

Key Regional I/I Control Program Elements

The term “I/I control” refers broadly to all measures used to reduce levels of I/I in sanitary sewers. However, for development of a comprehensive I/I management program, two separate program elements need to be considered: direct I/I *reduction* and long-term I/I *control*. Reduction and control involve different approaches and strategies that work together to provide both near-term and ongoing elements of an effective I/I management program. These two approaches, discussed more thoroughly in this chapter, can be defined as follows:

Direct I/I reduction refers to sewer system rehabilitation or replacement projects that can be done in a targeted basin to reduce I/I flows and alleviate immediate downstream capacity constraints.

Long-term I/I control refers to policy, administrative, financial, and technical measures aimed at limiting future increases in I/I flow. Keeping the system in good repair minimizes future increases of I/I in the system. Long-term I/I control measures could include public education, design standards for new construction or rehabilitation, inspection and/or permitting requirements, new regulations or policies, and financial incentives.

In addition, this chapter discusses key legal and regulatory issues, including the ability to fund and implement I/I projects on public and private property, the ability to set and enforce long-term I/I control standards for collection agencies and private property owners, and issues relating to warranty and liability.

3.1 Direct I/I Reduction

Direct I/I reduction involves identifying sewer mini basins with high I/I volumes, and then reducing I/I by replacing or rehabilitating the whole mini basin or the portions of the system where specific sources of I/I have been identified within a mini basin. Mini basins are smaller sub-areas of a sewer model basin covering approximately 150 acres and containing about 22,000 linear feet of sewer pipe. Identifying I/I flow components for mini basins provides much more detail than the model basins, helping to more accurately identify where I/I flows are generated and how much rehabilitation investment may be required. Additionally, it would be more cost-effective to conduct I/I rehabilitation projects at the smaller mini basin level. This is because model basins are large and complex, averaging 1,000 acres and typically containing about 100,000 linear feet of sewer pipe. More discussion on basins and I/I quantification can be found in the *Regional Needs Assessment Report*.

I/I reduction techniques can include the use of one or more trenchless rehabilitation technologies such as cured-in-place lining or pipe-bursting sewer mains, side sewers, laterals, and/or manholes. Trenchless technologies are used whenever applicable because they are less invasive than excavating the existing pipe and replacing it with new pipe. Sometimes, however, excavation and replacement may be necessary.

3.1.1 Types of Projects to be Implemented

The capital conveyance facilities needed to accommodate future flows through 2050 in King County's regional sewer system were identified in a series of conveyance system improvement (CSI) reports.¹ These reports continue to be updated using the flow data collected as a part of this I/I program. The latest update is included in the *Regional Needs Assessment Report*, Chapter 4.

The CSI reports identify King County regional treatment plant upgrades and list necessary regional conveyance system pipe and pump station capacity improvement projects scheduled through 2050. The CSI reports also provide planning-level estimates of construction and project costs for each capacity improvement project.

To be cost-effective, an I/I reduction project, or set of projects, must be less costly (including capital and operations and maintenance) than projects that would otherwise be required to convey and treat the higher flows including I/I flows. (See the *Regional Needs Assessment Report* for more detailed information on how I/I flows in the existing system affect conveyance system needs.) In the King County regional sewer system, I/I reduction projects must meet two criteria to be considered cost-effective:

- The I/I reduction project must reduce, delay, or eliminate planned conveyance system improvements.
- King County's cost for this I/I reduction project must be less than the combined cost of treating I/I flows and the cost of the planned conveyance system improvement.

3.1.2 Program Funding

Several funding approaches and alternatives are being considered for both the reduction and long-term control components of a regional I/I control program. These approaches include County grants and/or loans to local agencies and/or private property owners and changes to rates or addition of surcharges. Other funding approaches include how rate revenues could be used to fund I/I control measures, how local agency contributions could impact projects, and how individual property owner payments or contributions could be incorporated into project funding.

For direct I/I reduction work, I/I projects must be cost-effective when compared with the costs of related conveyance and treatment system improvements. Funding of cost-effective I/I projects could be accomplished in four ways:

¹ <http://dnr.metrokc.gov/wtd/csi/library.htm>

County-funded—A cost-effective I/I project is funded by the County because it meets the two criteria described in Section 3.1.1 above.

County/local agency shared cost—The County and a local agency jointly fund an I/I reduction project to make it cost-effective for the County. If the planning-level cost estimates for a particular CSI project is used as the basis for determining cost-effectiveness, some I/I projects do not initially seem cost-effective because the projected cost for the I/I improvement exceeds the projected cost of the needed CSI project. However, because a local agency might receive incidental benefits from the I/I project, the agency may choose to contribute funds, thereby reducing King County's cost. The local agency contribution of funds could make the I/I project cost-effective for King County while at the same time providing the agency with a system upgrade that is partially funded by the County.

Private property owner participation—Private property owners participate in and fund rehabilitation projects for work on their property.

Funded as part of another project—An I/I reduction project that is not cost-effective as a stand-alone project could become cost-effective if other funding sources pay for related project costs (for example, resurfacing the street). This type of situation could occur when another agency's multipurpose project already includes funding for transportation, stormwater, and/or water improvement and an I/I improvement can coincide with that work to capture efficiencies and cost-savings.

Because multipurpose project funding depends on availability of other financing sources, construction timing for a multipurpose I/I reduction project can be different than the timing for a stand-alone project. A significant scheduling change would require re-evaluation of the cost-effectiveness of the I/I project.

Funding considerations that apply to both direct reduction efforts and long-term I/I control measures are discussed in further detail in Chapter 4. In 2005, the County and local agencies will discuss and develop decisions and agreements related to program and project funding.

3.2 Long-Term I/I Control

Long-term I/I control measures include policy, administrative, financial, and technical considerations that promote an ongoing program of review, maintenance, and repair of the collection and conveyance system. The objective of the program is to recover and maintain regional system capacity. Long-term I/I control measures would also help keep the system in good repair, which would minimize future increases of I/I in the system.

3.2.1 Policy Considerations

The County and local agencies are working together to shape key policy elements for consideration and adoption as part of the overall I/I control program. These policy measures would contribute to long-term I/I control in the region. The policy considerations include ways to

address private property I/I sources, inter-agency relationships and cooperation, and whether to establish specific I/I reduction goals and/or maximum I/I thresholds.

Private property I/I control—Based on information gathered from the pilot projects, it is believed that a significant amount of I/I may originate from privately owned components of the wastewater collection system. The I/I pilot projects demonstrated that considerable I/I reduction can be achieved in basins when these privately owned components are rehabilitated. Working on private property requires the cooperation of the property owner. The County and local agencies are continuing discussions about legal considerations and methods for funding improvements on private property over the long term.

Inter-agency relationships—Consideration of County and local agency interactions and formal relationships will be an integral part of any I/I control program alternative. The County and local agencies will continue their discussions about the nature and extent of inter-governmental agreements (IGAs) or service contract amendments related to implementation of an I/I control program and specific I/I projects that may be considered.

I/I Reduction Goals—The RWSP states that the overall goal for peak I/I reduction in the service area should be 30 percent from the 20-year peak level defined in the *Regional Needs Assessment Report*.² However, cost-effectiveness is also a significant I/I program goal. It may be determined through benefit-to-cost analyses that achieving 30-percent reduction is not cost-effective and that some other reduction goal may be more appropriate. The program alternatives, discussed in Chapter 4, address both the 30-percent goal and the cost-effectiveness measure.

Maximum Thresholds—Through continued discussions, the County and local agencies will consider whether or not a maximum I/I threshold for local agencies to meet should be incorporated into an I/I control program. Potential benefits and impacts of establishing an I/I threshold are discussed further in Chapter 4.

The County and local agencies will continue to discuss these policy considerations during development of a regional I/I control program in 2005.

3.2.2 Administrative Considerations

The County and local agencies are also evaluating ways to administer a regional I/I control program. Administrative considerations include the following:

Program management—Centralized program management would organize and manage follow-through for agreed-upon action items as well as coordination and communication during program implementation. Program management would also encompass planning, analysis, and integration of I/I control measures and conveyance needs.

Public education and involvement—Program alternatives must also include defining responsibilities for administration of public awareness approaches, including public

² King County Ordinance 13680, Section 7, I/I Policy 2.4 (I/I P-2.4).

education and involvement. Overall programmatic public awareness strategies should be considered as well as project-specific responsibilities and protocols. Project-specific public education and involvement decisions may be left to individual IGAs. Administration of the public involvement aspects of working on private property should also be considered.

Flow monitoring and ongoing system assessment—As part of a long-term I/I control program, ongoing or periodic system flow monitoring may be necessary to assess progress made at reducing I/I levels and meeting thresholds (if established). The frequency and scale of any flow monitoring efforts will need to be considered. For example, flow monitors could be placed at the agency level, model basin level, or mini basin level; data could be collected annually or less frequently. The monitoring choices made will result in levels of data collection with varied levels of associated cost.

Standards, procedures, guidelines, and policies—Currently in final draft form, a set of standards, procedures, guidelines, and policies were developed in partnership with the local agencies through the MWPAAC Engineering and Planning (E&P) Subcommittee. Development of a final version will be part of continued discussions between the County and local agencies in 2005 during development of a recommended program alternative. Key administrative considerations include implementation, compliance, future reviews, and uniformity of application.

3.2.3 Technical Considerations

With many of the program considerations described above, the following associated technical aspects need to be considered:

- Technical specifications or standards for design, construction, and inspection of new or rehabilitated sewers
- Methods and timing of monitoring and modeling sewer flows
- Technical criteria for flow monitoring, data management, and analysis
- Development of specific I/I reduction goals and thresholds if a policy decision is made to include them
- Decisions on planning assumptions to be used for modeling I/I in the sewer system and determining cost-effectiveness of I/I controls in relation to CSI improvements

The County and local agencies continue to work on these technical considerations.

3.3 Legal/Regulatory Foundation

One of the major policy considerations for a regional I/I control program will be how to manage I/I when it originates on private property. It is believed that I/I from private property constitutes a significant amount of the I/I entering the regional collection system. Four of the ten I/I pilot projects focused repairs on private property and achieved the highest levels of I/I reduction. By

contrast, I/I pilot projects that focused on repairs only on the public portion of the system achieved substantial reduction percentages but not as high as those that were located predominantly on private property. Therefore, the option of including I/I repairs on private property as one strategy in the overall I/I control program needs to be considered and explored. However, several legal questions must be addressed in order to consider inclusion of this strategy as a program option.

This section is not intended to provide the completed analyses or conclusions on these legal questions, but rather to introduce some of the key considerations and preliminary findings to inform further discussion and analysis. *Appendix A6* provides a listing of pertinent legal authorities related to this topic.

A primary question of the legality of spending public funds to make I/I repairs on private property is being explored and will continue to be analyzed and discussed in 2005 as the regional program options are developed. Preliminary research suggests that such expenditures would not constitute the unconstitutional gift of public funds under Article 8, Section 7, of the Washington State Constitution, provided that they have a public benefit outweighing the cost of other approaches to managing I/I and that any private benefit is incidental and not intended to be a gift.

These findings are based on the reasoning in the Supreme Court case *City of Tacoma v. Taxpayers of the City of Tacoma*.³ This was an electrical utility case in which conservation expenditures on private property to achieve cost savings for the electrical utility were held not to be unconstitutional gifts of public funds. Concerns about the applicability of this case to a potential I/I program that uses public funds to make I/I repairs on private property will need to be analyzed and discussed more thoroughly as the program continues to be developed in 2005.

Additionally, Article 8, Section 10, of the State Constitution contains specific authority for the County to loan sewer utility revenues to private property owners to finance private property I/I repairs, provided that an “appropriate charge back” is made. Such a loan program is one alternative that could be implemented to deal with I/I originating on private property. However, initial research indicates that this constitutional provision would not pre-empt a program that directly funds the I/I repairs on private property without requiring the funds to be repaid. Again, more detailed discussion and analysis on this topic will occur in 2005.

Based on initial analysis it appears that King County and local agencies could consider three basic kinds of I/I programs affecting private property:

- Compliance program, based on existing ordinances and regulations
- Loan program, under the authority of Articles. 8, Section 10, of the Washington Constitution
- Publicly funded program, of the kind that has been judicially upheld in the *City of Tacoma* and other cases

³ *City of Tacoma v. Taxpayers of the City of Tacoma*, 108 Wash. 2d. 679, 743 P.2d 793 (1987). (*City of Tacoma*).

Each would rely on a different combination of legal authorities, but they would not be mutually exclusive and could be used in combination with one another.

3.3.1 Compliance Program

King County and most local agencies currently have legislation and regulations that to varying degrees assert authority over the initial construction standards, types of flows accepted, and condition of the sewer pipes that are tributary to their collection systems. King County Code (KCC) 28.84.050 and regulations issued under it assert the authority to (1) require planning and design standards that will limit I/I; (2) prohibit discharge of several kinds of private property and municipal drainage into the sewer system; and (3) limit the overall amount of non-wastewater flow into the system. The County could consider implementing an I/I program based on amending and enforcing its sewage disposal regulations. Such a compliance program could be improved by amending the regulations to address I/I more expressly as a defined problem. The enforcement provisions would have to be improved before a I/I compliance program could be implemented.

In most cases, the local agencies have the primary responsibility for regulating the connection of privately owned sewer system components to the local and regional system. Each agency has enacted code provisions that regulate private sewer system components and restrict discharges. While there is no uniform approach, there seems to be a consensus on certain key points:

- **Permits and inspections are generally required.** Most local agencies require permits and an inspection before private sewer system components are connected to the local sewer.
- **The property owner is responsible for maintaining and repairing the sewer system components they own.**
- **Excessive and hazardous discharges into the sewer system are prohibited.** Stormwater, surface water, groundwater, roof drains, downspouts, condensation from coolants, and a variety of other unwanted discharges are restricted from entering the sewer system.
- **Sanctions are available for violations.** These sanctions typically include levying fines and charging the property owner for the costs of inspection and repairs. Other codes authorize disconnection of water or sewer service.

Advantages:

- A compliance program could build on existing sewer codes.
- It would be less costly to the County and local agencies if property owners bore the cost of repairing the sewer system components they own.

Disadvantages:

- The program would not be voluntary.
- It could increase the administrative burden of an I/I program.

- Enforcement might be difficult. Entry onto private property for inspection, mandatory repair, or storm disconnections should be done with the property owner's consent.
- It may be difficult to gain cooperation from individual property owners to complete all needed repairs in a timely manner. This difficulty could limit the extent of repairs in a particular basin, which is not conducive to reaching targeted reduction percentages in order to eliminate a needed downstream conveyance improvement.

3.3.2 Loan Program

Article 8, Section 10, of the Washington Constitution and RCW 35.67.360 clearly authorize the County and the local agencies to undertake an I/I loan program. From a legal perspective, the most straightforward approach to conducting an I/I program for privately owned sewer system components would be to implement a loan program with "appropriate charge back" provisions.

Advantages:

- This program clearly would be authorized by the Washington Constitution and Washington State law.
- It could be a voluntary program.

Disadvantages:

- Administration could be complex. Repayment requirements could be hard to enforce. Repayment through fees might be difficult to administer.
- Compliance may be difficult because participation would still involve a cost for property owners to bear.
- Although a voluntary program, it would provide little motivation for property owners to take loans.
- Scattered timing and limited extent of repairs for those accepting loan funding in a particular basin would not be conducive to reaching targeted reduction percentages in order to eliminate a needed downstream conveyance improvement.

3.3.3 Direct Purchase Program

A direct purchase program would involve public funding of repairs on privately owned sewer system components. Public funding could come from King County and/or the local agencies. The County in partnership with the local agencies could either pay the cost of sewer repairs or perform the work themselves. This program would need to rely on the authority of the *City of Tacoma* case, and related cases, to avoid challenge as an illegal gift of public funds. Based on the decision in the *City of Tacoma* case, a successful cost-benefit analysis for the I/I program will be a prerequisite to designing a constitutional direct purchase program.

Advantages:

- This would be a voluntary program.
- Participation would likely be improved. The pilot projects show 90 percent voluntary participation.
- The administrative burden would be smaller.
- Funding would be reliable.
- The program would foster cooperation with the local agencies.
- It would assure that timing and extent of repairs in a particular basin would be conducive to reaching targeted reduction percentages in order to eliminate a needed downstream conveyance improvement.

Disadvantages:

- There are potential risk factors, including liability, potential implied warranty, and restoration expenses.
- This might be a more expensive program for the County.
- Additional time and staffing levels may be required to obtain Right of Entry agreements with homeowners in target basins.
- It could be subject to legal challenge as an unconstitutional gift of public funds.

3.3.4 Summary

In summary, preliminary findings indicate that an I/I program involving repair of privately owned sewer system components could potentially take three forms: compliance, loan, or directly funded. These three forms are not mutually exclusive and could be combined in various ways. The use of public funds for an I/I program on private property in a loan program is authorized by Article 8, Section 10, of the Washington Constitution. There is some legal authority that public funds may be used on private property in a direct purchase conservation program under carefully defined circumstances. Legal issues remain with respect to all three alternatives, but all have sufficient legal basis to warrant further consideration.