STAFF REPORT

To: Chief Administrative Officer **Date:** June 6, 2022

From: Arthur Kastelein, Senior Infrastructure Planning Engineer

Subject: **Utility Master Plan**

Recommendation:

It is recommended that Council endorse the Utility Master Plan.

Executive Summary

The final Utility Master Plan report has been delivered by the engineering consultant. It combines asset replacement recommendations for the sanitary sewer, drainage, and water systems with capacity upgrades necessary for growth. Cost estimates for the projects are included. They are identified to be funded by either the utilities, through revenue provided by user rates, or by development/Development Cost Charges (DCC). The financial implications for the utilities are large. Staff will present phasing-in options as part of the 2023 financial planning process and the development/DCC component will be included in the next update of the DCC bylaw. As well, staff will pursue other investigations related to asset life expectancies, design events, and pipe rehabilitation strategies.

Purpose

This report seeks Council endorsement of the Utility Master Plan. Endorsement indicates Council's support of the general direction of the plan and moves consideration of the cost implications to the upcoming financial plan discussions.

Background

The City of Mission's 2018-2022 Strategic Plan includes developing engineering master plans for long-term infrastructure planning in the areas of water, sewer, and drainage. A Request-for-Proposals (RFP) outlining the scope of work for a master plan for all three areas was posted on BC Bid. WSP Canada Group Ltd was retained in August 2020 and, after approximately 20 months, has completed the plan. The intent is to combine asset replacement with growth-related upgrades to ensure Mission provides robust water, sewer, and drainage systems for the next 25 years. While growth-related master plans were done in the past, this is the first comprehensive time a review of asset replacements is included.

The process included numerous workshops with City staff, two workshops with City Council and senior staff, a virtual Open House presentation, and posting draft documents and a video on the community communications platform "Engage Mission".

The input from stakeholders has been considered and the result is a comprehensive master plan for all three utilities which calls for significant investment in Mission's infrastructure over the next 25 years.

Discussion and Analysis

The Utility Master Plan has a number of objectives but the primary purpose is to determine short-

and long-term strategies and funding levels for:

1) Maintaining existing assets. Existing infrastructure needs to be replaced as it reaches the end of its design life to ensure levels of service to existing customers are not compromised. WSP built on the City's existing desk-top asset management studies, expanded the condition assessment database, and developed risk-based rating systems for the utilities.

   The study determined, over the next 25 years, the utilities require, to maintain the existing pipes and pump stations:

2023-2047	**Sanitary Sewer**	**Storm Sewer**	**Watermain**
Length of Pipe to be Replaced	71 km	33 km	44 km
Total Kilometres of Existing Pipe	160 km	184 km	180 km
Percentage to be Replaced	44%	18%	24%
Other Rehabilitation Projects	Pump station upgrades	Pump station upgrades	PRV upgrades
Estimated Cost	$73.5M	$39.3M	$44.4M

   The biggest impact is to the sanitary utility because a significant quantity of the sewers were installed in the 70's and 80's and are reaching the end of their service life in the next 25 years. The storm mains are subject to less corrosive flows and, provided they are not constructed of metal, the pipes tend to last longer than sanitary mains. Replacement of watermains has been in process for several years already, through the Asbestos-Cement Watermain Replacement Program, accounting for about 9.6 km, or 5% of the total length being replaced relatively recently.

2) Improving existing systems where required to eliminate surcharging in sewers or to improve fire flows at hydrants. The estimated costs are:

   - Sanitary Sewer $4.1M
   - Storm Sewer $12.5M
   - Watermain $2.2M

3) Ensuring that future developments are serviced appropriately. This is determined through updated computer modelling which incorporates the 2018 Official Community Plan, the Cedar Valley Neighbourhood Plan, trunk servicing for the Silverdale Comprehensive Planning Area (SCPA) and, to a minor extend, the Waterfront area.

   The plan estimates the investment required to service growth over the next 25 years to be:

   - Sanitary Sewer $30.8M
   - Storm Sewer $2.9M (plus detention facilities)
   - Watermain $44.8M

These figures do not include servicing inside the SCPA of Waterfront lands – those are included in separate studies underway.

The plan also includes a number of related studies - reviewing all utility Policies and Procedures, an assessment of the Ruskin Water System, recommending upgrades to the SCADA system, a review of wastewater treatment options, and a detailed inspection of six of the City's older pump stations.

Utility Master Plan Prioritized Action Plan

The master plan generated a prioritized action plan for infrastructure improvements. The prioritized plan is based on determining assets where failure is likely to occur in the next 5, 10, and 25-year periods, and prioritizing those based on the potential impacts of failure (a risk-based approach). Added to those are capital upgrades that are necessary to address existing capacity deficiencies, and those that are required to service growth over the same time periods.

Cost estimates have been prepared for all improvements and allocated to either utility fees or development. Projects necessary for growth are 100% funded by DCC/Development, whereas replacement type related projects are funded 100% by user fees. Some projects are both, and costs are apportioned accordingly to flow rates.

The condition and capacity needs have been checked against the City road rehabilitation program, with the intent that rehabilitated or "recapped" asphalt is not dug up again for a City utility project for at least six years.

Utility Master Plan Outcomes

The cost to achieve the goals of the UMP are significant, and will impact Development Cost Charges (DCC) and Utility rates. The DCC/Developer Funded projects will be reviewed as part of the proposed update to that bylaw, but the total costs and preliminary allocations of funding are:

2022-2046	Costs to Replace Infrastructure	Costs for Upgrades & New Infrastructure	Total	DCC or Developer Funded	**Utility Funded**
Sanitary	$73.5M	$34.9M	$108.4M	$30.8M	**$77.6M**
Storm	$39.3M	$15.4M	$54.7M	$2.9M	**$51.8M**
Water	$44.4M	$47M	$91.4M	$44.8M	**$46.6M**

For the sanitary sewer system, approximately $2.0M of the required replacement projects are already funded, and there is an annual replacement budget of $310,000. To maintain and upgrade the sanitary sewer utility will cost an average of an additional $2.7M per year.

The storm sewer budgets include about $5.0M for replacement projects, with a small existing annual replacement budget of about $30,000. To maintain and upgrade this utility will cost an average of an additional $1.8M per year.

Similarly, for the water system, approximately $1.0M of the required replacement projects are already funded, and there is an annual replacement budget of $1.0M until 2028. To maintain and upgrade the water utility will cost an average of an additional $0.9M per year.

It is clear from the Utility Master Plan that the City needs to plan for increasing its utility rates to avoid emergency works and the potential damages of pipe failures due to the aging pipe systems. A pro-active replacement program is much preferred over the re-active approach,

which is typically more expensive as failures usually result in damage to other infrastructure and to property.

Next Steps

Staff will review the financial implications to identify options and develop an affordable and phased financial strategy for utility rate increases in the proposed 2023 financial plans. In addition to the cost of construction, there are also planning and staffing needs associated with a large increase in capital projects that need to be phased in.

The projects which are necessary for growth will be added to the proposed Development Cost Charge bylaw update, where applicable.

Other areas which staff will pursue include:

1) Checking the assumptions made about life expectancy of the pipe systems. The condition assessments and recommended replacements are based on similar types of infrastructure in other areas. The current CCTV inspection programs for sanitary and storm sewers identify required repairs but detailed evaluation of the pipe systems is needed to determine how accurate the assumed life-expectancies are. This was done several years ago for asbestos-cement watermains and similar investigations could be done for other pipes.
2) Conduct a risk assessment for climate change and design storms to investigate the storm sewer system in more detail. For this system, many of the replacement projects are not based on the condition assessment but mains are under capacity for the design flows, due to changing rainfall patterns and storm intensities. That is, a storm sewer is typically designed for a 1-in-25-year event. Over the past few decades, more rain has been falling, and the 1-in-25-year event year event has changed. Pipes designed and installed 40 or 50 years ago do not have the capacity to carry the extra flow, and the master plan recommends replacing them with larger pipes. An alternative is to accept a lower level of protection for neighbourhoods impacted by this. Staff will investigate this in more detail.
3) Continue to investigate strategies and cost estimates for rehabilitation of existing pipes instead of replacement. Sanitary and storm mains can be relined through “trenchless” methods, extending their life expectancies, and in some cases, this may be less expensive than cutting trenches into existing roadways.

Council Goals/Objectives

In the Strategic Plan, the Utility Master Plan:

- supports the Council focus area for “Secure Finances, Assets and Infrastructure.”; and
- completes priority action item “2.4 Develop engineering master plans for long-term infrastructure planning (water, sanitary, drainage)”.

Financial Implications

There are no immediate financial implications associated with this report. Staff will develop a financial strategy for the Utility Master Plan as part of the 2023 financial planning process.

Communication

If the recommendation for endorsement is approved, the Utility Master plan will be posted on the City’s website. As well, City communications staff will prepare a press release and post the recommendations on social media.

Report Prepared by:	Arthur Kastelein, Senior Infrastructure Planning Engineer
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Approved for Inclusion:	Mike Younie, Chief Administrative Officer