



THE MUNICIPALITY OF THE VILLAGE OF LIONS BAY

Type	Information Report		
Title	Infrastructure Master Plan – 2021 Year-End Status Summary		
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Recommendation:

THAT the Information Report, “Infrastructure Master Plan – 2021 Status Summary” be received.

Attachments:

(1) Appendix A – Completed IMP Projects (2017-2021)

Key Information:

The Infrastructure Master Plan (IMP) was adopted by Council on September 6, 2016 – five years ago this year. Since it’s adoption, Public Works (PW) staff have been slowly and steadily advancing and working on items from the IMP – Appendix 1 summarizes the projects from the IMP Project List that have been completed.

What follows is a status update of the items and issues concerning Public Works staff as we look towards the 2022 Budget Cycle. Some of these projects required immediate attention while others should be addressed within the next three years.

Water Treatment (\$0.00)

In 2021 Public Works Staff completed upgrades to the Harvey Creek UV reactors and developed emergency setpoint levels for both the Harvey and Magnesia Creek Tanks in accordance with the recommendations of the Drinking Water Protection Officer (DWPO). Staff continue to work with the DWPO to further the Municipality’s filtration avoidance application. Two outstanding items are being discussed and will continue to be worked upon:

- (1) A strategy to contend with the turbidity events experienced in both watersheds, and
- (2) A source water protection plan for both watersheds.

Tanks (\$45,000)

The new Harvey tank requires an internal inspection in accordance with the manufacturer's warranty, staff will be requesting funding in the 2022 Budget process to add this to the already planned inspection and cleaning that was budgeted in 2021. In 2021 staff had set aside funds to inspect it and the other two potable water tanks in our system: the Magnesia Creek Tank and the Highway Tank (**IMP Project #33**). Staff were unable to complete this work in 2021 and will be requesting a re-budget of the funds to complete this necessary work in 2022.

PRV Stations (\$3,300,000.00)

PRV's have a life expectancy of 25 years under ideal conditions – the Municipality's PRV stations are 30 years or older and not functioning under ideal conditions. Moreover, the existing PRV stations are noncompliant with current WorkSafeBC standards. Replacement of these PRV stations (**IMP Projects 57 and 58**) are included in the 5-year financial plan and will cost approximately \$3.3 million over the next 5 years.

Water Mains (\$3,660,000.00)

Aside from the Bayview DWIP (drainage and watermain improvement project) which is discussed under the roads and drainage section of this report, there are three high priority watermain replacements that will require capital funding over the next few years:

- (1) The 200mm diameter cast iron water main on Creekview Place is in very poor condition and has significant fire flow deficiencies (**IMP Project #16**). Flushing of these mains is producing little effect to the water quality experienced by residents along this street. The project consists of replacement of 115 m of watermain and reconstruction of the roadway. The estimated cost of this project is \$175,000.00.
- (2) The 150 mm diameter cast iron watermain along Oceanview Road beginning at 270 and carrying on to the end of the cul-de-sac at Highview Place is in poor condition and is also experiencing water quality issues, though not as much as Creekview (**IMP Project #21**). The watermain continues to become occluded by tubercules and has insufficient fire flow capacity. This 415-meter length of main and the roadway require reconstruction as well as drainage improvements. The drainage works have been designed by ISL as part of the Oceanview Drainage Study – the watermain and road needs to be redesigned. Included in

the watermain replacement are two PRV's, #2 and #6. The current estimate for this work is \$1,700,000 including design.

(3) The Centre Road, Upper Bayview and Bayview Place project design is currently being tendered. Design work will likely begin in 2022 with a final design completed late in the summer. The current estimate for the completion of all three areas of this project is \$1,785,000.00. The project consists of three distinct watermains:

- a. 150 mm diameter asbestos cement watermain from the cul-de-sac at the top of Upper Bayview to the intersection of Bayview, Bayview Place, and Upper Bayview was installed in 1968 and has experienced two breaks in its history (**IMP Project #20**). As this 500-meters of pipe continue to age and degrade, more consequential breaks can be expected. Estimated replacement cost for this portion of the project is \$750,000.00.
- b. The 150 mm diameter watermain from the intersection to the end of Bayview Place is cast iron and was install at about the same time as the Upper Bayview watermain (**IMP Project #18**). This 265-meter length of main is in extremely poor condition and is continuing to become occluded with tubercles which is severely restricting the fire flow to the cul-de-sac. Estimated replacement cost for this section of the project is \$397,500.00.
- c. The 150 mm diameter cast iron watermain from the intersection of Bayview, Bayview Place, and Upper Bayview down to Centre Road past the Fire Hall and past Crosscreek Road was installed in 1965 and has also experienced two breaks in its history (**IMP Project #35**). PRV station #4 is included along this 225-meter section of watermain. The estimated replacement cost for this section of the project is \$637,500.00.

Sewer (\$10,000.00)

With the complete replacement of the wastewater treatment plant in 2019, staff's attention has turned to the mainline system which consists of 2,173 meters of polyvinyl chloride (PVC) pipe. In 2022 staff will be putting forward a budget to smoke test the lines. Smoke testing is a relatively inexpensive method by which line integrity can be tested. The estimate for smoke testing the entire wastewater system is \$10,000.00.

SCADA (\$100,000.00)

The Village's existing SCADA system is comprised of obsolete components and technology which is causing issues with obtaining replacement parts. Increasing down time is resulting in

increased overtime as operators are being called out after hours to investigate and monitor the system. 2021 saw an increase in outages and down time for the system. The estimate for the replacement of the system is \$100,000.00. This is related to IMP Project #7 which was abandoned due to the age of our SCADA system and recommendation for its replacement by AECOM Engineering came after the completion of the IMP.

Roads, Bridges, & Drainage (\$2,762,683.00)

The Municipal road network is made up of approximately 11km of asphalt paved road, 8 bridges, and 3 railway crossings. Tied to this network is the drainage system which typically consists of open watercourses (drainage ditches) that frequently cross underneath roads and ultimately empty into one of the three creeks within the Village: Magnesia Creek, Alberta Creek, and Harvey Creek.

Roads (\$530,000 plus a \$190,000 re-budget)

Transport Canada's new Grade Crossing Regulations came into effect in 2021. As a result, the long-standing stop signs at each of our railway crossings were ordered removed. Staff have confirmation with Transport Canada's Rail Safety Officers and their Engineering Branch Head, that the stop signs may remain in place until the Municipality is able to conduct engineering traffic reviews of the intersections. Staff will be requesting a necessary budget of \$30,000.00 to review traffic patterns at two crossings (Brunswick Beach and Kelvin Grove) to ensure safe passage of pedestrians and traffic at these crossings.

The section of roadway selected for paving in 2021 was Isleview Road (**IMP Project #28**), unfortunately, due to the severely inclement weather in October and November, paving could not proceed. This project will be re-budgeted in 2022 at a cost of \$190,000.00.

Three other critically poor sections of road are:

1. 375 meters of road between 200 and 241 Bayview Road. Full reconstruction of this section of roadway is included in the scope of work for the Bayview DWIP (drainage and watermain improvement project – **IMP Project #12**). Unfortunately, the condition of the roadway has deteriorated significantly and will not last much longer before some intermediate form of remediation is required. Staff estimate interim remediation to cost about \$125,000.00.

2. 250 meters of Oceanview road from the intersection of Highview Place down to the intersection at Creekview Road (**IMP Project #53**). This section of roadway has deteriorated significantly since the IMP inspection work done in 2015. Poor drainage is the cause of the deterioration; however, like Upper Bayview and the paving works done in 2019, this section cannot be ignored much longer. Remediation work will be required despite having to correct the drainage problems. Staff estimate this portion of work to be approximately \$125,000.00.
3. 200 meters of road from 270 Oceanview to the intersection of Oceanview and Highview. Like the section above, deterioration has progressed since the 2015 inspection work was carried out. Full road restoration is included in the project costs for **IMP Project #21**, but like the Bayview DWIP, it is anticipated that restoration paving will be required prior to the initialization of that project. Staff estimate this section of paving to cost approximately \$250,000.00

Bayview DWIP (\$2,262,683.00)

The Bayview DWIP is the topmost project in the IMP and was considered to be the highest priority in 2016. Since then, the Municipality has completed the design work (**IMP Project #1**) and in 2018 applied for a grant under the first intake of the Investing in Canada Infrastructure Program (ICIP) in the amount of \$2,262,683.00 for which we were unsuccessful. This project (**IMP Project #12**) continues to be a top priority as the drainage system continues to deteriorate resulting in further degradation of the roadways. Ultimately, a decision to proceed with the work irrespective of grant funding opportunities may be required. As indicated under the road pavement section of this report – the road cannot wait much longer before funds need to be directed towards temporary repairs that will eventually have to be dug up again to perform the watermain and drainage upgrades.

Bridges

The very high priority bridge repairs identified in the IMP have been completed. The high and medium priority repairs have not yet been initiated but will likely take place in 2023 or 2024. Staff's primary focus has been to remediate Bridge 06, the driveway bridge over Alberta Creek, which is in a state of significant deterioration.

Drainage (\$250,000.00)

Over 90% of the Village’s drainage culverts were constructed using corrugated metal pipe (CMP) and many of these culverts are rapidly deteriorating. Staff are aware of one failure on Mountain Drive but suspect additional issues with these culverts – in order to better understand the condition of these culverts, staff will be submitting a \$35,000.00 capital request to video various critical culverts (**IMP Project #7**) throughout the Village.

The priority at present is a 200-meter section of drainage pipe on Mountain Drive (**IMP Project #45 and 46**). There are 2 known failures along this pipe and during heavy rains, the system backs up and overflows onto the roadway. Eventually this will further damage the roadway and necessitate remediation of the asphalt. The estimated cost for this project is \$215,000.00.

CONCLUSION

There is a plethora of projects that required attention within the immediate future and will not be able to be funded through grant applications. Council will need to determine how to move many of these projects forward.

ITEMS IDENTIFIED IN THIS REPORT	ESTIMATED COSTS
Tanks:	
- Re-budget tank inspections	\$ 25,000
- Warranty Inspection of Harvey Tank	\$ 20,000
PRV Stations	\$ 3,300,000
Water Mains:	
- Creekview watermain	\$ 175,000
- Oceanview/Highview watermains	\$ 1,700,000
- Upper Bayview watermain	\$ 750,000
- Bayview Place watermain	\$ 397,500
- Bayview and Centre (PRV#4) watermains and PRV station	\$ 637,500
Sewer - smoke testing	\$ 10,000
SCADA - complete replacement	\$ 100,000
Roads:	
- Engineering Traffic Review of Railway Crossings	\$ 30,000
- Isleview Re-budget	\$ 190,000
- Bayview (200 - 241 Bayview)	\$ 125,000
- Oceanview (Highview to Creekview)	\$ 125,000
- Oceanview (270 to Highview)	\$ 250,000
Bayview DWIP	\$ 2,262,683

Bridges	t.b.d.
Drainage:	\$ 250,000
- CCTV Video Inspection	\$ 35,000
- Mountain Drive Culvert Replacement	\$ 215,000
Total Capital	\$ 10,597,683

Follow Up Action:

Staff to continue working towards the completion of the projects and recommendations of the IMP and will bring forward immediate priority items during the 2022 Budget deliberations.

Communication Plan:

Village Update and direct mail pieces as required.

APPENDIX A – COMPLETED INFRASTRUCTURE MASTER PLAN PROJECTS 2016 - 2021

Project #	Description	Approximate Cost
1	Design of the Bayview DWIP Project - Survey & Design of Watermain Upsizing, Galvanized Drain Replacement & Road Reconstruction on Bayview Rd.	\$ 50,000
2	CCTV, Condition Assessment of Kelvin Grove Beach Park culvert.	\$ 1,500
3	Kelvin Grove WWTP Safety and Monitoring Improvements	\$ 25,000
5	Digitize, organize and backup all hard copy engineering drawings.	\$ 3,000
6	General Bridge Repairs (Very High Priority)	\$ 15,500
7	SCADA Control Strategy Study – included in Project #56	See #56
8	Survey & Design of Stormwater system on Oceanview Road (watermain and road design still outstanding)	\$ 18,000
51	Remove danger trees at Alberta Creek water main bridge and inspect 2 water main bridge crossings.	\$ 20,000
56	Design and Construction to replace Harvey Creek 400,000-gallon water reservoir. Including construction of 3 new PRV Stations on Upper Bayview, Mountain, and Bayview	\$ 3,311,000
15A	CCTV of sanitary sewer system	\$ 10,000
38	Survey, Design and Construction to upsize Water main on Inlet/Outlet of Phase IV & Phase V Tanks (46 m). Included in Project #56.	See #56
41	Magnesia Tank requires additional storage capacity for fire flow. This deficiency was included the construction of the new Harvey Tank which was upsized to account for the Magnesia tanks deficit. Included in Project #56.	See #56
49 & 50	Design for a new Harvey Creek raw water intake structure & Replacement of Harvey Creek raw water intake structure	\$ 171,000
60	WWTP Replacement	\$ 1,100,000
TOTAL		\$ 4,725,000
Funded by Grants:		\$ 2,374,130
Funded by Loans:		\$ 1,060,900
Funded by Operating/Surplus:		\$ 360,970
Funded by Parcel Tax		\$ 929,000