



Municipal Technical Advisory Service  
INSTITUTE for PUBLIC SERVICE

Published on *MTAS* (<https://www.mtas.tennessee.edu>)

November 14, 2019

## Develop an Infiltration/Inflow Correction Plan

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Dear Reader:

The following document was created from the MTAS website ([mtas.tennessee.edu](https://www.mtas.tennessee.edu)). This website is maintained daily by MTAS staff and seeks to represent the most current information regarding issues relative to Tennessee municipal government.

We hope this information will be useful to you; reference to it will assist you with many of the questions that will arise in your tenure with municipal government. However, the *Tennessee Code Annotated* and other relevant laws or regulations should always be consulted before any action is taken based upon the contents of this document.

Please feel free to contact us if you have questions or comments regarding this information or any other MTAS website material.

Sincerely,

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**Reference Number:** MTAS-792

### ***What Are You Trying to Solve?***

Not every problem has a cost-effective solution. What is the benefit-to-cost ratio? It should be 1.0 or greater.

- Is there environmental damage? Are there health problems? Are regulatory agencies pressuring the town to solve its I/I problems?
- Are you trying to eliminate lift station overflows or excessive pumping costs?
- Are you trying to reduce treatment costs?
- Are you trying to solve a specific problem — solids washout of the treatment plant, a backup in Mr. Smith's basement.
- Reduce potential regulatory or legal liability.

### ***Develop an I/I Correction Plan***

At this point, you have in mind what you want to accomplish and why. You have accumulated data to help identify where the worst problems are, and you have ruled out other possible causes of the high water problems. During this process, you will be able to assess how much time and expertise you have in house for solving I/I problems. Now you are ready to tackle solutions. If you have decided your staff does not have the time, equipment, and/or expertise to identify, analyze and fix the problems, it is time to hire consultants and contractors.

If you can use in house resources to further identify, analyze and fix I/I problems, here are some tips:

- Look at the geologic and topographic conditions for the part of the system you will be working on first. Is the collection system under the ground water table? If yes, use nighttime flow isolation, televising the lines and flow monitoring to get more information. If no, use smoke testing, rainfall simulation, dye testing and flow monitoring to gain more information. In either case, use physical inspection of manholes. They can be big sources of I/I. Brick manholes are especially subject to I/I. Manhole covers that are in depressions, near streams or in streets or other areas subject to sheet runoff are subject to I/I.
- Focus on interceptors (large sewers), especially those near creeks. They can carry more I/I on a per-inch basis than smaller lines. For this reason, many sewer line rehabilitation experts advocate working from the sewer plant up to the system and not from the dead ends down.
- Size up the magnitude of the problem and what it is going to cost. Does the town need to borrow money and make an all out effort to improve the system? Or does a phased approach interest the town's governing body? First, you will have to answer why you have decided to fix I/I problems. Once you get the present I/I crisis solved by either the traditional way or the operator's way, MTAS strongly advocates annual budgeting for collection system maintenance. The goal is to strengthen the collection system infrastructure in order to minimize future I/I problems.

### ***Rehabilitate the System***

Use in house and/or outside expertise to fix the problems. Until your operators have experience with repair methods, outside contractors will be needed to make many of these repairs. Rehabilitation methods include:

- Point repairs;
- Cured in place pipe lining;
- Grouting;
- Manhole liners, coatings, and specialty seals;
- Pipebursting;
- Root control; and
- Line replacement.

Experience has shown that groundwater migrates along sewer pipes, sometimes for long distances. Because of migration rehabilitation starting low in the system is the recommended strategy. Also when working on a section of pipe, always renew all mains, taps, and service lines to a level above the groundwater. When possible include groundwater dams along pipes especially PVC to reduce the migration. A good rehabilitation strategy should reduce I/I in the renewed area by 50 percent. If rehabilitation work is successful, expect the former I/I water to appear at some other location.

In rehabilitation or new construction, 100 percent inspection is recommended.

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*DISCLAIMER: The letters and publications written by the MTAS consultants were written based upon the law at the time and/or a specific sets of facts. The laws referenced in the letters and publications may have changed and/or the technical advice provided may not be applicable to your city or circumstances. Always consult with your city attorney or an MTAS consultant before taking any action based on information contained in this website.*

**Source URL (retrieved on 11/14/2019 - 9:31pm):** <https://www.mtas.tennessee.edu/reference/develop-infiltrationinflow-correction-plan>



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