Appendix A: Water Utility Affordability Options

Executive Summary

International consensus considers water to be affordable if households are spending no more than two to five per cent of annual household income on water, depending on circumstances. Given the higher costs associated with providing water services in Regina due to the need to transport water from Buffalo Pound Water Treatment Plant, 56 kilometers away, and the higher costs of treating water on the prairies, the five per cent threshold was used for analysis. Using this benchmark, an analysis of the state of water affordability in Regina suggests that approximately 8.2 per cent of households experience water unaffordability with the lowest-income households estimated to be spending as much as 30 per cent of annual income on water. Water affordability programs may be an effective solution to improve water affordability for low-income households. The City currently offers payment plans to residents but does not have an affordability program.

This paper explores the issue of water affordability and provides a review of affordability program options, including rebates, one-time assistance payments, service fee waivers, and providing high-efficiency retrofits. Table 1 summarizes the results of the analyses. Where an option is expected to improve on the current state it is highlighted in green. Where an option is expected to worsen performance relative to the current state it is highlighted in red. Where an option is expected to be neutral to the current state or where a change is expected to be negligible it is highlighted in yellow. Where an option has mixed or complex results on a criterion, it is marked with hash marks that reflect the mixed results. Where data is unavailable, the option is marked in grey.

Table 1: Summary of Affordability Programs

Option	Afford.	Conserv.	Equity	Comm. Support	Admin. Cost	Overall
Rebates						
One-time Assistance Payments						
Service Fee Waivers						
High-efficiency Retrofits						

Rebates and high-efficiency retrofits appear to be the most viable options for improving affordability for low-income households. One-time assistance payments and service fee waivers have limited overall impact but have strategic value for customers who accumulate too many overdue payments to recover or who must pay repeated service charges (e.g., for moving, water reconnection, etc.). High-efficiency retrofits may have the greatest strategic value overall because they can help improve affordability in the short term but may also help reduce long-term capital costs by reducing consumption. This may allow for rate

reduction or reduced rate increases. However, their impacts are mitigated by the significant fixed charges in the rate structure.

Equity effects for most options are complex because of the tradeoffs between vertical, horizontal, and intergenerational equity. Vertical equity refers to the principle that costs should be proportional to ability to pay (i.e., lower-income households pay less). Horizontal equity refers to the principle that customers should pay similar amounts for similar levels of consumption. Intergenerational equity refers to the principle that costs should be borne by the generation that benefits and that benefits and costs should not fall disproportionately on different age groups. Most of the options are expected to make improvements in vertical and intergenerational equity.

A public engagement was conducted on the City's public engagement tool, *Be Heard Regina,* from May 28 to June 30, 2021. 70 per cent of respondents support or somewhat support affordability programs in general. Rebates received strong support, one-time assistance payments received moderate to strong support, depending on program design, and high-efficiency retrofits received only moderate support. Service fee waivers were added to consideration after the survey was released and so cannot be evaluated in terms of community support. A detailed summary of the public engagement results can be found in Appendix E: COR Water Utility & Property Tax Affordability.

Service fee waivers are expected to have the least impact in terms of administrative costs while rebates, one-time assistance payments and high-efficiency retrofits require additional resources to administer.

Overall, rebates and high-efficiency retrofits are expected to have the most positive impacts with the fewest negative trade-offs.

The most effective policy may be one which uses a combination of these approaches. For example, a program that requires customers to be on a payment plan for six months before transferring to a rebate would effectively address short-term and long-term income insecurity. This could be paired with service fee waivers to address customers experiencing housing insecurity or repeated income insecurity. Overall, the program options discussed here contain a high degree of nuance and their performance is highly sensitive to program design. A rigorous analysis of program design alternatives and further engagement should be undertaken before any approach is adopted.

The paper is structured as follows:

Water Affordability

The United Nation's Sustainable Development Goals recognize water and sanitation as a human right and call on governments to achieve universal and equitable access to safe and affordable drinking water for all by 2030[1]. Access to safe and affordable water is a concern in many countries where the cost of providing water has increased significantly in the last two decades. The cost increases are a global phenomenon resulting from increased regulatory costs, energy and construction costs, water scarcity, the need to address maintenance deficits and replace aging infrastructure, climate change, and changing ideas about utility costs. In many cases, income and population growth have not kept pace with rising costs. In response to rising rates, many customers have reduced their consumption by upgrading to more efficient water fixtures or changing consumption patterns. However, this has further increased rates in an effort to maintain utility revenues. The result is an increased burden on customers who are less able to improve their water efficiency, which tend to be low-income households.[2]

The American Water Works Association frames water utility affordability in three ways that emphasize its systemic nature (
Table 2). This paper primarily focuses on household affordability as this is where the City of Regina has the most influence. Household affordability is usually evaluated as the proportion of household income that is spent on water services, including water, wastewater and storm drainage.[3] It is internationally agreed that the cost of providing water should not exceed between two to five per cent of household income for it to be considered affordable.[4] Water in Regina is inherently more expensive than in other cities because of the need to transport water from Buffalo Pound, 56 kilometers away, and the higher costs of treating water on the prairies. Given this, the five per cent threshold is used to evaluate water affordability in Regina.

Table 2: Water Affordability Definitions

Type	Definition
Household affordability	A household's ability to pay for water without having to sacrifice other essential goods and services. This is the conventional way in which affordability is defined and involves considerations of both the cost of water services and household income.
Community affordability	A community's ability to pay for investments in water facilities and operations and maintenance expenses required to sustainably deliver services in compliance with laws and regulations. This is closely related to the idea of cost recovery and is related to a community's fiscal capacity and the cost of providing a certain level of service.

[1] United Nations (2021)
[2] Mack and Wrase (2017), Canadian Water Network (2018), American Water Work Association (2019), Canadian Water and Wastewater Association (2021).
[3] This approach must be used cautiously as it does accurately reflect the common definition of household affordability (i.e., the ability of households to pay for water services without needing to sacrifice other essential goods and services to pay their water utility bills). Nevertheless, the approach is widely accepted and is useful for making rough comparisons.
[4]OECD (2010)

National affordability	The extent to which water sector utilities can pay for the costs associated with regulatory requirements without creating an economic burden on communities and households.

Source: American Water Works Association (2019)

Table 3 presents the affordability estimates for Regina in 2015 [5]at the five per cent threshold using 2015 water and wastewater rates.[6] Approximately 8.2 per cent of all households experience water unaffordability. Most of the households have incomes below the average After-Tax Low Income Cut-Off (LICO-AT).[7]

Table 3: Regina Water Services Affordability (5% of Annual After-Tax Income)

No. of persons living in household	Annual estimated bill for water, wastewater and drainage	Annual income required for affordability	Estimated no. of households below affordability threshold	Share of total households
1	$946.48	$18,930	4545	
2	$1,120.92	$22,418	1485	
3	$1,266.25	$25,325	915	
4	$1,395.41	$27,908	420	
5	$1,513.74	$30,275	380[8]	
Total			7,745	8.2%

[5] 2015 is the most recent year for which data was available. Data is from the 2016 Census.

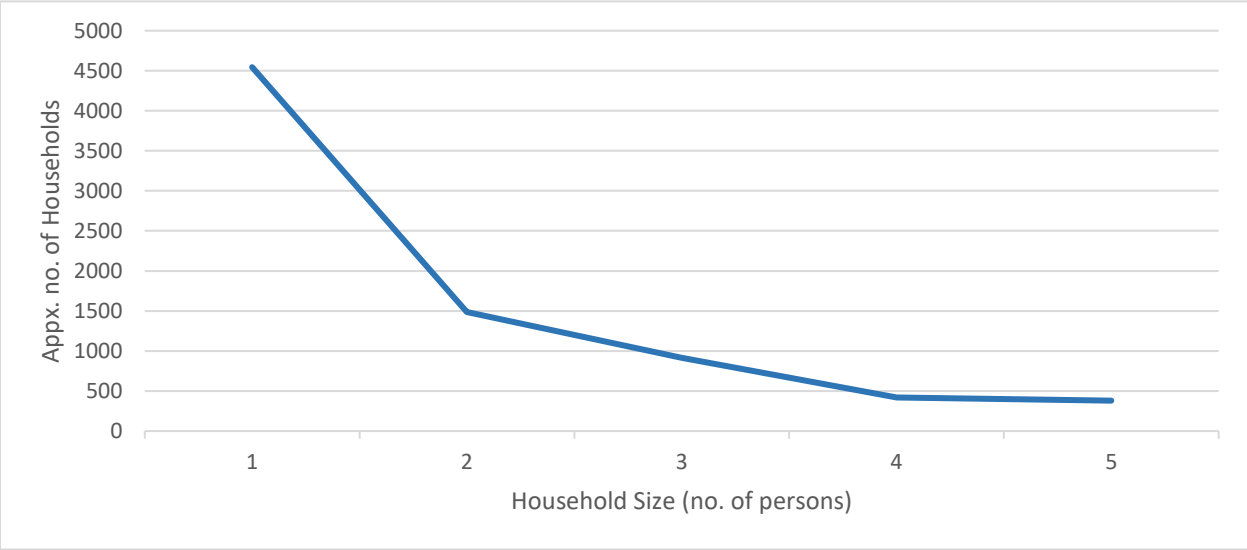
[6] The analysis follows the method used by Dr. Jim Warren (2019, 2021) and consumption estimates from DeOreo and Mayer (2014). Dr. Warren has advised that the consumption estimates may be out of date and overestimate average consumption per person. The number of households below the threshold was estimated using annual household after-tax income groups from the 2016 Census, the most recent data available.

[7] The LICO-AT varies by household and community size. In 2015the LICO-AT was $17,240 for a single-person households and $32,596 for a two-person household. The average LICO-AT for Regina was $21,406. This is a weighted average based on the number of households in each size category.

[8] Statistics Canada's household size bracket includes households with more than five persons. The estimate for five-person households is inflated.

Figure 1 shows that the number of one and two-person households experiencing unaffordability is considerably higher than larger households due to the impact of the shares of fixed and volumetric charges for water, wastewater and drainage, as defined in Table 4.

Figure 1: Approximate Number of Households Above Affordability Threshold



Estimates based on Warren (2019), DeOreo and Mayer (2014), and Statistics Canada (2019a)

Table 4: Volumetric and Fixed Charges

Charge	Definition
Volumetric (per cubic metre)	Intended to cover the costs of supplying and treating water and wastewater. Applied to the amount of water and wastewater used by each customer, ensuring large-volume users pay more.
Fixed (daily base charge)	Intended to cover the costs of the infrastructure from which all customers benefit equally. Includes water and wastewater charges based on meter size and a drainage infrastructure levy applied based on property size. Fixed charges are applied on a daily basis.

Figure 2 depicts the relationship between fixed and volumetric charges. As consumption increases, volumetric charges increase, but fixed charges stay the same and their share of total charges decreases as consumption rises, as shown in Figure 3. Fixed costs do not include any amount of consumption which means a typical household with zero consumption would still pay approximately $65 per month. Smaller households experience water unaffordability more often because they tend to have lower household incomes and reducing consumption to lower costs is less effective because of the high fixed charges. Larger households experience less water unaffordability because they tend to have higher household incomes and benefit from increased water consumption efficiency as shown in Figure 4.

Figure 2: Volumetric and Fixed Charges

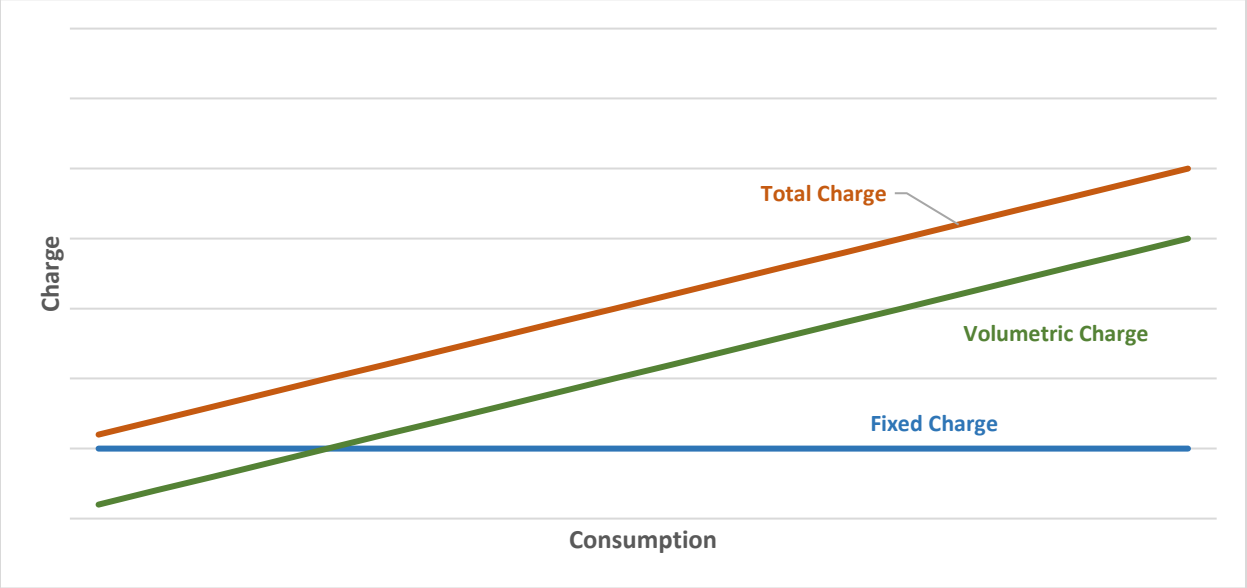
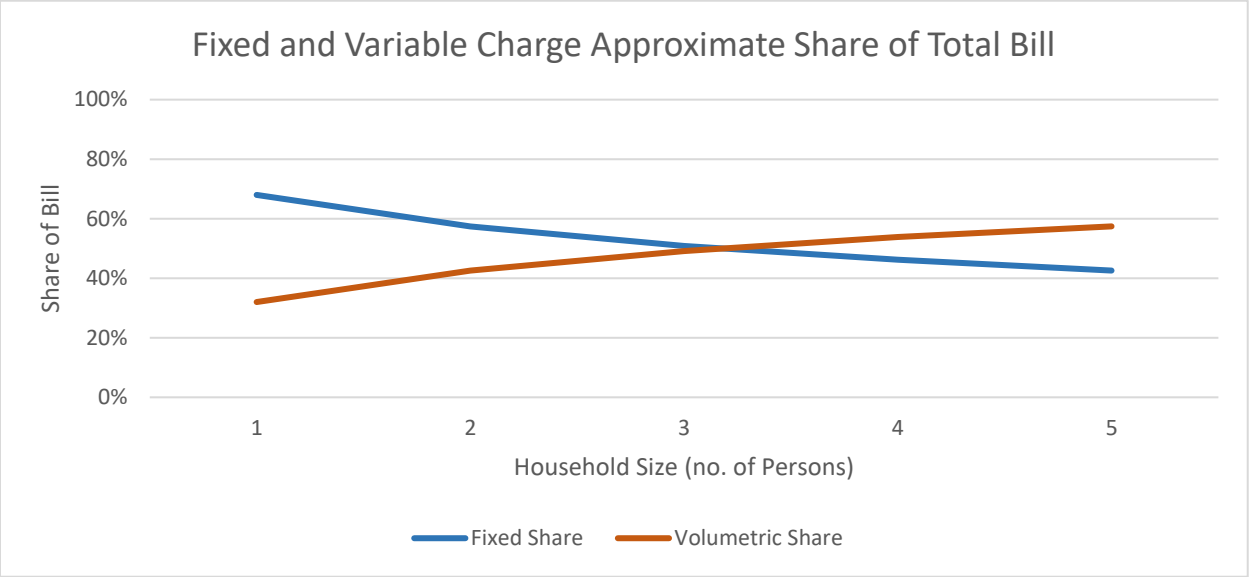
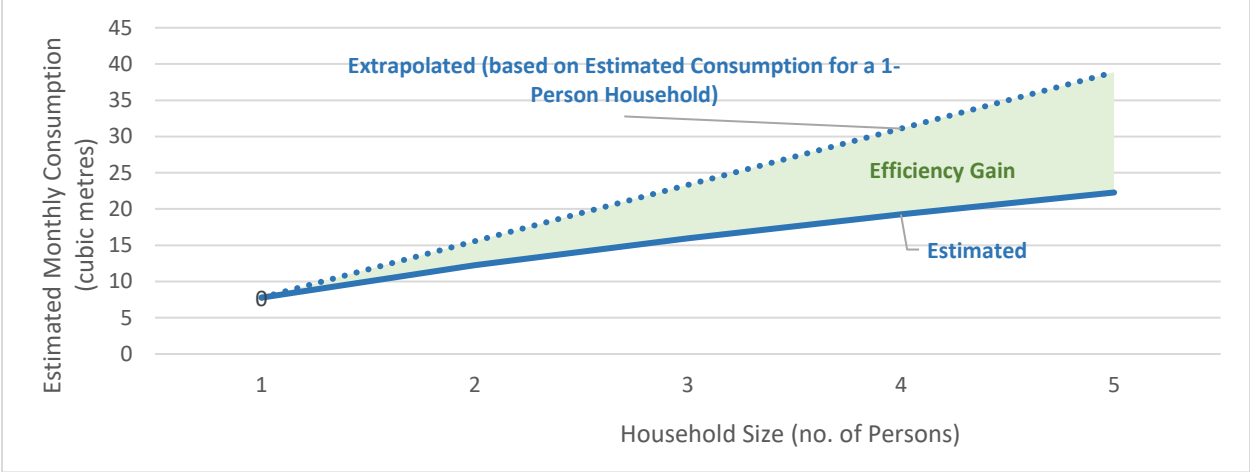


Figure 4: Fixed and Variable Charge Approximate Share of Total Water Utility Bill



Estimates based on Warren (2019), DeOreo and Mayer (2014)

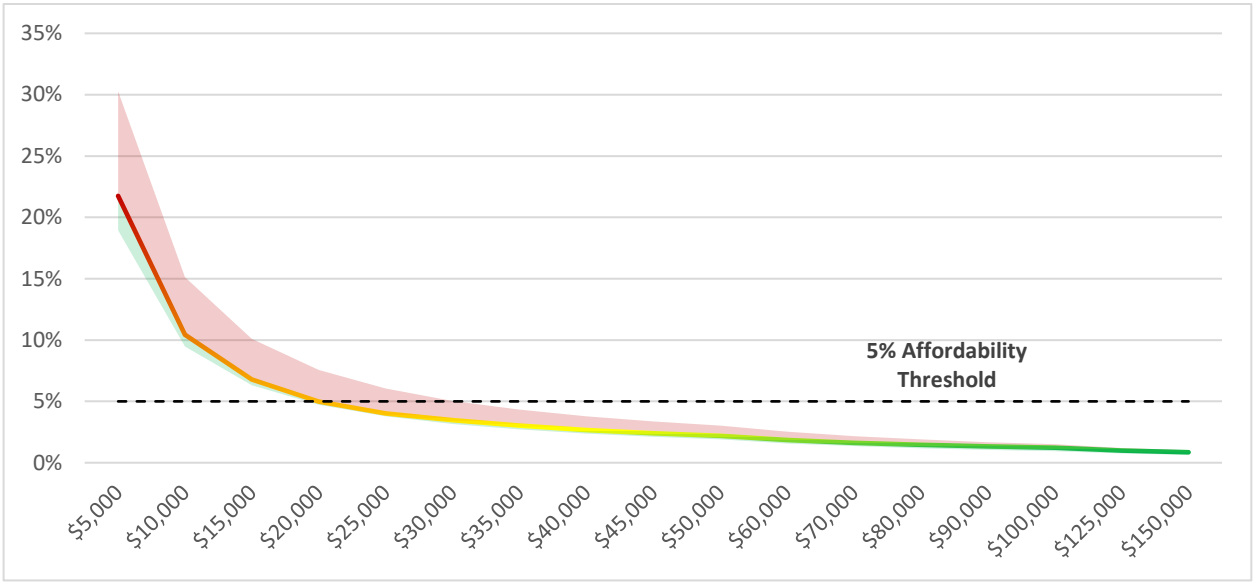
Figure 3: Estimated Monthly Water Consumption by Household Size



Estimates based on Warren (2019), DeOreo and Mayer (2014)

Figure 5 plots the approximate combined costs of water services as a share of annual after-tax household income for different income thresholds and highlights how affordability decreases rapidly as income falls below about $25,000 per year. The coloured line is the average cost-to-income ratio for water services weighted by household size. The red shaded area indicates the highest cost-to-income ratio among households of all sizes and the green shaded area indicates the lowest cost-to-income ratio at a given income level. Though the depth of unaffordability experience by low-income households is significant, the number of low-income households is relatively low.

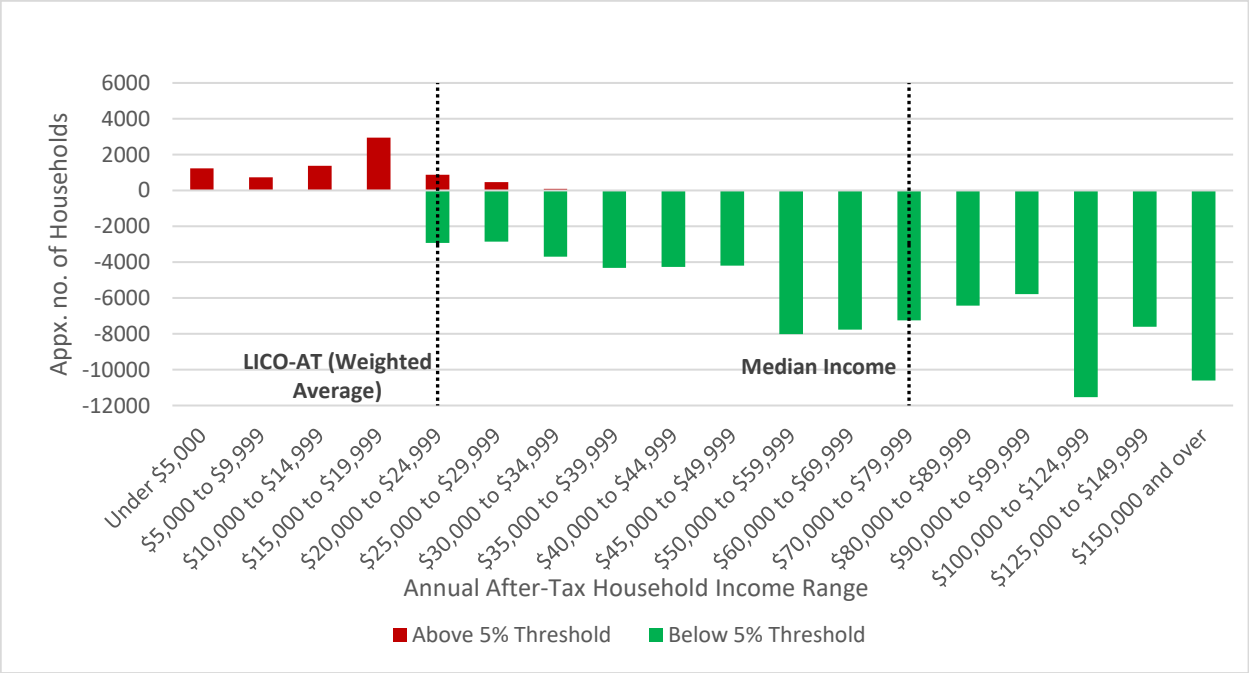
Figure 5: Water Services Costs as Share of Annual After-Tax Household Income



Estimates based on Warren (2019), DeOreo and Mayer (2014), and Statistics Canada (2019a)

Figure 6 shows the approximate number of households in each income range that would fall above or below the five or two per cent affordability thresholds. Positive values (red) reflect the number of households that fall above the affordability threshold (i.e., water is unaffordable) and negative values (green) indicate the number of households that are below the affordability threshold (i.e., water is affordable).

Figure 6: Approximate Number of Households Above and Below Affordability Threshold



Estimates based on Warren (2019), DeOreo and Mayer (2014), and Statistics Canada (2019a)

Evaluation Criteria

In addition to affordability, the evaluation draws criteria from the City's policies in *Design Regina: The Official Community Plan Bylaw No. 2013-48 (OCP)* and the Water Master Plan (WMP). Program options are evaluated on conservation and sustainability, equity, community support and administrative cost.

Conservation
The OCP identifies promoting conservation, stewardship and environmental sustainability as a community priority. Goal 5 of the WMP commits the City to supporting environmental conservation and sustainable water management. Council directed Administration consider conservation when crafting options for affordability programs. Improving water use efficiency is important for sustainable growth and can help low-income customers reduce their water use and water bills while maintaining benefits similar to current consumption.

Equity
Intergenerational equity is explicitly referred to in Goal 11 of the WMP which commits to a financially sustainable utility by funding it on a full cost recovery, user-pay basis. Other types of equity are implicitly referred to in policy 13.19 of OCP which states the City will establish programs and a fee structure to ensure that City programs, services and facilities are affordable, accessible and welcoming to all resident of Regina. This emphasizes affordability and is closer to the concept of vertical equity. This analysis considers intergenerational equity and vertical equity as well as horizontal equity. These are defined in Table 6: Types of Equity.

Table 5: Types of Equity

Type	Principle
Intergenerational Equity	Costs created in the present should be borne by the present generation instead of passing them on to future generations. Benefits and costs should be equally distributed across age groups in the present.
Vertical Equity	The cost of goods and services should be based on customers' ability to pay.
Horizontal Equity	Customers should pay similar amounts for similar quantities of goods and services consumed.

There is often tension between the three types of equity. Charging customers according to their ability to pay may mean customers pay different amounts for similar quantities of consumption, creating a conflict between vertical and horizontal equity. Conflicts between vertical and intergeneration equity may arise because of distributional effects. For example, households with senior citizens tend to have fewer people and lower water consumption, whereas households with children tend to have more people and higher water consumption. Fixed charges make up a larger portion of the water bill for households with seniors whereas volumetric charges make up a larger portion of the water bill for households with children. A policy that reduces variable or fixed charges, but not the other will inherently benefit one generation more than the other.

Community Support
A key consideration stated in the OCP is that Regina residents be engaged in the activities of the City, leading and supporting initiatives that enhance an inclusive city-building process that offers residents transparency in decision-making and builds ownership through

participation. For this analysis, residents had an opportunity to provide input on water affordability programs in an engagement survey conducted from May 28 to June 30, 2021 on *Be Heard Regina*. Respondents self-selected into the survey rather than being selected through random sampling so the survey is not statistically valid. A full report of the results can be found in Appendix E: COR Water Utility & Property Tax Affordability. Engagement results show that 70 per cent of respondents support or somewhat support implementing an affordability program whereas 29 per cent did not support affordability programs.[9] Support was highest among households with annual incomes of less than $20,000 (93 per cent) and declined as incomes increased though support still remained significant among households with incomes greater than $150,000 per year (65 per cent).

61 per cent of respondents support or somewhat support eligibility for any low-income household while 28 percent support tailoring programs to specific demographic groups should the City implement a program. Support for all low-income households was strongest among households with annual incomes less than $20,000 per year and declined as income increased though a majority of households with incomes greater than $150,000 per year (54 per cent) still supported eligibility for all low-income households. Support for this group was also stronger among respondents who support affordability programs (76 per cent) than among those who do not (28 per cent). Respondents who do not support affordability programs would prefer a program to be targeted to specific demographic groups (42 per cent) should one be implemented. 23 per cent of respondents who support affordability programs support targeting specific demographic groups. 22 per cent of overall respondents support or somewhat support tailoring affordability programs to low-income households with seniors, 18 per cent support or somewhat support tailoring affordability programs to low-income households that include a person living with a disability and 12 per cent support or somewhat support tailoring affordability programs to low-income households with children under the age of 18. The ranking is similar across all household income groups.

In addition to the public engagement survey, the Administration received unsolicited feedback in the form of emails from 37 residents. 11 (30 per cent) expressed support for affordability programs and 14 (38 per cent) expressed opposition to affordability programs. The most common reasons for opposition to affordability programs were that high utility rates make them reluctant to pay more (8, 22 per cent) and that the City should focus on managing operational inefficiencies as a means or option to address the affordability issue (4, 11 per cent). 12 respondents (32 per cent) did not express support or opposition to affordability programs, but rather provided comments on program administration, survey design and opinions and ideas related to other City policies, programs and services.

Administrative Costs

The OCP identifies achieving long-term financial viability by considering the full costs of operating before committing to projects or services as a community priority. This analysis considered the administrative costs, including how complex a policy is to administer, the cost in terms of resources, and additional effort that would be required to implement each program option. It does not account for the actual cost of delivering a program. This will be considered in program design, should Council decide to implement an affordability program.

[9] Engagement results may not add to 100 per cent due to non-response, multiple response or rounding.

Evaluation Criteria

Based on these criteria, the guiding principles for the evaluation are shown in Table 6: Evaluation Criteria. Data limitations prevent thorough analysis of the effects of different policies. Though we cannot be certain how great of effects different policies will have in these areas, we can estimate whether the effect will be positive, negative, or neutral. Options are evaluated based on their expected performance relative to the current state.

Table 6: Evaluation Criteria

Criteria	Will be evaluated positively if:
Affordability	The option reduces the proportion of income spent on water services.
Conservation	The option reduces consumption or improves consumption efficiency.
Equity	The option results in a improvement between vertical, horizontal and intergenerational equity.
Community Support	The option received more support in the public engagement than the option to not implement an affordability program.
Administrative Cost	The option reduced administrative complexity, costs less and can be easily implemented.

Current State

The City of Regina currently uses a rate structure involving both fixed and uniform volumetric charges for water, wastewater, and storm drainage. Table 7 presents the rates for water, wastewater, and drainage infrastructure levy for a typical household.[10] Overall, volumetric charges generate 65 per cent of revenue and fixed charges generate about 35 per cent of revenue. On the cost side, the fixed costs of operating the utility system make up approximately 80 per cent of all costs, while volumetric costs account for the remaining 20 per cent.

Table 7: Water, Wastewater and Drainage Infrastructure Levy for a Typical Household

Service	Fixed Charge	Volumetric Charge
Water	$0.88/day (5/8" water meter)	$2.10/$m^3$
Wastewater	$0.68/day (5/8" water meter)	$1.86/$m^3$
Drainage Infrastructure Levy	$0.59/day (0 to 1000 m^2 property)	-

Increased water demand from population growth and increased economic activity, and increased risk of drought from climate change have drawn more attention to the issue of water sustainability. The City's past conservation performance has been good with water consumption declining 26.7 per cent from 445 litres per capita in 1997 to 326 litres per capita in 2019. By comparison, overall annual consumption has only increased 1.8 per cent in the same time period.[11] This may be due to customers choosing high-efficiency fixtures, improved management of water infrastructure, or behavioral responses to increased water prices and concerns about climate change.

[10] This assumes a 5/8" water meter and a property size of 0 to 1,000 m^2

[11] Water Security Agency (2013, 2020)

The City currently offers budget billing and payment plans to customers, allowing customers to spread their payments out over time. This can reduce the burden of higher charges in high-consumption months or when settling overdue payments, but this does not ultimately improve affordability. There are approximately utility customers enrolled in budget billing and 3,949 (5.3 per cent) accounts more than 30 days overdue, 654 of which have payment arrangements set up.[12] The City currently does not have an affordability program for low-income customers.

Evaluation 1 evaluates the current state against the selected criteria. By default, the current state is neutral to itself and so is evaluated as satisfactory (green) or unsatisfactory (red). Hash marks indicate complexity in the evaluation, with satisfactory and unsatisfactory elements.

Evaluation 1: Current State

Overall				
Affordability	**Conservation**	**Equity**	**Community Support**	**Administrative Cost**

Affordability: An estimated 8.2 per cent of households spend more than five per cent of annual after-tax household income on water services. These households are concentrated below the LICO-AT. Performance is graded negatively because the fixed rate portion of the water rate structure does not allow for any consumption and customers who use no water are still charged approximately $65 per month. This can lead low-income customers to reduce consumption to the point where it adversely effects their health and they may still not be able to afford their bill. The flexible payment plans currently offered are useful for customers experiencing temporary low-income but do not improve overall affordability.

Conservation: The decrease in per capita consumption since 1997 suggesting the current structure is satisfactory for encouraging conservation. The potential of reduced demand leading to increased operational and maintenance costs is not a concern at this time, and efforts to improve conservation, especially during peak usage, should continue.

Equity: The current structure is vertically inequitable because it does not account for ability to pay and the fixed rate charge places a greater burden on smaller households which tend to experience higher rates of low-income. Horizontal equity is ambiguous because customers pay the same fixed rates and pay the same amount for similar levels of consumption so the structure is equitable in each rate but inequitable overall. There is an intergenerational equity issue as households with seniors and households with children tend to experience a higher rate of low-income than households with neither seniors nor children, resulting in decreased affordability. This is compounded for households with seniors who tend to live in smaller households. There is currently a infrastructure deficit, which would normally have a negative impact on intergenerational equity, but this is mitigated by the current capital investment plan which aims to eliminate the deficit.

[12] There are 10,202 overdue accounts, approximately 14 per cent of all accounts. The majority of overdue accounts pay their bills within 30 days of the due date and are not considered problematic. Accounts overdue by more than 30 days are reported because this provides a more realistic of overdue accounts.

Community Support: The 70 per cent of respondents who support or somewhat support affordability programs suggests there is dissatisfaction with the current system with respect to affordability. This is further supported by the unsolicited feedback.

Administrative Cost: The current system is not unduly complex or costly to administer.

Overall: The performance of the current state is polarized, performing satisfactorily in terms of conservation and administrative cost, but poorly in terms of affordability and community support. The current state is neither definitively satisfactory nor unsatisfactory.

Water Affordability Programs

The following analysis evaluates policy options to identify any that may help improve affordability. Options were identified through a scan of 19 municipal and 28 corporate water, power and energy utility providers and include rebates, one-time assistance payments, service fee waivers, and providing high-efficiency retrofits. A detailed jurisdiction scan is included as Appendix D: Utility Affordability Programs Jurisdictional Scan.

Where an option is expected to improve on the current state it will be highlighted in green. Where an option is expected to worsen performance relative to the current state it will be highlighted in red. Where an option is expected to be neutral to the current state or where a change is expected to be negligible it will be highlighted in yellow. Where an option has mixed or complex results on a criterion, it will be marked with hash marks that reflect the mixed results.

The five criteria are equally weighted. Data and technical limitations constrain evaluation of individual areas to logical analysis rather than a formal scoring system and reflects the general effects of an option, though there may be nuance that makes two otherwise identical options distinct.

Overall scores are based on whether an option has positive, negative, or neutral effects on a majority of the criteria. In cases where a positive and negative score on two criteria would cancel each other out, the two will be treated as a single neutral score for overall evaluation. The same rule will apply when determining overall score for criteria with mixed scores (hash marks).

Option 1: Rebates

Rebates reduce the amount eligible customers pay by applying either a fixed (e.g., a $40) or proportional (e.g., 25 per cent) reduction on the bill. Evaluation 2 evaluates the expected outcome of a rebate applied at the time of billing.

Evaluation 2: Rebates

Overall				
Affordability	**Conservation**	**Equity**	**Community Support**	**Administrative Cost**

Affordability: Rebates will improve affordability for low-income customers struggling to pay regular water bills. A fixed rebate would be most helpful to smaller households who struggle

with fixed charges whereas a proportional rebate would be more effective for larger households where volumetric charges are more significant.

Conservation: Reduced costs may lead to increased consumption, but the overall effects are anticipated to be small and can be influenced by the amount of support provided. Conservation is not expected to change significantly compared to the current state.

Equity: Rebates can improve vertical equity by reducing costs for those least able to afford them. They worsen horizontal equity because customers consuming similar amounts of water may no longer pay similar costs and households that do not receive benefits would subsidize the consumption of those who do. As households with seniors and households with young children tend to experience low-income at a higher rate than other households, rebates can be expected to improve intergenerational equity. A fixed rebate will tend to benefit smaller households and households with seniors more than a proportional rebate which will benefit larger households and households with young children more. There is expected to be an improvement in equity overall.

Community Support: 63 per cent of respondents ranked rebates as their first or second choice among four affordability program options, indicating strong support for rebates should the City implement an affordability program. Rebates were the most preferred option among respondents who support or somewhat support affordability programs (78 per cent) and the least preferred options among respondents who do not support affordability programs (30 per cent)

Administrative Cost: Rebates will lead to an increase in administrative complexity due to the need to verify eligibility and manage program enrollment. This will likely require additional personnel to administer.

Overall: Though there are slightly different impacts depending on program design, rebates enjoy strong community support and are expected to create an overall improvement in affordability and equity, though with an increase in administrative costs.

Option 2: One-time Assistance Payments

The jurisdictional scan found one-time assistance payments to be offered in cases of financial hardship or in cases such as plumbing emergencies. The City already offers payments plans to assist in cases of temporary financial hardship which may result in one or two missed payments, one-time assistance would in this case would be oriented to customers who have fallen into arrears with little hope of catching up on their overdue payments. Falling behind on payments can decrease water affordability because customers must pay for both present and past consumption. Once customers begin to fall behind on payments it can be difficult to recover. One-time assistance payments are intended to prevent customers from accumulating significant amounts of owed charges and avoid this situation. One-time assistance for plumbing emergencies would cover a portion of repair costs and may help customers avoid going into debt to pay for repairs. Evaluation 3 evaluates the impacts of one-time assistance payments.

Evaluation 3: One-time Assistance Payments

Overall				
Affordability	**Conservation**	**Equity**	**Community Support**	**Administrative Cost**

Affordability: One-time assistance payments can improve affordability by eliminating or reducing the amount of overdue charges a customer must pay in addition to current charges. This can improve affordability over the long-term as it reduces the likelihood that the customer will continue to be overdue or increase the amount they owe due to being unable to pay the full amount. This approach does not improve overall affordability and may not prevent a customer from falling behind again after receiving assistance. Providing assistance in the case of plumbing failure can help customers avoid taking on debt to pay for repairs, but also does not improve overall affordability.

Conservation: As one-time assistance payments are not related to consumption, there are not expected to be significant impacts on conservation.

Equity: One-time assistance payments would slightly improve vertical equity since low-income customers are more likely to have trouble making full payments or to be unable to afford plumbing repairs. There is a slight decrease in horizontal equity as the assistance payments would mean not all customers are paying the same amount for similar levels of consumption and customers who do not receive assistance would be subsidizing those who do. Though the assistance payments effectively assist present day customers with debt incurred due to challenges in the past, the difference would likely only be a matter of months and so the intergenerational effects are negligible. The overall equity effects are not expected to be significant.

Community Support: 34 per cent of respondents ranked one-time assistance payments in cases of financial hardship as their first or second choice among four affordability program options, indicating moderate support should the City implement an affordability program. 35 per cent of respondents who support or somewhat support affordability programs and 33 per cent of respondents who do not support affordability programs ranked this option as their first or second choice. The engagement also asked about one-time assistance in cases of plumbing emergencies. 46 per cent of respondents ranked one-time assistance payments in cases of plumbing emergencies as their first or second choice among four affordability program options, indicating moderate to strong support should the City implement an affordability program. 49 per cent of respondents who support or somewhat support affordability programs and 41 per cent of respondents who do not support affordability programs ranked this option as their first or second choice. Overall, support for assistance in the case of plumbing failure was the second most preferred option, after rebates.

Administrative Cost: One-time assistance payments will lead to an increase in administrative complexity due to the need to verify eligibility and manage program enrollment. This will likely require additional personnel to administer.

Overall: One-time assistance payments enjoy moderate to strong community support and may have high strategic value for customers who are overwhelmed by overdue bills, or for customers who experience plumbing failure, though the general affordability impacts are limited. Overall, one-time assistance payments are not expected to significantly improve on the current state.

Option 3: Service Fee Waivers

Eligible customers will be exempt from service fees such as connection or reconnection fees. This can help reduce costs for customers who repeatedly incur service fees such as through frequent moves. Evaluation 4 evaluates the expected outcome of service fee waivers.

Evaluation 4: Service Fee Waivers

Overall				
Affordability	**Conservation**	**Equity**	**Community Support**	**Administrative Cost**

Affordability: Service fee waivers would help improve affordability for customers who are charged services fees, such as those that frequently move, but do little to address customers who do not but still struggle to afford their water bills. The overall affordability improvements are expected to be small.

Conservation: As service fee waivers are not related to consumption, there are not expected to be significant impacts on conservation.

Equity: Service fee waivers would slightly improve vertical equity since low-income families are more likely to be housing insecure or experience difficulty making payments. There is a slight decrease in horizontal equity as not all customers would be paying the same amount for additional services. The effects on intergenerational equity are uncertain. The overall equity effects are not expected to be significant.

Community Support: Service fee waivers were added as an option after the engagement survey was released so community support cannot be evaluated.

Administrative Cost: Service fee waivers can be administered as part of current practice and are not expected to require more resources.

Overall: Service fee waivers may have high strategic value for customers who repeatedly pay service fees but are not expected to make significant changes compared to the current state.

Option 4: High-efficiency Retrofits

Research demonstrates that water efficiency programs that fund or provide high-efficiency toilets, faucets and showerheads can help reduce household consumption significantly. However, low-income households are often unable to afford high-efficiency upgrades. Providing these upgrades can be a cost-effective way to help reduce costs by reducing consumption. Evaluation 5 evaluates the expected outcome of providing high-efficiency retrofits for low-income customers.

Evaluation 5: High-efficiency Retrofits

Overall				
Affordability	**Conservation**	**Equity**	**Community Support**	**Administrative Cost**

Affordability: Research shows that high-efficiency upgrades can reduce consumption by approximately 10 to 20 per cent depending on household size, weather effects, income level, and other variables. This could have significant affordability benefits for low-income households, especially over the long term. An additional long-term affordability effect is the potential to reduce long-term capital costs for the system which may allow for rate reductions (or at least smaller increases). Funding retrofits may also have other quality of life improvements for households who are otherwise unable to afford to replace damaged or worn-out fixtures. The affordability effects are partially mitigated by the significant fixed charge component of the rate structure.

Conservation: There are expected to be reductions in consumption, with potentially significant benefits in the long term.

Equity: Providing high-efficiency retrofits is expected to improve vertical equity by reducing overall costs for low-income households. This is without the usual trade-off with horizontal equity as all customers still pay similar rates for similar amounts of water consumed, though there may be a negative impact on equity with regard to purchasing high-efficiency fixtures. This option is expected to have benefits for all low-income households so intergenerational equity is expected to remain neutral. There is expected to be an improvement in equity overall.

Community Support: 25 per cent of respondents ranked high-efficiency retrofits as their first or second choice among four affordability program options. Given that 29 per cent of respondents did not support affordability programs, this is interpreted as moderate support. High-efficiency retrofits received higher support among respondents who do not support affordability programs (31 per cent) than among respondents who support or somewhat support affordability programs (23 per cent).

Administrative Cost: A retrofit program will likely require additional resources due to the need to verify eligibility and manage enrolment.

Overall: Providing high-efficiency retrofits will improve affordability, conservation and equity. The option only has moderate support and comes with increased administrative cost.

Preliminary Cost Estimates

All four options could be financed through either a fee applied to all water utility bills or through general rate increases. Table 8 presents the required monthly fee and utility rate increases that would be required to finance several different costs. Table 9 and Table 10 present the impacts of each type of financing on several sample properties.

Table 8: Monthly Fee and Water Rate Financing for Affordability Programs

	Program Cost				
	$250,000	$500,000	$1 Million	$2 Million	$3 Million
Monthly Fee on All Water Bills	$0.28	$0.56	$1.12	$2.23	$3.35
Utility Rate Increase (over 3% scheduled increase and 2% increase for lead program in 2022)	0.10%	0.50%	0.70%	1.50%	2.25%

Table 9: Impact of Monthly Fee Financing on Sample Properties

Sample Property	2022 Projected Monthly Charges	Change (%Change) in Monthly Charges				
		$250,000	$500,000	$1 Million	$2 Million	$3 Million
Grocery Store	$2355.99	$0 (0.0%)	$1 (0.0%)	$1 (0.1%)	$2 (0.1%)	$3 (0.1%)
Bottled Water Supplier	$1847.43	$0 (0.0%)	$1 (0.0%)	$1 (0.1%)	$2 (0.1%)	$3 (0.2%)
Restaurant	$536.17	$0 (0.1%)	$1 (0.1%)	$1 (0.2%)	$2 (0.4%)	$3 (0.6%)
Average House	$145.81	$0 (0.2%)	$1 (0.4%)	$1 (0.8%)	$2 (1.5%)	$3 (2.3%)
Large House	$207.91	$0 (0.1%)	$1 (0.3%)	$1 (0.5%)	$2 (1.1%)	$3 (1.6%)
Non-Profit Organization	$561.12	$0 (0.1%)	$1 (0.1%)	$1 (0.2%)	$2 (0.4%)	$3 (0.6%)
Townhouse Condo	$185.06	$0 (0.2%)	$1 (0.3%)	$1 (0.6%)	$2 (1.2%)	$3 (1.8%)

Table 10: Impact of Utility Rate Financing on Sample Properties

Sample Property	2022 Projected Monthly Charges	Change (%Change) in Monthly Charges				
		$250,000	$500,000	$1 Million	$2 Million	$3 Million
Grocery Store	$2355.99	$2 (0.1%)	$11 (0.5%)	$16 (0.7%)	$34 (1.5%)	$51 (2.2%)
Bottled Water Supplier	$1847.43	$2 (0.1%)	$9 (0.5%)	$13 (0.7%)	$27 (1.5%)	$40 (2.2%)
Restaurant	$536.17	$1 (0.1%)	$3 (0.5%)	$4 (0.7%)	$8 (1.5%)	$12 (2.2%)
Average House	$145.81	$0 (0.1%)	$1 (0.5%)	$1 (0.6%)	$2 (1.4%)	$3 (2.1%)
Large House	$207.91	$0 (0.1%)	$1 (0.5%)	$2 (0.7%)	$4 (1.4%)	$7 (2.1%)
Non-Profit Organization	$561.12	$1 (0.1%)	$3 (0.5%)	$4 (0.7%)	$8 (1.4%)	$12 (2.2%)
Townhouse Condo	$185.06	$0 (0.1%)	$1 (0.5%)	$1 (0.7%)	$3 (1.5%)	$4 (2.2%)

Option 1: Rebates
The City does not collect household income information from utility customers, so customers would have to apply to receive rebates. The program is expected to require 100 per cent of a full-time position to administer. Depending on program design and participation, a rebate program could cost between $300,000 and $3 million per year.

Option 2: One-time Assistance Payments
It is unknown how many customers experience plumbing failure in a year so cost estimates are for providing assistance to customers in arrears. One-time assistance payments may be restricted to low-income customers only, in which case they would require an application, or may feasibly be extended to all customers, in which case they can be applied automatically. The program is expected to require 100 per cent of a full-time position to administer. Depending on program design, the cost is expected to be $1 million to $2 million per year.

Option 3: Service Fee Waivers
Service fee waivers may be made available to low-income customers only, in which case they would require an application, or may feasibly be extended to all customers, in which case they can be applied automatically. This program can be administered as part of current administrative practices and is not expected to require additional resources. Depending on program design, the cost is expected to be $100,000 to $250,000 per year.

Option 4: High-efficiency Retrofits
This program would require an application process to verify low-income status. The program is expected to require 100 per cent of a full-time position to administer. Depending on program design and participation, providing high-efficiency retrofits could cost between $250,000 and $500,000 per year.

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