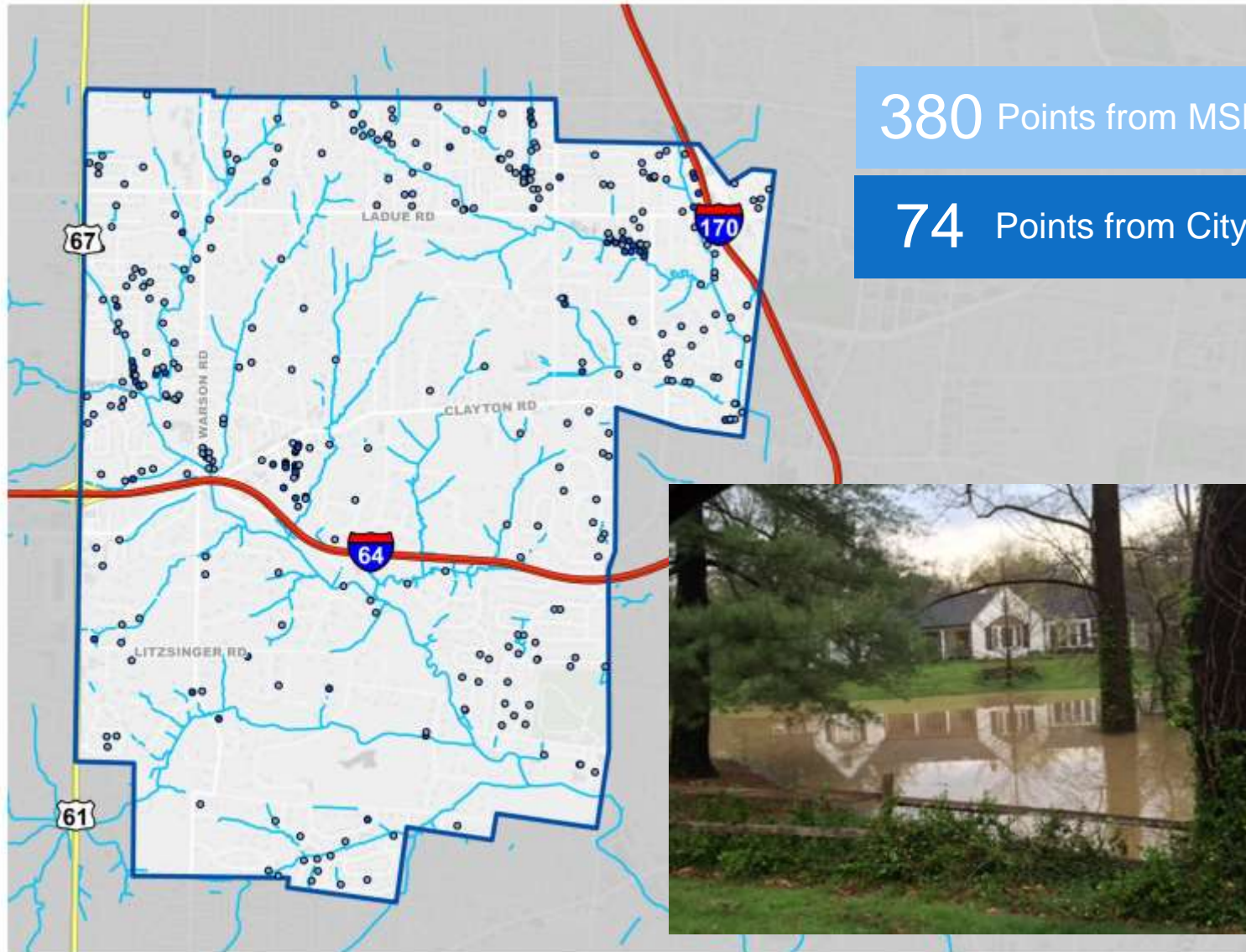


Resident Concerns

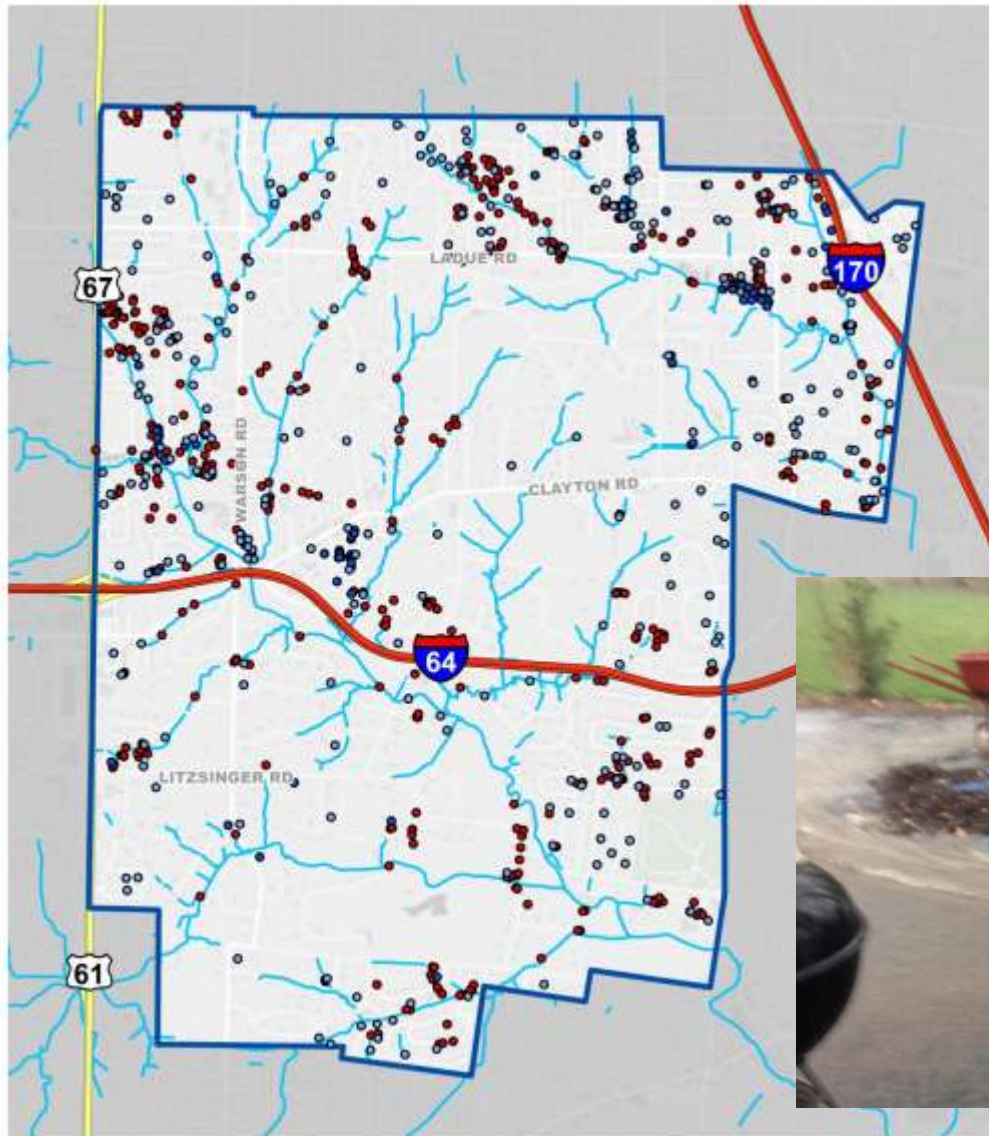
380 Points from MSD



Resident Concerns



Resident Concerns



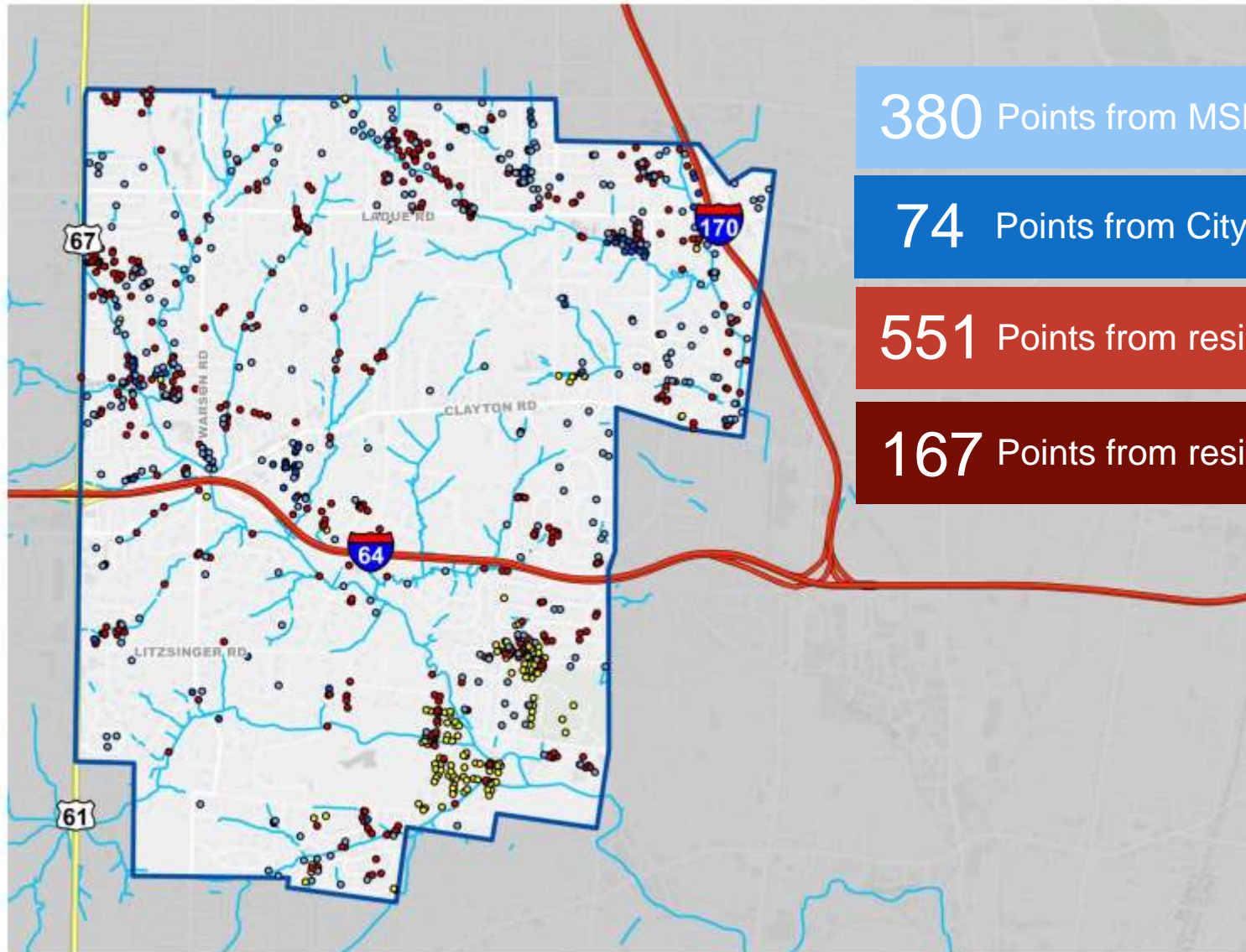
380 Points from MSD

74 Points from City

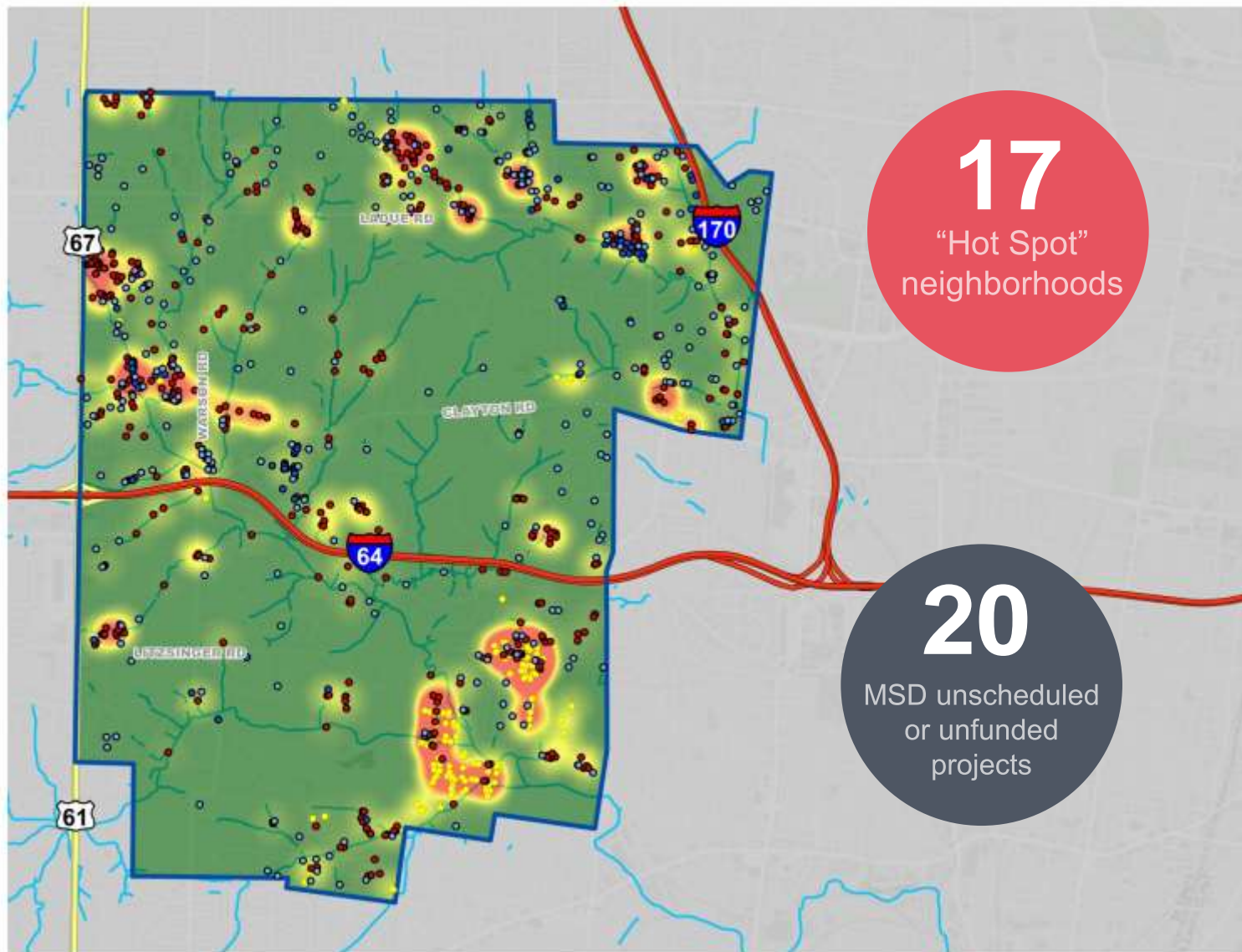
551 Points from residents



Resident Concerns

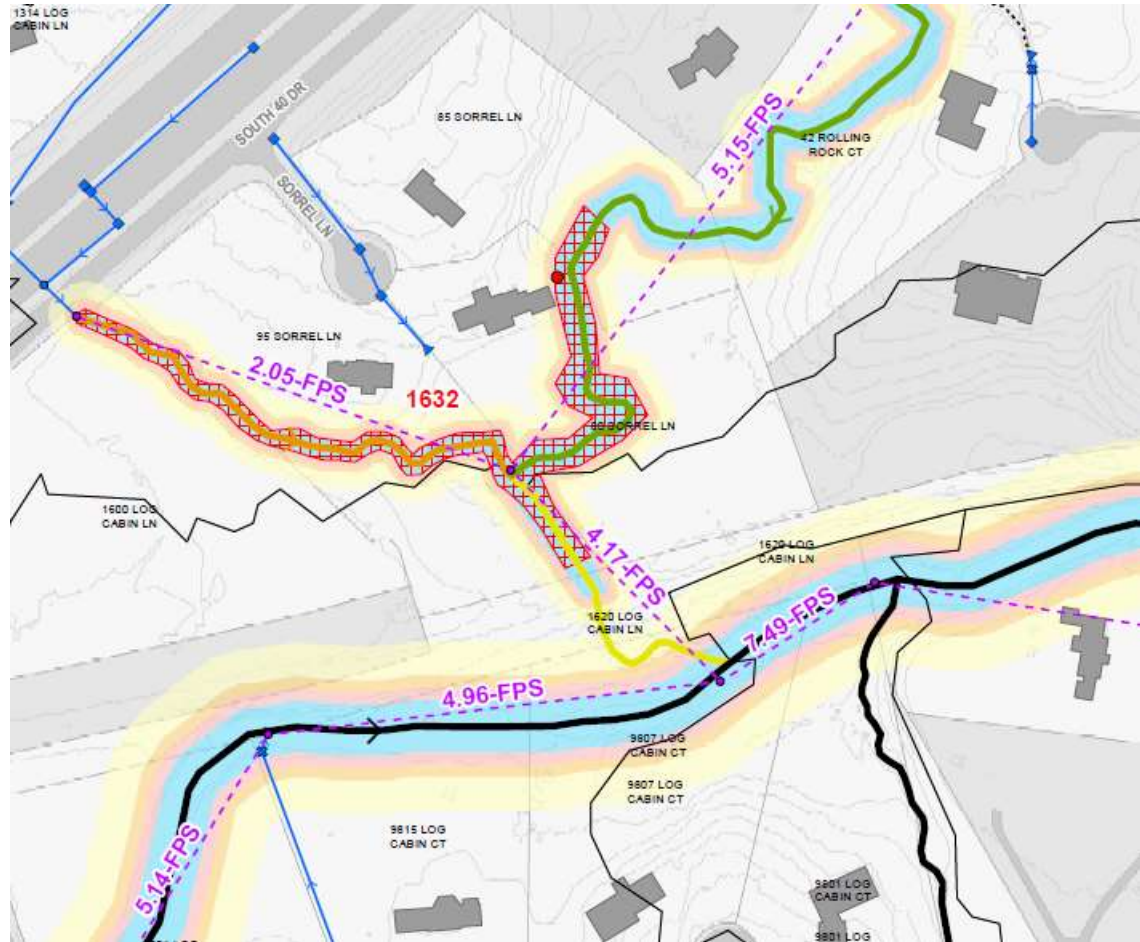


Heat Map

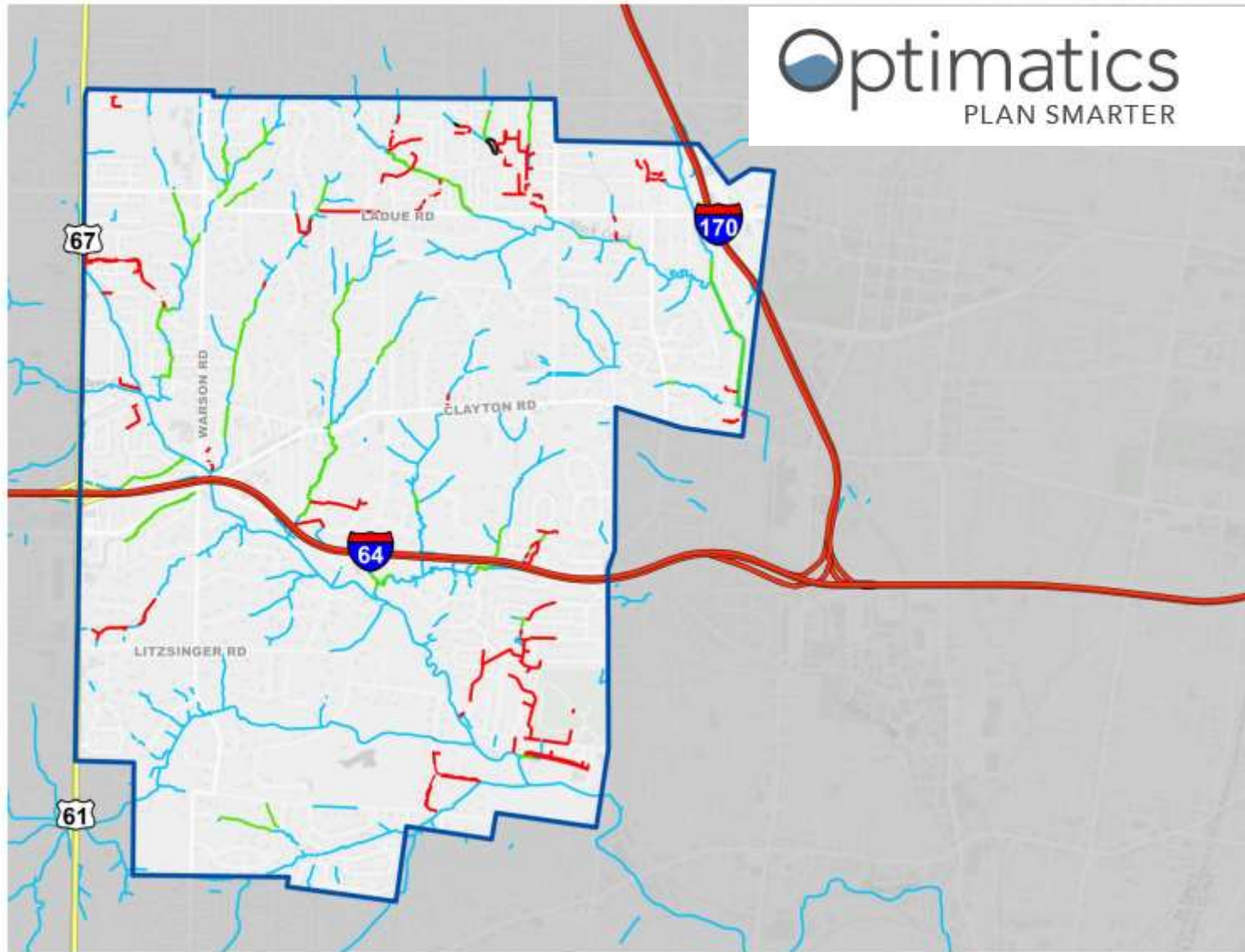


Stream Erosion Risk Zones

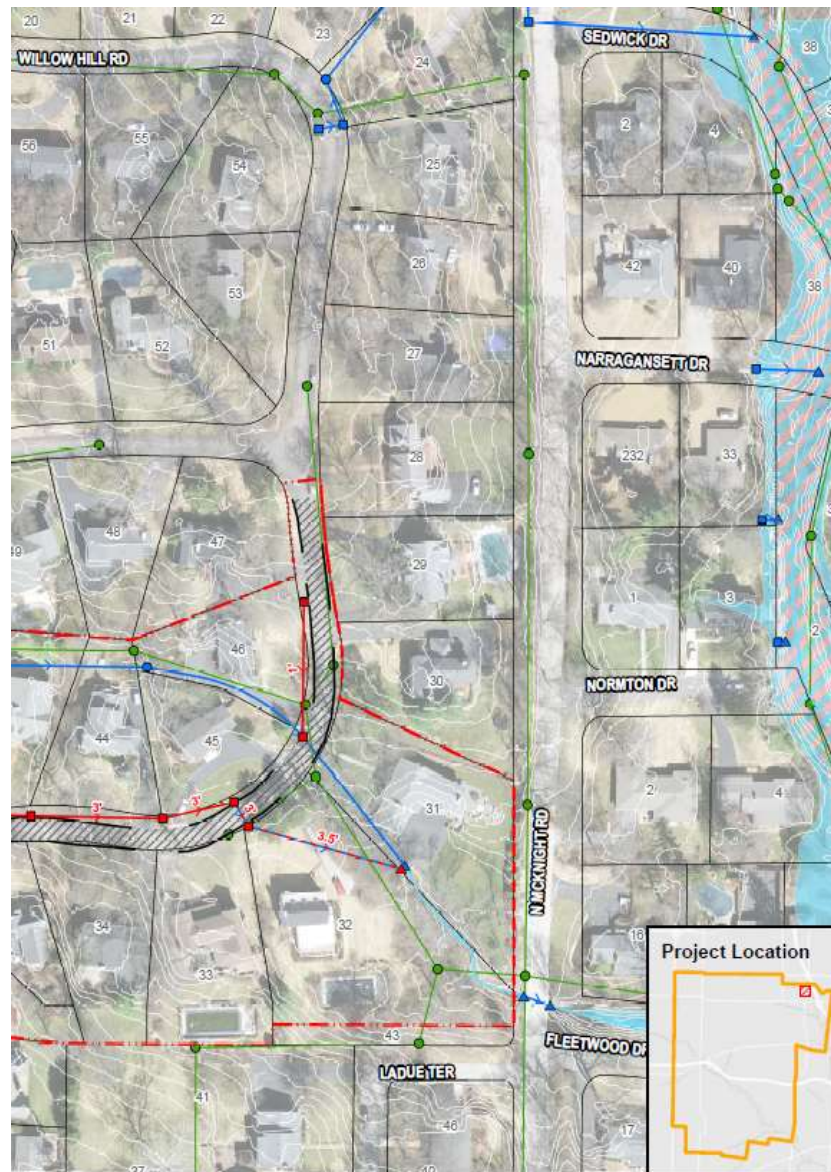
- Bank Height vs. Distance to Structure



Optimization of Flood Reduction Solutions



Projects



Legend

- 2-ft Contours
- City Boundary
- Parcels
- Approx. Drainage Path
- Proposed Improvements**
 - Stormwater Inlet
 - Stormwater Intake/Outfall
 - Curb
 - Stormwater Pipe
 - Replace Ex. Stormwater Line
 - Replace Road
 - Strip Map Limits
- Existing Stormwater Network**
 - Gravity Main
 - Inlet
 - Manhole
 - Intake/Outfall
- Existing Sanitary Network**
 - Gravity Main
 - Manhole
- FEMA Flood Zones**
 - Regulatory Floodway
 - 1.0% Annual Chance Flood Hazard

0 50 100
Feet
1 inch = 100 feet



Easements Required	18
Properties Benefited	15
Properties Impacted	18
Project Benefit Points	630.00
Conceptual Project Cost	\$1,497,974.06
Benefit to Cost Ratio	0.4200

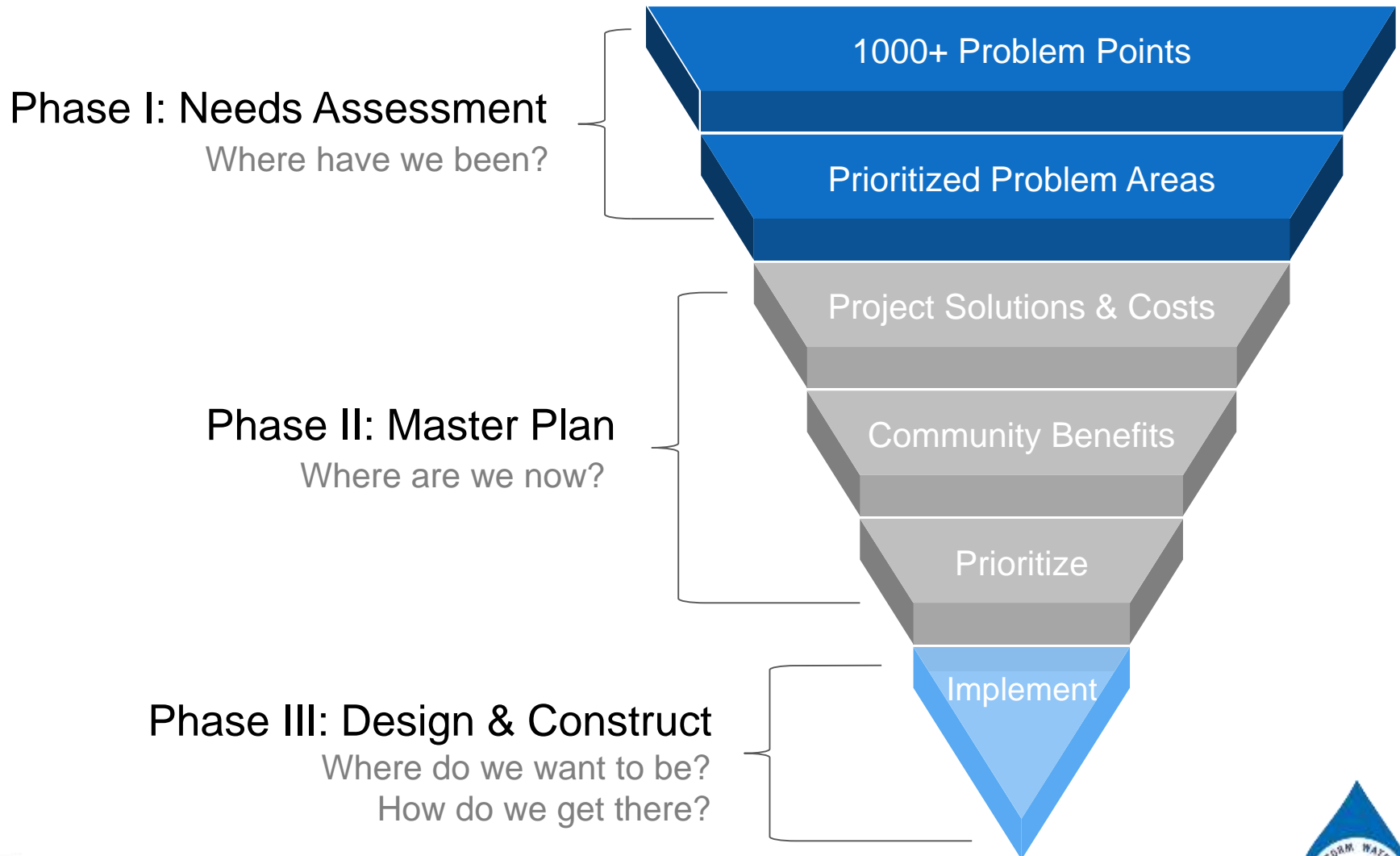
Problem Description

Yard, road, & structure flooding due to uncontrolled runoff & an inadequate storm system.

Proposed Solution Description

Extend the storm system west and reroute the main trunk along Willow Hill Road.

The Funnel Concept

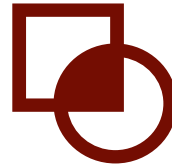


Implementation Goals



Sustainable

Tax generates \$1M / year; at this rate the program is funded



Share the Cost

Cost Share opportunities could exist with Deer Creek Watershed Alliance and the Public



Alleviating Stormwater Problems in Ladue

Flexibility

\$6/7M in reserves provides City flexibility



MSD as a Partner

Program is set up to align with MSD criteria; we will aggressively pursue MSD Cost Share Opportunities



Questions...

Josiah Holst, PE, CFM

jholst@hrgreen.com

636.812.4207

