

Baltimore City Department of Public Works



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DPW

DEPARTMENT OF PUBLIC WORKS

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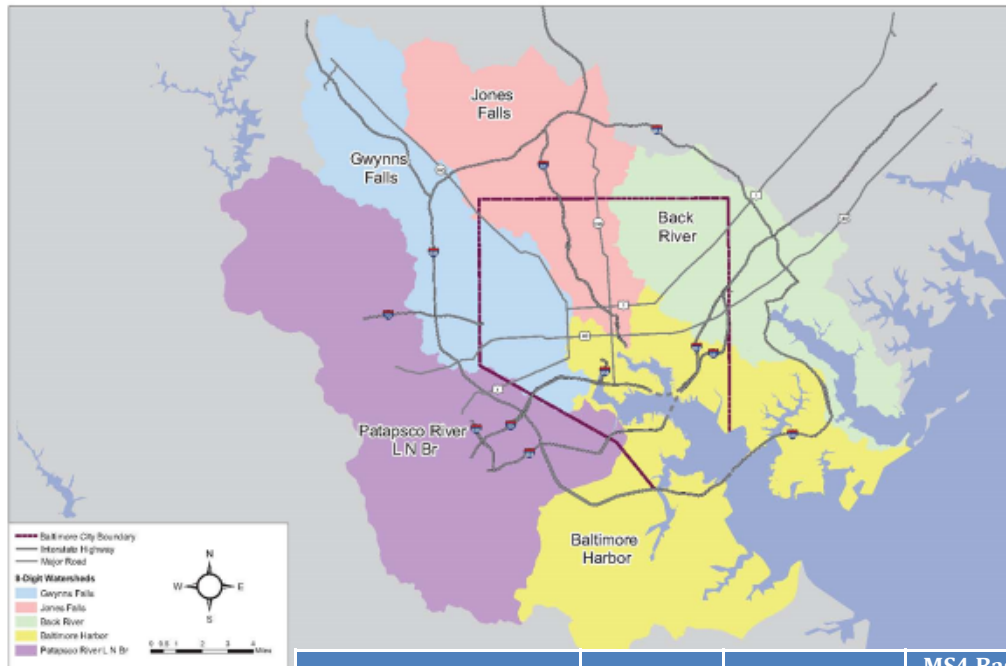
Chasing Compliance: Baltimore's Use of IDDE Methods for Bacteria Reduction



**Van Sturtevant and
Bilal Sarayra
Department of Public Works
City of Baltimore**

June 2016

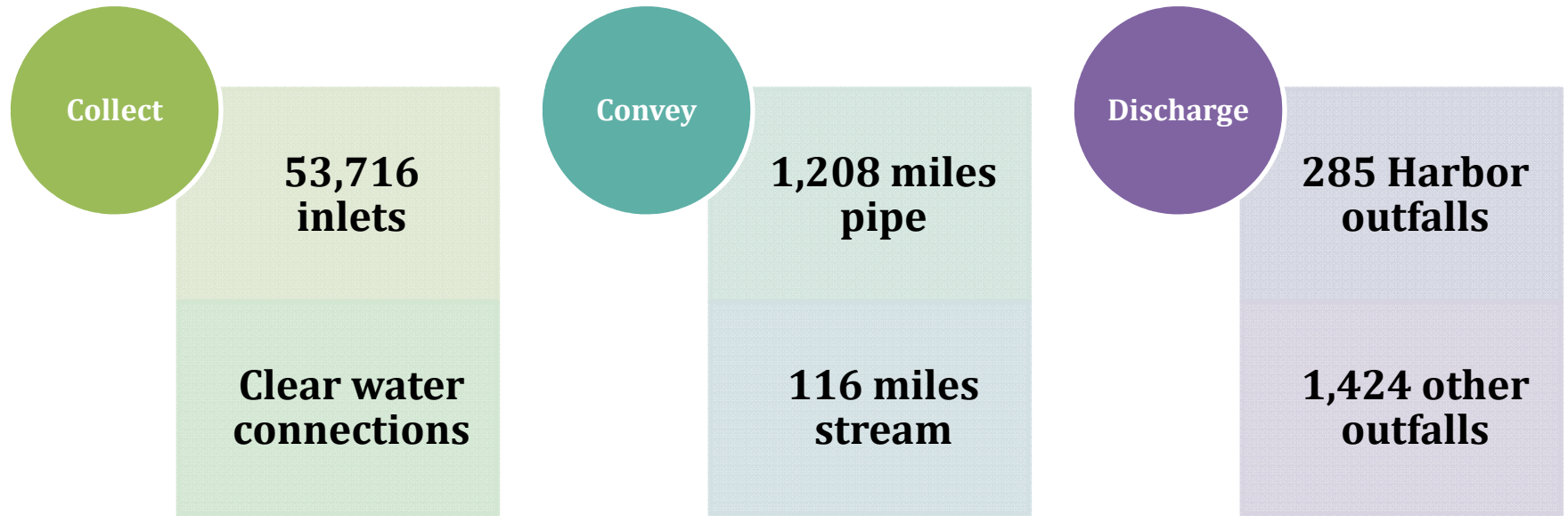
Bacteria TMDLs for Baltimore



- Capital infrastructure improvements
- Traditional, ESD, and Alternative BMPs
- Septic system improvements
- Preventive maintenance
- Education
- IDDE

Watershed	Issue Date	Pollutant	MS4 Baseline Load	WLA	Units	Description	% Reduction
Back River (Herring Run)	2007	E.coli	5,860,942	214,920	Billion MPN/year	Annual Avg.	96.3%
Gwynns Falls	2007	E.coli	98,157	322	Billion MPN/day	Daily	99.7%
Jones Falls	2008	E.coli	8,608	314	Billion MPN/day	Daily	96.4%
Lower N. Branch Patapsco	2009	E.coli	5,393	3,902	Billion MPN/year	Annual Avg.	27.6%

Baltimore's Stormwater System



DPW Operations for IDDE

- 14 positions
 - 1 supervisor
 - 8 field
 - 1 data mgt.
 - 4 vacant
- Scientists and engineers, min. bachelors degree

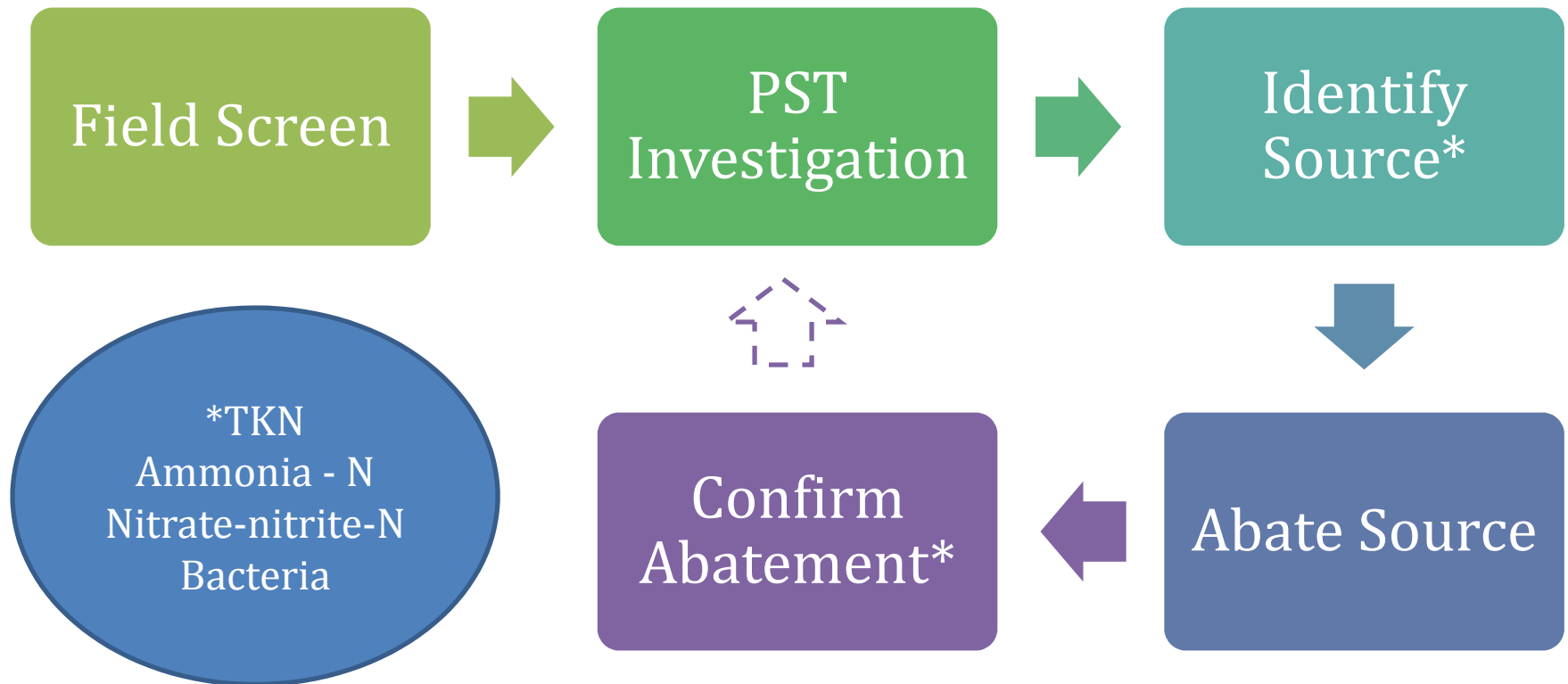
- \$2.0 M / year budget
- 3 funding sources
- Some private partnerships and volunteer programs

- Weekly field screening at over 80 locations
- FY 2015: 244 pollution source tracking (PST) investigations

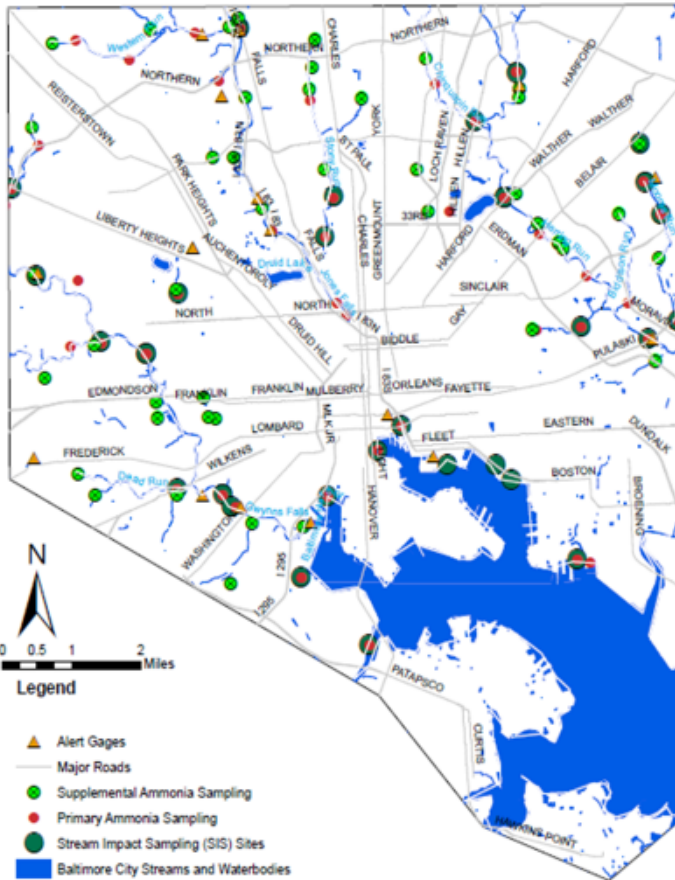
Stream Impact Sampling ● Chemical & Biological Assessment ● 311 Response
SSO Abatement Confirmation ● ERP SSO Sampling ● Flood ALERT Management ● Education



Assessing Pollutant Reductions



Field Screening & PST



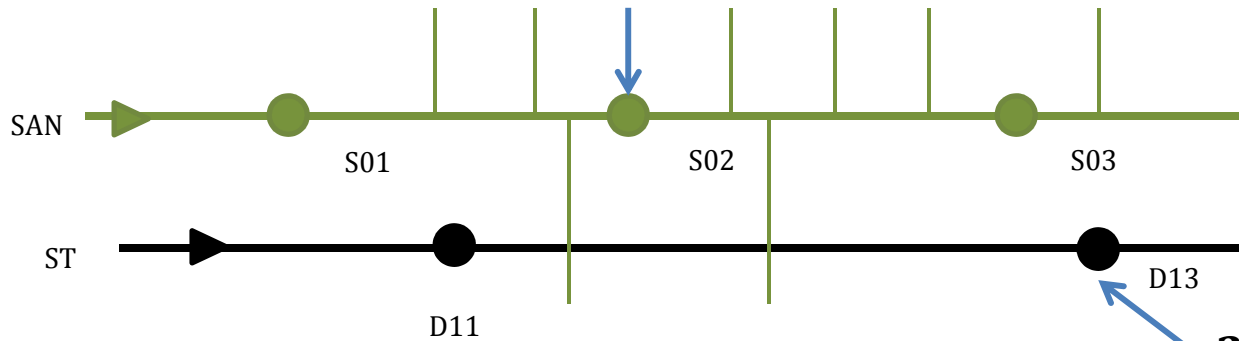
Investigation Details

Investigation ID	847
Name	Bloom St
Location Description	Underdrain for sanitary northwest of side of 36" storm drain below at 502 Bloom St
Approximate Address	502 Bloom St
Explanation	Observed waste water contamination by David Flores at outfall J236. Problem was tracked to a 9" under drain for sanitary line (S25I_025G1), inside 36" storm drain on Bloom St. Sewage is escaping the sanitary system and entering the storm drain by way of the under drain. Waste Water Engineers had the sanitary asset S25I_025G1 and the manholes at each side fixed. But the issue did not abate the problem. On October 30, 2016, CP&I
Problem Type	Sewage
Watershed	Jones Falls
Stream Name	Jones Falls
Outfall ID	D31HK_138ES
Complainant Category	Blue Water Baltimore
Complainant	David Flores
Complaint Date	2013-07-22
Status	Referred, Not Resolved
Field Investigation Date	2013-07-23
Discharge Classification	SDUO



Traditional Dye Testing

1. Single dye deployment here



2. Dye viewed here within a short timeframe.



Method	Cost
One-point-repair	\$7,800
Lining *	\$18,000
Pipe Bursting*	\$60,000

* Assumes 400 LF pipe segment.

Alternate 1: Mass Dye

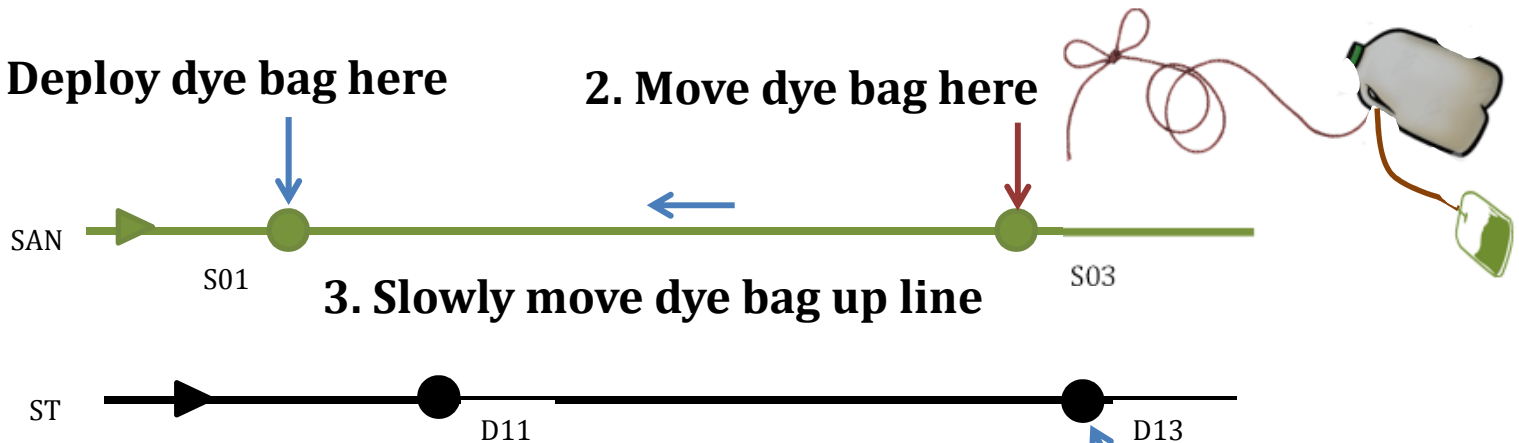


Example:
Small leak with a 130-
acre drainage area.
Discharge in stream,
not storm sewer
system.

Alternate 2: Segmental Dye

1. Deploy dye bag here

2. Move dye bag here

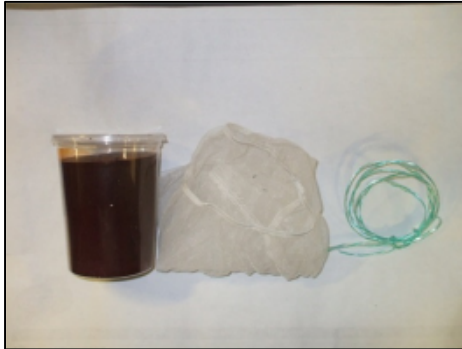


4. See dye here

Example: 370 LF previously lined 14-inch sanitary pipe, where CCTV showed no defects

Other Dye Deployment Methods

Dye tea bag



Dye diffuser



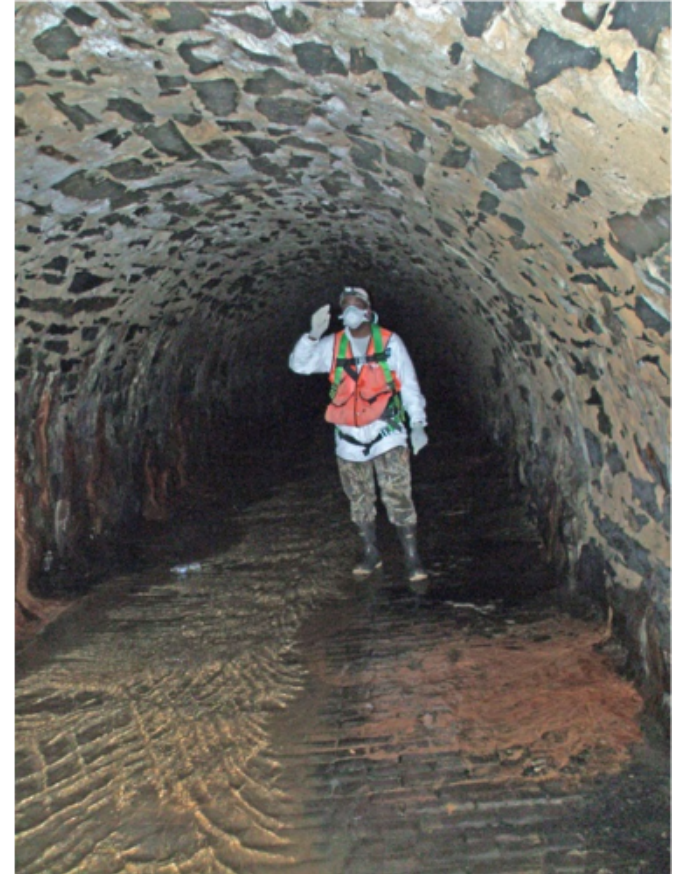
Alternate 3: Long Term Dye



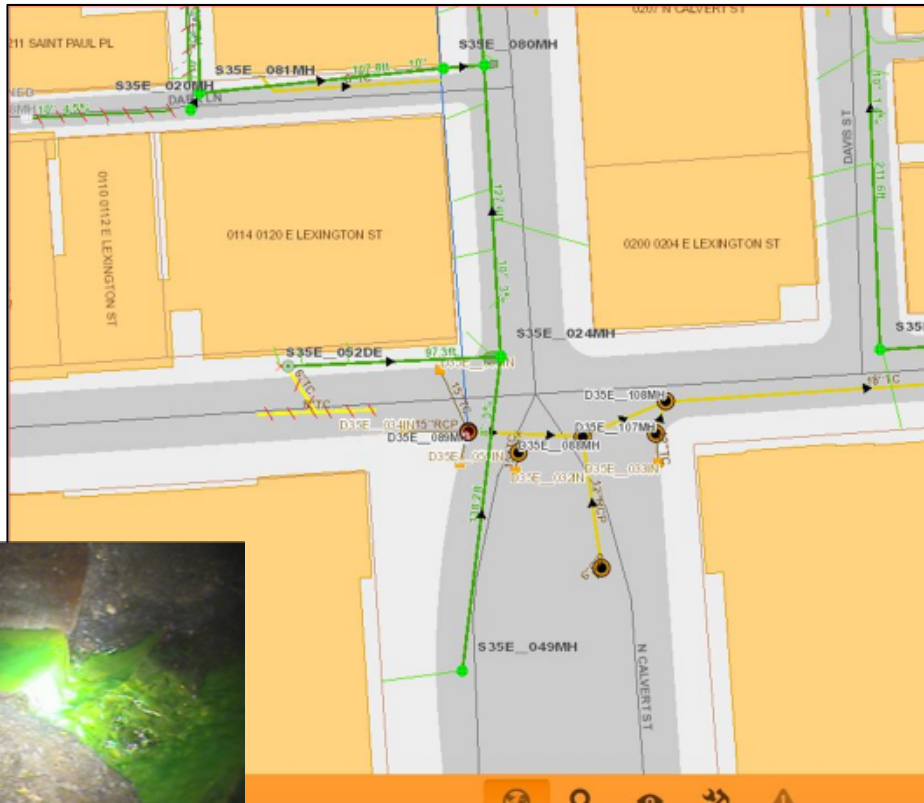
Example:
Closest sanitary asset was not the source.

Visual Assessment

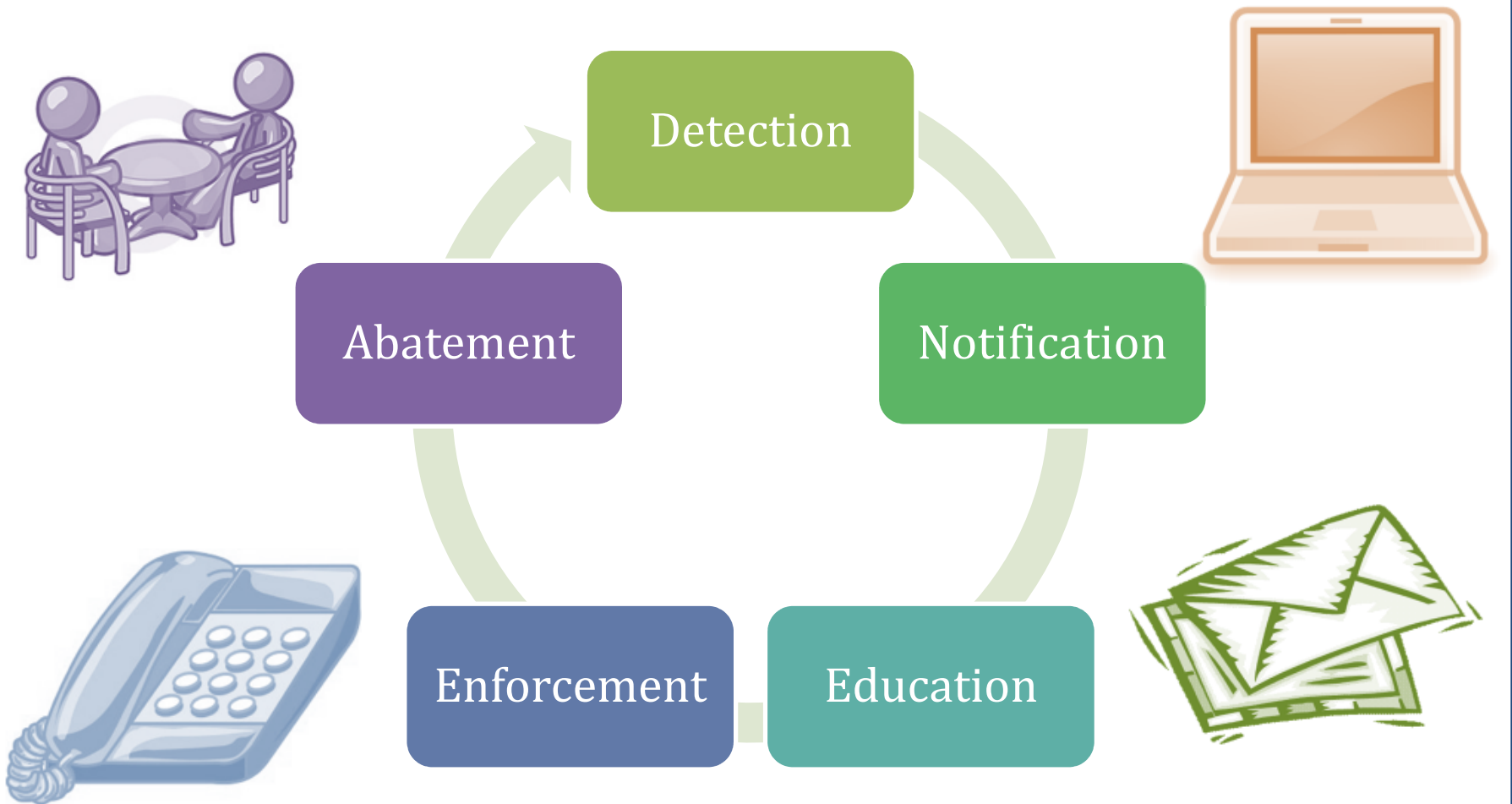
- Storm System
 - Pipe walk with Go Pro
 - Pole camera
 - Push camera
 - Pipeline camera (crawler)
 - Camera locator
- Sanitary System
 - CCTV truck



Case Study: Downtown Investigation



Communication as a Tool

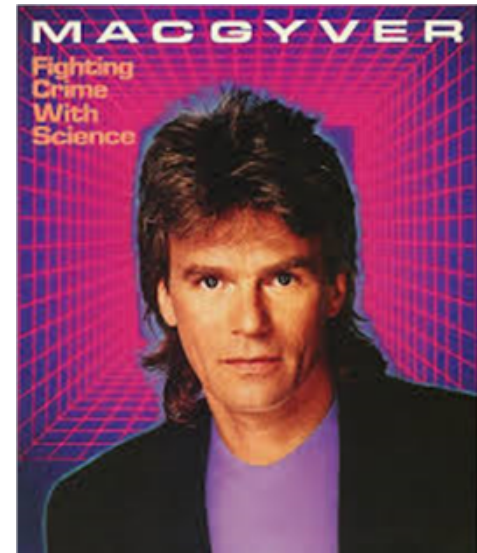


Case Study: Small but Complex



Final Thoughts

- An ounce of detection is worth a pound of elimination.
- Double check your work.
- Think outside the pipe.
- Practice patience.
- Communication is key!
- Find your inner McGyver.



Thank You for Your Time.

Office of Compliance and Laboratories

Department of Public Works

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