

# Lansdowne Stormwater UPDATE



CITY OF  
Ann Arbor  
MICHIGAN

August 22, 2012


## Ann Arbor Footing Drain Disconnection Stormwater Review Presentation





### Agenda

- Welcome and introductions
- Background on stormwater and sanitary sewer issues
- Footing Drain Disconnection Program
- Lansdowne stormwater issues: Case study
- Brief summary of City-wide stormwater initiatives

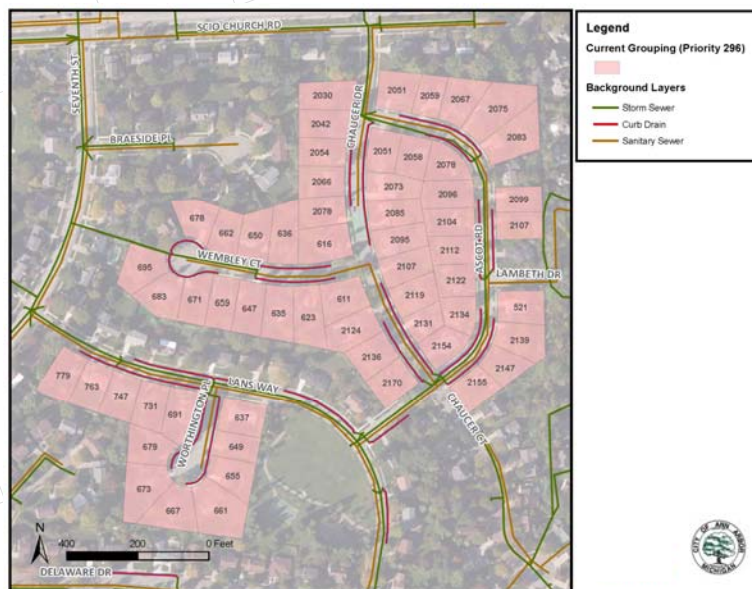


## Purpose Statement for Today's Meeting

- Revisit Footing Drain Disconnection (FDD) for homes in current group
- Provide additional information on sanitary sewer and stormwater drainage systems
- Address questions of FDD Program impacts on stormwater issues

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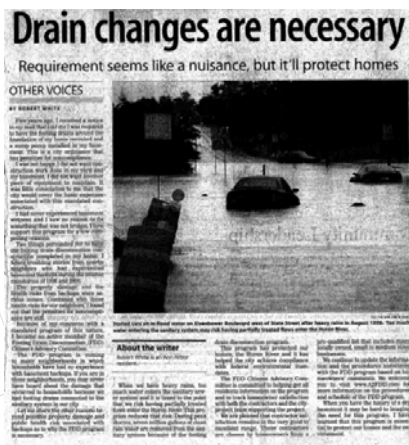
## Current FDD Work Area



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## What Started us Down this Road?

### August, 1998 Storm



### March 15, 2012 Storm



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## What Problem(s) are we Discussing?

### Heavy Rainfall

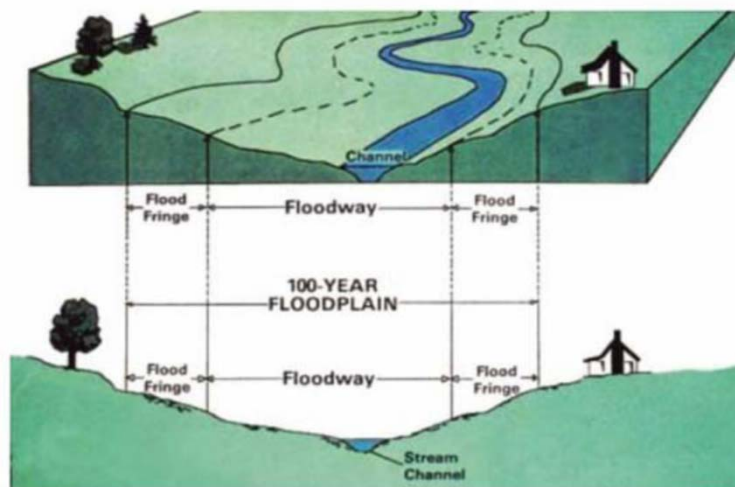
Storm Drainage System:  
Street Flooding  
Basement Flooding

Sanitary Sewer System:  
Sewer Surcharging  
Basement Backups

- How are these different?
- What causes each problem?
- Are these issues related?

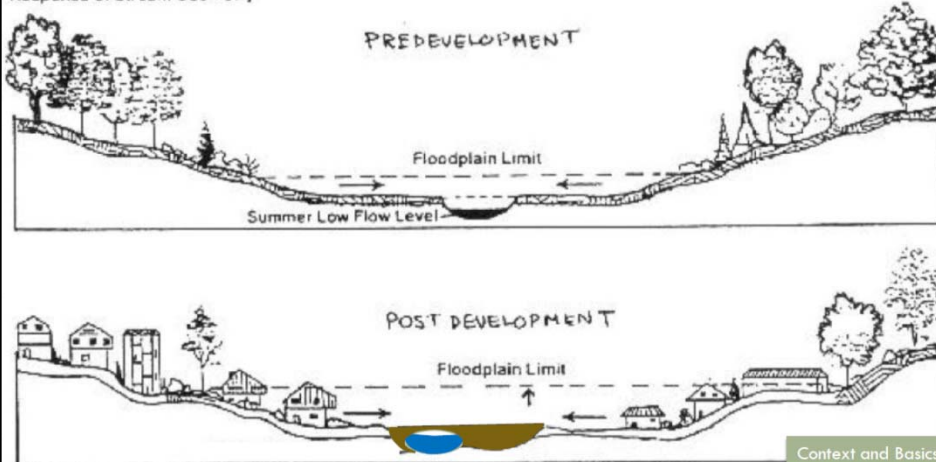
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## What are Floodplains?

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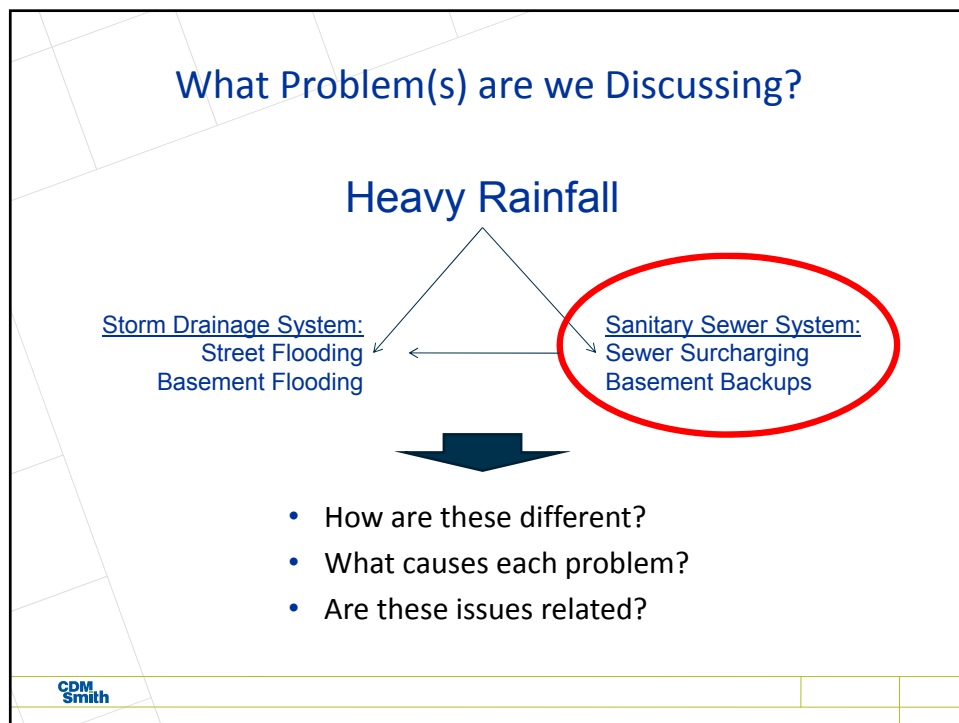
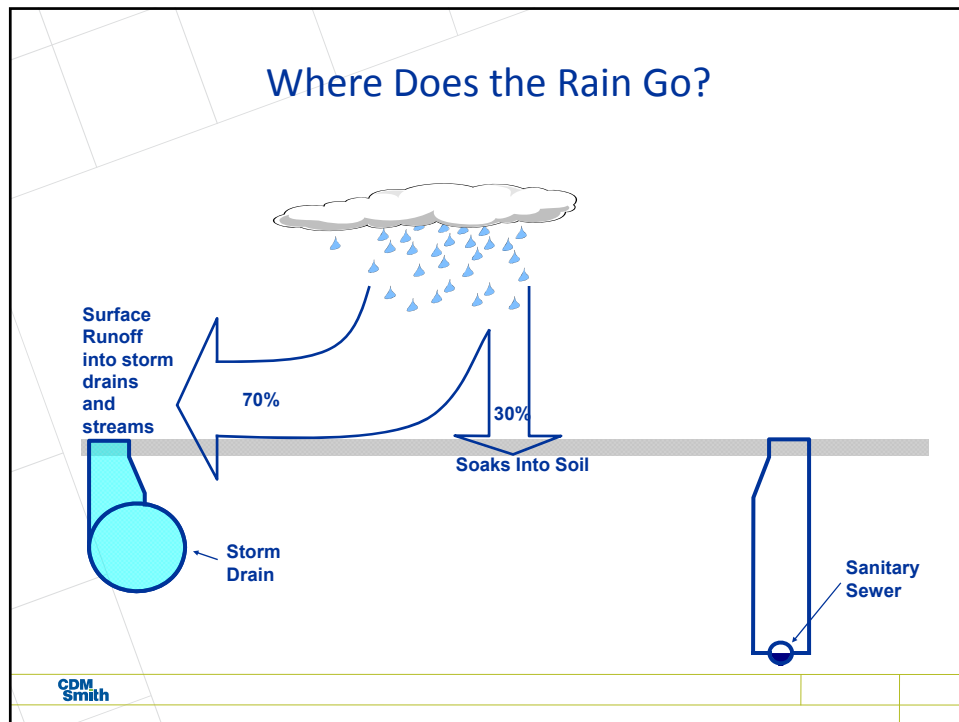
## What Happens When Development Occurs?

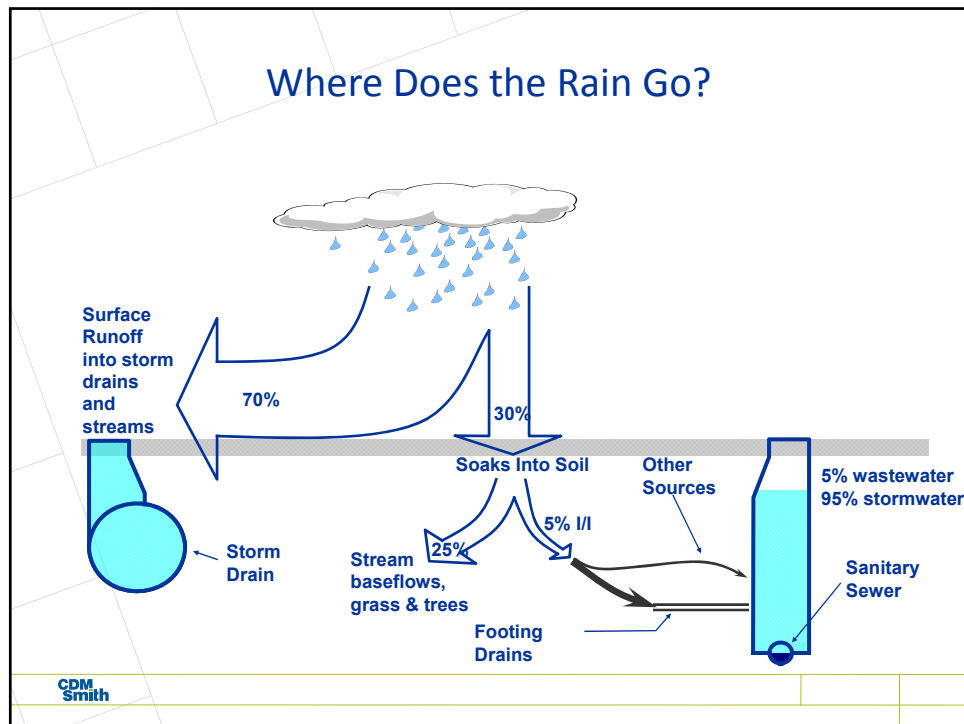
Response of Stream Geometry



Context and Basics

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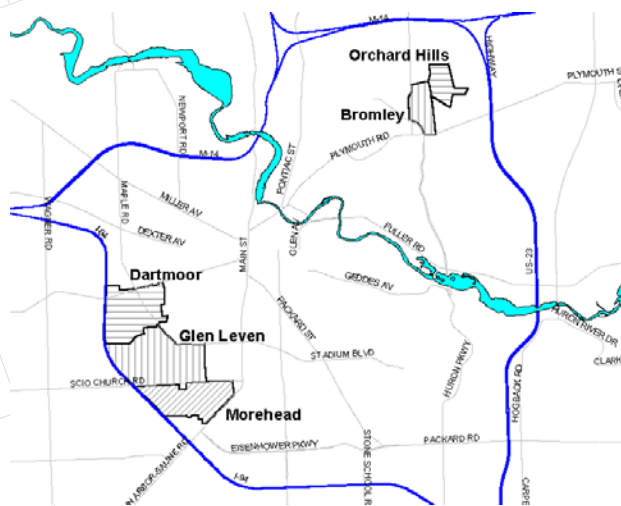
## FOOTING DRAIN DISCONNECTION (FDD) PROGRAM

## Problem Background

- Basement backup issue (1998) caused citizen involvement
- Citizens sought to work with City to understand problem and develop solution
- SSO Task Force formed (1999)
  - Homeowner representatives
  - Utilities, Public Services, and Administration staff
  - Washtenaw County Drain Commissioner
  - Huron River Watershed Council
  - U of M Professor (engineering expert)

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## Where are the Study (Priority) Areas?



*5% of the  
City*

*50% of the  
basement  
backup  
problems*

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## SSO Advisory Task Force Objectives

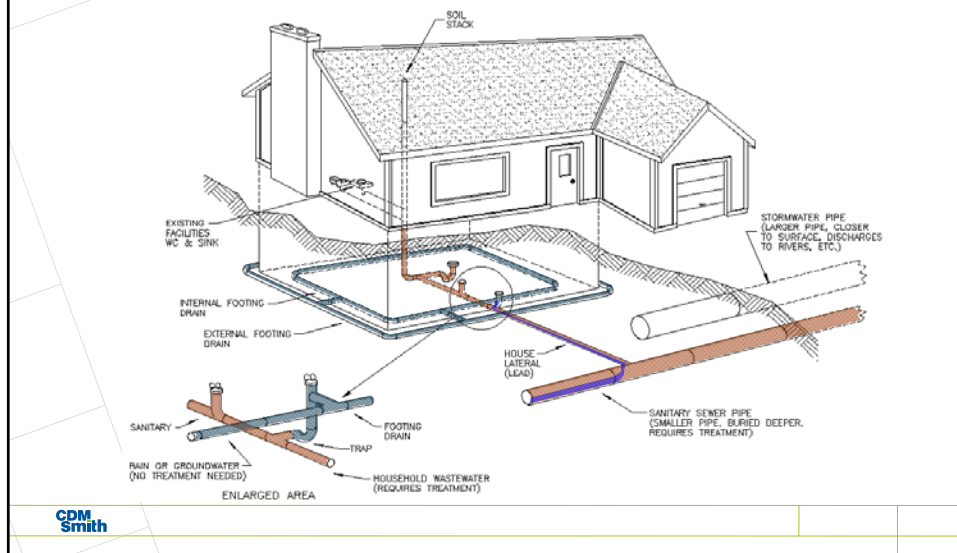
- Define scope of the SSO problem in priority areas
- Establish health, property, and environment as key goals
- Include open public engagement
- Identify effective solution(s) through a comprehensive engineering study
- Explore funding sources
- Specify an action plan for priority areas that is consistent with a system-wide approach

## 2000 Engineering Study

- Collected historical information
- Evaluated homeowner issues
- Reviewed other community solutions
- Performed flow and rainfall monitoring
- Developed computer model
- Reviewed alternative solutions
- Made recommendations
- Involved the public



## Connected Footing Drain Schematic



## ALTERNATIVES & RECOMMENDATIONS OF THE CITIZENS' TASK FORCE

## Corrective Alternatives

- Install relief sanitary sewers\*
- Upsize the existing sanitary sewers\*
- Provide storage of wet weather sanitary flows\*\*
- Perform Footing Drain Disconnections (FDD)

\* Includes FDD for historically impacted areas

\*\* Includes both relief or upsizing and FDD for historically impacted area

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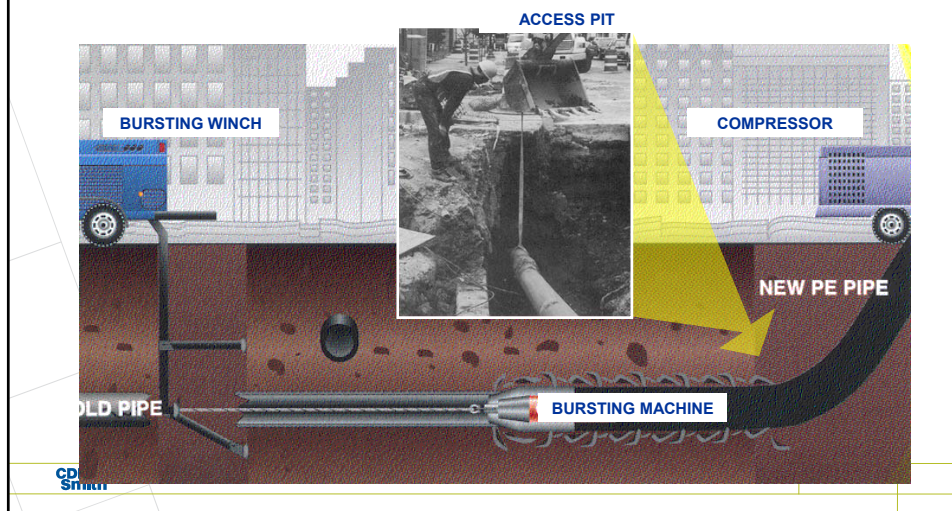
## Relief Sewer Construction



Relief sewers require trench construction in each street and potentially require reconnections of some house leads

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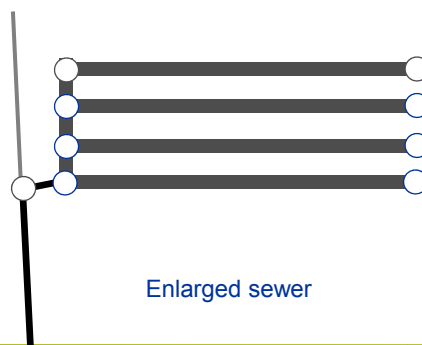
## Upsizing (Pipe-bursting) Construction



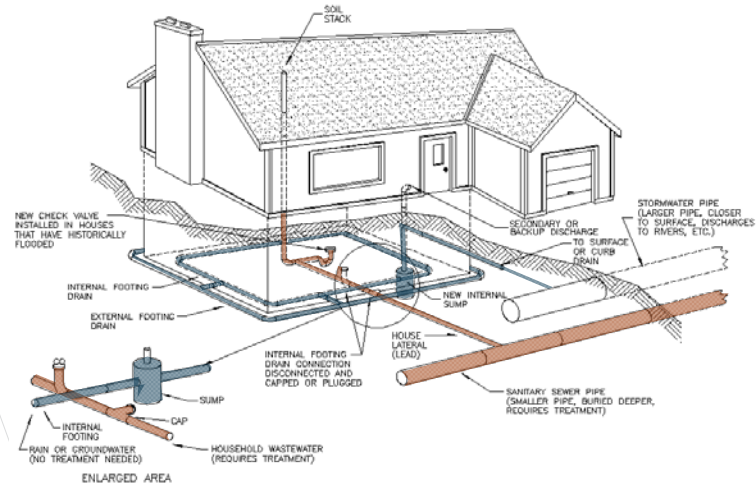
## Upsizing/Storage Construction



Storage requires underground storage pipes 5' to 6' in diameter that will fill during large storms



## FDD Construction with Internal Sump



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## In-home Construction



New sump is installed with sump pump and PVC discharge line

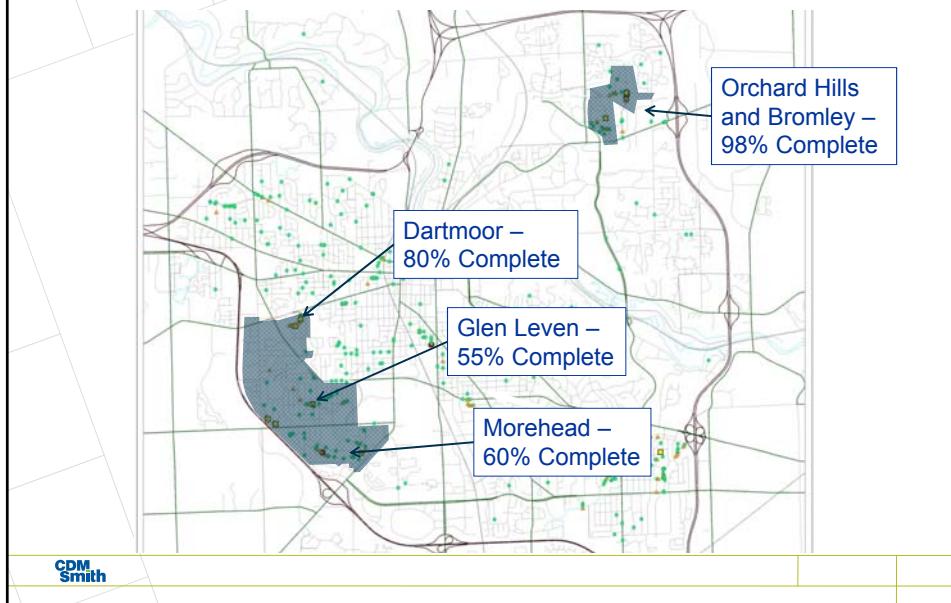
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Recommendation:  
*City-wide FDD Program*

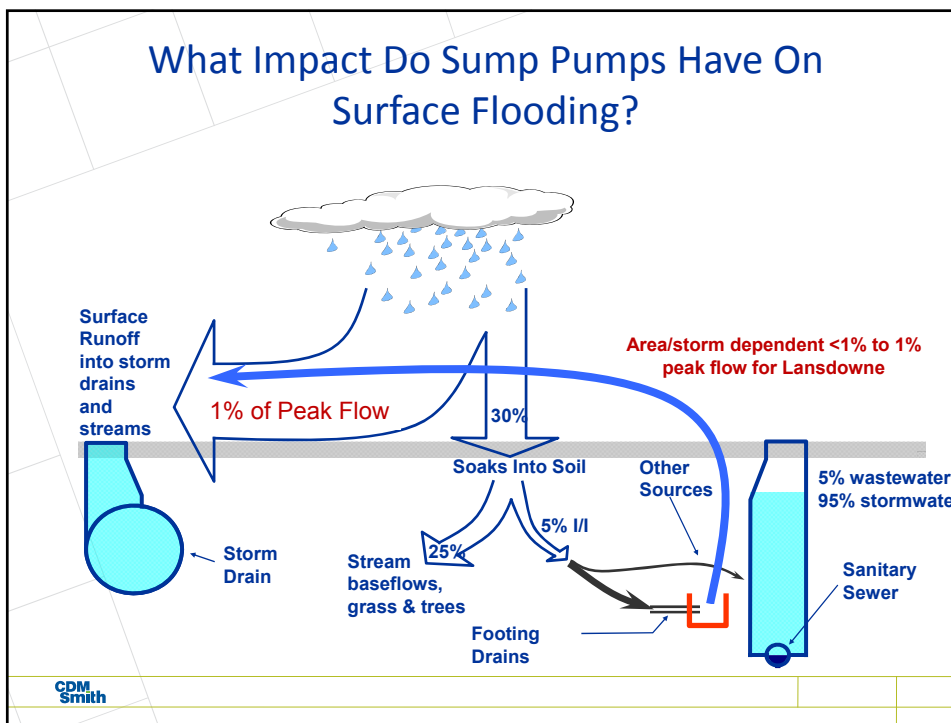
- Eliminates underlying cause of problem
- Maximizes homeowner protection
  - effective for all storm sizes
- Environmentally responsible
  - Less flow requiring treatment
  - Less construction impact on natural features
- Does not move the problem downstream
- Meets SSO regulations at WWTP

## FDD: PROGRESS AND RESULTS

## Footing Drain Disconnection Program – Progress

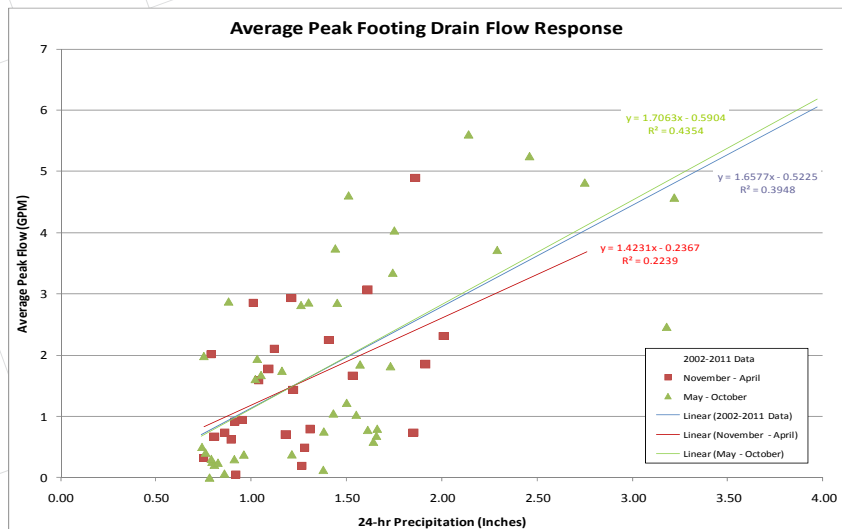


## What Impact Do Sump Pumps Have On Surface Flooding?

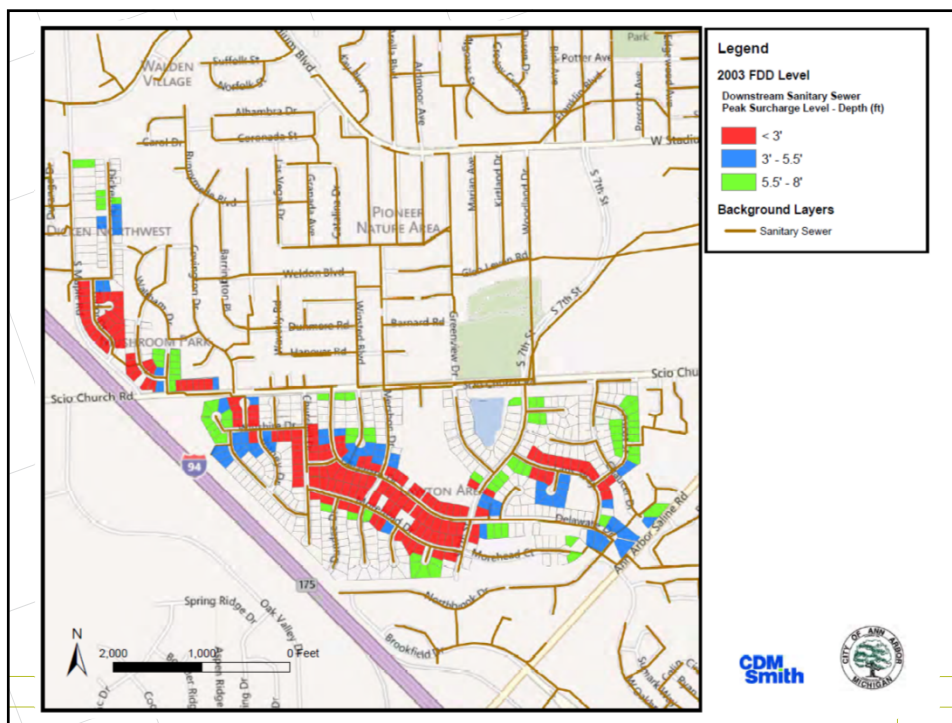


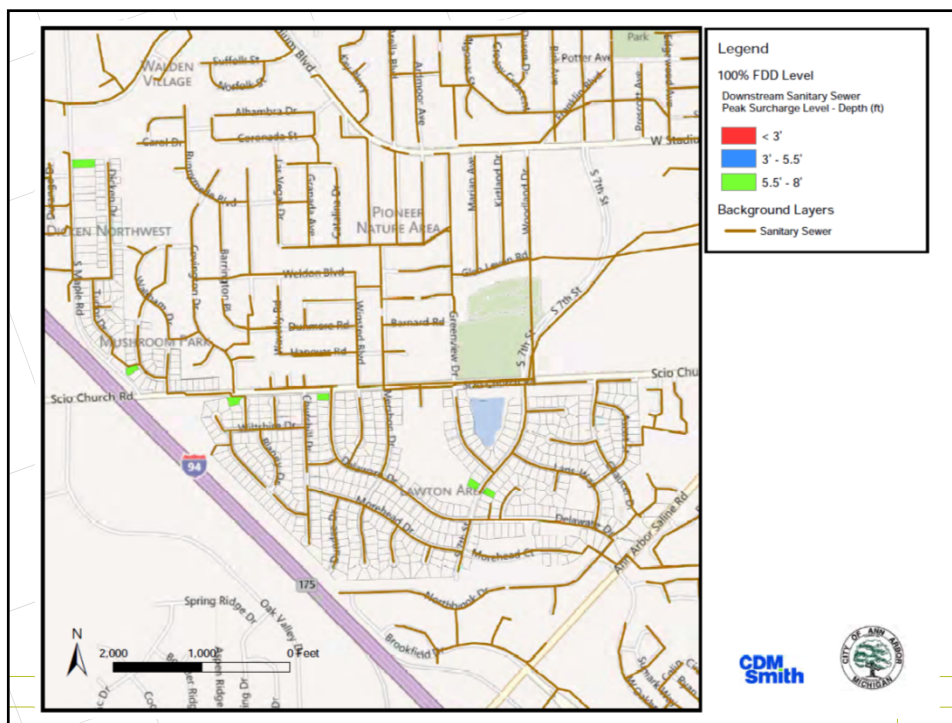
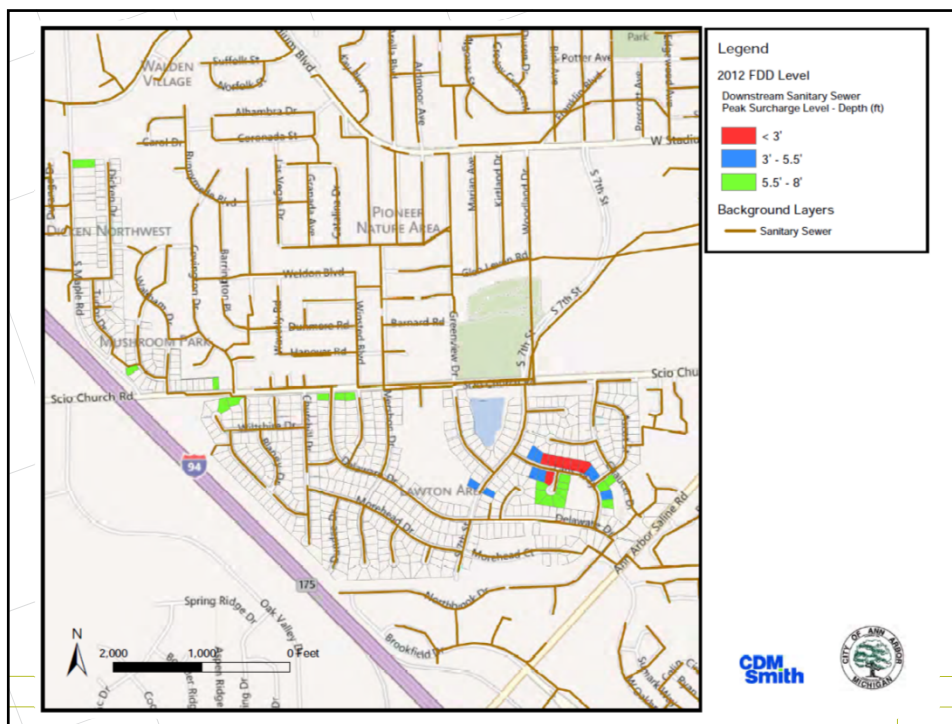


## Sump Pump Discharges – Measured Flow Rates



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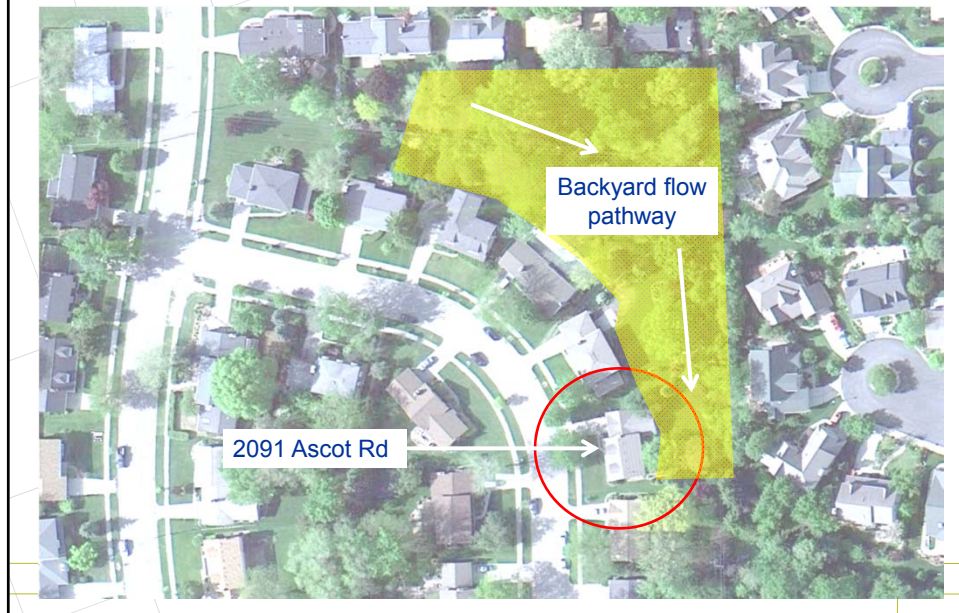


## FDD Program – Homeowner Steps

- Review program information packet and other information resources (website, DVD)
- Arrange pre-construction inspection with Justin
  - 30-45 minutes - discuss sanitary and stormwater issues, FDD process, sump location, discharge pipe routing
- Obtain cost estimate(s) from pre-qualified FDD contractors; coordinate with Justin on paperwork and funding approval
- Schedule construction with selected contractor
- Arrange post-construction inspection with Justin
  - 15 minutes – check and document installation, provide feedback survey, authorize payment to contractor

## LANDSOWNE STORMWATER ISSUES

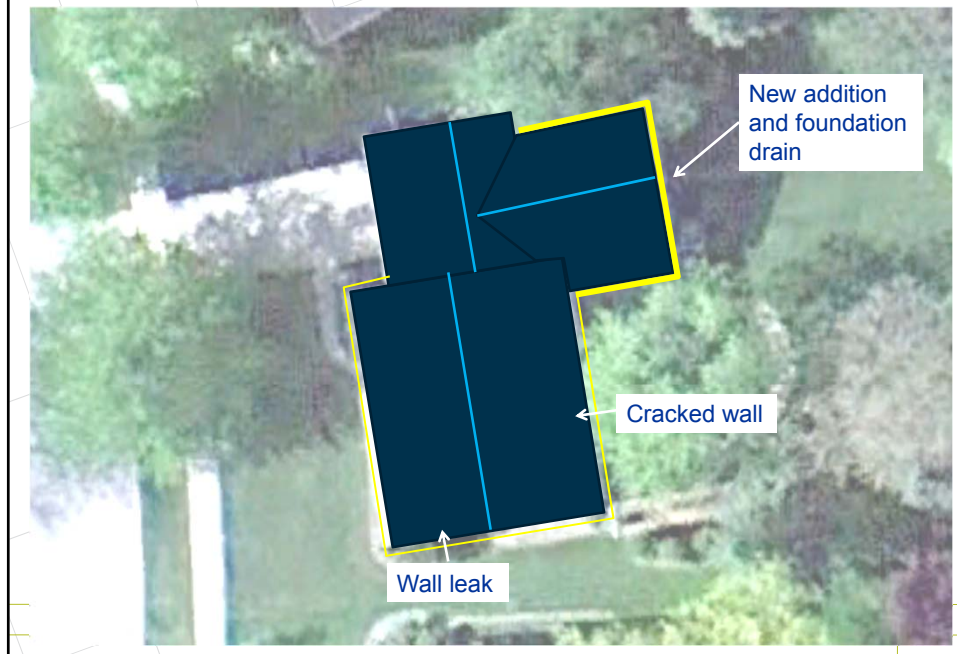
### Local Case Study – 2091 Ascot Road



### 2091 Ascot – Original Construction



## 2091 Ascot - Addition



## 2091 Ascot – New Foundation Drains



## 2091 Ascot – New Foundation Drains



## 2091 Ascot Findings

### Observations

- Home situated at low spot with lots of surface drainage to back of home
- Footing drain sand backfill evident at surface
- Excessive surface ponding likely enters the drainage system
- Drains and sump pumps cannot handle this flow - flow enters the basement and causes damage

### Solutions

- Redirect overland flows from backyard directly to street
- Improve drainage away from foundation
- Seal footing drains at surface with clay:
  - Around addition
  - Over new footing drains around house

## 2100 Churchill Findings

### Observations

- Home situated at confluence of predevelopment streams
- Water ponds next to foundation for large storms
- Low egress window curbs allow water to enter basement
- Drains and sump pumps cannot handle flow entering basement

### Solutions

- Raise egress window above water level (DONE)
- Add sump pump capacity (DONE)
- Seal footing drains at surface with clay to prevent excessive flow if high levels reached (DONE)

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## Assistance Offered Through the FDD Program

- FDD program pre-inspection:
  - Provides information on FDD program
  - Discuss any water in basement issues
  - Review sump location(s) and any options
  - Review exterior conditions and flow pathways
  - Review surface drainage interaction (downspouts, ponding)
- FDD Contractor:
  - Install interior sump, sump pump, and discharge line
- FDD Program Post-inspection:
  - Verify system installed per requirements
  - Review any restoration issues with homeowner

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## Upcoming City Stormwater Activities

- Completed Village Oaks/Chaucer Court study recommends:
  - Better high flow drainage pathway
  - Maintain upstream stormwater basins
  - Provide additional detention
- Citywide stormwater analysis project:
  - Developing citywide computer model
    - Public input
    - Flow monitoring
    - Model calibration
  - Evaluating system capacity throughout city
  - Will identify system deficiencies
  - Will recommend capital improvements

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## DISCUSSION