Acknowledgements

Gary Moore - Planning Program Manager (MSD)
Karen Janson - Principal Engineer (MSD)
Don Davis - Engineer (MSD Operations)
Ethan Waters - Field Crew Supervisor (Ace Pipe)
Terry Adams - Field Crew Supervisor (ADS)
Ed Laux - Field Crew Supervisor (RJN)
Rob Segar - Civil Engineer (MSD)
Jeff Shiner - Civil Engineer (MSD)
Josh Hallsten - Modeler (Jacobs)
St. Louis MSD Today

- Fourth-largest sewer system in the United States
- Third-largest inland port
- 525 square miles
- 75-square-mile combined area
- 1.3 million people
- 9,460 total miles of sewers
- 68 Citysheds
Historic Dogtown
Est. 1853
Clayton/Tamm Neighborhood
History of Dogtown

Traditionally Irish
South of Forest Park
Origins of Name-Neighborhood was considered a small mining community as far back as mid-1800s

"dogtown" was a term widely used in the 1800s by miners to describe a group of shelters surrounding a mine.
Oakland Avenue Looking East

Louisville Avenue Looking South
New Tamm Bridge over I-64
Turtle Park
Demolition of Forest Park Hospital for Zoo Expansion
Approximately 140 acres that includes I-64 drainage. Located just south of and drains through the St. Louis Zoo and historic Forest Park. Sewer infrastructure designed utilizing standards of 1890-1930. Hydrologic techniques utilized limited rainfall analysis.
The Metropolitan St. Louis Sewer District

OAKLAND WATERSHED
educated and organized owners

• created e-mail address
• created Facebook page
• distributed flyers
• contacted MSD and local elected officials
• multiple news reports aired on local TV and several articles appeared in local newspapers.
The Metropolitan St. Louis Sewer District
Offer backflow preventers in hardest hit areas.

- Fourteen homes equipped by July 1.
- Twelve additional homes approved by MSD awaiting homeowner participation.

Schedule CCTV/Cleaning

Prioritize resources to begin engineering study

- Planning Consultant
- Radar Rainfall Vendor
- I/I Consultant
- Flow Metering Program
- CCTV Vendor
Assess Engineering Study Needs

Hydraulic grade line on neighborhood streets

- Catchments specific to a single reach
- Include all known public manholes, sewers, and connections

- Separate roof connections from house laterals
- Extrapolate/scale to infrequent storms
- Analyze impact on downstream collection system
Constructing the Hydrologic Model

Detailed impervious area shapefile (sidewalks, rooftops, streets, etc.)

2-ft contours

Seventy catchments representing 360 acres were delineated using GIS software – Forty-four drainage catchments and 26 rooftop catchments – Fifty catchments representing 80 acres south of I-64
Constructing the Hydraulic Model

- All reaches and manholes surveyed and included in the model
- Record drawings, where available
- Manhole inspections to identify pipe material, shapes, sizes, and connectivity
- CCTV data to determine pipe condition and confirm other pipe parameters and diversions
To 48-inch circular sewer

To Wells Drive
Model Calibration

Radar rainfall provided 2 "fixed gages"

Eight flow meter locations beginning July 2010

- four south of I-64
- four north of I-64

Data collected by MSD and provided online and instantly available in raw format

Continuous simulation from July through September
Alley behind Graham Avenue

Oakland → Alley behind Graham Avenue
Identify Solutions

- Sewer separations
- Detention/Storage
- Increase conveyance capacity (parallel and/or replacement)
- Property buyouts
- Green infrastructure
- Re-development
- Educate property owners and building tenants
Easy Solutions

Yeah, Right!

Resistance to immediate impact items offered:

– Removal of rooftop connections may lead to water overflow sidewalks causing slip hazard

– Rain barrels offered limited storage capacity

– Liability/maintenance issues with backflow preventers.

Educate property owners and tenants
More than 150 unique simulations performed over an eight-month period. Most promising solutions involved combinations of projects but still didn’t provide 20-year level of service (MSD standard for combined sewers). Analysis continues with recent demolition of Forest Park Hospital.
Dewey International

New bioswales
New rain gardens
Expanded landscape areas
New mature trees
New learning garden with greenhouse
New vegetated swale to existing inlet
New vegetation to cover retaining wall
Quickly and efficiently deployed resources…

Don’t equate to easy solutions

Help to understand problem in cost-effective manner

Allow for timely response to and education of affected persons

Provide flexibility for MSD to program capital projects