Funding Water Infrastructure for the Long Term

Regional District of Central Kootenay

Balfour

April 3, 2018

econics

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1.0 Executive Summary

The Balfour water system is owned and operated by the Regional District of Central Kootenay (RDCK) and is located in Electoral Area E, on the north shore of the west arm of Kootenay Lake. The system was originally developed in 1947; it became a RDCK service area in 2011 and currently services the equivalent of 326 single-family dwellings.

This report summarizes the infrastructure of the Balfour water system. The report identifies the Annual Cost of Sustainable Ownership (ACSO) for the water system, and presents a funding scenario for long term sustainable renewal of the system.

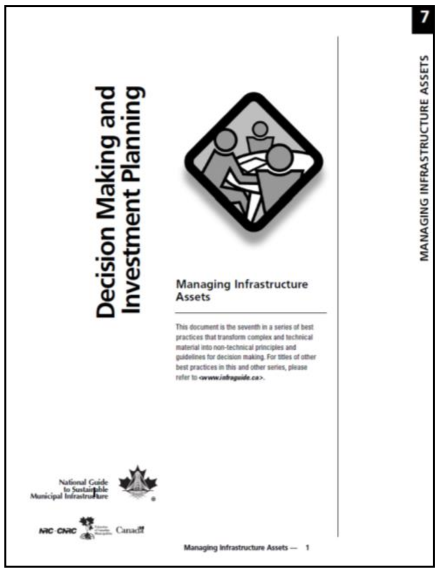
The analysis is based on assumptions current as of January 2018. Infrastructure management is a work-in-progress and should be reviewed from time to time as assumptions and other influencing factors change over time.

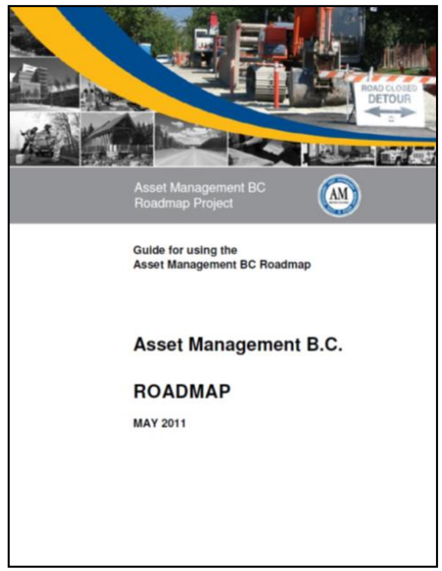
Four recommendations follow from this analysis as follows:

1. Review regularly the unit costs for pipe replacement and other pricing assumptions.
2. Prioritize work using a risk-based approach by considering condition and impact of failure of assets.
3. Bolster annual contributions for asset renewal from rates and fees and build up reserves to required target levels.
4. Update the asset schedule on ongoing basis.

2.0 Best Practices

The information in this report is developed using an adaptation of best practices, methods and frameworks from several sources. See section 8.0 References for details.





Best practices encourage elected representatives to ensure there are adequate provisions in local government budgets to renew infrastructure when it is required. Sufficient funds should be raised for that purpose and whenever appropriate an infrastructure reserve fund can be used to accumulate funds until they are needed.

3.0 Tangible Capital Asset Reporting

With the introduction in 2009 of new reporting requirements as per section 3150 of the Public Sector Accounting Board (PSAB) Handbook, local governments are required to report tangible capital assets[1] as assets (versus expenses) in the financial statements as shown below in Table 1.

Table 1: Tangible Capital Asset Value Reported in Financial Statements (2015-2017)

	Dec 31, 2015	Dec 31, 2016	Dec 31, 2017
Historic Cost	$1,644,648	$1,647,049	
Accumulated Depreciation	$147,519	$184,480	
Net Value	$1,497,129	$1,462,569	
Annual Asset Depreciation	$33,134	$34,309	

Source: RDCK Finance Department

3.1 Annual Asset Depreciation

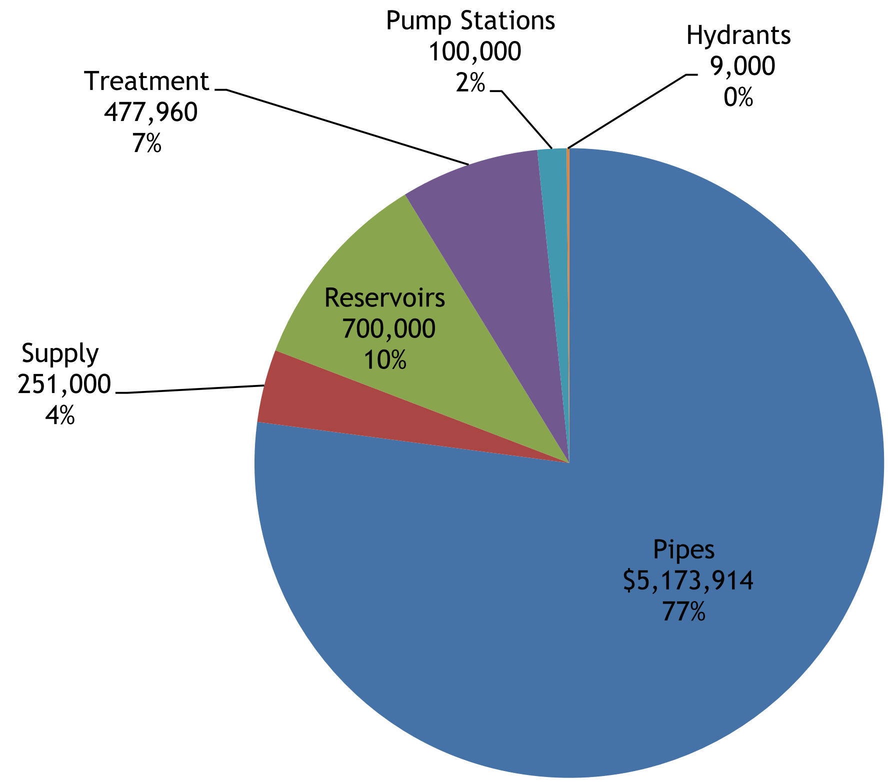
Annual asset depreciation[2] is an accounting term that represents how much an asset's book value reduces every year. It is normally calculated by dividing an asset's historic cost by its estimated service life. Depreciation can be used as an indicator of how much funds should be put aside each year for the eventual future replacement of the asset. However, because asset depreciation does not reflect the effects of inflation, technological advancements or changing standards, relying on depreciation can result in under funded reserves.

1. Tangible Capital Assets (TCA) are defined by the Public Sector Accounting Board as a physical asset used in the delivery of service and having a useful life of more than 1 year.
2. Is sometimes termed annual asset amortisation.

4.0 Asset Inventory

Balfour water infrastructure is summarized here. The total value of the infrastructure and the value of each asset category is shown here in 2017 dollars.

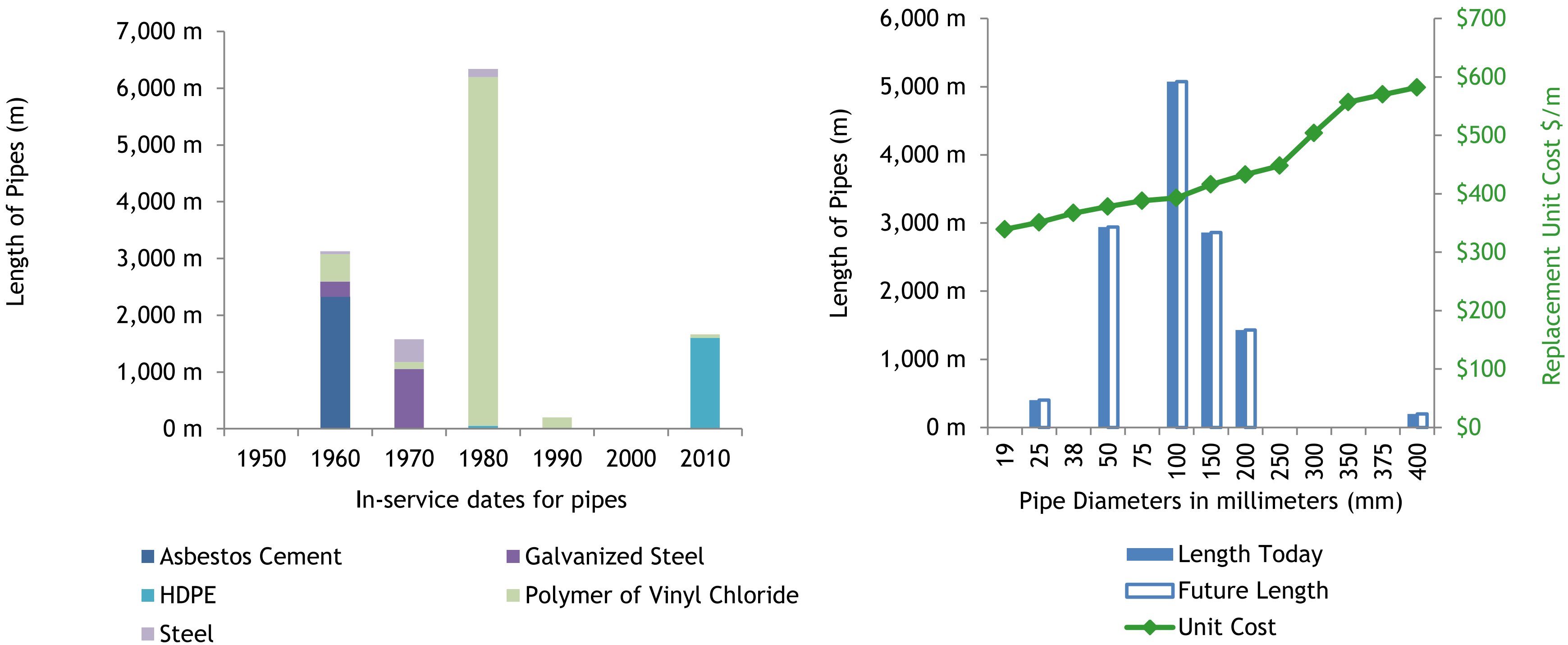
Figure 1: Balfour 2017 WATER Assets Replacement Value: $6,711,874



4.1 Water Transmission and Distribution Network

Approximately 13 Kms of pipes was installed in Balfour since the 1960s.

Figure 2: Balfour Pipe Distribution Network (Length, Material, Diameter)



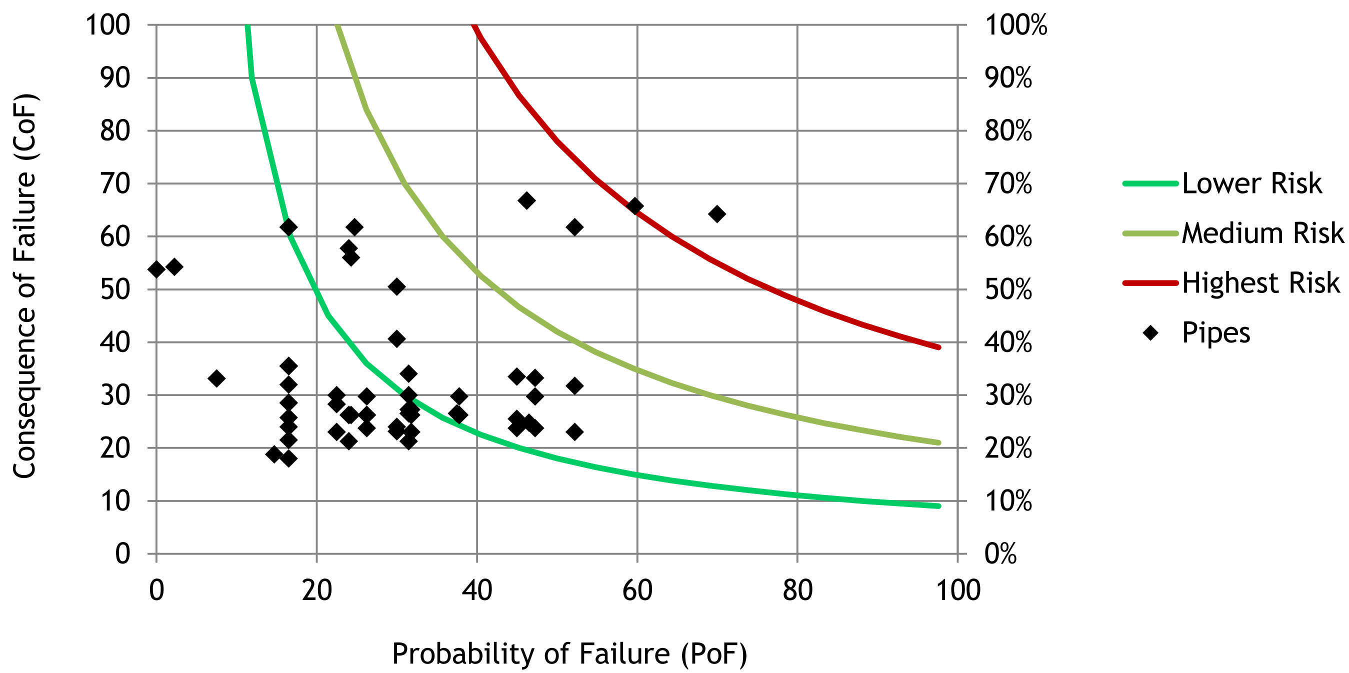
Note: due to minimal availability of records, some in-service dates may be estimated by decade from old maps.

4.2 Risk and Criticality Assessment of Distribution Network

Each length of pipe was plotted on this risk matrix based on its probability and consequence of failure. These were determined by applying a risk and criticality scoring method based on specific data for each pipe including: critical land use affected, water pressure, available fire flows, stream proximity, break history, install quality, install depth and number of connections. Explanation for the application of this method is beyond the scope of this report.

The results shown below in Figure 3 provide a way for RDCK management to alter the expected replacement dates and prioritize work based on highest risk/ highest needs.

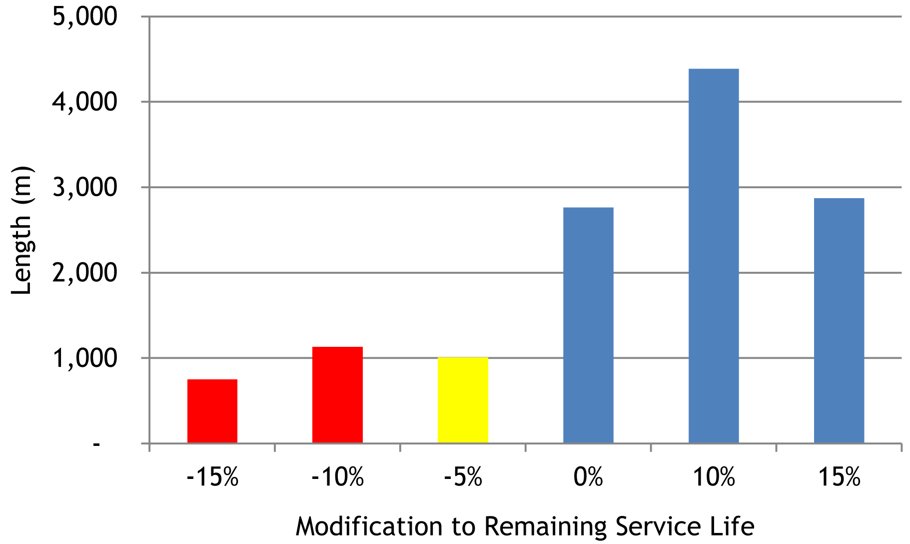
Figure 3: Consequence and Probability of Failure for Distribution Network



4.2 Risk and Criticality Assessment of Distribution Network

Depending on its position on the risk matrix in figure 3, each pipe's estimated service life will be modified. Low risk pipes (those with a low probability and/or low consequence of failure) will have their service life extended. High risk pipes will have their service life decreased and therefore become a higher priority. Figure 4 below summarizes the application of this service life modifier to the total length of pipes in the system.

Figure 4: Pipe Remaining Service Life Modifications Resulting from Risk Factor



4.2 Risk and Criticality Assessment of Distribution Network

Table 2 below lists the pipes with the highest risk scores based on probability of failure (PoF) and consequence of failure (CoF).

Table 2: Pipes with Highest Risk Factors

Item ID	Description	Qty	Type	Diameter Today	In Service Year	PoF	CoF	RiskF	Base ESL	RBSL	Next Replacement Year	Model Replacement Value
PN01C	Raw line going across Highway 31	751.0	PVC	150	1986	70	64	-15%	80	68	2054	312,416.00
PN24	7680 Balfour Wharf Rd to 7924 Balfour Wharf Rd	873.0	AC	100	1961	60	66	-10%	50	45	2006	343,089.00
PN22	7620 Hwy 3A to 7672 Hwy 3A	259.0	AC	100	1961	52	62	-10%	50	45	2006	101,787.00
PN26	450 Balfour Ferry Rd & 8120 Busk Rd to 8172 Busk Rd	215.0	AC	100	1961	46	67	-5%	50	47.5	2009	84,495.00
PN29	8216 Busk Rd to 8404 Busk Rd	178.0	AC	100	1961	46	67	-5%	50	47.5	2009	69,954.00
PN21C	7484 Hwy 3A to 7612 Hwy 3A	558.0	AC	50	1961	52	32	-5%	50	47.5	2009	210,924.00
PN01A	Raw line from Pumphouse to Meadow St	53.8	HDPE	150	1985	30	51	-5%	80	76	2061	22,380.80
PN21A	7463 Hwy 3A to 7476 Hwy 3A	41.0	AC	100	1961	52	23	0%	50	50	2011	16,113.00
PN23	7697 Hwy 3A to 7799 Hwy 3A	482.0	GALV	50	1975	47	33	0%	60	60	2035	182,196.00
PN20	From WTP/Reservoir to Schoolhouse Rd	472.0	PVC	150	1961	25	62	0%	80	80	2041	196,352.00
PN05B	610 Queens Bay Rd	61.3	ST	50	1975	24	56	0%	80	80	2055	23,171.40
PN35	Down Glady Rd & 8640 Beach St to 8989 Beach St	494.8	PVC	100	1985	45	34	0%	80	80	2065	194,456.40
PN30A	8435 Busk Rd and up Charles Rd from 533 to 573 Charles Rd	78.0	PVC	100	1985	24	58	0%	80	80	2065	30,654.00
PN38	From Adams St up Queen's St to 8931 Meadow St	462.0	PVC	150	1985	32	30	0%	80	80	2065	192,192.00
PN30	Mainline connection across Busk Rd to Charles Rd	13.7	PVC	100	1985	32	34	0%	80	80	2065	5,384.10
PN03	From Reservoir moving down towards Upper Balfour Rd	19.0	PVC	150	1985	17	62	0%	80	80	2065	7,904.00
PN06A	Reservoir to Booster Pump	81.0	PVC	100	1985	17	62	0%	80	80	2065	31,833.00
PN01B	Raw line from Meadow Street	558.0	HDPE	200	2010	30	41	0%	80	80	2090	241,614.00

4.2 Risk and Criticality Assessment of Distribution Network

Table 3 below lists the pipes with the highest probability of failure (PoF).

Table 3: Pipes with Highest Probability of Failure

Item ID	Description	Qty	Type	Diameter Today	In Service Year	PoF	CoF	RiskF	Base ESL	RBSL	Next Replacement Year	Model Replacement Value
PN01C	Raw line going across Highway 31	751.0	PVC	150	1986	70	64	-15%	80	68	2054	312,416.00
PN24	7680 Balfour Wharf Rd to 7924 Balfour Wharf Rd	873.0	AC	100	1961	60	66	-10%	50	45	2006	343,089.00
PN22	7620 Hwy 3A to 7672 Hwy 3A	259.0	AC	100	1961	52	62	-10%	50	45	2006	101,787.00
PN21C	7484 Hwy 3A to 7612 Hwy 3A	558.0	AC	50	1961	52	32	-5%	50	47.5	2009	210,924.00
PN21A	7463 Hwy 3A to 7476 Hwy 3A	41.0	AC	100	1961	52	23	0%	50	50	2011	16,113.00
PN23	7697 Hwy 3A to 7799 Hwy 3A	482.0	GALV	50	1975	47	33	0%	60	60	2035	182,196.00
PN31	530 Robert Rd to 572 Robert Rd	179.0	GALV	50	1975	47	30	10%	60	66	2041	67,662.00
PN33A	435 Westley Rd & 8480 Beach St to 8448 Beach St	49.5	ST	50	1961	47	24	10%	80	88	2049	18,711.00
PN19	7409 Upper Balfour Rd to 7435 Upper Balfour Rd	273.0	GALV	25	1961	47	25	10%	60	66	2027	95,823.00
PN26	450 Balfour Ferry Rd & 8120 Busk Rd to 8172 Busk Rd	215.0	AC	100	1961	46	67	-5%	50	47.5	2009	84,495.00
PN29	8216 Busk Rd to 8404 Busk Rd	178.0	AC	100	1961	46	67	-5%	50	47.5	2009	69,954.00
PN35	Down Glady Rd & 8640 Beach St to 8989 Beach St	494.8	PVC	100	1985	45	34	0%	80	80	2065	194,456.40
PN37	From corner of Adams St west and up dirt road on west side of soccer fields	228.0	PVC	150	1985	45	26	10%	80	88	2073	94,848.00
PN39	Mainline extending into Park soccer fields (Glady Rd & Adams St)	31.5	PVC	50	1985	45	24	10%	80	88	2073	11,907.00
PN28	Service Main - 8221 Busk Rd to 8263 Busk Rd (same side of street)	63.0	ST	25	1975	38	30	10%	80	88	2063	22,113.00
PN27	Short mainline across Busk Rd and up to Madeline Rd	13.0	ST	25	1975	38	26	10%	80	88	2063	4,563.00
PN27A	Madeline Rd	53.0	ST	25	1975	38	26	10%	80	88	2063	18,603.00
PN15	7521 Upper Balfour Rd to 7539 Upper Balfour Rd	151.0	PVC	100	1985	38	27	10%	80	88	2073	59,343.00

4.2 Risk and Criticality Assessment of Distribution Network

Table 4 below lists the pipes with the highest consequence of failure (CoF).

Table 4: Pipes with Highest Consequence of Failure

Item ID	Description	Qty	Type	Diameter Today	In Service Year	PoF	CoF	RiskF	Base ESL	RBSL	Next Replacement Year	Model Replacement Value
PN26	450 Balfour Ferry Rd & 8120 Busk Rd to 8172 Busk Rd	215.0	AC	100	1961	46	67	-5%	50	47.5	2009	84,495.00
PN29	8216 Busk Rd to 8404 Busk Rd	178.0	AC	100	1961	46	67	-5%	50	47.5	2009	69,954.00
PN24	7680 Balfour Wharf Rd to 7924 Balfour Wharf Rd	873.0	AC	100	1961	60	66	-10%	50	45	2006	343,089.00
PN01C	Raw line going across Highway 31	751.0	PVC	150	1986	70	64	-15%	80	68	2054	312,416.00
PN22	7620 Hwy 3A to 7672 Hwy 3A	259.0	AC	100	1961	52	62	-10%	50	45	2006	101,787.00
PN20	From WTP/Reservoir to Schoolhouse Rd	472.0	PVC	150	1961	25	62	0%	80	80	2041	196,352.00
PN03	From Reservoir moving down towards Upper Balfour Rd	19.0	PVC	150	1985	17	62	0%	80	80	2065	7,904.00
PN06A	Reservoir to Booster Pump	81.0	PVC	100	1985	17	62	0%	80	80	2065	31,833.00
PN30A	8435 Busk Rd and up Charles Rd from 533 to 573 Charles Rd	78.0	PVC	100	1985	24	58	0%	80	80	2065	30,654.00
PN05B	610 Queens Bay Rd	61.3	ST	50	1975	24	56	0%	80	80	2055	23,171.40
PN03A	From WTP/Reservoir to Schoolhouse Rd	11.3	PVC	150	1961	2	54	10%	80	88	2049	4,700.80
PN40	Intake Line (Submarine)	200.0	PVC	400	1991	0	54	10%	80	88	2079	116,400.00
PN01A	Raw line from Pumphouse to Meadow St	53.8	HDPE	150	1985	30	51	-5%	80	76	2061	22,380.80
PN01B	Raw line from Meadow Street	558.0	HDPE	200	2010	30	41	0%	80	80	2090	241,614.00
PN05	From WTP/Reservoir down & along Upper Balfour Rd from 7645 to 7742 & on to Queens Bay Rd from 540 to 602	864.0	PVC	150	1985	17	36	10%	80	88	2073	359,424.00
PN06B	Reservoir to Booster Pump	27.0	PVC	100	1985	17	36	10%	80	88	2073	10,611.00
PN07	Booster Pump to Upper Balfour Rd mainline	59.0	PVC	100	1985	17	36	10%	80	88	2073	23,187.00
PN06C	Connection from Reservoir to line running from Booster Pump to Upper Balfour Rd	1.3	PVC	100	1985	17	36	10%	80	88	2073	510.90

4.2 Risk and Criticality Assessment of Distribution Network

Table 5 below lists the pipes in order of soonest planned for replacement.

Table 5: Next Pipes Due for Replacement

Item ID	Description	Qty	Type	Diameter Today	In Service Year	PoF	CoF	RiskF	Base ESL	RBSL	Next Replacement Year	Model Replacement Value
PN24	7680 Balfour Wharf Rd to 7924 Balfour Wharf Rd	873.0	AC	100	1961	60	66	-10%	50	45	2006	343,089.00
PN22	7620 Hwy 3A to 7672 Hwy 3A	259.0	AC	100	1961	52	62	-10%	50	45	2006	101,787.00
PN26	450 Balfour Ferry Rd & 8120 Busk Rd to 8172 Busk Rd	215.0	AC	100	1961	46	67	-5%	50	47.5	2009	84,495.00
PN29	8216 Busk Rd to 8404 Busk Rd	178.0	AC	100	1961	46	67	-5%	50	47.5	2009	69,954.00
PN21C	7484 Hwy 3A to 7612 Hwy 3A	558.0	AC	50	1961	52	32	-5%	50	47.5	2009	210,924.00
PN21A	7463 Hwy 3A to 7476 Hwy 3A	41.0	AC	100	1961	52	23	0%	50	50	2011	16,113.00
PN41	7414 Hwy 3A to 7460 Hwy 3A	198.0	AC	50	1961	15	19	15%	50	57.5	2019	74,844.00
PN19	7409 Upper Balfour Rd to 7435 Upper Balfour Rd	273.0	GALV	25	1961	47	25	10%	60	66	2027	95,823.00
PN23	7697 Hwy 3A to 7799 Hwy 3A	482.0	GALV	50	1975	47	33	0%	60	60	2035	182,196.00
PN20	From WTP/Reservoir to Schoolhouse Rd	472.0	PVC	150	1961	25	62	0%	80	80	2041	196,352.00
PN31	530 Robert Rd to 572 Robert Rd	179.0	GALV	50	1975	47	30	10%	60	66	2041	67,662.00
PN18	waterline on private property - 7418 Upper Balfour Rd to 7450 Upper Balfour Rd	188.0	GALV	50	1975	26	30	15%	60	69	2044	71,064.00
PN16A	Service Mainline off Upper Balfour Rd for 7492 Upper Balfour Rd	54.0	GALV	50	1975	26	26	15%	60	69	2044	20,412.00
PN16B	Service Mainline off Upper Balfour Rd for 7518 to 7528 Upper Balfour Rd	66.0	GALV	50	1975	26	26	15%	60	69	2044	24,948.00
PN16	Service Mainline across Upper Balfour Rd to service 7492 to 7528 Upper Balfour Rd	17.0	GALV	50	1975	26	26	15%	60	69	2044	6,426.00
PN14A	Service Mainline off Upper Balfour Rd for 7542 to 7546 Upper Balfour Rd	67.0	GALV	50	1975	26	24	15%	60	69	2044	25,326.00
PN03A	From WTP/Reservoir to Schoolhouse Rd	11.3	PVC	150	1961	2	54	10%	80	88	2049	4,700.80
PN33A	435 Westley Rd & 8480 Beach St to 8448 Beach St	49.5	ST	50	1961	47	24	10%	80	88	2049	18,711.00

5.0 Annual Cost of Sustainable Ownership (ACSO)

Because things wear out over time and with constant use, including water infrastructure, it makes sense that eventually they will need to be replaced. Replacing infrastructure is often very expensive so it is typically desirable to put funds aside during the life of the infrastructure so that funds are available when needed. So a question that infrastructure-based organizations should ask is: *how much should be contributed annually to keep up with the asset wear*?

Assets wear out over time and eventually need to be replaced.

This question can be answered in different ways. Some look to the financial statements to find the annual asset depreciation amount. Although conveniently available in any financial statement, this figure likely does not accurately answer the question. Asset depreciation is useful for determining the net value of assets on the books. Because depreciation is based on historic cost, it doesn't reflect present day costs and therefore under represents actual wear and tear.

Another approach in determining *annual asset wear* is to determine the present day replacement value of the assets and take a percentage, say 1% or 2% of that value. Establishing 1% as the average annual wear and tear cost implies that the entire asset base is replaced, on average, every 100 years (every 50 years at 2%). This is easy to calculate if you have present day valuations for the assets. However this method makes a broad assumption about estimated service life (ESL) of assets. In fact, different asset types have different ESLs.

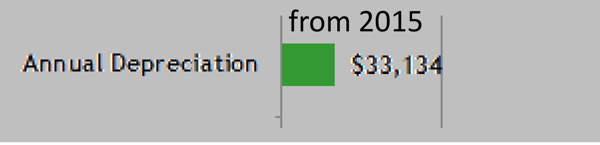
In a more refined approach, instead of aggregating ESL, an asset replacement schedule is developed itemizing each asset along with their specific ESLs. In this way, the replacement time frames for each asset can be accounted for separately. This approach enables a risk-based approach to determining replacement time frames. For example, assets of the same class that are in good condition may have delayed replacement despite reaching their ESL.

See Appendix A for a more detailed discussion on Annual Cost of Sustainable Ownership.

5.0 Annual Cost of Sustainable Ownership (continued)

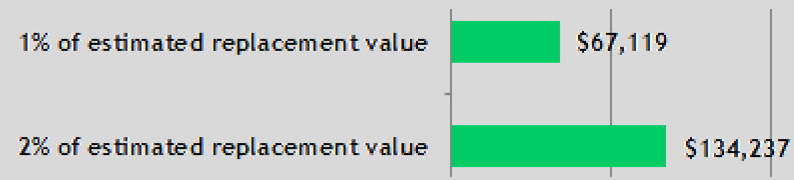
Recall the annual asset depreciation which was discussed earlier in section 3.0. This figure is an indication of annual wear and tear but is based on historic cost and does not reflect replacement cost in present day terms.

Annual depreciation, also known as annual amortisation, from financial statements is shown here for comparison purposes but not recommended as ACSO.



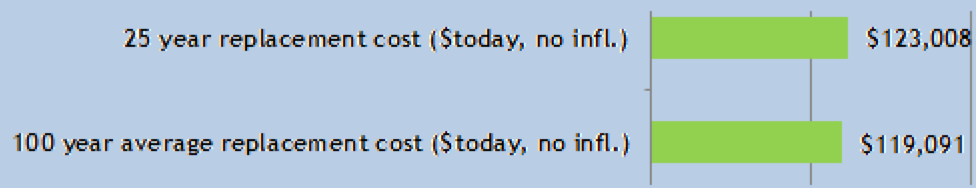
Another approach to determine annual cost of sustainable ownership is to use a figure between 1% and 2% of the total system replacement value. This implies the aggregate estimated service life of the system is between 50 and 100 years.

Calculation based on percentage of present day replacement value.



To get a more refined figure, instead of taking an aggregate approach, an asset replacement schedule is developed and each asset's estimated service life is taken into account separately. See Appendix A for a more detailed discussion on Annual Cost of Sustainable Ownership.

Calculation based on Asset Replacement Schedule

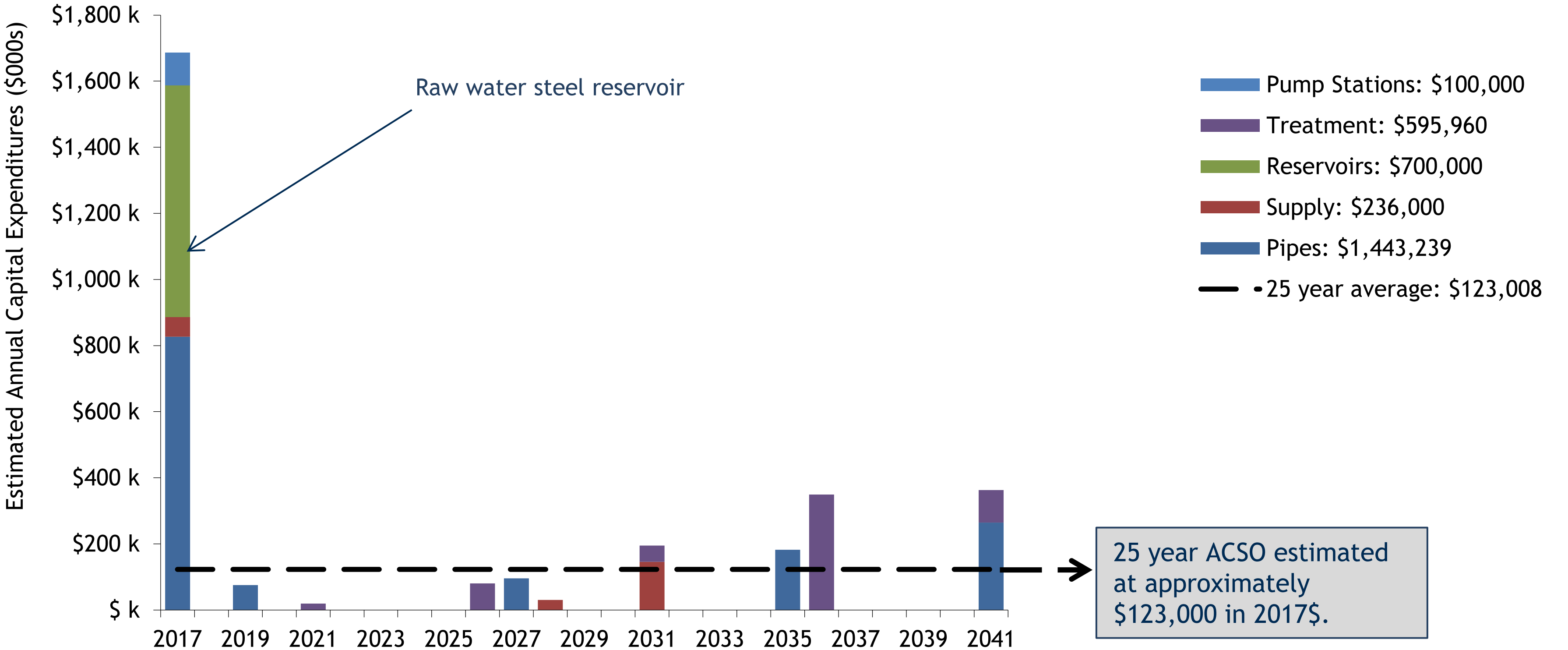


5.0 Annual Cost of Sustainable Ownership (continued)

5.1 Asset Replacement Schedule

This chart summarizes the Asset Replacement Schedule (ARS) 25 year period projection of asset replacement. The average cost over the 25 year period, also termed the Annual Cost of Sustainable Ownership (ACSO) is shown by the dash line.

Figure 5: Balfour 25 Year Asset Replacement Schedule



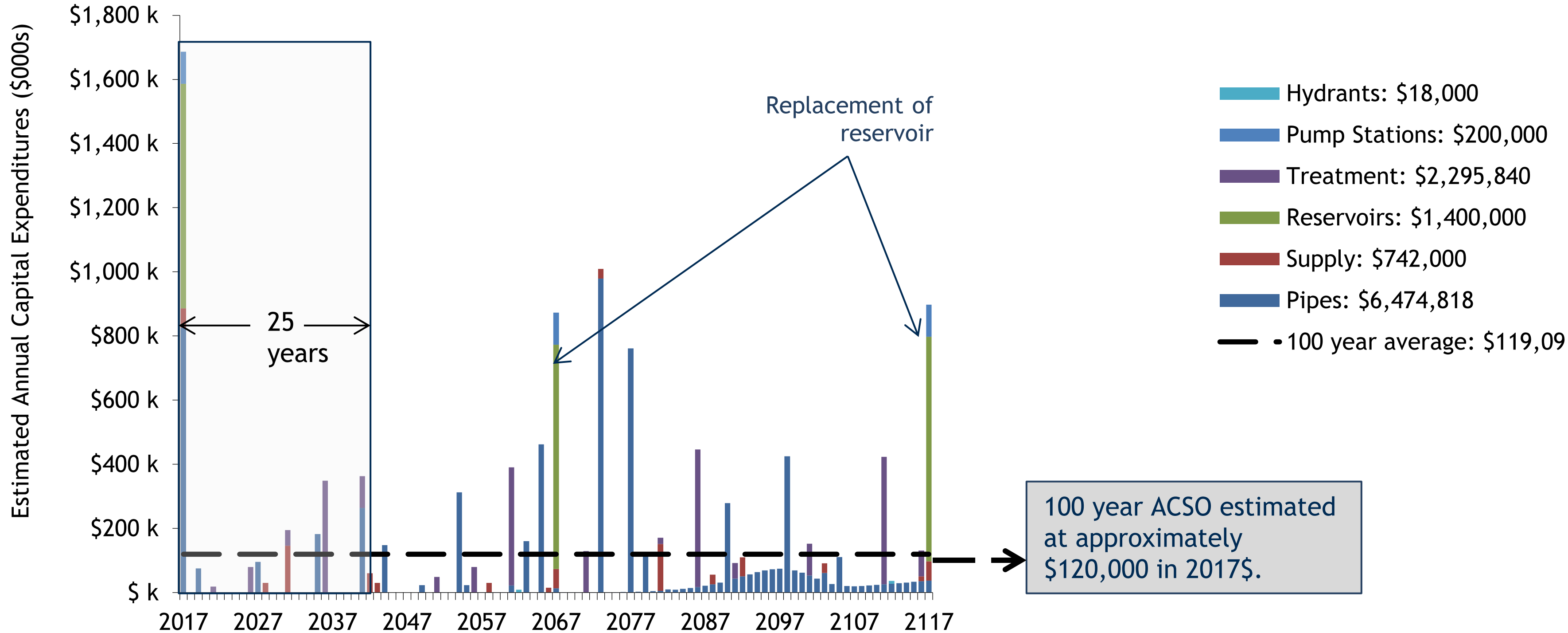
Figures are in 2017$ and not adjusted for inflation.

5.0 Annual Cost of Sustainable Ownership (continued)

5.1 Asset Replacement Schedule (continued)

This chart summarizes the Asset Replacement Schedule (ARS) 100 year period projection of asset replacement. The average cost over the 100 year period, also termed the Annual Cost of Sustainable Ownership (ACSO) is shown by the dash line.

Figure 6: Balfour 100 Year Asset Replacement Schedule



Figures are in 2017$ and not adjusted for inflation.

5.0 Annual Cost of Sustainable Ownership (continued)

5.2 Asset Maintenance

Certain infrastructure components undergo maintenance on a regular basis to maximize operating conditions and extend the life of the infrastructure as much as possible before replacement is required. Maintenance activities are covered under the operations and maintenance budget rather than the capital budget. The following table outlines maintenance activities specific to the Balfour water system.

Table 6: Balfour Maintenance Activities

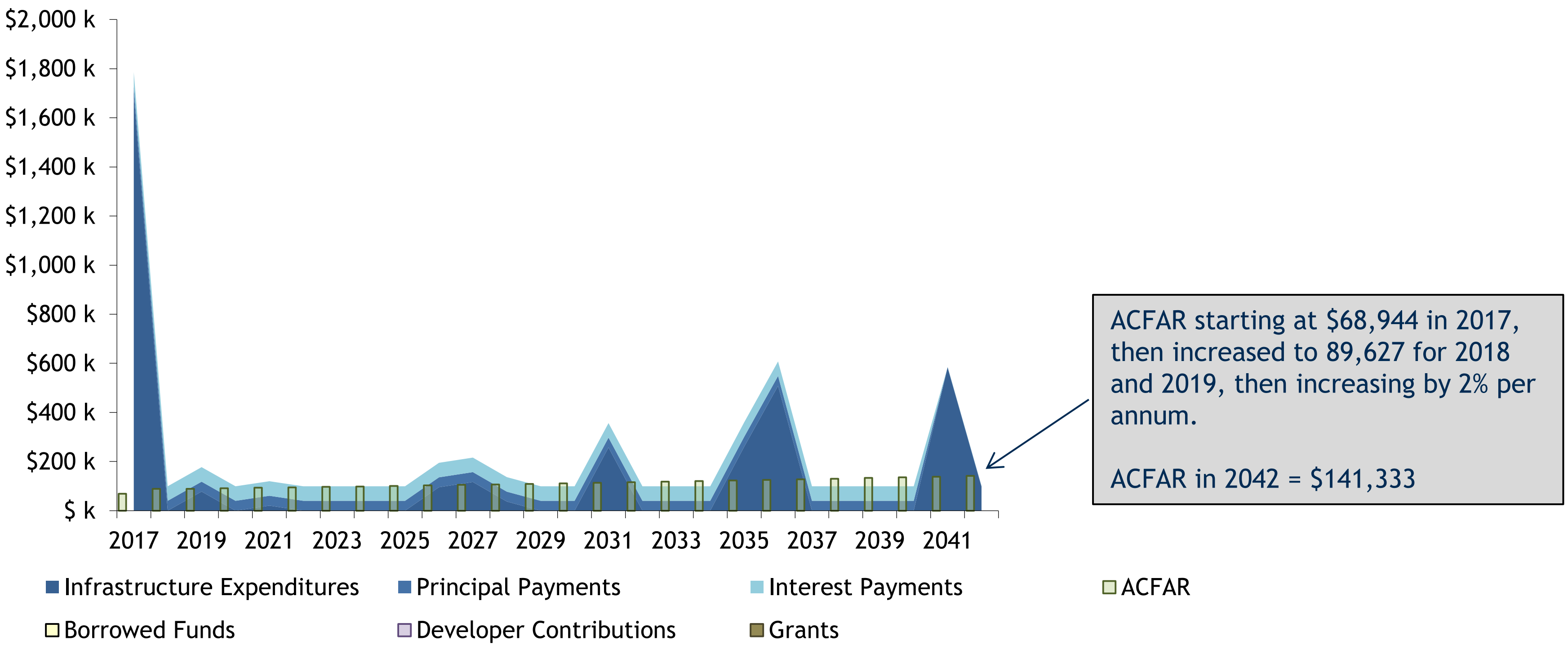
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Balfour											
Reservoir Cleaning and Inspection											
Flushing											
Valve Exercising											
Full Comprehensive Sampling											
Annual THM testing (June, September)	twice/year	twice/year	twice/year	twice/year	twice/year	twice/year	twice/year	twice/year	twice/year	twice/year	twice/year
Hydrant tear down											
Intake cleaning											
Back flow testing ferry and golf course											
Instrumentation Calibration by contractor											
Curb stop Location and Inspect											

6.0 Funding Scenarios

The Annual Contributions for Asset Replacement (ACFAR) refers to the amount of funds allocated annually from operating revenues towards asset replacement. ACSO, described earlier is the theoretical amount to be achieved. ACFAR is the actual amount generated from operations. Ideally ACFAR = ACSO. The funds are used in different ways: some funds are spent annually on asset renewal projects for the year, some portions may be put away into reserve, or some used to service debt associated with past projects.

RDCK policy is to cover ACFAR through parcel taxes. For modeling purposes this scenario assumes that grant funding available today will also be available in the future, however this is not guaranteed.

Figure 7: Balfour 25 Year Expenditures and Funding

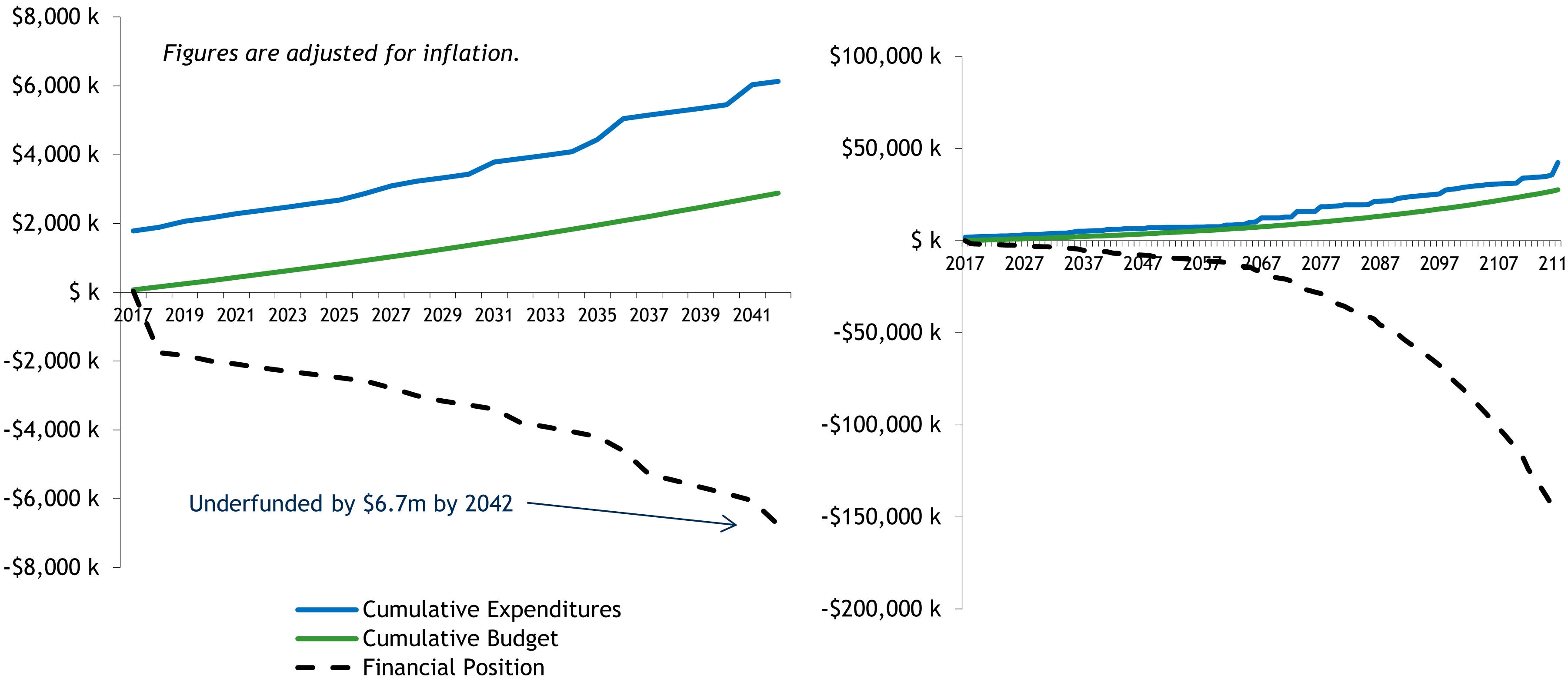


6.0 Funding Scenarios (continued)

This chart compares the expenditures and allocated funds from figure 7. The blue line shows the cumulative expenditures, inflation adjusted, projected over the next 25 years in the asset schedule. The green line shows the cumulative funds allocated towards these projects.

The dash line is the difference between what is projected to be spent and available funds. When this line is above 0, it represents a surplus of funds typically held in an asset reserve fund; when below zero, the dash line represents a shortfall and implies the need for additional funding, or the works need to be delayed or canceled.

Figure 8: Balfour 25 Year and 100 Year Financial Position



7.0 Recommendations

The following recommendations follow from the analysis in this report.

1. Unit costs for pipe replacements can vary significantly between the average default unit costs provided in the model and a real unit cost determined from a carefully costed project budget. To ensure the accuracy of the long term revenue requirements and avoid over-stating funding requirements, unit costs for pipe replacement and other pricing assumptions of the other assets should be reviewed regularly;
2. To ensure accuracy of the model, remaining service life of assets should be reviewed and updated regularly. Detailed condition assessments should be conducted on the oldest assets, those assets nearing or beyond the 2/3rd or later stage in their estimated service life. Also, assessing the impact of failure and consequence of failure for each asset will help to prioritize on a risk and criticality basis;
3. Make necessary adjustments to rates and fees to bolster the annual contribution for asset replacement (ACFAR) with an aim to have ACFAR meet ACSO and to build up a reserve fund in advance of large future expenditures. The financial position on page 20 can be a guide in determining reserve fund target level; and,
4. Update the asset schedule tool on a regular basis to reflect changes brought about from items 1, 2 and 3 above, and other external factors that change the financial picture.

8.0 Related Reading

Opus (2011). Guide for Using the Asset Management BC Roadmap. Opus International Consultants (Canada) Limited 2011

Infraguide (2005). Decision Making and Investment Planning: Managing Infrastructure Assets. Federation of Canadian Municipalities and National Research Council, Ottawa, ON, October 2005.

Econics (2013). Funding Infrastructure Replacement for the Long Term: Developing an Asset Replacement Schedule (ARS) and Establishing an Annual Contribution for Asset Renewal (ACFAR). November 2013. See Appendix A.

9.0 Glossary of Terms

Annual Asset Depreciation (Annual Amortisation) - The amount the net value of an asset decreases each year; normally calculated by dividing the historic cost by the estimated service life. Does not factor inflation.

Annual Contribution for Asset Replacement (ACFAR) – ACFAR refers to the amount of funds allocated annually from operating revenues towards asset replacement: spent on projects that year, put away into reserve; or used to service debt associated with past asset replacement projects. Increasingly, ACFAR is becoming a budgeted line item rather than based on unplanned revenue surpluses.

Annual Cost of Sustainable Ownership (ACSO) – ACSO is the average annual cost of replacing infrastructure over a long time period, say 25 or 100 years. ACSO is given in today's dollars and therefore does not consider inflation. ACSO therefore increases over time and should be recalculated periodically.

Asset Liability – Assets currently overdue for replacement based on theoretical estimated service life.

Asset Replacement Schedule (ARS) - A forward looking method that considers in-service year, estimated service life and current replacement value of assets to estimate extent of future anticipated capital expenditures.

Asset wear and tear - A concept that is meant to imply that assets wear down every year and it is therefore logical that the beneficiaries of the assets repay the dollar value of that *wearing down*.

9.0 Glossary of Terms

Consequence of Failure (CoF) – refers to a relative assessment in terms of a score from 0 to 100 of how significant the impact of failure would have on the community and considers economic, operating, social and environmental consequences.

Estimate Service Life (ESL) – refers to the number of years an asset or group of assets is expected to remain in service before being replaced. This value may change over time from its original estimate to reflect assets that are wearing out more quickly than anticipated, or lasting longer than originally expected.

Financial Position - The term *financial position* is used in this report to mean the relationship between the long-term expenditures and long-term funding available to support expenditures. The financial position is calculated by subtracting the cumulative expenditures from the cumulative available funding. If the financial position is positive, then there are surplus funds available in reserve. A negative financial position implies borrowing.

Infrastructure Deficit – An infrastructure deficit exists if the average annual contributions towards asset replacement are not sufficient to meet the annual average cost of sustainable ownership.

Probability of Failure (CoF) – refers to a relative assessment in terms of a score from 0 to 100 of the likeliness that a failure would occur based on the condition of the pipe as measured through several proxies including: age, water pressure, break history, install quality and install depth.

Tangible Capital Assets (TCA) - Defined by the Public Sector Accounting Board as a physical asset used in the delivery of service and having a useful life of more than 1 year.