Presentation Acronyms

- BWV – Backwater Valve
- CCTV – Closed Circuit Television Inspection
- CMOM – Capacity Management Operations & Maintenance
- CIPP – Cured In Place Pipe
- CSO – Combined Sewer Overflow
- CTDEEP – Connecticut Department of Energy & Environmental Protection
- CWP – Clean Water Project
- I/I – Infiltration & Inflow
- IP – Integrated Plan
- LF – Linear Feet
- LTCP – Long Term Control Plan
- SSES – Sanitary Sewer Evaluation Survey
- SSO – Sanitary Sewer Overflow
- SWMM – Stormwater Management Model
- USEPA – Environmental Protection Agency
- UV – Ultra Violet
- WPCF/WWTP – Water Pollution Control Facility/Wastewater Treatment Plant
Agenda

• Linbrook Road/Montclair Dr Project Summary
• Failure Event & Response
• West Hartford/Linbrook Road Area Engineering Analysis
1. Linbrook/Montclair Project Summary
Project Summary

- The purpose of this project was to replace aged water line installed between 1935 and 1941 with an extensive break history and to replace/rehab sanitary sewer that was installed in 1935 and subject to substantial Infiltration & Inflow.
- Over the last 10 years
  - Numerous work orders for repairs or maintenance on the sanitary sewers and domestic water system
- The project construction budget was $5,400,000
  - The sanitary sewer repairs were $3,300,000
  - The domestic water construction budget was $2,100,000
- The project was coordinated with the Town of West Hartford’s plans to rehabilitate the roadways and curbs in this neighborhood.
- The Contract for construction was let to Ludlow Construction. The notice to proceed was issued on 5/3/17. Substantial completion anticipated Fall 2018. Ludlow hired Precision Trenchless as a subcontractor to complete lining portion of the project.
Project Scope - Water
Project Scope – Sanitary Sewer

Sewer with the failed liner. It is the downstream last 50' that had an issue.
MDC Lining History

- The MDC began utilizing Cured In Place Pipe (CIPP) lining technologies in the mid 1990s, with majority completed since 2006.
  - CIPP Lining technologies first came to the US in the 1970s.
  - All of MDC lining completed prior to 2017 was heat/steam cured.
  - UV Lining was introduced to the US in 2006.
  - UV Lining recently began being utilized by the MDC in addition to heat/steam cured.
- To date, the District has lined approximately 200 miles (17%) of its sanitary and combined sewers.
  - Minimal history of lining failures
    - Keney Park due to excessive infiltration
    - Rood Avenue due to compressor failure during cure
- To date, the District has lined approximately 80 miles in West Hartford, or 36% of the 223 miles.
- Lining Inspection:
  - Conformance with Manufacturer recommended & industry standard (ASTM) installation procedures
  - General conformance to specifications and contractor submittals (equipment/materials/etc)
  - Confirm equipment is working order
  - Samples collected for testing and analysis
Why Does MDC Line Pipe?

- Lining is used primarily for one of 2 reasons:
  - As a structural rehabilitation of a sewer pipe
  - A means to eliminate ground water infiltration from cracks and leaky joints.
- Reduction in cost and impacts to all stakeholders
  - Reduction in installation time
  - Lining costs range between $60/LF and $200/LF
  - Excavation & replacement costs range between $500/LF and $1,000/LF
    - Reduction in costs of $465M-$945M when comparing 200 miles of excavate and replace vs 200 miles of lined sewers
    - Key to Integrated Planning Approach
  - Reduction in traffic and disruption with lining
  - Liners are designed to be a “new pipe”
  - Liners typically increase capacity due to eliminating the roughness of existing pipe
  - Elimination of utility conflict issues
  - Goal is to line before collapse/failure
UV Cured in Place Pipe

- Steam installations require a “host pipe” to be fairly intact, while UV can be installed in more deteriorated pipes, but not collapsed.
- UV does not require refrigeration resulting in a smaller installation footprint (fewer trucks).
- UV Cure times are not affected by temperature or high ground water.
- Less odors
- Shorter cure times resulting in shorter times for bypass pumping; service lateral and traffic impacts – resulting in lower costs, especially in larger diameter pipes.
- UV cured liners are visually inspected after installation and inflation, but before curing. This allows liner to be removed and reinstalled if necessary.

70 year Design Life for UV vs 50 year Design Life for Steam
MDC’s Use of UV Lining

- MDC met with manufacturers and contractors
- MDC consulted with engineers and peer municipalities
- MDC Conducted UV Installation Pilot
  - Installed 12/15/16
  - Marshall Phelps Road in Windsor
  - 310 LF of 12-inch Styrene Rubber Pipe was lined
  - UV Cured Liner
  - Installed by Precision Trenchless, LLC
  - 2018 Re-inspection CCTV 10/11/18
- Two US Manufacturers of UV Liners

Recent UV Installations in the US:

- Knoxville, TN
- New Cumberland, PA
- Ohio DOT
- Oneida County, NY
- Burlington County, NJ
- NY DOT
- CALTRANS
- Vermont DOT
- Burlington, VT
- South Windsor, CT
- Penn Dot
- Pendleton Marine Base
- Stamford, CT
- Kingston, NY
- Wilmington, DE
Montclair & Linbrook, W.H.
UV Cured vs. Steam Cured/Open Cut

- High groundwater condition exists
  - UV light curing is not affected by ground water around the pipe.
- Noise Ordinance issue
  - The Town reconsidered their noise ordinance waiver, in the wake of DEEP’s stream channel clearing project, and agreed to allow a waiver for overnight work only on Friday nights. This restriction would result in 4 separate mobilizations over 4 weeks or more for steam cured or more for open cut excavation.
  - UV light curing is faster than traditional steam curing, minimizing long cure times. This minimizes the need to request a waiver.
- Extremely deep sewer (20’), makes open-cut cut challenging
2. Failure Event & Response
Failure Event & Response

• On 10/3/18 a failure occurred on the final 30’ of liner installed in a 380 ft section of 27-inch sewer on Linbrook Road located near house numbers 57 & 58 Linbrook Road.

• MDC staff responded to Linbrook Road to attempt to unblock the sewer and immediately mobilized bypass pumps to the site to begin pumping around the blockage.

• MDC’s contractor, Ludlow Construction, also began mobilizing larger pumps to the site to set up a permanent bypass.

• MDC staff mobilized smaller pumps to begin dewatering basements for property owners.

• MDC contractors were mobilized to assist with basement dewatering as well as initial basement cleaning.

• MDC inspected the pipe on the evening of 10/3/18 with camera equipment and identified the root cause as a failed liner.

• MDC continued dewatering and cleaning basements throughout the night.

• In total, 26 homes were affected.
Failure Event & Response

- 10/4/18 – MDC contractor’s continued cleaning efforts. MDC contracted mechanical and electrical contractors to begin making the homes habitable.

- 10/4/18 - Ludlow Construction began excavation over the section of failed liner in an effort to begin pipe replacement if determined necessary.

- 10/5/18 – MDC’s contractor performed a visual inspection of the liner to determine the extent of the failed liner. Following the inspection, the contractor began removing a 50’ section of liner to a point where all remaining liner left in place is suitable to remain upon visual inspection.

- 10/4, 10/5, & 10/18/18 – MDC met with Ludlow Construction and Precision Representatives and put the contractors on notice for the damages and future damages.

- All other lined sections have passed post installation testing and re-inspection. Certified MDC staff visually inspected all similar type liners installed throughout the District during the week of 10/8/18 and all liners have passed inspection.

- A new liner has been produced by an alternate manufacturer. A sample installation of the new liner was completed at an MDC facility on 10/11/18 and the liner was tested by a third party.

- Test results indicate compliance with the specifications, therefore the 380 ft section of pipe will be lined with the alternative liner.

- Any portion of lined sewer to remain will be re-inspected on a periodic basis by Certified MDC staff.
Private Property Restoration Process

• **Phase 1: Dewater, Clean and Sterilize Affected Properties.**
  – MDC contractors have cleaned and sterilized affected properties. MDC will be hiring an industrial hygienist to inspect properties prior to final restoration work.
• **Phase 2: Provide Habitable Living Conditions.**
  – MDC’s contractors are continuing to work on necessary replacement of hot water heaters, boilers, gas furnaces and restoration of electrical service. The goal remains making the properties habitable and getting families back in their homes.
• **Phase 3: Restore Affected Properties to Previous Condition**

MDC is committed to work with our Contractor and its insurance carrier to address property damage, including direct repair, replacement and/or payment to the customer for those costs associated with making the home habitable. MDC has demanded that its contractor respond immediately to our customers’ damages, and will in the interim seek full reimbursement for any payments it makes until such time as the responsible party steps in. MDC claims staff will continue to monitor the process.
Project Restoration Schedule

**Linbrook Road**
- Liner Installation (Proposed Early AM Wednesday 10/24/18)
  - Install Liner
  - Remove by-pass pumps and associated piping
  - Remove temporary driveway ramps and sweep clean aprons
- MDC Contractor Restoration (Completion by 10/31/18)
  - Landscaping and walkway repairs
  - Sweep roadway
  - Loam and seed front lawn damage from dumpsters and sewer overflow
- Town of West Hartford Restoration (Completion by 10/31/18)
  - Loam and seed area between curb and sidewalk both sides entire length of road
  - Road reclamation and paving entire length of road

**Montclair Drive**
- MDC Contractor Restoration (Completion by 10/31/18)
  - Landscaping and walkway repairs
- Town of West Hartford Restoration (Completion by 10/31/18)
  - Loam and seed area between curb and sidewalk from Fern Street to Linbrook Road
  - Road reclamation and paving from Fern Street to Linbrook Road
Sewer Backup Prevention and Reporting Program

### Signs of a Sewer Backup
- You will have limited or no sewer service within the property.
- You may notice water bubbling out of a sewer manhole in the street.
- Sometimes sanitary sewer pipes fail or become blocked, causing sewage to backup through the sewer lateral into unprotected plumbing fixtures such as tubs, toilets or washing machine drains in basements.

### What to Do in the Event of a Sewer Backup
- Avoid using toilets, sinks, showers, washing machines, dishwashers, etc., as this could cause the backup to become worse.
- Avoid contact with wastewater. Clean and disinfect basement walls and floors after the problem is resolved.
- Never operate or disconnect an electrical appliance/main fuse box while standing in water.
- Contact the electric utility company for shut off.

### Helpful Definitions

**Sanitary Sewer Lateral**: House connection - the pipe that connects the main sewer line in the street to the property.

**Main Sewer**: The main sewer pipe in the street that conveys wastewater from properties to the Water Treatment Facility.

**Inflow & Infiltration (I&I)**: Non-wastewater (typically storm water) that enters the sanitary sewer system through direct connections, leaks or cracks in pipes and manhole covers.

### To Report a Backup or Sewer Emergency, Contact:

- **MDC Command Center**
  - (860) 278-7850 (press 1)
  - or
  - (860) 278-7850 Ext. 3600
  - (Available 24/7)

### To Request More Information, Please Contact:

- **MDC Utility Services**
  - (860) 278-7850 Ext. 3780
  - UtilityServices@themdc.com
  - 125 Maxim Road
  - Hartford, CT 06114

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Sewer Backup Prevention & Reporting Program

What you should know to prevent sewer backups and report sewer emergencies.
3. West Hartford/Linbrook Road Area Engineering Analysis
How are Separated Sewers different from Combined Sewers?

- **Dry day** – no difference (household sewage plus some I/I)
- **Wet day** – no flow from catch basins/brooks, BUT still additional flow from I/I sources
  - Peak flow from Bloomfield, West Hartford, Newington, Windsor & Wethersfield (excluding Hartford) of 143 MGD EXCEEDS the current 130 MGD HWPCF capacity
  - Peak flow from Wethersfield & Rocky Hill of 37 MGD EXCEEDS the current 20 MGD RHWPCF capacity
West Hartford Sewer System

- Town of West Hartford became MDC Member Town in 1984
  - Any sewers constructed prior to 1984 were constructed by the Town
- Second oldest sewer system in the District. Average Age of 53 Years
- West Hartford is a Separated System
  - Separate pipes for storm water/ground water and sanitary sewers
  - Storm sewers are owned/maintained by the Town of West Hartford
- Sewer flows from West Hartford into Hartford increase by nearly 9 times during wet weather events compared to dry weather
  - Majority of homes have stormwater or groundwater connections to sanitary sewer (over 90% in some areas). Typically – foundation drains
- District initiates SSES Program and CMOM Program in 2006
  - CCTV, Building Inspections, Flow Metering, Sewer Model
- There are two structural Sanitary Sewer Overflows (SSOs) in West Hartford: CTS-2 and CTS-3, both of which currently discharge to Trout Brook. These will be eliminated by the South Hartford Conveyance & Storage Tunnel Project, currently in construction.
  - Work being done as part of compliance with 2006 Consent Decree.
Except as specifically provided with reference to some particular sewer, sanitary sewers shall be used only for the conveyance and disposal of sanitary sewage as defined in Section S1b(2) of this ordinance and for diluted, water-carried industrial wastes which are not objectionable as provided hereinafter. Except as specifically provided for some particular sewer or location, no sanitary sewer shall be used to receive and convey or dispose of any storm or surface water, subsoil drainage, any large continuous flow of water seeping into buildings or excavations from soils or other underground sources, flows of natural springs, or ground waters, surplus from flowing wells, the discharge from roofs, roof conductors, yard drains, street or highway drains.
West Hartford’s Sewers have excessive Inflow and Infiltration (I/I)?

**WHAT ARE INFLOW AND INFILTRATION?**

- **Inflow** – *Clean Water* (typically stormwater) that enters the sanitary sewer directly, such as catch basins, brooks, & **Private Connections: roof leaders, sump pumps, foundation drains, etc.**
- **Infiltration** – *Clean Water* (typically groundwater) that seeps into the sanitary sewer from cracked pipes, manhole leaks, lateral leaks, etc.

- Dry weather flows are 8 million gallons/day
- Wet weather flows can get up to 69 million gallons/day
- These flows enter Hartford’s CSO System en-route to the Hartford Water Pollution Control Facility for treatment

% Private = 60%
% Public = 40%
How Stormwater (Inflow) & Groundwater (Infiltration) Enters a Separated Sewer
West Hartford Sewershed Recommendations - 2015

SSES Implementation (Mainline Sewer and Manholes Lining & Repairs) – Various Locations

50% I/I Reduction (private I/I and capacity improvements) WH29, WH30 and WH31

Four Mile Road Area Sewer Improvements (SSES, private I/I and capacity improvements) - Completed

Greenhurst Road Area Sewer Improvements (SSES, private I/I and capacity improvements) - Completed

Center Trunk Sewer SSO Consolidation to South Hartford Conveyance & Storage Tunnel (tunnel relief)
Linbrook Road Area (WH-29,30, 31) - Private

- **Recommended Plan ($52.2M).**
  - Scheduling TBD – Integrated Planning Process
  - Disconnection of Private Inflow Sources (typically foundation drains)
  - Installation of Drainage Infrastructure
    - In coordination with, and assistance from Town of West Hartford
  - Lining and/or replacement of sanitary laterals
  - Downstream Capacity Improvements ($2.3M)

- **Private Inflow Removal Costs:**
  - WH-29 = $7.8M
  - WH-30 = $13.4M
  - WH-31 = $15.5M

- **Private Lateral Rehabilitation/Repair Costs:**
  - WH-29 = $3.7M
  - WH-30 = $3.3M
  - WH-31 = $6.2M

% Private = 68%
% Public = 32%
How To Stay Informed

The MDC uses several tools to keep customers informed, including:

- Door to Door Outreach (notices)
- Public Meetings
- E-Blasts (mass emailing)
  - Email Outreach@themdc.com
- Press Releases
- Website & Social Media
  - Follow us on Facebook and Twitter
- MDC Alerts – an Everbridge powered system to call, text or email participants.

Sign up at the MDC homepage: www.themdc.org
Thank you for joining us today.

Discussion and Questions?

Please remember to sign in or leave your business card.
## Sewer Collection System Renewal = I/I Reduction

<table>
<thead>
<tr>
<th>Town</th>
<th>Miles</th>
<th>Completed (%)</th>
<th>Recommended (%)</th>
<th>Total (%)</th>
<th>Prior to CWP (2005)</th>
<th>If Infrastructure Ignored (2038)</th>
<th>After IP (2038)</th>
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<tbody>
<tr>
<td>Bloomfield</td>
<td>118</td>
<td>6%</td>
<td>35%</td>
<td>41%</td>
<td>34 yrs</td>
<td>67 yrs</td>
<td>45 yrs</td>
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<tr>
<td>East Hartford</td>
<td>168</td>
<td>3%</td>
<td>23%</td>
<td>26%</td>
<td>45 yrs</td>
<td>78 yrs</td>
<td>58 yrs</td>
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<tr>
<td>Hartford</td>
<td>217</td>
<td>5%</td>
<td>67%</td>
<td>72%</td>
<td>74 yrs</td>
<td>107 yrs</td>
<td>35 yrs</td>
</tr>
<tr>
<td>Newington</td>
<td>128</td>
<td>27%</td>
<td>14%</td>
<td>41%</td>
<td>38 yrs</td>
<td>71 yrs</td>
<td>50 yrs</td>
</tr>
<tr>
<td>Rocky Hill</td>
<td>90</td>
<td>7%</td>
<td>10%</td>
<td>17%</td>
<td>30 yrs</td>
<td>61 yrs</td>
<td>54 yrs</td>
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<tr>
<td>West Hartford</td>
<td>223</td>
<td>36%</td>
<td>43%</td>
<td>79%</td>
<td>53 yrs</td>
<td>84 yrs</td>
<td>35 yrs</td>
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<tr>
<td>Wethersfield</td>
<td>122</td>
<td>32%</td>
<td>22%</td>
<td>54%</td>
<td>45 yrs</td>
<td>76 yrs</td>
<td>43 yrs</td>
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<tr>
<td>Windsor</td>
<td>152</td>
<td>18%</td>
<td>12%</td>
<td>30%</td>
<td>36 yrs</td>
<td>67 yrs</td>
<td>49 yrs</td>
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<td>Total</td>
<td>1,218</td>
<td>17%</td>
<td>33%</td>
<td>50%</td>
<td>50 yrs</td>
<td>81 yrs</td>
<td>45 yrs</td>
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Phased Approach to Abate Sewer Surcharges in the Linbrook Road Area

- **Phase I** – Install backwater valves where requested/needed & complete repairs to lined sewer
- **Phase II** – Complete remaining sewer lining and repairs in nearby contributing areas
- **Phase III** – Remove *private property* stormwater and groundwater sources
- **Phase IV** – Increase downstream sewer capacity to address **INFLOW** and **Infiltration**
West Hartford Lining History
## MDC’s UV Cured Lining History

<table>
<thead>
<tr>
<th>Location</th>
<th>Pipe Diam. (in.)</th>
<th>Length</th>
<th>Date(s) of Installation</th>
<th>2018 Re-inspection CCTV Date</th>
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<tbody>
<tr>
<td>Montclair Dr., W. Hartford</td>
<td>8</td>
<td>1,552</td>
<td>10/31/17 to 11/2/17</td>
<td>10/10/18 and 10/12/18</td>
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<tr>
<td>Linbrook Rd., W. Hartford</td>
<td>27</td>
<td>2,071</td>
<td>5/10/18 to 6/12/18</td>
<td>10/8/18 and 10/10/18</td>
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<tr>
<td>North Main St., W. Hartford</td>
<td>8</td>
<td>684</td>
<td>5/1/18</td>
<td>10/12/2018</td>
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<tr>
<td>Brookfield Rd., W. Hartford</td>
<td>8</td>
<td>405</td>
<td>11/2/17 and 5/7/18</td>
<td>10/10/2018</td>
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<td>Fern St., W. Hartford</td>
<td>8</td>
<td>694</td>
<td>5/8/2018</td>
<td>10/12/2018</td>
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<tr>
<td>Marshall Phelps Rd., Windsor</td>
<td>12</td>
<td>310</td>
<td>12/15/2016</td>
<td>10/11/2018</td>
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<td>Bloomfield Ave, Windsor</td>
<td>8</td>
<td>2,538</td>
<td>6/18/18 to 8/23/18</td>
<td>10/11/2018 and 10/12/18</td>
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<tr>
<td>Bloomfield Ave, Windsor</td>
<td>12</td>
<td>804</td>
<td>8/24/18 to 8/29/18</td>
<td>10/11/2018</td>
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<tr>
<td>Bloomfield Ave, Windsor</td>
<td>15</td>
<td>1,797</td>
<td>8/30/18 to 9/7/18</td>
<td>10/11/2018</td>
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<tr>
<td>Thompson Rd., W. Hartford (off road)</td>
<td>18</td>
<td>177</td>
<td>2/28/2017</td>
<td>10/11/2018</td>
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<td>Stanley St., E. Hartford</td>
<td>8</td>
<td>280</td>
<td>7/6/2017</td>
<td>10/9/2018</td>
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<tr>
<td>Columbus Cir., E. Hartford</td>
<td>8</td>
<td>280</td>
<td>7/6/2017</td>
<td>10/9/2018</td>
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<td>Park Ave., E. Hartford</td>
<td>10</td>
<td>1,035</td>
<td>7/6/2017</td>
<td>10/10/2018</td>
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<tr>
<td>Monroe St., Hartford (int. White St.)</td>
<td>15</td>
<td>30</td>
<td>8/2/2017</td>
<td>10/11/2018</td>
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<td><strong>Total</strong></td>
<td><strong>12,747</strong></td>
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Sanitary Sewer Evaluation Survey Implementation Scope of Work

**Sewer Mains and Laterals**
- Segment Replacement
- Point Repairs
- Cured-in-Place Pipe (CIPP) Lining
- CIPP Short Liners
- Lateral Repairs and CIPP Lining

**Manholes**
- Frame and Cover Replacement
- Cementitious Lining
- Internal Chimney Lining
- Dead End Manholes
Separated Sewer System I/I Sources

Public I/I Sources

- Leaky Main
- Leaky MH
- Cover w/ Holes

Typically 8” to 10” Local Pipe

Private I/I Sources

- Sump Pump
- Foundation Drain
- Roof Leader
- Leaky Lateral
How Private Stormwater & Groundwater (Inflow) is Disconnected from a Separated Sewer
Inflow Removal
The Backwater Valve Program separates the inflow and infiltration from your homes footing and foundation drains and roof leader connections to the sanitary sewer system.

The sanitary sewer system is designed to handle sanitary waste only.

By removing outside water sources from the sewer system, the potential of surcharging is reduced considerably during wet weather events.

The removal of these connections is paramount to the reduction of surcharging and flooding events for the future.
Back Water Valve Program

• Primary goal is educating customers on Sewer Back up protection through BWV assessment.
• MDC offers installations for our customers:
  ▪ Replace Back Water Valves and combined sewer and storm systems
  ▪ Cut and Cap BWV and install Sump Pumps eliminates infiltration into the sewer system
Backwater Valve Program

- Call the MDC Command Center at (860) 278-7850, ext. 3600
- MDC will come out and provide evaluation
- MDC and property owner signs application form which includes **Owner Responsibilities – Maintenance, Don’t Surcharge yourself**
- MDC contacts their approved program vendor
- Plumber will coordinate schedule w/ property owner
- Plumber takes out permit with Town inspector
- Once work is complete, MDC performs final inspection
SSES Pilot Study (2011-2014)

Newington
- N6 (SSES only)

West Hartford
- WH8 (SSES + MHs)
- WH9N (SSES only)
- WH9S (SSES + lateral lining)
- WH34 (SSES + main/MHs/tophats)

Wethersfield
- FB2 (SSES + private I/I)
- RH2AN (SSES + lateral replacement)
- RH2AS (SSES + lateral lining)

Windsor
- WI3A (SSES + private I/I)
- WI8-9-10-11 (SSES only)
West Hartford – SSO Program

• Consent Decree Field Investigations
  – SSES Investigations
  – SSO Pilot Study
  – CMOM Program

• Sewer Capacity Analysis
  – USEPA Based SWMM Model Utilized per Consent Decree
    • Updated/calibrated from 2007-2014
    • Maintained by MDC’s CWP Program Management Consultant
    • Utilized for evaluation of Consent Decree Solution Alternatives

• Recommendations
  – Mainline (aka sanitary sewer) Rehabilitation
  – Additional I/I Removal (private property)
  – Capacity Improvement Projects
Linbrook Road Area (WH-30) - Private
Purpose of I/I Reduction Pilot Study

• Validate 10% I/I reduction for implementing SSES recommended rehabilitation (sewer mains/manholes)

• Develop “toolbox” of additional I/I reduction techniques
  o Lateral replacement (excavate and replace to property line)
  o Lateral lining (CIPP line from mainline sewer to both property line and house)
  o Tophats (liner of lateral connection and first 6’)
  o Private I/I removal (re-direction of sump pumps/foundation drains to municipal drainage/stormwater systems)
  o More comprehensive sewer main/manhole rehabilitation

• Determine cost & expected I/I reduction for each technique
Four Mile Road Area Project

- **Response to March 6-7, 2011 Storm Event**
  - Approx. 20 homes with backups

- **Comprehensive Approach**
  - Sewer main replacement
  - Sewer lateral replacement
  - Sewer lateral CIPP
  - Private Inflow Removal
  - Drainage System Improvements

- **Results**
  - Comprehensive approach in 40 acres
    - Represents 7% of total subarea (567 acres)
    - SSES in remaining portion of subarea (not completed yet)
  - Estimated 25% reduction in wet weather flows from comprehensive I/I removal in 7% of subarea
    - Spring 2005 versus spring 2014
    - No capacity limitations in project area since project completion
Four Mile Road Area Project
Linbrook Road Area (WH-29,30, 31) - Private

- **Confirmed Private Inflow Homes**
  - WH-29 = 10 (out of 467)
  - WH-30 = 179 (out of 635)
  - WH-31 = 146 (out of 684)

- **Suspected Private Inflow Homes (Dye Testing Req.)**
  - WH-29 = 230 (out of 467)
  - WH-30 = 119 (out of 635)
  - WH-31 = 144 (out of 684)

- **Up to 90% of Suspected were Confirmed in other similar West Hartford Areas**
MDC’s CMOM Program

- Capacity Maintenance Operations Management
- Includes Following:
  - CCTV Inspection
  - Sewer Cleaning (Large Diameter & Small Diameter)
  - Manhole Inspections
- Approximately 92% of sanitary/combined system CCTV inspected since 2006. Remaining 8% is within off-road areas
- Identified approximately $450M in repairs
MDC’s CMOM Program

• Example of Recently Failing West Hartford Sewers

Asylum Avenue

Sycamore Lane

Montclair Drive
3. MDC’s CWP Update
The Clean Water Project (CWP)

- The CWP is the MDC’s Response to:
  1. *Consent Order* from CT DEEP to address combined sewer overflows
  2. *Consent Decree* from EPA to address sanitary sewer overflows
- Multiphase program that will take 20 years to complete

- Project Goals:
  1. Reduce the CSOs to streams/rivers
  2. Eliminate CSO outfalls to Wethersfield Cove & North Branch Park River
  3. Reduce Nitrogen discharged to CT River
  4. Address sanitary sewer overflows (SSOs) outside of Hartford
Five Main Components of the CWP

- Inflow & Infiltration Reduction
- Sewer Separation
- Treatment Plant Improvements
- Storage Tunnels
- Relief Interceptor Pipes
Linbrook Road Area (WH-29,30, 31)

- WH29 & WH-31 Flow into WH-30
- Completed Rehabilitation (Mainline)
  - WH-29 = 83%
  - WH-30 = 25%
  - Wh-31 = 55%
- Pending Rehabilitation (Mainline)
  - WH-29 = 16% (Total of 99.9%)
  - WH-30 = 68% (Total of 93.5%)
  - WH-31 = 32% (Total of 86.8%)
5. MDC’s CMOM Program
CMOM Program

• Includes all activities/operations associated with maintenance of sewer system
  – CCTV inspections
    ➢ Includes interceptors/trunk sewers
  – Cleaning
  – Manhole inspections
• Required as part of Consent Decree
  – CCTV 8% of sewer system annually
  – CCTV 100% of sewer system by end of 2017
  – Includes ~500,000 ft of cross-country sewers
    ➢ Easement Improvement Program
• Required inspections are finding issues
• Identified $450M in repairs
Project Stats

- **Water**
  - 9,361 LF of water piping installed
    - 5,819 LF of 8-inch ductile iron distribution water main
    - 3,452 LF of copper water services
  - 8 new fire hydrants installed

- **Sanitary Sewer**
  - 4,862 linear foot of new sewer line installed
    - 3,663 LF of 6-inch sanitary sewer laterals
    - 410 LF of 8-inch mainline sanitary sewer
    - 789 LF of 10-inch mainline sanitary sewer
  - 5,408 LF of sanitary sewer lined
    - 3,337 LF of 8-inch mainline sanitary sewer was lined
    - 2,071 LF of 27-inch sanitary sewer trunk line
  - 268 vertical feet of manhole rehabilitation
Sewer Backup Prevention and Reporting Program

Program Goals
- Elimination of Basement Surcharging
- Removal of Inflow and Infiltration Sources that result in additional sewer volume

Elimination of Basement Surcharging
- A backwater valve (sometimes called a backflow preventer or sewer backup valve) is a valve installed on a wastewater pipe that is designed to allow water or sewage to flow only one way (out of the house). If there is a sewer system backup, and a backwater valve is in place, sewage will not be able to flow back into the house and through a basement fixture. Additional protection devices or solutions may be used or recommended to protect basement plumbing fixtures.

Removal of Inflow and Infiltration Sources
- Sump pumps are used to remove ground water that is in and around the foundation and discharge that ground water safely to vegetation, waterways or a storm piping system.
- The installation of the sump pump coupled with elimination the footing drain discharge connection to the main sewer removes inflow and infiltration and reduces the overall volume of water in the sewer line to help reduce downstream surcharging.

MDC staff will perform an assessment of each home and provide solutions to meet the program goals (free of charge to the customer). Customers are asked to contact MDC Utility Services for an appointment. Additional program information and available appointment scheduling is available this evening for customers to sign up.

Since 10/5/18, MDC has scheduled 48 Assessments in the Linbrook neighborhood and has completed 17 installations.
MDC completed numerous sewer investigations in West Hartford

  - 35 flow meters to collected sewer flow information
  - Smoke tested 86 miles
  - Flow isolated 132 miles
  - TV inspected 209 miles
  - 20,000 manhole inspections
  - 3,200 building inspections
- Developed a computer model of the sewer system
- Identified Infiltration/Inflow Sources