

# **Update on Evaluation of I/I Reduction Concepts**

**September 7, 2017**

**Steve Tolzman & Nicole Smith, King County WTD  
Steffran Neff & Bob Jacobson, Brown and Caldwell**

---

## **Agenda**

---

- KC Standards and Agency Standard Review Results
  - Common Approach to Standards Options
  - Inspection Procedures Review Results
    - Inspection Training Options
    - Next Steps

# Background and Status

## **Purpose:**

- Inform the region about potential new elements for the I/I Control Program
- Present frameworks for implementation of potential programs

## **Outcomes to Date:**

- Conducted interviews with each local agency
- Technical Memos for KC Standards, Agency Standards and Inspection Practices reviews have been completed

# Plan for Discussion

- Present results of the KC and Agency Standards reviews
- Discuss options for a common approach to sewer standards in the Region
- Present the results of the Inspection Practices review
- Discuss format and content options for an inspection training program in the Region

# KC Standards Review

## **Task Activities:**

- Review 2004 KC Final Draft Regional I/I Control Standards (2004 KC Standards)
- Compare to relevant national standards
- Verify whether 2004 standards are still accurate and can be used for benchmarking

# KC Standards Review Summary Table

Table 1. 2004 KC I/I Policies Review Summary

Policy #	Issue	Comment
1	Public funding for I/I reduction projects	There is no indication that KC intends to fund all phases of I/I mitigation work on privately owned property, and it may not be in the best interest of KC or local agencies to set such a precedent now.
2	Public awareness of I/I: educational materials	Information maintained on KC's website is useful but somewhat dated ( <a href="http://www.kingcounty.gov/services/environment/wastewater/ii/resources.aspx">http://www.kingcounty.gov/services/environment/wastewater/ii/resources.aspx</a> ). KC could provide examples of current local agency-generated educational materials and/or a link to WEF's Private Property Virtual Library ( <a href="http://www.wefppvl.org/WEF-PPVL-library/">http://www.wefppvl.org/WEF-PPVL-library/</a> ).
3	Public awareness of I/I: responsibility for community	This policy appears to be supported by many local agencies, and is a strong policy to help prevent and/or mitigate the impact of I/I.
4	Access to private property for I/I reduction and control	This is a strong policy that should be supported; KC could consider providing example legal authority language to local agencies.
5	Inspection training	Programmatic support for this policy is being developed as part of this project.
6	Limiting liability	This is a strong policy that should be supported; KC could consider providing example contract language to local agencies.
7	Bonding, licensing, insurance, and warranty provisions	This is a strong policy that should be supported; KC could consider providing example contract language to local agencies.
8	Stormwater drainage ordinances	This is a strong policy that should be supported.
9	Responsibility for stormwater drainage	This is a strong policy that should be supported.
10	Infeasible and/or prohibitively expensive modifications	This is a strong policy that should be supported.
11	Property restoration	This is a strong policy that should be supported.
12	Contractor qualifications	This policy may be overwhelming for local agencies that may have only one-off projects that address I/I; however, establishing a regional prequalification program may make sense and attract reputable sewer rehabilitation contractors to bid on projects in the KC service area.

## 13 Required permits

**This is a strong policy that should be supported; KC could consider developing a permitting checklist that could be used by local agencies.**

14	Cooperative efforts	Strong policy that should be supported.
15	Revisions to standards, procedures, and policies	As fully developed I/I-related specifications and procedures were not developed following adoption of the 2004 KC Standards, this policy may not be appropriate now.

# KC Standards Review Findings

- National standards have evolved since the 2004 KC Standards were developed
- Assessment equipment and technology have advanced
- Some 2004 KC Standards remain relevant
- Other standards are outdated or not written with sufficient detail to be useful guidance
- Updated standards would be needed to implement regional program
- Many local agencies have continued to develop their standards and align with national BMPs.

# Agency Standards Review Overview

## Task Activities:

- Interview cities and sewer districts to collect information on construction standards and practices
- Assess local agency sewer and side sewer standards
- Present regional findings and compare to national BMPs

# Agency Standards Review Findings

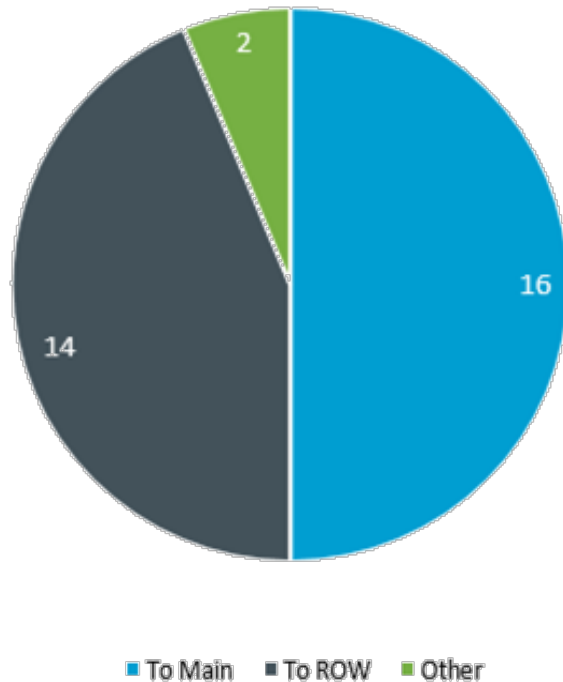
- In general, local agencies have adopted standards and practices largely in line with national BMPs
- No practices were identified with a disproportionately high risk for I/I



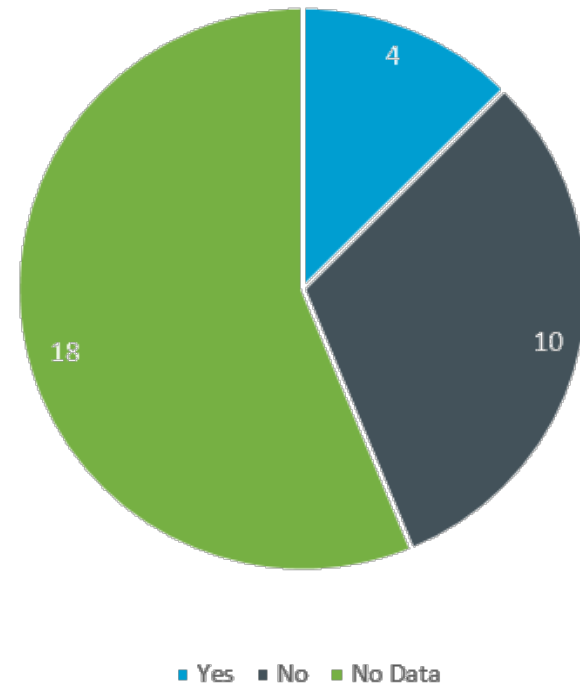
# Agency Standards Review Findings

## Side Sewer Ownership:

Limits of side sewer ownership, from building



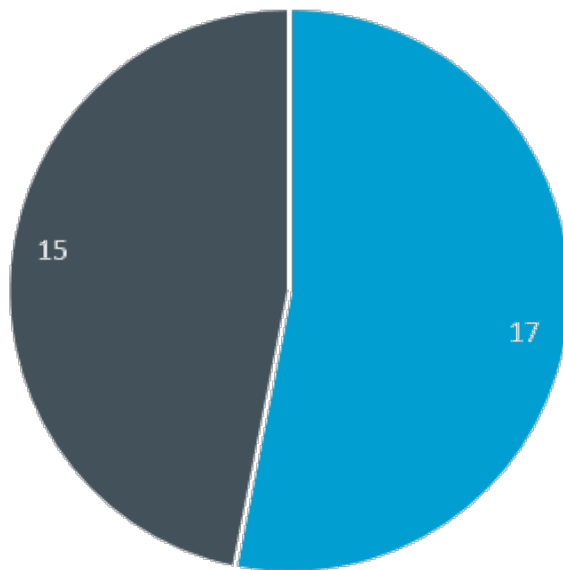
Side sewer ownership customer awareness



# Agency Standards Review Findings

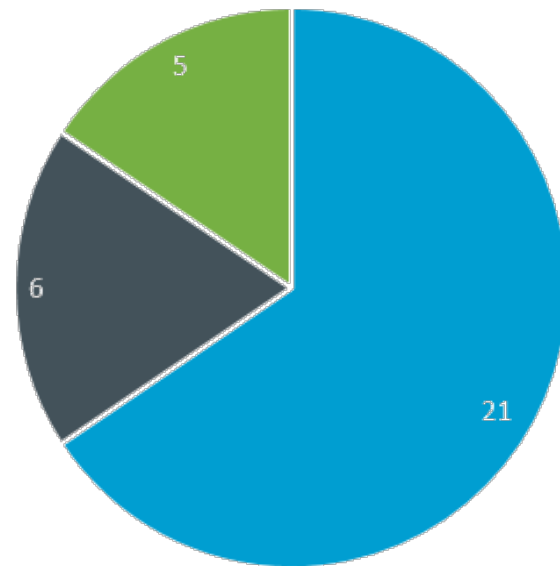
## Rehab/Replacement Programs:

Agencies with areas constructed to different standards



■ Yes ■ No

R&R Programs Established



■ Yes ■ No ■ In Development

# Agency Standards Review Findings

Identifying and implementing the following may reduce the overall I/I experienced in KC's regional wastewater service area.

- Appropriate and applicable/targeted I/I policies
- Stricter design guidelines
- Construction standards and specifications that incorporate best available technologies and materials
- State-of-the art inspection technologies and methods
- Proactive maintenance practices

# Agency Standards Review Findings

Examples of these opportunities include:

- Incorporating side sewer inspections at point-of-sale or property transfer
- Requiring side sewer inspections in structure demolition/abandonment permits
- Prohibiting manholes in gutters, low-lying areas, and other areas prone to flooding



# Agency Standards Review Findings

Examples of these opportunities include:

- Evaluating watertight products and requiring their use
- Developing a strong new construction and repair inspection program
- Requiring side sewer rehabilitation as part of sewer main R&R projects
- Conducting illicit connection inspections





# Common Approach to Standards Overview

## Task Activities:

- Develop an approach to achieve common sewer and side sewer standards in conformance with the findings presented
- Research policy and legal issues
- Develop tools, practices, procedures or other materials to assist agencies in addressing irregular standards.

# Common Approach to Standards Discussion

## Task Approach:

- Guidance vs. Standard - What type of enforcement and/or incentive should be required?
- Should including update to I/I best management practice in Comprehensive Plan 6-year cycle be considered?
- What kind of support would be required to make progress?

## **Conceptual Approach**

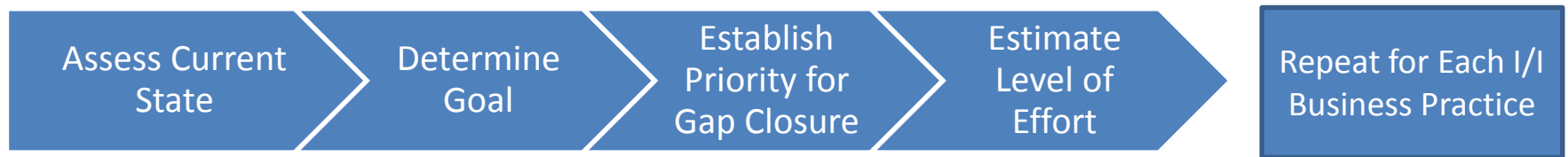
**Task 430: Develop an Approach to Common  
Sewer and Side Sewer Standards**



# Six Elements of a Successful and Complete I/I Program

- Defined Purpose that Supports the Agency's Vision and Mission
- Short and Long Term Goals
- Documented
- Trained Staff
- Performance Measures
- Continual Improvement

# Conceptual I/I Program Improvement Process



# Process Highlights

- Fully Developed I/I Programs Have Reached Defined Level In All Applicable Business Practices
- Goals Are Useful but May Not Suit All Organizations
- Guidance Distinguishes Between Core and Advanced Practices
- Specific Guidance for Each I/I Business Practice Is Tailored to the Size of the Organization, Where Applicable.
- Process Is Intended to be Helpful and not Rigid

# Example Descriptions

Status	Flow Monitoring	Watertight System Design Specification
Optimized	Dedicated to improving monitoring processes, equipment, and data management procedures	Refines watertight specifications by identifying possible inflow sources and including preventive measures in specifications (e.g., requiring manholes located in potential flooded areas to be equipped with locking gasketed ring and cover; lateral abandonment; lake line provisions; etc.)
Advanced	Regular system monitoring, including long term flow monitors, in support of I/I program	Addresses sewer main and side sewer water testing, integrates lateral liners with main liners, and requires water-tight system components (e.g., pre-fabricated manhole base with glass fiber supported plastic liner and gasketed connections; watertight seals on liners etc.)
Defined	Performed for focused I/I studies	Requires sewer main testing and some watertight system components (e.g., rubber gasket or solvent welded joints; manholes not located in gutters; etc.)
Initial	Infrequent, sporadic, and not strategic	Requires minimal I/I prevention measures (e.g., sewer main testing)
Unaware	Does no flow monitoring	Does not address watertightness issues in specifications

Practice status levels are progressive and build up from Unaware to Optimized.

# Score Sheet Sample and Outstanding Needs

Sample of how an  
agency might score in  
this practice category

		Flow Monitoring	Watertight System Spec
<b>Optimized</b>	<b>5</b>		
<b>Advanced</b>	<b>4</b>		
<b>Defined</b>	<b>3</b>		
<b>Initial</b>	<b>2</b>		
<b>Unaware</b>	<b>1</b>		
Current Score (1)		3	2
3-Year Goal (2)		5	4
Gap		2	2
Priority(3)		2	3
Priority x Gap		4	6
Rank of Priority x Gap		2	1
Level of Effort (4)		1	3

# Inspection Practices Overview

## Task Activities:

- Interview cities and sewer districts to collect information on inspection standards and practices
- Evaluate sewer and side sewer inspection programs throughout region
- Review national standards and identify BMPs for MWPAAC side sewer inspection programs
- Present findings and compare to national BMPs

# Inspection Practices Findings

## National I/I Inspection Best Practices Sources:

- 2016 Water Environment Federation (WEF) special publication - Private Property Infiltration and Inflow Control
- WEF Manual of Practice FD-6, Third Edition, Existing Sewer Evaluation and Rehabilitation, 2009. Chapter 5, Infiltration and Inflow Source Detection

# Inspection Practices Findings

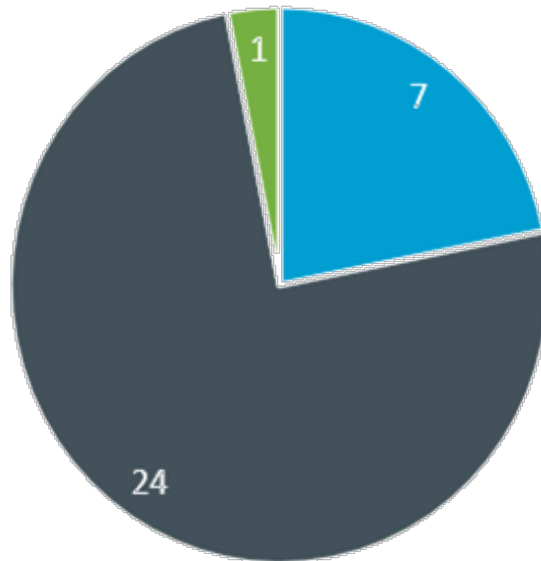
- All agencies found to follow BMPs for new construction
- Suggestions to improve inspection of existing infrastructure inspections:
  - Simple Testing Procedures
  - Inspect Full Length of Side Sewer
  - Pressure Test Side Sewer
  - Inflow Source Inspection
  - Active CCTV Program



# Inspection Practices Findings

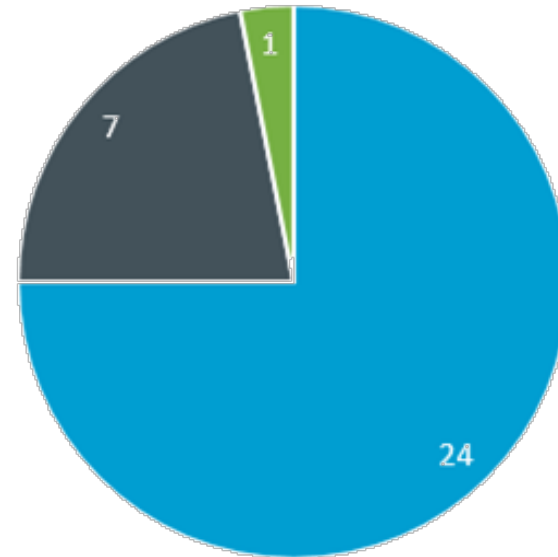
## Inspections:

When Side Sewer Inspections Occur



■ Throughout ■ Before Covering ■ Unsure

CCTV Inspection Programs



■ Active Program ■ No Active Program ■ In Development

# Inspection Training Program Overview

## Task Activities:

- Prepare an outline for a regional inspection training program with the following elements:
  - Identification of improvements needed to inspection programs in the regional wastewater service area.
  - Identification of improvements needed in training of inspectors.
  - Content for inspector training.
  - Entity conducting the training.
  - Requirements to complete the training.
  - Funding sources for the training.
  - Methods to assess effectiveness of the program at reducing I/I.

# Inspection Training Program Example Content

- Overview of King County sewer standards
- How to properly complete a vacuum test
- How to properly complete an air pressure test
- How to properly complete a water leakage test
- CIPP lining best practices
- How to identify tricks and shortcuts by contractors
- Discussion of recent changes in NASSCO P/L/MACP standards
- Discussion of recent changes to best practices
- What to look for when inspecting a spot repair
- Confrontation training – what to do when a contractor pushes back
- Are those roof drains connected to the sewer? – What other items to inspect when on site

# Inspection Training Program Discussion

## Questions:

- Formal certification or voluntary?
- Program format - online, classroom, or hands-on
- One time only or annual refresher?
- Should coordination with local associations be considered?

# Project Schedule

Table 2. Project Deliverable Schedule

2017						2018		
April–June	June–August	September	October	November	December	January–February	March	March–June
I/I data collection and MWPAAC site visits	Prepare draft memos for existing side sewer review and inspection programs	Present memos to E&P Subcommittee for review	Finalize memos	Private sewer inspection and maintenance I/I workshop with E&P Subcommittee	Private sewer insurance and grant/loan workshop with E&P Subcommittee	Develop memos and framework for four private side sewer programs	Present draft memos and frameworks to E&P Subcommittee	Finalize private side sewer program memos and frameworks
	Develop draft inspection training program		Present training program to E&P Subcommittee for review	Finalize training program				

# Next Steps and Action Items

- Develop approach to achieve standards
- Develop inspection training program outline
- Develop draft frameworks for private side sewer programs

# Questions

Are the project results meeting MWPAAC E&P Expectations?