A Multi-Community Approach for Addressing I/I

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Agenda

- > Location & History
- > Project Need
- > Project Approach
- > Field Work Results
- Capital Project Development



Locatio







Lessons Learned

- > Look "Big Picture"
- Avoid tunnel vision



 Consider neighboring municipalities → "Regional" approach → "fundability"



Project Need –

I/I Studies 80% funded by EFC Engineering Planning Grants (2015, 2017x2)





Common Ground

- > 3 Villages...*1 shared County-owned WWTP*
- Sanitary sewer infrastructure over 100 years old...primarily untouched...
- Consistently high peaking factors

 documented SSO's
- Vested interest in lowering WWTP & PS operating \$\$
 Higher Flows = Higher Sewer Rates



Looking at the Numbers...

- > Big \$ in "recent" WWTP improvements
- Good Asset Management
 Practices @ WWTP by County
- No \$ invested in collection systems, only reactive

NORTHEAST

REGIONAL



Flash Flooding: Herkimer County- June 23, 2013

On <u>June 23rd</u>, <u>slow-moving thunderstorms moved over the same areas</u> (trained) of southern Herkimer County which were already saturated from previous rainfall events over the last several weeks. <u>Flash flooding occurred</u> with the towns of Middleville and Herkimer hardest hit with several road washouts, reports of debris in roadways, and homes being flooded. Little Falls also experienced flash flooding with roads being washed out. Homes in Kast Bridge were flooded as well as roads being closed. Multiple roads were also washed out in Fairfield. <u>West Canada Creek at Kast Bridge</u> and <u>Mohawk River at Little Falls</u>.

Flash Flooding: Herkimer & Montgomery counties - June 28, 2013

After several weeks of very wet weather, the ground across the region was already quite saturated due to recent flooding making the region susceptible to flooding. On June 28th, heavy rainfall occurred across the Mohawk Valley and western Adirondacks with rainfall fell at rates of nearly one inch per hour at times with a total rainfall of three to five inches. This led to significant flash flooding across both the Mohawk Valley and Adirondacks. Many roads were washed out and closed, including a portion of the New York State Thruway between exits 29 (Canajoharie) and 29A (Little Falls). In addition, urbanized areas along the Mohawk River experienced dangerous amounts of flooding. The entire town of Fort Plain was under water and many swift water rescues had to take place. The West Canada Creek at Kast Bridge and the Mohawk River at Little Falls both experienced major flooding.

(V) Ilion June/July 2013 Inflow and Infiltration

14



135 million gallons





Wet-weather flow behavior...is there a trend?





Historical Flows

Flow Data Obtained



Parameter	Year 1	Year 2	Year 3	3-yr Average
Ave. Daily Flow (MGD)	4.32	4.46	4.13	4.30
Daily "Base" Flow (MGD)	3.25	4.27	3.78	3.76
Max Observed Daily I/I (MG)	6.03	17.22	7.58	10.28



Asset Management-based Approach

- Aging municipal workforce
- > Harness institutional knowledge for future workforce
- > Implementation of sound data management practices
 → trend asset condition
- Provide mechanism for proactive O&M and CIP development



Asset Management & Rehabilitation Project Development article in 2017 NASTT-NE Fall Journal p.42



Asset Management – Shared Database

- > Utilized County-owned software
- > Ability to catalog/track MACP Inspections
- Ability to catalog/track PACP Inspections
- Ability to assign rehabilitation methods based on defect type, number, frequency, etc.



Asset Management & Rehabilitation Project Development article in 2017 NASTT-NE Fall Journal p.42





Asset Inventory to CIP





Field Work Results

Manhole Inspections

MACP data export → Asset Management program

ID: 4984		84	Street Location:	11 benedic	11 benedict		
MH Num.	24131	-	Municipality	(V) Ilion		-	
Inspector:	Degnan	T	Surface Type:	Asphalt		•	
On Map/Pla	ins? Yes	•	Weather D Temp.:	amp 55 deg. F	Date: Time:	12-Apr-17 7:25 AM	
Code: Invert Dept	Light Highway th (in): 1	•	MHCleanliness: Manhole Diamet	Adequate er (in.)	 ▼ ■ 3 48 ▼ 	Surcharged	

bservations	1 Observations 2	Observation	ns 3 Notes Ph	otos Sketche	S
		Click for Ma	nhole Diagram		
Material	Cast Iron	✓ Mar	nhole Cover Lo	ocation Flush	•
Condition	Sound	- Am	nount Raised/E	Depressed (in.) 0
Cover Diam	eter (in.)	24 - Nu	mber of Pick H	loles	0 -
Cover Dept	h (in.):	1.5 - Dia	ameter of Pick	Holes (in.)	0 -
Material	Cast Iron	 Fr 	ame Diameter	(in.)	24 -
Condition	Sound	▼ Fr	ame Depth (ir	n.):	
Is there ar	n Insert				
Is Manhole	e Frame Offset from	n Manhole			•
How Much	is it Offset (in.)				0
Corbel Informa	tion		Wall Information		
Material	Brick	-	Material	Concrete	-
Condition 1	Mortar Missing		Condition 1		-
Condition 2	2 Deposits		Condition 2		-
Condition 3	3	-	Condition 3		

	Click for Manhole	Diagram		1.1
Source Location *	Est Flow [GPM] *	Deficiency	* Rating *	Comm



Field Work Results

Manhole Inspections



If one 1.5" dia pickhole can result in over 14,400 gpd inflow...







Field Work Results

CCTV Inspections

NORTHEAST REGIONAL

CHAPTER

h.5)/

- > PACP data export \rightarrow Lucity AM database
- Segment analysis based on defect severity level of infiltration



CENTIFIED WILE & DUE CONTRA	CT0#			Fax: E-mai	E	
		Inspecti	on Report			
Date 6/5/2017	P/O. No.	Weather Dry	Surveyor's Name J. McKinney	Pipe Segment Reference	Section No. 1	
Certificate No.	Survey Customer	System Owner	Preset :	Pre-Cleaning No Pre-Cleaning	Sewer Categor	
Morgan Use of Sever Sa City Ilion Drainage Area Loc. details Flow Control Flow Control Location Code Main Highway - Urban Length surveyed 17			tary 05 ft	Upstream MH. 24217 Dowstream MH 24225 Dir. of Survey Downstream Section Length 170.05 ft		
Purpose of Survey Year Laid Year Rehabilitated Tape / Media No. Add. Information :	Maintenance Related		Joint Length Dia./Height Material Lining Method	8 inch Vitrified Clay Pipe		
24217	<u>0.00</u> Manhol <u>19.06</u> Water L <u>37.80</u> Crack C <u>41.90</u> Repair <u>89.96</u> Tap Bre <u>89.96</u> Fractur <u>89.96</u> Infiltrati <u>96.69</u> Tap Bre <u>96.69</u> Infiltrati	e, 24217 Level, Sag in pipe, 5 % o Dircumferential, from 8 o' Pipe Replaced Pak-In Active, at 3 o'clock e Multiple, from 9 o'clock on Runner, at 12 o'clock on Runner, at 9 o'clock on Runner, at 9 o'clock	f cross sectional area clock, to 4 o'clock s, 4 inch dim s, to 3 o'clock s, 4 inch dim		04.27 FT	

Capital Improvement Plan

> Take holistic approach!!

- > Do not have tunnel vision...groundwater migrates
- > Address entire subareas, or entire collection system

> Evaluate user cost impacts

- > What can the community afford?
- Work with local government to determine acceptable target charges....back into an affordable CIP







Capital Project Development

Trenchless rehab solutions

- > Mainline CIPP (Steam, water, or UV-cured?)
- Packer Injection Grouting
- > Lateral CIPP (0-3ft, 0-15ft)
 - > "design-build" approach?
 - Bidding Flexibility
- > Manhole lining & injection grout





Trenchless-Based Rehab. vs. Conventional Replacement





Trenchless-Based Rehab. Benefits

- > Old communities...narrow streets
- > Sanitary sewer typically under centerline
- > Roadway restoration = \$\$\$\$



- > Multiple utility conflicts.....abandoned Erie Canal!
- > Residents & Boards sensitive to construction disturbance



CIP Recommendations Asset Renewal Items and Anticipated Quantities

Parameter	(V) Frankfort	(V) Ilion	(V) Mohawk	Totals
Mainline CIPP (LF)	38,000	93,000	29,000	160,000
Lateral CIPP (EA)	60	TBD	220	280+
Manhole Rehabilitation/ Replacement (EA)	140	230	90	460
Open-cut repairs (LF)	3,500	8,000	4,800	16,300



CIP's





CIP Progress to Date





(V) Frankfort – Construction!

- **Prime Contractor:**
- Jablonski Excavating
- Trenchless Subcontractors:



Stronger. Safer. Infrastructure."



National Water Main Cleaning Co. A Carylon Company ~ New England Divisons The Environmental Protection Specialists





(V) Frankfort - Construction

- \$6.23M Capital Project cost
 \$1.55M Grant Awarded in 2017
- 64% I/I reduction anticipated
- Mainline CIPP Lining: 38,000+ LF 8- to 20-inch dia, Steam-cured
- Lateral-related work Trelleborg epros DrainMTH/LCR Systems
- Manhole Rehab: 114 Structures Avanti AV-101,101,102 Milliken Geospray, Quadex Hyperform, Quad Plug





What does the future hold?

- Collection systems on "even playing field"
- "Regional" collection system O&M
 - Shared services, maintenance district → increased funding opportunities for consolidation/shared services
- Increased capacity = economic growth potential
- > Utilization of Asset Management Software
 - > Generation of Work Orders
 - > Track asset condition
- Leverage Term Contracts for future trenchless work





Questions?

The texperience to listen.

The power to 1 Solve.



