



# Water Conservation Strategy

*What We Heard - Options Review Stakeholder Meetings*  
December 2, 2020



## Executive Summary

The City of Saskatoon is developing a long-term Water Conservation Strategy that will focus on all water uses and users including residential; the industrial, commercial, and institutional sectors; the City itself; and water used indoors and outdoors. The Water Conservation Strategy aims to develop best practices, generate and gain approval for programs that could lead to incentive programs for residents and businesses, develop educational materials, and create the potential for changes to policies/regulations. From February 2020 – March 2021, Administration is engaging stakeholders on relevant components of a Water Conservation Strategy. Based on what we heard from stakeholders, in addition to further research and internal considerations, Administration will develop a comprehensive strategy that will be presented to City Council in May 2021.

The Individual Stakeholder Meetings were designed to inform the following engagement goals for the development of the Water Conservation Strategy:

- Identify the benefits of water conservation and efficiency initiatives
- Identify potential impacts of water conservation initiatives
- Develop a prioritized list of recommended water conservation and efficiency initiatives

Program preferences that emerged from the stakeholder meetings and online surveys are discussed in this section, including:

### **Businesses, Business Groups and Industry Associations**

Respondents identified several benefits for businesses to conserve water, including cost saving options for businesses to implement more sustainable practises. Many businesses are combining environmental savings with fiscal savings in order to do more for the environment and their customers while improving cost efficiencies. Numerous barriers to water conservation in the business community were provided, including the costs associated with making upgrades, lack of awareness and education on what opportunities exist, and compounding need for improvements for business in older buildings. Numerous businesses were identified as actively taking steps to conserve water and should be encouraged to share their success stories in order to increase up-take within the business community.

Respondents were hesitant in providing recommendations for the top programs and considerations due to business needs and preferences varying; however, support was given to the assessments and fixture incentives, capacity buybacks, and once-through cooling systems location and replacement programs. Participants identified education as a critical component for any of the proposed programs and provided numerous suggestions for opportunities including, creating incentive programs that are easy to access, phasing-in the program slowly through pilot programs, showing savings through engaging formats, and working with suppliers to share information/messaging.

### **Environmental Organizations and Institutions**

Numerous organizations provided information regarding their current water conservation efforts and the current threats to water conservation within Saskatoon, including climate change, drought/flooding, and pollution/contaminants. When asked what percentage of water is feasible to conserve, respondents identified 5-10% but identified this as potentially being too low to contribute to the amount of change needed. It was recommended that the City introduces gradual targets that

are flexible in nature to support forming habits and combat individuals viewing targets as unattainable goals.

Of the potential programs presented both outdoor water usage and indoor residential water use were identified as priorities. Public incentive programs, programs that promote residential behavioural change, and irrigation systems for the industrial, commercial, and institutional sectors were viewed as potentially gaining the most support. Suggestions to increase up-take were provided, including creating an accessible (i.e., website) resource repository, formatting water bills to show the users their savings potential, and creating a local competition/game amongst users to improve their water conservation.

### **Irrigation Professionals**

All participants agreed that there is a significant potential for outdoor water conservation in the 25% to 60% of Saskatoon homes that have in-ground sprinkler systems. A variety of opportunities to significantly reduce water use were identified by respondents, which included installing better designed systems and more modern equipment, xeriscaping, and promoting better water use through education and public awareness. Numerous measures to achieve the largest conservation savings were provided, including installing rain sensors within the industrial, commercial, and institutional sector/multi-unit developments, improving criteria for commercial areas, and offering incentives/package deals that are easy to apply for. Out of all the suggested measures both rain sensors for electric systems and financial incentives to upgrade to controller systems were identified as generating the most support.

Barriers to water conservation included shifting the importance of costs being the primary focus for consumers, users using outdated and wasteful systems/equipment, overwatering due to lack of education and manual systems (~50% of homes with in-ground sprinklers), and a current lack of standards/regulations. 80% of respondents identified water conservation or long-term savings as not being a key consideration for them and their clients when quoting or designing irrigation systems. This is primarily due to the clients dictating that the cheapest system is most important followed by additional system perks/upgrades, especially in reinstallation/retrofit projects with older homes and condos. Although clients will ask about water savings, this typically is from the lens of cost savings.

It was recognized by all participants that making upgrades to irrigation-system controllers would save significant amounts of water by reducing overwatering, reducing irrigation times, and accounting for variations in the landscape. Participants estimated that ~60% or more of controllers in Saskatoon would need upgrading. The majority of respondents agreed that incentives to replace outdated controllers would be effective. The top recommended types of controllers to upgrade to were automatic with timers, rain sensors, and WIFI controllers; however, this varies with the customers' needs.

All respondents were strongly in favor of the City providing training and certification focused on irrigation system design for water conservation. Most respondents agreed that this form of training could lead to better systems and water savings, as well as a sense of comfort for clients. Numerous training opportunities were identified, and it was suggested that training needs to be available for professionals outside of the irrigation industry in order to improve the overall knowledge within the professional community. Uptake would be favorable if the cost was low, training occurred during the

off-season (winter) and training was framed as an opportunity for recognition amongst professionals. Numerous respondents provided their assistance in developing any future training methods/materials.

The majority of irrigation professionals interviewed agreed that incentives would help spur irrigation-system tune-ups and thereby increase water savings. Participants noted system tune-ups should occur every two to three years, but more commonly occur annually for businesses/institutions and when they are in need of repair for homeowners. Annual tune-ups provide water-saving potentials, such as reducing/eliminating the costs of future repairs, and costs of tune-ups should be advertised as being covered within a year from reduced water use.

Education was recognized as a critical component for water conservation and efficiency for all sectors; however, it needs to align with best practises in the industry and be freely accessible to all users. Numerous suggestions on what to educate users on were provided, including costs and your water bill, how an efficient irrigation system works, and how to make adjustments to the system to improve efficiency.

### **Plumbing Professionals**

Respondents recognized the potential for water conservation within the plumbing industry and identified the largest opportunities for water conservation in homes and businesses as updating to modern fixtures and toilets, using flow-through humidifiers, grey water systems, and improving irrigation systems. It was recognized that manufacturers are leading the curve in water conservation technologies, causing clients to be unaware of the differences in functionality between water efficient and non-efficient fixtures. Barriers to water conservation that were identified included education, associated costs, and changing technologies that discourage changes in habits.

The majority of stakeholders agree that upgrades to toilet and/or shower heads would save significant amounts of water. It was suggested that a clear movement towards installing these forms of upgrades has been seen within the industry, especially within the hospitality and property sectors. Respondents estimated that up to 50% of toilets and showerheads in older neighborhoods and buildings might need such upgrades.

Respondents viewed incentives to help spur toilet and showerhead replacements with mixed opinions, since customers are primarily looking for the least expensive or aesthetically pleasing option. Numerous suggestions were provided to increase uptake, including educating users on the potential cost savings through engaging formats, mandating all new houses to install water efficiency fixtures, and accounting for pushback from high water consumers. Current educational gaps within the residential indoor water use education programs included identifying the amount of water wasted per individual, what steps the average resident can take to improve their water conservation, and new technologies that improve water conservation.

Within the industrial, commercial, and institutional sectors numerous respondents were in favor of an assessments and fixture incentive program. Individuals identified needing to emphasize, in simple terms, the water saving capacity to improve up-take and ensure the process is collaborative with numerous representatives from clients engaged throughout the process (i.e., head of maintenance, building manager, and owner). The biggest potential for water savings identified was the toilet and showerhead replacement program; however, commercial industries (ex. cleaning/sanitizing industries), gyms, and buildings cooled by water-cooled condensing units were



also identified as being of high potential. In order to increase uptake within the industrial, commercial, and institutional sector respondents suggested providing incentives (minimum 10%), encouraging the use of reliable equipment, creating assessments that promote positive changes.

Industrial, commercial, and institutional capacity buyback programs were identified as potentially assisting building owners in paying for toilet replacements or reclaimed water systems, working well for property owners and office buildings, and providing significant savings overall.

Once-through cooling were identified as a major hindrance to water conservation. An estimated 100-200 once-through cooling systems units are within Saskatoon and are primarily found in leased properties, manufacturing centres, stores, food industries, and laboratories. These systems are currently being phased out by more improved systems with a payback period of 1-2 years, but the process is slow due to the high replacement costs and the current location of the units. Suggestions were provided to increase up-take, which included creating incentives that are advertised through the professional network, making financing options available, and adapt to changing programs/technologies.

Out of the provided measures respondents identified reusing water and focusing on the industrial, commercial, and institutional /industry sector as being the top programs to consider. Respondents expressed that focussing on the installation of retrofits (i.e., toilets, showerheads, etc.) within the industrial, commercial, and institutional sector would have the most support and up-take.

### **Common Themes**

Throughout the Individual Stakeholder Meetings some common themes were identified and are described below:

**Better Equipment and Systems:** using modern equipment greatly improves water conservation potential; design systems for function; reduce inefficiencies

**Costs:** the most mentioned and considered theme for users and stakeholders; upfront costs; increasing administrative costs; lost time; inconvenience; costs for large or compounding retrofit projects; primary concern for users is price above factors such as quality and life-cycle; developers are installing systems based on lowest price not water conservation; residents are looking for ways to reduce their costs/bills

**Education:** education and information is the most effective action the City could take to encourage water conservation; very low cost and easy to implement; users don't realize how much water they waste and how much money they lose because of it; opportunities for education and informing

**Incentives:** making all incentive programs easy to access; leads to individuals performing the work themselves instead of hiring professionals

**Individual Impacts:** understanding consequences at different scales (i.e., global, City, and individual) is crucial; finding engaging and interactive ways to inform users is important; measuring and monitoring individual water usage is vital

**Lack of Knowledge:** of what opportunities exist and have other sustainability priorities; people don't know who to talk to; have networking opportunities for water conservation; homeowners can install equipment on their own, but they need training to properly manage it

**Prioritization:** there is a lack of knowledge surrounding which programs will maximize savings for users; need to prioritize water uses and defend selections; competing priorities generates inaction

**Simple:** all program elements should be easily understood and implemented, streamline all processes to reduce user confusion, reduce administrative burden

**Targeting the Already Engaged:** target youth that have been shown to care significantly more about water conservation; target high-volume users to generate the most up-take

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## 1 Background

The City of Saskatoon (City) is developing a long-term Water Conservation Strategy that will focus on all water uses and users including residential; the industrial, commercial, and institutional sector; the City itself; and water used indoors and outdoors. There are many reasons to conserve water, but three in particular stand out:

1. Reducing greenhouse gas emissions, which the City of Saskatoon has committed to reduce its own emissions by 40% (below 2014 levels) by 2023 and water-related emissions make up about a third of overall City emissions.
2. Creates the potential to better manage and plan—and possibly to defer or avoid—capital expenditures that may otherwise be needed to add capacity to Saskatoon’s water and wastewater systems.
3. Increase system resilience and maximize capacities to deal with intensifying climate change.

The Water Conservation Strategy aims to develop and gain approval for programs that could lead to incentive programs for residents and businesses, develop best practices and educational materials, and create the potential for changes to policies/regulations. Program outcomes include identifying the benefits and impacts of water conservation initiatives, developing a prioritized list of recommended water conservation initiatives, and determining how they should be implemented. For these and other reasons City Administration are engaging internal and external stakeholders as well as the general public in the development of a long-term strategy.

The Water Conservation Strategy supports numerous sustainability initiatives within the City of Saskatoon and is explicitly included in the Low Emission Community Plan. It is intended that the strategy will incorporate an Integrated Water Management approach and Triple Bottom Line framework, as well as produce a long-term planning document highlighting the benefits of conservation and efficiency, the potential impacts, and featuring an integrated, prioritized list of recommended water conservation and efficiency initiatives, a multi-year workplan, and cost estimates. This will be followed up a step-by-step map for securing stable funding, staffing, and other resources; details on how to implement specific initiatives; and information on scaling and the effects on costs and performance.

From February 2020 – March 2021, Administration is engaging stakeholders on relevant components of a Water Conservation Strategy. Based on what we heard from stakeholders, in addition to further research and internal considerations, Administration will develop a comprehensive strategy that will be presented to City Council in May 2021.

## 1.1 Strategic Goals

This project supports the Strategic Goal of Environmental Leadership and Sustainable Growth, contributing to reducing our consumption of water and energy.

## 1.2 City Project Team

- Jeanna South, Director, Sustainability
- Amber Weckworth, Manager, Climate, Strategy and Data, Sustainability
- Genevieve Russell, Special Project Manager, Sustainability
- Gabriella James, Accounting Coordinator, Finance
- Megan Quintal, Marketing Consultant, Communications & Public Engagement
- Kenton Lysak, Engagement Consultant, Communications & Public Engagement

## 1.3 Spokesperson(s)

- Jeanna South, Director, Sustainability
- Amber Weckworth, Manager Climate, Strategy and Data, Sustainability

## 2 Summary of Engagement Strategy

The following engagement goals were identified to help inform development of a Water Conservation Strategy:

- Identify benefits and barriers and explore opportunities to enhance initiatives
    - Identify benefits and barriers to water conservation initiatives in Saskatoon.
    - Of the potential initiatives, identify opportunities to enhance benefits and mitigate barriers.
- We Are Here** →
- Select preferred initiatives to prioritize the Strategy
    - Identify public preference for each initiative to help inform selection of preferred initiatives to prioritize and Plan Options Identification
  - Close the Loop
    - Share relevant components of the Water Conservation Strategy with stakeholders to close the loop and provide opportunities to identify any red flags.
    - Validate key findings and test with wider stakeholder base.

### 2.1 Stakeholder Groups

Four stakeholder groups were identified with the potential to be impacted by the Water Conservation Strategy. These groups include:

#### 2.1.1 Low Emissions Community Plan Stakeholder Groups

- During engagement on the Low Emissions Community Plan, several organizations were provided the opportunity to be reengaged on future Low Emissions Community Plan initiatives, including the Water Conservation Strategy. These Low Emissions Community Plan Stakeholder groups include:
  - Business Improvement Districts
  - Greater Saskatoon Chamber of Commerce
  - North Saskatoon Business Association (NSBA)
  - Saskatoon & Region Homebuilders Association (SRHBA),
  - Federated Cooperatives Limited,
  - Nutrien
  - University of Saskatchewan
- If the identified stakeholders showed interest in participating in the engagement program, they were assigned to the most relevant stakeholder group described below.

#### 2.1.2 Subject Matter Experts

- Internal and external stakeholders with experience or knowledge related to water conservation, retrofits, water costing and both indoor and outdoor water usage. These included industry experts such as:
  - Industry professionals: the Saskatoon and Region Home Builders Association, general contractors, plumbers, plumbing equipment suppliers, irrigation installers, and building operators, United Association of Plumbers and Pipefitters Local 179
  - Community organizations: Saskatchewan Environmental Society, Meewasin, Partners For the Saskatchewan River Basin, Safe Drinking Water Foundation, Saskatchewan Environmental and Industry Managers Association, Saskatoon Energy Management Taskforce

- Academic institutions: Global Institute for Water Security, Global Water Futures
- Water managers from other jurisdictions or the industrial, commercial, and institutional sector
- Individuals recognized for innovation in water conservation technologies or programming.

### 2.1.3 Key Stakeholder Groups

- Individuals and groups who will potentially be impacted by the implementation of Water Conservation programming in Saskatoon. The following groups/organizations were identified:
  - Equity groups
  - Indigenous residents and organizations
  - Low-income residents and organizations
  - SaskWater
  - Saskatoon Water

### 2.1.4 Water Consumers and Potential Program Users

- Stakeholder groups who currently use water and have the potential to participate in Water Conservation programming once implemented. Target audiences for engagement under this category include:
  - CHEP Good Food and Community Garden Leaders
  - Developers
  - Golf Courses (Internal)
  - Industrial, commercial, and institutional sector (i.e., businesses and organizations)
  - Meewasin
  - Parks department (Internal)
  - Property managers
  - Recreation and Community Development Community Consultants (Internal)
  - Residents (i.e., renters, homeowners and youth)
  - Saskatchewan Landlords' Association
  - Saskatoon Food Bank and Learning Center

A summary of stakeholder groups, level of engagement, engagement objectives, engagement goals and engagement activities completed are provided below.

Table 1: Summary of Engagement Strategy

Phase	Stakeholder	Level of Participation	Objective	Engagement Goal	Potential Activities
0	Low Emissions Community Plan Stakeholders	Involve	I need to understand how citizens will be affected by a decision.	Determine level of interest of Low Emissions Community Plan Stakeholders and how they would like to be engaged.	Meetings/Phone Calls/Emails
1	Subject Matter Experts, SaskWater	Involve	I need to understand how citizens will be affected by a decision.	Identify benefits and barriers and explore opportunities to enhance initiatives.	Meetings/Phone Calls/Emails
1	Low Income Residents	Collaborate	I need to work with stakeholders to find solutions.	Identify benefits and barriers and explore opportunities to enhance initiatives.	See Low Emissions Community Plan Engagement Strategy
1	Water Consumers	Involve	I need to understand how citizens will be affected by a decision.	Identify benefits and barriers and explore opportunities to enhance initiatives.	Meetings, Workshops Survey (Optional)
2	Low Income Residents, Water Consumers, Subject Matter Experts	Consult	I need comments to inform a decision.	Select preferred initiatives to prioritize in the Strategy	Survey, Meetings, Workshops
3	All Stakeholders	Consult	I need comments to inform a decision.	Feedback on draft strategy.	Feedback Form, Emails, Meetings

### 3 Engagement Activities

Individual stakeholder meetings were used to collect feedback to inform the development of the Water Conservation Strategy.

#### 3.1 Individual Stakeholder Meetings

Consultations were held with various stakeholders to determine barriers and opportunities related to the Water Conservation Strategy.

##### 3.1.1 Intended Audience

Various members of Key Stakeholder Groups, Subject Matter Experts and Water Consumers were engaged through Individual Stakeholder Meetings, including:

#### 3.2 Data Limitations

Due to the public health orders related to the COVID-19 pandemic, all engagement activities for this project were halted in May 2020. This resulted in Phase 1 engagement being restricted to Individual Stakeholder Meetings, without the inclusion of workshops and surveys with water consumers and the general public. The goal of this phase was to identify a range of perspectives, needs and concerns across sectors to help inform refinement of the options. The sample size within the



Individual Stakeholder Meetings potentially limits the validity of the results in terms of providing a full representation of the population under consideration; however, the results provide the best available indication of how stakeholders perceive the program elements of the Water Conservation Strategy.

Additional considerations for low-income, Indigenous and equity groups will need to be incorporated into future engagement opportunities. Online engagement has its limitations in not being as inclusive to those individuals with limited to no internet access, including low-income groups. Multiple avenues were available to the public for providing input to help mitigate potential issues of inclusivity due to the inability to conduct in-person activities; however, engagement practises and procedures were limited due to the COVID-19 pandemic, especially in conducting physical meetings with individual stakeholders.

## 4 What We Heard

### 4.1 Demographics

The following participants provided feedback in the Individual Stakeholder Meetings:

Table 2: Individual Stakeholder Meetings Representation

Sectors Represented	Participants
Businesses, Business Groups and Industry Associations	9
Environmental Organizations/Institutions	16
Irrigation Professionals	8
Plumbing Professionals	15
<b>Total:</b>	<b>48</b>

### 4.2 Businesses, Business Groups and Industry Associations

#### 4.2.1 Local Benefits and Challenges

Respondents identified several benefits for businesses to conserve water, including cost saving options for businesses to implement more sustainable practises. Many businesses are combining environmental savings with fiscal savings in order to do more for the environment and their customers while improving cost efficiencies. This has in turn caused local business ethics and practises to drastically shift within the last decade to be more environmentally conscious and responsible. However, numerous barriers to water conservation still exist in the business community, including:

**Costs:** upfront costs, administrative burdens, lost time, inconvenience, challenging for businesses with toilets or faucets that work well already to justify needing to interrupt business to replace them with more efficient models, water and waste water are especially important considerations when businesses are looking at potential locations

**Engagement:** limited opportunities to engage in water conservation in Saskatoon since production sites are in other cities, there is a need to engage with incoming businesses early enough (i.e., building permit/license stage) to inject the conversation regarding water conservation possibilities and incentives prior to builds

**Funding opportunities:** businesses in older areas of the city experience challenges accessing capital to fund large renovations or retrofit projects and are assessed and taxed differently than new businesses

**Internal strategies:** many businesses lack internal strategies and capacities to deal with water conservation

**Lack of awareness:** of what opportunities exist and have other sustainability priorities, people don't know who to talk to, have networking opportunities for water conservation, water conservation does not tend to come up when supporting businesses

**Lack of knowledge:** businesses don't realize how much water they waste and how much money they lose because of it

**Location:** it is not fair to put the responsibility for water conservation solely on businesses in older neighborhoods when growth/sprawl in Saskatoon is more likely to increase overall water usage and create stress on current infrastructures

**Meeting needs:** many businesses have not renovated/replaced old appliances with water efficient models because their current set up is meeting their needs, especially in older developments

**New businesses:** when people are looking to start a business in Saskatoon they look at water and electricity rates and are willing to go elsewhere if rates are too high, restrictions on water usage or a cap and trade system would be a deterrent to economic growth

**Older businesses:** if businesses in the Business Improvement Districts are targeted for retrofits because of the age of the buildings the financial burden of renovating could make it more challenging to compete with similar businesses who do not need such upgrades, doing retrofits can be additionally challenging because once you start retrofitting/replacing appliances you might find additional improvements required in order to ensure the building is up to code

**Sanitizing:** one of the primary industries to focus on, if manufacturing businesses produce more product they need to use more water to adhere to health and safety requirements which requires more water for processing/sanitizing

**Volume:** some businesses require large volume of water (i.e., manufacturing, processing, etc.)

Participants provided suggestions for businesses who are actively working to conserve water that the project leads could get in touch with, which included developers; downtown businesses who are already taking steps towards water efficiency; property managers and landlords; and realtors

One individual commented that there is an opportunity to share individual success stories in water conservation to inspire others and give them the confidence/knowledge to make changes in their own operations without the need for incentives.

#### 4.2.2 Programs Under Consideration

The following comments were provided for each potential program option:

##### **Industrial, commercial, and institutional assessments and fixture incentives program:**

- The program could be positive for businesses, but incentives might be able to be avoided if the program encourages businesses to complete a free audit
- If information is not available about upfront costs and rates of return at the time of the audit, it could deter people from participating. It is often the upfront cost and the administrative burden of figuring out the savings themselves that people are concerned about
- Suppliers need to give water conservation advice that aligns with water conservation goals
- Need to have a clear idea of the possible upgrades or projects we might recommend as part of the audit and figure out the upfront costs and payback time
- Educating owners that replacing aging toilets now instead of at the end of their life cycle will save them money overall
- The state of the asset being assessed would be a determining factor, as the long-term savings would be less attractive to businesses occupying facilities that may need to be replaced in the future due to their age

### **Industrial, commercial, and institutional capacity buyback:**

- Would see stronger support if the program was targeted at high-volume users where there is a higher reduction potential
- Large industries would appreciate opportunities for long-term savings
- Education on water usage and costs would be helpful in promoting opportunities
- The program could consider waiving the fee for businesses who are more efficient

### **Once-through cooling location and replacement:**

- Recognized within the industry as a system that wastes water
- Need to confirm that the alternatives are as effective and improve on temperature control
- Could have this program fall within either the incentives or buy-back programs as a type of equipment to upgrade

### **4.2.3 Top Programs and Other Considerations**

Respondents were hesitant in providing recommendations for the top programs due to individual preferences varying with business needs. Participants identified education as a low-cost, critical component for any of the proposed programs to be successful. Comments included:

- Education is the most effective action the City could take to encourage water conservation
- Education can be a low-cost and easy solution to implement. Take the “Shop Local” campaign for example
- Targeting youth and setting up booths at events are a great way to reach a lot of people
- It is important to get the information to the decision makers directly
- Share information about best practises and what can be done to improve water conservation today

Additional opportunities were provided to improve the success of the program, including:

**Incentives:** make incentive programs easy to access

**Pilot programs:** use pilot programs to encourage positive use, phase-in the program slowly

**Reduce costs:** avoid programs that need more City staff as it increases costs to taxpayers

**Work with suppliers:** share messaging and information about water saving opportunities, incentives should be designed for the supplier and customer

Participants identified the best way to engage with interested businesses on this topic is through holding several engagement workshops, providing information to business affiliates/memberships to pass on to their members, and through business newsletters.

## 4.3 Environmental Organizations and Institutions

### 4.3.1 Local Programs and Considerations

Numerous organizations provided information regarding their current water conservation efforts, which are summarized below:

#### **Global Institute for Water Security:**

- Ability to convene water related meetings to discuss water conservation issues
- Ability to partner on future student research projects
- Can provide data associated with water flow, quality, etc.
- Can provide understandings of the river, watershed and the impacts of climate change
- Supports co-developmental approach to research
- Want to start regular meetings with stakeholders on water quality and conservation

#### **Meewasin:**

- Native Plant Retail and Distribution:
  - Upgrade and relocate their green house for the purpose of offering educational experiences and selling native plants
- Native Plantings Stewardship Program:
  - Planting of drought tolerant species
  - Strategically irrigates new plantings to aid in establishment prior to turning areas over to City Parks for ongoing management
- Partners with Partners FOR the Saskatchewan River Basin to deliver educational programming associated with water conservation

#### **Partners FOR the Saskatchewan River Basin:**

- Caring for Watersheds Education Program:
  - Grades 7-12
  - Considers the watersheds where they live, problems facing watersheds and how they can help
  - Includes conservation and protection of water
- Sanitary Sewers System Education Program:
  - Grades 4-5
  - What not to put down drains or toilets
- Yellow Fish Road Education Program:
  - Grades 5-8
  - What goes on our streets/lawns/sidewalks goes into storm drains and the river
- Water protection is part of their mandate

#### **Safe Drinking Water Foundation:**

- Student Action Components Education Program:
  - Encourages students to learn about the sources of their drinking water
  - Saskatoon, Saskatchewan and Nationally
- Water Testing:



- 2,900 kits sent out to schools in Canada since 2001.
- Schools can submit findings to a website

**Saskatchewan Environmental Society:**

- Energy Audit Education Program
  - Students perform an audit on their homes or schools

**South Saskatchewan River Water Stewards:**

- Aquatic invasive species monitoring:
  - Surveying and eradication of flowering rush within watershed
  - Funded by HSP-DFO-SARA
  - Partners include: Ministry and Agriculture, Ministry of Environment, Native Plant Society of Saskatchewan, Meewasin Valley Authority, City of Saskatoon
- Microplastics Monitoring:
  - Testing in Saskatoon and rural aquifers
  - Partnered with Global Institute for Water Security
- Phosphorus Monitoring:
  - Funded by the Lake Winnipeg Foundation
- Watersheds Educational Website:
  - Displaying all points of entry for contaminants within our watershed
  - Partners include Safe Drinking Water Foundation, Meewasin Valley Authority and Partners FOR the Saskatchewan River Basin

**University of Saskatchewan:**

- Capstone Project:
  - Designing a way to use river water for cooling to replace evaporative cooling
  - Currently exploring using thermal storage tanks - closed loop with heat exchanger that pulls water from the river at night
  - In early concept level of being developed with a group of engineering students
  - Partners include City of Saskatoon, municipal hospitals, and Business Improvement Districts
- Cooling and Heating:
  - Added a valve to a transformer room and received a return of roughly \$19,000/year
  - Central chiller plant on campus that provides cooling to many buildings on campus uses evaporative cooling, which is efficient compared to radiators or dry towers
  - Refrigeration shops use a water regulating valve to control the amount of water through a compressor, which is challenging to find/fix leaky valves
  - Water-cooled air conditioning units and coolers (water-cooled compressors) are another opportunity for replacement since condenser systems that will run in the extreme cold can now be purchased
- Fixtures:
  - Installing new water efficient fixtures in all new constructions
- Outdoor Water Use:
  - Agricultural lands are watered using raw water from a dedicated line and the pump house at the weir

- Rainwater capture tanks are located on two buildings and used for irrigation of four on-campus community garden programs
- Use microclimate sensors, automated systems, and weather smart irrigation
- Xeriscaping and using drought tolerant grass blends
- Toilet and Urinal Replacements:
  - Currently underway in older buildings and installing flush-low water alternatives
  - Considered installing continual flushing and waterless urinals, but they were inefficient
  - Upgrades only completed as part of larger renovation projects

### **Water Security Agency:**

- Agricultural producers
- Wetland conservation

In regards to additional benefits to water conservation for Saskatoon residents and businesses besides greenhouse gas emissions and water treatment infrastructure costs, respondents identified reductions in overall energy consumption and progressing the movement towards planting native plant species that require less water.

Numerous environmental threats to Saskatoon's water supply and watershed were identified, including:

**Agricultural:** flood prevention, drainage, irrigation, erosion

**Climate change:** scarcity of water or overabundance, run-off will go up in the plains and mountain regions, water quantity and flow rate will change, increase water volume due to greater seasonal precipitation, impacts on water treatment plant intake and various road systems

**Current:** describe water issues as being current rather than future issues and to connect to a bigger picture of how these issues effect energy consumption and the health of ecosystems

**Drought:** management can be difficult without proper models

**Flooding:** managing flooding years, significance of Diefenbaker Dam

**Gaps:** missing source water protection considerations

**Invasive species:** zebra mussels, flowering rush (3000 cases along river), both with little research

**Isolation:** individual watersheds and organizations work independently, including source water protection within some communities

**Pollution and contaminates:** oil spills, pipeline failures at river crossings, pharmaceuticals, microplastics, exotic contaminants, risks to human health

**Uncertainty:** variability of water availability and seasonality, climate change could result in less precipitation falling as snow and bigger storms increasing the risk of flooding

**Usage:** Master Agreement on Apportionment for three Prairie Provinces, provinces agreed to equitable sharing of water coming from the mountains, Alberta has to pass on 50% of the water to

Saskatchewan which has to pass on 50% to Manitoba, these amounts are not monitored and can be affected by current threats and practises (ex. irrigation).

**Upstream/downstream impacts:** water quality issues will have the worst impact, roughly 2% of the water in the river originates from runoff and the rest comes from Alberta, how Alberta uses the water upstream will impact us downstream because there is low replenishment, we affect those downstream

#### 4.3.2 Barriers and Considerations

Numerous barriers to water conservation in Saskatoon were provided, including:

**Competing priorities:** hard to spur behavioral change when there are many current issues, if living in poverty individuals will not prioritize getting a low-flow showerhead

**Complex:** issues can seem complex/unsolvable to the average resident, could make it easier for consumers to see their impacts to water usage by making bills easier to understand

**Industry/developers:** changes need to occur beyond residents and towards industrial/development sectors, households and industry tend to get lumped together

**Lack of knowledge:** biggest challenge for conservation

**Measuring water use:** some buildings still use analogue meters and require assistance to take readings, AMI meters could solve this issue

**Planning:** drought proofing components, source water protection plans

**Prioritization:** need to prioritize water uses and defend selections,

**Resources:** biggest barrier, need resources to do initial assessments, then need designers and resources to manage projects

**Value:** initiatives need to show what the potential for change is and the financial gains

**Understanding consequences:** if we reduce water usage rates may increase but this could be offset by deferring big infrastructure upgrades

When asked what percentage of water is feasible to conserve some respondents identified 5-10%, but this value is potentially too low to contribute to the amount of change needed. It was recommended that the City introduces gradual targets that are flexible in nature, such as 5% for the first year, and as gains are achieved it can increase to 10%. This practise would support forming habits and combat individuals viewing a target as an unattainable goal.

#### 4.3.3 Programs Under Consideration

The following comments were provided for each potential program options:

##### Residential toilet-replacement incentives:

- Likely more useful in older homes
- Considerations should be made on how to dispose of used toilets properly and the costs
- Upfront costs could be a barrier
- There is a fear that the replacement will have an equivalent lifetime and not longer

- Would the City ever consider mandating low-volume toilets?
- Measures should be taken to ensure replacement toilets are still easily repairable
- Considerations should be made on weighing the pros and cons of dual flush toilets

**Residential showerhead-replacement incentives:**

- There are differences between quality and lifestyle models, since certain showerheads are aesthetically pleasing to certain individuals.
- Would there be multiple showerheads eligible for large households or multi-unit complexes?
- Would developers be eligible?
- \$20 - \$50 per showerhead seems high
- How will the program account for the range of showerhead types and costs?
- Need to work with plumbers to ensure proper installation standards are met

**Residential indoor water use education programs:**

- Education is a key component for all the programs
- Educating people about wasted water seems to be easy, since anyone can visualize water running down a drain as being wasted
- Often education programs run for a certain timeframe and then stop
- Shower timers could be used as an educational tool
- Leak detection education is important
- Dishwashing practises (ex. rinsing before placing in the dishwasher is not necessary)
- Numerous groups to target, including schools, professionals, and seniors
- Provide messaging for two perspectives: environmental benefit and cost savings.
- Use the AMI system as an opportunity to gamify water savings within communities
- Point out the inconveniences of wasting water for neighbours and for the community

**Residential indoor water assessments:**

- Not likely to occur due to the associated costs
- Could be included when purchasing a home in combination with a home energy audit
- Valuable to homeowners to recognize current wasteful pathways

**Residential outdoor irrigation controller replacement incentives:**

- Great idea if the program promotes automatic controllers and better timing

**Residential irrigation education and awareness programs:**

- Water bill inserts/pamphlets will not be effective
- Use social media and humor to get attention, such as the City's construction signs
- Use Saskatchewan Waste Reduction Council Mobile Program as a template for how to communicate information to the public

**Residential low-water landscaping program:**

- Some individuals are leery of a landscaping program unless professionals are involved in its installation

- Connect with existing programs, such as the Master Gardener Program, and involve the Native Plant Society
- Provide examples of gardens with native plants and alternative options for people to learn from
- Education is needed to shift standards and expectations of what yards are supposed to look like

**Residential rain barrel incentives:**

- Supported by numerous respondents

**Other residential programs identified:**

- Appliances
- Garburators
- Swimming pools, solar blankets, and winter covers
- Water heating systems, insulating pipes, in-line hot water system

**Industrial, commercial, and institutional assessments and fixture incentives program:**

- Upgrades identified in audits are perceived as being mandatory to address, which is a concern for condos and multi-unit dwellings

**Advance Metering Infrastructure (AMI):**

- Extremely useful in determining potential leaks and a powerful tool for education/awareness

**Planning, land use, and urban form:**

- The quality of the water re-entering the river and wetlands needs to be considered
- There are opportunities to work with stormwater ponds to capture water and also incorporate native vegetation as a natural filter, improving water quality in catchment ponds
- Show proximity to the natural areas and importance of protecting these spaces
- Incentivise people to plant native drought resistant species to help reduce the spread of common invasive species
- Regulators are concerned about non-potable water in taps

**City of Saskatoon Programs:**

- There is an opportunity for the City to pull river water for irrigation prior to treatment
- If summer water use peaks are caused by watering parks, is there an opportunity to alternate days/nights/hours that parks are irrigated
- Plant more drought-tolerant species of grasses and plants
- Move toward evapotranspiration-based watering
- Using storm water systems in parks for irrigation
- Is it possible to flush hydrants with reused water?
- Consider designing all City facility landscapes to be low water, with the possibility to connect with High Performance Buildings.



#### 4.3.4 Top Programs and Other Considerations

Of the potential programs presented both outdoor and residential water use were identified as priorities. Public incentive programs, programs that promote residential behavioural change, and irrigation systems for the industrial, commercial, and institutional sector were viewed as the programs that would gain the most support/up-take within the Water Conservation Strategy.

Considerations for opportunities and comments were provided, including:

- Could a rebate be provided right at the till, such as when SaskPower administered the lightbulb rebate?
- Could put resources on the City website – have a resource repository
  - Calculator or *Water Savings Central*
  - Potential partnership for a new app or check into existing apps
- Gamify or make water conservation into a competition
  - Need different techniques for different people
  - Some people would use info in printed bill, others AMI system/ app
  - Enable residents to compare their use with my neighbour
- Format water bills to let people know when they are using less water and saving money
- Look at other municipalities to adopt similar practises/strategies.
  - Calgary has a big leak-detection program that they perform during Christmas when there is little activity in the industrial area
  - Regina water use study: biggest users were hospitals, as well as the SaskPower building
- Make sure everything incentivized is WaterSense rated
- Natural resource asset mapping and trying to monetize the value of our river/water
- People don't connect electricity and greenhouse gas emissions with water
- Share local success stories in water conservation by profiling successful organizations

## 4.4 Irrigation Professionals

### 4.4.1 Local Services and Technologies Provided

Participants included industry professionals that have worked on a wide variety of projects, including residential, commercial, irrigation services for the City (parks and streetscapes), golf courses, and P3 projects. Participants included individual business owners to companies employing numerous individuals, with years of service ranging from 3 – 33 years.

Identified irrigation services and associated technologies within both residential, multi-unit and commercial applications include:

- Back-flow devices – cross-connection installs and assessments
- Controller replacements
- Custom irrigation equipment – vandal resistant shrub riser
- Design services
- Educational workshops, website and information on best practises and water conservation
- Installations
- Low-water use products - drip irrigation system for a rooftop garden
- Maintenance
- Rain Sensors
- Repairs/Tune-Ups
- Retrofits
- Smart home controllers (digital and WIFI)
- Start-up
- Tests
- Warranty – up to 3 years
- Winterization

Respondents identified many factors that are considered when installing or maintaining irrigation equipment, including environmental characteristics (i.e., direction of sun, amount of sun, water, etc.), landscape characteristics (i.e., vegetation type, water flow, moisture retention, etc.), and structural considerations (i.e., vicinity to home and structures, street spray, etc.).

### 4.4.2 Opportunities and Barriers

All participants agreed that there is a significant potential for outdoor water conservation. A variety of opportunities to significantly reduce water use were identified by respondents, which included:

**Better designed systems:** design systems for function, reduce inefficiency in coverage, pressure regulation, working with architects at the onset to improve irrigation designs, more sprinkler heads to improve coverage, system size needs to match the yard size

**Education:** critical for change, how and how often to water, costs to the consumer/City, use easily understood comparisons (ex. bathtubs full)

**Improving methods:** using “cycle and soak” method that uses a timed-sequential order in turning on sprinklers to mitigate over-watering/runoff, time of day and duration

**Smart systems:** use automated timers to improve scheduling (90% of new systems), rain sensors to reduce watering while raining, moisture sensors, night watering

**Use of better equipment:** using heads that reduce evaporation, driplines, controllers can save 30% less water, proper landscape fabric to hold moisture

**Xeriscaping:** recent growth in this sector,

Numerous barriers to water conservation were identified, including:

**Complexity:** some technologies (ex. controllers) are becoming more difficult to understand/operate

**Costs:** primary focus for consumers, developers are installing systems based on lowest price not water conservation, residents are looking for ways to reduce their costs/bills, automatic system upfront costs too much, despite Saskatoon having relatively low costs for water, builders don't want to be placed in a situation where they are forced to install them and pass the cost on to customers

**Entrenched:** users often do not follow professional advice despite the savings

**Lack of regulations/standards:** unlike other areas (i.e., California) there are no regulations in Saskatoon that govern installations nor third-party review of installations, rates will go up to support training/certification, lack of business licenses in installers

**Manual systems:** system runs unneeded for hours due to forgetfulness, but auto-valves are more expensive

**Multi-units/condos:** large condo communities can have the most issues due to the amount of green grass, but they are rarely fixed due to costs to the building owners/tenants

**Overwatering:** watering well beyond what is needed is a large issue in Saskatoon

**Poor products:** inexpensive systems often fall apart and are not efficient

**Poor workmanship:** installations are often not done well (i.e., using wrong wiring, battery operated controllers, etc.) and it is challenging to repair poorly designed systems

**Priority:** landscaping and irrigation considerations are often made at the end of the project or build when remaining funds are low

**Reduced red tape:** need to make any program easy to use, with short wait times and reduced delays

#### 4.4.3 Views on Potential Programs and Water Conservation

Participants identified that anywhere from 25% to 60% of Saskatoon homes have in-ground sprinkler systems, with new builds making up the majority (~40% - 75%). It was speculated that this percentage is higher in Saskatoon due to our hot/dry climate and the aesthetic value placed on green grass. Of that group, at least ~40% to 60% would have a manual system (i.e., ball-valve) rather than controller-based which have become more popular in the last five years, and ~75% of controller-based systems would be electric. It was suggested that some areas, such as Briarwood and Erindale, are at the age where older, manual systems are in need of replacement, but repairs require major landscape changes (ex. digging up grass).

It was recognized by all participants that making upgrades to irrigation-system controllers would save significant amounts of water by reducing overwatering, reducing irrigation times, and accounting for variations in the landscape. Some individuals stated that the installation of a controller will typically pay for itself within one season. Participants estimated that ~60% or more of controllers in Saskatoon might need such upgrades, in part due to individuals not having the most recent technologies and expertise available to them from outlet hardware stores. When asked which types of controllers are most effective at saving water, individuals provided the following order by the number of times they were mentioned:

1. **Automatic controller with timers:** schedule watering more appropriately, great for residents and multi-unit condos
2. **Rain sensors:** most cost effective and easy to maintain, account for ~15% of installs and would average of ~15% in water savings, maximize efficiency
3. **WIFI controllers:** don't use sensors but instead incorporate the weather forecast, dependant on where the weather readings come and the diversity of precipitation in Saskatoon, reduces irrigation on cloudy days, most popular and easy to use because they provide a hands-off approach,
4. **Sprinkler heads:** properly managing pressure and coverage
5. **Soil moisture sensors:** can be difficult to manage, required frequent maintenance, maximize efficiency, more risk of breaking due to landscaping and rodents, better for golf courses
6. **Underground weeping systems:** difficult to maintain

However, numerous participants stated that the best controller varies with the customers' needs/requirements.

The majority of respondents agreed that incentives to replace outdated or inefficient irrigation-system controllers would be effective in convincing people to install new controllers. Comments identified incentives as being an easy win for the client and installer, but attention should also be given to rain sensors and recognizing the best upgrade that will account for the local environmental conditions (ex. WIFI controllers are better when running lines under concrete).

80% of respondents identified water conservation or long-term savings as not being a key consideration for them and their clients when quoting or designing irrigation systems. This is primarily due to clients wanting the most affordable system followed by additional system perks/upgrades, especially in reinstallation/retrofit projects with older homes and condos. Those that take more interest in these considerations are those interested in sustainability or the technology involved. Although clients will ask about water savings, this typically is from the lens of cost savings; however, manufacturers are designing all of their equipment with water conservation in mind.

The following risks, concerns associated with incentivizing system controller upgrades were provided:

**Entrenched:** won't work as effectively in residential sites due to individuals being unwilling to spend more on water conserving products

**Knowledge:** homeowners can install equipment on their own, but they need training/information on system variables (i.e., timing needs for each type of spray zone, programming, etc.) in order to properly manage it

**Reliability:** most system controllers work well without any issues, but malfunctions can occur primarily on moisture sensors

#### 4.4.4 Installer Training and Certification

All respondents were strongly in favor of the City providing training and certification focused on irrigation system design for water conservation. Training opportunities with the National Irrigation Association ([www.irrigation.org](http://www.irrigation.org) - \$600 - \$2,000), Irrigation Auditor and online training through manufacturing companies (ex. Hunter Irrigation) were identified as being beneficial, but costly. Saskatoon and Region Home Builders Association would endorse the Water Smart certification as it very closely aligns with certification/training programs they are currently offering for home builders and renovators. The training needs to be available for professionals outside of the irrigation industry, such as developers, property managers and architects, who are directly involved in the designing of irrigation systems. This could also include summer students and short-term work placements. Most respondents agreed that this form of training could lead to better designed systems and water savings, as well as a sense of comfort for clients.

It is generally viewed that uptake for training would be favorable as long as the associated costs were low, training occurred during the off-season (winter) and training was framed as an opportunity for recognition amongst professionals, thus promoting intrinsic competition. Some respondents identified the need for training to be mandatory and enforced for both the company and its employees. This could be supported further by the City by encouraging the public to use trained professionals or creating an audit/inspection process following the completion of projects to support the industry/standards. If not mandatory, then perhaps there could be an incentive/rebate for homeowners that use certified installers for their projects. In order to incentivise irrigation professionals one respondent suggested offering a business or tax incentive. Numerous respondents offered their assistance in developing any future training methods/materials.

#### 4.4.5 Subsidized System Assessment and Tune-Ups

Often referred to as “spring start-ups”, the majority of individuals agreed that incentives would help spur irrigation-system tune-ups and water savings. Repairs rarely occur within the fall season due to the large demand for blow-outs prior to the winter season and temperature unpredictability. Individuals recognized that spring-start-ups are either not performed regularly or often enough as they appear to be working, especially for multi-unit condos and businesses. This would allow inefficiencies to be caught and corrected for sooner.

In order to advertise the need for tune-ups individuals should note that the cost of assessment and tune-up could be covered by a year of water savings as a results of better water use. Annual tune-ups provide water-saving potentials, such as reducing/eliminating the costs of future repairs and compensating for yearly environmental changes (i.e., shifting, plant growth, etc.).

Participants noted system tune-ups commonly occur annually for businesses/institutions and when they are in need of repair for homeowners. The recommended time between tune-ups was identified as two to three years, depending on the age of the system. Respondents believe there is an adequate capacity within the sector to undertake a significant number of water-efficiency



inspections/tune-ups and retrofits, with potential for growth. However, these visits must not be held during the busy season (spring to fall).

Identified concerns associated with subsidized system assessments/tune-ups included clients being hesitant to open their system to assessment when costs can compound quickly and that assessments need to be fair for all parties involved.

#### 4.4.6 Education and Awareness Programs

Education was recognized as a critical component for water conservation; however, it needs to align with best practises in the industry and be freely accessible to homeowners. Although it was recognized that every irrigation installation/retrofit is different from one another, created standard practises and educating people through free seminars and online content would be advantageous. Education programs should focus not just on residents, but the commercial, retail, and secondary industries (i.e., property management, developers, etc.).

The following topics were suggested by respondents for potential education programs:

- Adjustments to the system
- Costs and your water bill – financial savings
- Different water controls – spray heads, drip heads
- How an irrigation system works
- How to design an efficient irrigation system – staggered zones, coverage
- Landscape requirements and soil types
- Risk and liabilities
- Timing and duration – night watering, plant needs, overwatering
- Xeriscaping

Identified concerns associated with launching education and awareness included needing to work with irrigation professionals to understand best practises to be incorporated and running training programs during the winter to maximize attendance.

#### 4.4.7 Top Programs and Other Considerations

The following suggestions were provided as top programs considered to achieve the largest conservation savings:

- Rain sensors within the industrial, commercial, and institutional sectors and condo developers
- Criteria for commercial areas
- Offering a package deal – with multiple phases and incentives
- Make applying for incentives easy
- Educating of all parties involved in irrigation, especially homeowners
- Upgrade all controls to electric

In regards to the measures that would have the most support/up-take from the industry or public, both rain sensors for electric systems and financial incentives to upgrade to controller systems were identified.



Considerations for additional measures in improving water conservation included focussing on new builds, investing more into rainwater catchments, providing a property tax rebate, and using flow sensors. One individual noted that there is a need to regulate the industry to improve installs and increase the likelihood that incentives for equipment will maximize water conservation through proper installation. Another individual suggested looking into the landscaping requirements regarding median developments that are currently being reviewed as part of the Zoning Bylaw Update. Medians are required to have grass and trees and irrigation; however, builders want more flexibility in terms of the landscaping (i.e., xeriscaping, gravel, rocks, etc.) so they can reduce irrigation needs entirely.

## 4.5 Plumbing Professionals

### 4.5.1 Local Services and Technologies Provided

Respondents included industry professionals that have worked on a wide variety of projects, including residential, commercial, multi-unit housing, food processing operations, and refrigeration. Participants included individual business owners to companies employing numerous individuals, with years of service up to 40 years.

Identified plumbing services within both residential, multi-unit and commercial applications included:

- Designing/pre-designing plumbing systems
- Low-flow showerheads and faucets
- Plumbing
- Replacements
- Sewer
- Water heaters

### 4.5.2 Opportunities and Barriers

Respondents recognized the potential for water conservation within the plumbing industry and provided the following opportunities for the largest untapped potentials they see in water conservation in homes and businesses:

- Fixtures: shower heads with lower pressure and new aeration
- Flow-through humidifiers: compared to steam which use less water, but have the potential for maintenance
- Grey water: more opportunities in new homes, but how is it affected by new drainage bylaws, mixed messages surrounding its practical use
- Irrigation: metered with control systems and timers, alternating irrigation days (ex. Warman)
- Low-flow toilets: 4.8 L (1000 gal flush)

It was recognized that manufacturers are leading the curve on water conservation technologies, causing clients to be unaware of the differences in functionality between water efficient and non-efficient fixtures.

Potential barriers to water conservation that were identified included education, associated costs (costs are the same to buy a more efficient model versus traditional) and changing technology to encourage changes in behaviours.

### 4.5.3 Residential Toilet and Showerhead Replacement Programs

The majority of stakeholders agree that upgrades to toilet and/or showerheads would save significant amounts of water. It was suggested that a clear movement towards installing these forms of upgrades has been seen within the industry, such as in the hospitality sector (hotels) installing low-flow shower heads within their facilities and many switching to toilet savers by 2021. Property and hospitality managers are finding that being environmental leaders brings in customers while increasing cost savings.

However, this comes at a cost to our landfills, which are receiving outdated/used fixtures and toilets on a regular basis. One individual suggested this issue could be minimized by promoting toilet savers which reduce waste and costs while improving the flow. Some respondents asked whether there was research/data on the amount of water saved by using dual-flush toilets, since dual-flush toilets can potentially be more difficult to repair.

Some points were brought up regarding water conservation in commercial manual and automatic urinals. Automatic flushing fixtures use more water, especially while constantly running during big events. There should be a delay (five uses) to reduce the amount of water used. It is strongly recommended that waterless urinals are not used due to their lack of cleanliness and potential for buildup.

Respondents estimated that up to 50% of toilets and showerheads in older neighborhoods and buildings might need such upgrades. It is more likely that newer developments have already installed low-flow toilets and fixtures.

Possible suggestions for sources of leaks (toilets or elsewhere) and how they can be addressed were provided:

**Education:** for homeowners to diagnose problems before they turn into larger problems

**High pressure:** puts strain on the equipment, maximum pressure causes relief valves to come into effect, ensure relief valves are in good condition

**Leaks:** most common service calls, dripping faucets add up to several gallons a day and can easily be fixed by changing the cartridge, toilets leaks tend to occur around the flapper which can be replaced (Hornet flappers are more resistant)

**Leak detection devices:** can be put right into main water line to detect flow consistency

**Temperature swings:** pressure is increased with heating and affects both cold and hot water after the check valve (back flow), need to size the expansion tank specific to the system as it serves as a backup

Respondents viewed incentives to help spur toilet and showerhead replacement with mixed opinions. One individual stated that previous provincial toilet rebate programs proved ineffective, only benefiting those performing home renovations. Another individual thought a \$50-\$100 toilet rebate and \$40-\$50 showerhead rebate would produce heightened interest, especially for showerhead replacements over toilets. It was noted that most customers are looking for the most affordable or aesthetically-pleasing option despite the durability.

When asked what would work well about this type of program, respondents suggested mandating that all new houses have water efficient fixtures, sending money directly to the homeowner when offering incentives, and educating about cost savings through informative and engaging formats

When asked what would not work well about this type of program, respondents provided the following:

- Potential pushback from commercial areas and older buildings that require extra water flow to keep lines free
- More research is needed on dual-flush toilets due to the difficulty in obtaining replacement parts
- Do not incorporate high-end fixtures that are difficult to get parts for or low-end fixtures that require replacement quickly
- Showerheads are a personal choice and will be difficult to incentivise

In order for the City to improve or maximize the benefits of this program respondents suggested targeting younger generations that are already interested in water conservation, running an incentive program via an online program administered by the supplier, and adding incentive for large buildings to install urinals that are more water efficient than older models.

#### 4.5.4 Residential Indoor Water Use Education Programs

Current education gaps within the industry or public that the City could help address were identified and included:

- **Advancements:** new and evolving plumbing technologies, supported by research
- **Information:** outline concerns and what the average person can do to improve
- **Water waste:** how much water is wasted by not using water conservation practises

Suggestions for messages to be included in the program included:

- **Effectiveness:** prioritize projects in the home based on effectiveness and not popularity
- **Focus on schools:** students will provide this information to homeowners who will make the changes at home
- **Hot water:** with instant hot water people do not feel the need to conserve anymore.
- **Leaks:** listen for drips and look for water
- **Water coolers/ice makers:** also help reduce water use

#### 4.5.5 Industrial, commercial, and institutional Sector

When asked to identify the biggest water-saving potentials in the industrial, commercial, and institutional sector, respondents provided the following examples:

- **Biggest potential:** toilet and showerhead replacement
- **Commercial industries:** cleaning and sanitizing is a major cause of water use
- **Grey water:** incorporating systems into plant redesigns, needs to be built into the design of the building, need two drain systems and a way to filter the water prior to use
- **Gyms:** water wasted in showering facilities
- **New builds:** easier to incorporate into the program at the onset of development
- **Water-cooled condensing units:** 300 g/m for sanitization, running 12 hours/day

It was noted by one respondent that if the goal is to offset the energy expended to move water around and increase capacity in infrastructure the City needs to ensure a cost/benefit balance.

#### 4.5.6 Industrial, commercial, and institutional Assessments and Fixture Incentives Program

When asked what would work well about this type of program individuals identified needing to emphasize, in simple terms, the water saving capacity to improve up-take and ensure the process is collaborative with numerous representatives engaged throughout the process (i.e., head of maintenance, building manager, and owner).

When asked what would not work well for this type of program individuals suggested the following:

- **Costly:** especially for large retrofit projects (i.e., hospitals, hotels, etc.)
- **Demand:** ability to participate is dependent on current economic trends
- **Equipment:** avoid automatic infrared water or hand towel dispensers that are more prone to failure, ensure good quality equipment
- **Incentives:** leads to individuals performing the work themselves instead of hiring professionals
- **Upfront costs:** challenging for many, could introduce flexibility for staggered replacement for a longer time period

In order for the City to maximize the benefits of this program, respondents provided the following suggestions:

- Look into using Water Matrix for large retrofit projects
- Assessments should have an associated cost to promote actual changes to the system
- Provide incentives that are at minimum 10% return to encourage participation
- Use reliable and trustworthy manufacturers

#### 4.5.7 Industrial, commercial, and institutional Capacity Buyback Program

Individuals provided the following comments in regards to what would work well about this type of program:

- Could provide significant savings for industrial, commercial, and institutional sectors
- Aid building owners in paying for toilet replacements
- Contribute to using reclaimed water systems in order to be reused
- Would work well with property management companies, school boards and office buildings

In order to maximize benefits of this program individuals suggested advocating for the use of on-demand water heaters to reduce pressure/heating issues and allow the recirculation of heat to be maximized during peak usage hours. Another suggestion was to focus less on incentives and more on the future cost savings the client will receive as a long-term investment.

#### 4.5.8 Once-Through Cooling Location and Replacement

When asked whether stakeholders are seeing many once-through cooling systems cooling systems within Saskatoon numerous respondents stated that even though they are present they are currently being phased out by loop and air-cooled (i.e., condenser) systems, which can now be used in colder climates. This process is taking a significant amount of time due to the replacement costs (\$7,000 - \$8,000) and that larger buildings are having a more difficult time justifying the

conversion. However, respondents noted that individuals who have already converted report a payback period of 1-2 years.

An estimated 100-200 once-through cooling systems units are within Saskatoon and are primarily found in leased properties where landlords incorporate the costs of water into the cost of the lease or emergency cooling towers and can still be easily purchased. Other potential candidates include: manufacturing and processing centres, convenience stores, grocery stores, restaurants, bakeries, labs, research centres, and microbreweries. In order to locate once-through cooling systems units respondents suggested contacting maintenance department supervisors or refrigeration companies who may be willing to provide information. One individual identified that restaurant and hotels consistently experience leaking systems, so they are an easy target for a conversion as long as the project completion time is reasonable.

Numerous points were addressed regarding what would not work with this program, which included:

- **Costs:** a barrier for small businesses and hotels with many once-through cooling systems units (\$5,000 to \$10,000 per unit), leasing equipment is an option
- **Inability for conversion:** some machines are unable to be retrofitted with air condensers, such as ice-cream machines
- **Location:** many water-cooled units are located in warmer locations and will need to be moved if converted to air-cooled units that run hotter
- **Reluctance for incentives:** might get individuals who do not qualify, better approach is to provide financing support
- **Sound:** air-cooled units create more noise and need proper ventilation, typically installed on roofs

In order to improve or maximize the benefits of this program respondents provided the following suggestions:

- Adapt to changing programs, such as valve replacements which seasonally throttle to maintain a certain pressure and are therefore more prone to failure
- Advertise incentives to the industry and community through professional networks
- Create incentives, such as waving water bills
- Make financing options available
- Send information to associations to share with plumbers and suppliers

#### 4.5.9 Top Programs and Other Considerations

Out of the provided measures respondents identified using reclaimed water and making the largest steps within the industrial, commercial, and institutional /industry sector. Reclaimed water systems can be used for any system, from single-family dwellings to hotels. If the appropriate equipment is used (i.e., filters, sediment tank, holding tank, etc.) reclaimed water can be used for toilets with connections outside the house and for the irrigation of yards.

Respondents identified that focussing on easy installations of retrofits (i.e., toilets, showerheads, etc.) within the industrial, commercial, and institutional sector would have the most support and up-take. Additional opportunities were provided, including:

- Drilling wells



- Grass blends: choose blends that require less water, biochar to retain moisture
- Greywater recycling: reuse sink and shower water, municipalities identify regulatory hurdles
- High-efficiency water heaters: do waste some water during recycling
- Hot water on-demand – more expensive
- Humidifiers
- Night watering for yard – important for commercial properties, restrict watering times
- Replacing other appliances: dishwashers, washers
- Rain collectors
- Metal roofs in combination with rain collectors
- Steam generators
- Xeriscaping

## 5 Next Steps

The next steps for development of Water Conservation Strategy are described below:

- Identify benefits and barriers and explore opportunities to enhance initiatives
    - Identify benefits and barriers to water conservation initiatives in Saskatoon.
    - Of the potential initiatives, identify opportunities to enhance benefits and mitigate barriers.
- Select preferred initiatives to prioritize the Strategy
    - Identify public preference for each initiative to help inform selection of preferred initiatives to prioritize and Plan Options Identification
  - Close the Loop
    - Share relevant components of the Water Conservation Strategy with stakeholders to close the loop and provide opportunities to identify any red flags.
    - Validate key findings and test with wider stakeholder base.