Town of West Hartford Drainage System Evaluation

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October 21, 2020



Town Council Workshop

CDM Smith

Agenda

- Project Overview
- Existing Conditions
- Recommendations
- Costs
- Funding Options
- Next Steps





Project Overview

Project Area History

- Town project includes six drainage areas
- Significant flooding within the six areas
- Recent significant storm events
 - April and September 2018
 - August 2019
- First Public Meeting June 2019
- Completed Phase 1 Study (Areas 1 to 3)
- Second Public Meeting November 2020
- Working on Phase 2 Study (Areas 4 to 6)



Drainage Project Scope

Phase 1 Study completed for Areas 1 to 3

- Collect and review data
- Survey & field work
- Stormwater system modeling
- Alternatives analysis
- Recommendations

	Acre (acres)	Number of Properties	% Area of Town
Area 1 FEAT	270	785	1.9%
Area 2 Milton St	232	510	1.6%
Area 3 Linbrook	174	400	1.2%
Total Study Area	676	1,695	4.7%





Existing Conditions

Drainage Model Development

- Performed supplemental survey
- Developed models of 21 drainage systems that discharge to Trout Brook
- Conducted calibration and validation of the hydraulic models
- Modeled for a 10 year design storm (10% chance of occurring in a given year)







Metering Program

- 5 flow meters installed within the drainage system
- Metering program successful, capturing three storms exceeding 0.5 inches
- Metering data used to validate model response and gain confidence in representation of the drainage system



Drainage Systems with Modeled Flooding

			10-year Design Storm	Tropical Storm Lee	2018 Storms	August 2019
Area	Outfall	Location				
1	5641-022	FEAT – Trunk line	V	V	V	V
1	5641-017	Middlebrook Road				
2	5641-007	Fern Street East	V	V	V	V
2	5641-001	Milton Street	V	V	V	V
2	5641-16	Trout Brook Drive East of Linbrook Road				
2	5641-14	Trout Brook Drive East of Linnard Road				
2	5641-13	Trout Brook Drive Central				
2	5641-11	Trout Brook Drive South				
2	5641-12	Ballard Drive	V			
3	1091-001	Clifford Drive North	V			
3	0731-001	Linbrook Road	V			
3	3261-001	Linnard Road	V	V	V	V
3	1981-009	Fern Street West	V	V	V	V
3	3681-001	Montclair Drive	V	V	V	V
3	2171-001	Fox Meadow Lane				
3	3321-002	Loomis North	V			
3	3321-001	Loomis South	٧			
3	2547-002	Hammick Road North				
3	2547-003	Hammick Road South				
3	3321-003	Loomis Central	V			
3	2547-001	Clifford Drive Cross-County	V	V	V	V
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Private Inflow Removal

- 1,747 total buildings
- 661 <u>known</u> private inflow removal buildings (shown in red)
- 38% of the buildings need to be removed
- Could be additional buildings that have not been inspected



Collector Drainage Systems



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Groundwater Assessment

 Assess the project area to provide guidance on groundwater infiltration



Screening Level Groundwater Model

Simulated depth to groundwater

- Green = depth to groundwater within 5 feet below ground surface
- Purple = depth to groundwater within 10 feet below ground surface







Recommendations

Recommendations

- Drainage system improvements
- Collector drains







Drainage System Prioritization

Tier 1 – High Priority

Areas with documented and modeled flooding

- Tier 1A modeled flooding coincides with Town reported flooding
- Tier 1B areas where flooding is also related to groundwater
- Tier 1C areas with modeled flooding during all historical events

Tier 2 – Moderate Priority

Modeled flooding during all historical events

Tier 3 – Low Priority

Modeled flooding only during the 10 year design storm event



Prioritization Recommendation Summary

Area	Outfall	Location	Outfall Drainage Area	Tier
			Bainbridge Road Area	
			Bainbridge Road and Walbridge Road	1A
1	1 5641-022 FEAT Trunk Line		Birch Road and Chelsea Lane	1 C
			Fernwood Road and Cross County	2
			Dorset Road	1A
			Fern Street - Middlebrook Road Area	1 C
2	5641-007	Fern Street East	Penn Drive	1C
			Bretton Road	1C
2	5641-001	Milton Street	Milton Street	2
2	5641-12	Ballard Drive	Ballard Drive	3
3	3681-001	Montclair Drive	Montclair Drive	1B
3	0731-001	Linbrook Road	Linbrook Road	3
3	1981-009	Fern Street West	Fern Street	2
3	2547-001	Clifford Road/Cross Country	Clifford Road/Cross-Country	2
3	3261-001	Linnard Road	Linnard Road	2
3	1091-001	Clifford Road	Clifford Road	3
3	3321-002	Loomis North	Loomis Drive North	3
3	3321-003	Loomis Central	Loomis Drive Central	3
3	3321-001	Loomis South	Loomis Drive South	3





Collector Drainage System Recommendations

Requires MDC Coordination to Proceed

Area 1

- 325 buildings (green)
- 17,500 If collector drains (red)
- 3,800 lf drain extensions (dash)
 Area 2
- 222 buildings (green)
- 13,500 lf collector drains (red)
- 3,600 lf drain extensions (dash) Area 3
- 114 buildings (green)
- 6,200 If collector drains (red)
- 2,500 lf drain extensions (dash)



Possible Groundwater Study

- Depth to groundwater is very shallow within 5 feet of ground surface
- Area 3:

Approximately 85 houses with 5 feet Approximately 90 houses with 10 feet

- The project areas are located within a regional low elevation point
- Future groundwater study is recommended including monitoring wells – approximate cost \$50,000





Costs

Drainage System - Conceptual Design Costs

Area	Outfall	Location	Recommendations	Tier	
1	5641-022	FEAT Trunk Line	\$25,700,000	1A, 1C, 2	
2	5641-007	Fern Street East	\$4,200,000	1C	
2	5641-001	Milton Street	\$7,800,000	2	
2	5641-12	Ballard Drive	\$300,000	3	
3	3681-001	Montclair Drive	\$300,000	1B	
3	0731-001	Linbrook Road	\$1,100,000	1B	
3	3261-001	Linnard Road	\$2,300,000	2	
3	2547-001	Clifford Cross Country	\$600,000	2	
3	1981-009	Fern Street West	\$800,000	2	
3	1091-001	Clifford Drive	\$300,000	3	
3	3321-002	Loomis North	\$271,000	3	
3	3321-003	Loomis Central	\$60,000	3	
3	3321-001	Loomis South	\$277,000	3	
		TOTAL COST	\$44,008,000		





Collector Drain System- Conceptual Design Costs

		Private I/I		Drain	Drain	
		Removal	Collector	Extensions	Structure	Total Contral
Outrail	Location	Buildings	Drain (Lf)	(LT)	(Each)	lotal Costs'
5641-022	FEAT - Trunk line	292	15,281	3,303	21	\$5,392,00
5641-007	Fern Street East	87	5,615	1,789	12	\$2,346,000
5641-001	Milton Street	129	7,872	1,614	15	\$2,758,000
5641-12	Cross Country System Area 2	35	2,106	641	3	\$853,000
3681-001	Montclair Drive	9	350	0	0	\$77,000
0731-001	Linbrook Road	8	645	0	0	\$141,000
3261-001	Linnard Road	45	2,489	1,700	8	\$1,586,000
2547-001	Clifford Drive Cross Country	4	256	0	0	\$56,000
1981-009	Fern Street West	26	1,440	332	2	\$521,000
1091-001	Clifford Drive	4	256	0	0	\$56,000
3321-002	Loomis North	0	0	0	0	\$0
3321-003	Loomis Central	0	0	0	0	\$0
3321-001	Loomis South	0	0	0	0	\$0
	Totals	639	36,309	9,379	61	\$13,786,000
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Funding Options

Funding Opportunities

All Funding Options Require Town Capital Improvements Bonding

Building Resilient Infrastructure Communities (BRIC)

- FEMA Grant 75% Federal 25% non-federal
- Public infrastructure projects that mitigate risk, incorporate nature based solutions & include adaptation
- Due January 29, 2021, awarded June 2021

Flood Mitigation Assistance (FMA)

- FEMA Grant 75% Federal 25% non-federal
- Projects with repetitive flood damage, within Flood Insurance Program & have a benefit cost ratio >1
- Due January 29, 2021, awarded summer of 2021

Water Infrastructure Finance and Innovation Act (WIFIA)

- Federal credit program that provides low interest loans (1.27%)
- Application fee of \$100,000, 49% of the project can be funded through this program
- Due October 15, 2021

CT DEEP Clean Water Fund (CWF) and State Revolving Funds (SRF)

- 50% grant for CSO projects
- Projects that take stormwater out of the sewer system Team with MDC



Funding Opportunities – Stormwater Utilities

- Conceived in the 1970's to more **equitably** fund stormwater management programs
- Key to success is engagement by stakeholders



Fee Contribution by Property Class (Based on impervious area - ERU basis)



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CT Stormwater Utilities – Legal Authority

2003 CT Municipal Separate Storm Sewer System (MS4) Permit

- 2007 Pilot program for 4 CT municipalities to investigate a stormwater utility Three municipalities conducted studies: New Haven, New London and Norwalk
- 2017 Updated Stormwater MS4 Permit
- 2019 State enabling legislation (HB 7408) ran into problems
- 2020 Stand alone bill allowing municipalities to form a stormwater utility without CT DEEP approval



New England Stormwater Utilities (2018)

Community	State	Туре	ERU	Mont	thly Fee	Year Est	Рор	Anı	nual Rev
Chelmsford	MA	Т		\$	3.33	2017	33,802	\$	2,000,000
Chicoppee	MA	E	2,000	\$	8.33	1998	54,653	\$	1,000,000
Fall River	MA	E	2,800	\$	11.67	2008	91,938	\$	4,660,000
Gloucester	MA	F		\$	4.42	2011	30,273		
Milton	MA	Т		\$	4.33	2016	27,003	\$	705,000
Newton	MA	D	3,100	\$	2.08	2006	83,829	\$	575,000
Northampton	MA	F		\$	5.00	2014	28,952	\$	1,980,000
Reading	MA	D	3,210	\$	3.33	2006	24,145	\$	357,000
Westfield	MA	F				2010	41,094	\$	600,000
Augusta	ME	E	2,700	\$	7.54		18,560		
Bangor	ME	E	3,000	\$	1.83	2012	33,011		
Lewiston	ME	D	1,800	\$	4.17	2006	35,690		
Long Creek Watershed	ME	D	12,000	\$	6.89	2010		\$	1,400,000
Portland	ME	E	1,200	\$	6.00	2017	66,000	\$	3,000,000
Burlington	VT	Т	1,000	\$	1.69	2009	38,889	\$	1,500,000
Colchester	VT	E	4,400	\$	4.37	2017	17,067	\$	1,500,000
South Burlington	VT	Т	2,700	\$	5.94	2005	15,814		







Next Steps

Next Steps

Milone & MacBroom Study: November 2018

CDM Smith Drainage Study – Phase 1

- June 2020: Final Report
- October 2020: Town Council Workshop
- November 23rd & 30th 2020: Public Information Meetings
- Grant Submission: January 2021
- MDC Coordination: Ongoing
- Support Stormwater Utility Legislation
- CDM Smith Drainage Study Phase 2
- October 2020 February 2021: Drainage Study
- February 2021: Draft Report
- Spring 2021: Town Council and Public Information Meeting





Questions and Contacts

QUESTIONS??

Contacts:

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https://www.westhartfordct.gov/town-departments/engineering/storm-water-management



