

Sewer System Capital Budget Process

Presentation to
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Department of Special Services Committee Meeting

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Review Asset Management Philosophy

What do we want?

How do we get There?

Step 1 - Improve Data Management

Step 2 - Implement Asset Management Plan

Improve Data Management

Initiate Proactive Condition Assessment

Develop Standard Data Analysis



What is Asset Management?

A set of integrated processes to minimize the lifecycle costs of owning, operating and maintaining assets, at an acceptable level of risk, while continuously delivering established levels of service.

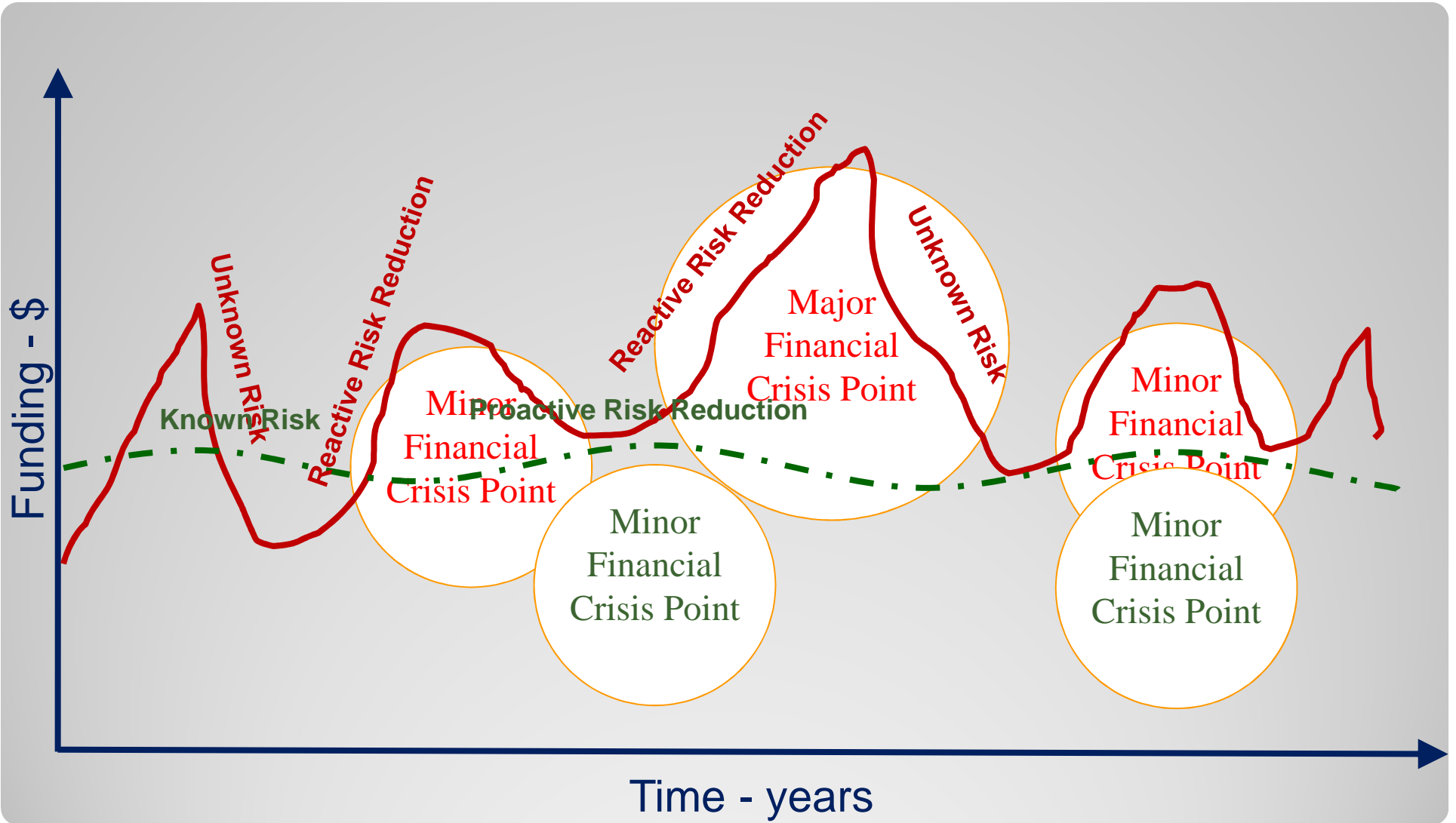
Service

Risk

Cost



Lower Overall Cost of Ownership



Improve Data Management

Asset Hierarchy

An "outline" of data that organizes assets, facilitating data analysis

Found Hansen, GIS and Tier organize information differently

Sewer Asset Hierarchy is based on relative size of asset and location

- "System" - Defined by the Pump Station or Treatment Plant
- "Basin" - Defined by the Interceptor
- "Asset Group" - Collector System or portion of the Interceptor
- "Asset" - Individual manhole, pipe or other "component"

Simplified, more standard organization method

Established "county-wide" hierarchy system that can expand beyond the sewer system

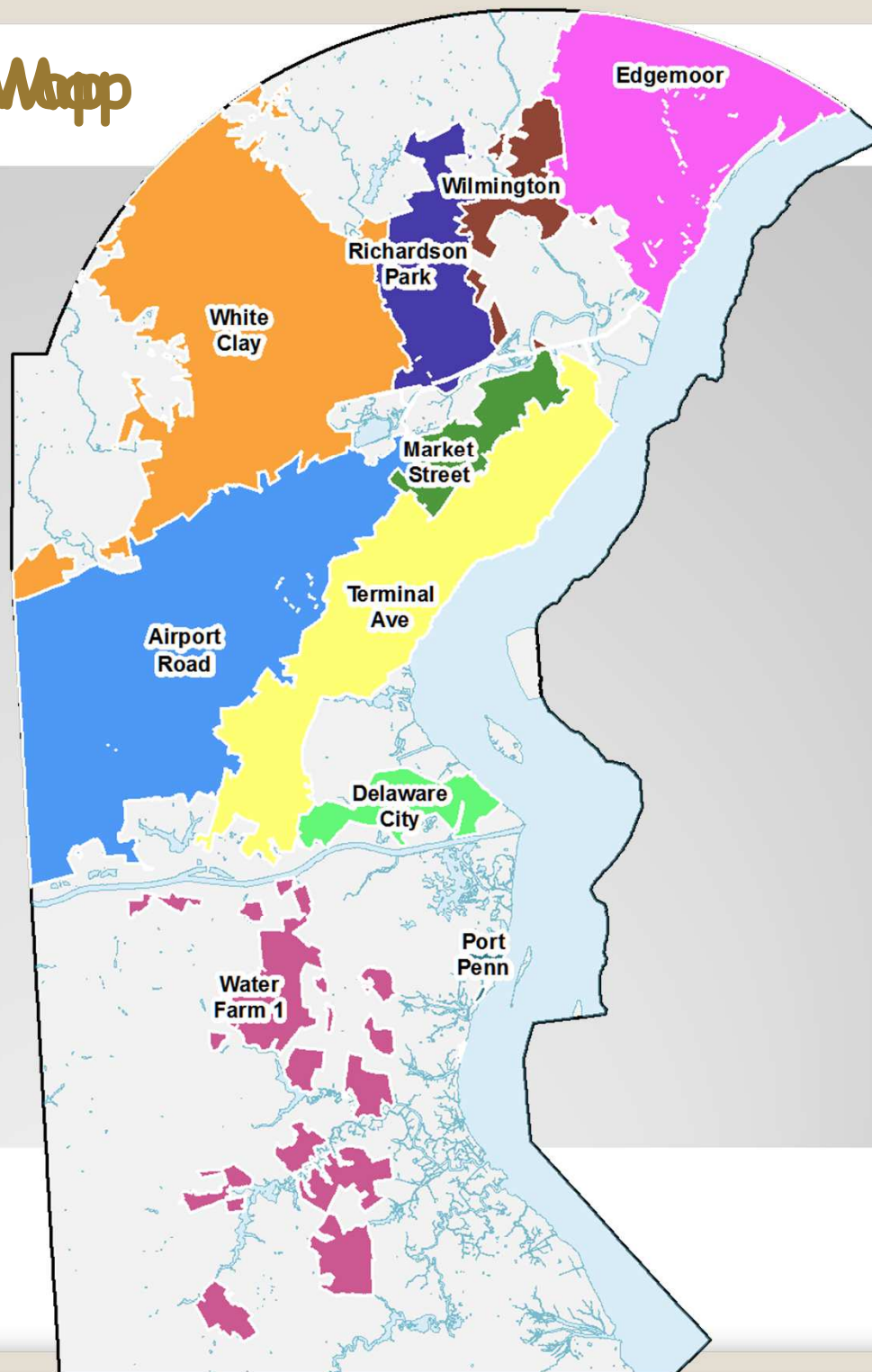


Asset Hierarchy

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7
Enterprise	Department	Division	WWTP	System	Basin	Asset Group
NCC	Special Services Department	Sewers Division	Wilmington	CRFM Richardson Park System	Richardson Park PS Little Mill Interceptor System	Little Mill A Little Mill B Little Mill C
					Little Mill Collector System	LITTLE-1 LITTLE-9 LITTLE-15 LITTLE-21 LITTLE-30 LITTLE-32 LITTLE-33 LITTLE-43
					North Christina Interceptor North Christina Collector System	NCHRIST-1 NCHRIST-10 NCHRIST-13
					Boxwood Road Trunkline Boxwood Road Collector System	BOXWOOD-1 BOXWOOD-6
					Chestnut Run Trunkline System (LM-16)	Chestnut Run A



New Sewer System Map



Improve Data Management

GIS is backbone of work communication

Strong system, well maintained

CMMS replacement

Cityworks configuration on-going

Open architecture allows easy communication with other systems

Cityworks uses GIS hierarchy

CCTV upgrade

CCTV investigation provides Structural Condition

Current CCTV system does not integrate with Cityworks or GIS

Investigating other Systems



Past Condition Assessment Process

"Run to Failure" type of process

Little to no preventative maintenance

High number of overflows triggers response

Hire consultant to investigate, plan and perform improvements

Long process

Many problems

Poor Customer Service

High, unexpected Capital Costs

Regulatory Issues



Current Condition Assessment Process

Improved maintenance and rehabilitation, fewer overflows

Minor issue(s) found trigger investigation

- High maintenance activity

- High storm response

- High customer complaints

Better than "Run to Failure" method

- Allows for better prediction of sewer issues

- Already performing rehabilitation in areas other than BW100

Closer to Proactive, but still Reactive



Proactive Condition Assessment

Allows prediction of failures, even before minor issues

Requires continual and intentional investigation

Sewer Maintenance focuses on maintenance

Engineering focuses on fixing known issues

AM Program provided framework for Condition Assessment

Capacity Performance - from our Hydraulic Model

Operating Performance - from maintenance work orders

Structural Condition - from sewer system investigation

Must standardize and facilitate analysis and rehabilitation



Proactive Condition Assessment

Created "System Investigation and Rehabilitation" Projects

On-going data collection and analysis results in more rehabilitation

Pipe lining (trenchless)

Lateral Lining (trenchless)

Test and Seal Pipe Grouting (trenchless)

Manhole rehabilitation (primarily trenchless)

Minor Pipe Replacement/Point repairs

Re-organized Engineering staff responsibilities

Group dedicated to investigation, rehabilitation and analysis

Group dedicated to larger-scale capital improvements

Staff assigned based on skills and interest, may rotate

Major efforts will be assigned individual capital project



System Rehabilitation Projects

Project Number	New Project Title	Old Project Title
221710	White Clay System Rehabilitation	
210323		MILL CREEK INTERCEPTOR RELIEF
220422		PIKE CREEK IMPROVEMENTS
220614		WHITE CLAY SEWER BASIN REHAB
221707	Terminal Avenue System Rehabilitation	
210420		OLD STATE RD INTERCEPTOR
221704	Richardson Park System Rehabilitation	
221404		LITTLE MILL BASIN REHABILITATION
221702	Airport Road System Rehabilitation	
210611		SOUTH CHRISTIANA INTERCEPTOR ANALYSIS
221708	Edgemoor System Rehabilitation	
221001		BRANDYWINE HUNDRED NORTH REHAB PHASE 2
221002		BRANDYWINE HUNDRED SOUTH REHAB PHASE 2
221604		STONEY CREEK BASIN
221714	Water Farm #1 System Rehabilitation	
221711	Wilmington System Rehabilitation	
221705	Delaware City System Rehabilitation	
221709	Port Penn System Rehabilitation	
221703	Market Street System Rehabilitation	

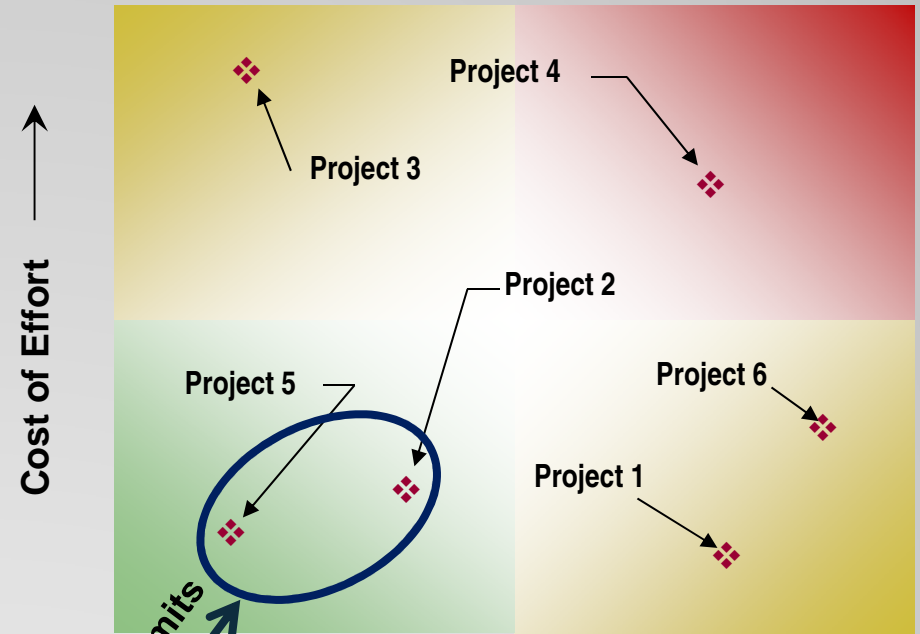


Standard Data Analysis

Consequence ↑	Severe	10	20	30	40	50	60	70	80	90	100	
	Moderate	9	18	27	36	45	54	63	72	81	90	
		8	16	24	32	40	48	56	64	72	80	
	Low	7	14	21	28	35	42	49	56	63	70	
		6	12	18	24	30	36	42	48	54	60	
	Negligible	5	10	15	20	25	30	35	40	45	50	
		4	8	12	16	20	24	28	32	36	40	
		3	6	9	12	15	18	21	24	27	30	
		2	4	6	8	10	12	14	16	18	20	
		1	2	3	4	5	6	7	8	9	10	
		Negligible	Possible				Likely		Very Likely			
		Likelihood →										

Risk Reducing Options

- Rehab/Replace
- O&M procedures
- Improve Response Time
- Reduce LOS & Educate



Risk Reduction
Cost



Standard Data Analysis

Condition Assessment data collected routinely

Capacity Performance - existing Hydraulic Model

Operating Performance - existing Cityworks

Structural Condition - from proactive investigation

Data Analysis performed prior to budget process

Will prioritize capital work

Grant secured to develop this prioritization process



Benefits

Move from Reactive to Proactive Management

Smaller, less disruptive, less expensive projects

Better customer service with fewer emergencies

Prevents smaller problems from getting bigger

All areas will get some regular attention

Staff will focus on these tasks, develop expertise

Faster project delivery

Better long-term planning

