



Hamilton

# INFORMATION REPORT

<b>TO:</b>	Chair and Members Public Works Committee
<b>COMMITTEE DATE:</b>	May 16, 2022
<b>SUBJECT/REPORT NO:</b>	Annual Watermain Break Report – 2021 (PW22031) (City Wide)
<b>WARD(S) AFFECTED:</b>	City Wide
<b>PREPARED BY:</b>	Dave Alberton (905) 546-2424 Ext. 1090
<b>SUBMITTED BY:</b>	Shane McCauley Acting Director, Water and Wastewater Operations Public Works Department
<b>SIGNATURE:</b>	

## COUNCIL DIRECTION

On January 23, 2019 Council directed staff to provide the Public Works Committee with an annual report on watermain breaks, the total number, cause and cost of each break, as well as the distance of water mains relined with total cost and overall report on sustainability.

## INFORMATION

### Total Number, Cause and Cost of Watermain Breaks

In 2021, Hamilton Water experienced a total of 261 watermain breaks resulting in a total repair cost of approximately \$2.25M. The total repair cost is the summation of repair cost valued at \$1.48M (including excavation, repair, and temporary restoration), and permanent restoration valued at approximately \$0.77M. Approximately 39% of the watermain breaks were caused by corrosion, 57% were caused by ground movement, and 4% were the result of displaced pipe joints. A summary of watermain breaks by cost and mode of failure is provided in Appendix “A” attached to Report PW22031. A detailed report of the cost and mode of failure of each watermain break is provided in Appendix “B” attached to Report PW22031.

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OUR Vision: To be the best place to raise a child and age successfully.

OUR Mission: To provide high quality cost conscious public services that contribute to a healthy, safe and prosperous community, in a sustainable manner.

OUR Culture: Collective Ownership, Steadfast Integrity, Courageous Change, Sensational Service, Engaged Empowered Employees.

**SUBJECT: Annual Watermain Break Report - 2021  
(PW22031) (City Wide) - Page 2 of 4**

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On average, from 2012 to 2021, the City of Hamilton (City) experienced approximately 308 watermain breaks per year. However, this average is affected by significantly higher numbers of watermain breaks in 2014 (440) and 2015 (433). The increased number of watermain breaks in 2014 and 2015 were the result of abnormally low winter temperatures caused by polar vortex events. A summary of total watermain breaks by year is provided in Appendix “C” attached to Report PW22031.

**Distance and Cost of Watermain Relining Program**

The Engineering Services Division monitors and tracks the length and cost of watermains that are replaced and rehabilitated (relined). Since 2003 Engineering Services has lined 84.4km of watermain at cost of \$70,687,013. In 2021 the length of watermains rehabilitated (relined) was 5km at an approximate cost of \$7.3M. The length of watermains replaced was 4km and the cost of watermains replaced was approximately \$5.3M. A 10-year summary of watermain replacements and rehabilitation is provided in Appendix “D” attached to Report PW22031 and the same information is tabulated in Table 1 below.

**Table 1 - Length and Cost of Watermain Replacement and Rehabilitation**

Year	Rehabilitated		Replaced	
	Pipe (Km)	\$ (Millions)	Pipe (Km)	\$ (Millions)
2010	6.2	\$3.4	5.7	\$8.4
2011	6.3	\$2.8	8.9	\$6.8
2012	3.3	\$2.7	9.1	\$17.6
2013	3.9	\$4.3	6.3	\$11.5
2014	6.4	\$5.4	10.5	\$16.1
2015	6.3	\$5.5	9.0	\$10.5
2016	4.2	\$5.5	5.0	\$7.0
2017	7.3	\$6.5	6.6	\$8.7
2018	5.3	\$4.6	5.2	\$6.0
2019	6.0	\$5.5	3.7	\$5.0
2020	5.6	\$6.2	5.1	\$9.5
2021	5.0	\$7.3	4.0	\$5.3
Total	65.8	\$59.7	79.1	\$102.4
% of Overall Inventory	3.03%	-	3.64%	-

From 2022 through 2031, the City plans to spend \$180.6M on watermain replacement and rehabilitation projects. A summary of the projects that have been approved in principle as part of the 10-year Water, Wastewater and Storm Rate Budget is provided in Appendix “E” attached to Report PW22031.

**SUBJECT: Annual Watermain Break Report - 2021  
(PW22031) (City Wide) - Page 3 of 4**

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The strategic asset management program for watermains is currently in progress to comply with O.Reg. 588/17 under the Infrastructure for Jobs and Prosperity Act that requires an Asset Management Plan (AMP) for all core assets, including watermains, to be approved by Council by July 1, 2022.

The Hamilton Water Division, Water Distribution and Wastewater Collection Section is responsible for maintenance and repairs of the City's watermains throughout the asset lifecycle. This work adheres to the strict legislative requirements surrounding potable water in municipal distribution networks, issued by the Ministry of the Environment, Conservation, and Parks (MECP).

The primary objective of the City's asset management, maintenance, and repair programs for watermains are to ensure the uninterrupted supply of high-quality potable water to the City's residents and industrial, commercial and institutional customers. It is very important to note that the City's water distribution systems are designed with a significant amount of redundancy, such that sections of watermain can be isolated for maintenance and repairs to be completed with minimal to no disruption to the supply of potable water to our customers.

The City has 199.8 kilometers of transmission mains ( $\geq 450\text{mm}$ ) and 1,970.8km of local watermains for a total of 2,170.6km of watermains.

Transmission mains are large watermains which allow for large volumes of water to be transported across the City to fill potable water storage facilities (reservoirs and towers), to supply water pumping stations, and to supply local watermains. Transmission mains carry the largest risk for the City in terms of ensuring that the supply of potable water remains uninterrupted.

Local watermains, or distribution mains, are smaller (400mm or less), and they supply potable water to the serviced properties within the City. As mentioned previously, the distribution network for local watermains includes a significant amount of redundancy, such that sections of watermain can be isolated for maintenance and repairs to be completed with minimal to no disruption to the supply of potable water to our customers.

Approximately 35% of the City's transmission watermains, and 21% of the distribution watermains were installed prior to 1951. Similarly, approximately 38% of the transmission watermains, and 31% of the distribution watermains were installed between 1951 and 1980. A summary of the City's transmission and distribution watermain inventory is provided in Appendix "F" attached to Report PW22031.

The Water Distribution and Wastewater Collection Section will continue to repair watermain breaks as they arise. The Hamilton Water Division will also continue to work collaboratively with the Engineering Services Division and the Corporate Asset

**SUBJECT: Annual Watermain Break Report - 2021  
(PW22031) (City Wide) - Page 4 of 4**

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Management Team to ensure that aging watermain are rehabilitated or replaced in a timely and cost-effective manner. This includes providing periodic updates to City Council on the state of the watermain infrastructure, and the sustainability of the rehabilitation/replacement program through the Corporate Asset Management Plan, the Annual Drinking Water Report, and the Annual Watermain Break Report.

**APPENDICES AND SCHEDULES ATTACHED**

Appendix "A" to Report PW22031 - Summary of Watermain Breaks by Cost and Mode of Failure

Appendix "B" to Report PW22031 - Detailed Watermain Break Mode of Failure and Cost Data

Appendix "C" to Report PW22031 - Summary of Total Watermain Breaks by Year

Appendix "D" to Report PW22031 - 10-Year Summary of Watermain Replacements and Rehabilitation

Appendix "E" to Report PW22031 - Summary of Approved in Principle, Watermain Replacement and Rehabilitation Projects in 10-year Water, Wastewater and Storm Rate Budget

Appendix "F" to Report PW22031 - Summary of the City's Transmission and Distribution Watermain Inventory by Age