

APPENDICES



APPENDIX A:

LIMITATIONS AND ASSUMPTIONS

Key Assumptions

Capital grants: Forecasts include the assumption that the City will obtain \$2M in annual grants from senior levels of government for infrastructure replacement. In addition, forecasts include the assumption that the City will obtain and use \$1.9M in annual Community Works Fund proceeds for infrastructure replacement.

Capital Service Continuity: For modelling, it was assumed that the City of Vernon would want to continue with the current capital services and capital service levels. The City of Vernon may choose not to replace some of its capital or reduce / increase capital services. Such decisions could materially impact modelling.

Climate change: The Plan did not examine the risk or impact of climate change to the City of Vernon's infrastructure or private property. Further review, funding, and staff capacity would be required should Council or the community wish to understand the broader implications of climate change risk on the community. Climate risk is actively integrated into some asset management plans which have been integrated into this report.

Estimate of 2012 Sustainable Funding: In the Financial Section of this Plan, the annual sustainable funding level is estimated for 2012 through 2024. To estimate prior years' sustainable funding, this Plan utilized the BC Highway Construction Cost Index published by the Province of British Columbia. These values were applied retroactively to the estimated 2024 sustainable funding amount to determine the 2012 equivalent value. This methodology is imperfect as each asset class may be subject to different annual cost escalation values. Furthermore, this index is a Province wide average, and the City of Vernon is subject to local conditions that may differ from Provincial averages.

Existing Capital Only: The Plan does not model anticipated growth in infrastructure requirements. Forecasts are based on the replacement of existing municipal infrastructure only. For instance, these forecasts have not contemplated the increased capacity required to support future densification or development. The Plan has not anticipated potential future decisions to increase capital service levels. The City of Vernon's Master Plans do anticipate growth. Adoption of the sustainable asset management recommendations in the Plan, such as Financial Plan Bylaw #3 Recommendation, will support the sustainable funding of future growth.

Inflation: Modelling has been prepared using 2024 values. No inflationary factor has been applied to forecasted replacement costs. As unit costs are likely to escalate, the City of Vernon should consider applying a relevant annual cost escalation factor to recommended investment levels (see Financial Plan Bylaw #1 Recommendation).

Infrastructure Replacement Standards: Forecasts are prepared with the assumption that infrastructure will be replaced at the same standard that currently exists. However, some of the City of Vernon's infrastructure does not meet desired standards, for example, some of the City of Vernon's sidewalks are 1.5m in width and would need to be widened to 2m to meet improved standards. Buildings standards are also often upgraded when building replacement occurs.

Investment Revenue: Modelling has integrated a 3% investment return rate. This assumption may be conservative in the long run. Since its inception, the Municipal Finance Authority Money (MFA) Market Fund has had a historical return of 3.59%. However, the return has been 1.96% for the past 5 years and 5.07% for the last year. Yields have recently swung from a historically low yield of less than 0.25% to a yield of above 5.00%. Additionally, the City of Vernon can choose to diversify its long-term cash flows in higher yielding funds such as the MFA's bond fund. This fund has returned over 5% on average since inception, with a current 2.04% 5-year average due to interest rate increases. Also, the MFA has recently introduced a new Diversified Multi-Asset Class Fund, which is exposed to market equities and is expected to produce high yields over the long term. Increasing forecasted investment returns from 2% to 3% could increase modelled investment returns from approximately \$120M to \$560M+ over the next 100-years.

Pavement Capital Budget Forecasts: The City utilizes pavement modelling software to recommend annual pavement budgets. The modelling conducted with the software recommends a variety of capital maintenance treatments including overlays, grind and pave, full depth reconstruction, full depth recycling, chip seal, microsurfacing, and others. This methodology results in modelling that is significantly less expensive compared to a conventional method of simply predicting top layer and base layer replacement. The effectiveness of the modelling diminishes significantly after 10 years. As a result, 10-year modelling was duplicated for the remaining duration of the Plan. The modelling indicates road pavement condition as remaining or exceeding the current state through the 10-year duration.

Replacement Cost Accuracy: Unit rates were developed to estimate overall replacement costs and to develop a long-term sustainable funding model. No Class-D or above construction estimates have been prepared. Therefore, none of the spending forecasts should be utilized to prepare a capital plan. Spending forecasts demonstrate an overall funding level likely needed to support the ongoing replacement of existing infrastructure. Replacement cost accuracy will differ between asset class and subclass:

- **Roads, storm sewer, sanitary sewer:** assumed zero bedrock removal, depth of mains 1 to 5 meters, no bypass pumping, or removal of existing mains is assumed.
- **Buildings:** Capital maintenance and replacement cost estimates were based on values provided by the Building Asset Management Plan that was underway at the time this Plan was developed.
- **Vernon Water Reclamation Centre:** replacement costs were based on The Water Reclamation Centre / Spray Irrigation / Outfall Asset Management Plan with updated figures to include High Strength Waste Treatment Facility data in 2024.
- **Airport Infrastructure:** pavement for runways was based on the same unit rates developed for roads. Airport buildings were included in the scope of the Building Asset Management Plan.
- **Park structures:** based on the most recent values used in the 2023 Parks Asset Management Plan.

Unit Pricing Inclusion: Unit prices were current as at May 2024. All unit costs used to derive replacement costs include 10% Surveying and other costs, 15% Engineering and Construction Administration plus a 40% contingency. An Engineering firm was engaged to develop unit rates based on recent tender prices.

Useful lives: The Plan utilizes a modified National Asset Management Standards (NAMS) approach to useful lives. Useful lives were generally estimated to be near the midway point of the NAMS recommended useful life range, with some exceptions based on recent condition assessments.

Vehicles and Equipment: The replacement cost and annual funding levels for general vehicles and equipment was not quantified and not included in the scope of this Plan. General vehicles and equipment are funded via an internal rental rate. This rental rate is charged to all departments who utilize vehicles and equipment in the equipment pool. The rental rate is calculated to be sufficient to cover all vehicles operating costs as well as save for the replacement of vehicles in the equipment pool. Fire Apparatus and Equipment is supported by an annual transfer to reserve.

APPENDIX B:

SENSITIVITY ANALYSIS

A sensitivity analysis has been conducted to help authenticate the broad findings of this review. Broad findings include estimated annual sustainable funding, annual funding gap, and total replacement costs. The City used defensible assumption, with the best information available when arriving at Plan findings. However, a sensitivity analysis was conducted by modelling a change in estimated useful lives and replacement costs of the City’s drainage and transportation infrastructure.

“Optimistic” assumptions are those that would reduce forecasted replacement costs and/or annual funding needs, and “pessimistic” assumptions are those that would increase forecasted replacement costs and/or annual funding needs

The replacement value of the Transportation and Drainage asset classes represents 84% of replacement value of all general fund assets. For this reason, these asset classes were selected for sensitivity modelling. Overall, the sensitivity analysis confirms the City is facing an annual funding gap that will need to be addressed now or into the future.

Table 33: Sensitivity Analysis Parameter Modelling

	Scenario A - Optimistic	Scenario B – Plan Findings	Scenario C - Pessimistic
Estimated Useful Life – Drainage & Transportation	+25%	-0%	-25%
Replacement Costs – Drainage	-25%	-0%	+25%
Replacement Costs - Transportation	-0%1	-0%	+25%

Table 34: Sensitivity Analysis – General Fund Assets

	Scenario A	Scenario B	Scenario C
Replacement Costs	\$1.6B	\$1.7B	2.1B
100-Year Spending	\$1.8B	\$2.0B	2.3B
Annual Sustainable Funding	\$17.7M-18.2M	\$19.4-20.0M	\$22.0 – 22.6M
Annual Funding Gap	\$1.8M-2.3M	\$4.6-5.4M	\$6.1-6.7M
% Sustainability	87.4% – 89.8%	72.9% – 75.3%	70.4% – 72.3%

APPENDIX C:

2013 ORGANIZATIONAL ASSET MANAGEMENT PLAN PROGRESS

Step 1: Asset Management Investment Plan		
	Progress?	Comment
Existing infrastructure	✓	Infrastructure inventory updated frequently
Renewal	✓	Infrastructure renewal forecasted as part of scope of Organization AM Plan
Replacement value	✓	Replacement costs updated as part of this Plan
Remaining life	✓	Remaining lives refined using condition assessments and integrated into this Plan
Backlog	✓	Backlog refined using condition assessments and integrated into this Plan
Infrastructure renewal contribution	✓	
Step 2: Asset Management Revenue Plan		
Revenue streams	✓	Utility rate review underway as separate project
Existing and new capital	✗	This Plan proposes policy options for new development and non market change revenue
Borrowing	✗	Some borrowing options have been modelled in this version of the Plan
Reserves	✓	Reserve policy underway and reserve policy recommendations presented in this Plan
Sustainability gap	✓	Updated as part of this Plan

Step 3: Balancing Costs and Revenues		
Condition assessments	✓	Formal condition assessments have been conducted on all major asset classes: Facilities, Road Infrastructure, Drainage, and Sanitary Sewer
Risk assessments	✓	Risk assessments have been conducted on select asset classes such as the Drainage Improvement Prioritization Plan
Levels of service	✓	Incorporated into individual asset management plans. Refined periodically.
Utility feasibility studies	✓	Utility rate review underway as separate project
Step 4: Developing Prioritized and Affordable Capital Plans		
Short term (3 year) capital plan	✓	Several asset management and capital plans underway by asset class.
Long term (15 year) capital plan	✗	Long-term capital planning has improved but a consolidated 15-year capital plan is not in place.
Step 5: Implementation and Updating		
Infrastructure renewal	✓	Ongoing
Annual iteration of steps 1-4	✓	Ongoing

APPENDIX D:

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