



THE PIPELINE

COMMUNITY NEWSLETTER

September 2024

Message from Tamara Wambeam, GIS/IT Systems Administrator



Artificial Intelligence (AI) is the biggest buzzword in the world of technology today. Everyone has heard of AI being used for writing, painting, driving cars, and creating smart robots but how can AI help Salt Lake City Department of Public Utilities (SLCDPU)? I am the Administrator of SLCDPU's Geographic Information Systems & Information Technology (GIS/IT) division. The GIS/IT division works with all divisions within SLCDPU

and with the City's IT department to evaluate AI software vendors for usability, affordability, and effectiveness. Technology is constantly evolving, and it takes everyone in the Department working as a team to make an informed decision about the benefit and risks associated with this emerging technology.

There are many different definitions of AI, but Google's own AI defines it as "a field using computers and machines to perform tasks that usually require human intelligence, 'smart' technology." A branch of AI that most often applies to the needs at SLCDPU is Machine Learning (ML). ML uses mathematical models, algorithms, and statistics from large data sets to help computers "learn." As more data is entered into the models, they become better at predicting outcomes.

Since our inception, SLCDPU has been gathering data from stream flows to the sizes and types of mains throughout our utility network. We have vaults of data in the forms of maps and charts. Starting in the 1980s, most of our data was stored in a digital format. With 50 years of our own data and access to data from outside sources, we can begin to use ML to help with efficiency and predictions across our different divisions.

SLCDPU is using AI to assist with the implementation of the EPA's updated Lead and Copper regulations. With the help of Salt Lake City's data scientists, we have created a ML model to predict the likelihood of a service line having lead pipe which allows our water quality technicians to focus on specific areas that are most likely to be affected. As the technicians find or don't find lead in the field, the data is entered into the model so it can "learn" and make better predictions.

Our sewer and storm water crews use cameras to televise the inside of pipes to determine their condition. The videos and condition assessments are uploaded to the cloud through a software program and the data are used as training for machines to learn how to find issues such as cracks in the pipes from photo interpretation. Although this is still a work in progress, it allows for a backup when our crews are busy and need extra help.

We are currently evaluating software that will help us predict the probability of breaks for water mains in our system. AI can use our 50 years of break history combined with factors such as material, size, and age of the pipe as well as soil type, proximity to faults, and roadway type to come up with a probability index that can help our engineers determine a water main replacement schedule.

SLCDPU has installed over 50,000 Advanced Metering Infrastructure (AMI) meters. Water meter usage is recorded hourly and can be used by customers to check for water leaks or to see how much water they are using. Using these big data sets, we can use ML to analyze customers' actions compared to temperature increases or rain events.

As with all technology, AI is just a tool that can be used for good or bad. AI can be used to learn passwords, help build malware, and create cyber security risks. It is a difficult task to keep up with all the cyber-attacks and with AI it is becoming easier for bad players to easily program new malware and viruses. SLCDPU employees are trained to be vigilant and report any security risks.

Although AI can be used for many different purposes and can make us more efficient, it is important to remember that it is a supplement to human decision making. AI only works with quality data and needs to have knowledgeable people with experience to QA/QC the results, but it allows SLCDPU the tools to be more efficient and open.

SLCDPU's stormwater maintenance crews, pictured at right, completed a project to rehabilitate one of Salt Lake City's local drainage ditches. These improvements will allow runoff to flow more smoothly in the area, which contributes to our ability to effectively manage the City's stormwater system as a whole.



Project Updates

Salt Lake City's Department of Public Utilities manages a number of construction projects to maintain and improve our system. Many of these projects are smaller in scale but we've highlighted a few of our larger projects below. If you're interested in learning more about other SLCDPU projects, please [visit our website](#).

Arlington Hills Pump Station: In September 2024, crews will begin construction to replace the emergency generator at the Arlington Hills Pump Station (located at 1225 Chandler Drive in Salt Lake City). The existing generator at this site is undersized and needs to be replaced. In the event of a power outage, the emergency generator will ensure that water service continues to the area.



Salt Lake City Department of Public Utilities
Administrative Offices: 1530 S. West Temple Street | Salt Lake City, UT | 84104
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