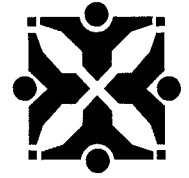


City of Columbia

701 East Broadway, Columbia, Missouri 65201



Agenda Item Number: REP 95-14

Department Source: Public Works

To: City Council

From: City Manager & Staff

Council Meeting Date: October 20, 2014

Re: Sanitary Sewer Backflow Prevention Device Program

Documents Included With This Agenda Item

Council memo

Supporting documentation includes: Images

Executive Summary

Staff has prepared a report concerning the creation of a sanitary sewer backflow prevention device program for property owners who experience sewer backups into their buildings during periods of heavy rainfall.

Discussion

Backup of sewage into buildings during periods of heavy rainfall happen when the following two conditions exist: 1) the elevations of the plumbing fixtures in the building are below the elevation of the upstream sewer manhole, and 2) the sanitary sewer collection system is surcharged due to excessive amounts of stormwater entering the sanitary sewer collection system, commonly referred to as inflow and infiltration (I&I).

During periods of heavy rainfall, the flow due to I&I can increase to the point that the capacity of the city's sewer system is exceeded. Once this happens, the sewer collection system surcharges and begins to backup sewage into buildings and/or overflows from manholes. Currently, the city is in the process of reducing flow due to I&I through the identification and removal of public and private sources of I&I, and by rehabilitating the sanitary sewer collection system. As this work is completed, the frequency and duration of backups and overflows will be reduced however, this work will not eliminate all overflows and backups. This corrective work will take many years to complete and property owners will continue to experience backups.

During fiscal years 2010 through 2014, there were approximately 49 property owners that reported backups into their buildings during heavy rains (not including buildings connected to private common collector sewers). Several of these properties had multiple backups during this five year period, and records show some have had backups as far back as the 1970's. The only way to reasonably ensure these buildings will not be susceptible to backups is to modify the plumbing system for the individual buildings.



The most common plumbing modifications are: 1) Installation of a backflow prevention valve, 2) plumbing retrofit, typically removal of plumbing fixtures in the basement, and 3) installation of a grinder pump.

Some municipalities, and other sewer providers, have sanitary sewer backflow prevention device programs that provide financial assistance to property owners for these plumbing modifications. The most common type of program is a reimbursement program. This type of program typically requires the sewer service provider to confirm a property has experienced a sanitary sewer backup as a direct result of a surcharged sewer main due to excessive I&I. Once this is confirmed, the property owner is eligible for the financial assistance program, and is provided information on the different plumbing modifications that could be completed to reduce the likelihood of future backups. The property owner chooses the type of modification they feel is most appropriate, and schedules the repair. The sewer service provider then reimburses the property owner for a percentage of the cost, up to a specified maximum.

Implementing this type of program in Columbia would provide a mechanism to assist property owners with reducing or eliminating the backup of sewage into their homes in a more timely manner than can be accomplished with only the I&I reduction efforts. It would also provide a mechanism to assist property owners that continue to experience backups after the I&I reduction work has been completed.

The three plumbing modifications identified above can prevent sewer backups, however, they do have limitations. Following is a brief description of each modification, the advantages and disadvantages, and costs.

Backflow Prevention Valve

Current plumbing codes for new construction requires a backflow prevention valve be installed for plumbing fixtures that are below the rim elevation of the next upstream manhole (Exhibit A). These valves are the most common method used to prevent sewage backups into buildings since they are the most economical, \$50 to \$500 plus cost of installation. During normal operation, the backwater valve allows sewage to leave the building unchecked. If the sewer main gets surcharged and sewage begins to flow back toward the building, the valve automatically closes, preventing sewage from entering the building. When the valve is closed, occupants of the building cannot use toilets, sinks or other fixtures protected by the valve. These valves require routine maintenance to ensure proper operation, and if the valve malfunctions it can cause a blockage in the sewer service line.

Plumbing Retrofit

Disconnecting or removing all plumbing fixtures that are below the elevation of the next upstream manhole (Exhibit B) is another method used to prevent sewage backup due to surcharged sewer mains. This includes things such as plugging floor drains, removing toilets and sinks and other



plumbing fixtures, and rerouting washing machine discharges to an elevation that is above the next upstream manhole. The costs to modify the plumbing can vary widely from a few hundred dollars to several thousand, depending on the complexity. This can be a very simple and inexpensive method to prevent sewer backups however, if the condition sewer line under the building is in poor condition, sewage can leak out under the building causing uplift pressure on the floor which can result in structural damage to the building.

Grinder Pump

The installation of a grinder pump (Exhibit C) on the service lateral is another option for preventing sewer backups. This tends to be the most expensive option of the three with costs up to approximately \$20,000; however, these provide the highest level of protection and maintains the ability to use plumbing fixtures when the sewer main is surcharged.

Fiscal Impact

Short-Term Impact: If this program was implemented during FY15, funds currently included in the operating budget for I&I reduction could be utilized to cover costs. It is anticipated the cost would be less than \$100,000, (20 homes at \$5,000 per home) and the funding would be available on a first come, first served basis.

Long-Term Impact: If this program is implemented, a designated amount of funding could be included in the annual operating budget to be provided on a first come, first served basis (\$100,000 - \$200,000). As these devices are installed, eventually all buildings would be protected and funding would no longer be necessary.

Vision, Strategic & Comprehensive Plan Impact

Vision Impact: Environment

Strategic Plan Impact: Health, Safety and Wellbeing, Infrastructure

Comprehensive Plan Impact: Environmental Management, Infrastructure

Suggested Council Action

Staff will move forward with developing a Sanitary Sewer Backflow Prevention Device Program as identified above, and will bring back legislation for Council consideration, unless otherwise directed by Council.

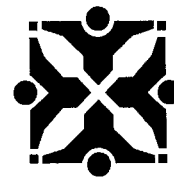
Legislative History

07/05/11 - Report - Backwater Protection

02/17/14 - Report - Aldeah Sewer and Stormwater Issues

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Department Approved



City Manager Approved



SUPPORTING DOCUMENTS INCLUDED WITH THIS AGENDA ITEM ARE AS FOLLOWS:

Images

