## CASE STUDY: LAS VEGAS VALLEY WATER DISTRICT

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The Las Vegas Valley Water District (LVVWD) is a not-for-profit agency that provides water to much of the Las Vegas Valley. Since 1998, the region has experienced an extraordinary level of development and growth in both the residential and business landscape.

An economic boom and unprecedented population growth has created a significant challenge for the area's water district. Over the last eight years, LVVWD has added approximately 2,000 water meters per month, which are largely located in outside meter boxes. Collecting data from each of these new meters, in addition to monitoring ongoing water conservation efforts, has placed a significant strain on the system and its employees. In order to keep up with the current, as well as pending growth, the District was forced to increase the number of employees to cover the developing areas, as well as address the potential for water shortages as people continue to move into the highly arid, desert region.

**Finding a Solution in AMR Technology**

As growth continued to mount, the LVVWD Board of Directors made a critical decision. Instead of focusing on increasing the size of its staff, the District would focus on key technologies that would lessen their dependency on new hires while concurrently providing a viable solution for the future development. After significant research and a thorough analysis, the LVVWD determined that Automatic Meter Reading (AMR) technology would offer the most practical and affordable solution for their needs.

"A cost/benefit analysis identified some $32,000,000 in direct hard cost savings over the life of the hardware with an additional $44,000,000 in related benefits to our Customer Service and Conservation Divisions," stated Meter Services Manager Mike Kebles. "The District's goal after full deployment is to reduce the number of manual meter readers from 25 to a Mobile Reading workforce of six."

To ensure the best technology was implemented, the LVVWD created an open bidding process for purchasing water meters. This gave the District a strong base of diverse meter manufacturers and types from across the country. After reviewing key research, the LVVWD determined that it would not be cost-effective to replace the recently installed straight-read units, without the electronic output needed for many AMR systems, because they were functioning accurately and reliably. This led to a directive that any new AMR products purchased by the District must be compatible with all existing brands and types of meters already deployed.

Over the course of several months, the LVVWD explored a large variety of AMR alternatives and concluded that Datamatic, an AMR manufacturer based in Plano, Texas, was the only supplier that could meet its AMR system criteria. "When considering the cost effectiveness of adding an AMR to an existing system, meter independence is often a critical factor," explained Datamatic President and CEO Ken Kercher. "We were able to help the LVWWD in two important ways. First, we provided the key product technology that limited the need to replace all of the District's new meters; Secondly, we provided them with the product and installation within their budget constraints."

**What is AMR?**

The LVVWD selected the unlicensed Datamatic FIREFLY® AMR system with mobile ROADRUNNER data collection hardware and software. The FIREFLY technology can read today's pulse and encoded registers and can optically recognize the passage of the sweep-hand on LVVWD's majority of standard meter registers.

"An added bonus of this system is its capability to store and provide water usage history profiles," noted Kebles. "The FIREFLY units are programmed to capture 74 days of hourly reads, giving the LVVWD the capability to analyze the data for leaks and other consumption anomalies."

Handheld and mobile computers are used to collect meter data during the transition from manual meter reading to AMR. Upon completion, all meters will be read using vehicle-mounted data collection units. The LVVWD has experienced minimal problems with radio reception of the meter data transmitted from within the meter boxes. Installation was outsourced to Datamatic to create single-source accountability for the overall operation of the AMR system, and Datamatic sub-contracted the installation of the AMR meter modules.

"Each mobile Meter Reading Route currently reads from 2,500 to 3,000 meters per day versus 600 manually," stated Kebles. "Manual Meter Reading Routes are being combined to form new larger AMR Routes, but the historical geographic design of the Routes has not been re-evaluated. The ultimate goal is 6,000 to 7,000 reads per mobile unit per day. Currently, 260,000 meters have been retrofitted since 2000, with an additional 125,000 meters scheduled to complete the project. Current rate of deployment is 2,500 meters per week."

"Once Datamatic had delivered the system to the LVVWD, its maintenance was handed over to the District's in-house staff," noted Andy Kercher, Datamatic Vice President. "The system is virtually self-sustaining and, to date, we know the District has experienced little operational problems with the equipment. An important point to emphasize is that the expected battery life of the FIREFLY units are between 10 to 15 years because of the low-power requirements of our optic technology.."

**Overcoming Implementation Issues**

The District experienced some initial "growing pains" when some FIREFLY electrical connections were not properly waterproofed. Scratched and dirty lenses also contributed to problems tuning the FIREFLY's optical sensors to address variable conditions of existing meter registers**.** However, these problems were easily remedied through a collaboration between the LVVWD and Datamatic**.**

In addition, a sub-contractor was chosen to install Datamatic's FIREFLY units, which led to some preliminary programming issues that were not addressed in a timely manner. The sub-contractor also experienced some difficulty in properly programming the units in the field with the meter reading of the meter. Datamatic, however, quickly overcame the issues by modifying the contract to offer clear incentives to correct the problem.

In addition, improved processes resolved some problems that occurred when meter data was outdated by the time the installation contractor arrived at the site of each meter to be retrofitted. This was due to interim meter exchanges occurring between the time the work orders were created and the time the work was performed.

Employees have been kept well informed of the progression of the AMR project and Meter Readers have responded by re-training to higher-level positions. Extensive communication has been focused on customers and response has generally been positive.

**Best Practices**

According to Kebles, utilities need to keep the following in mind:

- Collaboration between the utility and the AMR supplier is needed to fit the right technology to the organization, modify hardware and software as needed along the way, and work with meter manufacturers to optimize overall system performance. For example, the LVVWD and Datamatic are working together to upgrade the FIREFLY modules to be "self-provisioning" during installation. This will reduce the manual programming processes now required of the installation contractor. Further, installation would be significantly streamlined if meter suppliers installed the AMR modules during the manufacturing process, avoiding the need to retrofit the meters after delivery to the utility.

- Load profiling capability of the AMR system enables LVVWD employees to resolve customer-billing concerns by sharing graphs of hourly consumption to customers. In many cases this allows pinpointing of specific consumption events that represent leakage or other consumption anomalies.

- Critical success factors for AMR implementation are selection of the right AMR product to meet organization requirements, and hiring of the right contractors to perform implementation activities. In order to accomplish these objectives, the organization must know precisely what it is trying to achieve

and identify the specific data it needs to do that. During implementation, the most challenging task is data management and administration, both for meter inventory and work order tracking, as well as for meter reading data.

- Accountability for successful accomplishment of AMR implementation tasks is critical to project achievement. This was accomplished by LVVWD assigning responsibility for both meter reading and meter maintenance to a single manager.

**Lessons Learned**

The LVVWD and Datamatic worked closely with another to build and install an AMR system that empowers the District to manage its growth, improve productivity, streamline processes and improve customer service. The District's methodical approach will pay dividends for the city and its customers for decades to come.