... City of Ladue’s stormwater management program

2016 Annual Conference
Illinois Association for Floodplain and Stormwater Management Conference
March 9th, 2016
... who are we?

Today’s Presenters
1. City of Ladue Description
2. Quick Review of Program
3. What did we learn from Phase I?
   a. Data Gathering
   b. Preliminary Assessment
   c. Public Engagement
   d. Problem Prioritization
4. What can / should we do next?
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”
Metropolitan St. Louis Sewer District (MSD) is “umbrella” regulator with almost NO FUNDING for stormwater

- Primary MS4 Permit Holder
- 59 Co-Permittees
... what happened in December 2015?
... what happened in December 2015?
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... what happened in December 2015?
Funded by a ½ cent Stormwater Sales Tax, the goals of the Storm Water Management Program are:

**Phase I**
- Identify storm water infrastructure problems
- Confirm that the problems are real
- Prioritize the list of the infrastructure problems identified

**Phase II**
- Develop conceptual solutions and cost estimates for a number of prioritized problems
- Re-prioritize based on conceptual designs and public input
- Prepare a Storm Water Master Plan

**Phase III**
- Design and construct improvements from the Storm Water Master Plan to alleviate runoff and flooding impacts.
**Data Gathering**
- Walk 20+ miles of Deer Creek and tributaries to identify potential problem areas
- Document (GIS) and photograph specific issues
- Research existing MSD, City, and other complaint data

**Preliminary Assessment**
- Meet with Deer Creek Watershed Alliance
- Develop watershed H&H model of existing conditions in XPSWMM
- Create Report documenting calculations and conclusions

**Public Engagement**
- Develop project website
- Host and attend Public Open Houses
- Develop kiosks around Ladue for informational project brochures
- Attend Dogwood Festival to promote program

**Problem Prioritization**
- Verify / legitimize potential problems
- Prepare problem listing, prioritized by need

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**Completed Task**
... data sources
...what was assessed in phase I?

This is the model that MSD uses, allowing us to seamlessly integrate our program into theirs.
... what was assessed in phase I?

Problem Types

Structure Flooding
Structure Erosion
Roadway Flooding
Roadway Erosion
Yard Flooding
Yard Erosion
... stream assessment

24 miles assessed

GPS data collection and rapid geomorphic assessment protocol
... stream assessment results
... stream assessment results

52 Problems Identified

Included items such as excessive erosion, threatened structures, and failing infrastructure.
... stream problem findings
Ladue lies completely within the Deer Creek Watershed.
Number of miles of drainage lines created by HR Green in the modeling of the watersheds

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

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

Number of miles of drainage lines created by HR Green in the modeling of the watersheds
Use of XPSWMM to model and analyze hydraulic characteristics of streams & piping system.
... open channel results

Velocity is an indicator of instability

52% of streams run over 5 ft/sec
... piped system results

Pipe Surcharging Frequency

<table>
<thead>
<tr>
<th>Frequency</th>
<th>2-yr</th>
<th>5-yr</th>
<th>15-yr</th>
<th>50-yr</th>
<th>100-yr</th>
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<tr>
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<td>25%</td>
<td>35%</td>
<td>57%</td>
<td>64%</td>
<td>67%</td>
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Typical MSD design storm
Many residents shared their concerns verbally over the phone to document problems.

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

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

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

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

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

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

380 Points from MSD
... resident concerns

380 Points from MSD

74 Points from City
... resident concerns

380 Points from MSD
74 Points from City
551 Points from residents
... heat map

17 “Hot Spot” neighborhoods

20 MSD unscheduled or unfunded projects
... the funnel concept

Phase I
Where are we now?

1000+ Problem Points

Prioritized Problem Areas

Phase II
Where do we want to be? How do we get there?

Project Solutions & Costs

Community Benefits

Prioritize

Phase III
Execute the plan.

Implement

Design

Heat Map

Master Plan

...
... where do we go from here?

Integrated master plans achieve success when community resources are directed towards managing issues using the most effective solutions to address the most significant problems in a way that is affordable to citizens.
... key issues

Identify

• Public vs. Private Property
• Requests for Acute Fixes
• Optimized Solutions

Prioritize

• Flood Mitigation vs. Stream Mitigation
• Benefits – What about water quality?
• Defensible Prioritization

Implement

• Which projects are worth it?
• Maximize ROI
## Example Project Implementation Cycle

<table>
<thead>
<tr>
<th>Year</th>
<th>Master Plan Process</th>
<th>PI*</th>
<th>Project Group (package #1)</th>
<th>Project Group (package #2)</th>
<th>Project Group (package #3)</th>
<th>Project Group (package #4)</th>
<th>Project Group (package #5)</th>
<th>Potential Yearly $$$ Outlay (in thousands)</th>
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<tr>
<td>2016</td>
<td>Develop</td>
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<td>2017</td>
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<td>Design / Acquire Esmts.</td>
<td>Design</td>
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* PI = Public Involvement
... implementation continued

- **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

- **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

**Alleviating Stormwater Problems in Ladue**
... let’s talk

questions...  
comments...  
concerns...