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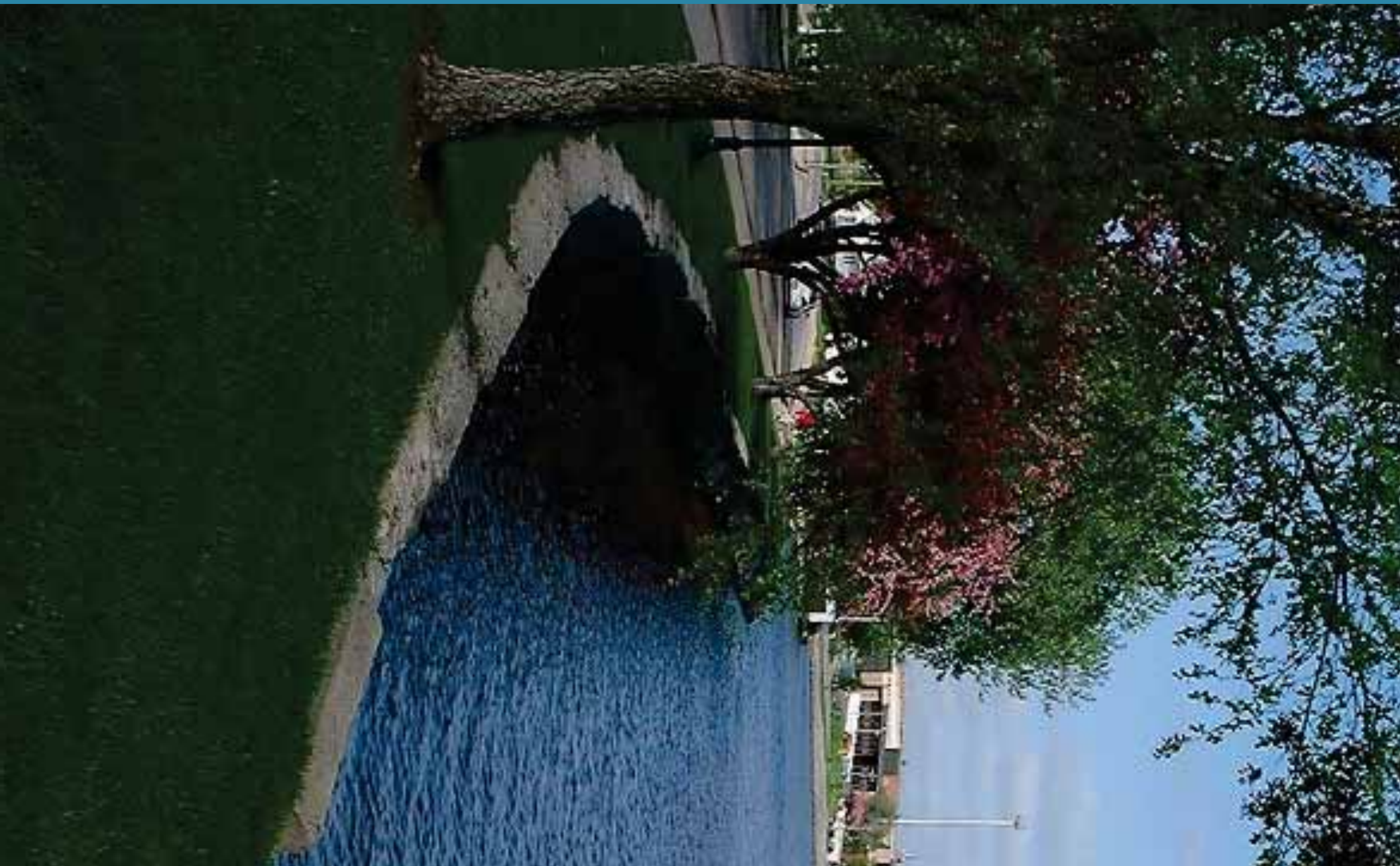
Section 05
Water + Wastewater



Water + Wastewater

In Albert Lea

551 million

gallons of wastewater generated in 2019

341

Community flooding events reported in Freeborn County since 2001 (NOAA)

Water and Wastewater

Why Water and Wastewater is Important

Water is at the core of climate change and sustainable development. Quality water is vitally important for socio-economic development, maintaining healthy ecosystems, and for human survival. Water is central to the production and preservation of a wide range of services benefiting people. How we process water is also linked to our greenhouse gas emissions. Water related energy use totals 13% of US electricity consumption and has a carbon footprint of at least 290 million metric tons. Meanwhile, wastewater treatment is responsible for 3% of global GHG emissions.

Water is also at the heart of adaptation to climate change. As the IPCC (Intergovernmental Panel on Climate Change) noted in its special report on extremes, it is increasingly clear that climate change "has detectably influenced" several of the water-related variables that contribute to floods, such as rainfall and snowmelt. In the Midwest, climate change exacerbates many of the factors that create significant flood conditions. For Minnesota, climate change has, and is projected to continue to bring heavier precipitation events as well as longer periods of time between rainfall events, creating dryer surfaces for those heavier rains to fall upon.

These climate change impacts significantly increase the threat of flooding in our communities. Flood danger includes over-bank flooding of rivers, ponds, and lakes that are over burdened with heavy precipitation or snowmelt runoff. In addition, the potential for heavier rainfalls on dryer surfaces also increases the risk of flash flooding which is caused by heavy rain events over a short period of time. Flooding in Minnesota can be expected to increase in both regularity and severity. According scientific study issued in 2019 by the University of Notre Dame, the severity of extreme hydrologic events, so-called 100-year floods, hitting watersheds in Minnesota and the Midwest will increase by as much as 30 percent by the end of the century.

Water and Energy Nexus

Water and energy are fundamental components of our 21st century life. Production, distribution, consumption, and treatment of water consumes energy. Production of energy - particularly those generated through fossil fuel use - consumes water. The water-energy nexus is the relationship between how much water is used to generate and transmit energy, and how much energy it takes to collect, clean, move, store, and dispose of water. Both fresh water production and waste water treatment are typically the highest energy and carbon emission sources within a community's operations. Reduction of water demand saves energy not only in the production and distribution of fresh water but also in the collection and treatment of wastewater.

Climate Change Considerations

Climate Impacts

This sector impacts climate change through fossil fuel use to generate the electricity required to process and distribute water.

Climate Hazards

Hazards to the water and wastewater system include damage to infrastructure from extreme weather and flooding. City-wide hazards include increased flooding and flash flooding potential.

Water and Wastewater

Equity Considerations

- Low-income neighborhoods frequently suffer more damage from flooding, according to studies by the National Academies of Sciences, Engineering and Medicine (*Framing the Challenge of Urban Flooding in the United States*, 2019). The frequency and magnitude of heavy rain events is expected to increase as a result of a changing climate, making the future flooding impacts for at-risk neighborhoods potentially more acute.
- Disadvantaged communities within cities often have denser populations, more impervious surfaces, and less open/green spaces. These areas can also be prone to flooding and sewer overflows. Stormwater management through the creation of open, green spaces serve to revitalize and promote health within these disadvantaged communities.

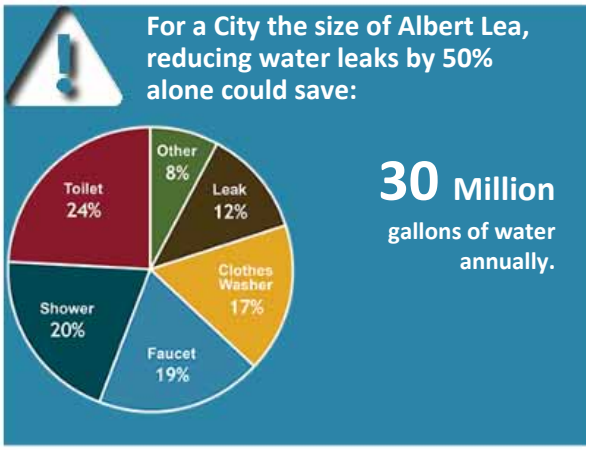
City-Wide Water and Wastewater Targets Supporting Sector Goals

Sector goals are established to both support the City's Climate Action Plan in creating a climate resilient community and to reduce City-wide GHG emissions.

Potable Water Consumption

Today	551 Million Gallons
2030 Targets	**518** Million Gallons

Water Conservation Potential



Source: Water Research Foundation, Residential End Uses of Water, Version 2. 2016

Strategies Supporting Sector Goals

Sector goals related to GHG emissions reductions are designed to balance reduction across all sectors and achieve the overall emissions goals set forth for the community. The goals seek to strike a balance between achievability while also reaching -for improvement beyond business-as-usual.

As indicated in the introduction, the Climate Action Plan is intended to be a 9 year plan to be updated at the completion of that time. Consequently, the goals and strategies outlined in this section are intended to be achieved by 2030 (or earlier) unless otherwise noted.

Implementation of actions are anticipated to be initiated over 3 phases: phase 1 within 1-2 years, phase 2 within 2-7 years, and phase 3 within 4-8 years of CAP approval.

1. **Strategy W-1:** Promote increased water conservation City Wide with a targeted reduction of 6% by 2030.
2. **Strategy W-2**: Reduce wastewater generation City Wide with a targeted reduction of 6% by 2030.
3. **Strategy W-3**: Mitigate the projected increased flood hazards and impacts due to climate change.
4. **Strategy W-4**: Update design standards and plans to meet projected climate change flood mitigation requirements.
5. **Strategy W-5:** Maintain source and drinking water quality through climate related challenges.

1 Strategy W 1:

Promote increased water conservation City Wide with a targeted reduction of 6% by 2030.

	Actions	Implementation Phase
W-1-1	Conduct a study to identify leaks within water infrastructure and implement an action plan for leak abatement.	1
W-1-2	Accelerate the installation of low-flow water fixtures in residential homes and expand the program to commercial businesses. Goal: achieve 100 households and 10 businesses upgraded annually. Implement pricing preference for households installing water efficient fixtures (such as WaterSense certified fixtures) and water/energy efficient water heaters. Establish incentives/cost reduction programs for qualifying low-income residents to purchase WaterSense certified fixtures.	1
W-1-3	Implement a policy to require installation of rainwater collection systems and WaterSense water efficient fixtures and appliances at all City facility projects and all projects receiving $30,000 or more in City tax abatement, financing or funding. Provide information and technical assistance to projects as needed.	2
W-1-4	Increase the use of Smart Irrigation systems and water conservation fixtures (new or retrofit opportunities). Establish a policy to require use at City facilities. Create rebate programs for replacement of existing irrigation systems with smart irrigation systems at homes and businesses.	2
W-1-5	Implement Advance Meter technology: Water loss detection and repairs, distribution system, By 2025 have a program in place Water audits of top water users – plans for reduction – 50/50 audit reimbursement, goal to do at least 2 per year Customer portal opt-in incentive 50% of customers enrolled by 2030 60-70% by 2040	3
W-1-6	Explore modifying residential water rates that better incentivize water conservation and dis-incentivize water use. An example would be implementing pricing preference for households installing water efficient fixtures (such as WaterSense certified fixtures) and water/energy efficient water heaters.	3

2 Strategy W 2:

Reduce wastewater generation City Wide with a targeted reduction of 6% by 2030.

	Actions	Implementation Phase
W-2-1	Improve/refine waste water and storm water discharge incentives: Implement incentives/pricing preference for businesses and households installing waste/storm water avoidance strategies: - Rain gardens - permeable pavers - energy efficient dishwashers - Greywater reuse Implement new data enhanced outreach and incentives to identify and remedy sources of waste/storm water before management or processing is required. Incentive implementation should focus on improving community equity	1
W-2-2	Evaluate the potential for installation of rainwater collection systems at City facilities for graywater uses, and investigate opportunities for graywater reuse at existing and new City facilities and properties. Implement grey-water systems identified capable of reducing energy/water demand in other areas (for example, watering urban tree	1

3 Strategy W 3:

Mitigate the projected increased flood hazards and impacts due to climate change.

	Actions	Implementation Phase
W-3-1	Establish a Storm Water Infiltration Plan identifying priority areas and strategies for improved infiltration of storm water to minimize storm water volumes requiring handling while increasing water aquifer recharging. Strategies to focus on reduction of impervious surfaces, increase of permeable surfaces, trees, bio swales, rain barrels, rain gardens, compost, mulch, etc. Coordinate and integrate Plan with city's Citywide Heat Island Impact Study (see Buildings and Energy actions)	1
W-3-2	Promote effective Storm Water infiltration in residential sectors by exploring rebates and incentive opportunities including tax incentives, rebates, or other incentives for deceasing driveway, roof, and yard run-off. Implementation of incentive structure to focus on increasing community equity	1
W-3-3	Restructure storm water fee based on impermeable surfaces with tax or other incentives for permeable surfaces and other water retention improvements.	1
W-3-4	Establish incentives to prioritize the development of “green infrastructure” such as parks, wetlands, riparian and wildlife corridors, natural drainage-ways, and low-impact development, particularly in residential districts. Research green infrastructure implementation and long-term viability in local environment	2
W-3-5	Advance improved Storm Water infiltration in new development by creating and enforce codes aimed at zero run-off with a focus on zero run-off parking strategies. Coordinate and integrate Plan with city's Citywide Heat Island Impact Study (see Greenspace and Trees actions)	2

4 Strategy W 4:
Update design standards and plans to meet projected climate change flood mitigation requirements.

	Actions	Implementation Phase
W-4-1	Determine stormwater volume requirements meeting anticipated future storm levels using 20 year precipitation projections based on RCP 8.5 climate models. Identify stormwater management systems and infrastructure not capable of meeting projected needs. Prioritize upgrades required and implement. Integrate upgrades into already scheduled maintenance programs and budgets.	1
W-4-2	Expand inclusion of green infrastructure in City's Stormwater Management Plan to meet increased precipitation projections of climate change as well as in response to the Flood Risk Assessment and Blue Spot mapping. Identify specific types of green infrastructure to implement including: parking lots, alleys, parks, vacant lots, parkways, and grading near sidewalks. In addition, identify property owned by other public entities that have a high potential for improved ecological management to improve stormwater management functions.	1
W-4-3	Build more permeable parking lots and driveways and use more recycled materials with concrete.	2
W-4-4	Modify water utility bills to provide education to residents on what actions they can take to reduce their risk to extreme precipitation events and flash flooding. Develop an information HUB with tools and resources (e.g. https://www.cnt.org/tools/my-rainready-home-assessment-tool)	2

5 Strategy W 5:
Maintain source and drinking water quality through climate related challenges.

	Actions	Implementation Phase
W-5-1	Ensure Wellhead Protection Plan recommended actions have been implemented. Maintain and update Wellhead Protection Plan based on current and projected precipitation and climate data.	1
W-5-2	Develop educational materials covering the link between water resources and climate change.	1
W-5-3	To improve water quality in Albert Lea's lakes Albert Lea public works will increase the frequency of street sweeping with funding provided by the Shell Rock Watershed District. (Related to improving the water quality and reducing summer algal blooms in Albert Lea's Lakes, given bigger rain events, more run off and hotter summers)	1

Planned Water and Wastewater GHG Emission Reductions

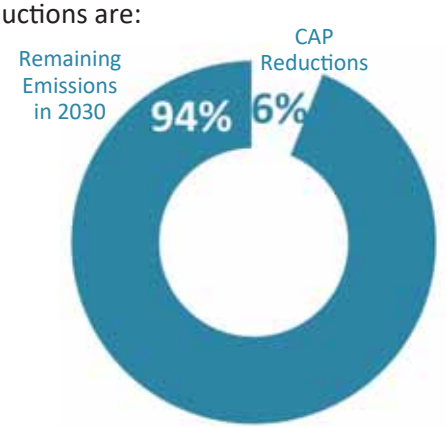
Planned Sector Emission Reductions Through 2030

The strategies and actions included in this section of the Climate Action Plan are projected to reduce the City's annual GHG emissions by 16,671 metric tons (MT) by 2030 - a 31.8% reduction over 2019 levels.

When compared to 2019 emissions, this is equivalent to eliminating **327 million** cubic feet of man-made greenhouse gas atmosphere annually by 2030.

Sector Emissions Reduction below 2019 by 2030

The total change to sector emissions include CAP Plan reductions are:



Albert Lea's Water and Wastewater Carbon Reduction Pathway

What You Can Do

You can support the goals of the Water and Wastewater section of the Albert Lea Climate Action Plan as an individual, household, or a business. Here are just a few things you can do:

- Turn off the faucet while brushing your teeth.
- If you have dishwasher, use it. Research shows we use more water washing dishes by hand than running a full or nearly full dishwasher.
- Replace your lawn or portions of your lawn with drought resistant native plantings, prairie grasses, and wild flowers and eliminate or greatly reduce exterior watering.
- If you have a lawn and garden irrigation system, or use hoses and sprinklers, water thoroughly less often, and do so in the early morning or evening.
- Collect rainwater and use it for indoor and outdoor plants.
- Install — or have a licensed plumber install — water-saving aerators on 2 or more showerheads and faucets.
- Install — or have a licensed plumber install — a water-saving low-flow toilet.